APPROVED- FURTHER ACTION ESI NEEDS TO BE EVALUATED 9/30/92

THIS DATE WAS PUT INTO WASTELAN PREMATURELY AFTER CONSULTATION W/B&V (DRAFT RESULTS).

SITE INSPECTION REPORT

Hercules, Inc.

Hattiesburg, Forrest County, Mississippi

EPA ID № MSD008182081

WasteLAN № 02297

EPA Work Assignment № 11

EPA Contract № 68-W9-0055

Prepared for

WASTE MANAGEMENT DIVISION

U.S. Environmental Protection Agency

Prepared by

B&V Waste Science and Technology Corp

BVWST Project № 52011.040

April 29, 1993

Prepared by:	Reviewed by:	Approved by:
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Executive Summary

The Hercules, Inc. facility is located on West Seventh Street in Hattiesburg, which is situated in the northern portion of Forrest County, Mississippi. Since 1923, this 200 acre facility has manufactured over 250 different products through a chemical operation which involves wood grinding, shredding extraction, fractionation, refining, rosin processing and distillation. A state preliminary assessment was completed in December 1989.

Two source areas were detected on Hercules property: 37.7 acres of contaminated soil and 895,600 cubic feet of surface impoundments. The contaminated soil includes such contaminates as cadmium, cobalt, lead, mercury, toluene, MEK, benzene, PCB's, and acetone. Contaminants present in the surface impoundment include arsenic, heavy metals, toluene, MEK, and benzene.

The Hercules plant is located within the Pine Hills physiographic district of the Coastal Plain physiographic province. Groundwater occurs in the alluvial and terrace deposits as well as the Hattiesburg formation. The nearest private well is located 0.3 miles north of the site. The nearest municipal well is 0.7 miles northwest of the facility. The groundwater pathway is a great concern due to the release of contaminants and the large nearby population which utilizes groundwater.

The surface water pathway is also a concern at Hercules, Inc.. A release of contaminants has been noted within Greens Creek which is attributable to source areas on Hercules property. The presence of endangered or threatened species plus recreational fishing and swimming render this site a concern and threat to populations and environments.

The soil and air pathways are also a concern at the Hercules site. A large population surrounds the facility and many endangered and threatened species are found in close proximity to the site.

Due to releases of contaminants into the environment and the many targets potentially affected, further action should be planned under CERCLA authority for Hercules, Inc.

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1.0 Introduction

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 U. S. Environmental Protection Agency (EPA), Waste Management Division of Region IV contracted B&V Waste Science and Technology Corp. to perform a site inspection (SI) and geophysical survey at the Hercules, Inc. site in Hattiesburg, Forrest County, Mississippi. The primary purpose of the investigation was to collect data and information regarding potentially hazardous environmental conditions at the site. The investigation included a review of readily available site-specific historical file documentation, collection and chemical analysis of readily identified wastes and potentially impacted media at the site, evaluation of preliminary assessment (PA) hypotheses, preparation of Hazard Ranking System (HRS) factor values and scores, collection of additional information relating to site conditions at the time of the investigation, and interview sources with knowledge related to the site and site activities in the past and present processes.

The objectives of the inspection were to evaluate the presence, of contaminants and to evaluate the potential for adverse impact on the environment. Additionally, the work effort will examine the potential pathways the contaminants could travel and the populations and environs the contaminants could potentially impact. Through these objectives, a recommendation was formulated regarding the necessity for additional work and the disposition of the site.

Background information pertaining to the site was collected from the State of Mississippi Department of Environmental Quality, U. S. EPA files, and Mr. Charles

Jordan, Environmental Supervisor for Hercules, Inc.. Additionally, information relating to the municipal water systems, the number of connections, and distribution patterns were obtained. A potable well survey was performed in the vicinity of the site to estimate the location and lateral distances from the site. The information collected is presented on a detailed map showing the approximate locations of field sampling activities and activities related to the geophysical surveys performed at the facility.

2.0 Site Description

2.1 Site Location

The Hercules, Inc. facility is located on West Seventh Street in Hattiesburg, which is situated in the northern portion of Forrest County, Mississippi. More specifically, the facility is located in Township 4 North, Range 13 West, within Sections 4 and 5 -just north of Hattiesburg, Mississippi (Appendix A). The geographic coordinates of the facility are 31° 20' 20" north latitude and 89° 18' 25" west longitude (Appendix A). Land use in the vicinity of the site is industrial/residential. The site location is detailed in Figure 1.

Climate in the Forrest County area is characterized by long, hot, humid summers because moist tropical air from the Gulf of Mexico persistently covers the area (Ref. 1, p. 1). Winters are cool and fairly short. Occasionally a rare cold wave occurs that dissipates in 1 or 2 days (Ref. 1, p.1). Precipitation is fairly heavy throughout the year (Ref. 1, p. 1). In the winter, the average temperature is 51° F, while during the summer the average temperature is 81° F (Ref. 1, p. 1). The average annual precipitation for the Hattiesburg area is 60 inches, with a mean annual lake pan evaporation of 46 inches, yielding a net annual precipitation of 14.0 inches (Ref. 2, pp. 43, 63). The 2-year, 24 hour rainfall is 5.0 inches (Ref. 3, p. 95). The elevation of Hercules, Inc. is approximately 170 feet above mean sea level (amsl). Estimated elevations within a four-mile radius of the facility range from 120 to 350 feet amsl (Appendix A).

BASE MAP IS A PORTION OF THE USGS 7.5 MINUTE QUAD. OF HATTIESBURG, MISS. 1964.

SITE LOCATION MAP
HERCULES, INC.
HATTIESBURG, FORREST COUNTY, MISSISSIPPI

FIGURE
1

2.2 Site Description

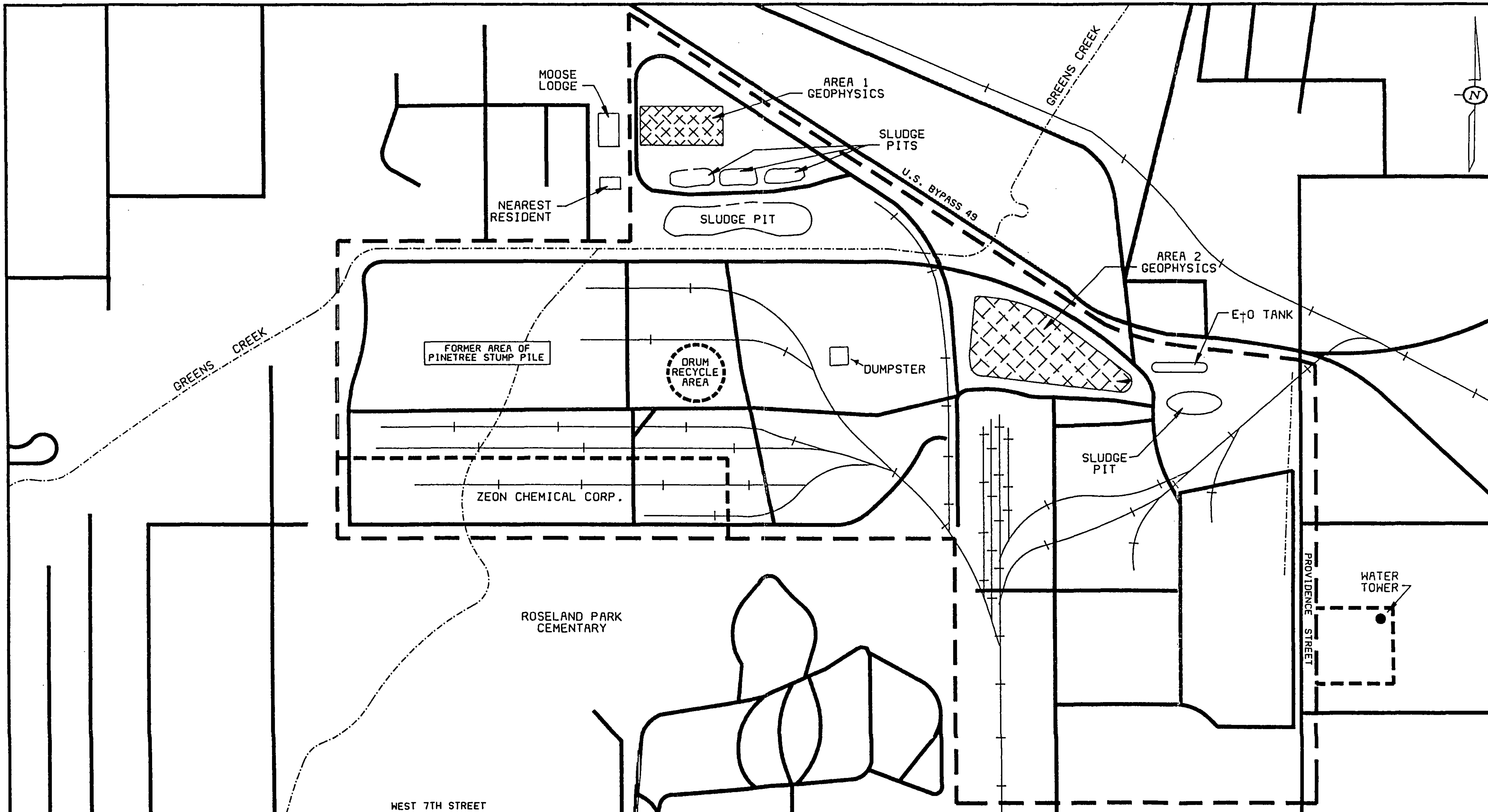
The Hercules facility is approximately 200 acres in size. The facility consists of a complex chemical operation that involves wood grinding, shredding extraction, fractionation, refining, distillation, and processing of rosin from pine tree stumps. Some of the products manufactured at the facility are modified resins, polyamides, ketene dimer, crude tall oil wax emulsions, synthetic rubber, and delnav, an agricultural pesticide (Ref. 4). Over 250 products are produced at the facility. The facility began operations in 1923 and is presently active in production (Ref. 5). Structures at the facility include the offices, laboratories, shops, powerhouses, a wastewater treatment plant, settling ponds, landfills, central loading and packaging facilities,and the railroad (Refs. 4;6).

The entire facility is fenced in and is not accessible to non-employees. This facility is surrounded by residential and industrial areas and the Rose Hill Cemetery (Ref.6, Appendix A). The site location map is shown as Figure 1, and a site layout map is displayed as Figure 2. The Hercules facility as well as specific site components have been documented with photographs and is displayed as Appendix B.

2.3 Operational History and Waste Characteristics

An area located on the north portion of facility property, is referred to as the "back forty," and has been used in the past for disposal of various wastes, including process wastes, boiler ash and waste treatment sludge from plant activities (Refs. 5, 6, 7). The type of disposal of the process wastes has been primarily by landfill, but sludge has also been disposed of in open shallow pits (surface impoundments). The boiler ash has been disposed of by landfill and waste piles (Refs. 6, 7, 8).

In 1980, pursuant to RCRA, Hercules filed notification for on-site generation, treatment and storage of spent sulfuric acid from a rosin polymerization operation (Refs. 8, 9). In 1983, the Mississippi Bureau of Pollution Control (BPC) determined that the spent sulfuric acid was exempt from the RCRA hazardous waste regulations, because it was being reused in the wastewater treatment system for elementary neutralization (Ref. 10). As a result of the determination, interim status for storage and treatment of the spent sulfuric acid in tanks and in a surface impoundment was



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SITE LAYOUT MAP	HERCULES, INC. HATTIESBURG, FORREST COUNTY, MISSISSIPPI	FIGURE 2

withdrawn and Hercules reverted to the status of an occasional generator (Ref. 10). The wastewater treatment system treats contaminated water from all sources throughout the plant. Hercules currently has a NPDES permit for discharge of the treated wastewater in the Bowie River (Ref. 11).

Prior to 1980, in response to a congressional subcommittee request for information from major chemical companies concerning waste disposal, Hercules voluntarily completed a survey form in which they identified disposal of various wastes from their process operations in a landfill on site. The landfill was referred to as the "back forty" landfill. This voluntary survey form later served as notification under the CERCLA program for on-site disposal of potentially hazardous substances. This landfill is not regulated under the RCRA program (Ref. 7, 8, 9).

3.0 Field Investigation

3.1 Geophysical Investigation

According to file material obtained through the U.S. EPA, Region IV, and the Mississippi Department of Environmental Quality, Hercules, Inc., landfilled, land applied and buried in pits: drums, sludge, boiler ash, and other process wastes in an area referred to as the "back forty" as well as a landfill area south of the back forty for an unknown period of time (Refs. 6, 7). Therefore, a surface geophysical survey program was developed to evaluate areas of specific concern within the northern portion of site property. The use of these instruments was intended to aid in the selection of sampling locations. Realizing the limitations of the methods and the equipment used, this activity was performed as a screening method. It should be understood that data gained from these surveys indicate a response of magnetic corresistive change within the surfical soils, which may be attributable to subsurface burial or naturally occurring lithologic conditions. Information containing a detailed explanation and applications of these methods is contained in Appendix C.

The scope of surface geophysical surveys include the following activities:

- Conduct an electromagnetic (EM) survey in the "back forty" portion of the facility (evaluate subsurface conductivity).

- Conduct a regional magnetic (MAG) survey within the limits the facility boundaries (evaluate the earth's magnetic field intensity).

- Generate the following maps for each surveyed area:

    - Geophysical Base Map
    - Conductivity Contour Map
    - Conductivity Surface Anomaly Map
    - Magnetic Intensity Contour Map
    - Magnetic Intensity Surface Anomaly Map

3.1.1 Geophysical Survey Methodology

The two geophysical instruments used in the subsurface study were a ground proton precession magnetometer (Geonics-856) and an electromagnetic non-contacting ground conductivity meter (EM-31). At the beginning of field activities fresh batteries were installed and both instruments were put through their respective calibration and pre-operational procedures according to the manufacturers' specifications. Details of the calibration responses for both instruments are contained within the field logbook (Ref. 6).

A background base station was established in the far northwest corner of facility property, where undisturbed field conditions were believed to be present (Ref. 6). The base station locations were marked with wooden stakes, and measurements were taken with both instruments at the stations prior to the surveys and upon completion of the surveys. Field conditions at each area of concern and base station instrument readings were recorded in the Hercules BVWST logbook (Ref. 6). The field measurements collected from the actual grid locations were recorded on EM or MAG data sheets which are considered to be an extension of the BVWST logbook (Ref. 6).

At the background base station, five positions were established. A center position with four locations radiating outward and terminating 10 feet from the center positioned in the north, east, south, and west directions. At each position of the base station, three readings were collected with the magnetometer and the EM-31, respectively. The average background magnetic intensity response at the onset of magnetometer readings was 50,835.2 nanotesla. At the end of the day, the same background location readings indicated an average response of 50,838.9 nanotesla (Ref. 6). The 3.7 nanotesla variation is typical of ambient diurnal fluctuations, and indicates stable magnetic field conditions for the time interval during which the other magnetic field measurements were collected (Appendix C).

The electromagnetic non-contacting ground conductivity meter (EM-31) was used in one of its two operative modes, the "comp" mode also known as the in-phase component mode. The in-phase component mode is used to evaluate metal detection. Background values documented for the EM in comp mode registered between 38 to 42 mmhos/meter (Ref. 6). All EM readings were collected with two orientations at each station location: north-south and east-west.

Two areas on the Hercules site were selected to further evaluate subsurface conditions with surface geophysical methods. The two areas are detailed on Figure 2. As noted on Figure 2, the areas have been designated as "Area 1 Geophysics" and "Area 2 Geophysics." Area 1 is located within the north back forty, approximately 200 feet northwest of the sludge pits (Ref. 6, Figure 2). Area 1 measures 700 square feet, contains 10 foot intervals, and is situated approximately 150 feet east of the Moose Lodge (Ref. 6). The north-south baseline extends 70 feet and the west-east baseline measures 100 feet (Ref. 6). Refer to Figure 3 for the Geophysical Base Map for Area 1. A cartesian coordinate-oriented grid was laid out in both areas, using a Brunton compass and a right angle prism in addition to surveying techniques (stadia & levels). In Area 2, north-south and east-west oriented survey lines were spaced at 25 foot intervals. The north-south baseline extended 150 feet, while the east-west baseline was 250 feet, resulting in a total area of 37,500 square feet (Ref. 6). Figure 4 illustrates the Geophysical Base Map for Area 2.

The X (north) and Y (east) axes (baselines) were marked by wooded stakes in both areas. The other station locations within the coordinate system were marked by labelled wire flags. . The grids for both Areas 1 and 2 were tied into fixed points at each area of concern to ensure replication.

3.1.2 Geophysical Survey Results

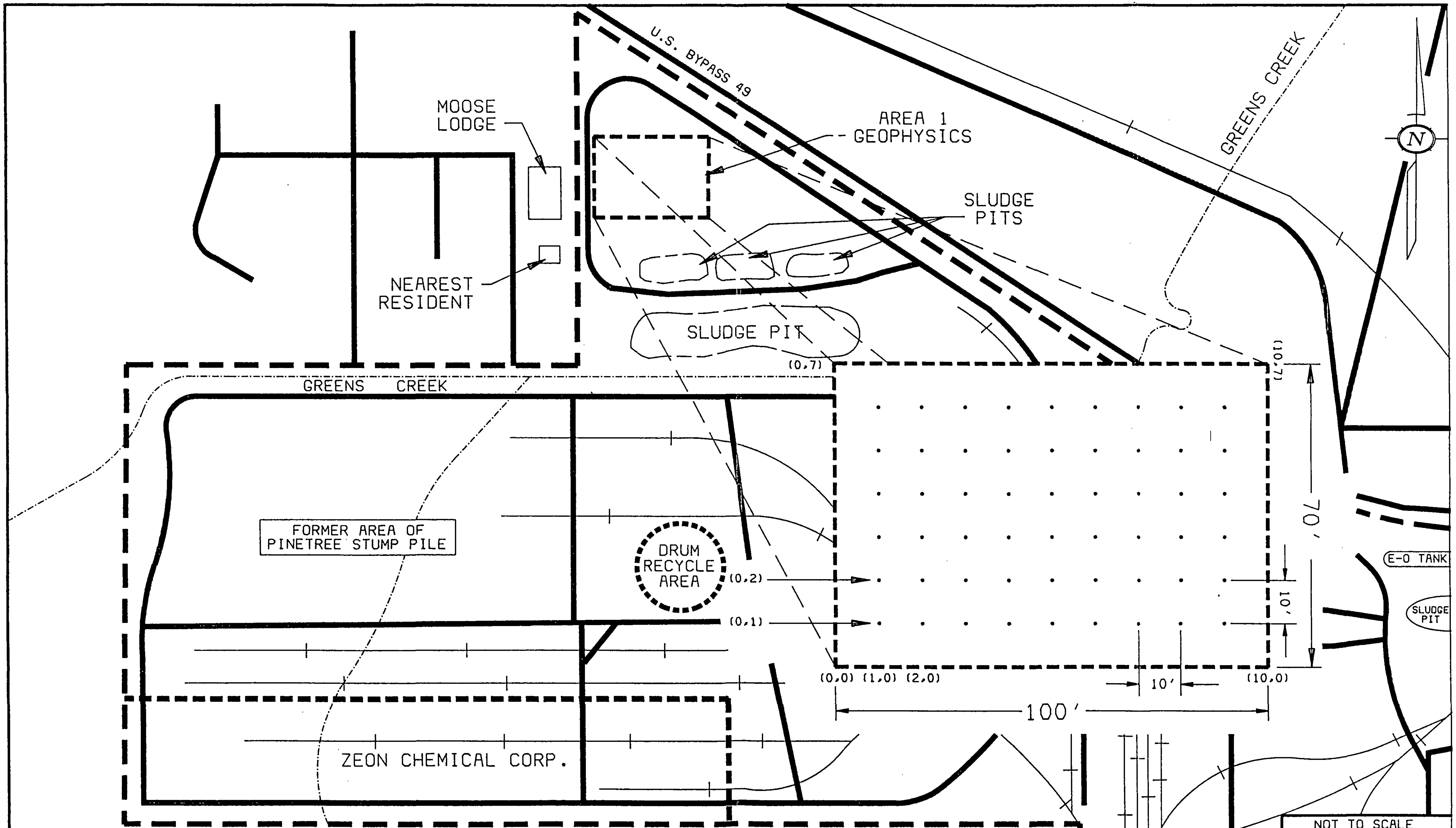
3.1.2.1 The Magnetic Field Intensity Survey. A Geonics-856 proton precession magnetometer was utilized to check and record the intensity of the earth's magnetic field at all station locations. Variations (anomalies) may be caused by the natural distribution of iron oxides or by the presence of buried iron or steel objects. The G-856 was calibrated and put through pre-operational checks according to manufacturer's recommendations. Magnetic intensity contour and anomaly maps were generated using Golden Graphics Surfer Software.

3.1.2.2 The In-phase Conductivity Survey. An electromagnetic (EM) non-contacting ground conductivity meter, the EM-31 was utilized to check and record subsurface conductivity measurements at each station location. The EM-31 was calibrated and put through pre-operational checks according to manufacturer recommendations.

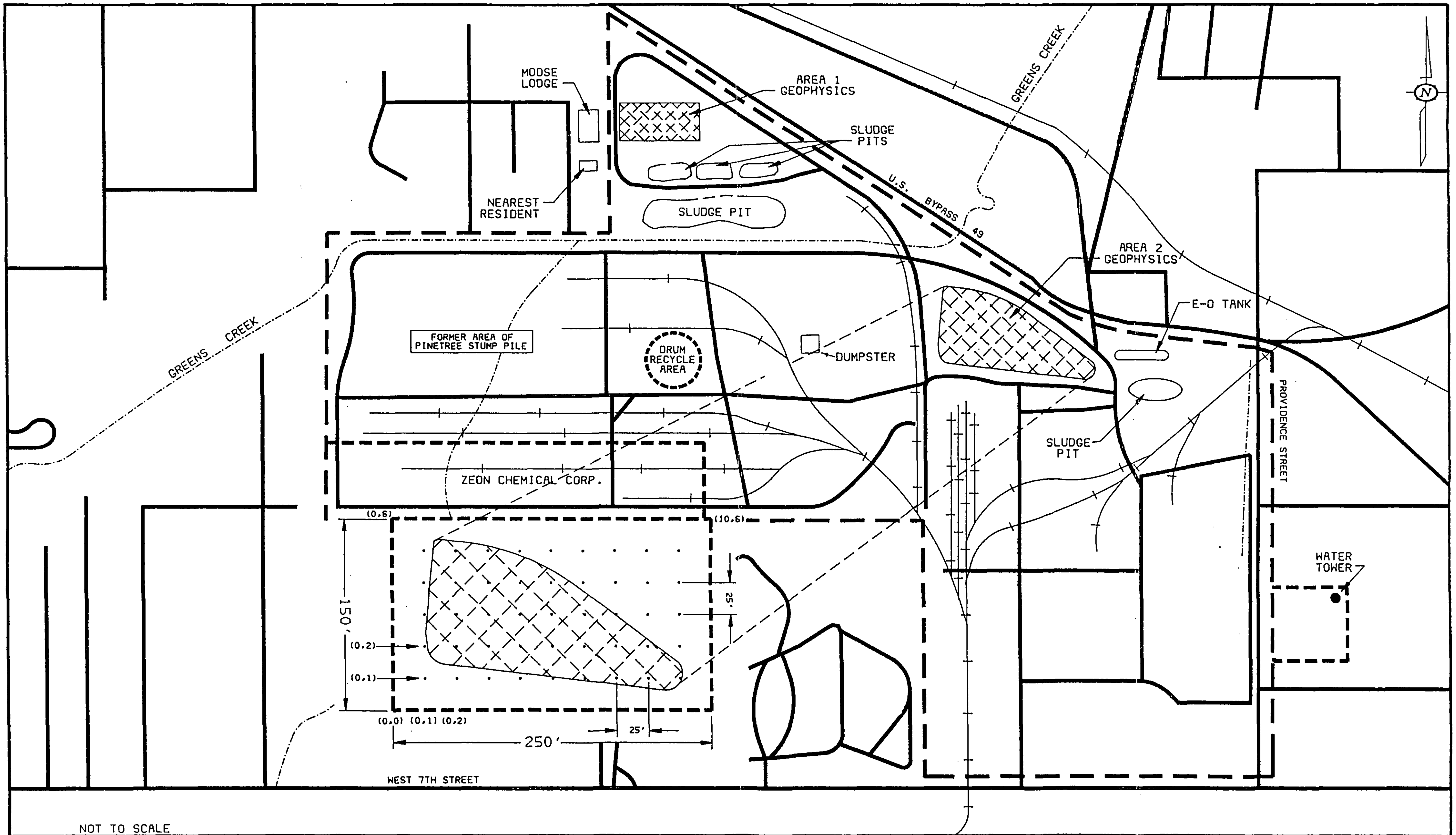
Electrical conductivity is a function of soil type, rock type, porosity, and permeability. Metal objects and landfilled or buried materials with significant metallic properties may cause variations in subsurface conductivity and create "anomalies" or differences in background conditions.

Conductivity contour and anomaly maps were generated using Surfer Software (version 3.0).

3.1.2.3 Geophysical Results. The geophysical results from Area 1 using the Geonics-856 magnetometer depicts two distinctive anomalies. This area contains no surficial interference (Ref. 6). The area of interest extends from X = 4 to X = 8 and Y = 1 to Y = 5. Figure 5 is the contour map of magnetic intensities for Area 1. The two focal points are (6,4) and (6, 2). This area of interest measures 40 feet by 40 feet and is located beneath immature forest growth. Indications of subsurface geophysical anomalies, possibly buried metals are observable on the contour map (Figure 5) as closed contours (both hatchured and non-hatchured). Two hundred



SCIENCE AND TECHNOLOGY CORP	GEOPHYSICAL BASE MAP-AREA 1	HERCULES, INC. HATTIESBURG, FORREST COUNTY, MISSISSIPPI	FIGURE 3



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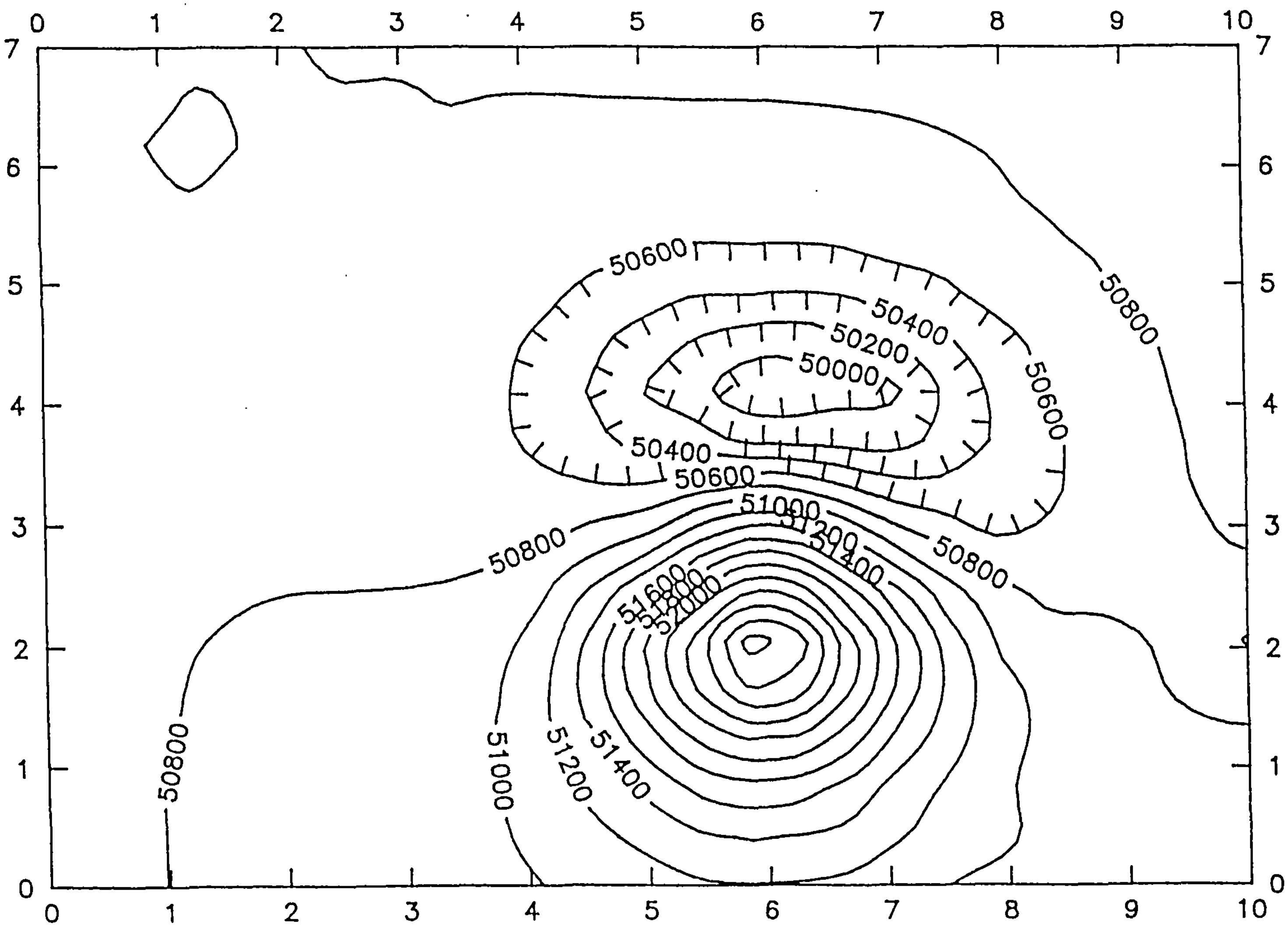
GEOPHYSICAL BASE MAP-AREA 2

HERCULES, INC.
HATTIESBURG, FORREST COUNTY, MISSISSIPPI

FIGURE 4

AREA 1 MAGNETIC INTENSITY CONTOUR MAP (NANOTESLA)



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HERCULES, INC.
HATTIESBURG, FORREST COUNTY, MISSISSIPPI

FIGURE 5

nanotesla contour line intervals are used in Figure 5. Measurements that differ from background magnetic intersitites are considered anomalous and are indicated as closed contours. Magnetic readings that exceed background levels are shown with non-hatchered contour lines ("peaks"), while measurements that fall below background intensities are similarly suspicious or anomalous and are indicated with hatchered contouring ("valleys").

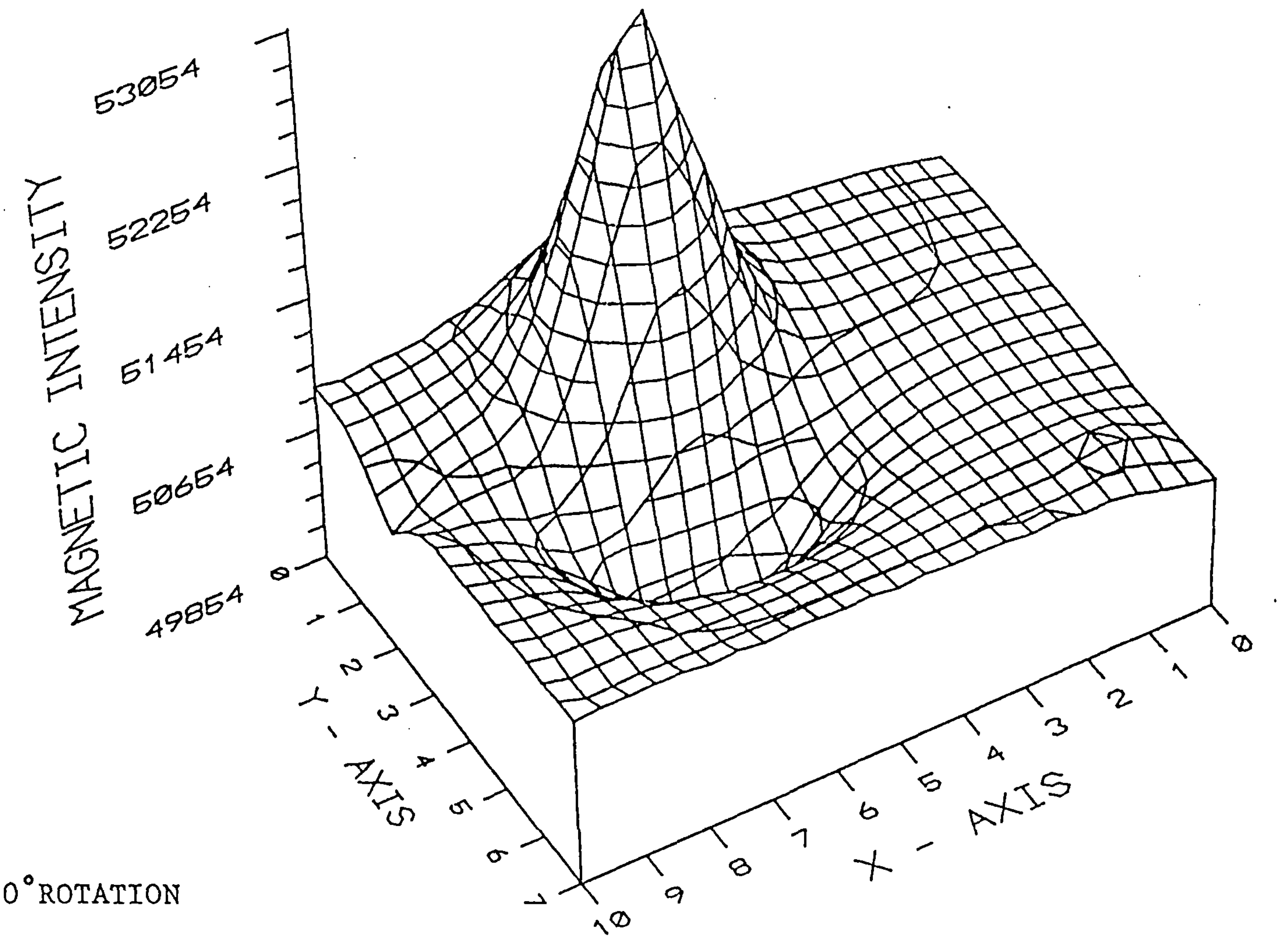
The highest magnetic intensity reading occurs at station (6, 2) and measures 53,387 nanotesla (Ref. 6). The lowest magnetic intensity reading occurs at station (6, 4) and measures 49,720 nanotesla (Ref. 6).

A surface map (3-dimensional) of isomagnetic intensities occurring in geophysical area 1 is included as Figure 6. The graphical representation of Area 1 on Figure 6 is rotated 180° to aid the viewer in seeing the anomalous "valley" surrounding station (6,4). An extreme "high" or "mountain" anomolous area occurs near station (6,2) on Figure 6.

Results from the EM-31 non-contacting terrain conductivity meter in the "comp" or "in-phase" mode yields data that show three anomalous areas in Area 1. Figure 7, a subsurface conductivity contour map, shows two high anomalies and one low anomaly. The contour interval for Figure 7 is 5 mmhos/meter. The subsurface conductivity surface map (3-dimensional), Figure 8, has not been rotated since the anomalous "valleys" are close to the origin (0,0) and therefore easily viewed by the reader. An extremely high ground conductivity reading of 115 mmhos/m was observed at station (7,7). The lowest conductivity reading (0 mmhos/m) occurred at stations: (6,2), (7,3), (6,3), and (6,4). This area of low anomalies form a triangle of concern centered around station (6,3) within geophysical Area 1.

Geophysical Area 2 indicates magnetic intensity anomalies in the northwest quadrant of the large study area as Figure 9 illustrates. The area of interest extends from X = 0 to X = 4 and Y = 2 to Y = 6 (Figure 9). Figure 9 is the contour map of magnetic intensities for Area 2. Contour line intervals measure 2000 nanotesla. Two focal points that occur are at stations (1,3) and (3,6). The northwest corner of the Area 2 grid is an area of interest which measures 100 feet by 100 feet or 10,000 square feet.

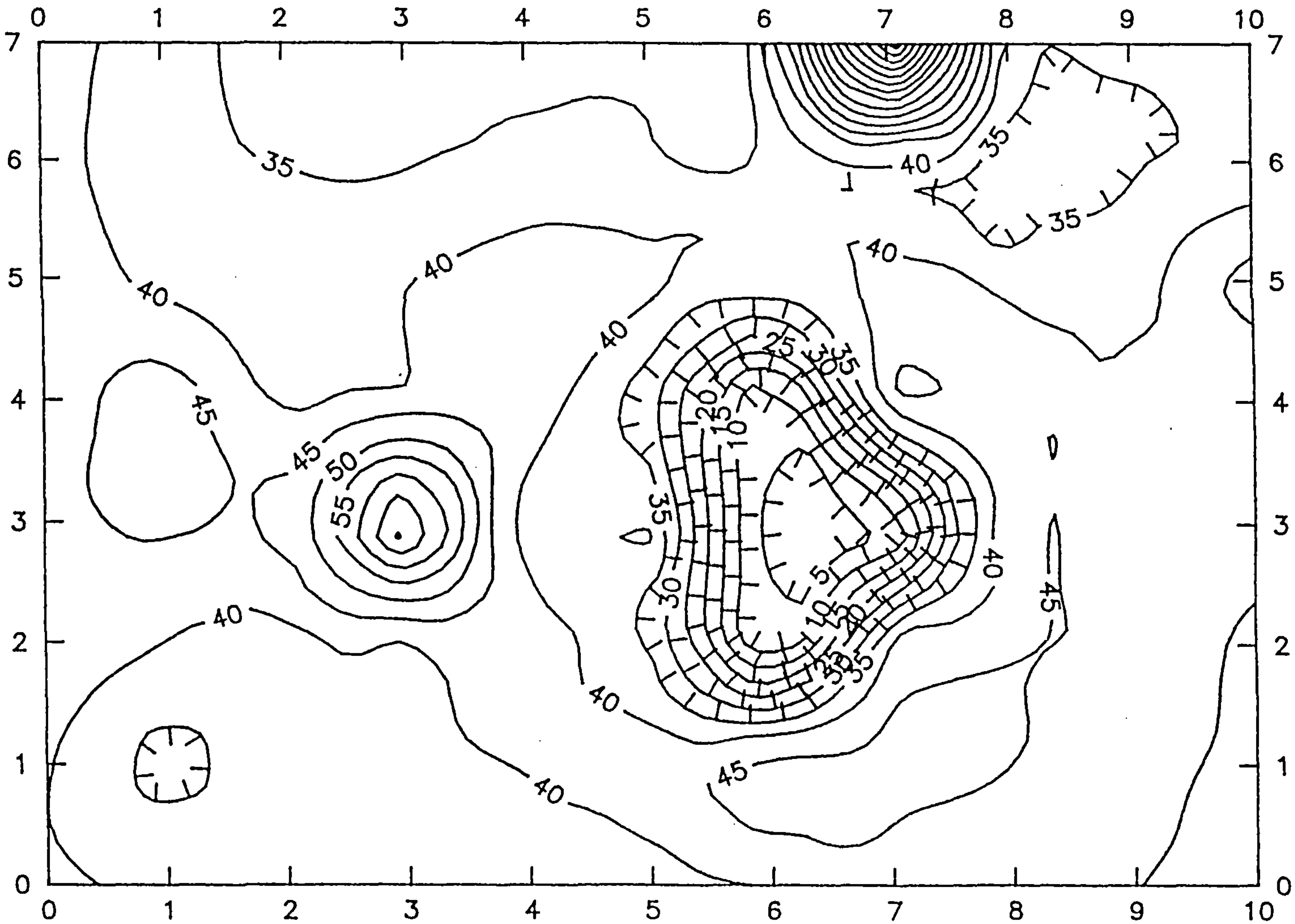
AREA 1 ISOMAGNETIC SURFACE MAP (NANOTESLA)



NOTE: 180° ROTATION

SCIENCE AND TECHNOLOGY CORP WASTE BVE	HERCULES, INC. HATTIESBURG, FORREST COUNTY, MISSISSIPPI	FIGURE 6

AREA 1 SUBSURFACE CONDUCTIVITY CONTOUR MAP MMHOS/M



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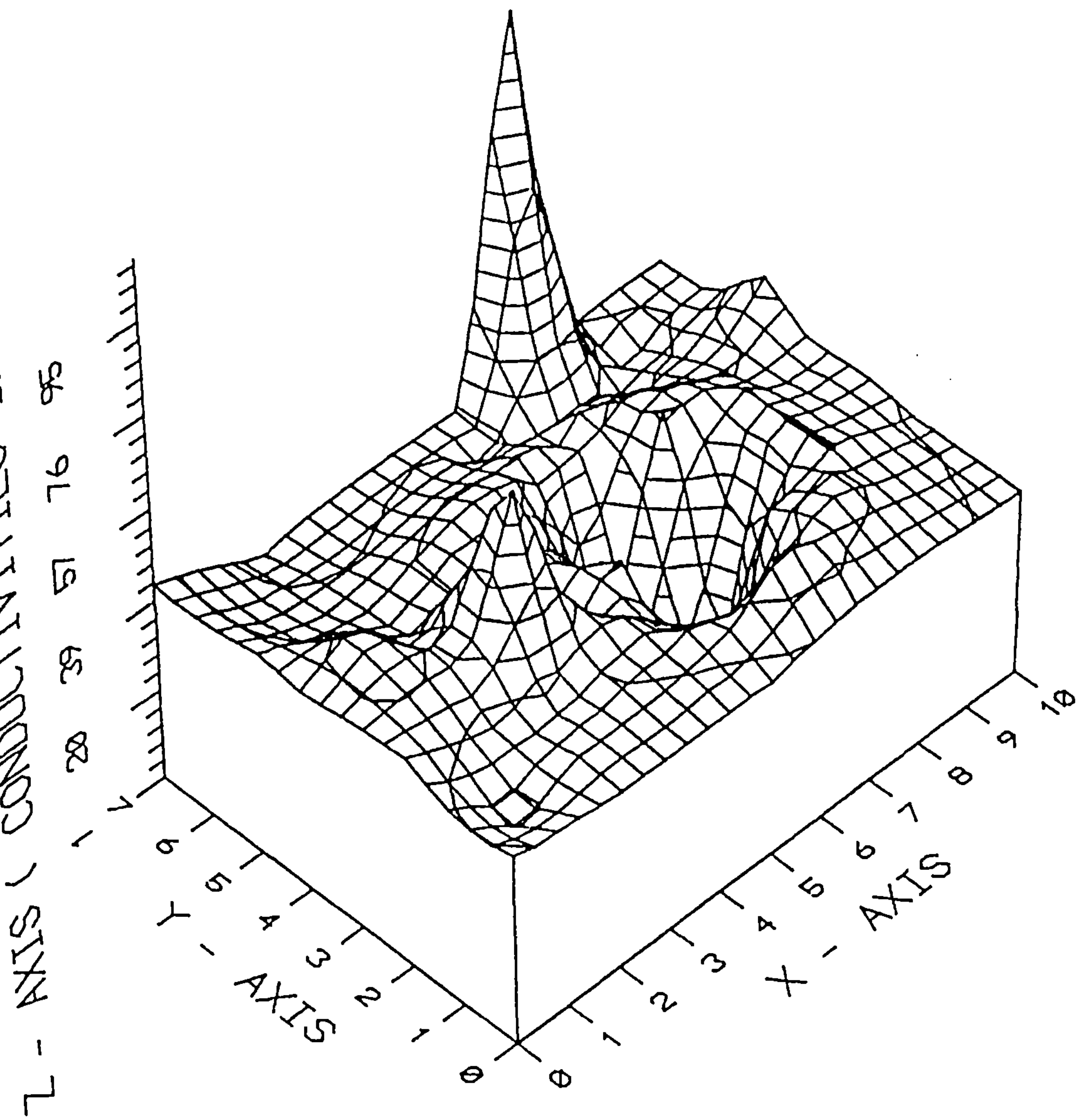
HERCULES, INC.
HATTIESBURG, FORREST COUNTY, MISSISSIPPI

FIGURE 7

AREA 1 PLOT OF SUBSURFACE CONDUCTIVITIES



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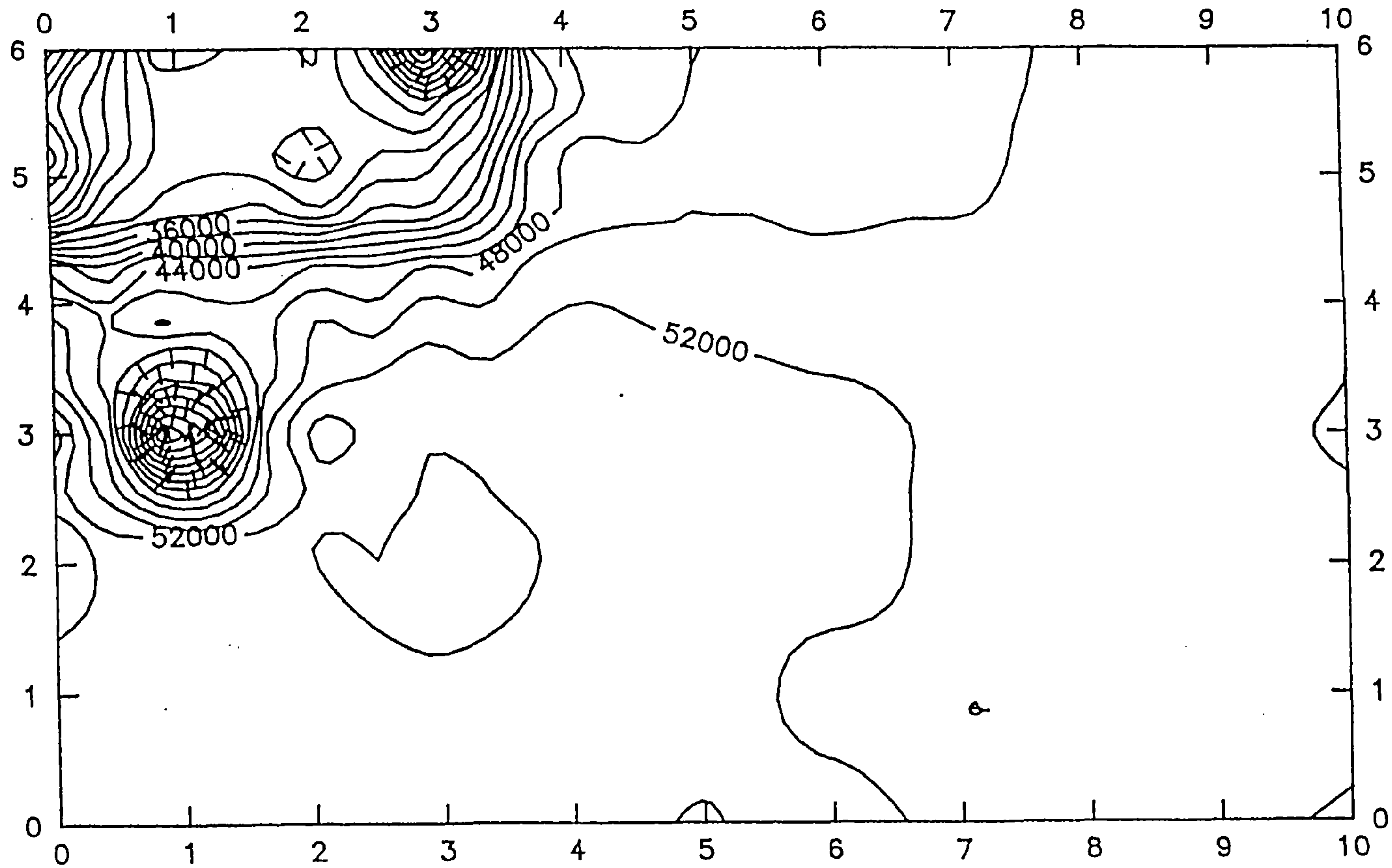
HERCULES, INC.
HATTIESBURG, FORREST COUNTY, MISSISSIPPI

FIGURE 8

AREA 2 MAGNETIC INTENSITY MAP (NANOTESLA)



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The lowest magnetic intensity occurs at station (3,6) and measures 11,539 nanotesla (Ref. 6). Another interesting anomaly occurs at station (1,3) and measures 23,606 nanotesla. In Figure 10, it becomes evident that the low magnetic intensity readings of the northwest quadrant becomes significant or anomalous whereas the anomalous highs seem to be normal background conditions (Ref. 6). Figures 9 and 10 exemplify the low, anomalous magnetic reading characterizing Area 2. Figure 10 is the isomagnetic surface map (3-dimensional) which has been rotated 90° to help distinguish these anomalous "valleys."

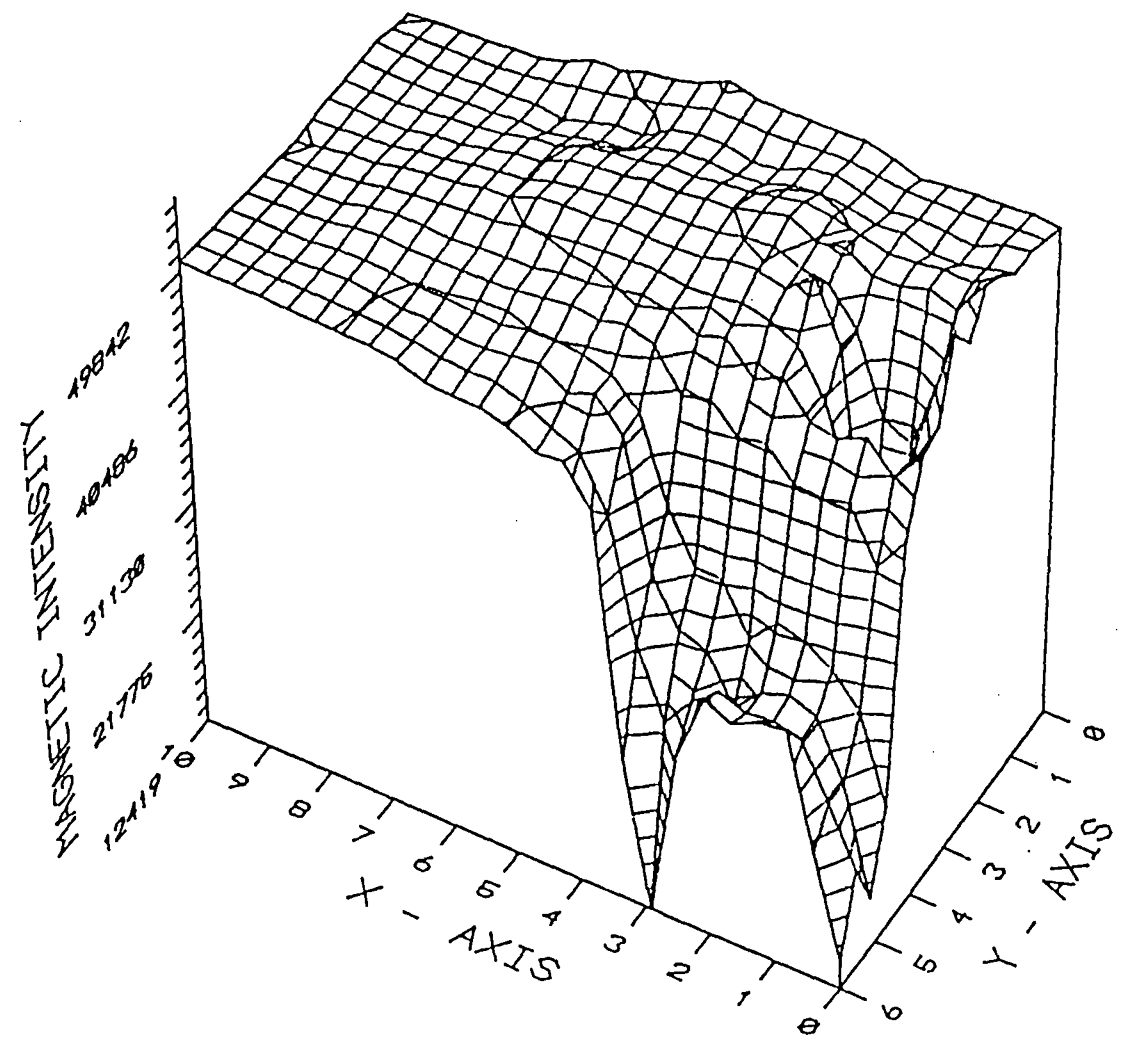
Results from the EM-31 conductivity meter, in the "comp" (in-phase) mode yields data which illustrates a low of 0 mmhos/m at station (1,4) and a conductive high of 210 mmhos/m at station (3,4) (Ref. 6). Figure 11 is the subsurface conductivity contour map for Area 2. The contour interval is 10 mmhos/m. Figure 12 is a 3rd dimensional reflection of conductivies at Area 2 are shown on Figure 12. No rotation was necessary in Figure 12.

3.1.3 Geophysical Conclusions

Both the magnetic intensity survey (Figure 5) and the in-phase conductivity survey (Figure 7) outline the same area of interest in Area 1. this area is centered around the following station locations: (6,2) and (6,4). The magnetic intensity maps (Figures 5 and 6) do not indicate any other area of anomalous readings. The conductivity maps (Figures 7 and 8) do, however, show other potential areas of subsurface inconsistences, particularly near stations (3,3) and (7,7). After evaluating all geophysical data for Area 1, the most anomalous area is determined to be between station coordinates (6,2) and (6,4). Natural subsurface conditions do not appear to exist in this area. Subsequently, soil and groundwater samples (HI-SS-05, HI-SB-05, and HI-TW-05) were collected between those two station locations.

Area 2 as depicted by Figures 9 through 12 also illustrates a common area of anomalous readings, i.e., the northwestern quadrant of the grid. Of particular interest are the station locations (1,3) and (1,4). In fact, there is a 54 percent difference in station (1,3) magnetic intensity readings compared to background magnetic intensity readings. Conductivity readings at station (1,4) differ greatly from background readings (a span of 40 mmhos/meter).

AREA 2 ISOMAGNETIC SURFACE MAP (NANOTESLA)



NOTE: 90° ROTATION

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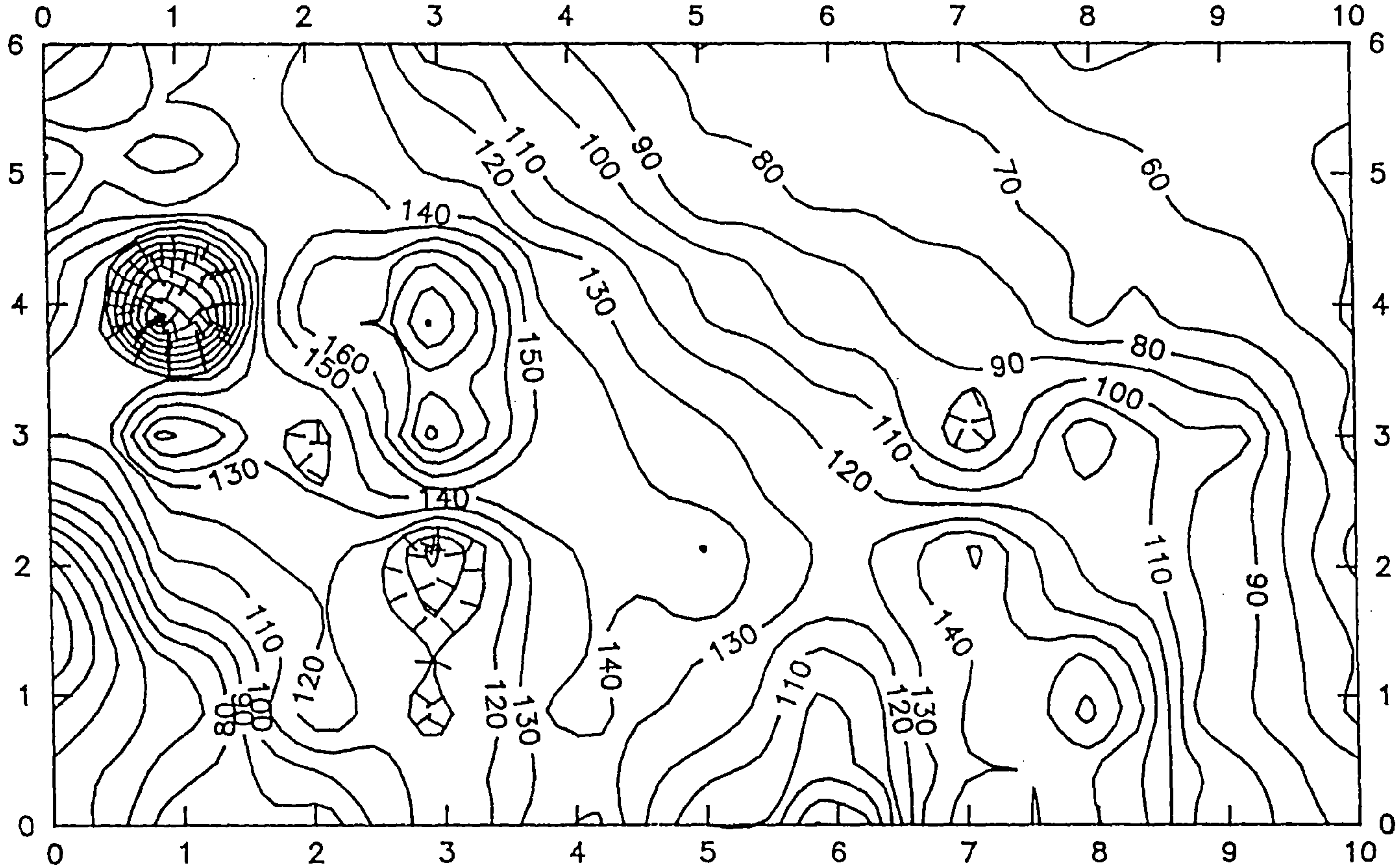
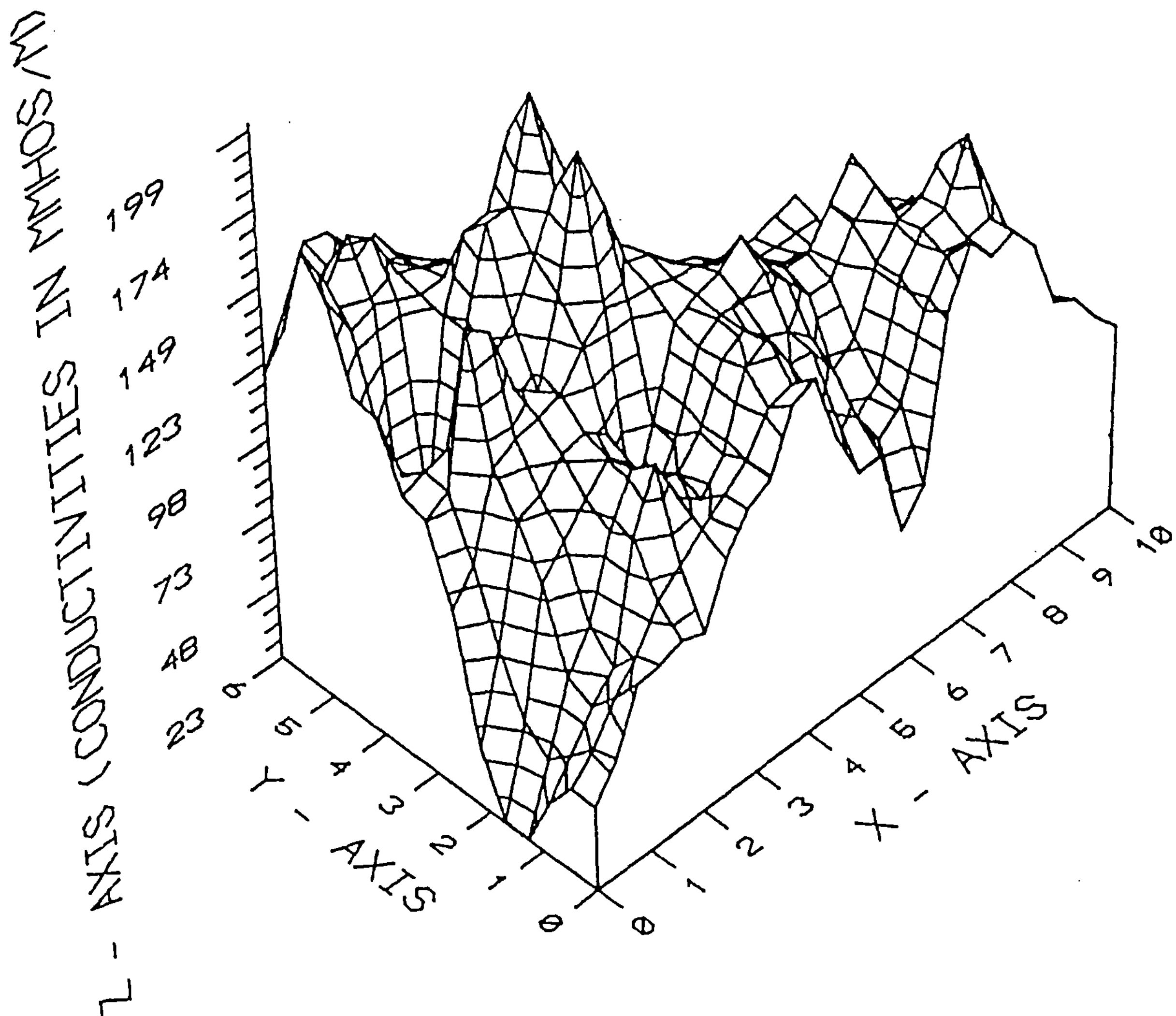
FIGURE 10

AREA 2 SUBSURFACE CONDUCTIVITY CONTOUR MAP MMHOS/M



SCIENCE AND TECHNOLOGY CORP	HERCULES, INC. HATTIESBURG, FORREST COUNTY, MISSISSIPPI	FIGURE 11

AREA 2 PLOT OF SUBSURFACE CONDUCTIVITIES



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HERCULES, INC.
HATTIESBURG, FORREST COUNTY, MISSISSIPPI

FIGURE 12

Subsurface conductivity values show their greatest variation in the western third of the grid area.

After careful consideration, the BVWST geophysical team had determined that soil sampling between station locations (1,3) and (1,4) would best characterize Area 2. Subsequently, sample HI-SS-04 was collected from this area.

3.2 Sample Collection

During the field investigation, conducted during the weeks of June 22 and August 17, 1992, B&V Waste Science and Technology Corp. attempted to identify and characterize contaminants which may be present in the environment as a result of activities that were conducted at the Hercules site. To accomplish this, BVWST collected environmental sediment, surface water, surface soil, subsurface soil, and groundwater samples from a number of strategic locations. These locations were selected based on historical information, hydrological data for the region and site area, and direct observation at the site.

3.2.1 Sample Collection Methodology

All sample collection, sample preservation, and chain-of-custody procedures used during this inspection were in accordance with the standard operating procedures as specified in Sections 3 and 4 of the Environmental Compliance Branch's Standard Operating Procedures and Quality Assurance Manual, United States Environmental Protection Agency, Region IV, Environmental Services Division, February 1, 1991, and with the Field Study Plan prepared by BVWST on June 12, 1992. Deviations from the study plan include the following:

- Only two of the 6 proposed temporary wells were installed. Auger refusal occurred due to metal debris and/or numerous roots encountered.

- Only one of the two on-site monitoring wells was sampled. The integrity of the second well was questioned by the sampling crew due to a well obstruction and no locking cap.

- Several of the soil samples were moved from proposed locations to collect representative samples which reflect site conditions.

- Two sets of the proposed surface water and sediment samples were deleted based upon conditions encountered in the field, rendering the samples redundant.

Surface soil, subsurface soil and sediment samples were collected using a stainless steel spoon and a 2-quart glass bowl. The portion of the sample being analyzed for volatile organic compounds (VOC) was collected first and placed directly into the appropriate container. The remainder of the sample was collected into the glass bowl, thoroughly homogenized, and then distributed to the proper containers. Surface soil samples were collected from a depth of 0-6 inches below land surface (bls), and sediment samples were collected from the aforementioned creeks and rivers. Surface water was sampled directly from the aforementioned creeks and rivers.

Subsurface soil samples were collected from boreholes advanced using either a hydraulic auger or a hand auger, depending on soil conditions. A clean auger bucket was used to collect the actual sample after reading the desired depth, and the VOC containers were filled first. The rest of the sample was then collected and placed in a decontaminated glass bowl, mixed thoroughly, and put into the appropriate containers. Subsurface soil samples were collected at a depth of 5 to 7 feet bls.

The sample from the on-site groundwater monitoring wells (B-1) was collected using a teflon® bailer. The water was purged until pH, temperature, and conductivity values stabilized and/or a total of five well casing volumes had been removed. The volatile sample was collected first, then the remaining samples were collected.

The temporary well was installed in the same borehole from which surface soil and subsurface soil samples were extracted. A well casing and screen was placed in the borehole. The groundwater sample was collected using a peristaltic pump fitted with teflon tubing, and purged until a reasonably sediment-free water sample was obtained. The volatile sample was collected directly from the teflon tubing in the well, and the remainder of the sample was gathered in the 1 gallon glass jug, and evenly distributed into the other containers.

3.2.2 Duplicate Samples

Duplicate samples were offered to and accepted by Joe Powers of Bonner Analytical Testing Service, environmental consultant for Hercules. Receipt for sample forms are on file at BVWST.

3.2.3 Description of Samples and Sample Locations

During the sampling investigation, a total of 16 environmental samples were collected. Samples SW-01, SW-02, SD-03, SD-04, SS-04, SS-05, and SB-05 were recollected in August 1992, as portions of these samples were lost by Federal Express during shipment in June 1992. Sample codes, descriptions, locations, and rationale are contained in Table 1 and a sample location map is presented as Figure 13.

3.2.4 Field Measurements

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

3.3 Sample Analysis

3.3.1 Analytical Support and Methodology

All samples collected were analyzed under the Contract Laboratory Program (CLP) and analyzed for all parameters listed in the Target Compound List (TCL) and the Target Analytical List (TAL). In the June 1992 sampling event, organic analysis of soil and water samples was performed by Compuchem Labs of Research Triangle Park, North Carolina. Inorganic analysis of soil and water samples was performed by American Analytical and Tech Service of Broken Arrow, Oklahoma. In the August 1992 sampling event, organic analysis was performed by IEA Labs of Cary, North Carolina. Inorganic analysis was performed by Keystone Environmental Resources of Monroeville, Pennsylvania. All laboratory analyses and laboratory quality assurance procedures used during the investigation were in accordance with standard procedures and protocols as specified in the <u>Laboratory Operations and</u>

TABLE 1
Sample Locations and Rational
Hercules, Inc.
Hattiesburg, Forrest County, Mississippi

Sample Code	Sample Type	Location	Depth	Rationale
HI-SS-01	Surface Soil	Mrs. Sadie Smith's property, 906 Seventh St., south of Hercules	6 inches	To establish background levels
HI-SS-02	Surface Soil	next to the dumpster, near the drum recycling area	4 inches	To determine presence or absence of contaminants
HI-SS-03	Surface Soil	Former area of pinetree stump piles, western portion of Hercules	6 inches	To determine presence or absence of contaminants
HI-SS-04	Surface Soil	In geophysical area N° 2, near coordinates (1,3) and (1,4)	6 inches	To determine presence or absence of contaminants
HI-SS-05	Surface Soil	In "back forty" at geophysical area N° 1, near coordinates (6,4) and 6,3)	5 inches	To determine presence or absence of contaminants
HI-SB-01	Subsurface Soil	Mrs. Sadie Smith's property, 906 Seventh St., south of Hercules	7 feet	To establish background levels
HI-SB-05	Subsurface Soil	In "back forty" at geophysical area N° 1, near coordinates (6,4) and 6,3)	3 feet	To determine presence or absence of contaminants
HI-SD-01	Sediment	On Green's Creek, at the point of entrance onto Hercules property	0.2 inches	To establish background levels
HI-SD-02	Sediment	On Green's Creek, at the point of exit off of Hercules property	0-2 inches	To determine presence or absence of contaminants
HI-SD-03	Sludge	From the sludge holding pond in "back forty" portion of site	0-2 inches	To determine presence or absence of contaminants
HI-SD-04	Sediment	From an intermittent drainage ditch, on the east side of site property	0-2 inches	To determine presence or absence of contaminants
HI-SW-01	Surface Water	In Green's Creek, at the point of entrance onto Hercules property	N/A	To establish background levels
HI-SW-02	Surface Water	In Green's Creek, at the point of exit off of Hercules property	N/A	To determine presence or absence of contaminants
HI-TW-01	Groundwater	Mrs. Sadie Smith's property, 906 Seventh St., south of Hercules	8 feet	To establish background levels
HI-TW-05	Groundwater	In "back forty" at geophysical area N° 1, near coordinates (6,4) and 6,3)	5 feet	To determine presence or absence of contaminants
HI-MW-B1	Groundwater	In "back forty," approximately 250 feet east of sludge pits	97.8 feet	To determine presence or absence of contaminants

HI - Hercules, Inc
SS - Surface Soil
SB - Subsurface Soil
SD - Sediment
TW - Temporary well
MW - Monitoring well
SW - Surface water
bls - below land surface

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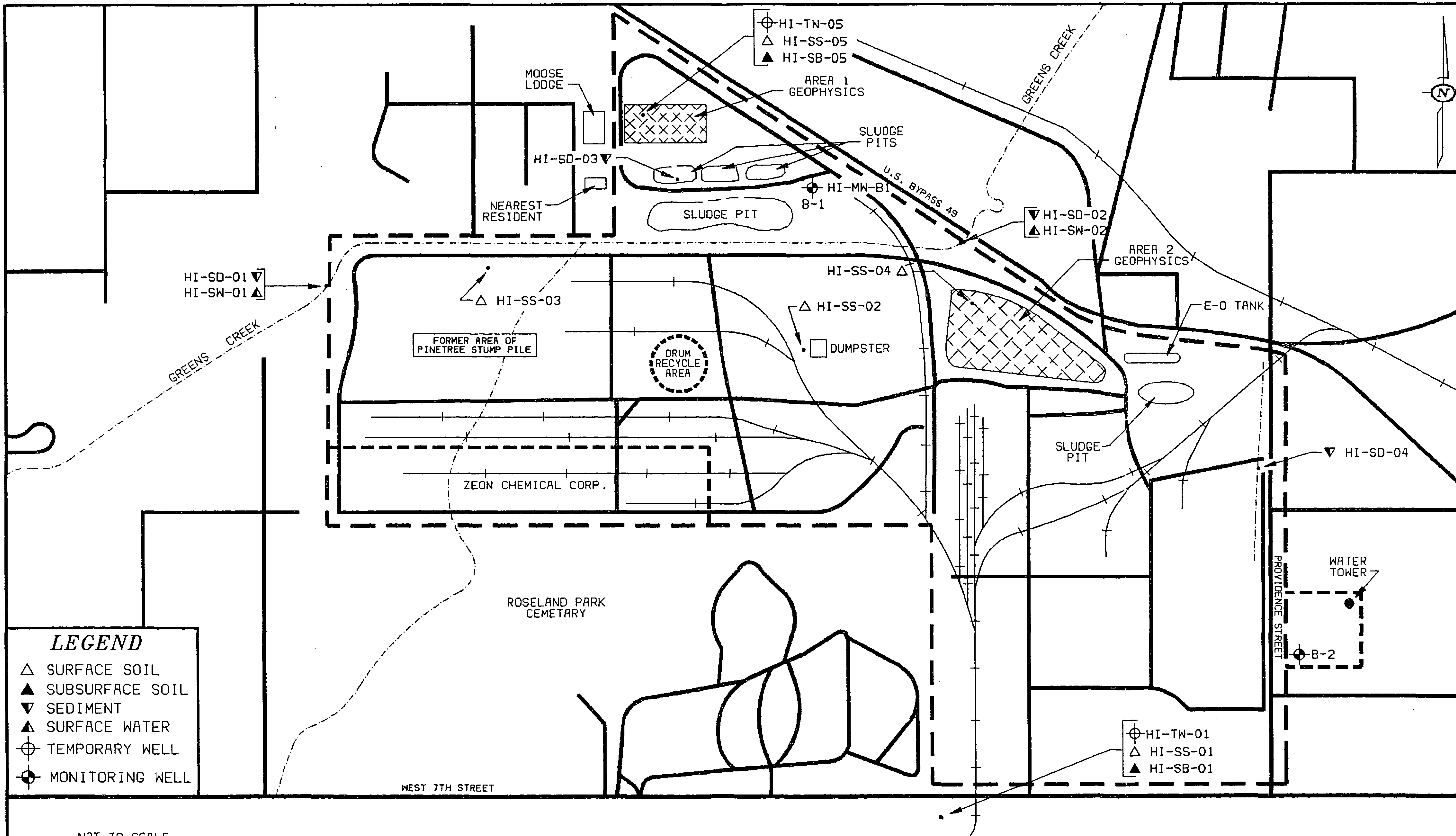

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SAMPLE LOCATION MAP

HERCULES, INC.
HATTIESBURG, FORREST COUNTY, MISSISSIPPI

FIGURE 13

TABLE 2
Field Measurements for Groundwater and Surface Water Samples
Hercules, Inc.
Hattiesburg, Forrest County, Mississippi

Sample	Sample Type	pH	Conductivity (mmhos/cm)	Temperature (F°)
HI-SW-01	Surface Water	7.91	82	96.1
HI-SW-02	Surface Water	7.36	415	97.3
HI-TW-01	Groundwater	5.87 5.83 5.81	256 254 254	87.8 88.2 89.2
HI-TW-05	Groundwater	7.58 7.56 7.42	397 388 392	82.7 83.8 83.9
HI-MW-B1	Groundwater	7.33 7.28 7.02	241 242 259	81.0 79.7 81.5

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Quality Control Manual, United States Environmental Protection Agency, Region IV, Environmental Services Division, issued October 24, 1990; or as specified by the existing United States Environmental Protection Agency standard procedures and protocols for the Contract Laboratory Program (CLP) Statement of Work (SOW), as applicable.

3.3.2 Analytical Data Quality and Data Qualifiers

All analytical data were subjected to a quality assurance review as described in the EPA Environmental Services Division laboratory data evaluation guidelines. In the tables, some of the concentrations of the organic and inorganic parameters have been qualified with a "J." This indicates that the qualitative analysis was acceptable, but the quantitative value has been estimated. A few other compounds are qualified with an "N," indicating that they were detected based only on the presumptive evidence of their presence. This means that the compound was tentatively identified, and its detection cannot be used as a positive indication of its presence. Results for some background samples were reported with a "U" qualifier. this qualifier means that the material was analyzed for but not detected. The reported number is the laboratory-derived sample quantitation limit (SQL) for the compound or element in that sample. At times, miscellaneous organic compounds that do not appear on the target compound list are reported with the data set. These compounds are qualified as "JN," indicating that they are tentatively identified at estimated quantities. Because these compounds are not routinely analyzed for or reported, background levels or SQL levels are not generally available for comparison. Deviations in the June sampling data include trace amounts of bromodichloromethane, and dibromochloromethane in the trip blank. No deviations were noted in the August sampling data. The complete analytical data sheets are presented in Appendix D.

4.0 Source Sampling

4.1 Sources and Sampling Locations

Two sources of contamination were revealed during the field investigation at the Hercules facility in Hattiesburg: contaminated soil and surface impoundments. The contaminated soil consists of 37.7 acres or 1,640,625 square feet. The size of this area was formulated by connecting five sampling locations within Hercules property:

- Sample HI-SS-03 located on the western portion of site property in an area where pinetree stump stockpiles once existed - a black ooze was percolating from some areas surrounding the sample location,

- Sample HI-SS-02 located at the center of Hercules property next to a dumpster in the galvanized drum recycling area (the dumpster was being filled with a black, greasy sludge - some overflow was noted),

- Sample HI-SD-04, a sediment sample located within a drainage ditch on the east side of site property, (the analysis for SD-04 utilized the sample collected from the second sampling trip which was extracted 200 feet south of the original SD-04 location),

- Sample HI-SS-05, a soil sample located within the geophysical Area 2, an old landfill on the northeast portion of site property, and

- Sample HI-SB-05, a soil sample located within geophysical Area 1, situated in the back forty, in the north corner of site property (Ref. 6, Appendix D).

The second source of concern at the Hercules facility is a cluster of six surface impoundments that are located in the back forty. All six "ponds" encompass an area 500 feet by 500 feet and are split in threes by a dirt service road (Figure 2). These holding ponds are contained by dike walls which are four to five feet tall (Ref. 5). Some of the south pond dike walls have collapsed but the integrity of the perimeter dike walls is good (Refs. 5, 6). All impoundment materials is of the same composition, but depositional times have been variable (Ref. 5). Total volume of these impoundments is approximately 895,600 cubic feet (Ref. 12). No liner is present beneath these holding ponds (Ref. 6, 7). Sample HI-SD-03 was collected from one of the northern sludge ponds and is representative of all Hercules' surface impoundment material (Appendix D). Sample codes and rationale are summarized in Table 1 and sample locations are illustrated in Figure 13.

4.2 Analytical Results

This section presents the analytical results for samples collected at Hercules. Values for background sample results are presented either as a measured value or as the sample quantitation limit (SQL). Samples containing concentrations of contaminants greater than three times the background level, or equal to or greater than the SQL of these contaminants are considered to be elevated.

4.2.1 Contaminated Soil Results

The only surface soil sample with elevated inorganics was sample SS-02. Cadmium (2.4 mg/kg, above SQL), cobalt (260 mg/kg, 173 times background), copper (820 mg/kg, 41 times background), lead (estimated 370 mg/kg, 9 times background), magnesium (1200 mg/kg, 7 times background), and nickel (460 mg/kg, above SQL). The only elevated inorganic in the subsurface soil sample was sodium in SB-05 (Table 3).

Elevated organics in sample SS-02 include acetone (estimated 3000 μg/kg, above SQL), toluene (2,500 μg/kg above SQL), and total xylenes (21 μg/kg, above SQL). Ten miscellaneous extractable organics were detected at estimated levels ranging from 500,000 - 20,000,000 μg/kg. Organics in sample SS-03 included methyl ethyl ketone (23 μg/kg, above SQL), toluene (46 μg/kg, above SQL), heptachlor epoxide (4.6 μg/kg, above SQL), and endrin ketone (67 μg/kg, above SQL). The only organic elevated in sample SS-04 was PCB-1254 (810 μg/kg, above SQL). No organics were elevated in the subsurface soil samples (Table 4).

One sediment sample (SD-04) was collected from an intermittent ditch at the eastern site of the property. Elevated inorganics in this sample include copper (27 mg/kg, 7 times background), mercury (0.21 mg/kg, above SQL), and nickel (16 mg/kg, above SQL) (Table 5).

Organics detected in sample SD-04 include toluene (14,000 μg/kg, above SQL), methyl ethyl ketone (470 μg/kg, above SQL), and benzene (180 μg/kg, above SQL). Twenty unidentified miscellaneous extractables were also detected in this sample (Table 6).

Table 3

Summary of Inorganic Analytical Results
Surface Soil/Subsurface Soil Samples
Hercules, Inc.
Hattiesburg, Forrest County, Mississippi

Metals	SS-01 mg/kg	SS-02 mg/kg	SS-03 mg/kg	SS-04 mg/kg	SS-05 mg/kg	SB-01 mg/kg	SB-05 mg/kg
Aluminium	3900 J	1700 J	4000 J	2300 J	4500 J	1800 J	6800 J
Arsenic	3.7	2.8	–	–	–	–	–
Barium	88 J	80 J	26J	41 J	27 J	9.1 J	26 J
Beryllium	0.39	–	–	–	–	0.24U	0.26
Cadmium	.65 U	2.4	–	–	–	–	–
Calcium	990	3100	1100	570	230	96	55
Chromium	5.1 J	12 J	5.1 J	14 J	4.5 J	4.6 J	5.1 J
Cobalt	1.5	260	–	–	2.3	1.2U	1.9 J
Copper	20	820	7.1	11	3.2	2.2U	3.1
Iron	9000 J	9600 J	5100 J	3500 J	3900 J	1100 J	6200 J
Lead	39 J	370 J	22 J	20 J	14 J	2.5 J	21 J
Magnesium	180	1200	240	120	160	84	260
Manganese	230 J	170 J	92 J	74 J	300 J	3 UJ	80 J
Mercury	0.17	0.35	–	–	–	–	–
Nickel	1.5 U	460	–	–	–	–	–
Potassium	140	240	130	150	120	87 J	190
Sodium	180 U	960	–	–	–	210U	1800
Vanadium	15	5.2	10	6.3	8.9	4.1	10
Zinc	110 J	390J	16 J	11 J	11 J	3 UJ	8.7 J

Notes:

J–Estimated Value

U–Material was analyzed for but not detected. The number given is the sample quantitation limit (SQL).

mg/kg–milligrams per kilogram

Shading denotes those values that are three times the background, or greater than or equal to the SQL.

Table 4

Summary of Organic Analytical Results
Surface Soil/Subsurface Soil Samples
Hercules, Inc.
Hattiesburg, Forrest County, Mississippi

	SS-01	SS-02	SS-03	SS-04	SS-05	SB-01	SB-05
Purgeable Organics	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Acetone	50 U	3000 J	–	–	–	–	–
Methyl Ethyl Ketone	11 U	80	23	–	–	–	–
Toluene	11 U	2500	46	6 J	–	–	–
Chlorobenzene	11 U	–	–	–	–	–	–
Methyl isobutyl ketone	11 U	830J	–	–	–	–	–
Benzene	11 U	4J	–	–	–	–	–
Ethyl benzene	11 U	4 J	–	–	–	–	–
Total Xylenes	11 U	21	–	–	–	12U	2 J
Misc. Purgeable Organics							
Tetrahydrofuran		30JN					
Methylpentanol		10JN					
Carene		30JN					
Dimethylmethylenebicycloheptane		30JN					
Trimethylbicycloheptane		20JN					
Unidentified Compounds/No.		90J/2					
Extractable Organics	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Fluoranthene	110J	–	–	–	–	–	–
Phenanthrene	55 J	–	–	48 J	–	–	–
Pyrene	100J	–	–	–	–	–	–
Misc. Extractable Organics							
Dimethylphenanthrene	200JN						
Tetramethylphenanthrene	700JN		20000JN				
Phenanthrene Carboxylic Acid	1000JN		10000JN				
Methyl (methylethenyl) cyclohexene		500000JN					
Methyl (methylethyl) benzene		500000JN					
Trimethylcyclohexanemethanol		600000JN					
Trimethylbicycloheptanone		500000JN					
Isoborneol		800000JN					
Trimethylcycloheenemethanol		10000000JN					
Propylphenol		700000JN					
Terpin Hydrate		20000000JN					
Oxybisbenzene		700000JN					
Phenanthrene Carboxylic Acid, Methyl Este		1000000JN	90000JN	2000JN	400JN		
Phenanthrene Carboxaldehyde			40000JN				
Unidentified Compounds/No.	2000J/4	9000000JN/10	500000J/16	10000J/18	4000J/4		
Pesticides	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Gamma-BHC (Lindane)	1.6 J	–	–	–	–	–	–
Aldrin	3.6 J	–	–	–	–	–	–
Heptachlor epoxide	9.2 U	–	4.6	–	–	–	–
Dieldrin	61	–	–	–	–	–	–
4,4'-DDE (P,P'-DDE)	130 C	–	–	–	–	–	–
4,4'-DDD (P,P'-DDD)	68	–	–	–	–	–	–
4,4'-DDT (P,P'-DDT)	31	–	–	–	–	–	–
Methoxychlor	92 U	–	–	–	–	–	–
Endrin ketone	18U	–	67	–	–	–	–
Endrin aldehyde	18U	340N	–	–	–	–	–
Endosulfan sulfate	18U	390N					
Gamma-chlordane	26 N	–	–	–	–	–	–
Alpha-chlordane	26	–	–	–	–	–	–
PCB's	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
PCB-1254 (Aroclor 1254)	180 U	–	–	810	–	–	–

Notes:

C-Confirmed by GCMS
J-Estimated Value
N-Presumptive evidence of presence of material
U-Material was analyzed for but not detected. The number given is the sample quantitation limit (SQL).
ug/kg-micrograms per kilogram
Shading denotes those values that are three times the background, or greater than or equal to the SQL.

Table 5
Summary of Inorganic Analytical Results
Sediment Samples
Hercules, Inc.
Hattiesburg, Forrest County, Mississippi

	SD-01	SD-02	SD-03	SD-04
Metals	mg/kg	mg/kg	mg/kg	mg/kg
Aluminium	2500 J	1900 J	20000 J	2900 J
Arsenic	2.7	11	33	–
Barium	82 J	66 J	100 J	18 J
Beryllium	0.39	0.38	0.70	–
Cadmium	.78 U	–	1.4	–
Calcium	880	1900	4600	680
Chromium	83 J	4.7 J	110 J	7.4 J
Cobalt	6.8	–	27	–
Copper	3.6	3.8	95	27
Iron	10000 J	24000 J	17000 J	4300 J
Lead	350 J	11 J	100 J	30 J
Magnesium	380	320	190	120
Manganese	460 J	290 J	140 J	13 J
Mercury	.13 U	–	0.26	0.21
Nickel	1.8 U	–	350	16
Potassium	240	210	140	140
Sodium	220 U	230	–	–
Vanadium	5.6	11	14	9.5
Zinc	160 J	19 J	2400 J	110 J
Cyanide	mg/kg	mg/kg	mg/kg	mg/kg
	0.65U	–	2.1	–

Notes:

J–Estimated Value

U–Material was analyzed for but not detected. The number given is the sample quantitation limit (SQL).

mg/kg–milligrams per kilogram

Shading denotes those values that are three times the background, or greater than or equal to the SQL.

Table 6
Summary of Organic Analytical Results
Sediment Samples
Hercules, Inc.
Hattiesburg, Forrest County, Mississippi

	SD-01	SD-02	SD-03	SD-04
Purgeable Organics	ug/kg	ug/kg	ug/kg	ug/kg
Toluene	13 U	–	31000	14000
Methyl ethyl ketone	13U	–	–	470
Benzene	13U	–	–	180
Styrene	13U	–	–	15J
Total Xylenes	13U	–	–	21J
Misc. Purgeable Organics				
Cyclohexane			50000JN	
Carene			30000JN	
Dimethylmethylenebicycloheptane			30000JN	
Trimethylbicycloheptane			30000JN	
Misc. Extractable Organics				
Nonylphenol		300JN		
Hexadecanoic Acid		500JN		
Methylanthracene		500JN		
Phenanthrene carboxaldehyde		500JN		
Methyl (methylethyl) cyclohexane			4000000JN	
Oxybisbenzene			3000000JN	
Petroleum Product				N
Hexahydrotetramethylmethanonaphthalene			4000000JN	
Unidentified Compounds/No.	6000J/3	3000J/6	1x10^8 JN/17	4000000J/20
Pesticides	ug/kg	ug/kg	ug/kg	ug/kg
4,4'-DDE (P,P'-DDE)	4.2 U	2.2 J	–	–
Methoxychlor	22 U	3.6 J	–	–
Alpha-chlordane	1.7J N	–	–	–
PCB's	ug/kg	ug/kg	ug/kg	ug/kg
PCB-1260 (Aroclor 1260)	39 J	–	–	–

Notes:
- J–Estimated Value
- N–Presumptive evidence of presence of material
- U–Material was analyzed for but not detected. The number given is the sample quantitation limit (SQL).
- ug/kg–micrograms per kilogram
- Shading denotes those values that are three times the background, or greater than or equal to the SQL.

4.2.2 Surface Impoundment/Sludge Pit Results

Sample SD-03 was collected directly from the sludge pit. Elevated inorganics in this sample include aluminum (20,000 mg/kg, 8 times background), arsenic (33 mg/kg, 12 times background), cadmium (1.4 mg/kg, above SQL), cobalt (27 mg/kg, 4 times background), copper (95 mg/kg, 26 times background), mercury (0.26 mg/kg, above SQL), nickel (350 mg/kg, above SQL), cyanide (2.1 mg/kg, above SQL), and zinc (2400 mg/kg, 15 times background) (Table 5).

Organics detected in the surface impoundment/sludge pit included toluene (31000 μg/kg, above SQL), four miscellaneous purgeable organics, three miscellaneous extractable organics, and 17 unidentified extractable compounds (Table 6).

4.3 Source Conclusions

Contaminated soil is present at the Hercules facility as soil sampling has indicated (Appendix D). Sample HI-SS-02, collected near a dumpster, was more representative of spillage or overflow of dumpster material which looked like an oily or greasy, black sludge (Ref. 6). During the sampling trip in August, it was noted that this dumpster was removed. The drainage ditch on the east side of Hercules property (HI-SD-04) had waste material "ponded" in a different location during the second sampling trip (Ref. 6), therefore this sample was taken 200 feet south of the original SD-04 location in order to collect a representative sample of drainage ditch materials (Ref. 6). Samples HI-SS-03 and HI-SS-04 were collected from inactive areas where past dumping or landfilling had occurred. It was noted that a black vicious ooze was percolating from various areas in the old pinetree stump pile areas (SS-03) - part of this ooze was homogenized within the soil during sample collection in June (Ref. 6). Significant contaminants in the 38-acre contaminated soil area include: cadmium, cobalt, lead, mercury, toluene, MEK, benzene, PCB's and acetone.

The surface impoundments are also a concern at Hercules, Inc. Direct source sampling (HI-SD-03) indicated high arsenic and heavy metal contamination as well as high organic contaminants such as: toluene, MEK, and benzene. Many miscellaneous or unidentified organics were also present in these sludge ponds. The collapse of dike walls, lack of a liner beneath the six ponds, and the large volume of material (895,600 cubic ft.) all indicate the severity of concern that these surface impoundments pose.

5.0 Groundwater Pathway

5.1 Regional Hydrogeology

The Hercules Inc. site is located within the Pine Hills physiographic region of the Coastal Plain physiographic province (Ref. 13, p. 14). The topography of the region is characterized by a maturely dissected plain which slopes gently to the southeast. The topography is dominated by the valleys of the Bowie and Leaf Rivers coupled with the nearly flat or gently flat or gently rolling bordering terrace uplands (Ref. 13, p. 16, Appendix A).

Soils beneath the Hercules facility are classified as Urban Land (Ref. 1, sheet 9). Cuts and fills for the purpose of installing works and structures have altered and obscured the soil features to the point soil can no longer be identified as a soil type (Ref. 1, p. 21). Most of the original soils were moderately to well drained (Ref. 1, p. 21). Surficial soils in the vicinity of the Hercules facility include: the Prentis-Urban Land complex; the Trebloc silt loam; and the Brassfield-Urban Land complex (Ref. 1, sheet 9). In general, these soils are poorly to moderately well drained and strongly acidic (Ref. 1, pp. 7, 18, 19, 21). The parent material from which the soil was derived is mainly marine deposits of sandy, loamy, and clayey material (Ref. 1, p. 44).

The geologic formations beneath the site area, (in descending order), are as follows: Pleistocene alluvial and terrace deposits, the Miocene-aged Hattiesburg and Catahoula Sandstone formations, the Oligocene-aged Baynes Hammock Sand and Chickasawnay Limestone formations, and the Oligocene aged Bucatanna Clay member of the Byron formation of the Vicksburg group (Refs. 14, Table 1; 15, Table 18).

The recent aged alluvial and terrace deposits consist of flood plains and, gravel, silts, and clays (Ref. 13, p. 27). The thicknesses of the alluvial and terrace deposits are variable due to erosion. Based upon drillers logs of wells located in the vicinity of the Hercules facility, thickness of the alluvial and terrace deposits is estimated to be approximately 50 feet, while absent in others (Ref. 13, pp. 35-45; 16).

Beneath the alluvial and terrace deposits lies the Hattiesburg formation. The Hattiesburg formation is comprised predominantly of clay. Regionally, beneath the Forrest County, the formation contains at least two prominent sand beds from which a viable water supply is obtained (Refs. 13. p. 24; 14, pp. 6, 38). Logs from area wells indicate that the Hattiesburg formation ranges from approximately 130 feet to 260 feet in thickness (Refs. 14, pp. 58, 59, 62, 63; 16).

The Catahoula sandstone underlies the Hattiesburg formation. It is not exposed near the facility but is penetrated by numerous wells in the area (Ref. 13, p. 24). A driller's log of a municipal well approximately 1.25 miles northwest of the facility indicated that approximately 770 feet of the Catahoula sandstone was encountered (Refs. 14, p. 58; 16).

Near the facility, the Catahoula sandstone overlies the Chickasawhay limestone (Ref. 15, pp. 114-115). Neither the Chickasawhay limestone nor the underlying Bucatunna formation are considered to be viable (potable) aquifers. The Bucatunna formation is comprised of clay and effectively acts as confining layer for the underlying Oligocene aquifer (Refs. 14, Table 1; 15, Table 18).

The Miocene aquifer is comprised of both the Hattiesburg and Catahoula sandstone formations. The aquifer system is composed of numerous interbedded layers of sand and clay; because of their interbedded nature, the Hattiesburg and Catahoula sandstone cannot be reliably separated (Ref. 14, Figure 20). The formations dip southwestward approximately 30 to 100 feet/mile. While the dip steepens near the coast, the formations thicken (Ref. 14, Figure 20). The shallowest portions of the aquifer system are unconfined with the surficial water table ranging from a few inches to greater than six feet below land surface (Refs. 1, Table 18; 15, Table 18). Deeper portions of the aquifer are confined with artesian conditions common (Refs. 15, Table 18; 17). Hydraulic conductivities, determined from pump test data of wells screened within the aquifer range from 1.76×10^{-2} to 6.0×10^{-2} centimeters per second (cm/sec) (Ref. 17).

Recharge to the Miocene aquifer is from rainfall and leakage between aquifer units of the Miocene aquifer system. Water movement is down dip, towards the center of pumpage, and between aquifers of the system . Near the facility it would be difficult to estimate direction of groundwater flow within the aquifer due to the presence of several pumping wells and the influence of the Bowie and Leaf rivers. The clay of the underlying Bucatunna formation effectively prevents movement between the Miocene and Oligocene aquifer systems.

5.2 Groundwater Targets

The majority of residents within the 4-mile radius area of the Hercules, Inc facility obtain their drinking water from the Hattiesburg Public Utility, which operates 13 wells in two clusters plus 3 single operating wells (Ref. 18, Appendix A). One cluster of wells is located 0.7 miles northwest of the facility and comprises 8 wells (Ref. 18, Appendix A). The second set of potable drinking water wells is located 2.0 miles southeast of Hercules and includes 5 deep wells (Ref. 18, Appendix A). Seven other water municipalities serve smaller areas within the 4-mile radius area. Table 7 outlines all municipal water companies in addition to other pertinent municipal groundwater use information (Refs. 19, 20, 21, 22, 23, 24, 25). Well depths for the municipal systems range from 692 feet to 902 feet bls. The nearest municipal wells from the site is the cluster of 8 Hattiesburg Public Utility wells located 0.7 miles northwest of Hercules (Table 7, Appendix A). Other municipal well locations are outlined in Table 7. Few private wells exist in the study area (Appendix A). Since Hercules, Inc. is located on the northern boundary of Hattiesburg city limits, the Hattiesburg municipal water system serves all homes which lie south of the facility for at least 4 miles. The Hattiesburg municipal water system extends only 0.25 mile north of Hercules - just before encountering the Bowie River; some homes in this corridor utilize private wells (Ref. 18, Appendix A). The Glendale Public Water Supply services areas north of Bowie River (Ref. 19, Appendix A). The following chart shows the estimates of residents utilizing private wells within 4 miles of the site (Refs. 18-25; Appendix A):

Radius ring area	Nº of homes	Nº of residents
0 - 0.25 mile	0	0
0.25 - 0.50 mile	7	18
0.50 - 1.0 mile	2	5
1.0 - 2.0 mile	3	8
2.0 - 3.0 miles	2	5
3.0 - 4.0 miles	20	51
Total	34	87

TABLE 7
Municipal Groundwater Use in the Hattiesburg Area

Municipal Water Supplier	Nº of Connections	Corresponding Nº of residents	Total Nº of Wells	Distance of Direction from site to wells	Blended
Hattiesburg Public Utility	15,965	40,551	16	Cluster 1 - 8 wells - 0.7 miles northwest Cluster 2 - 5 wells - 2.0 miles southeast Well Nº 14 - 0.8 miles southwest Well Nº 15 - 1.6 miles southwest Well Nº 16 - 3.2 miles west	Y
Glendale Public Utility	1196	3038	2	4.8 miles north	Y
Petal Public Utility	2700	6858	4	Cluster 1 - 2 wells - 2.7 miles east Cluster 2 - 2 wells - 4.4 miles northwest	N 20% 80%
Eastabuchie Utility Association	390	990	2	4.6 miles northeast	N 10% 90%
Rawls Springs Public Utility	775	1969	4	3.2 miles northwest	Y
Arnold Line Water Association	1105	2807	3	2.9 miles west	Y
Lamar Park Water Association	775	1969	3	3.2 miles southwest	Y
North Lamar Water Association	1685	7087	4	5.0 miles southwest	Y

References 18, 19, 20, 21, 22, 23, 24, 25; Appendix A

Jv-CH
January 27, 1993
A:\FIT\52011\040\TABLE 7

The nearest private well from the facility lies 0.3 miles north (Appendix A). These estimates were obtained by a house count on topographic maps of the area. An estimated total private well users within a 4 mile radius area of the site is 87 persons (Ref. 26, Appendix A). County-wide there are very few private wells (Ref. 27). There are 48,755 total residents that utilize groundwater within a 4 mile radius of Hercules.

5.3 Groundwater Analytical Results

The Hercules facility maintains two deep groundwater monitoring wells, MW-B1 and MW-B2. Monitoring well B1 is located in the "back forty" about 250 feet east of the sludge holding ponds (Ref. 6). The total well depth of B1 is 97.8 feet bls and contained a total water column of 71.8 feet (Ref. 6). The only elevated inorganic present in MW-B1 was arsenic (12 μg/l, above SQL) (Table 8). Small amounts of unidentified extractable organic compounds were found in MW-B1 (Table 9).

Monitoring well B2 is located on the far eastern portion of Hercules property - near the wastewater treatment plant. Attempts to sample MW-B2 were futile due to well obstruction (inner PVC piping) in addition to poor well integrity (openings in well "stick-up" portion) (Refs. 6, Appendix B).

Two temporary wells were installed to determine shallow groundwater quality at the Hercules facility. The background temporary well (HI-TW-01) installation occurred on the property of Mrs. Sadie Smith, 906 Seventh Street, approximately 250 feet south of Hercules property (Ref. 6). Analysis of HI-TW-01 indicated no organic contaminants, however; chromium, lead, and barium levels exceed the MCL's for groundwater.

Temporary well HI-TW-05 was located in geophysical Area № 1, in an area where high geophysical anomalies were present (Ref. 6). Inorganics elevated in sample HI-TW-05 included: cobalt (59 μg/l, 3 times background), copper (140 μg/l, 3 times background), manganese (4100 μg/l, 14 times background), and mercury (2 μg/l, 4 times background) (Table 8, Appendix D). Small amounts of unidentified extractable organic compounds were found in HI-TW-05 (Table 9).

Table 8
Summary of Inorganic Analytical Results
Groundwater Samples
Hercules, Inc.
Hattiesburg, Forrest County, Mississippi

	Background	On-site		Trip Blank
	TW–01	TW–05	MW–B1	TB–01
Metals	ug/L	ug/L	ug/L	ug/L
Aluminium	36000	77000 J	–	–
Arsenic	4U	–	12	–
Barium	1800	3600J	320	–
Beryllium	11	21J	–	–
Cadmium	2U	3 J	–	–
Calcium	24000	45000 J	27000	–
Chromium	94	40 J	–	–
Cobalt	19	59 J	–	–
Copper	23	140 J	7	–
Iron	15000	47000 J	530	–
Lead	380 J	380 J	6 J	–
Magnesium	9000	17000 J	6200	–
Manganese	300	4100 J	451	–
Mercury	0.45	2.0 J	–	–
Nickel	39	53 J	–	–
Potassium	3200	4400 J	400	–
Sodium	21000	–	17000	–
Vanadium	160	100 J	–	–
Zinc	160	170 J	110	–

Notes:
- J–Estimated Value
- U–Material was analyzed for but not detected. The number given is the sample quantitation limit.
- ug/L–micrograms per liter
- Shading denotes those values that are three times the background, or greater than or equal to the SQL.

Table 9
Summary of Organic Analytical Results
Groundwater Samples
Hercules, Inc.
Hattiesburg, Forrest County, Mississippi

	Background	On-site		Trip Blank
	TW-01	TW-05	MW-B1	TB-01
Purgeable Organics	ug/L	ug/L	ug/L	ug/L
Bromodichloromethane	10 U	–	–	2 J
Dibromochloromethane	10 U	–	–	1 J
Misc. Extractable Organics				
Unidentified Compounds/No.		200J/7	30J/1	

Notes:
- J–Estimated Value
- N–Presumptive evidence of presence of material
- U–Material was analyzed for but not detected. The number given is the sample quantitation limit.
- ug/L–micrograms per liter

Table 10
Summary of Inorganic Analytical Results
Surface Water Samples
Hercules, Inc.
Hattiesburg, Forrest County, Mississippi

	Background upstream SW-01	On-site downstream SW-02
Metals	ug/L	ug/L
Barium	51	160
Calcium	10000	33000
Copper	6U	7
Iron	350	4800
Lead	4 J	3 J
Magnesium	2000	6500
Manganese	24	1400
Nickel	8U	18
Potassium	2000	5000
Sodium	14000	29000
Zinc	9U	28

Notes:
J-Estimated Value
U-Material was analyzed for but not detected. The number given is the sample quantitation limit (SQL).
ug/L-micrograms per liter
Shading denotes those values that are three times the background, or greater than or equal to the SQL.

5.4 Groundwater Conclusions

At least 18 residents within 0.5 miles of the site utilize private wells for potable use plus 8 Hattiesburg municipal wells lie 0.7 miles northwest of Hercules - all are critical targets when evaluating the groundwater pathway. An observed release of site contaminants to groundwater was noted in both the samples HI-MW-B1 and HI-TW-05. Arsenic was found in the monitoring well MW-B1 located 250 feet east of the surface impoundments and heavy metal contamination (cobalt, copper, iron, manganese, and mercury) was present in TW-05. Both samples also contained small amounts of unidentified extractable organic compounds. The surface impoundments were laden with arsenic, cobalt, copper, and mercury - making these ponds potential sources of the contamination.

Another pathway concern is the large population served by wells located within a 4-mile radius of the site, plus the use of groundwater in food packaging and crop irrigation (Ref. 18). All these factors, especially the observed contaminate release, make the groundwater pathway a concern at Hercules, Inc.

6.0 Surface Water Pathway

6.1 Hydrologic Setting

The Hercules property contains 200 acres of land in a residential and industrial setting (Ref. 5, Appendix A). The facility is predominantly drained by three waterways which include:

- the eastern flowing, perennial Greens Creek,
- an unnamed northern flowing, intermittent drainage ditch within the eastern boundary of Hercules,
- and an unnamed, eastern flowing, intermittent drainage ditch which is located in the southeastern portion which flows south of the facility's wastewater treatment plant (Appendix A), (figure 2).

The site's three drainage pathways flow northeast for 1.0 to 1.2 miles before entering the southeastern flowing Bowie River (Appendix A). Depending upon which pathway surface water enters the Bowie River, site runoff travels 0.9 to 1.9 miles before entering the southern flowing Leaf River. The surface water pathway then terminates 12.1 to 12.9 miles downstream within the Leaf River (Appendix A).

The average annual flow rate for the Bowie River has been estimated to be 910 cubic feet per second (cfs) and the average annual flow rate for the Leaf River is estimated to be 2725 cfs (Refs. 28; 29). Greens Creek exhibits a flow rate under 100 cfs (Ref. 28).

The surface impoundment area is located at an elevation of 155 feet amsl and is considered to be within the 500-year flood plain (Ref. 5, Appendix A). The contaminated soil area is located at an elevation of 140 to 160 feet amsl and is also considered to be within the 500- year flood plain (Ref. 5, Appendix A).

6.2 Surface Water Targets

All municipal water sources, within the study area, obtain potable water from wells none of the seven municipalities contacted receive their water from intakes along the Hercules surface water pathway (Refs. 18-25). Hercules operates a surface water intake within the Bowie River, however, it's only use is for industrial cooling and is not potable (Ref. 30). Other industrial intakes along the pathway provide cooling water for Mississippi Power, and the Petromill Corporation (Ref. 28).

Federally threatened species that occur along the surface water pathway include the American alligator (*Alligator mississippiensis*) and the gopher tortoise (*Gopherus polyphomus*) (Ref. 31). State threatened species that occur include: the yellow blotched map turtle (*Graptemys flavomaculata*) and again, the gopher tortoise (Ref. 32). Both the Bowie and the Leaf Rivers are utilized for sport and commercial fishing (Ref. 33). Also both of those rivers have been used for recreational swimming (Ref. 33). Greens Creek is too small to be used for fishing or swimming (Ref. 33). No wetlands have been documented along the 15-mile surface water pathway (Ref. 28, Appendix A).

6.3 Surface Water Analytical Results

Inorganics elevated in the sediment of Greens Creek downgradient from the Hercules Site include arsenic (11 mg/kg, 4 times background) and sodium (230 mg/kg, above SQL) (Table 5). Inorganics elevated in the surface water include barium (160 μg/l, 3 times background), copper (7 μg/l, above SQL), iron (4800 μg/l, 14 times background), magnesium (6500 μg/l, 3 times background), manganese (1400 μg/l, 50 times background), nickel (18 μg/l, above SQL), and zinc (28 μg/l, above SQL (Table 10).

No organics were detected in sample SD-02. Four miscellaneous extractables were tentatively identified based on presumptive evidence (Table 6). No Target Compound List organics were detected in downgradient surface water. Four unidentified extractables and presumptive evidence of petroleum products were detected in sample SW-02.

6.4 Surface Water Conclusions

An observed release to the surface water pathway was indicated by the sampling of Greens Creek upon its exit from Hercules property. Such contaminants as arsenic and other heavy metals are directly attributable to the contaminated soil and/or surface impoundments on Hercules property.

Samples HI-SW-02 and HI-SD-02 were collected from Greens Creek, approximately 1600 feet downgradient from the surface impoundments. State and federally threatened species plus recreational swimming and fishing are all a concern when evaluating the Hercules' surface water pathway.

7.0 Soil Exposure and Air Pathways

7.1 Physical Conditions

The Hercules facility is located in the northwest corner of Forrest County, on the northern outskirts of Hattiesburg (Appendix A). The southwestern portion of the facility adjoins the Zeon Chemical Corporation of Mississippi (Ref. 6). The land which Zeon Chemical occupies was purchased from B. F. Goodrich, who previously purchased the acreage from Hercules, Inc. (Ref. 5). South of Zeon Chemical which is also south of the old pinetree stump stockpiles, lies the Roseland Park Cemetery, otherwise residential areas occupy the majority of the site boundary except to the north. U. S. Bypass Route 49 (State Route 42) is the northern extent of Hercules property. Many businesses and industries are located along this street (Ref. 6).

The entire 200 acre facility is secured by a high fence with 24 hour security gatehouses with guards on duty. Access is restricted to employees only (Ref. 6). Providence Street divides the Hercules Wastewater Treatment Plant from the main plant, however, this treatment plant is also surrounded by a high fence with a locked gate (Ref. 6). The perennial Greens Creek flows through the facility, the entrance and exit of this creek is well maintained and fenced which limits access of the public through these waterways onto Hercules property (Ref. 6).

Stressed vegetation has been documented in areas near the dumpsters within the drum recycling area, around the drainage ditch along the eastern portion of Hercules property, and within the surface impoundments in the back forty (Ref. 6).

7.2 Soil and Air Targets

Hercules employs 290 people in the Hattiesburg plant (Ref. 5). Residents live all around site property, especially along the west, south, and east perimeters. The nearest resident is Mr. Mo Booth who lives next to the Moose Lodge - west of the back forty, and approximately 250 feet west of the fence line (Ref. 6), and approximately 500 feet west of the surface impoundments (Ref. 6).

The nearest school also has a daycare center which is located south of the Hercules plant, the Jeff Davis Elementary School is located at the intersection of Providence Street and West 7th Street which is approximately 600 feet from Hercules property (Ref. 6, Appendix A). Many churches and schools are located south of Hercules property and within Hattiesburg city limits.

The 4-mile radius area surrounding the facility is included in the ranges of many endangered and threatened species. The following air and terrestrial species are federally listed for Forrest County ("T" denotes threatened and "E" denotes endangered) (Ref. 31):

- Florida panther (*Felis concolor coryi*) - E
- bald eagle (*Haliaeetus levcocephalus*) - E
- arctic peregrine falcon (*Falco peregrinus tundrius*) - T
- Bachman's warbler (*Vermivora bachmanii*) - E
- red-cockaded woodpecker (*Pcioides borealis*) - E
- eastern indigo snake (*Drymarchon corais couperi*) - T
- ivory-billed woodpecker (*Campephilus principalis*) - E

Total population within the 4-mile radius area of the site, based upon the 1980 U. S. Census GEMS database is 55,723 people (Ref. 34).

The specific ring radii breakdown indicates the following populations (Ref. 34):

0 - 0.25 mile	580 people
0.25 - 0.5 mile	0 people
0.5 - 1.0 mile	5727 people
1.0 - 2.0 miles	15,741 people
2.0 - 3.0 miles	23,450 people
3.0 - 4.0 miles	10,225 people

7.3 Soil Analytical Results

Soil analytical results have been summarized in Section 4.2.1 which discusses the 37.7 acres of contaminated soil at the Hercules facility.

Field soil gases were measured at all sampling locations utilizing flame and photo-ionizing devices (OVA and HNu). Health and Safety concerns required the use of these instruments. Samples HI-SD-02 and HI-SS-02 indicated higher than background organic vapor readings in the breathing zone (Ref. 6).

7.4 Soil and Air Pathway Conclusions

Sampling at Hercules indicates that contaminants have been released to the environment. Surface soil and sediment sampling have indicated many heavy metal contaminants and a few organic contaminants in areas near or within the two source areas. Due to high levels and high toxicities of known contaminants, endangered and threatened species nearby, and large resident populations in close proximity, the soil and air pathways are a moderate concern at Hercules, Inc.

8.0 Summary and Conclusions

The Hercules, Inc. site investigation and geophysical survey gathered data necessary to characterize waste sources and to evaluate potentially affected populations and environments. The geophysical investigation successfully detected anomalous areas within both geophysical study areas. The geophysical survey conducted in both study areas produced sampling locations in which contaminates were found. Two source areas were discovered at Hercules, Inc.: 37.7 acres of contaminated soil and 895,600 feet cubic feet of surface impoundments. Different migration pathways have been studied and evaluated, yielding the following conclusions:

The groundwater pathway is of great concern. Contaminants from both the contaminated soil and the surface impoundments have been released into the groundwater. Arsenic was found in HI-MW-B1 at a depth of 98 feet bls and heavy metals were found in HI-TW-05 at a depth of 5 feet bls. Other unidentified organic contaminates were found in both groundwater samples. Groundwater is a major resource for the area's municipal/public supply. Nine municipal wells formerly of Hattiesburg, are located within a one mile radius area of the site.

The site's surface water pathway is also a concern since contaminate release has been observed in Greens Creek. Arsenic and heavy metals were found in sediment and surface water samples at the exit point of Greens Creek on the Hercules property line. Other pertinent factors include: state and federally threatened and endangered species along the pathway, recreational and commercial fishing, and recreational swimming.

Soil and air pathways could be affected since the ranges of endangered and threatened species are part of the 4-mile radius area. Many residents live near the Hercules plant rendering these pathways a concern. The results of this investigation indicates that further action be planned under CERCLA authority for Hercules, Inc.

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APPENDIX A

Topographic Map

jv\CH
April 29, 1993
A:\52011\040.SI

Photo № 7 Roll № 1 Frame №: 6 Date: 6/24/92
Subject: "Back forty" sludge pits.

Photo № 8 Roll № 1 Frame №: 7 Date: 6/24/92
Subject: "Back forty" sludge pits.

Photo № 9 Roll № 1 Frame №: 10 Date: 6/24/92
Subject: "Back forty" sludge pits.

Photo № 10 Roll № 1 Frame №: 11 Date: 6/24/92
Subject: "Back forty" sludge pits - partially dried.

Photo № 14 Roll № 1 Frame №: 15 Date: 6/25/92
Subject: A dike breach in the sludge pits located near the E-O tank, northeast corner of site property.

Photo № 15 Roll № 1 Frame №: 16 Date: 6/25/92
Subject: Sludge pits located near the E-O tank.

Photo № 16 Roll № 1 Frame №: 17 Date: 6/25/92
Subject: Sludge pit material that has flowed out of the diked areas, and has hardened. This sludge exhibits increased viscosity with ambient temperature.

Photo № 17 Roll № 1 Frame №: 18 Date: 6/25/92
Subject: The E-O Tank (Ethylene Oxide) located in the northeast portion of site property.

Photo № 18 Roll № 1 Frame №: 19 Date: 6/25/92
Subject: Sludge flow near E-O tank - overflow from the diked pond.

Photo № 19 Roll № 1 Frame №: 20 Date: 6/25/92
Subject: Sludge flow through a breach in the containing dike. Near the E-O tank.

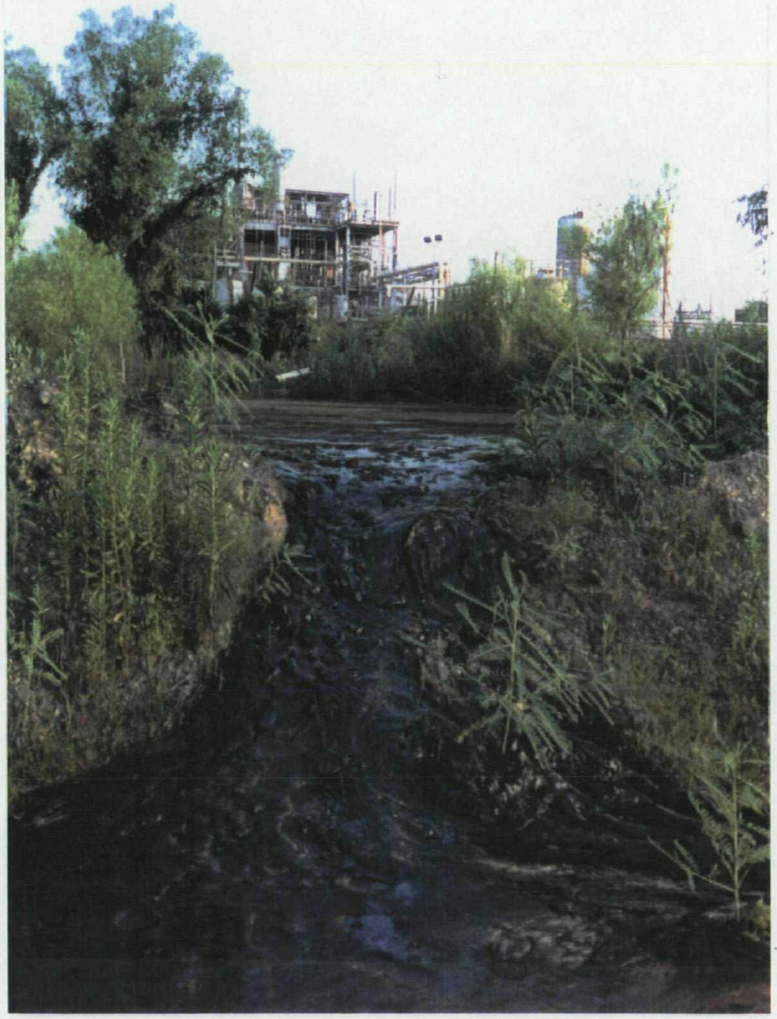

Photo № 20　　Roll № 1　　Frame №: 21　　Date: 6/25/92
Subject: Looking south from E-O tank area, of breached dike wall.

Photo № 21 Roll № 1 Frame №: 23 Date: 6/25/92
Subject: The unloading dock located near the drum recycling area. Location of HI-SS-02. Notice the stained soil and stressed vegetation.

Photo № 22 Roll № 1 Frame №: 24 Date: 6/25/92
Subject: Dumpster on left (covered with a tarp) which has been filled off the unloading dock. Note: Dumpster was removed, area was "clean" during the second site visit in August 1992.

Photo № 23 Roll № 1 Frame №: 25 Date: 6/25/92
Subject: Piles of recycled galvanized 55-gallon drums, located at the center of site property.

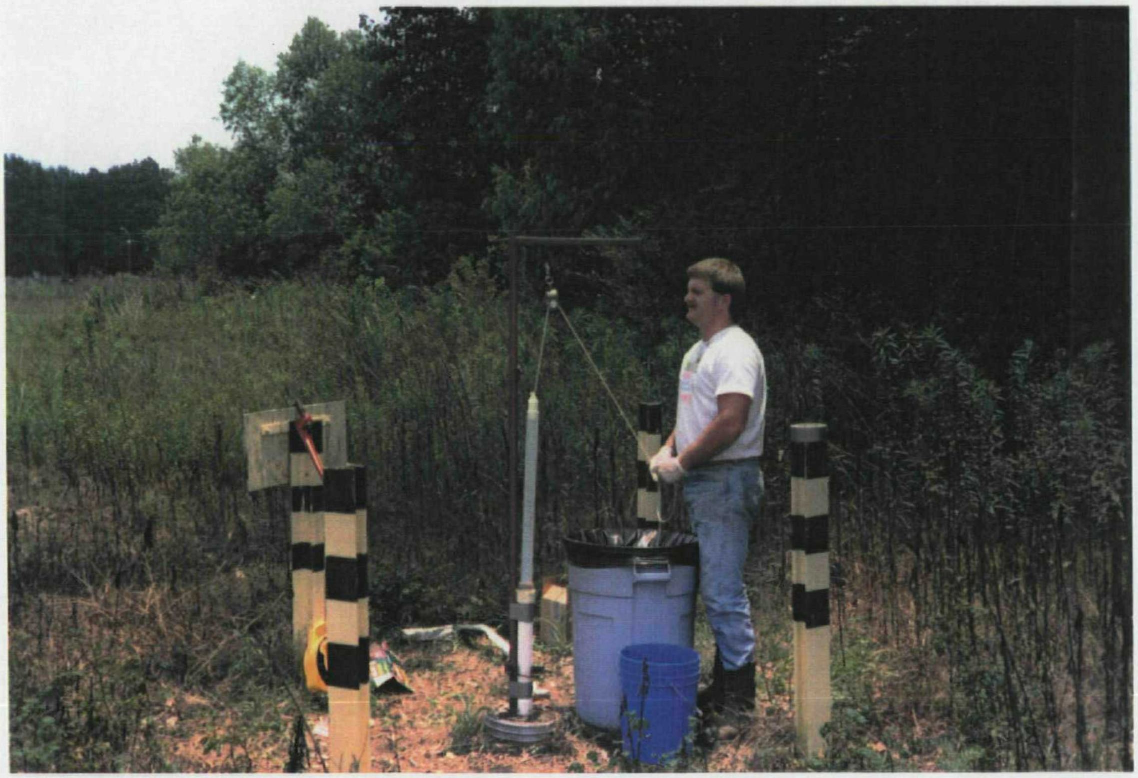

Photo № 24 Roll № 2 Frame №: 1 Date: 6/25/92
Subject: Purging monitoring well B-1, in the "back forty" portion of site property. Preparing for Sample HI-MW-B1

Photo № 25 Roll № 2 Frame №: 3 Date: 6/25/92
Subject: A neighbor that exists on the east side of Providence Street - Solar Supply.

Photo № 26 Roll № 2 Frame №: 4 Date: 6/25/92
Subject: The drainage ditch in which sample Hi-SD-04 was collected. Runoff flows north.

Photo № 27 Roll № 2 Frame №: 6 Date: 6/25/92
Subject: North view of drainage ditch which lies along eastern portion of site property. Location of HI-SD-04.

Photo № 28 Roll № 2 Frame №: 13 Date: 6/25/92
Subject: The well obstruction found within monitoring well MW-B2- near the water treatment plant (east of Providence Street).

Photo № 1 Roll № 1 Frame №: 0 Date: 6/24/92
Subject: Greens Creek exit off of Hercules Property. Northeast portion of site property. Notice the leachate flowing from the south bank potentially originating from inactive landfill (Geophysical area 2). Locale of HI-SD-02.

Photo № 2 Roll № 1 Frame №: 1 Date: 6/24/92
Subject: Greens Creek exit off site property. Notice the "security gate" limiting public access to site property - Location of HI-SW-02

Photo № 3 Roll № 1 Frame №: 2 Date: 6/24/92
Subject: South bank of Greens Creek, near the exit off of site property. Green and brown leachate present.

Photo № 4 Roll № 1 Frame №: 3 Date: 6/25/92
Subject: West view of the former pinetree stump pile area, west portion of site property.

Photo № 5 Roll № 1 Frame №: 4 Date: 6/24/92
Subject: An abandoned drum stuck in the sludge pits in the "back forty" portion of site property.

Photo № 6 Roll № 1 Frame №: 5 Date: 6/24/92
Subject: Location of HI-SD-03, within the "back forty" sludge pits.

Photo № 13   Roll № 1   Frame №: 14   Date: 6/24/92
Subject: Drainage ditch along the eastern portion of site property. Location of HI-SD-04.

Photo № 11 Roll № 1 Frame №: 12 Date: 6/24/92
Subject: Dried "back forty" sludge pits.

Photo № 12 Roll № 1 Frame №: 13 Date: 6/24/92
Subject: Foreground shows dumped boiler ash, background lies another sludge pit.

Photo № 2
Subject:
property.

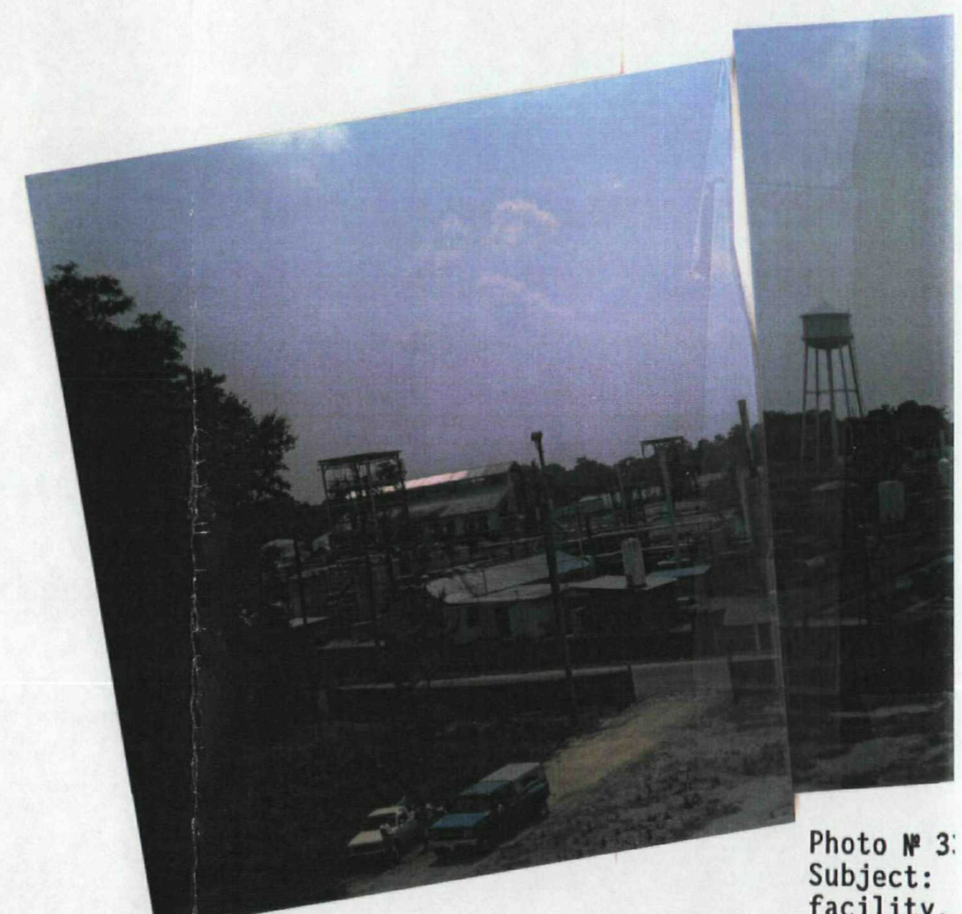

Photo № 3
Subject:
facility.

Photo № 29 - 32 Roll № 2 Frame №: 8 - 11 Date: 6/25/92
Subject: Panoramic view along drainage ditch on the east side of site property. View is from south to west to north.

Photo № 33 - 35 Roll № 2 Frame №: 14 - 16 Date: 6/25/92
Subject: Panoramic view from top of water treatment plant. West view of facility.

APPENDIX B

Photodocumentation Log

SUMMARY OF GEOPHYSICAL METHODS

The following sections are from "Geophysical Techniques for Sensing Buried Wastes and Waste Migration" by Glaccum, R. A., and M. R. Noel, August, 1983, Technos, Inc., for Environmental Monitoring Systems Laboratory, ORD., USEPA, Las Vegas, Nevada.

ELECTROMAGNETICS (EM)*

The electromagnetic (EM) method provides a means of measuring the electrical conductivity of subsurface soil, rock, and ground water. Electrical conductivity is a function of the type of soil and rock, its porosity, its permeability, and the fluids which fill the pore space. In most cases the conductivity (specific conductance) of the pore fluids will dominate the measurement. Accordingly, the EM method is applicable both to assessment of natural geohydrologic conditions and to mapping of many types of contaminant plumes. Additionally, trench boundaries, buried wastes and drums, as well as metallic utility lines can be located with EM techniques.

Natural variations in subsurface conductivity may be caused by changes in soil moisture content, ground water specific conductance, depth of soil cover over rock, and thickness of soil and rock layers. Changes in basic soil or rock types, and structural features such as fractures or voids may also produce changes in conductivity. Localized deposits of natural organic, clay, sand, gravel, or saltrich zones will also affect subsurface conductivity.

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*The term electromagnetic has been used in contemporary literature as a descriptive term for other geophysical methods, including GPR and metal detectors which are based on electromagnetic principles. However, this document will use electromagnetic (EM) to specifically imply the measurement of subsurface conductivities by low-frequency electromagnetic induction. This is in keeping with the traditional use of the term in the geophysical industry from which the EM methods originated. While the authors recognize that there are many electromagnetic systems and manufacturers, the discussion in this section is based solely on instruments which are calibrated to read in electrical conductivity units and which have been effectively and extensively used at hazardous waste sites. There is only one manufacturer of such instruments at the time of this writing.

Many contaminants will produce an increase in free ion concentration when introduced into the soil or ground water systems. This increase over background conductivity enables detection and mapping of contaminated soil and ground water at Hazardous Waste Sites (HWS), landfills, and impoundments. Large amounts of organic fluids such as diesel fuel can displace the normal soil moisture, causing a decrease in conductivity which may also be mapped, although this is not commonly done. The mapping of a plume will usually define the local flow direction of contaminants. Contaminant migration rates can be established by comparing measurements taken at different times.

The absolute values of conductivity for geologic materials (and contaminants) are not necessarily diagnostic in themselves, but the variations in conductivity, laterally and with depth, are significant. It is these variations which enable the investigator to rapidly find anomalous conditions.

Since the EM method does not require ground contact, measurements may be made quite rapidly. Lateral variations in conductivity can be detected and mapped by a field technique called profiling. Profiling measurements may be made to depths ranging from 0.75 to 60 meters. The data is recorded using strip chart and magnetic tape recorders. This continuous measurement allows increased rates of data acquisition and improved resolution for mapping small geohydrologic features. Further, recorded data enhanced by computer processing has proved invaluable in the evaluation of complex hazardous waste sites. The excellent lateral resolution obtained from EM profiling data has been used to advantage in efforts to outline closely-spaced burial pits, to reveal the migration of contaminants into the surrounding soil, and to delineate fracture patterns.

Vertical variations in conductivity can also be detected by the EM method. A station measurement technique called sounding is employed for this purpose. Data can be acquired from depths by combining results from a variety of EM instruments, each requiring different field application techniques. Other EM systems are capable of sounding to depth of one-thousand feet or more, but have not yet been used at HWS and are not adaptable to continuous measurements.

Profiling is the most cost-effective use of the EM method. Continuous profiling can be used in many applications to increase resolution, data density, and permit total site coverage at critical sites.

At HWS, applications of EM can provide:

- Assessment of natural geohydrologic conditions;
- Locating and mapping of burial trenches and pits containing drums and/or bulk wastes;
- Determination of flow direction in both unsaturated and saturated zones;
- Rate of plume movement by comparing measurement taken at different times;
- Locating and mapping of utility pipes and cables which may affect other geophysical measurements, or whose trench may provide a permeable pathway for contaminant flow.

Although there is available a wide variety of EM equipment, most of it is intended for geophysical exploration of mineral deposits. These units have not been used at HWS and do not provide a simple conductivity reading. This document discusses only those instruments which are designed and calibrated to read directly in units of conductivity.

Conductance is measured with electronic instrumentation consisting of a transmitter coil and receiver coil. The transmitter coil radiates an electromagnetic field which induces eddy currents in the earth below the instrument. Each of these eddy current loops, in turn, generates a secondary electromagnetic field which is proportional to the magnitude of the current flowing within that loop. A part of the secondary magnetic field from each loop is intercepted by the receiver coil and produces an output voltage which (within limits) is linearly related to subsurface conductivity. This reading is a bulk measurement of conductivity, e.g., the cumulative response to subsurface conditions ranging all the way from the surface to the effective depth of the instrument.

The sampling depth of EM equipment is related to the instrument's coil spacing. Instruments with coil spacings of one, four, ten, twenty, and forty meters are commercially available. The nominal sampling depth of an EM system is taken to be approximately 1.5 times the coil spacing.

The EM sounding method can rarely identify more than two or three layers with reasonable confidence. The greater the contrast in the conductivity values of each layer, the better the results. Often, the more detailed resistivity sounding method is used to complement EM profiling data.

The results of sounding analysis are usually presented as a vertical section, in which the conductivity layers are identified as a function of depth. The analyst may be able to correlate these layers to geohydrologic units believed to exist at the site.

Although the EM technique can be used for profiling or sounding, profiling is the most effective use of the EM method. Profiling makes possible the rapid mapping of subsurface conductivity changes, and the location, delineation, and assessment of spatial variables resulting from changes in the natural setting or from many contaminants.

EM is a very effective reconnaissance tool. The use of qualitative non-recorded data can provide initial interpretation in the field. If site conditions are complex, the use of a high-density survey grid, continuously-recording instruments, and computer processing may be necessary, in order to properly evaluate subsurface conditions. When continuously-recording instruments are used, total site coverage is feasible. More quantitative information can be obtained by using conductivity data from different depth ranges. At present, three different systems must be used to acquire data from 0.75 to 60 meters. Very often, however, data from two standard depths, e.g. six and fifteen meters, is adequate to furnish depth information.

Capabilities

- The EM profile method permits rapid data acquisition, resulting in high-density and high-resolution surveys.
- Profiling data may be acquired from various discrete depths, ranging from 0.75 meters to 60 meters.
- Continuously-recording instruments (to fifteen meter depth) can increase survey speed, density, and resolution permitting total site coverage, if required.
- EM reads directly in conductivity units (mm/m) permitting use of raw data in the field, and correlation to specific conductance of ground water samples.
- EM can map local and general changes in the natural geohydrologic setting.
- EM can detect and measure the boundaries of a conductivity plume.
- Direction of plume flow can be determined from an EM conductivity map.
- EM measurements taken at different times can provide the means to compute movement rates of conservative contaminants.
- EM can detect and map burial pits and trenches of both bulk and drummed wastes.
- EM can detect and map the location of buried metallic utility lines.

Limitations

- EM has less sounding (vertical) resolution than the resistivity method due to its limited number of depth intervals.
- The acquisition of data from depths of 0.75 to 60 meters requires the use of three different EM systems.
- Continuous data can be obtained only to depths up to approximately fifteen meters.
- An EM measurement is influenced by the shallower materials more than the deeper ones; this must be considered when evaluating the data.
- EM measurements become non-linear in zones of very high conductivity.
- The EM method is susceptible to noise from a number of sources, including natural atmospheric noise, powerlines, radio transmitters, buried metallic trash, pipes, cables, nearby fences, vehicles, and buildings.

MAGNETOMETER

Magnetic measurements are commonly used to map regional geologic structure and to explore for minerals. They are also used to locate pipes and survey stakes or to map archeological sites. They are commonly used at HWS to locate buried drums and trenches.

A magnetometer measures the intensity of the earth's magnetic field. The presence of ferrous metals creates variations in the local strength of that field, permitting their detection. A magnetometer's response is proportional to the mass of the ferrous target. Typically, a single drum can be detected at distances up to six meters, while massive piles of drums can be detected at distances up to twenty meters or more.

Some magnetometers require the operator to stop and take discrete measurements; other instruments permit the acquisition of continuous data as the magnetometer is moved across the site. This continuous coverage is much more suitable for high resolution requirements and the mapping of extensive areas.

The effectiveness of a magnetometer can be reduced or totally inhibited by noise or interference from time-variable changes in the earth's field and spatial variations caused by magnetic minerals in the soil, or iron and steel debris, ferrous pipes, fences, buildings, and vehicles. Many of these problems can be avoided by careful selection of instruments and field techniques.

At HWS, magnetometers may be used to:

- Locate buried steel containers, such as 55-gallon drums;
- Define boundaries of trenches filled with ferrous containers;
- Locate ferrous underground utilities, such as iron piles or tanks, and the permeable pathways often associated with them;
- Select drilling locations that are clear of buried drums, underground utilities, and other obstructions.

A magnetometer measures the intensity of the earth's magnetic field. Variations in this field may be caused by the natural distribution of iron oxides within the soil and rock or by the presence of buried iron or steel objects. (The magnetometer does not respond to nonferrous metals such as aluminum, copper, tin, and brass).

The earth's magnetic field behaves much as if there were a large bar magnet embedded in the earth. Although the earth's field intensity varies considerably throughout the United States, its average value is approximately 50,000 gammas.* The angle of the magnetic field with respect to the earth's surface also varies. In the U.S., this angle of inclination ranges approximately sixty to seventy-five degrees from the horizontal.

The intensity of the earth's magnetic field changes daily with sunspots and ionospheric conditions which can cause large and sometimes rapid variations. With time, these variations produce unwanted signals (noise) and can substantially affect magnetic measurements.

If the magnetic properties of the soil and rock were perfectly uniform, there would be no local magnetic anomalies; however, a concentration of natural iron minerals, or a buried iron object, will cause a local magnetic anomaly which can be detected at the surface.

Typical magnetic anomalies at HWS will range from one to hundreds of gammas for small discrete targets, depending on their depth. Massive piles of buried drums will result in anomalies of from one-hundred to one-thousand gammas or more.

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*The unit of magnetic measurement is the gamma. Recently, the gamma unit has been renamed the Nano Tesla. At this time, most instruments are still labeled in gammas, as are specification sheets, existing literature, and field data; hence all references to magnetic data in this document are expressed in gammas.

While several factors influence the response of a magnetometer, the mass of a buried target and its depth are the most important. A magnetometer's response is directly proportional to the mass of ferrous metal present and varies by one over the distance cubed ($1/d^3$) for total measurements. If a gradiometer is used, the response falls off even faster, as one over the distance to the fourth power ($1d^4$). With sensors of equal sensitivity, the total field system provides the greater working range. Typically a single drum can be detected at distances up to six meters or more. There is a wide variety of magnetometers available commercially; specific performance is highly dependent upon the type of magnetometer and the field conditions. Theoretically, the number of drums may be calculated, however, such results should be considered only approximations because of the number of variables associated with targets, site conditions, and calculations. Actual results may vary considerably.

A magnetometer with continuous recording capabilities can be used to produce a strip chart of the field data, which is helpful in assessing signal-to-noise ratio, anomaly shape, target location, and provides a means of exercising quality control over field data. This continuous coverage is much more suitable for high-resolution requirements and the mapping of extensive areas.

The effectiveness of a magnetometer can be reduced or totally inhibited by noise or interference from time-variable changes in the earth's field and spatial variations caused by magnetic minerals in the soil, or iron and steel debris, ferrous pipes, fences, buildings, and vehicles. Many of these problems can be avoided by careful selection of instruments and field techniques.

Capabilities

- Magnetometers respond to ferrous metals (iron or steel) only.
- Individual drums can be detected at depths up to six meters.
- Large masses of drums can be detected at depths of six to twenty meters.
- Magnetometers can provide a greater depth range than metal detectors.
- Interpretation of their data may be used to provide estimates of the number and depth of buried drums.
- They can provide a continuous response along a traverse line.
- They may be mounted on vehicles for coverage of a large site.

Limitations

- In general, magnetometers are susceptible to noise from many different sources, including steel fences, vehicles, buildings, iron debris, natural soil minerals, and underground utilities.
- Low cost units are limited in depth range (but their limitations make them insensitive to many of the above sources of noise).
- Total field instruments are also sensitive to fluctuations in the earth's magnetic field which can seriously affect data.
- Data is of limited use in determining the number and depth of targets.
- Complex site conditions may require the use of highly skilled operators, special equipment, and the recording and processing of data, along with skilled interpretation.

APPENDIX D

Analytical Data

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April 29, 1993
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Reference 1

SOIL SURVEY OF
Forrest County, Mississippi

United States Department of Agriculture
Soil Conservation Service and Forest Service

In cooperation with
Mississippi Agricultural and Forestry Experiment Station

Contents

Issued April 1979

Most map units include small, scattered areas of soils other than those that appear in the name of the map unit. Some of these soils have properties that differ substantially from those of the dominant soil or soils and thus could significantly affect use and management of the map unit. These soils are described in the description of each map unit. Some of the more unusual or strongly contrasting soils that are included are identified by a special symbol on the soil map.

Most mapped areas include places that have little or no soil material and support little or no vegetation. Such places are called *miscellaneous areas*; they are delineated on the soil map and given descriptive names. Urban land is an example. Some of these areas are too small to be delineated and are identified by a special symbol on the soil map.

The acreage and proportionate extent of each map unit are given in table 5, and additional information on properties, limitations, capabilities, and potentials for many soil uses is given for each kind of soil in other tables in this survey. (See "Summary of tables.") Many of the terms used in describing soils are defined in the Glossary.

AaA—Alaga loamy sand, 0 to 5 percent slopes. This is a somewhat excessively drained soil in broad, flat areas adjacent to large streams.

Typically the surface layer is very dark grayish brown loamy sand about 8 inches thick. This is underlain by dark yellowish brown loamy sand to a depth of about 24 inches, strong brown loamy sand to a depth of about 52 inches, and yellowish brown sand to a depth of about 90 inches.

This soil is strongly acid or very strongly acid. Permeability is rapid. Available water capacity is low. Runoff is slow. This soil tends to be droughty.

Included with this soil in mapping are small areas of Bassfield and Troup soils.

Most of this soil is used for woodland, and the rest is pasture and row crops. Corn, pasture plants, and pine trees are suited.

This soil has medium potential for row crops and pasture plants and is limited mostly by its tendency to be droughty. Corn and deep-rooted pasture plants such as bahiagrass and improved bermudagrass are suited. This soil has moderately high potential for loblolly pine, slash pine, and longleaf pine.

Potential for most urban uses is high. This soil has medium potential for openland and woodland wildlife habitat because of sandy texture. Potential for recreational uses is medium because of sandy texture. Capability unit IIIs-1; woodland suitability group 3s2.

BaA—Bassfield fine sandy loam, 0 to 2 percent slopes. This is a well drained soil on broad, flat terraces adjacent to large streams.

Typically the surface layer is dark brown fine sandy loam about 10 inches thick. The subsoil is yellowish red sandy loam that extends to a depth of about 41 inches. This is underlain to a depth of about 56 inches by reddish yellow loamy sand that contains common fine to coarse quartz pebbles and to a depth of about 70 inches by very pale brown sand that contains some medium gravel.

This soil is strongly acid or very strongly acid throughout. Permeability is moderately rapid. Available water capacity is medium. Runoff is slow. This soil tends to be slightly droughty.

Included with this soil in mapping are small areas of Prentiss soils and small areas of soils that have a finer textured subsoil. Also included are small areas of soils in which the sandy substratum is less than 40 inches deep.

Most of this soil is in cropland and pasture, and rest is in woodland. The soil has high potential for cultivated crops such as corn and soybeans. The use of adequate fertilization and conservation practices, such as row arrangement and return of crop residues, helps reduce runoff, control erosion, and improve infiltration.

This soil has high potential for pasture plants such as bahiagrass and improved bermudagrass. It also has high potential for loblolly pine, shortleaf pine, cherrybark oak, and sweetgum. There are no significant concerns in woodland use and management.

Potential is high for most urban uses and for woodland and openland wildlife habitat. Capability unit IIs-1; woodland suitability group 2o7.

BbA—Bassfield-Urban land complex, 0 to 2 percent slopes. This is a complex of nearly level, well drained soils on terraces within the city limits of Hattiesburg and Petal. Individual areas range from 60 to 2,000 acres.

This unit consists of an intricate pattern of Bassfield soils and Urban land. It is 40 percent Bassfield soils and 35 percent Urban land.

The well drained Bassfield soils have a surface layer of dark brown fine sandy loam about 10 inches thick. The subsoil is yellowish red sandy loam that extends to a depth of about 41 inches. The underlying material is reddish yellow and very pale brown loamy sand and sand that contains some gravel and that extends to a depth of 70 inches or more.

Bassfield soils are strongly acid or very strongly acid throughout. Permeability is moderately rapid. Available water capacity is medium. Runoff is slow. The soil is slightly droughty.

Urban land is mostly altered or reworked soil material that has no identifiable soil profile. These areas are mostly occupied by house sites and by the adjoining streets. A few light industrial and commercial buildings and paved parking lots are in this map unit.

Included with this unit in mapping are small areas of Bigbee, Latonia, Stough, and Cahaba soils. These are poorly drained soils along drainageways and in depressions.

Potential for most urban uses is high. Not assigned to a capability unit; Bassfield soil in woodland suitability group 2o7, Urban land not assigned to a woodland suitability group.

BcA—Bassfield-Urban land complex, occasionally flooded. This is a complex of nearly level soils on terraces that are occasionally flooded. Slopes are 0 to 2 percent. Most of this complex is within the city limits of Hattiesburg and Petal. Individual areas range from 40 to 1,500 acres.

is mottled in shades of red and brown and that contains plinthite nodules to a depth of about 25 inches; mottled light gray, red, and yellow clay loam to a depth of about 39 inches; and light gray clay mottled in shades of brown and red to a depth of about 62 inches or more.

Saucier soils are strongly acid or very strongly acid. Available water capacity is high. Permeability is slow. Runoff is slow to medium. This soil is subject to erosion if vegetative cover is removed.

Included with these soils in mapping are small areas of McLaurin soils; small areas of moderately well drained, loamy soils underlain by a layer that contains soft, yellowish red nodules; and small areas of poorly drained organic and mineral soils on flood plains.

Most of this association is in pine forest, mostly in the DeSoto National Forest.

This association has medium potential for cultivated crops such as cotton, corn, and soybeans because of slope, the erosion hazard, and the variability of the soils. Such erosion control measures as parallel terraces, stripcropping, grassed waterways, and crop residue management help prevent excessive soil loss. Potential for pasture plants such as bahiagrass is high. Adequate fertilization, proper stocking rates, and controlled grazing help control erosion. This association has high potential for longleaf pine, loblolly pine, and slash pine. Equipment limitations on the Saucier soil, however, are moderate because of wetness and low strength. Scheduling operations for drier periods helps avoid these limitations.

Potential is medium for most urban uses because of wetness and low strength. Poarch soils have fewer limitations than Saucier soils; permeability is slow in Saucier soils, and the lower part of the subsoil is clayey. Larger septic tank filter fields and specially designed foundations help overcome these limitations. Potential is high for woodland and openland wildlife habitat and for most recreational uses. Capability unit IIIe-1; Poarch soil in woodland suitability group 2o1, Saucier soil in woodland suitability group 2w8.

PtA—Prentiss loam, 0 to 2 percent slopes. This is a moderately well drained soil on broad flats on uplands.

Typically the surface layer is dark brown loam about 7 inches thick. The upper part of the subsoil is yellowish brown loam that extends to a depth of about 26 inches. Below this to a depth of about 30 inches is yellowish brown loam that has strong brown mottles. This layer is underlain to a depth of 60 inches or more by a compact and brittle fragipan of yellowish brown loam mottled with yellowish red and gray.

This soil is strongly acid or very strongly acid. Permeability is moderate in the upper part and moderately slow in the fragipan. Available water capacity is medium. Runoff is slow. A seasonal high water table is at a depth of about 24 to 36 inches.

Included with this soil in mapping are small areas of Bassfield, Benndale, Malbis, and Stough soils.

About half of this soil is in cropland or pasture. The rest is in woodland.

This soil has high potential for cultivated crops such as cotton, corn, and soybeans and for pasture plants such as bahiagrass, tall fescue, and improved bermudagrass. Adequate fertilization, return of crop residue, row arrangement, and surface field drains are needed in areas used for crops and pasture. Potential is also high for loblolly pine, slash pine, and longleaf pine. There are no significant limitations to use and management for woodland.

Potential is medium for most urban uses because of wetness and low strength. Larger septic tank filter fields, surface drainage, and specially designed foundations overcome these limitations. Potential is high for woodland and openland wildlife habitat and for most recreational uses. Capability unit IIw-1; woodland suitability group 2o7.

PtB—Prentiss loam, 2 to 5 percent slopes. This is a moderately well drained soil of the uplands.

Typically the surface layer is dark grayish brown loam about 6 inches thick. The upper part of the subsoil is yellowish brown loam that extends to a depth of about 18 inches. Below this to a depth of about 27 inches is yellowish brown loam mottled with strong brown. This layer is underlain by a compact and brittle fragipan of loam that is mottled in shades of brown and gray in the upper part and is yellowish brown mottled with grayish and brownish colors in the lower part.

The soil is strongly acid or very strongly acid. Permeability is moderate in the upper part and moderately slow in the fragipan. Available water capacity is medium. Runoff is medium, and the erosion hazard is moderate if vegetative cover has been removed. A water table is perched above the fragipan during wet seasons.

Included with this soil in mapping are small areas of Benndale and Pheba soils.

Most of this soil is in woodland, and the rest is in pasture or cropland.

This soil has high potential for cultivated crops such as cotton, corn, and soybeans. When used for crops, it needs adequate fertilization, return of crop residue, contour cultivation, minimum tillage, and terraces. Potential is high for pasture plants such as bahiagrass, tall fescue, and Coastal bermudagrass. Potential is also high for loblolly pine, slash pine, and longleaf pine. There are no significant limitations to use and management for woodland.

This soil has medium potential for most urban uses because of wetness and low strength. Larger septic tank filter fields and specially designed foundations help overcome these limitations. This soil has high potential for woodland and openland wildlife habitat and for most recreational uses. Capability unit IIe-3; woodland suitability group 2o7.

Pu—Prentiss-Urban land complex. This complex consists of gently sloping and sloping, moderately well drained soils and Urban land on uplands in metropolitan Hattiesburg and in the Camp Shelby area. Slopes are 2 to 8 percent. Areas range from 40 to 500 acres.

This unit consists of an intricate pattern of Prentiss soils and Urban land. It is about 40 percent Prentiss loam and about 35 percent Urban land.

The moderately well drained Prentiss soils have a surface layer of dark grayish brown loam about 6 inches thick. The upper part of the subsoil extends to a depth of 29 inches; it is yellowish brown loam that has strong brown mottles in the lower 9 inches. The lower part of the subsoil is a compact and brittle fragipan; to a depth of 37 inches, it is loam that is mottled in shades of brown and gray, and to a depth of 60 inches or more, it is brown loam that is mottled with gray.

Prentiss soils are strongly acid or very strongly acid. Permeability is moderate in the upper part and moderately slow in the fragipan. Available water capacity is medium. Runoff is medium. A water table is perched above the fragipan during wet seasons.

Urban land is mostly altered or reworked soil material that has no identifiable soil profile. These areas are mostly occupied by house sites and the adjoining streets. A few shopping centers and other public service areas that have paved parking lots are also in this map unit.

Included with this unit in mapping are small areas of McLaurin, Susquehanna, and Trebloc soils and small areas of poorly drained soils on narrow flood plains.

This unit has medium potential for most urban uses. Wetness and low strength are the main limitations. These limitations can be overcome through the use of specially designed foundations and by increasing the area of septic tank filter fields. Not assigned to a capability unit; Prentiss soil in woodland suitability group 2o7, Urban land not assigned to a woodland suitability group.

StA—Stough loam, 0 to 2 percent slopes. This is a somewhat poorly drained soil on broad flats.

Typically the surface layer is dark gray loam about 4 inches thick. The subsurface layer is grayish brown loam about 4 inches thick. The upper part of the subsoil is loam that is mottled in shades of brown and gray and that extends to a depth of about 15 inches. The lower part is loam that is mottled in shades of gray, brown, yellow, and red and that is partially compact and brittle; it extends to a depth of about 63 inches or more.

This soil is strongly acid or very strongly acid. Permeability is moderately slow. Available water capacity is medium. Runoff is slow. A water table is perched at a depth of about 12 to 18 inches during the wet season.

Included with this soil in mapping are small areas of Prentiss and Trebloc soils.

Most of this soil is in woodland, and the rest is in pasture and row crops.

Potential for cultivated crops such as cotton, corn, and soybeans and for pasture plants such as bahiagrass, tall fescue, and improved bermudagrass is high. Ditches are needed to remove excess water from the surface. This soil has high potential for loblolly pine and slash pine. Wetness and plant competition are the main limitations to use and management for woodland. These limitations can be partially avoided by scheduling operations for the dry season and through the use of management practices that eliminate plant competition.

This soil has medium potential for most urban uses because of wetness. This limitation can be partially overcome by adequate surface drainage. Septic tank filter fields should be designed larger than normal because of wetness. This soil has high potential for woodland and openland wildlife habitat. Potential is medium for most recreational uses because of wetness. Capability unit IIw-2; woodland suitability group 2w8.

SuB—Susquehanna silt loam, 2 to 5 percent slopes. This is a somewhat poorly drained soil on uplands.

Typically the surface layer is grayish brown silt loam about 4 inches thick. The subsurface layer is brownish yellow silt loam about 5 inches thick. The upper part of the subsoil is clay that is mottled in shades of brown, red, and gray and that extends to a depth of about 16 inches. The middle part is clay that is mottled in shades of red and gray and that extends to a depth of about 38 inches. The lower part is gray and light gray clay that is mottled in shades of brown and gray and that extends to a depth of 68 inches or more.

This soil is strongly acid or very strongly acid except for the surface layer in limed areas. Permeability is very slow. Available water capacity is high. Runoff is medium. The erosion hazard is slight to moderate. This soil has high shrink-swell potential.

Included with this soil in mapping are small areas of nearly level Falkner and Prentiss soils.

Most of this soil is in woodland, and the rest is in pasture.

This soil has low potential for cultivated crops because of the erosion hazard and the clayey texture. Potential for pasture plants such as bahiagrass and tall fescue is medium because of clayey texture. Adequate fertilization, proper stocking rates, and controlled grazing help prevent soil loss. This soil has moderately high potential for loblolly pine and shortleaf pine. Low strength is a moderate limitation to equipment operation, but scheduling operations for drier seasons overcomes this limitation.

This soil has low potential for most urban uses because of low strength, high shrink-swell potential, clayey texture, and wetness. Specially designed foundations, adequate drainage, and larger septic tank filter fields help overcome these limitations. This soil has a high potential for woodland and openland wildlife habitat. Potential is medium for most recreational uses because of wetness. Capability unit IVe-3; woodland suitability group 3c2.

SuD—Susquehanna silt loam, 5 to 12 percent slopes. This is a somewhat poorly drained soil on uplands.

Typically the surface layer is dark gray silt loam about 5 inches thick. The subsurface layer is light yellowish brown silt loam about 3 inches thick. The upper part of the subsoil is yellowish red silty clay that has yellowish mottles. The middle part is silty clay mottled in shades of red, gray, and brown. The lower part of the subsoil is clay mottled in shades of gray and red over gray clay mottled in shades of yellow; it extends to a depth of 65 inches or more.

This complex has low potential for most urban uses because of wetness and flooding. If the soils are used for urban purposes, they must be shaped and graded to remove water from the surface, and larger than normal septic tank filter fields are needed. Trebloc soils have high potential for wetland wildlife habitat, and Escambia soils have high potential for woodland and openland wildlife habitat. Potential is low for most recreational uses because of wetness and flooding. Capability unit Vw-1; Trebloc soil in woodland suitability group 2w9, Escambia soil in woodland suitability group 2w2.

TrB—Troup loamy fine sand, 0 to 8 percent slopes. This is a well drained soil of the uplands.

Typically the surface layer is dark grayish brown loamy fine sand about 3 inches thick. The subsurface layer is yellowish brown loamy fine sand about 23 inches thick. The next layer is yellowish red and red loamy sand that extends to a depth of about 64 inches. The subsoil is red sandy loam that extends to a depth of about 91 inches or more.

This soil is strongly acid or very strongly acid. Permeability is rapid in the thick, sandy surface layer and moderate in the subsoil. Available water capacity is low in the sandy layers and medium in the subsoil. Runoff is slow. The erosion hazard is slight. This soil tends to be droughty.

Included with this soil in mapping are small areas of Alaga, Heidel, and McLaurin soils.

Most of this soil is in woodland.

This soil has medium potential for cultivated crops such as corn and soybeans because of low available water capacity in the sandy layers. Early planting helps to avoid the driest part of the growing season. Potential is medium for pasture plants such as bahiagrass and improved bermudagrass because of sandy texture. Adequate fertilization, proper stocking, and weed control help preserve moisture and maintain a good grass coverage. This soil has moderately high potential for loblolly pine, longleaf pine, and slash pine. Moisture is the limiting factor. Seedling mortality and equipment limitations are concerns because of sandy texture. Equipment operates best on this soil during wetter periods.

This soil has high potential for most urban uses. Potential for woodland and openland wildlife habitat is medium because of droughtiness. Potential is medium for most recreational uses. Capability unit IIIs-1; woodland suitability group 3s2.

Ur—Urban land. Most of this map unit is in Hattiesburg, and a smaller amount is in Camp Shelby (Mississippi National Guard). About 70 to 95 percent of the area is covered with industrial, commercial, military, or residential development, such as railroad yards, buildings, streets, and parking lots. In the Camp Shelby area, warehouses, maintenance shops, parking areas, and vehicle storage areas cover this map unit.

Cuts and fills for the purpose of installing works and structures have altered and obscured soil features to the point that the soil can no longer be identified as a soil series. Most of the original soils were well drained and moderately well drained.

Use and management of the soils

The soil survey is a detailed inventory and evaluation of the most basic resource of the survey area—the soil. It is useful in adjusting land use, including urbanization, to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in uses of the land.

While a soil survey is in progress, soil scientists, conservationists, engineers, and others keep extensive notes about the nature of the soils and about unique aspects of behavior of the soils. These notes include data on erosion, drought damage to specific crops, yield estimates, flooding, the functioning of septic tank disposal systems, and other factors affecting the productivity, potential, and limitations of the soils under various uses and management. In this way, field experience and measured data on soil properties and performance are used as a basis for predicting soil behavior.

Information in this section is useful in planning use and management of soils for crops and pasture, rangeland, and woodland, as sites for buildings, highways and other transportation systems, sanitary facilities, and parks and other recreation facilities, and for wildlife habitat. From the data presented, the potential of each soil for specified land uses can be determined, soil limitations to these land uses can be identified, and costly failures in houses and other structures, caused by unfavorable soil properties, can be avoided. A site where soil properties are favorable can be selected, or practices that will overcome the soil limitations can be planned.

Planners and others using the soil survey can evaluate the impact of specific land uses on the overall productivity of the survey area or other broad planning area and on the environment. Productivity and the environment are closely related to the nature of the soil. Plans should maintain or create a land-use pattern in harmony with the natural soil.

Contractors can find information that is useful in locating sources of sand and gravel, roadfill, and topsoil. Other information indicates the presence of bedrock, wetness, or very firm soil horizons that cause difficulty in excavation.

Health officials, highway officials, engineers, and many other specialists also can find useful information in this soil survey. The safe disposal of wastes, for example, is closely related to properties of the soil. Pavements, sidewalks, campsites, playgrounds, lawns, and trees and shrubs are influenced by the nature of the soil.

Crops and pasture

The major management concerns in the use of the soils for crops and pasture are described in this section. In addition, the crops or pasture plants best suited to the soil,

Factors of soil formation

Soil is the product of the interaction of five major factors of soil formation: climate, living organisms, parent material, relief, and time. The kind of soil that formed in one area differs from the kind that formed in another area if there has been a difference between the two areas in any factor of soil formation.

Climate

Forrest County has the warm, humid, subtropical climate characteristic of much of the southeastern United States. This type of climate affects the physical, chemical, and biological relationships in soils, primarily through high temperature and precipitation.

Water dissolves minerals, supports biological activity, and transports minerals and organic residue in the soil profile. The amount of water that percolates through the soil depends mainly on rainfall, relative humidity, and the physiographic position, topography, and permeability of the soil.

Living organisms

Plants, animals, insects, bacteria, and fungi affect the formation of soils. Gains in organic matter and nitrogen, gains or losses in plant nutrients, and alterations in structure and porosity are some of the changes caused by living organisms.

Vegetation, mainly pine trees, has probably affected soil formation in Forrest County more than other living organisms have. The soils on uplands formed under dense forest dominated by pine trees, and the soils on flood plains formed under mixed hardwood and pine forest. The soils that formed under trees have lower organic-matter content than soils that formed under grasses.

Earthworms and other small invertebrates are most active in the upper part of the soil, and they continuously mix the soil. Rodents and other animals burrow in the soil and contribute to mixing. Little is known about fungi and other micro-organisms in the soils of Forrest County, but it is known that micro-organisms aid in weathering, decomposing organic matter, and fixing nitrogen in the soils.

Parent material

Parent material, the unconsolidated mass from which soil forms, has much to do with the chemical and mineral composition of the soil. The parent material of the soils in Forrest County is mainly marine deposits of sandy, loamy, and clayey material.

The clayey soils formed mostly in the Hattiesburg Clay and Pascagoula Clay Formations of Miocene age. The loamy and sandy soils are derived mostly from the Citronelle Formation of Pliocene age. The soils on flood plains are derived from material eroded from the nearby uplands. Organic soils formed in an accumulation of plant debris under saturated conditions. The soils that formed in clayey material are generally less weathered and contain more bases than those derived from the loamy material.

Relief

Relief affects soil formation through its influence on drainage, erosion, plant cover, and soil temperature. The relief in Forrest County ranges from nearly level to steep. Most of the nearly level land is on flood plains or stream terraces. Many of the soils are poorly drained or very poorly drained. Soils on ridgetops are mostly gently sloping or moderately sloping and are better drained than soils on flood plains or stream terraces. The steep soils are generally between the ridgetops and the flood plains. Runoff from them is greater, and as a result they generally show less horizon development than soils on ridgetops.

Time

The length of time required for soil development depends largely on the effects of the other four factors of soil formation. Less time is generally required for a soil to develop in warm, humid regions where the vegetation is luxuriant than in cold, dry regions where the vegetation is scant. Also, other factors being equal, less time is required if the parent material is coarse textured rather than fine textured.

Fairly stable, nearly level soils on interstream divides have more strongly developed horizons than sloping soils in which the rate of geologic erosion approaches that of soil development, and a smaller amount of total rainfall percolates through the profile. Soils on flood plains in Forrest County formed in deposits washed from uplands. Many of these soils, however, are old enough and have received such a small amount of sediment in recent times that they have formed thick, well drained horizons.

Processes of soil formation

The main processes involved in the formation of horizons are the accumlation of organic matter; the leaching of calcium carbonates and bases; the formation and translocation of silicate clay; and the reduction, segregation, and transfer of iron.

Accumulation of organic matter in the upper part of the soil profile contributes to the formation of an A1 horizon. Organic-matter content in the soils of Forrest County ranges from low to very high.

Carbonates and bases have been leached from nearly all the soils, and most are moderately to strongly leached. Leaching of bases from the upper horizons of a soil commonly preceded the translocation of silicate clay.

Translocation of silicate clay has occurred in many of the soils. This contributes to the development of an eluviated A2 horizon that contains less clay and that generally is lighter in color than the B horizon. The B horizon commonly has clay accumulations in films, in

TABLE 18.--SOIL AND WATER FEATURES

[Absence of an entry indicates the feature is not a concern. See text for descriptions of symbols and such terms as "rare," "brief," and "perched." The symbol < means less than; > means greater than]

Soil name and map symbol	Hydro-logic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Depth	High water table: Kind	High water table: Months	Bedrock: Depth
					Ft			In
Alaga:								
AaA	A	None to rare	Brief	Nov-Apr	>6.0	---	---	>60
Bassfield:								
BaA, [1]BbA, [1]BcA	B	None to common.	Very brief	Nov-Apr	>6.0	---	---	>60
Benndale:								
BeB, BeC, BeD	B	None	---	---	>6.0	---	---	>60
Bibb:								
Bf	C	Common	Brief	Dec-May	0.5-1.5	Apparent	Dec-Apr	>60
[1]BG:								
Bibb part	C	Common	Brief	Dec-May	0.5-1.5	Apparent	Dec-Apr	>60
Jena part	B	Rare to common.	Very brief to long.	Dec-Apr	>6.0	---	---	>60
Bigbee:								
Bh	A	Rare to common.	Brief	Jan-Mar	3.5-6.0	Apparent	Jan-Mar	>60
Cadeville Variant:								
CaF	D	None	---	---	>6.0	---	---	>60
Cahaba:								
ChA	B	None	---	---	>6.0	---	---	>72
Falkner:								
FaB	C	None	---	---	1.5-2.5	Perched	Jan-Mar	>60
[1]FsB:								
Falkner part	C	None	---	---	1.5-2.5	Perched	Jan-Mar	>60
Susquehanna part	D	None	---	---	>6.0	---	---	>60
Harleston:								
HaA	C	None to occasional.	Very brief	Nov-Apr	2.0-3.0	Apparent	Nov-Mar	>60
Heidel:								
HeD, HeE	B	None	---	---	>6.0	---	---	>60
Jena:								
[1]JN:								
Jena part	B	Rare to common.	Very brief to long.	Dec-Apr	>6.0	---	---	>60
Nugent part	A	Common	Brief to long.	Dec-Mar	>3.5	Apparent	Jan-Apr	>60
Latonia:								
LaA	B	None to common.	Very brief	Nov-Apr	>6.0	---	---	>60
[1]LT:								
Latonia part	B	None to common.	Very brief	Nov-Apr	>6.0	---	---	>60

See footnote at end of table.

TABLE 18.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock
		Frequency	Duration	Months	Depth	Kind	Months	Depth
					Ft			In
Latonia:								
Trebloc part---	D	None to common.	Very brief	Jan-Apr	0.5-1.0	Apparent	Jan-Apr	>60
Lucedale:								
LuA	B	None	---	---	>6.0	---	---	>60
Malbis:								
MaB	B	None	---	---	2.5-4.0	Perched	Dec-Mar	>60
McLaurin:								
MbB, MbC, [1]MCB---	B	None	---	---	>6.0	---	---	>60
[1]MLD:								
McLaurin part--	B	None	---	---	>6.0	---	---	>60
Benndale part--	B	None	---	---	>6.0	---	---	>60
Pamlico:								
[1]PD:								
Pamlico part---	D	Frequent----	Very long	Nov-Jun	(1)-1.0	Apparent	Nov-Jul	>60
Dorovan part---	D	Frequent----	Very long	Jan-Dec	<0.5	Apparent	Jan-Dec	>60
Petal:								
[1]PEC:								
Petal part-----	C	None	---	---	2.5-3.5	Perched	Jan-Apr	>60
Susquehanna part	D	None	---	---	>6.0	---	---	>60
Benndale part--	B	None	---	---	>6.0	---	---	>60
Pheba:								
PhA	C	None	---	---	1.5-2.0	Perched	Jan-Mar	>60
Pits:								
Pn.								
Poarch:								
PoB, PoC	B	None	---	---	2.5-5.0	Apparent	Dec-Mar	>60
[1]PSB:								
Poarch part----	B	None	---	---	2.5-5.0	Apparent	Dec-Mar	>60
Saucier part---	C	None	---	---	2.5-4.0	Perched	Jan-Mar	>60
Prentiss:								
PtA, PtB, [1]Pu----	C	None	---	---	2.0-2.5	Perched	Jan-Mar	>60
Stough:								
StA	C	None	---	---	1.0-1.5	Perched	Jan-Apr	>60
Susquehanna:								
SuB, SuD	D	None	---	---	>6.0	---	---	>60
Trebloc:								
Tb	D	None to common.	Very brief	Jan-Apr	0.5-1.0	Apparent	Jan-Apr	>60
[1]TeA:								
Trebloc part---	D	None to common.	Very brief	Jan-Apr	0.5-1.0	Apparent	Jan-Apr	>60
Escambia part--	C	None	---	---	1.5-2.5	Apparent	Dec-Mar	>60
Troup:								
TrB	A	None	---	---	>6.0	---	---	>60

See footnote at end of table.

TABLE 18.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock
		Frequency	Duration	Months	Depth	Kind	Months	Depth
					Ft			In
Urban land: Ur.								

[1]This map unit is made up of two or more dominant kinds of soil. See map unit description for the composition and behavior of the whole map unit.

SOIL LEGEND

The first letter, always a capital, is the initial letter of the soil name. The second letter is a capital if the mapping unit is broadly defined 1/; otherwise, it is a small letter. The third letter, always a capital, shows the slope. Symbols without slope letters are those of nearly level soils, except for Pits, Prentiss-Urban land complex, and Urban land.

SYMBOL	NAME
AaA	Alaga loamy sand, 0 to 5 percent slopes
BaA	Bassfield fine sandy loam, 0 to 2 percent slopes
BbA	Bassfield-Urban land complex, 0 to 2 percent slopes
BcA	Bassfield-Urban land complex, occasionally flooded
BeB	Benndale fine sandy loam, 2 to 5 percent slopes
BeC	Benndale fine sandy loam, 5 to 8 percent slopes
BeD	Benndale fine sandy loam, 8 to 12 percent slopes
Bf	Bibb silt loam
BG	Bibb and Jena soils, frequently flooded
Bh	Bigbee loamy sand
CaF	Cadeville Variant silt loam, 15 to 60 percent slopes
ChA	Cahaba sandy loam, 0 to 2 percent slopes
FaB	Falkner silt loam, 2 to 5 percent slopes
FsB	Falkner-Susquehanna-Urban land complex, 2 to 5 percent slopes
HaA	Harleston fine sandy loam, 0 to 2 percent slopes
HeD	Heidel sandy loam, 8 to 12 percent slopes
HeE	Heidel sandy loam, 12 to 30 percent slopes
JN	Jena-Nugent association frequently flooded
LaA	Latonia fine sandy loam, 0 to 2 percent slopes
LT	Latonia-Trebloc association, occasionally flooded
LuA	Lucedale loam, 0 to 2 percent slopes
MaB	Malbis loam, 2 to 5 percent slopes
MbB	McLaurin loamy sand, 2 to 5 percent slopes
MbC	McLaurin loamy sand, 5 to 8 percent slopes
MCB	McLaurin association, undulating
MLD	McLaurin-Benndale association, rolling
PD	Pamlico-Dorovan association
PEC	Petal-Susquehanna-Benndale association, rolling
PhA	Pheba silt loam, 0 to 2 percent slopes
Pn	Pits
PoB	Poarch fine sandy loam, 2 to 5 percent slopes
PoC	Poarch fine sandy loam, 5 to 8 percent slopes
PSB	Poarch-Saucier association, undulating
PtA	Prentiss loam, 0 to 2 percent slopes
PtB	Prentiss loam, 2 to 5 percent slopes
Pu	Prentiss-Urban land complex
StA	Stough loam, 0 to 2 percent slopes
SuB	Susquehanna silt loam, 2 to 5 percent slopes
SuD	Susquehanna silt loam, 5 to 12 percent slopes
Tb	Trebloc silt loam
TeA	Trebloc-Escambia complex, 0 to 2 percent slopes
TrB	Troup loamy fine sand, 0 to 8 percent slopes
Ur	Urban land

1/ The composition of these units is more variable than that of others in the survey area, but has been controlled well enough to be interpreted for the expected use of the soils.

CULTURAL

BOUNDARIES

National, state or provinc

County or parish

Minor civil division

Reservation (national for state forest or park, and large airport)

Land grant

Limit of soil survey (labe

Field sheet matchline &

AD HOC BOUNDARY (labe

Small airport, airfield, pa cemetery, or flood poo

STATE COORDINATE TICK

LAND DIVISION CORNERS (sections and land grants)

ROADS

Divided (median shown if scale permits)

Other roads

Trail

ROAD EMBLEMS & DESIG

Interstate

Federal

State

County, farm or ranch

RAILROAD

POWER TRANSMISSION L (normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES

Without road

With road

With railroad

DAMS

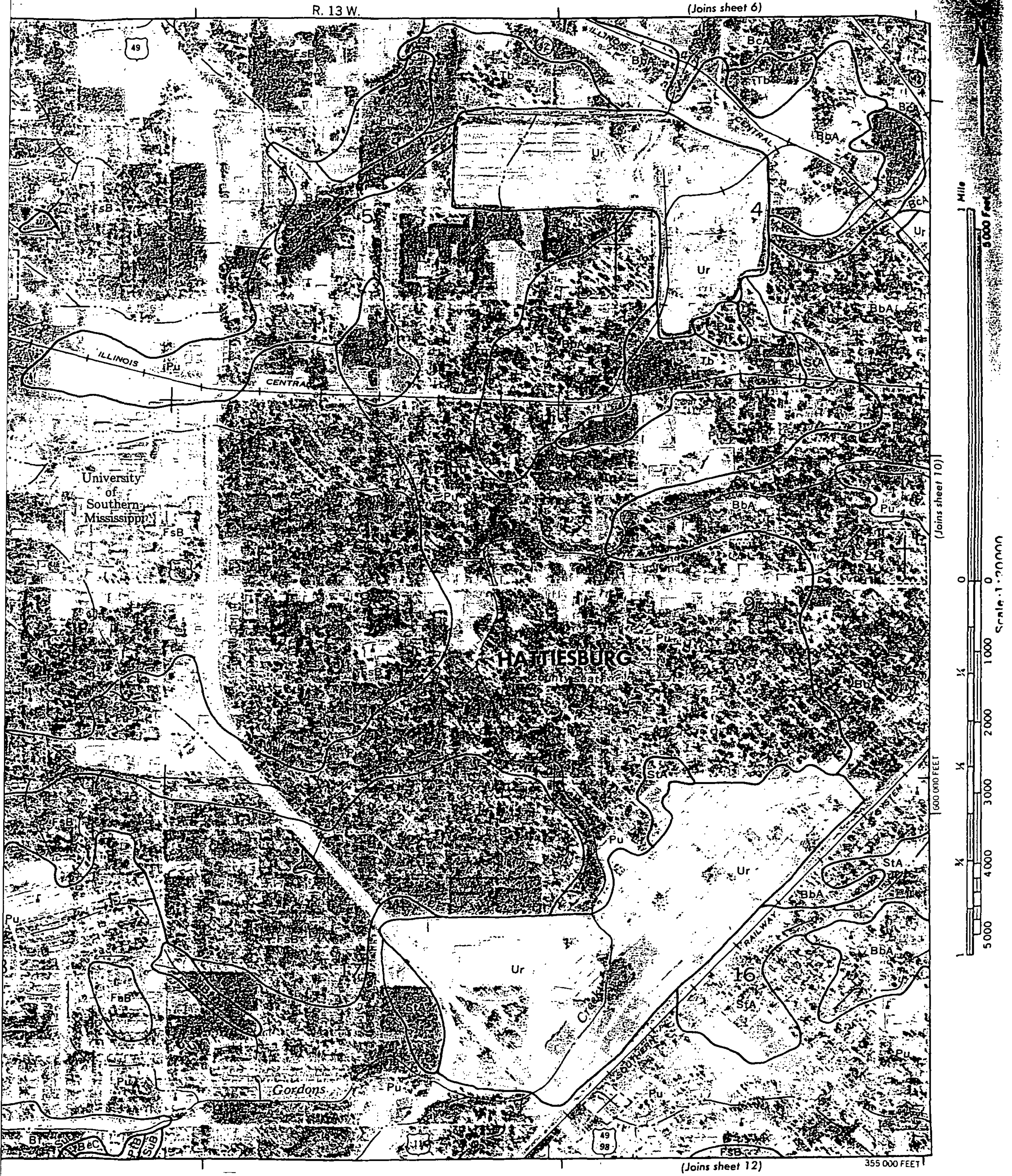
Large (to scale)

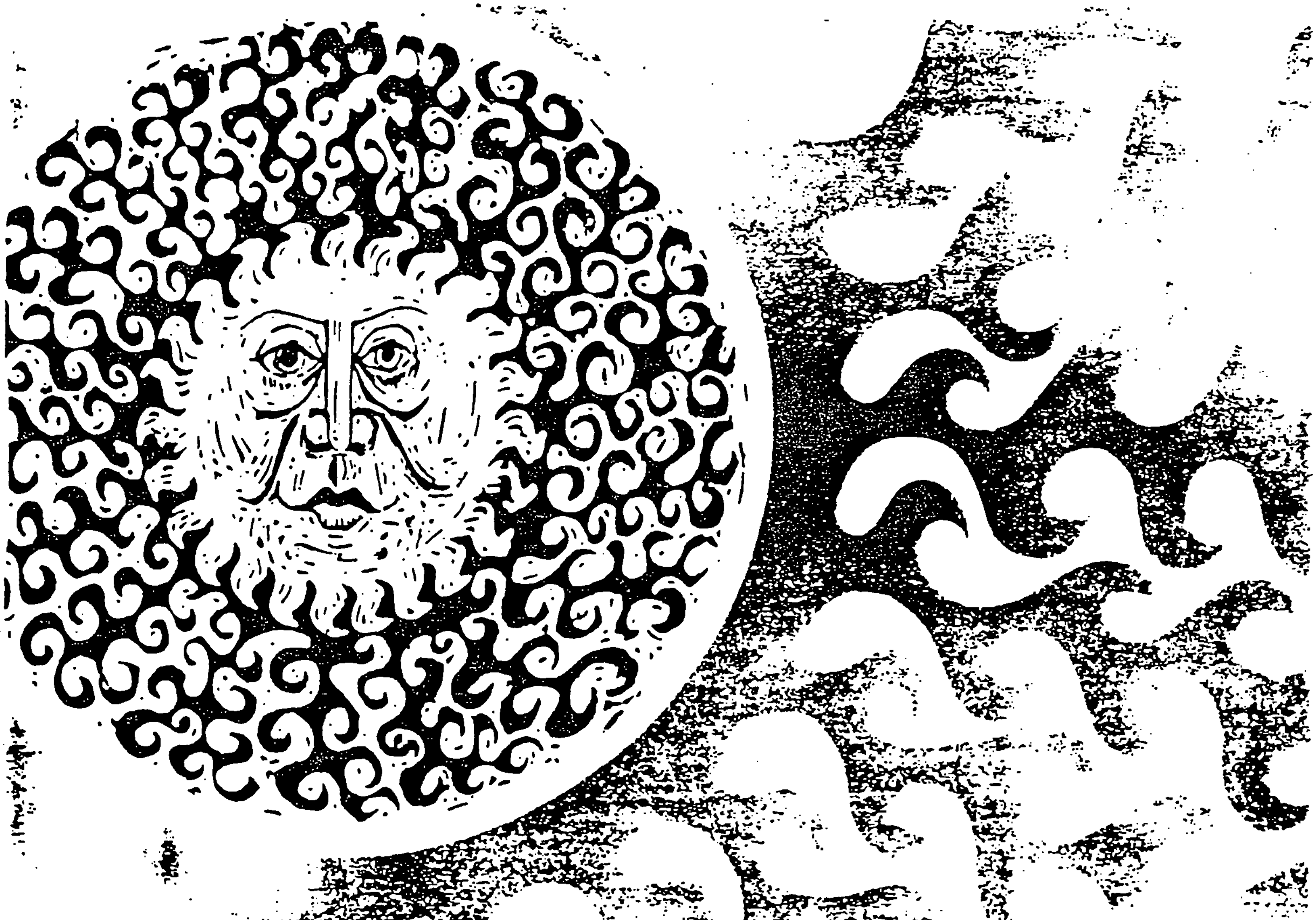
Medium or small

PITS

Gravel pit

Mine or quarry


R. 13 W.
(Joins sheet 6)
(Joins sheet 10)
(Joins sheet 12)
600 000 FEET
355 000 FEET
University of Southern Mississippi
HATTIESBURG
County seat
ILLINOIS CENTRAL
CENTRAL GULF
SOUTHERN RAILWAY
Gordons
Creek
Ur
BbA
BcA
Tb
Pu
StA
FsB
FaB
BbC
BeC
1 Mile
5000 Feet
Scale 1:20000
0
1000
2000
3000
4000
5000



LIMATIC ATLAS OF THE UNITED STATES

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

ENVIRONMENTAL SCIENCE SERVICES ADMII
Robert M. White, Administrator

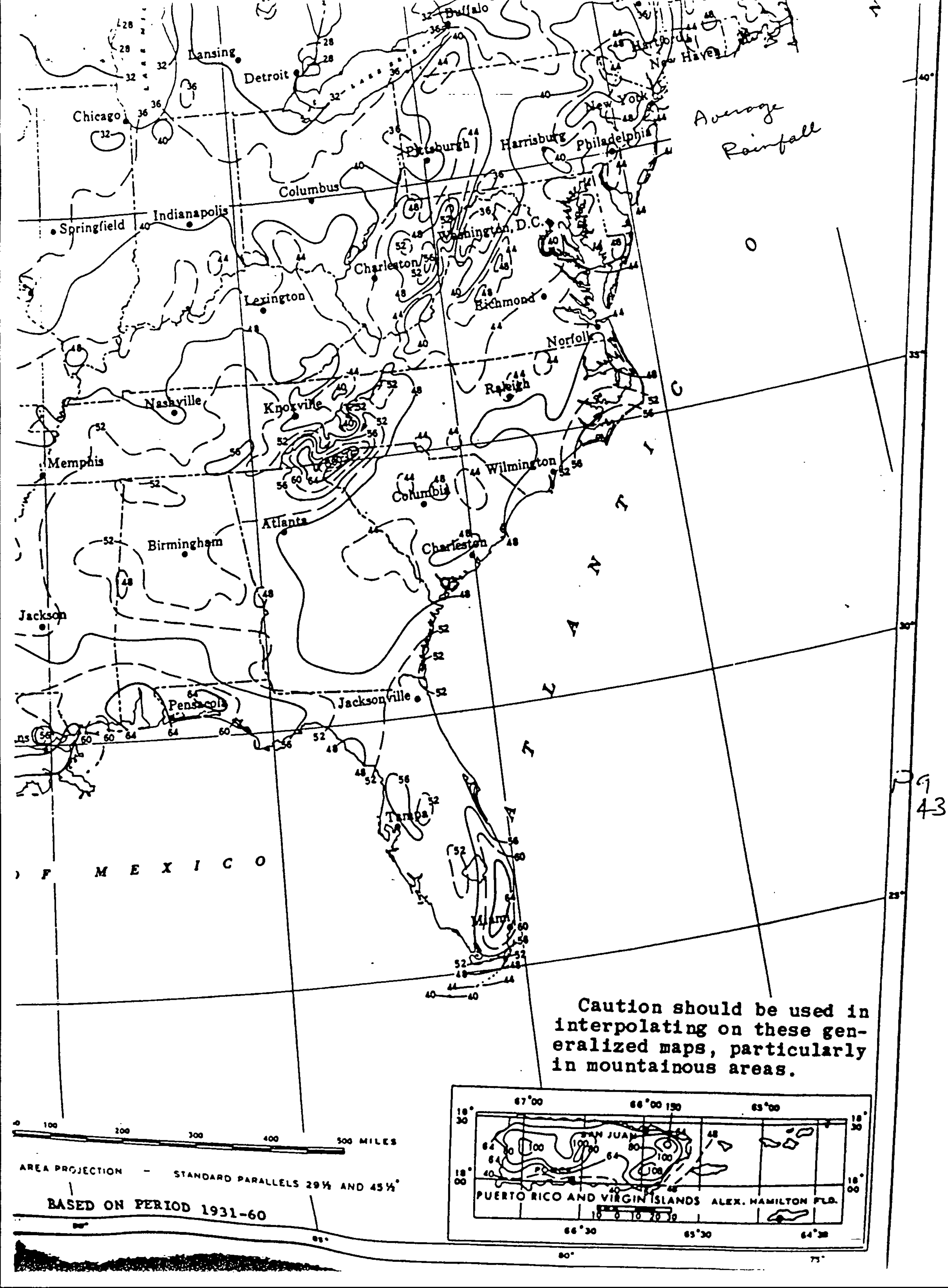
ENVIRONMENTAL DATA SERVICE
Woodrow C. Jacobs, Director

JUNE 1968

REPRINTED BY THE

NATIONAL OCEANIC AND ATMOSPHERIC ADM

1983



Average Rainfall

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

pg 43

LAKE EVAPORATION

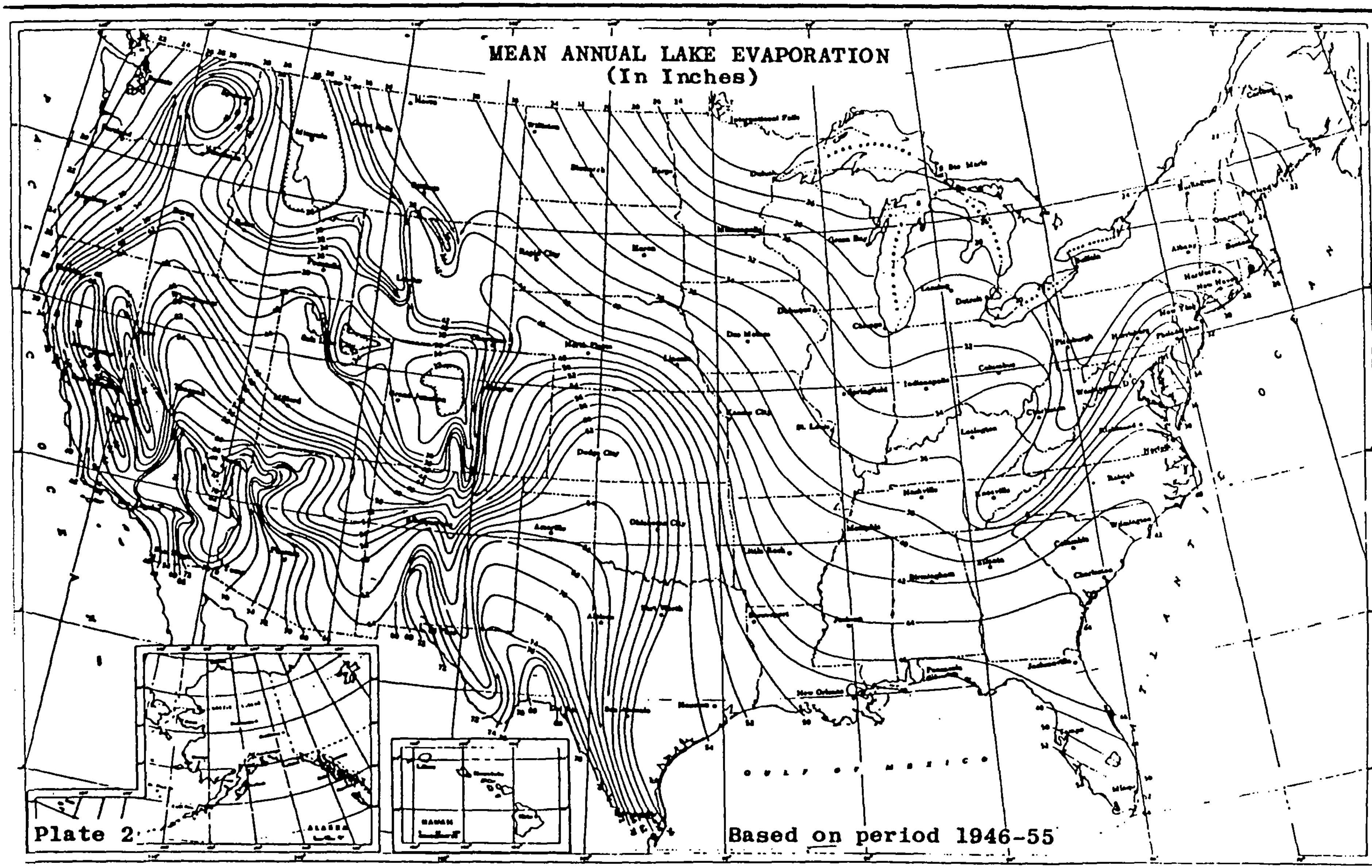
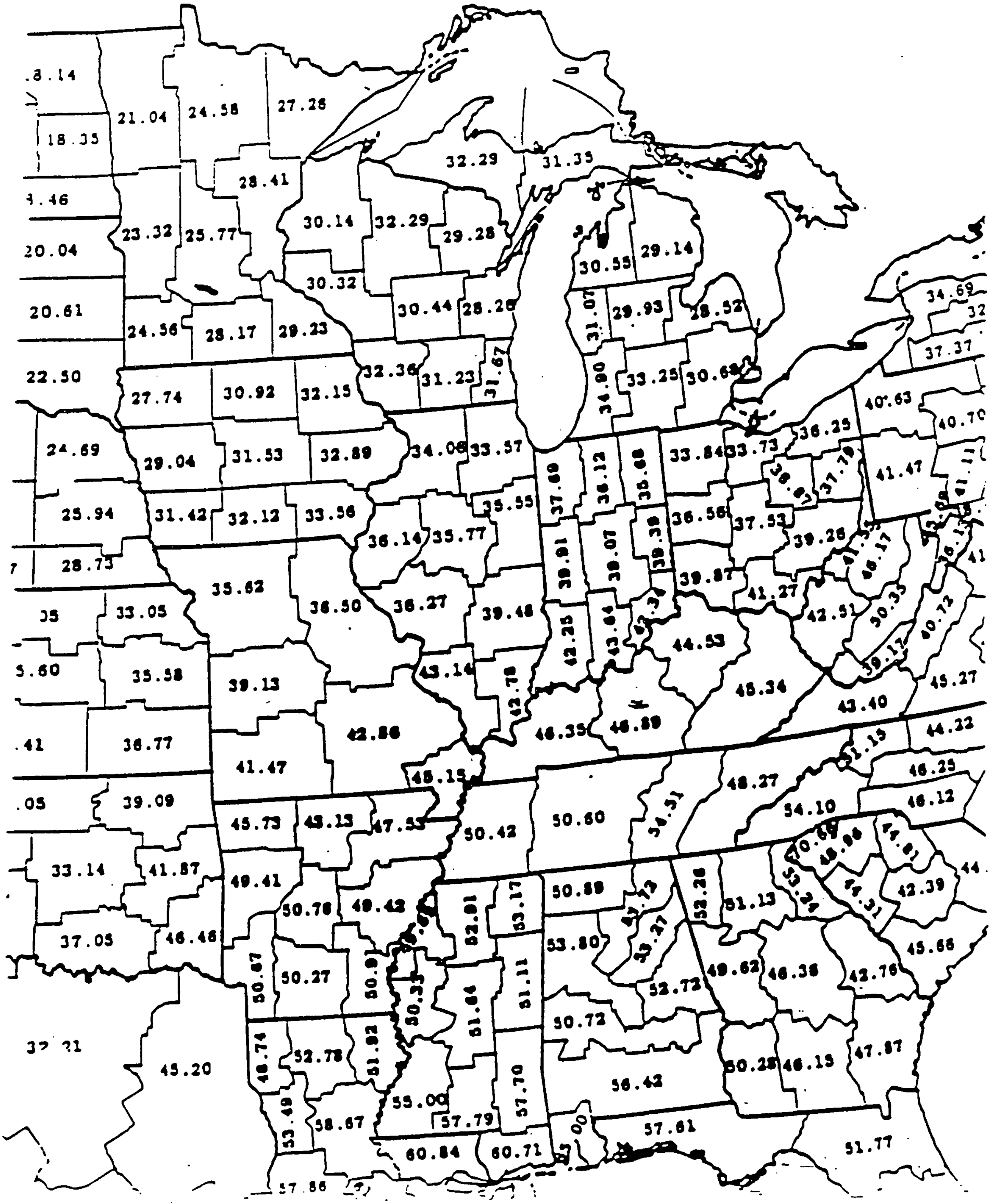


Plate 2

ON (inches) BY STATE CLIMATIC DIVISIONS



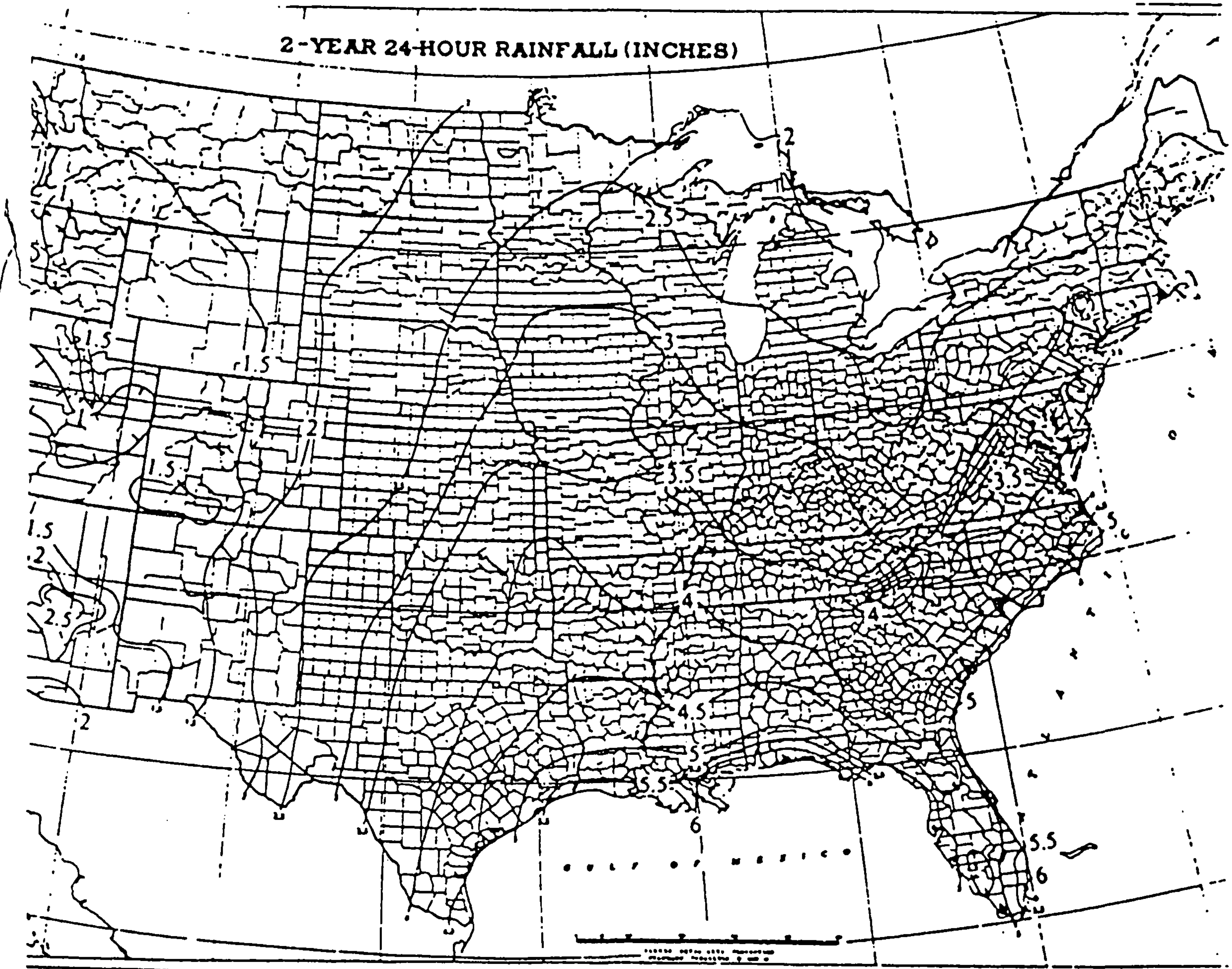
Reference 3

TECHNICAL PAPER NO. 40

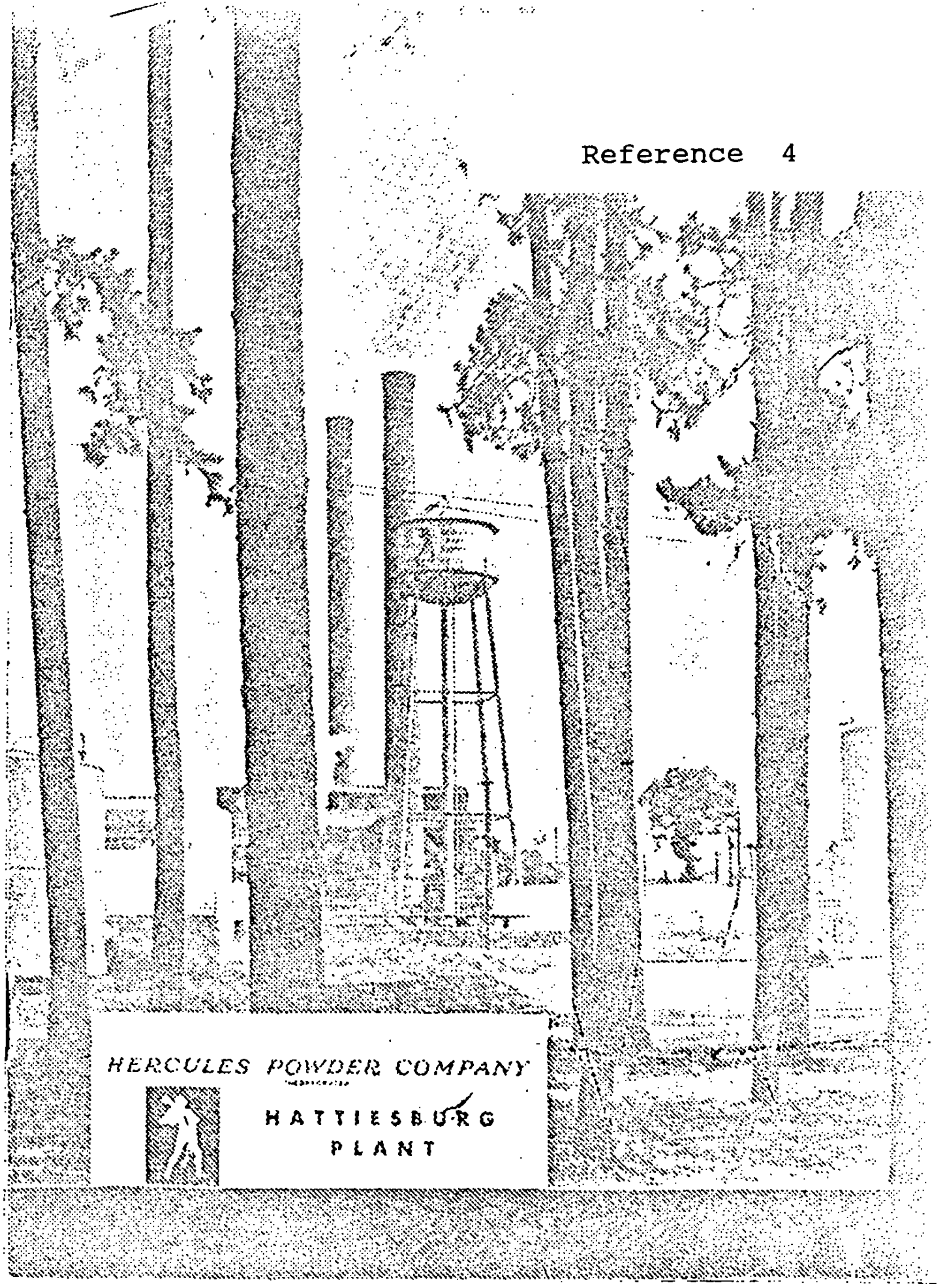
RAINFALL FREQUENCY ATLAS OF THE UNITED STATES

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

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


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

Reference 4

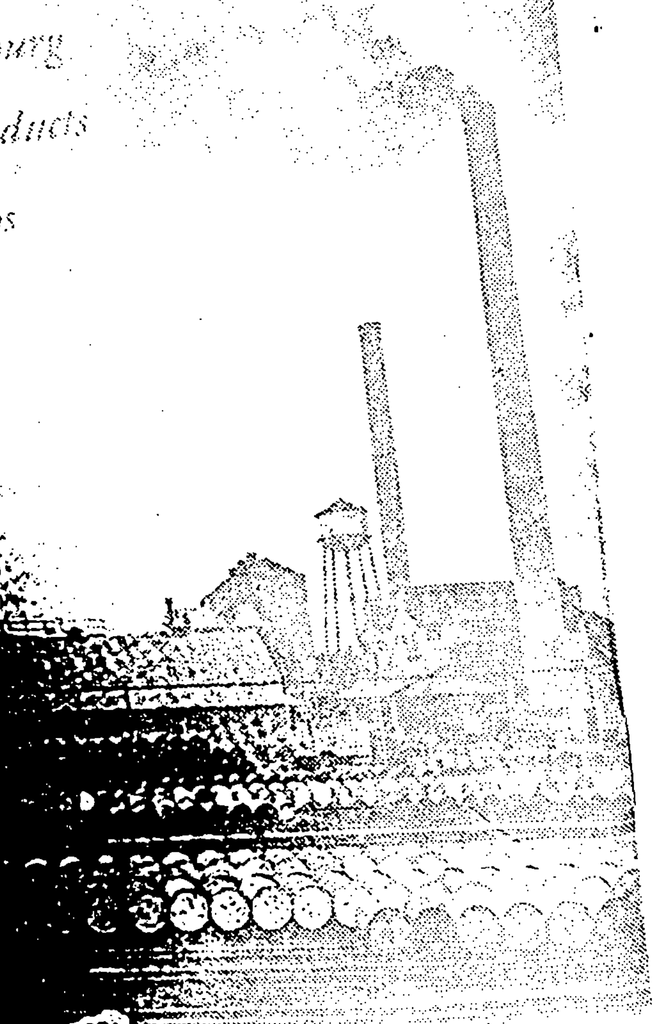


THE MAGIC OF CHEMISTRY

works at Hattiesburg

to pull useful products

out of pine stumps



DRUMS AND TANK CAPS. Specialty liquid naval products are ready for ... in dozens of indus- ... fields as widely ... paper and syn-

The stumps of the long-leaf pine, left in the ground after the trees have been cut down for lumber, contain valuable resins. At its Hattiesburg, Mississippi plant, Hercules extracts turpentine, pine oil, and rosin from these stumps.

The process is complicated, and the manufacturing equipment necessary costs millions of dollars. The chemical knowhow needed to do the job was acquired through Hercules' nearly forty years of experience in the naval stores business.

The operation begins when tractors with big, forklike fingers snake through the fields and forests of the South to find these stumps and tear them from the soil. The stumps and their roots, hauled to the plant in trucks and railroad cars, are stacked in huge piles or taken directly to the mill. From a storage pit an overhead crane lifts them on to a conveyor where they are washed and carried to the "hog."

The hog is a big grinder with knives sharp as razors, which slash and cut the stumps and roots – with a noise like thunder – into pieces of wood five to ten inches long. From there the wood goes to the shredder.

Sharp-edged hammers on the rims of wheels, rotating a mile a minute, sliver and chip the wood until it is almost as fine as shredded wheat.

The purpose of this cutting and slashing is to make it easier to remove the resin from the wood. In giant extractor tanks, solvents extract the resin from the chips in much the same way that coffee is brewed. The resultant oily mixture and the chemicals made from it are the lifeblood of the naval stores industry.

The naval stores industry produces chemicals for many of the things we use in our daily lives . . . insecticides, rosin for varnishes and paints, turpentine in the familiar Hercules orange-and-black cans, pine oils and chemicals that go into textiles, rubber, paper, adhesives, plastics, and a hundred other uses.

Thousands of Hercules men and women work in this industry, obtaining the chemicals from these resinous stumps. At Hattiesburg and its sister plant at Brunswick, Georgia, 1,80 people are employed, and 500 more work in woods camps around the tw plants to supply the hungry hogs an shredders with stumps. A steady strea of stumps comes into Hattiesburg fro millions of pine-covered acres in th states of Mississippi, Louisiana, a Alabama.

Hattiesburg operations consist wood gathering and plant operatio The plant operations can be grou into three classifications:

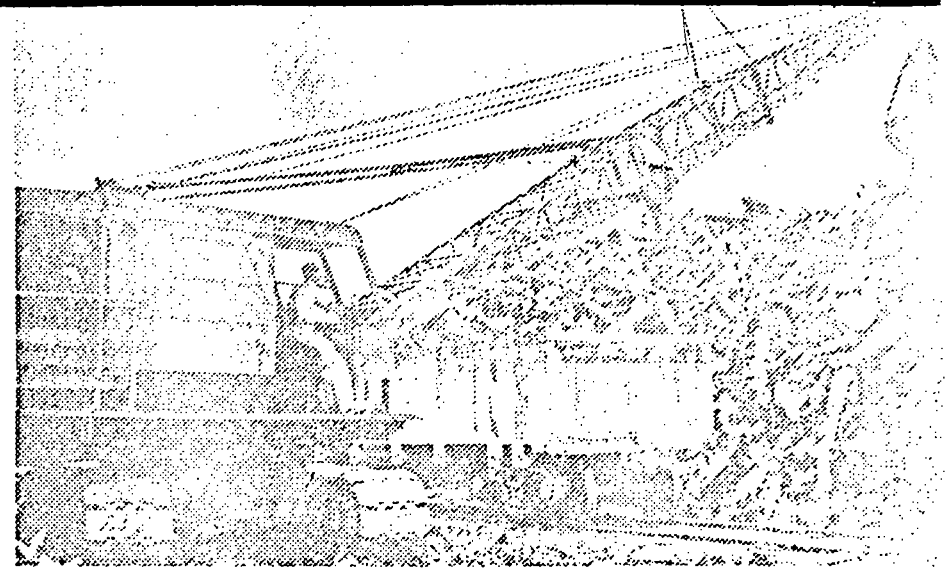
HATTIESBURG naval stores plant where nearly a thousand Herculites work with millions of dollars worth of equipment. Using the magic of chemistry and the know-how acquired by thirty-five years in the business, they turn Southern pine stumps into valuable products for industry.

Primary — all operating units required to produce rosin, pine oil, and turpentine. This covers wood grinding, shredding, extraction, refining, and distillation of the crude resin.

Secondary — those units that produce specialty products, in most cases using as the main raw material one of the materials produced by the primary operations.

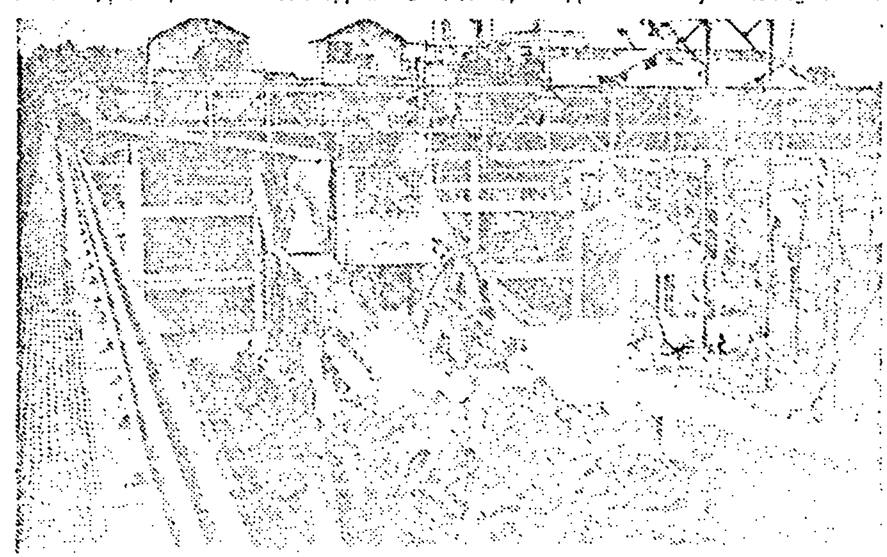
Common facilities — include the office, laboratory, shops, powerhouse, central loading and packaging facilities, and the railroad.

In secondary operations, rosin is processed into special grades; or it is limed, polymerized, hydrogenated, ammoniated, or esterified into chemicals having special properties for industrial uses. Pine oil is the source of anethole and other chemical materials which must meet rigid quality specifications. Turpentine is processed to yield pinene and synthetic pine oil. Dipentene

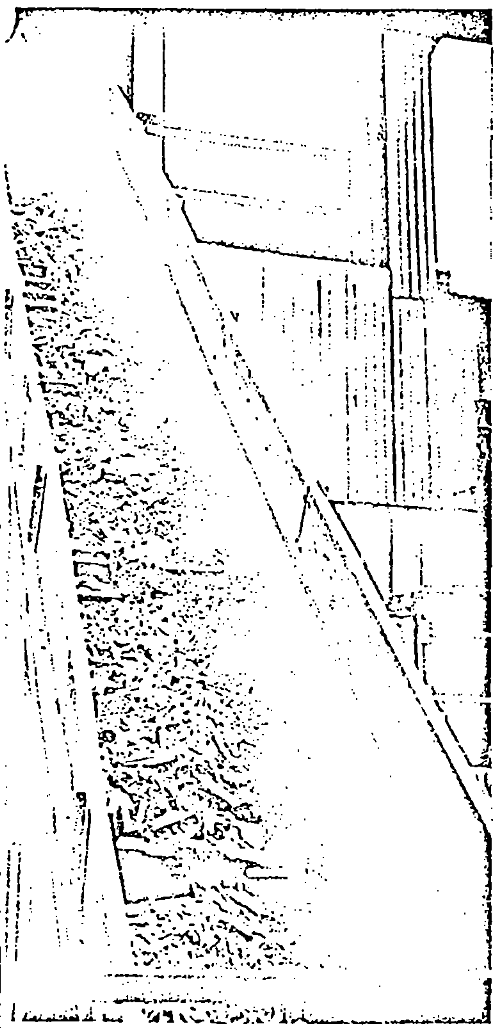


UNLOADING STUMPS from a gondola car to the wood storage pile is the job of this huge crane operated by Barney Sullivan. In addition to the stumps brought in by rail, some 300 tons are trucked in daily, five days a week, for the plant which operates 24 hours a day and to stock this over-size wood pile, covering about 80 acres and holding three to four months' supply.

THE STUMP PIT contains food for the hogs which are huge revolving Y-shaped spools covered with rows of heavy knives which tear the stumps apart. The pit, about a quarter full in this picture, holds 600 tons of wood. Here an operator, in the little house slung under the bridge of the crane, picks up a load to be dropped into the conveyor hopper on its way to the hogs above.



THE HOG has ground up the stumps into pieces about five to ten inches long. Here they are carried on the conveyor to the shredder house to be ground still finer. The shredders, a series of wheels with square-cornered hammers, pound and chip the wood.



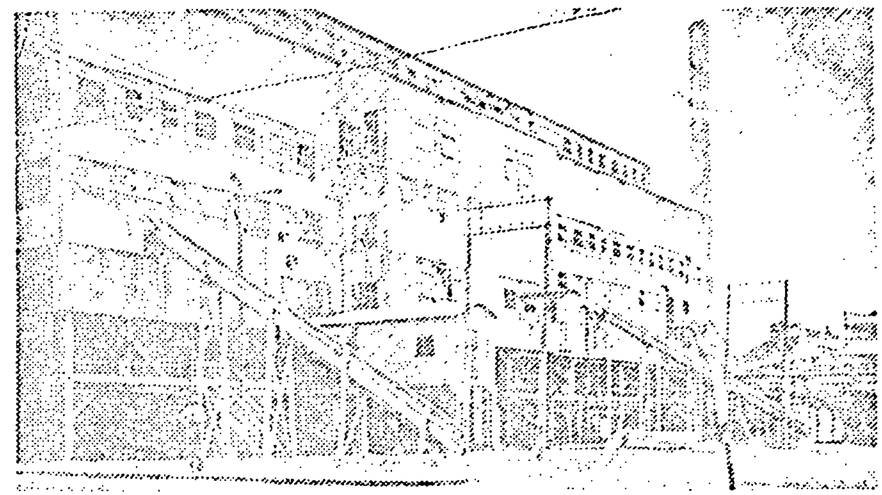
and Solvenol® are processed into para-cymene, para-menthane-hydroperoxide, para-cresol, acetone, and other high-quality products.

The plant operates twenty-four hours a day, with the exception of the railroad, millroom, and Truline® plant, which work sixteen hours a day; the mechanical department and shipping crews work eight hours a day, five days a week.

The cutting and slashing of the giant knives of the hogs and the shredders bring forth a stream of chips for the extractors and stills which remove the resins, separate the resins into many different products, and process them for the industries of the world.

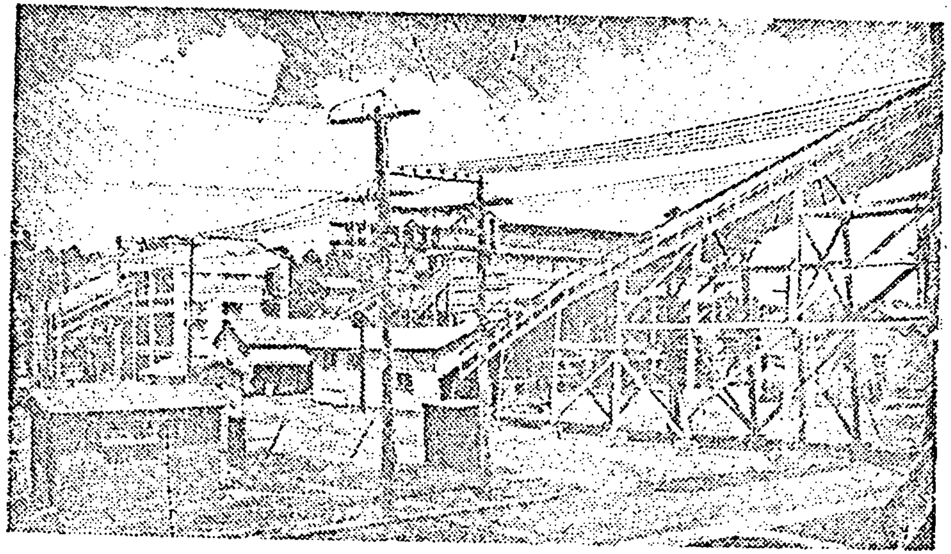
The fine chips go from the chip bin to the extractor house by conveyor. Inside this huge building sixteen steel tanks, each about the size of a farm silo, stand in a row. Into the extractors the conveyor belt dumps about half a carload of chips.

To dissolve the resins, the solvent enters the bottom of the tank and is pumped through the chips – to come off at the top and go on to the bottom of the next tank to repeat the process through ten extractors. The rest of the extractors are needed for solvent recovery, emptying, and refilling. Heat and pressure are used to extract the resin from the chips more thoroughly. The oily mixture of solvent and dissolved resin is drained off to be processed in the refinery. The solvent which remains in the chips is recovered for reuse in the process. Then the spent chips are removed from the extractor

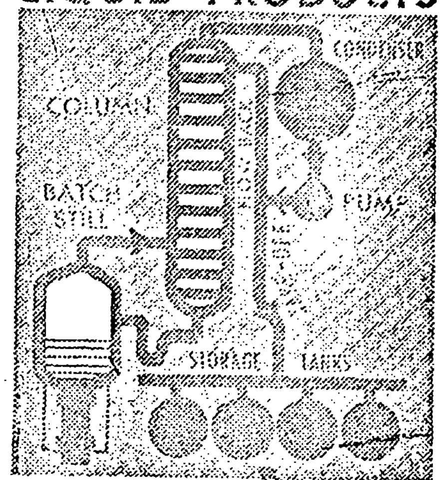


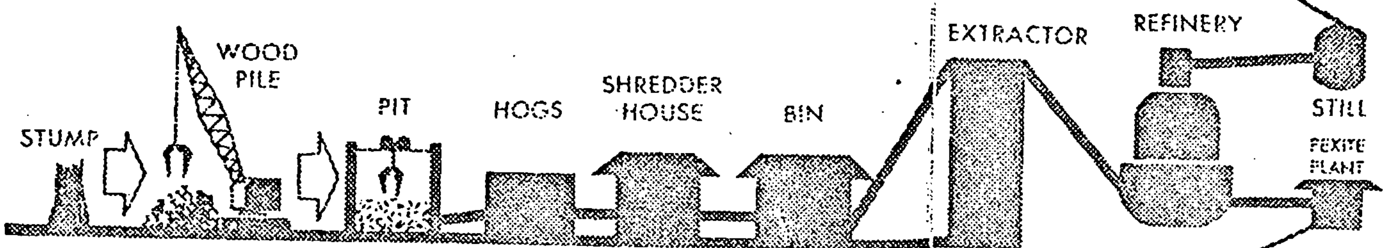
THE EXTRACTOR HOUSE contains a row of sixteen huge steel tanks, called extractors, each about as big as a good size farm silo.

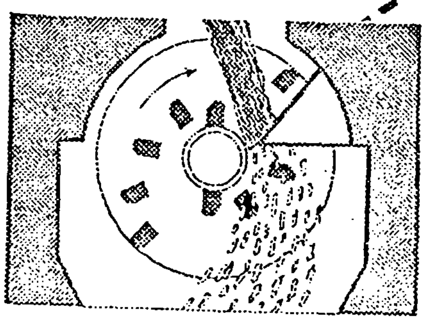
SPENT CHIPS, which have given up their resins in the extracting process, are raked out of the bottom of the extractor to go on their way by conveyor belt to a useful end as fuel for the plant's boilers. Hugh Moore, on the job here, and his fellow extractor pullers work at top speed like this for about an hour in order to empty the extractor. Then the puller has a well-earned rest period before unbolting the huge door of the next extractor.



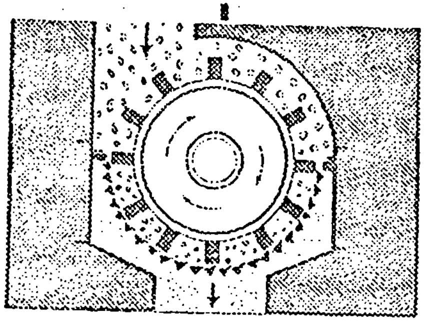
LIQUID PRODUCTS



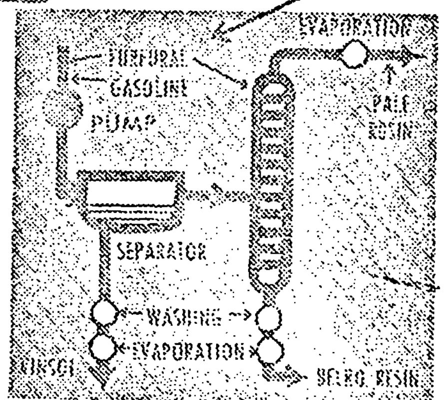




HOG



SHREDDER



ROSIN PRODUCTS

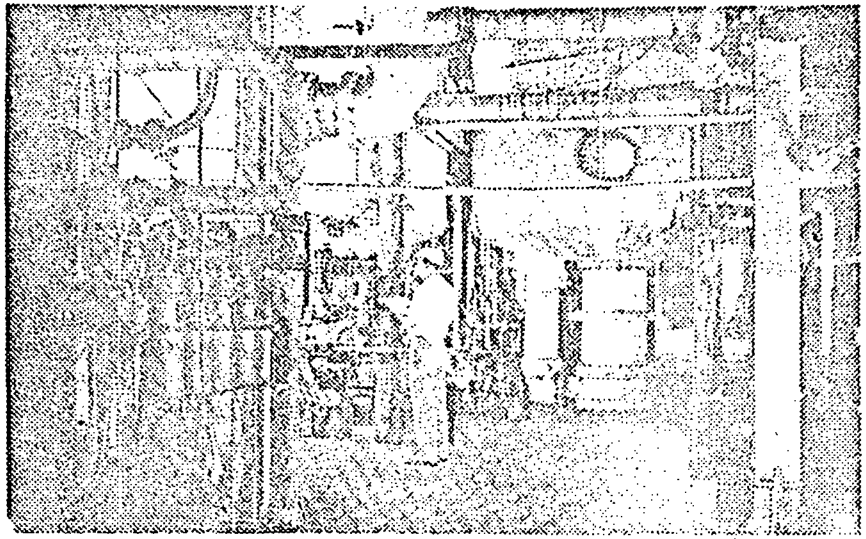
in order to make it ready to repeat the cycle.

In the refinery the solvent content and the turpentine and pine oil are removed by distillation in several evaporators, thus separating them from the crude rosin. This rosin goes to the Pexite plant, where it is refined. The turpentine and pine oil are sent into the stills for further separating ("fractionating" is the term chemists use).

A still is a piece of equipment widely used in chemical operations in which material is placed in a closed tank and heated to boiling. Then the hot vapors that rise are fractionated in a column to obtain a pure vapor, which is condensed into a liquid.

At the Hattiesburg plant and its sister plant at Brunswick, Georgia, are elaborate stills, which are tall towers with an inverted bottlelike tank at the base. The stills fractionate the liquid naval stores products into many different chemical materials, each having properties that fit them to do specific jobs as basic raw materials for industry. The refined liquid naval stores produced in these stills include: turpentine, alpha- and beta-pinene, monocyclic terpenes, pine oil, anethole, and other liquids.

The rosin from the evaporators is refined in the Pexite plant with furfural, a heavy liquid that smells like almonds and is obtained from oat hulls. The rosin, dissolved in gasoline, is washed with the furfural to remove the dark-colored portions, leaving a pale amber-colored rosin in the gasoline. After recovery of the gasoline,



IN THE REFINERY, W. S. Chambliss takes a reading at a distillation unit. Here the solvent and liquid naval stores products, which have been separated from the rosin, are fractionated to remove the solvent from the oils. Millions of dollars worth of equipment, know-how acquired by thirty-five years in the business, highly skilled workers, and constant laboratory check on quality and yield have gained Hercules a leading position in the naval stores industry.

the pale rosin is sold in drums and tank cars. Some of it is used in the plant to make other products like Poly-pale,® Staybelite,® and Resin 731.* The dark rosin is used to make Vinsol® and Truline® binder.

Today Hercules' naval stores products are many and varied, tailored to do specific jobs in hundreds of industries. These myriad products have been developed through the years by the ingenuity of chemists from three primary naval stores products – rosin, turpentine, and pine oil, which back in the early twenties were the only products of the industry.

Many skills and many tasks are needed to operate the Hercules naval stores plant at Hattiesburg. Yet this process could not stand by itself, and the operators alone could not make the plant run for long without the help of a large company of men and women who perform the plant services.

The service facilities, such as transportation by railroad and truck, the laboratory, and the office staff are all vital to the efficient operation of the Hattiesburg naval stores plant.

The office performs a variety of services for the plant. All payroll, accounting, purchasing, engineering, stenographic, and personnel work is carried on by eighty-four men and women in this group. They get the orders from our salesmen and pass them on to the plant so that the right products will be produced in the right quantities to fill our customers' demands.

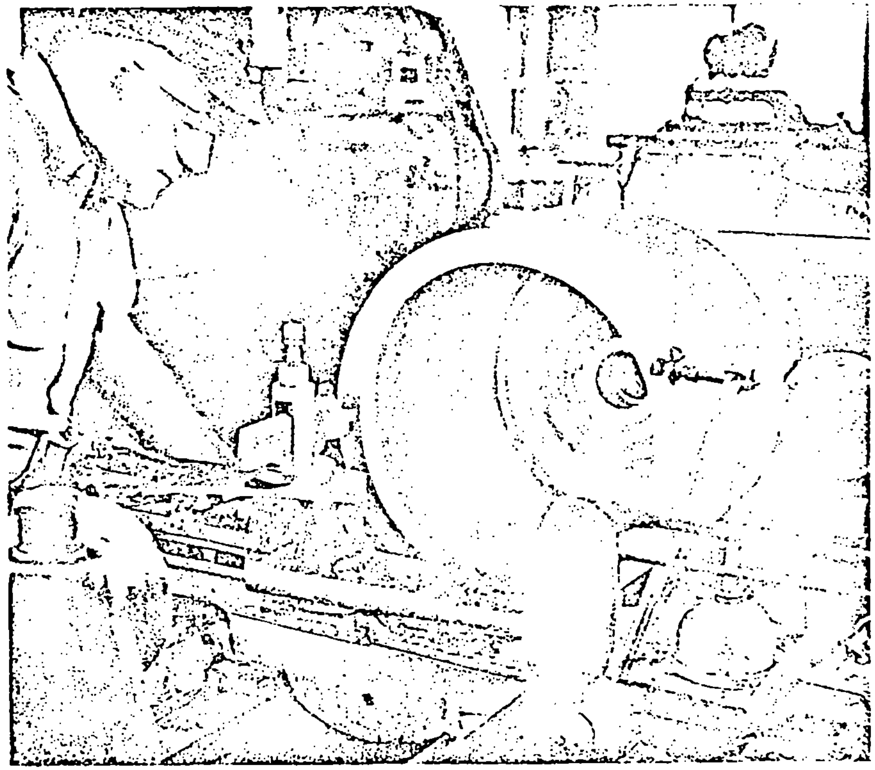
Safety is an important part of this staff's work. A safety committee which meets once a month, a roving safety committee which spots hazardous conditions in the plant and corrects them, and plant foremen who insist on safe methods for their crews all work with the Personnel and Safety Departments located in the plant office.

The machine shop and maintenance crew are the builders and troubleshooters of the plant. These 237 men – carpenters, pipefitters, pipe insulators, electricians, painters, welders, foundrymen, and other skilled workers – build and equip new buildings. They either make the equipment that goes inside or install tanks and reactors that we buy to equip the plant.

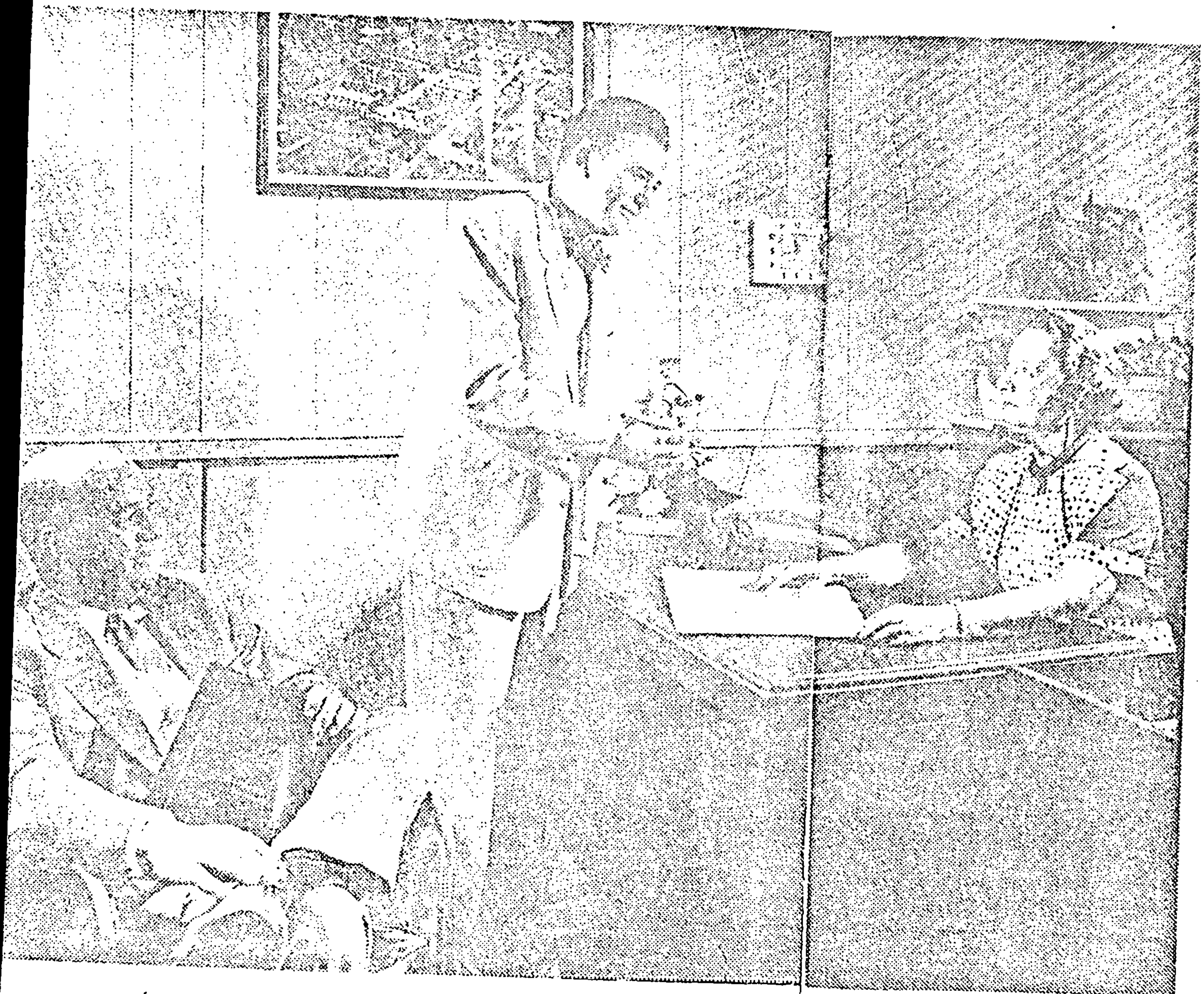
When something springs a leak or a pump won't work, it is a maintenance man who puts it back in shape again.

Another specialized group that helps

*Hercules Trademark



IN THE MACHINE SHOP, Dan Blocker faces off the end of a casting for the overhead crane, which lifts the stump wood onto the conveyor to the hog.



to run the plant is the laboratory. These eighty-nine men and women are the checkers for the operators; they tell the plant men how they are doing. They analyze chemical materials we buy to make sure that they are what we want, and they analyze all finished products to make certain that the quality is up to the standards we guarantee our customers.

Chemical research is carried on to see if better ways of making our products can be found, or if new products can be made from the resins or oils.

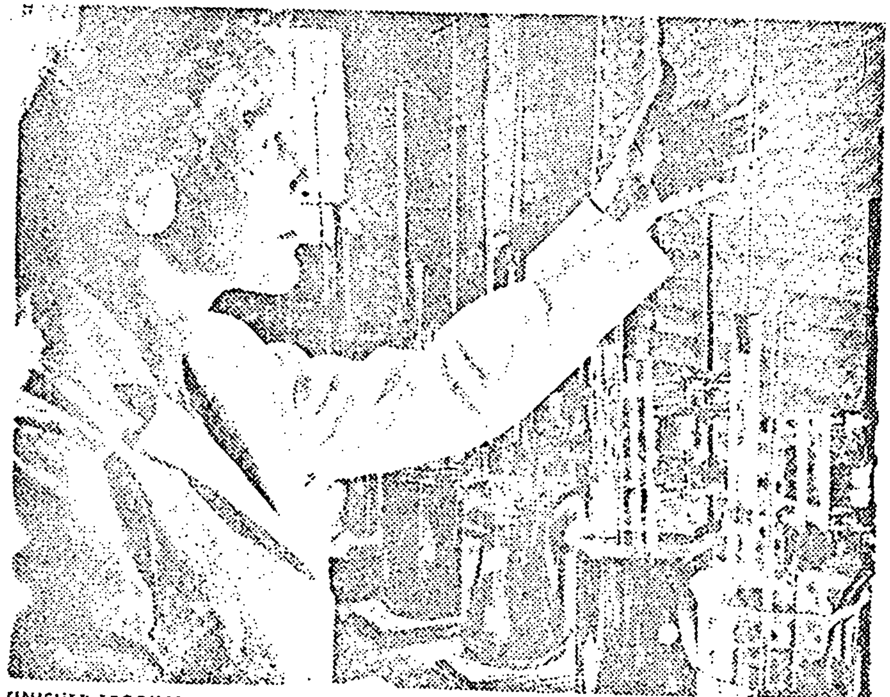
The three pilot plants at Hattiesburg are run by the laboratory. One is a hydrogenation high pressure plant; another is a pilot plant for Dresinate,® operated for the Paper Makers Chemical Department; and a third is kept busy on various sorts of research work.

A small railroad with a diesel locomotive and two smaller engines is used to shift nearly a thousand cars from place to place within the plant every month. Almost as many highway trucks enter and leave the plant. Cars and trucks haul stump wood into the plant; and finished drums of rosin, turpentine, and other products start out on their way to the customers.

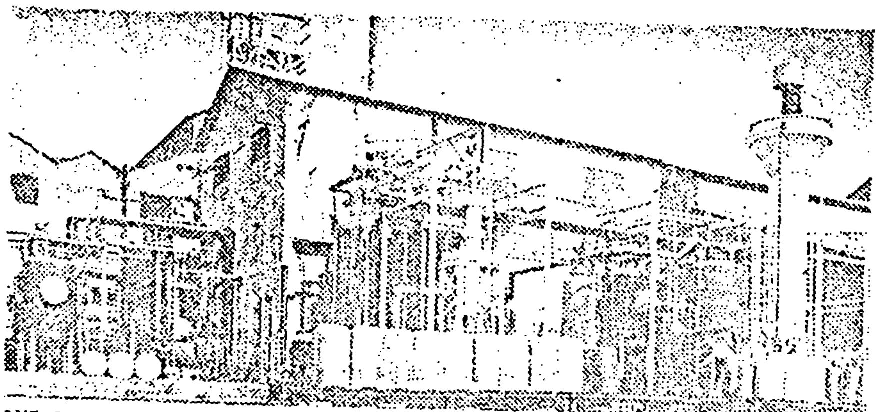
Four of the yard trucks are equipped with two-way radio, so that they can be dispatched to any point and directed about the plant.

The Hercules Hattiesburg plant is

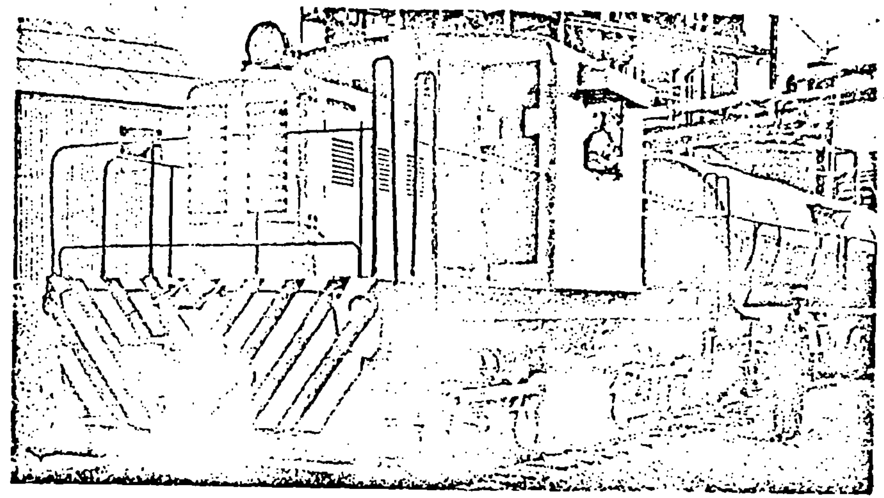
RECEPTIONIST AND TELEPHONE OPERATOR Mattie J. Odom welcomes plant visitors W. R. Shannon and A. H. Gallagher of the General Electric Company.



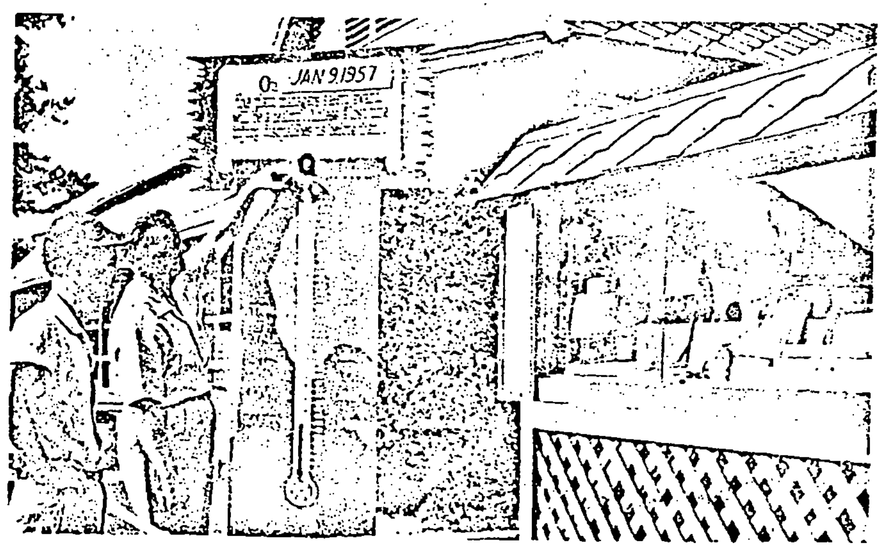
FINISHED PRODUCTS are analyzed in the laboratory. Here Katheryn N. McNease, analyst, uses the thermometer drop method to determine the softening point of rosin. The temperature at which rosin begins to soften is important to users of our products.



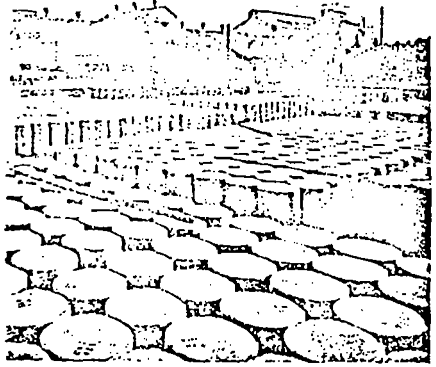
ONE OF THE PILOT PLANTS operated by the Lab to produce PMC rubber chemicals. Charles Walters is shown drawing off a sample of Dresinate.®



THE BIGGEST LOCOMOTIVE on the plant's railroad is this diesel. Here, D. H. Widdon, engineer, as he takes out a string of tank cars pauses to talk with Earlie Hudnall, signalman. Two other locomotives are "fireless cookers" — they get a charge of steam from the powerhouse which keeps them running for about a half day.



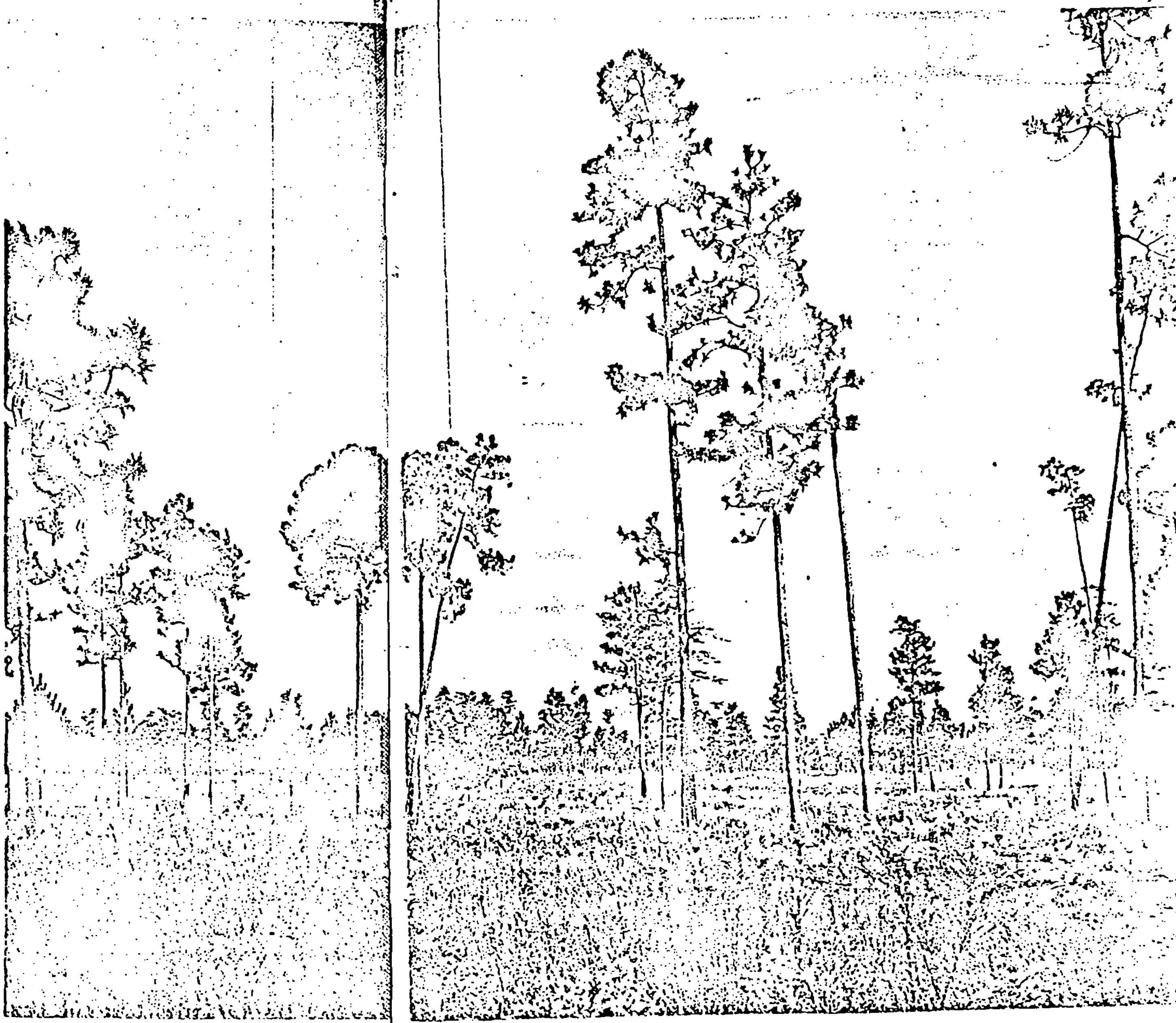
SAFETY THERMOMETER shows how long the plant has gone without a lost-time accident. Each employe has a choice of plant manager's prizes, shown in the window, after 270 accident-free days. E. L. Summers, safety supervisor, puts some red ink in the thermometer to mark another week without an accident. Lawrence O'Flynn, concrete finisher, looks at the prizes.



DRUMS OF ROSIN, made by the magic of chemistry from the resins in stump wood, are ready for shipment to naval stores customers in many industries all over the world.

one of the company's two naval stores plants in southeastern United States; a sister plant is located at Brunswick, Georgia. A Paper Makers Chemical Department plant at Savannah, Georgia, produces paper size and other paper chemicals, tall oil rosin, and tall oil fatty acids. At Bessemer, Alabama, Hercules makes dynamite and acid. Sales offices are located in the South at Atlanta, Georgia; Beaumont, Texas; Birmingham, Alabama; Brownsville, Dallas, and Houston, Texas; Greenville, Mississippi; New Orleans, Louisiana; and Raleigh, North Carolina. A map on the back cover shows the location of all Hercules plants and offices in the United States.

STUMPING OPERATIONS carried on throughout the South yield land values as well as naval stores chemicals. This typical field of stumps is of little value for forestry or agriculture. Stump-gathering operations will clear the land, churn the soil, and leave it suitable for crops, cattle grazing, or much more productive second-growth timber.



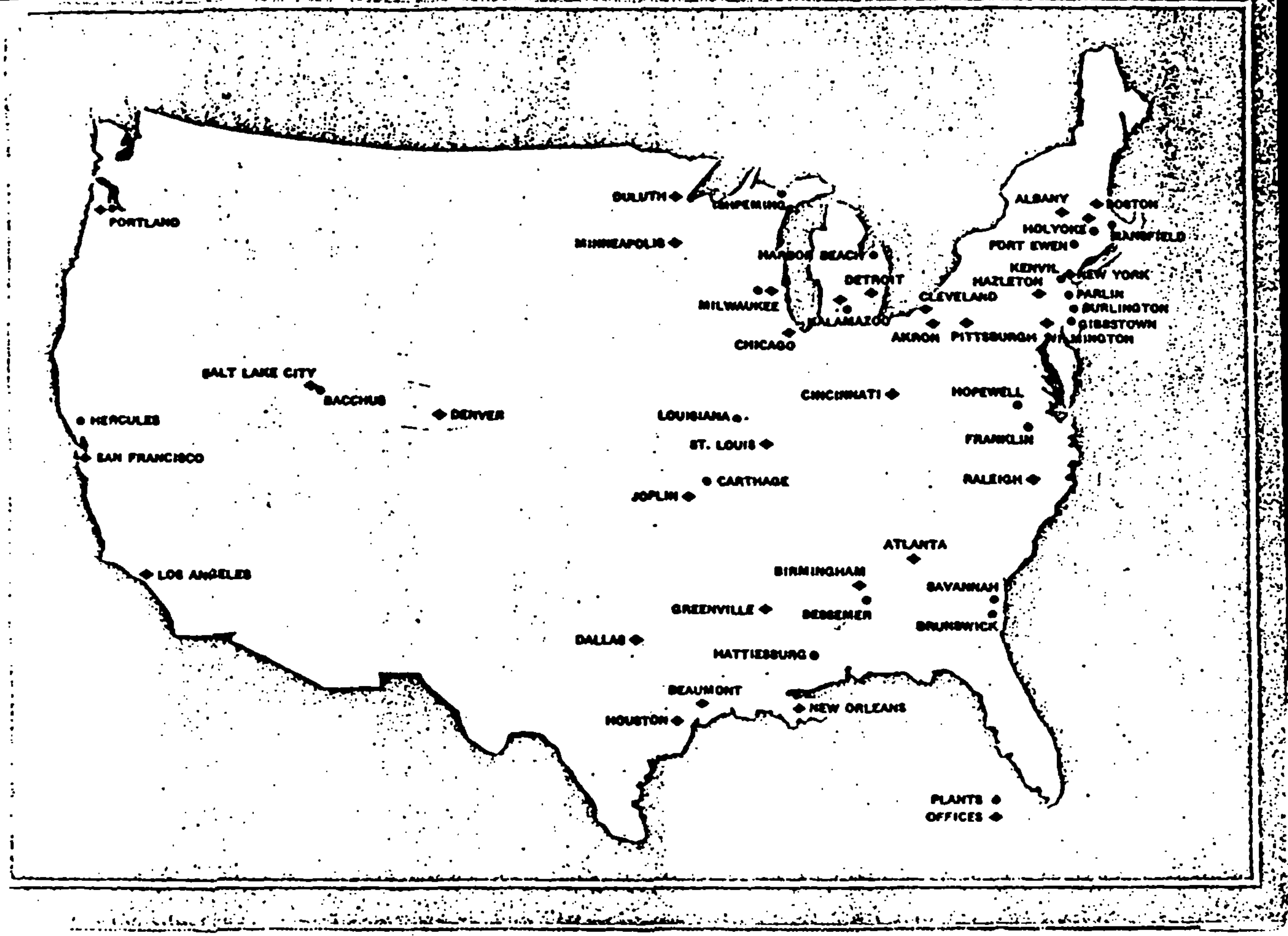
The products derived from the crude extract obtained from the pine stump flow out into a diverse tree of chemicals almost as wondrous as the pine which once grew where the stump was found. The oily crude extract is separated into the three primary products: rosin, turpentine, and pine oil, plus several miscellaneous chemicals. From these, an array of esters, resins, and other specialized chemicals are produced by the plant to meet more precisely the needs of Hercules customers, most of whom are manufacturers of a wealth of consumer products.

The chart below shows: (1) the primary products coming from the crude extract, (2) the products derived from them by Hercules, and (3) the end uses for which the customer buys our products.

1 Primary Products	2 Derivatives	3 Customers' Applications of Hercules Products
Rosin		protective coatings; paint; varnish; floor coverings; linoleum; soap; rubber
	Poly-pale Resin	ink; protective coatings; floor coverings; rubber; adhesives
	Staybelite Resin	rubber; adhesives; paper size
	Resin 731 and Dresinates	emulsifiers for synthetic rubber polymerization
	Dymerex Resin	ink; protective coatings; adhesives; shoe soles
	Resin 861	rubber; soap; adhesives
	Rosin Amines and Derivatives	corrosion inhibitors; flotation reagents; water conditioners; wood preservatives; wetting agents; algicides
	Rosin Esters:	
	Pentalyn Resins	paint; varnish; traffic paint; printing ink; adhesives
	Cellolyn Resins	lacquers
	Staybelite Ester Resins	chewing gum; adhesives; food packaging

1 Primary Products	2 Derivatives	3 Customers' Applications of Hercules Products
Rosin	Rosin Esters:	
	Poly-pale Ester	varnishes; adhesives
	Dymerex Resin Esters	printing inks
	Vinsol Ester Gum	floor tile
	Rosin Size	paper
Vinsol Resins		phonograph records; Portland cement; floor coverings; adhesives; asphalt; foundry; plastics; wallboard
Turpentine		paint thinners and solvents; textile printing and dyeing
	alpha-Pinene	oil additives; synthetic camphor; insecticides
Pine Oil		flotation of ores; disinfectants; cleaners and polishes; textile wetting, cleaning, and scouring agents; paint; varnish
Solvenol and Dipentene		paint and varnish; rubber reclaiming; lubricating oil additives
*Miscellaneous Products:		
	Technical Anethole	licorice flavoring
	Terpin Hydrate	cough syrups
	Terpineol 318	odorant in soap and perfumes; disinfectants
	para-Menthane Hydroperoxide	catalyst for synthetic rubber
para-Cymene		heat-exchange medium
	para-Cresol	anisaldehyde for synthetic hormones and dyes
Metalyn (Methyl Ester of Tall Oil)		petroleum oil additives; plasticizers for resins

*Most of these products are in the technical form, and some are further purified or compounded before being used in food and drugs.


PORTLAND
HERCULES
SAN FRANCISCO
LOS ANGELES
SALT LAKE CITY
BACCHUS
DENVER
DULUTH
MINNEAPOLIS
MILWAUKEE
CHICAGO
HARBOR BEACH
DETROIT
KALAMAZOO
CLEVELAND
AKRON
PITTSBURGH
ALBANY
BOSTON
HOLYOKE
PORT EWEN
KENVIL
HAZLETON
NEW YORK
PARLIN
BURLINGTON
GIBBSTOWN
CINCINNATI
HOPEWELL
FRANKLIN
RALEIGH
LOUISIANA
ST. LOUIS
CARTHAGE
JOPLIN
ATLANTA
BIRMINGHAM
BESSEMER
SAVANNAH
BRUNSWICK
GREENVILLE
DALLAS
HATTIESBURG
BEAUMONT
NEW ORLEANS
HOUSTON
PLANTS
OFFICES

B&V WASTE SCIENCE AND TECHNOLOGY CORP.

Reference 5

TELEPHONE MEMORANDUM

US EPA -- Region IV
Hercules, Inc.
General Site Information

BVWST Project 52011.040
BVWST File
November 2, 1992
15:20

To: Charles Jordan, Environmental Supervisor
Company: Hercules, Inc.
Phone No.: (601) 545-3450

Recorded by: Carter Helm

To fill in same data gaps, Mr. Jordan provided the following information:

- The entire 200-acre facility lies within the 500-year floodplain -- according to the Engineering Department's reference from the Corps of Engineers Map No. 28035C0045C Panel 45 of 200 dated April 2, 1990.

- Currently, Hercules employs 290 people including the clerical staff.

- Operations began in 1923, over 250 products are manufactured.

- The Hercules surface water intake on the Bowie River is used for industrial purposes only.

- Zeon Chemicals of Mississippi, located at 1301 West 7th, is located on land which was originally Hercules property, but this parcel of land was first purchased from Hercules by B. F. Goodrich, who then sold or leased it to Zeon. See Figure 2.

Information about the holding ponds (surface impoundments) located in the back forty, as offered by Mr. Jordan include:

- Three "ponds" are located north of the dirt road and share common dike walls. Their sizes and depths are similar.

- One large "pond" plus two smaller "ponds" exist south of the dirt road. Previously, common dike walls have collapsed and yield a large, but still contained, surface impoundment. Dike walls are four to five feet tall.

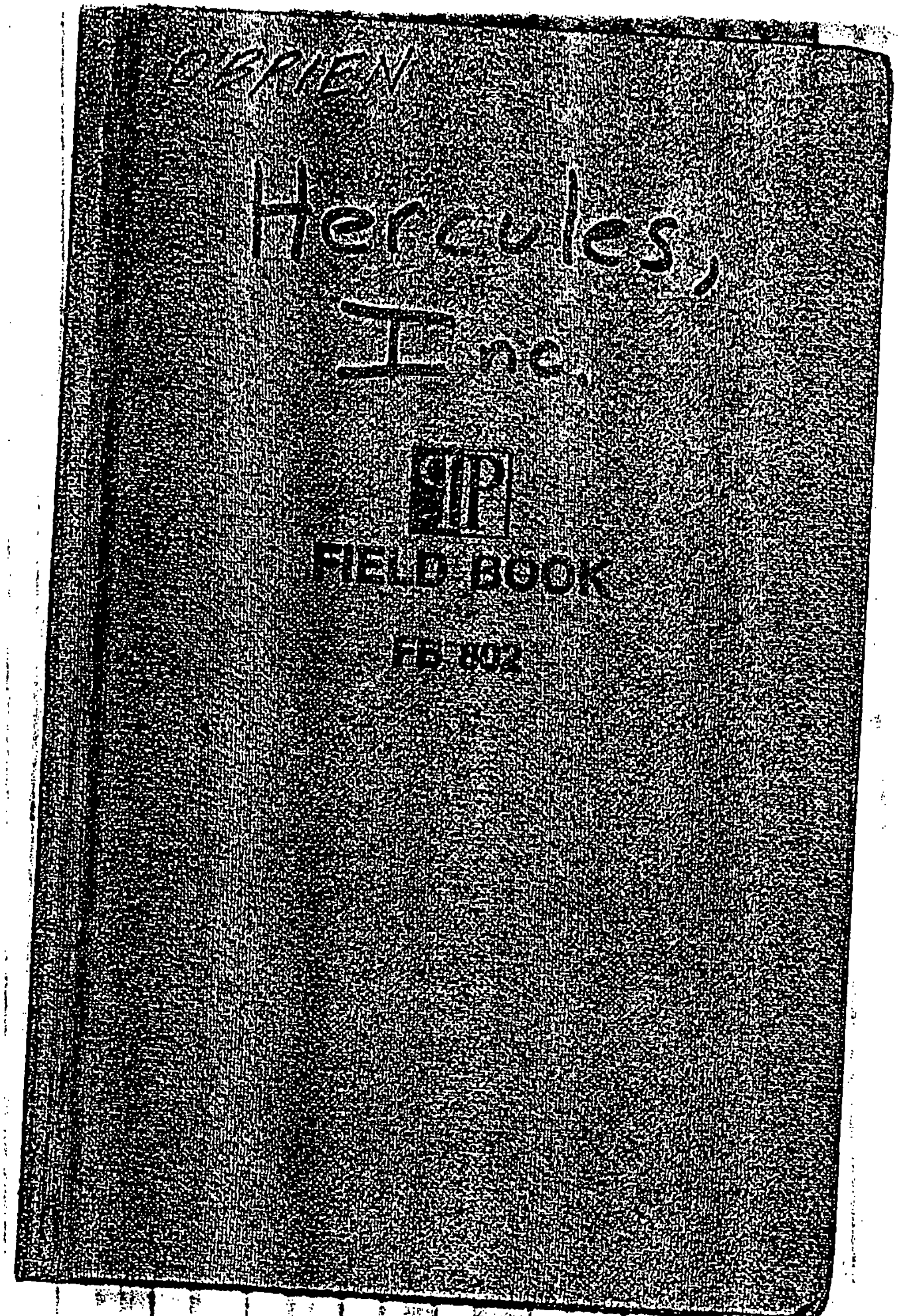
- All impoundment material is of the same composition, but deposition times are all different.

- Using four feet as an average depth, maximum volume of the impoundments is one million cubic feet.

- Mr. Jordan will fax me exact dimensions of these surface impoundments tomorrow.

ms

Reference 6



CONTENTS

PAGE NO.	REFERENCE	DATE

HERCULES, INC. ①

6-1-92 HATTIESBURG

0730 Arrive at BVWST office
pick up copies of aerial photos.
0750 Leave office for Airport.
0950 Board plane
1015 (CENTRAL) Arrive New Orleans
1251 Arrive at Hercules Inc in
Hattiesburg, Miss.
1300 Meet Charles Jordan
and go get a drink (soda)
1330 Meet Jim Hardage

1340 Begin touring Back Forty
- Sludge Pits - Unlined
- Waste piles all through Back 40 comprised of metals and drums, wood scraps and old equipment.
- Look at Green's creek no discloration noted.

1430 Go back to Charles

(2)

Jordan's office and discuss our sampling plan and geophysics survey. Jim Hardage brings up two areas of concern. Both areas reported to (MEQ). Charles said he was ~~was~~ aware of the areas. Jim will provide BVWST with copies of his maps.

1510 Go to view these two areas. One area on north appears ok, but mounded possible drum burial. The second on the west side can not be accessed easily but will be during investigation.

1630 Jim Hardage leaves as does Charles Jordan and Nikki Carlson. JBO will meet Jim Hardage in Jackson to look over files.

6-2-92 (3)

0600 Leave Hattiesburg for Jackson
0730 Arrive Jackson. Have breakfast
0800 Arrive at Mississippi State Department of Environmental Quality

(4) CMT 6-21-92

Sunday

weather: Sunny, 80°

12:00 ~~Stopped~~ by BVWST Office for field supplies & to copy sampling field sheets for Hercules, Inc.

1400 Depart office for Hattiesburg, MS Holiday Inn

EST → CST time zone change

21:15 Arrive at Holiday Inn

6-22-92 (5) CMT

HERCULES

Hercules Incorporated
P. O. Box 1937
Hattiesburg, MS 39401
(601) 545-3450

Charles S. Jordan
Environmental Supervisor

0740 Meet with Charles Jordan to discuss the week's events

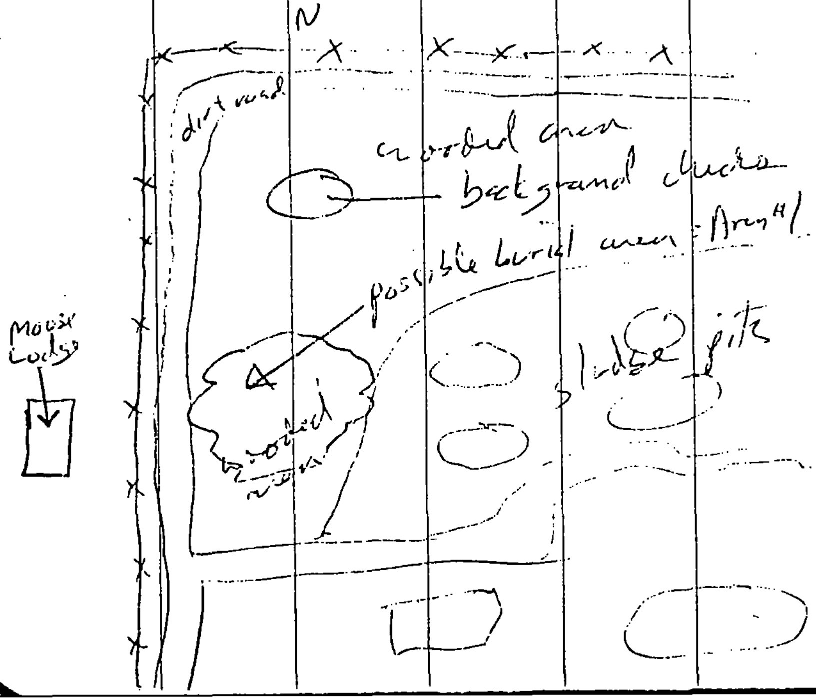
He showed us aerial maps of site circa 1980

location error on the FSP site layout + sampling maps: sludge pits are located at top △≈△ - above Greens Creek plus Xeon Chemical Co. has purchased land from Hercules, Inc. SW corner of site. New site layout maps will indicate this portion.

8

6-22-92

Background location ~ 30 ft South of fence in a wooded area that appears undisturbed by any prior activity



6-22-92

9

13:30 to 14:00 Lunch break

Mr. Jas Poole will replace Mr. Knight at 2:30 every day, however (14:30) he will be busy to be with us constantly

16:00 Spot checks indicate higher anomalies near the Moose Lodge - otherwise all other areas show background ± 70 gammas

We have found & delineated Area # 1 of Geophysical Grid

(12) C/

6-23-92

D. Brown & D. Smith
+ Brown & myself set up
grid stations (10 ft x 10 ft
wooden stakes at base line
wire flags at all other
stations = all flags labelled
(x, y) coordinate points

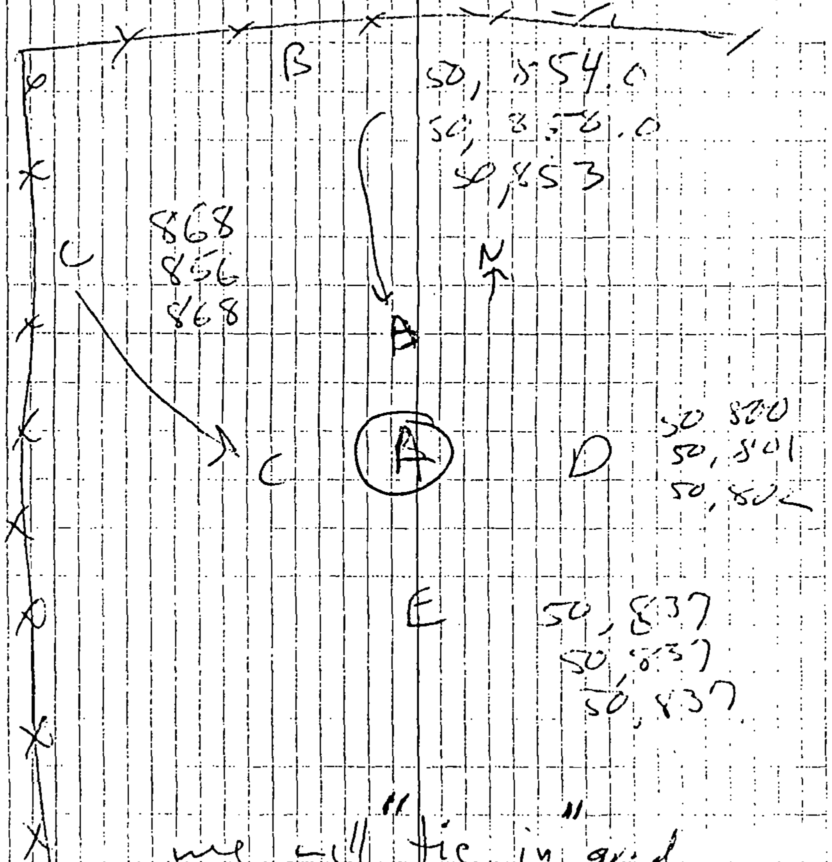
10:40 Low on wire flags
so I depart site for
Lowes to purchase more

11:40 Return - crew just finishing
the grid layout
& instruct Brown & Smith
on use of Mag G-856.

6-23-92 (13) C/

12:10 Same background area A : 50,836.6
50,833.8
50,843.0

93 G 22392



we will tie in grid at end of field sampling.

(14) CJH 6-23-92

12:20 Smith & Brown start
w/ G-856 at (0,0)

Helm & Jones start
at (0,7) with EM-31

we will not take readings
close to each other for fear
of interferences.

Please see
EM Field Data sheets
+
Mag Field Data sheets

Note Talked to neighbor, Mo Booth
he said retired employees live near
him that might help us locate
former burial pits
- Murphy Payton
& - C.L. Rankin

6-23-92 (15) CJH

13:30 Lunch break

14:30 back on site - area #1

15:40 All data collected
at area #1, we take
our instruments to suspected
Landfill near E-O tank

Spot checks indicate high
anomalies on hill of stressed
vegetation. This will be Area #2

16:00 Base Lines marked off
w/ wooden stakes

25 X 25 foot spacings

(16) CJH 6-23-92

Total grid size:
175 X 250 feet.

Again - Jones/Helm run EM-31

Smith/Brown operating G-856

see EM Grid sheets
" MAG " "

for data.

18:15 Both teams finish up w/ data collection

6-23-92 (17) CJH

18:30 Talked to Mr. Poole about today's activities & what to expect tomorrow. - I told him sampling will start early tomorrow

wrap up Recon

19:00 Depart site

19:05 Drive around site to speak to former employees of Hercules.
Go to Nixon Street - behind moose Lodge.
C. L. Rankin Not home

(18) CJH 6-23-92

19:20 talked to Murphy Payton

5828 Mixon Street, he used to operate heavy machinery that dug & buried empty drums plus some non-toxic full drum at bottoms of many pits - including the pine stump storage area. He states that fly ash was used to cover up burial pits - he said all haz waste was transported off site.

20:00 Brian & I shift data input into Surfer program for both Areas

Area 1
Em "Hot areas" (3,3), (7,7), (5,3), (6,2), (7,3) (6,4)
Mag "Hot areas" (6,2) (6,3) (6,4) (7,4)

Area 2
Em "Hot areas" (1,3) (1,4) (1,5) (3,4) (3,2)
Mag "Hot areas" (1,3) (1,4) (3,6)

22:30 GO To Bed

6-24-92 (19) CJH

6:40 Arrive on site

6:45 set up Recon & paperwork table

7:25 collect TB-01

8:00 Brian Calibrates OVA

Rest load equipment ~~on dooley~~ for next stop background location.

we will go south across the street from the gate house. This is the up gradient area.

20 CW 6-24-92

I explain paperwork procedures to crew especially David Brown. He is the designated paperwork person but everyone will help.

Bonner Labs employee, Jim Powers joins us to split samples - he has his own vehicle

08:40 I calibrate pH, conductivity temp meter

6-24-92 CW 21

0850 Permission granted from 906 Seventh St (Short Columbia St.) Mrs. Sadie B. Smith 601-583-4487

0855 Collected SS-01 - 6 inches bls back property

0905 - Silt, Clayey Sand soil is coming out of background. By the time we reached 4' we encounter Clay

0920 No OVA reading at 5' bls <1 ppm

0925 Hit saturated zone at 7' bls, Fine sand, white, tan

0925 Collected SB-01 OVA <1 ppm

(22) CJH 6-24-92

9:45 at 8 feet bls
we notice borehole
collapse occurring

due to plenty of groundwater
in hole so we
install 1 foot point,
3 foot screen
5 foot casing - all
stainless steel.

Set up peristaltic
pump & wait for recharge

10:00 Problem with pump
- a breach in the
tubing within pump head

6-24-92 (23) CJH
Mr Bonner (PRP Lab)
plus
Mr. Jordan arrive
at background locale

Mr. Bonner offers
a "pump head" to use
from his Lab - I said
"OK" - so he radioed
for one.

10:25 Bonner Lab
employee arrives with
new equipment -
we install it

10:30 We now set G-4
to pump out - problem
solved

24

6-24-92

10:33

		pH	conductivity	temp
10:37	1)	5.87	256	87.8
10:40	2)	5.83	254	88.2
10:45	3)	5.81	254	89.2

10:45 Collect TW-01

slow recharge

11:30 I drive back with samples already taken

Dave Brown is paperwork person,

Other crew is still collecting TW-01

6-24-92 25

1:30 (13:30) called office

Jim OB - is gone

Talked to Joe about Labs

organ: Comp Chem Lab

inorgan: AATS Lab

Talked to Bryan Williams,

he says don't do Temporary wells cause there are no targets - he said do onsite wells & check to see if City

26 CJH

6-24-92

of Hattiesburg Municipal wells (600 to 750 feet deep) use the same aquifer. They drink.

Talked to Hyponex's Katherine Sides / Belinda Brock

They said go ahead and collect at least one temporary well sample plus collect from this site's monitoring wells.

14:30 Scouted out the Greens Creek for best sample location

Cut a path through brush to access creek at point of entry onto site

6-24-92

27 CJH

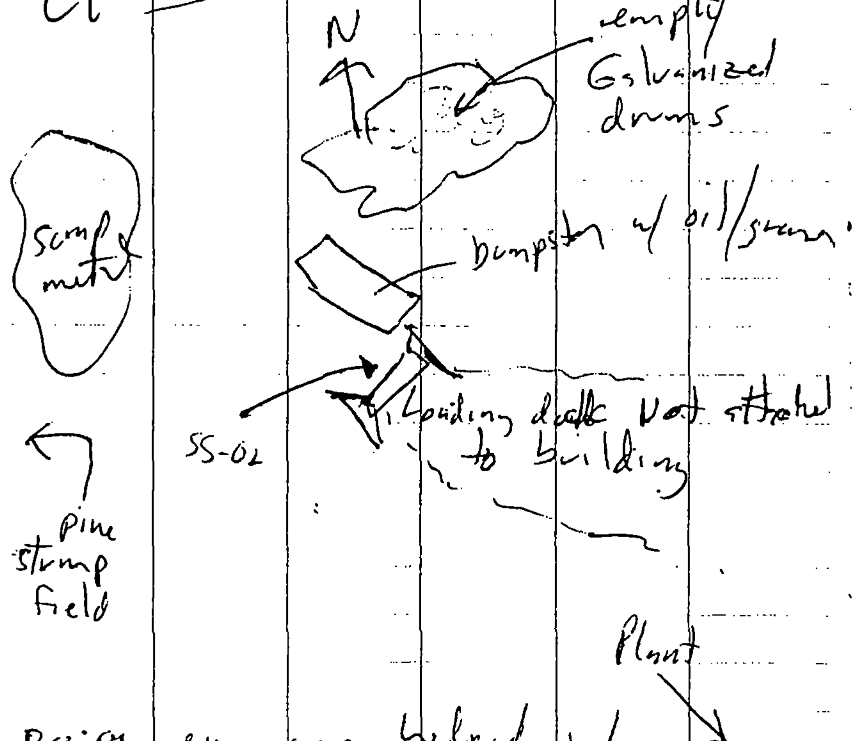
16:10 collected SW-01 * matrix Duplicate

16:20 parameters { Temp 96 °F, Cond " 82 x100 = 82, pH " 7.91 } slow

16:40 collected SD-01 matrix Dup.

also at creek's entry onto site property - crew noticed an oily slick sheen on water (non-site related) but otherwise "clean" ...

(32) CM — 6-24-92 Green's Creek



20:00 everyone helped w/ paperwork & sample prep.

20:45 Depart Site

6-25-92 (33) CM

0630 Arrive on site

Blanks & Spikes are with us - David Starts to prepare them to ship

OVA calibrated by Brian

We prepare for sample set #3

weather: 100°F 100% humidity no wind - muggy

7:15 In stump field for SS-03, SB-03, TW-03

near stained soil, tar spots

34 C1W 6-25-92

7:25 SS-03 collected
OVA <1 ppm
at 6 inches bls

7:45 ~~CH off~~ ~~off~~ Refusal w/ hard surface

7:55 ~~offset~~ Refusal

8:05 offset/Refusal

Too many stumps and scrap metal, Therefore No SB-04, nor TW-04 will be collected here.

6-25-92 35 C1W

8:15 OVA out of H_2

8:22 Calibrate HNu
10.2 ev probe
span = 9.8

8:20 At Area #2
(1,3) (1,4)
areas of high anomalies

6in bls - SS-04
8:45 SS-04 collected
HNu <1 ppm

9:00 1 ft bls
HNu = 55 ppm
w/ background = 10 ppm
in borehole

4 offsets - No luck - roots garbage

SB-04, TW-04
will not be collected

0945 At Area # 1

(G, 4) (G, 7) are
high anomalous areas
/ concerned and sample area
for SS-05.

0945 SS05 by Moose Lodge - 5' bls
0955 H1-SB-05 by Moose Lodge at
3ft bls

See cond/temp/pH on pg 39
10:40 Peristaltic pump in use

10:50 collect VOA's at 5' bls

38 CHW

6-25-92

11:40 All VOA's filled
but recharge is slow

Charles Jordan drops by
also Scott Wigley
of Bonner Labs, Scott
has brought a pulley device
That will aid in making
well purging (3 volumes)
B-1 well is next.

6-25-92

39 CHW

TW-05 Field Data

pH	cond.	temp
7.58	397	82.7
7.56	388	83.8
7.42	392	83.9

PHONE (601) 264-2854

BATCO

Scott Wigley

BONNER ANALYTICAL TESTING COMPANY

AIR, WATER, PETROLEUM,
AND HAZARDOUS WASTE

JOE C. POWERS
Analytical Reagents

668 Weathersby
~~ROUTE 14, BOX 509~~
HATTIESBURG, MS 39402

(40) CJW

6-25-92

12:00 I leave Brian Jones & Joe Powers at TW-05 to continue to collect GW samples

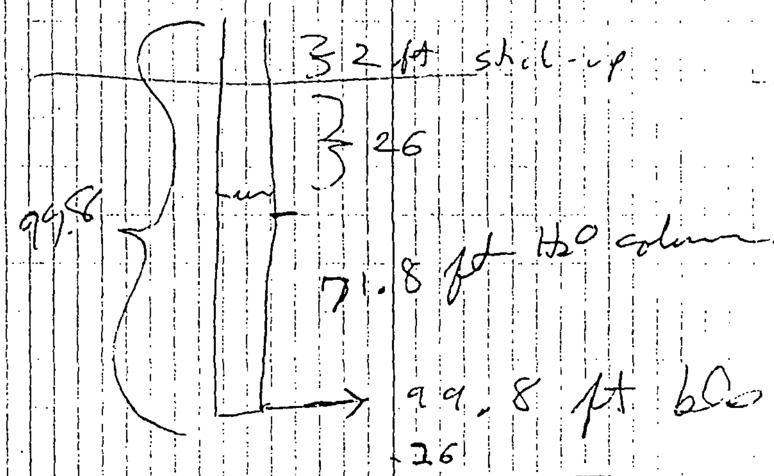
I return samples to paperwork trailer and grab water level indicator & mobilize to MW-B1

6-25-92

(41) CJW

12:10 at Permanent well B1

TO top of casing (2 ft)



11.75 gallons = 1 well volume

35.25 gallons = 3 well volumes

(42) CJW 6-25-12

I depart B-1 and let D. Smith & Scott Wiggins to continue bailing -

I check out drainage ditches on east side of plant.

12:35 One well volume purged (initial/base reading)

pH 7.33

cond 241

temp 81.0° F

6-25-12 (43) CJW

2 Volume Purged 12:40

Temp 79.7

PH 7.28

Cond 242

3 Volumes Purged 12:55

Temp 81.5

PH 7.02

Cond 259

4 volumes Purged 1:10 (13:10)

Temp 84.1

PH 6.88

Cond 268

(44) CP

6-25-92

12:45 Joe Powers & I scout out location for a soil or sediment sample on East Side of Plant. Near the Paracel Process Area is stagnet drainage ditch with brown/tan water w/ thin, hard coating. We sample here.

OVA/HNu indicates <1 ppm.

6-25-92

(45) CP

Drainage ditch

SD-04-e4

12:45 collection time

HI-B-1
collection at 13:30

13:30 all volumes collected for HI-mw-B1

(48) C 6-25-92

15:30 Return to decon
sampling is complete

all help to ship samples

1600 Brian delivers
Receipt for sample
to Sadie Smith
(Background location)

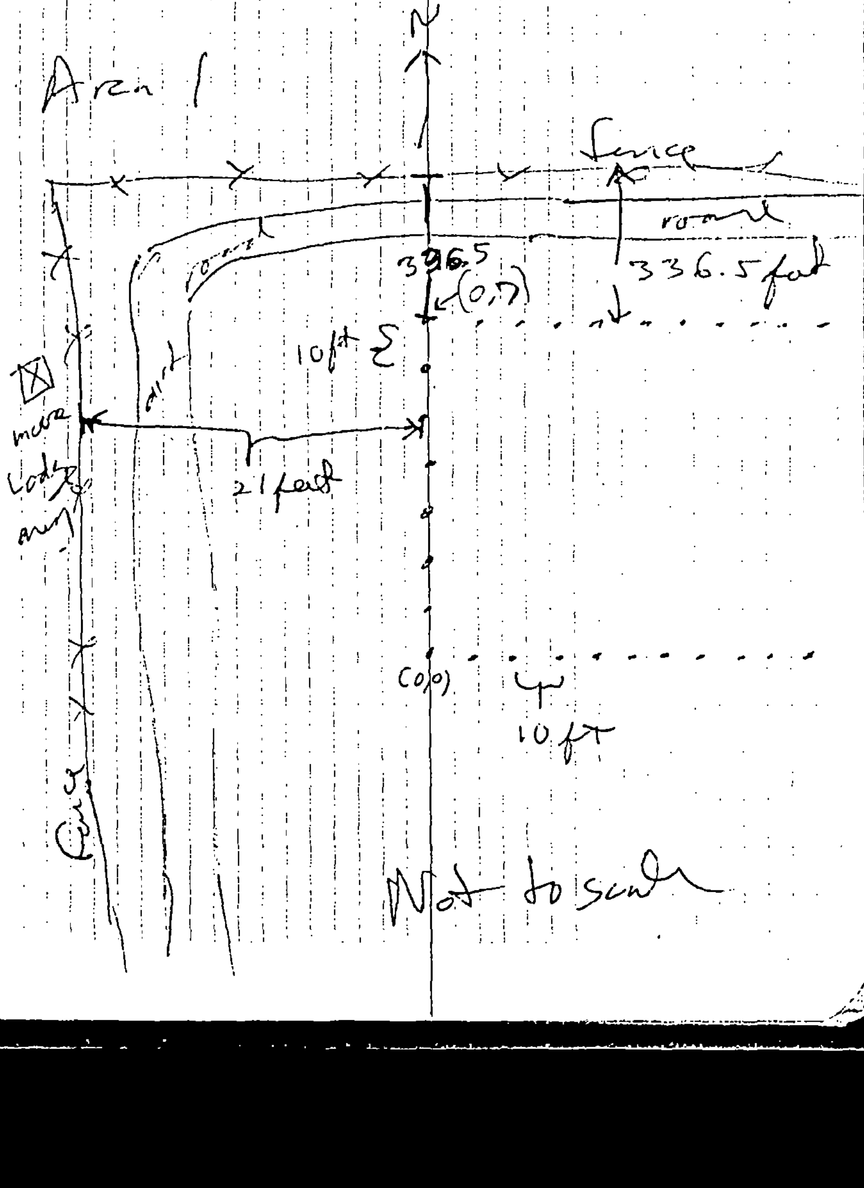
Joe Powers signs
his receipt for samples
(split samples).

1700 Brian + I measure out
the geophysical grids
for reproducibility.

6-25-92 (49) C

Note: Reproducibility
of Geophysical Area
Grids:

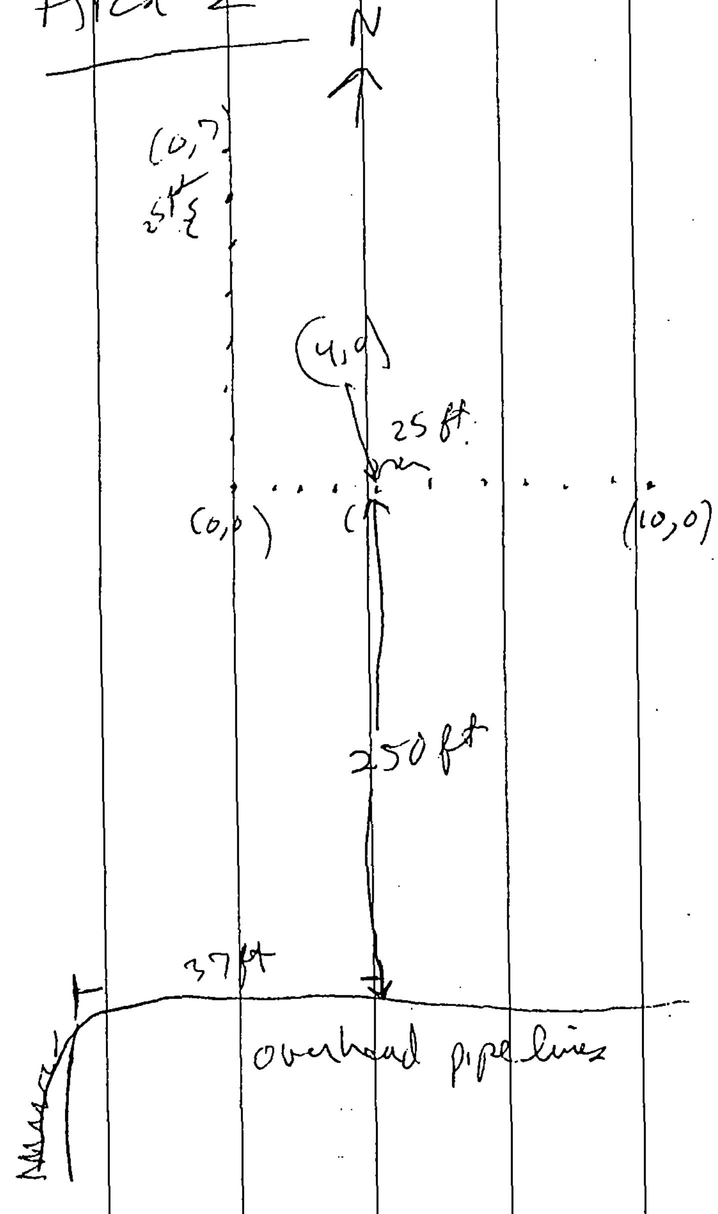
Area 1



Not to scale

50 CJH 6-25-92

Area 2



6-25-92 51 CJH

18:30 D. Smith & I take 6 coolers — 2 inorg — 4 organic to Hattiesburg Fed Ex.

19:30 Brian & D. Brown clean up Room & put equipment away

~~18~~ CJH

20:00 Depart Site

(52) 6-26-92

0900 SMO contacted for report of samples shipped:

SW - 5 + dup = 6
SD - 4 + dup = 5
SS - 6
SB - 3
TW - 2
MW - 1

1000 Called in hours to BUWST office

6-26-92 (53)

1030 Report Hattiesburg

17:45 Arrive in Atlanta

54 ~~CN~~ 8-18-92

0700 Meet w/ Robert Jordan BVWST

0720 Collected
PB-01 } blanks
TB-01

Off-site

Weather today:

70-80° F
clear
low humidity

0735 Meet w/ Charles Jordan for enterance meeting — explained what samples are necessary.

8-18-92 55 CM

Curtis Knight will escort us on site today.

0745 Set up Decon station

	Std.	Reading
pH	7.00	= 7.03
	4.00	= 3.98
	10.00	= 10.25

Conduct. 2000 = 2029

Temp. 75°F

Meter # 9976138
Dedal # 683 956
Calibrated by Carter Helm 08:42

56

8-18-92

Loc	pH	Cond.	(°F) Temp.	Time
SW-01	7.04	339	71.5	09:04
	7.13	239	71.3	09:05
	7.21	236	71.2	09:05

at 9:10 SW-01 collected
plus matrix dup's
two x volume

at Green's Creek
entrance onto site property
just below fence grating

8-18-92

57

9:30

at SW-02	pH	Cond	Temp
9:30	7.13	435	73.6
9:33	7.19	441	72.3
9:35	7.14	438	71.9

9:40 SW-02 collected

banks are again
oozing w/ rusty-colored
seepage. - No smell.

Note SD-02 contains
This seepage
which was collected
at last field trip.

Note:
SW-02 is at Green's Creek exit
from site property.

58 8-18-92

10:01 Old Landfill Location
Area #2 of Geophysics
(1,4) coordinate for SS-04
near old location

10:10 - SS-04 collected

3 ft south of (1,4) stake
at 6 inches bls

8-18-92 59

10:30 SD-04 collected
200 ft South of
original location
since old location has
dried-up.

New location is
30 ft East of ET 4 M1206 Surge tank H2O holding tank
2 inches bls

60 EW 8-18-92

11:15 - SD-03 collected from bldg 40 holding ponds at 2" bls

Same pond as before was sampled.

11:20 Behind Moore Lodge (6,4) coordinate area #1 of Geophysics

8-18-92 61 EW

SS-05 15 Matrix Duplicate

11:25 - SS-05 collected at 6 in bls

11:45 SB-05 collected

3 ft bls mud → sand tan red

between (7,4) & (7,3)

7½ ft bls (at pt of saturation) is where sample was collected

62 CJJ 8-18-92

12:40 Back at Recon station to begin paperwork

15:30 Deliver receipt for samples to Charles Jordan to sign

He wanted me to make a note that SD-04 location was moved 200 ft south & I did not give him an opportunity to split this sample.

8-18-92 63 CJJ

1600 exit meeting with Charles Jordan

1700 Clean up Recon Area

Depart site to Hotel

Note: No Lunch today

64

8-19-92

0900 Set up paperwork table and wait for Fed Ex w/ our blanks & spikes.

1000 Blanks & Spikes arrive

10:30 → 14:30
Prepare all samples for shipment

1500 Fed Ex delivery

organics - 2 large coolers
IEA Lab
Airbill # 5125970802

inorgs - 1 large cooler
Keystone - PA Lab
Airbill #: 5125970791

8-19-92 65

15:30 Lunch break

16:00 Depart Hattiesburg, MS

23:30 Arrive Atlanta

6/23/92

page 1 of __

DB

Area 1

MAG FIELD DATA SHEET

STATION		Reading	Reading	Reading	Average (gammas)	Comments
X	Y					
0	0	50717	717	718	50717	25' from fence
1	0	50804	805	805	50805	
2	0	50854	854	854	50854	
3	0	50902	50903	902	50902	
4	0	50985	985	985	50985	
5	0	51106	108	106	51107	
6	0	51181	179	175	51178	
7	0	51097	091	093	51094	
8	0	50976	976	976	50976	
9	0	50925	925	925	50925	
10	0	50914	914	914	50914	
10	1	50887	887	888	50887	
9	1	50894	894	894	50894	
8	1	50984	987	987	50986	
7	1	51394	400	401	51397	
6	1	51883	882	877	51881	
5	1	51542	537	538	51539	mounded area
4	1	51068	069	066	51068	mounded area
3	1	50893	893	893	50893	
2	1	50841	841	841	50841	
1	1	50804	804	805	50804	
0	1	50733	733	733	50733	
0	2	50716	715	715	50715	25' from fence
1	2	50792	792	792	50792	
2	2	50816	816	816	50816	

* Field data sheet is an extension of Geophysical Logbook ______.

Location ______________________

MAG FIELD DATA SHEET

Area I

STATION		Reading	Reading	Reading	Average (gammas)	Comments
X	Y					
3	2	50842	842	842	50842	On Mound
4	2	51006	001	005	51004	
* 5	2	52066	081	163	52070	Adjacent to Mounded Area
* 6	2	53380	385	397	53387	mounded Area
7	2	51893	919	902	51905	
8	2	50946	941	937	50941	
9	2	50840	841	841	50 841	
10	2	50864	865	865	50 865	
10	3	50842	842	841	50 842	
9	3	50740	739	739	50,739	
8	3	50521	50526	533	50 526	
7	3	50802	810	807	50 806	
6	3	51471	462	482	51472	
5	3	50867	872	881	50873	
4	3	50712	716	715	50 714	
3	3	50764	766	766	50 765	
2	3	50783	783	783	50783	
1	3	50766	766	766	50766	
0	3	50686	689	688	50 688	25' from fence
0	4	50668	666	666	50667	25' from fence
1	4	50741	741	741	50741	
2	4	50768	767	767	50767	
3	4	50731	730	730	50 730	
4	4	50586	588	588	50,587	
5	4	50173	168	173	50 171	

* Field data sheet is an extension of Geophysical Logbook ________.

Location ________________

6/23/92

page 3 of __

DB

MAG FIELD DATA SHEET

Area I

STATION		Reading	Reading	Reading	Average (gammas)	Comments
X	Y					
* 6	4	49719	718	722	49,720	Near North mounded Area
* 7	4	49852	872	872	49865	
8	4	50460	456	459	50458	
9	4	50760	759	762	50760	
10	4	50852	852	852	50852	
10	5	50857	857	856	50857	
9	5	50808	808	807	50808	
8	5	50703	705	707	50705	
7	5	50549	551	554	50552	
6	5	50477	493	488	50486	
5	5	50532	532	535	50533	
4	5	50685	686	687	50686	
3	5	50750	752	752	50751	
2	5	50765	766	766	50766	
1	5	50727	728	729	50728	
0	5	50637	641	642	50640	25' from fence
0	6	50630	629	630	50630	25' from fence
1	6	50725	726	725	50725	
2	6	50770	770	770	50770	
3	6	50789	789	789	50789	
4	6	50777	775	775	50776	
5	6	50758	756	755	50756	
6	6	50753	756	755	50755	Mound
7	6	50770	771	771	50771	
8	6	50804	804	804	50804	

* Field data sheet is an extension of Geophysical Logbook ________.

Location ________________

6/23/92

DB

MAG FIELD DATA SHEET

Area I

STATION X	STATION Y	Reading	Reading	Reading	Average (gammas)	Comments
9	6	50854	855	855	50,855	
10	6	50868	868	868	50868	
10	7	50886	886	886	50886	
9	7	50884	884	884	50884	
8	7	50863	863	862	50863	
7	7	50850	849	849	50849	
6	7	50838	838	838	50838	
5	7	50833	832	832	50832	
4	7	50815	815	815	50815	
3	7	50804	804	805	50804	
2	7	50781	781	781	50781	
1	7	50732	732	732	50732	
0	7	50643	645	645	50644	

* Field data sheet is an extension of Geophysical Logbook ________.

Location ________

Area 1

EM FIELD DATA SHEET

STATION		Instrument Reading	SCALE	Conductivity mmho/m	Comments NS / EW	Avg Cond
X	Y					
0	7				N-S +2 / E-W 42 Near fence 25'	42
1	7				NS 38 / EW 38	38
2	7				NS 32 / EW 32	32
2	Q				NS 35 / EW 35	35
3	7				34 / 34	34
4	7				34 / 34	34
5	7				34 / 34	34
6	7				34 / 34	34
7	7				110 / 120	115
8	7				36 / 34	35
9	7				36 / 36	36
10	7				36 / 36	36
10	6				36 / Not possible	36
9	6				34 / 34	34
8	6				32 / 32	32
7	6				34/34	34
6	6				34 / 34	34
5	6				36 / 36	36
4	6				36/36	36
3	6				34/34	34
1	6				36/36	36
0	6				41/43 Near fence	42
0	5				44 / 44 Near fence	44
1	5				38/38	38
2	5				36 / 36	36

* Field data sheet is an extension of Geophysical Logbook ____________.

Location ______________________

EM FIELD DATA SHEET

Area 1

(2)

STATION X	STATION Y	Instrument Reading	SCALE	Conductivity mmho/m	NS/EW Comments	Ave. Conduct
3	5				40/40	40
4	5				40/45	43
5	5				42/42	42
0	0				45/45	45
1	0				40/40	40
2	0				38/38	38
3	0				38/38	38
4	0				38/38	38
5	0				38/38	38
6	0				40/40	40
7	0				40/42	41
8	0				40/42	41
9	0				40/40	40
10	0				38/40	39
10	1				39/39	39
9	1				41/41	41
8	1				45/45	45
7	1				49/46	48
6	1				53/51	52
5	1				43/42	43
4	1				40/40	40
3	1				39/39	39
2	1				38/38	39
1	1				32/NP	32
~~[illegible]~~ 0	~~[illegible]~~ 0				~~46/47~~ [illegible] 46/47 final	46

* Field data sheet is an extension of Geophysical Logbook ______

Location ______

Area 1

EM FIELD DATA SHEET

(3)

STATION X	STATION Y	Instrument Reading	SCALE	Conductivity mmho/m	N-S / E-W Comments	Avg calc
0	2				45/45 Near River	45
1	2				40/40	40
2	2				38/38	38
3	2				38/38	38
4	2				44/NP	44
5	2				45/22	34
6	2				10/0	0
7	2				35/50	44
8	2				44/NP	44
9	2				43/43	43
10	2				39/39	39
10	3				41/41	41
9	3				43/41	42
8	3				48/46	47
7	3				0/0	0
6	3				0/0	0
5	3				38/48	43
4	3				41/22	32
3	3				41/113	77
2	3				45/45	45
1	3				47/46	46
0	3				45/43	44
0	4				43/41	42
1	4				49/49	49
2	4				38/38	38

* Field data sheet is an extension of Geophysical Logbook ____________.

Location ______________________

Area 1

page __ of __

4

EM FIELD DATA SHEET

STATION		Instrument Reading	SCALE	Conductivity mmho/m	N-S / E-W Comments	Avg. cond.
X	Y					
3	4				40/40	40
4	4				45/43	44
5	4				24/40	32
6	4				25/00	0
7	4				50/44	47
8	4				45/45	45
9	4				40/40	40
10	4				40/40	40
10	5				48/48	48
9	5				38/38	38
8	5				37/39	38
7	5				42/43	42
6	5				40/42	41

* Field data sheet is an extension of Geophysical Logbook ________.

Location ____________________

6/23/92

DB

MAG FIELD DATA SHEET

Area 2

STATION X	STATION Y	Reading	Reading	Reading	Average (gammas)	Comments
0	0	52570	568	566	52,568	
1	0	52721	722	723	52,722	
2	0	52262	263	267	52,264	Near pipe rack
3	0	53715	720	722	53,719	Near pipe rack
4	0	53735	733	737	53,735	Near pipe rack
5	0	54342	54340	340	54, 341	
6	0	52823	829	835	52829	
7	0	51849	861	865	51859	
8	0	50283	283	287	50285	
9	0	50065	064	063	50064	
10	0	49833	828	825	49828	
10	1	50566	578	575	50574	
9	1	50144	145	150	50147	
8	1	50177	177	189	50181	
7	1	49703	713	710	49709	
6	1	50683	692	715	50696	
5	1	53007	011	004	53,007	
4	1	52035	043	059	52046	
3	1	54083	061	050	54065	
2	1	52477	500	504	52494	
1	1	52378	380	383	52380	
0	1	53735	735	732	53734	
* 0	2	56301	334	368	56334	
1	2	55358	356	320	55345	
2	2	54732	713	730	54725	

* Field data sheet is an extension of Geophysical Logbook ________.

Location ____________________

6/23/92 DB

MAG FIELD DATA SHEET

STATION X	STATION Y	Reading	Reading	Reading	Average (gammas)	Comments
3	2	55333	314	388	55345	
4	2	54070	077	085	54077	
5	2	53808	813	812	53811	
6	2	53280	282	294	53285	
7	2	51740	737	727	51735	
8	2	50748	737	741	50742	Near Drum on Surface
9	2	50027	023	040	50030	Near Drum on Surface
10	2	50342	346	342	50343	
10	3	49782	781	778	49780	
9	3	50496	497	495	50,496	Near Drum
8	3	51366	350	360	51,354	Near Drum
7	3	51902	902	893	51899	
6	3	53101	118	107	53109	
5	3	53121	112	113	53115	
4	3	52946	943	940	52943	
3	3	53941	944	940	53,942	
2	3	55506	535	537	55526	
1	3	22869	23370	24573	23,606	From 22869 to 55000
0	3	54888	881	899	54889	
0	4	49191	229	276	49232	
1	4	50751	854	~~097~~	~~51000~~	50868
2	4	51319	252	186	51252	
3	4	52069	051	049	52056	
4	4	52763	768	759	52763	
5	4	51479	484	484	51481	

* Field data sheet is an extension of Geophysical Logbook ________.

Location ________________

6/23/92

DG

MAG FIELD DATA SHEET

STATION X	STATION Y	Reading	Reading	Reading	Average (gammas)	Comments
6	4	50824	846	855	50842	
7	4	50655	658	659	50657	
8	4	51067	1062	060	51063	15' from Steel beam
9	4	49982	986	992	49987	
10	4	49974	975	974	49989	
10	5	50179	178	180	50179	
9	5	49996	995	998	49997	
8	5	50383	389	386	50386	
7	5	49688	693	693	49691	
6	5	48975	993	998	48989	
5	5	49717	762	769	49759	
4	5	50449	463	470	50461	
3	5	14908	35174	46994	32359	From 14908 to 46994
2	5	13902	27938	38995	26445	From 13902 to 38995
1	5	19429	29210	41857	30265	From 19429 to 41857
0	5	14764	16095	14670	15176	From 14764 to 16095
0	6	13887	15362	15343	14864	From 13887 to 15362
1	6	29182	38977	32806	33655	
2	6	19450	58516	19425	32464	
3	6	10702	12035	11880	11539	
4	6	47575	578	578	47577	Next to telephone guide wire anchor
5	6	47896	897	906	47900	
6	6	48486	496	499	48494	
7	6	49880	875	883	49979	
8	6	50075	084	077	50079	

* Field data sheet is an extension of Geophysical Logbook ________.

Location ____________________

6/23/92
DS

MAG FIELD DATA SHEET

STATION		Reading	Reading	Reading	Average (gammas)	Comments
X	Y					
9	6	50429	428	433	50430	
10	6	50613	605	608	50609	

* Field data sheet is an extension of Geophysical Logbook ________.

Location ____________________

Area 2

EM FIELD DATA SHEET

①

STATION		Instrument Reading	SCALE	Conductivity mmho/m	NS/EW Comments	
X	Y					
0	0				52/52	52
1	0				82/90	86
2	0				84/82	83
3	0				120/110	115
4	0				150/140	145
5	0				90/110	100
6	0				62/62	62
7	0				150/150	150
8	0				140/146	143
9	0				100/110	105
10	0				80/90	85
10	1				64/64	64
10	2				53/55	54
10	3				56/54	55
10	4				42/50	46
10	5				45/47	46
10	6				52/58	55
9	6				50/50	50
8	6				45/43	44
7	6				56/64	60
6	6				75/77	76
5	6				70/68	69
4	6				91/83 Near telephone pole guy wire anchor	87
3	6				105/105	105
2	6				140/140	140

* Field data sheet is an extension of Geophysical Logbook ______.

Location ______

Area 2

EM FIELD DATA SHEET

2

STATION X	STATION Y	Instrument Reading	SCALE	Conductivity mmho/m	NS EW Comments	
1	6				150/160	155
0	6				120/120	120
0	5				170/180	175
1	5				180/170	175
2	5				150/130	140
3	5				125/125	125
4	5				100/106	103
5	5				80,80	80
6	5				75/75	75
7	5				75/75	75
8	5				65/65	65
9	5				55/57	56
9	4				62/64 adjacent to metal pipe	63
8	4				70/60	65
7	4				84/82	83
6	4				95/93	94
5	4				110/110	110
4	4				140/130	135
3	4				220/200	210
2	4				150/200	175
1	4				0/~~85~~ 85	0✓
0	4				140/130	135
0	3				110/110	110
0	2				50/30	40
0	1				40/42	41

* Field data sheet is an extension of Geophysical Logbook ______________.

Location ______________________________

Area 2

EM FIELD DATA SHEET

(3)

STATION X	STATION Y	Instrument Reading	SCALE	Conductivity mmho/m	Comments NS EW	
0	1½				0/0	0
1	1				105/59	62
2	1				130/140	135
3	1				110/100	105
4	1				160/ 140	150
5	1				130/130	130
6	1				92/86	89
7	1				145/145	145
8	1				170/170	170
9	1				88/88	88
9	2				94/94 → Near Surface	94
8	2				120/110 drums	11
7	2				150/165	158
6	2				120/140	130
5	2				155/151	153
4	2				145/140	143
3	2				92/60	76
2	2				125/121	123
1	2				125/110	118
1	3				210/148	175
2	3				115/135	125
3	3				155/235	195
4	3				150/140	145
5	3				135/131	133
6	3				115/125	120

* Field data sheet is an extension of Geophysical Logbook ________.

Location ____________________

Area 7

(4)

EM FIELD DATA SHEET

STATION		Instrument Reading	SCALE	Conductivity mmho/m	N-S / E-W Comments	
X	Y					
7	3				70 / 90	80
8	3				120 / 140 surface Drum and	130
9	3				105 / 110	107

* Field data sheet is an extension of Geophysical Logbook ________.

Location ________________________

Reference 7

Subsurface Disposal Corporation

5555 West Loop South, Suite 646 • Bellaire, Texas 77401 • (713) 666-8158 • Telex: 77-5907

22 September 1980

Mr. Thomas Thoms
Development Supervisor
P.O. Drawer 1937
Hattiesburg, MS 39401

Dear Tom:

I am enclosing the report of our investigation concerning a groundwater monitoring program at your plant. Thank you for the time extension you have afforded us in submitting the final report. We have been so busy this year that the extra time was much appreciated.

It was a real pleasure working with you during the study. If we can be of any further service, or if you have any questions, please don't hesistate to call.

Sincerely,

Larry Browning

Larry Browning
Senior Hydrologist

LB/dr

Enclosure

1.0 PURPOSE AND SCOPE

The purpose of this report is to present the results of a preliminary hydrogeologic analysis of the Hercules Hattiesburg, Mississippi plant, for purposes of designing a groundwater monitoring system. The objects of this monitoring system are a process water pond located near the southeastern boundary of the plant, and a series of active and inactive sludge disposal pits located in the unused northwestern part of the plant (the "Back 40").

The data utilized in this study consisted of general geologic reports for the area, six electric logs run in water wells in the area, field observation, and two borings with related soil and groundwater sampling. Field testing was conducted between July 21-25, 1980.

2.0 STUDY AREA

The Hercules Hattiesburg, Mississippi plant is located at Highway 42 and Providence Street, within the city limits of Hattiesburg in Forrest County, Mississippi. The climate of the area is humid and subtropical. Average annual rainfall is approximately 64 inches. The study area lies in the East Gulf Coastal plain, within the drainage area of the Leaf River.

The rocks exposed at the surface at the plant site are a thin veneer of alluvial terrace sands and gravels of Eocene to recent age. Immediately underlying these terrace deposits is a sequence of clays, sands, and gravels known as the Miocene Hattiesburg formation (Figure 1). This formation dips regionally southward at from 20 to 25 feet per mile. Aerial photo interpretation does not reveal any significant fault expression near the plant site.

The primary drinking water aquifer in the area is a series of sands and gravels of Miocene age. This aquifer exists at a depth of approximately 400 feet at the plant site.

2.1 PROCESS WATER IMPOUNDING BASIN AND SLUDGE PITS

The process impounding basin is located near the eastern plant boundary on Providence street. The basin is approximately 250 feet by 70 feet. The pond was excavated in native clays to a depth of approximately 10 feet. The basin sides are lined with boards, diked, and bordered to the south by a runoff collection ditch. No evidence of seepage was observed. Sludge accumulation is approximately 8 cu. yards per day, which corresponds to 1 inch per week within the basin. The basin is periodically dredged, and the sludge is disposed of in a series of pits located in the "Back 40".

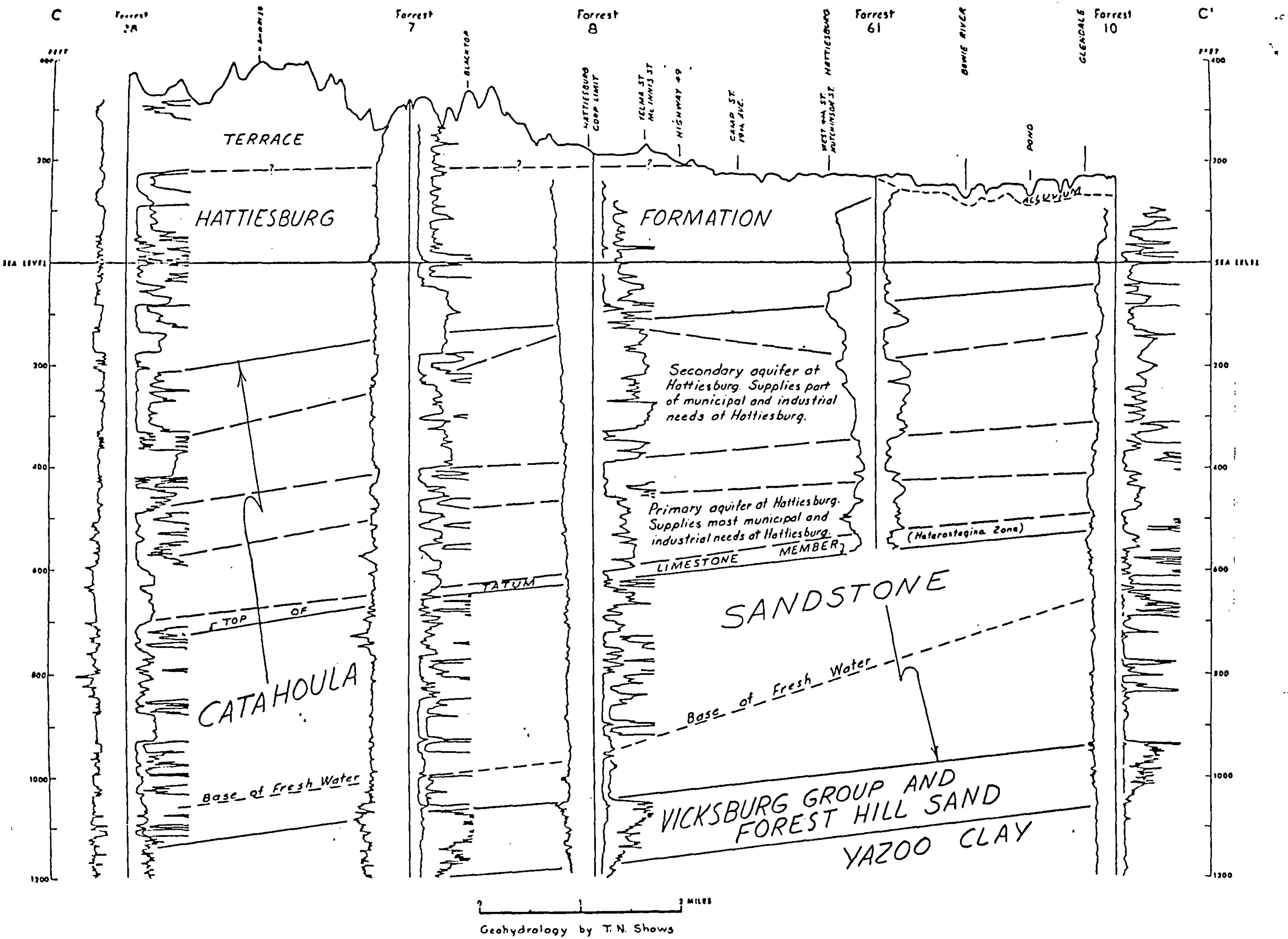


Fig. 1. Geohydrologic section (C-C') through the Hattiesburg area

The "Back 40" pits have been used for sludge disposal for at least 10 years. These beds vary in size. The largest pit is approximately 180' x 220', and the smallest is 80' x 140'. These pits were excavated by bulldozer into native clays to a depth of approximately 8 feet. The pits are diked on all sides with a combination of native clay and topsoil gravels. Four sludge pits are active, and consist of varying proportions of solidified black sludge, sludge liquors, and rainwater. One area of pits is inactive and covered by a cap of native clay.

This investigation was conducted during a period of higher than average rainfall. Some lowlying areas surrounding the active pits were marshy. Some leakage of pit contents was noticeable. This leakage was observed to result from both pit overflow and seepage at the dike toe.

Chemical analyses of impounding basin and sludge pit contents are presented in Appendix 1.

3.0 BORING PROGRAM

Two borings were completed at the plant site. One boring (B-1) was located at the southeast corner of the "Back 40" sludge pit area, and one boring was located across Providence Road, 100 feet east of the impounding basin. Drilling logs of these borings are presented in Appendix 2.

A generalized subsurface section of the soils beneath the plant site may be described as:

0-11	Sands and gravels, Fill
11-62	Very stiff blue clay
*62-69	Fine sands, coarse sand and gravel
*69-75	Stiff blue clay
75-102	Fine sands, coarse sand and gravel
102-Termination	Hard brown clay.

*Thickness varies.

The results of laboratory soil tests are presented in Appendix 2.

3.1 DISCUSSION

Borings B-1 and B-2, although located approximately one mile apart, exhibited very similar lithologies. This stratigraphic consistency is described in several soil and groundwater reports completed in the study area. Several points should be noted.

A. A thin veneer (approximately 10 feet) of fill and alluvial terrace deposits was noted in each boring. These sands, although relatively permeable, were not saturated at the time the wells were drilled. The thickness of the surficial deposits is highly variable at other locations within the Plant, ranging from 0 to 12 feet. The boring sites were located down-slope topographically from each facility. The thickness of the surficial deposits was observed to be less than 6 feet immediately surrounding both facilities.

B. At least 50 feet of relatively homogeneous, very dense blue clay underlies the area. Laboratory testing indicates the permeability of this clay to be at least 1.9×10^{-7} cm/sec. One in-place falling head permeability test of this clay was attempted in Boring B-2, but was discontinued after no inflow was determined after eight (8) hours. Furthermore, the upper 30 feet of this clay unit was unsaturated.

C. The lower sand and gravel units were observed to be very permeable, and correspond closely to established models of alluvial point-bar deposits. These deposits terminated unconformably upon a dense brown clay.

4.0 MONITORING WELLS

Borings B-1 and B-2 were completed as permanent monitoring wells. Two-inch schedule 40 PVC casing and #10 well screen were run to T.D. Bentonite clay pellets and portland cement were used to seal the wells according to EPA specification. The wells were pumped using a one-inch PVC air lift line and a portable air compressor. Both wells were pumped for four (4) hours prior to sampling. Results of chemical analyses and water level observation are presented in Table 1.

4.1 DISCUSSION

A. The sand and gravel zones below 62 feet constitute the first saturated "aquifer" to be encountered beneath each hazardous waste facility. These were the zones chosen for monitoring.

B. The permeability of the finest sand zones encountered was tested as 4.2×10^{-6} cm/sec. The permeability of the coarsest basal gravels is estimated to be at least 1×10^{-3} cm/sec. These extremes of permeability would correspond to a rate of water movement of from .03 to 4 feet/yr, under the observed hydraulic gradient.

C. Based on preliminary data, the hydraulic gradient of this zone is observed to generally correspond to the predicted dip of the aquifers. The general hydraulic gradient is from B-1 towards B-2, that is, from northwest to southeast. Supplementary data is necessary to determine the absolute direction and amount of gradient. The monitoring wells were sited generally downgradient of the subject facilities, and were observed to provide representative samples of formation water.

D. No evidence of groundwater contamination due to facility leakage was discovered in samples from the monitoring wells. Total Organic Carbon values are consistent with those encountered in shallow ground water of alluvial origin. Analysis for DELNAV (a Hercules product) was chosen as an indicator of organic contamination, as it is the chief organic constituent of facility contents and indicative of a wide range of organic species. All DELNAV analyses were below the limit of detection (1 part per billion).

5.0 REGULATORY REQUIREMENTS

The contents of both the impounding basin and "Back 40" sludge pits will be classified as hazardous waste under provisions of the Resource Conservation and Recovery Act (RCRA). RCRA also requires that a hydrologic assessment be made of each hazardous waste facility to determine the potential of each facility to contaminate ground water. A system of monitoring wells may be required for each facility. Details of these requirements are presented in Appendix 3.

6.0 CONCLUSIONS

A. The subject hazardous waste facilities have been in operation for over 10 years. No evidence of groundwater contamination was discovered.

B. The subject facilities are excavated into native clays of extremely low permeability. The pond bottoms are separated from the uppermost fresh water aquifers by over 50 feet of dense, very homogeneous, unsaturated clay of very low permeability. Electric logs of water wells indicate that this clay can be correllated throughout the study area. From a practical perspective, it is impossible for pond contents to migrate vertically through this clay and contaminate the uppermost fresh water aquifer.

C. Preliminary studies have shown that no water wells are completed in the uppermost aquifer within at least one (1) mile of the facilities. Drinking water supplies in the area are taken from aquifers at least 300 foot deep.

7.0 RECOMMENDATIONS

A. Field observation and testing have demonstrated an extremely remote potential for contamination of the uppermost aquifer by leakage of the contents of the subject facility. As provided in Section 265.90 (c) of RCRA, we recommend that these facilities be exempted from the groundwater monitoring requirements.

B. Surficial terrace deposits and fill material exist near each facility to some depth below land surface. These deposits were not found to be saturated at the time of this investigation and, as such, are neither considered "aquifers" nor subject to monitoring within the framework of RCRA. However, these deposits could conceivably transmit leakage from the facilities as a "perchec water table atop the dense clay described previously. This leakage would not pose any threat to the uppermost aquifer, but might run off laterally to ditches or streams. Therefore, we recommend that a series of dry auger borings to a depth of 12 feet be sited around each facility. These borings should be observed to determine if these soils are saturated. The boring may then be screened so as to intercept any shallow leakage, and sized to accept a bailer.

C. The sludge pits on the "Back 40" which are no longer used should be closed out. This closure would consist of a sloped native clay cap. This closure would not only prevent any future leaking of the contents, but also would eliminate any odor problem.

D. We recommend that an improved "housekeeping" program be instituted for the "Back 40". Better maintenance of dikes and periodic drainage of rainwater and sludge liquors from the pits would eliminate the hazard of surface contamination.

E. Details of construction of the present "Back 40" pits are not available. In the future, optimum construction techniques would allow for lining and compacting the pit sides and bottom with native clays. In light of better maintenance, optimum construction techniques for new pits, and correct closure of inactive pits, we can recommend the continued usage of the "Back 40" area for sludge disposal.

I certify that all of the data, conclusions, and recommendations contained in this report are true and correct, and represent an analysis based on sound engineering principles.

Lawrence A. Browning

Lawrence A. Browning
Senior Hydrologist

APPENDIX 1

TAPLE 2

METALS CONCENTRATION (PPM)

Type Metal	Water Extract mg/1	Extract Limit mg/1	Extracted Ash ppm	Original ASH ppm	% Extracted
Arsenic	0.008	0.500	0.011	0.170	93.6
Barium	0.860	10.000	2.130	19.330	89.0
Cadium	0.019	0.100	0.062	0.440	86.0
Chromium	0.044	0.500	0.108	0.990	89.1
Lead	0.083	0.500	0.159	1.820	91.2
Mercury	0.000	0.020	0.003	0.003	0.0
Selenium	0.006	0.100	0.039	0.160	75.5
Silver	0.000	0.500	0.000	0.000	-
Nickel	0.121	-	0.378	2.800	86.5
Aluminum	0.134	-	0.457	3.140	85.4
Zinc	0.208	- 50 mg/l	0.688	4.850	85.8
Copper	0.164	- 10 mg/l	0.219	3.500	93.7
Iron	1.392	- 3 mg/l	1.753	29.590	94.1

WHERE

Water extract = heavy metals concentration in the actual water extract from the sample being analyzed.

Extract limit = the maximum heavy metals concentration which if exceed in the water extract would define the sample as being a hazardous waste under toxic waste characteristics.

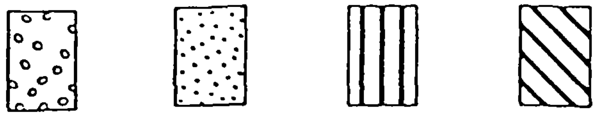
Extracted Ash = heavy metals concentration left in the sample after extraction.

Original ash = heavy metals concentration is the ashed sample. This was calculated based on the amount of water and sample used during extraction and the amount of heavy metals left in the extracted ash sample.

% Extracted = percent heavy metals extracted based on the above data.

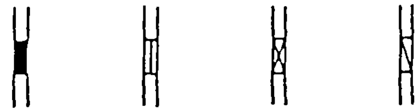
SYMBOLS AND TERMS USED ON BORING LOGS

SOIL TYPES
(SHOWN IN SYMBOL COLUMN)



Gravel Sand Silt Clay
Predominant type shown heavy

SAMPLER TYPES
(SHOWN IN SAMPLES COLUMN)



Shelby Tube, Pit Cutings, Split Spoon, No Recovery

TERMS DESCRIBING CONSISTENCY OR CONDITION

COARSE GRAINED SOILS (major portion retained on No. 200 sieve): Includes (1) clean gravels and sands, and (2) silty or clayey gravels and sands. Condition is rated according to relative density, as determined by laboratory tests.

DESCRIPTIVE TERM	RELATIVE DENSITY
Loose	0 to 40%
Medium dense	40 to 70%
Dense	70 to 100%

FINE GRAINED SOILS (major portion passing No. 200 sieve): Includes (1) inorganic and organic silts and clays, (2) gravelly, sandy, or silty clays, and (3) clayey silts. Consistency is rated according to shearing strength, as indicated by penetrometer readings or by unconfined compression tests.

DESCRIPTIVE TERM	UNCONFINED COMPRESSIVE STRENGTH TON/SQ FT
Very soft	less than 0.25
Soft	0.25 to 0.50
Firm	0.50 to 1.00
Stiff	1.00 to 2.00
Very stiff	2.00 to 4.00
Hard	4.00 and higher

Note: Slickensided and fissured clays may have lower unconfined compressive strengths than shown above, because of planes of weakness or cracks in the soil. The consistency ratings of such soils are based on penetrometer readings.

TERMS CHARACTERIZING SOIL STRUCTURE

Slickensided	– having inclined planes of weakness that are slick and glossy in appearance.
Fissured	– containing shrinkage cracks, frequently filled with fine sand or silt; usually more or less vertical.
Laminated	– composed of thin layers of varying color and texture.
Interbedded	– composed of alternate layers of different soil types.
Calcareous	– containing appreciable quantities of calcium carbonate.
Well graded	– having wide range in grain sizes and substantial amounts of all intermediate particle sizes.
Poorly graded	– predominantly of one grain size, or having a range of sizes with some intermediate size missing.

Terms used in this report for describing soils according to their texture or grain size distribution are in accordance with the UNIFIED SOIL CLASSIFICATION SYSTEM, as described in Technical Memorandum No 3-357; Waterways Experiment Station, March 1953

LOG OF BORING NO. 1
HERCULES POWDER COMPANY
HATTIESBURG, MISSISSIPPI

TYPE: 3" Shelby tube & 2" split-spoon LOCATION: As directed by Larry Browning

DEPTH, FT	DESCRIPTION OF MATERIAL (SURFACE EL.: Not known)	BLOWS PER FT	UNIT DRY WEIGHT LB/CU FT	COHESION, KIP/SQ FT; PLASTIC LIMIT / WATER CONTENT, % / LIQUID LIMIT	ELEVATION, FT
0–4	Medium dense light gray clayey fine sand	13			
4–10	Dense light gray fine to medium sand with coarse sand and gravel	62 33			
10–23	Hard gray and greenish clay, slightly silty -blue, slightly sandy below 18'				
23–36	Hard blue silty clay with silty fine sand laminations and seams				
36–	Hard blue clay -blue and brown below 43' -slightly sandy below 53' (continued next page)				

WARE LIND ENGINEERS

PLATE

LOG OF BORING NO. 1

(Continued)

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WEIGHT LB/CU FT	COHESION, KIP/SQ FT (1, 2, 3, 4) / PLASTIC LIMIT, WATER CONTENT, %, LIQUID LIMIT (20, 40, 60, 80)	ELEVATION, FT
			Hard blue clay (continued)				
60			Hard blue very sandy clay with fine sand seams				
65			Dense blue clayey fine sand				
70			Hard blue clay, slightly sandy				
75			Dense blue silty fine sand			Note: A well screen was set in this stratum from 73' to 76'	
80			-hard sandy clay layer 77'-80'	40			
85, 90			-coarse sand and fine gravel seam at 87'	35			
95, 100			Dense coarse sand and gravel -large gravel below 96'			Note: A well screen was set in this stratum from 93' to 96' and from 97' to 100'	
105			Hard brown clay				

COMPLETION DEPTH: 105 ft

DATE: 9/22/80

LOG OF BORING NO. 2
HERCULES POWDER COMPANY
HATTIESBURG, MISSISSIPPI

TYPE: 3" Shelby tube & 2" split-spoon   LOCATION: As directed by Larry Browning

SURFACE EL.: Not determined

DEPTH, FT	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WEIGHT LB/CU FT	COHESION, KIP/SQ FT (1, 2, 3, 4) / PLASTIC LIMIT – WATER CONTENT, % – LIQUID LIMIT (20, 40, 60, 80)	ELEVATION, FT
0–3	Loose medium to coarse sand with gravel (Fill)				
3–12	Loose gray and tan silty fine sand -occasional clay seams 8'-11' -medium dense below 8'	9 14			
12–17	Very stiff blue clay	14			
17–22	Very stiff blue silty clay with silty fine sand partings				
22–32	Hard brown and blue clay -blue, slightly sandy with occasional silty fine sand partings below 28'				
32–52	Hard blue silty clay, slightly sandy with occasional silty fine sand partings -very sandy 38'-43' -blue and brown 43'-46'				
52–	(continued next page)				

LOG OF BORING NO. 2

(Continued)

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	BLOWS PER FT	UNIT DRY WEIGHT LB/CU FT	COHESION, KIP/SQ FT (1, 2, 3, 4); PLASTIC LIMIT, WATER CONTENT, %, LIQUID LIMIT (20, 40, 60, 80)	ELEVATION, FT
60			Hard blue-green fine sandy clay with clay pockets (continued)				
65, 70			Dense medium to coarse sand with fine gravel	100 76		Note: A well screen was set in this stratum from 62' to 72'	
75, 80, 85			Hard blue clay, slightly sandy with silty fine sand partings and seams -very sandy to 74'			Note: A well screen was set in this clay stratum and the underlying sand stratum from 84' to 104'	
90, 95, 100			Dense blue silty fine sand -occasional clay pockets 88'-98' -clay pockets 103'-104'	55			
105			Hard blue-green clay -slightly sandy to 106' -brown and blue 106'-110'				

COMPLETION DEPTH: 110 ft

DATE: 7/23/80

WARE LIND
SOIL AND FOUNDATION CONSULTANTS

SOIL BORINGS
LABORATORY TESTS ENGINEERING REPORTS

859 PEAR ORCHARD ROAD • POST OFFICE BOX 10115 • JACKSON, MISSISSIPPI 39206 • AREA CODE 601 TELEPHONE 956-4467

August 13, 1980

Subsurface Disposal
5555 West Loop South
Belaire, Texas 77401

Report No. 80095

Attention: Mr. Larry Browning

Soil Borings, Piezometer Installation
and Laboratory Tests
Hercules Power Company
Hattiesburg, Mississippi

Gentlemen:

Submitted here is a summary of work recently performed for you at the Hercules Power Company site in Hattiesburg, Mississippi. This work was authorized verbally by Mr. Browning on July 8, 1980.

Two borings were completed at the site to depths of 105 ft and 110 ft during the period July 21 through July 24, 1980. Undisturbed samples of clayey soils were taken from the borings at about 5-ft intervals of depth. In sands, disturbed samples were taken at about 5-ft intervals of depth by driving a 2-in. OD split-spoon sampler 18 in. with a 140-lb hammer falling 30 in. Representative portions of all samples were sealed in glass jars for later use in the laboratory.

After completion of the borings, piezometers were installed to approximately the bottom of each boring using 2-in. OD PVC pipe and 3-ft long by 2-in. OD continuous slot well screens. The piezometers were later sealed and pumped in accordance with your instructions.

In the laboratory, one falling head permeability test was performed on a sample of gray silty fine sand taken from 74-ft depth in Boring 1. Results of this latter test indicate a coefficient of permeability of 4.18×10^{-6} cm/sec. In addition, five permeability tests and four liquid and plastic limit tests were performed on selected samples of clays using floating ring consolidometers. The tests were performed using consolidation loads of 500 and 1000 lbs per sq ft. Results of these latter tests are as follows:

Boring No.	Depth, ft	Material	(1) k, cm/sec	(2) LL	(3) PL
1	14.5	clay	1.87×10^{-7}	51	23
1	54.5	silty clay	3.42×10^{-7}	35	18
2	19.5	silty clay, slightly sandy	6.08×10^{-7}	36	25
2	59.0	clay, sand and clayey sand	6.30×10^{-7}	43	20
2	79.5	silty clay	7.84×10^{-7}	-	-

(1) Permeability
(2) Liquid limit
(3) Plastic limit

If we could furnish you with any additional information at this time, please call on us.

Very truly yours,

WARE LIND ENGINEERS, Inc.

Edwin E. Ware, P. E.

EEW/cw

CULPEPPER TESTING LABORATORIES

Air and Water Analyses

805 SOUTH MAIN STREET TELEPHONE 601 583-0411

HATTIESBURG, MISSISSIPPI 39401

Client: Hercules, Inc.
Date: July 30, 1980
Invoice No.: 0425

Date Received: July 25, 1980
Date Analysis Begun: July 25, 1980
Collected By: Client

Laboratory Number: H-72580-4A
Remarks:
Sample labeled HT-517-36-1
Water Well
Back 40

B-1

Analytical Parameter	Concentration	Methodology*
Total Chlorides	1.25 mg/l	112B
Total Sulfate	7.82 mg/l	156B
Alkalinity, Total	210.0 mg/l	102
Alkalinity, Phenolphtalein	0.0 mg/l	102
Alkalinity, Bicarbonate	210.0 mg/l	102
Sodium	None detectable	Atomic Absorption
Potassium	None Detectable	Atomic Absorption
Calcium	11.0 mg/l	Atomic Absorption
Magnesium	2.0 mg/l	Atomic Absorption
pH	7.25 SU	144A

*Standard Methods for the Examination of Water and Wastewater

Certified by: [signature]
T. J. Culpepper, Ph.D.

CULPEPPER TESTING LABORATORIES

Air and Water Analyses

206 SOUTH MAIN STREET TELEPHONE 601 583-0411

HATTIESBURG, MISSISSIPPI 39401

Client: Hercules, Inc.
Date: July 30, 1980
Invoice No.: 0425

Date Received: July 25, 1980
Date Analysis Begun: July 25, 1980
Collected By: Client

Laboratory Number: H-72580-4B
Remarks:

Sample labeled HT-517-36-2 8-2
Well Water
Providence Street

Analytical Parameter	Concentration	Methodology*
Total Chlorides	1.00 mg/l	112B
Total Sulfate	8.23 mg/l	156B
Alkalinity, Total	245.0 mg/l	102
Alkalinity, Phenolphtalein	5.0 mg/l	102
Alkalinity, Bicarbonate	235.0 mg/l	102
Sodium	None detectable	Atomic Absorption
Potassium	None detectable	Atomic Absorption
Calcium	None detectable	Atomic Absorption
Magnesium	3.0 mg/l	Atomic Absorption
pH	8.25 SU	144A

*Standard Methods for the Examination of Water and Wastewater

Certified by: [signature]
T. J. Culpepper, Ph.D.

RI NO: DATE [illegible]-4-80 RECORD BOOK NO. HT-517

SUBJECT: New Water Well Sample for Analysis

Bock 40 Well

pH 6.8
Delnav < 1ppb
TOC 9
Micromhos Sp. Cond. = 220

Providence St Well

pH 9.0
Delnav < 1ppb
TOC 15
Sp. Cond 270

SIGNED BY ______ (SIGNATURE OF PERSON DOING WORK) ______ (DATE OF SIGNATURE)

WORK OBSERVED BY [illegible signature] (SIGNATURE OF OBSERVER) Hercules, Inc. (DATE OF SIGNATURE) REPORTED

APPENDIX 3

percent in weight, and (2) for batch waste, any variation in piece count, such as a discrepancy of one drum in a truckload. Significant discrepancies in type are obvious differences which can be discovered by inspection or waste analysis, such as waste solvent substituted for waste acid, or toxic constituents not reported on the manifest or shipping paper.

(b) Upon discovering a significant discrepancy, the owner or operator must attempt to reconcile the discrepancy with the waste generator or transporter (e.g., with telephone conversations). If the discrepancy is not resolved within 15 days after receiving the waste, the owner or operator must immediately submit to the Regional Administrator a letter describing the discrepancy and attempts to reconcile it, and a copy of the manifest or shipping paper at issue.

§ 265.73 Operating record.

(a) The owner or operator must keep a written operating record at his facility.

(b) The following information must be recorded, as it becomes available, and maintained in the operating record until closure of the facility:

(1) A description and the quantity of each hazardous waste received, and the method(s) and date(s) of its treatment, storage, or disposal at the facility as required by Appendix I;

(2) The location of each hazardous waste within the facility and the quantity at each location. For disposal facilities, the location and quantity of each hazardous waste must be recorded on a map or diagram of each cell or disposal area. For all facilities, this information must include cross-references to specific manifest document numbers, if the waste was accompanied by a manifest;

[*Comment:* See §§ 265.119, 265.279, and 265.309 for related requirements.]

(3) Records and results of waste analyses and trial tests performed as specified in §§ 265.13, 265.193, 265.225, 265.252, 265.273, 265.345, 265.375, and 265.402;

(4) Summary reports and details of all incidents that require implementing the contingency plan as specified in § 265.56(j);

(5) Records and results of inspections as required by § 265.15(d) (except these data need be kept only three years);

(6) Monitoring, testing, or analytical data where required by §§ 265.90, 265.94, 265.276, 265.278, 265.280(d)(1), 265.347, and 265.377; and,

[*Comment:* As required by § 265.94, monitoring data at disposal facilities must be kept throughout the post-closure period.]

(7) All closure cost estimates under § 265.142 and, for disposal facilities, all post-closure cost estimates under § 265.144.

§ 265.74 Availability, retention, and disposition of records.

(a) All records, including plans, required under this Part must be furnished upon request, and made available at all reasonable times for inspection, by any officer, employee, or representative of EPA who is duly designated by the Administrator.

(b) The retention period for all records required under this Part is extended automatically during the course of any unresolved enforcement action regarding the facility or as requested by the Administrator.

(c) A copy of records of waste disposal locations and quantities under § 265.73(b)(2) must be submitted to the Regional Administrator and local land authority upon closure of the facility (see § 265.119).

§ 265.75 Annual report.

The owner or operator must prepare and submit a single copy of an annual report to the Regional Administrator by March 1 of each year. The report form and instructions in Appendix II must be used for this report. The annual report must cover facility activities during the previous calendar year and must include the following information:

(a) The EPA identification number, name, and address of the facility;

(b) The calendar year covered by the report;

(c) For off-site facilities, the EPA identification number of each hazardous waste generator from which the facility received a hazardous waste during the year; for imported shipments, the report must give the name and address of the foreign generator;

(d) A description and the quantity of each hazardous waste the facility received during the year. For off-site facilities, this information must be listed by EPA identification number of each generator;

(e) The method of treatment, storage, or disposal for each hazardous waste;

(f) Monitoring data under § 265.94(a)(2)(ii) and (iii), and (b)(2), where required;

(g) The most recent closure cost estimate under § 265.142, and, for disposal facilities, the most recent post-closure cost estimate under § 265.144; and

(h) The certification signed by the owner or operator of the facility or his authorized representative.

§ 265.76 Unmanifested waste report.

If a facility accepts for treatment, storage, or disposal any hazardous waste from an off-site source without an accompanying manifest, or without an accompanying shipping paper as described in § 263.20(e)(2) of this Chapter, and if the waste is not excluded from the manifest requirement by § 261.5 of this Chapter, then the owner or operator must prepare and submit a single copy of a report to the Regional Administrator within 15 days after receiving the waste. The report form and instructions in Appendix II must be used for this report. The report must include the following information:

(a) The EPA identification number, name, and address of the facility;

(b) The date the facility received the waste;

(c) The EPA identification number, name, and address of the generator and the transporter, if available;

(d) A description and the quantity of each unmanifested hazardous waste the facility received;

(e) The method of treatment, storage, or disposal for each hazardous waste;

(f) The certification signed by the owner or operator of the facility or his authorized representative; and

(g) A brief explanation of why the waste was unmanifested, if known.

[*Comment:* Small quantities of hazardous waste are excluded from regulation under this Part and do not require a manifest. Where a facility receives unmanifested hazardous wastes, the Agency suggests that the owner or operator obtain from each generator a certification that the waste qualifies for exclusion. Otherwise, the Agency suggests that the owner or operator file an unmanifested waste report for the hazardous waste movement.]

§ 265.77 Additional reports.

In addition to submitting the annual report and unmanifested waste reports described in §§ 265.75 and 265.76, the owner or operator must also report to the Regional Administrator:

(a) Releases, fires, and explosions as specified in § 265.56(j);

(b) Ground-water contamination and monitoring data as specified in §§ 265.93 and 265.94; and

(c) Facility closure as specified in § 265.115.

§§ 265.78–265.89 [Reserved]

Subpart F—Ground-Water Monitoring

§ 265.90 Applicability.

(a) Within one year after the effective date of these regulations, the owner or operator of a surface impoundment, landfill, or land treatment facility which is used to manage hazardous waste must implement a ground-water monitoring program capable of determining the facility's impact on the quality of ground water in the uppermost aquifer underlying the facility, except as § 265.1 and paragraph (c) of this Section provide otherwise.

(b) Except as paragraphs (c) and (d) of this Section provide otherwise, the owner or operator must install, operate, and maintain a ground-water monitoring system which meets the requirements of § 265.91, and must comply with §§ 265.92–265.94. This ground-water monitoring program must be carried out during the active life of the facility, and for disposal facilities, during the post-closure care period as well.

(c) All or part of the ground-water monitoring requirements of this Subpart may be waived if the owner or operator can demonstrate that there is a low potential for migration of hazardous waste or hazardous waste constituents from the facility via the uppermost aquifer to water supply wells (domestic, industrial, or agricultural) or to surface water. This demonstration must be in writing, and must be kept at the facility. This demonstration must be certified by a qualified geologist or geotechnical engineer and must establish the following:

(1) The potential for migration of hazardous waste or hazardous waste constituents from the facility to the uppermost aquifer, by an evaluation of:

(i) A water balance of precipitation, evapotranspiration, runoff, and infiltration; and

(ii) Unsaturated zone characteristics (i.e., geologic materials, physical properties, and depth to ground water); and

(2) The potential for hazardous waste or hazardous waste constituents which enter the uppermost aquifer to migrate to a water supply well or surface water, by an evaluation of:

(i) Saturated zone characteristics (i.e., geologic materials, physical properties, and rate of ground-water flow); and

(ii) The proximity of the facility to water supply wells or surface water.

(d) If an owner or operator assumes (or knows) that ground-water monitoring of indicator parameters in accordance with §§265.91 and 265.92 would show statistically significant increases (or decreases in the case of pH) when evaluated under § 265.93(b), he may, install, operate, and maintain an alternate ground-water monitoring system (other than the one described in §§ 265.91 and 265.92). If the owner or operator decides to use an alternate ground-water monitoring system he must:

(1) Within one year after the effective date of these regulations, submit to the Regional Administrator a specific plan, certified by a qualified geologist or geotechnical engineer, which satisfies the requirements of § 265.93(d)(3), for an alternate ground-water monitoring system;

(2) Not later than one year after the effective date of these regulations, initiate the determinations specified in § 265.93(d)(4);

(3) Prepare and submit a written report in accordance with § 265.93(d)(5);

(4) Continue to make the determinations specified in § 265.93(d)(4) on a quarterly basis until final closure of the facility; and

(5) Comply with the recordkeeping and reporting requirements in § 265.94(b).

§ 265.91 Ground-water monitoring system.

(a) A ground-water monitoring system must be capable of yielding ground-water samples for analysis and must consist of:

(1) Monitoring wells (at least one) installed hydraulically upgradient (i.e., in the direction of increasing static head) from the limit of the waste management area. Their number, locations, and depths must be sufficient to yield ground-water samples that are:

(i) Representative of background ground-water quality in the uppermost aquifer near the facility; and

(ii) Not affected by the facility; and

(2) Monitoring wells (at least three) installed hydraulically downgradient (i.e., in the direction of decreasing static head) at the limit of the waste management area. Their number, locations, and depths must ensure that they immediately detect any statistically significant amounts of hazardous waste or hazardous waste constituents that migrate from the waste management area to the uppermost aquifer.

(b) Separate monitoring systems for each waste management component of a facility are not required provided that provisions for sampling upgradient and downgradient water quality will detect any discharge from the waste management area.

(1) In the case of a facility consisting of only one surface impoundment, landfill, or land treatment area, the waste management area is described by the waste boundary (perimeter).

(2) In the case of a facility consisting of more than one surface impoundment, landfill, or land treatment area, the waste management area is described by an imaginary boundary line which circumscribes the several waste management components.

(c) All monitoring wells must be cased in a manner that maintains the integrity of the monitoring well bore hole. This casing must be screened or perforated, and packed with gravel or sand where necessary, to enable sample collection at depths where appropriate aquifer flow zones exist. The annular space (i.e., the space between the bore hole and well casing) above the sampling depth must be sealed with a suitable material (e.g., cement grout or bentonite slurry) to prevent contamination of samples and the ground water.

§ 265.92 Sampling and analysis.

(a) The owner or operator must obtain and analyze samples from the installed ground-water monitoring system. The owner or operator must develop and follow a ground-water sampling and analysis plan. He must keep this plan at the facility. The plan must include procedures and techniques for:

(1) Sample collection;

(2) Sample preservation and shipment;

(3) Analytical procedures; and

(4) Chain of custody control.

[*Comment:* See "Procedures Manual For Ground-water Monitoring At Solid Waste Disposal Facilities," EPA–530/SW–611, August 1977 and "Methods for Chemical Analysis of Water and Wastes," EPA–600/4–79–020, March 1979 for discussions of sampling and analysis procedures.]

(b) The owner or operator must determine the concentration or value of the following parameters in ground-water samples in accordance with paragraphs (c) and (d) of this section:

(1) Parameters characterizing the suitability of the ground water as a drinking water supply, as specified in Appendix III.

(2) Parameters establishing ground-water quality:

(i) Chloride
(ii) Iron
(iii) Manganese
(iv) Phenols
(v) Sodium
(vi) Sulfate

[*Comment:* These parameters are to be used as a basis for comparison in the event a ground-water quality assessment is required under § 265.93(d).]

(3) Parameters used as indicators of ground-water contamination:

(i) pH
(ii) Specific Conductance
(iii) Total Organic Carbon
(iv) Total Organic Halogen

(c)(1) For all monitoring wells, the owner or operator must establish initial background concentrations or values of all parameters specified in paragraph (b) of this Section. He must do this quarterly for one year.

(2) For each of the indicator parameters specified in paragraph (b)(3) of this Section, at least four replicate measurements must be obtained for each sample and the initial background arithmetic mean and variance must be determined by pooling the replicate measurements for the respective parameter concentrations or values in samples obtained from upgradient wells during the first year.

(d) After the first year, all monitoring wells must be sampled and the samples analyzed with the following frequencies:

(1) Samples collected to establish ground-water quality must be obtained and analyzed for the parameters specified in paragraph (b)(2) of this Section at least annually.

(2) Samples collected to indicate ground-water contamination must be obtained and analyzed for the parameters specified in paragraph (b)(3) of this Section at least semi-annually.

(e) Elevation of the ground-water surface at each monitoring well must be determined each time a sample is obtained.

§ 265.93 Preparation, evaluation, and response.

(a) Within one year after the effective date of these regulations, the owner or operator must prepare an *outline* of a ground-water quality assessment program. The outline must describe a more comprehensive ground-water monitoring program (than that described in §§ 265.91 and 265.92) capable of determining:

(1) Whether hazardous waste or hazardous waste constituents have entered the ground water;

(2) The rate and extent of migration of hazardous waste or hazardous waste constituents in the ground water; and

(3) The concentrations of hazardous waste or hazardous waste constituents in the ground water.

(b) For each indicator parameter specified in § 265.92(b)(3), the owner or operator must calculate the arithmetic mean and variance, based on at least four replicate measurements on each sample, for each well monitored in accordance with § 265.92(d)(2), and compare these results with its initial background arithmetic mean. The comparison must consider individually each of the wells in the monitoring system, and must use the Student's t-test at the 0.01 level of significance (see Appendix IV) to determine statistically significant increases (and decreases, in the case of pH) over initial background.

(c)(1) If the comparisons for the *upgradient* wells made under paragraph (b) of this Section show a significant increase (or pH decrease), the owner or operator must submit this information in accordance with § 265.94(a)(2)(ii).

(2) If the comparisons for *downgradient* wells made under paragraph (b) of this Section show a significant increase (or pH decrease), the owner or operator must then immediately obtain additional ground-water samples from those downgradient wells where a significant difference was detected, split the samples in two, and obtain analyses of all additional samples to determine whether the significant difference was a result of laboratory error.

(d)(1) If the analyses performed under paragraph (c)(2) of this Section confirm the significant increase (or pH decrease), the owner or operator must provide written notice to the Regional Administrator—within seven days of the date of such confirmation—that the facility may be affecting ground-water quality.

(2) Within 15 days after the notification under paragraph (d)(1) of this Section, the owner or operator must develop and submit to the Regional Administrator a specific plan, based on the outline required under paragraph (a) of this Section and certified by a qualified geologist or geotechnical engineer, for a ground-water quality assessment program at the facility.

(3) The plan to be submitted under § 265.90(d)(1) or paragraph (d)(2) of this Section must specify:

(i) The number, location, and depth of wells;

(ii) Sampling and analytical methods for those hazardous wastes or hazardous waste constituents in the facility;

(iii) Evaluation procedures, including any use of previously-gathered ground-water quality information; and

(iv) A schedule of implementation.

(4) The owner or operator must implement the ground-water quality assessment plan which satisfies the requirements of paragraph (d)(3) of this Section, and, at a minimum, determine:

(i) The rate and extent of migration of the hazardous waste or hazardous waste constituents in the ground water; and

(ii) The concentrations of the hazardous waste or hazardous waste constituents in the ground water.

(5) The owner or operator must make his first determination under paragraph (d)(4) of this Section as soon as technically feasible, and, within 15 days after that determination, submit to the Regional Administrator a written report containing an assessment of the ground-water quality.

(6) If the owners or operator determines, based on the results of the first determination under paragraph (d)(4) of this Section, that no hazardous waste or hazardous waste constituents from the facility have entered the ground water, then he may reinstate the indicator evaluation program described in § 265.92 and paragraph (b) of this Section. If the owner or operator reinstates the indicator evaluation program, he must so notify the Regional Administrator in the report submitted under paragraph (d)(5) of this Section.

(7) If the owner or operator determines, based on the first determination under paragraph (d)(4) of this Section, that hazardous waste or hazardous waste constituents from the facility have entered the ground water, then he:

(i) Must continue to make the determinations required under paragraph (d)(4) of this Section on a quarterly basis until final closure of the facility, if the ground-water quality assessment plan was implemented prior to final closure of the facility; or

(ii) May cease to make the determinations required under paragraph (d)(4) of this Section, if the ground-water quality assessment plan was implemented during the post-closure care period.

(e) Notwithstanding any other provision of this Subpart, any ground-water quality assessment to satisfy the requirements of § 265.93(d)(4) which is initiated prior to final closure of the facility must be completed and reported in accordance with § 265.93(d)(5).

(f) Unless the ground water is monitored to satisfy the requirements of § 265.93(d)(4), at least annually the owner or operator must evaluate the data on ground-water surface elevations obtained under § 265.92(e) to determine whether the requirements under § 265.91(a) for locating the monitoring wells continues to be satisfied. If the evaluation shows that § 265.91(a) is no longer satisfied, the owner or operator must immediately modify the number, location, or depth of the monitoring wells to bring the ground-water monitoring system into compliance with this requirement.

§ 265.94 Recordkeeping and reporting.

(a) Unless the ground water is monitored to satisfy the requirements of § 265.93(d)(4), the owner or operator must:

(1) Keep records of the analyses required in § 265.92(c) and (d), the associated ground-water surface elevations required in § 265.92(e), and

the evaluations required in § 265.93(b) throughout the active life of the facility, and, for disposal facilities, throughout the post-closure care period as well; and

(2) Report the following ground-water monitoring information to the Regional Administrator:

(i) During the first year when initial background concentrations are being established for the facility: concentrations or values of the parameters listed in § 265.92(b)(1) for each ground-water monitoring well within 15 days after completing each quarterly analysis. The owner or operator must separately identify for each monitoring well any parameters whose concentration or value has been found to exceed the maximum contaminant levels listed in Appendix III.

(ii) Annually: concentrations or values of the parameters listed in § 265.92(b)(3) for each ground-water monitoring well, along with the required evaluations for these parameters under § 265.93(b). The owner or operator must separately identify any significant differences from initial background found in the upgradient wells, in accordance with § 265.93(c)(1). During the active life of the facility, this information must be submitted as part of the annual report required under § 265.75.

(iii) As a part of the annual report required under § 265.75: results of the evaluation of ground-water surface elevations under § 265.93(f), and a description of the response to that evaluation, where applicable.

(b) If the ground water is monitored to satisfy the requirements of § 265.93(d)(4), the owner or operator must:

(1) Keep records of the analyses and evaluations specified in the plan, which satisfies the requirements of § 265.93(d)(3), throughout the active life of the facility, and, for disposal facilities, throughout the post-closure care period as well; and

(2) Annually, until final closure of the facility, submit to the Regional Administrator a report containing the results of his ground-water quality assessment program which includes, but is not limited to, the calculated (or measured) rate of migration of hazardous waste or hazardous waste constituents in the ground water during the reporting period. This report must be submitted as part of the annual report required under § 265.75.

§§ 265.95–265.109 [Reserved]

Subpart G—Closure and Post-Closure

§ 265.110 Applicability.

Except as § 265.1 provides otherwise:

(a) Sections 265.111–265.115 (which concern closure) apply to the owners and operators of all hazardous waste facilities; and

(b) Sections 265.117–265.120 (which concern post-closure care) apply to the owners and operators of all disposal facilities.

§ 265.111 Closure performance standard.

The owner or operator must close his facility in a manner that: (a) minimizes the need for further maintenance, and (b) controls, minimizes or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous waste constituents, leachate, contaminated rainfall, or waste decomposition products to the ground water, or surface waters, or to the atmosphere.

§ 265.112 Closure plan; amendment of plan.

(a) On the effective date of these regulations, the owner or operator must have a written closure plan. He must keep this plan at the facility. This plan must identify the steps necessary to completely close the facility at any point during its intended life and at the end of its intended life. The closure plan must include, at least:

(1) A description of how and when the facility will be partially closed, if applicable, and ultimately closed. The description must identify the maximum extent of the operation which will be be unclosed during the life of the facility, and how the requirements of § 265.111 and the applicable closure requirements of §§ 265.197, 265.228, 265.280, 265.310, 265.351, 265.381, and 265.404 will be met;

(2) An estimate of the maximum inventory of wastes in storage or in treatment at any given time during the life of the facility;

(3) A description of the steps needed to decontaminate facility equipment during closure; and

(4) A schedule for final closure which must include, as a minimum, the anticipated date when wastes will no longer be received, the date when completion of final closure is anticipated, and intervening milestone dates which will allow tracking of the progress of closure. (For example, the expected date for completing treatment or disposal of waste inventory must be included, as must the planned date for removing any residual wastes from storage facilities and treatment processes.)

(b) The owner or operator may amend his closure plan at any time during the active life of the facility. (The active life of the facility is that period during which wastes are periodically received.) The owner or operator must amend his plan any time changes in operating plans or facility design affect the closure plan.

(c) The owner or operator must submit his closure plan to the Regional Administrator at least 180 days before the date he expects to begin closure. The Regional Administrator will modify, approve, or disapprove the plan within 90 days of receipt and after providing the owner or operator and the affected public (through a newspaper notice) the opportunity to submit written comments. If an owner or operator plans to begin closure within 180 days after the effective date of these regulations, he must submit the necessary plans on the effective date of these regulations.

§ 265.113 Time allowed for closure.

(a) Within 90 days after receiving the final volume of hazardous wastes, the owner or operator must treat all hazardous wastes in storage or in treatment, or remove them from the site, or dispose of them on-site, in accordance with the approved closure plan.

(b) The owner or operator must complete closure activities in accordance with the approved closure plan and within six months after receiving the final volume of wastes. The Regional Administrator may approve a longer closure period under § 265.112(c) if the owner or operator can demonstrate that: (1) the required or planned closure activities will, of necessity, take him longer than six months to complete, and (2) that he has taken all steps to eliminate any significant threat to human health and the environment from the unclosed but inactive facility.

§ 265.114 Disposal or decontamination of equipment.

When closure is completed, all facility equipment and structures must have been properly disposed of, or decontaminated by removing all hazardous waste and residues.

§ 265.115 Certification of closure.

When closure is completed, the owner or operator must submit to the Regional Administrator certification both by the owner or operator and by an independent registered professional engineer that the facility has been closed in accordance with the

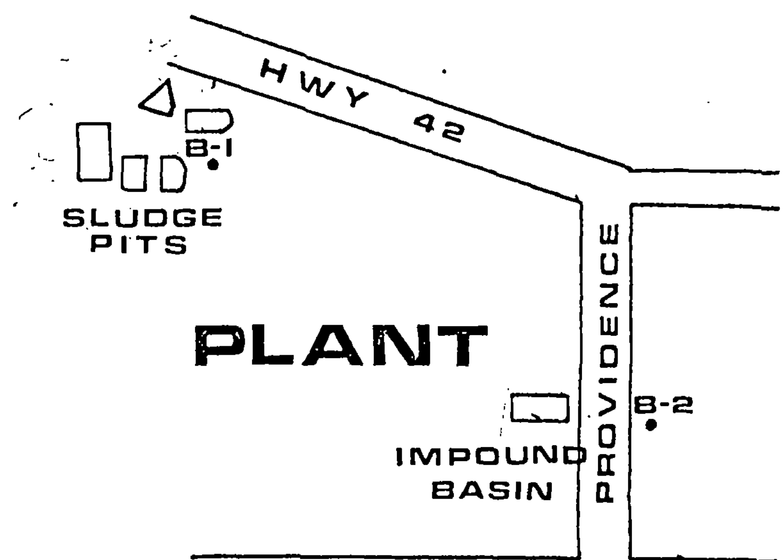
TABLE 1 - RESULTS OF CHEMICAL ANALYSES AND WATER LEVEL OBSERVATION

WELL NO.	pH	SP. COND (μ mhos)	Cl	SO4	ALK. TOTAL	ALK PHEN	ALK BICARB	Na	K	Ca	Mg	TOC	DELNAV
B-1	7.25	220	1.25	7.82	210	0.0	210.0	<1	<1	11.0	2.0	9	<1 ppb
B-2	8.25	270	1.00	8.23	245	5.0	235.0	<1	<1	<1	3.0	15	<1 ppb

Appearance of Samples: Clear
Odor: None
All units are mg/l unless specified

WATER LEVEL OBSERVATION (8/4/80)

WELL NO.	LAND ELEVATION (+MSL)	WATER LEVEL (+MSL)
B-1	155.0	130.6
B-2	159.7	121.5



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

Form Approved OMB No. 158-R0175

FORM 1 GENERAL

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program
(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER

F MSD008182081

LABEL ITEMS

I. EPA I.D. NUMBER — MSD008182081

III. FACILITY NAME — HERCULES INCORPORATED

V. FACILITY MAILING ADDRESS — PO BOX ~~1552~~ 1937
HATTIESBURG, MS 39401

VI. FACILITY LOCATION — W SEVENTH ST
HATTIESBURG, MS 39401

Reference 8

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

III. NAME OF FACILITY

1 SKIP HERCULES INCORPORATED

IV. FACILITY CONTACT

A. NAME & TITLE (last, first, & title)	B. PHONE (area code & no.)
2 THOMS TE DEVELOPMENT SUPV.	601 545 3450

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

3 PO BOX 1937

B. CITY OR TOWN	C. STATE	D. ZIP CODE
4 HATTIESBURG	MS	39401

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

5 WEST 7TH STREET

B. COUNTY NAME

FORREST

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE (if known)
6 HATTIESBURG	MS	39401	

EPA Form 3510-1 (6-80)

CONTINUE ON REVERSE

CONTINUED FROM THE FRONT

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

A. FIRST		B. SECOND	
7 2861	(specify) Gum and wood chemicals	7 2821	(specify) Synthetic resins

C. THIRD		D. FOURTH	
7 2822	(specify) Synthetic rubber	7 2879	(specify) Pesticides & Agricultural Chemica

VIII. OPERATOR INFORMATION

A. NAME: 8 HERCULES INCORPORATED

B. Is the name listed in Item VIII-A also the owner? [X] 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)

P (specify) Private

D. PHONE (area code & no.): A 601 545 3450

E. STREET OR P.O. BOX: PO BOX 1937

F. CITY OR TOWN: B HATTIESBURG

G. STATE: MS

H. ZIP CODE: 39401

IX. INDIAN LAND

Is the facility located on Indian lands? [ ] YES [X] NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water)	D. PSD (Air Emissions from Proposed Sources)	
9 N MS0001830	9 P NA	
B. UIC (Underground Injection of Fluids)	**E. OTHER (specify)**	
9 U NA	9 0800-00001	(specify) Air Permit
C. RCRA (Hazardous Wastes)	**E. OTHER (specify)**	
9 R NA	9 NA	(specify) NA

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. (See attached)

XII. NATURE OF BUSINESS (provide a brief description)

Manufacture of wood naval stores products; rosin, turpentine and pine oil. Manufacture modified resins, polyamides, Ketene dimer, wax emulsions, synthetic rubber, and an agricultural pesticide. Also, crude tall oil and pulp mill liquid refining, rosin, fatty acids, and terpene derivatives.

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
D. H. Little Vice President - Production	[signature]	Nov. 18. 1980

COMMENTS FOR OFFICIAL USE ONLY

C

|_|_|_|_|_| (1-5)
(DO NOT USE)

FORM A: GENERAL FACILITY INFORMATION

Company Name: Hercules Incorporated
Division/Subsidiary
Facility Name: Hattiesburg Plant

Address: West 7th Street
No. Street

Hattiesburg, Mississippi 39401
City State Zip Code

Name of Person Completing Form: R. H. Heller

Position: Plant Manager

Phone Number: (601) 545-3450

1. Year Facility Opened .... 19 |2|3| (10-11)

2. Primary SIC Code : .... |2|8|6|1| (12-15)

3. Estimate the total amounts of process wastes (excluding wastes sold for use) generated by this facility during 1978:
USE ONLY TONS IF POSSIBLE - right justify response

thousand gallons	|_|_|_|_|_|_|_|_|_|	(16-24)
hundred tons	|_|_|_|_|_|3|5|0|	(25-32)
thousand cubic yards	|_|_|_|_|_|_|_|_|_|	(33-41)

4. Estimate (in whole percents) how these process wastes generated in 1978 were disposed of:

in landfill	|_|9|8|	(42-44)
in pit/pond/lagoon	|_|_|2|	(45-47)
in deep well	|_|_|_|	(48-50)
incinerated	|_|_|_|	(51-53)
reprocessed/recycled	|_|_|_|	(54-56)
evaporated	|_|_|_|	(57-59)
unknown	|_|_|_|	(60-62)
other (Specify ____________)..........	|_|_|_|	(63-65)

5. What is the total number of known sites (including disposal on the property where this facility is located as one site) that have been used for the disposal of process wastes from this facility since 1950? .... |_|1|4| (66-68)

COMPLETE ONE FORM "B" FOR EACH OF THE SITES

6. Have any of the process wastes generated at this facility been hauled (removed) from this facility for disposal? (Yes=1; no=2) .... |1| (69)

IF YES, COMPLETE FORM "C"

7. Do you know the disposal site locations of all of the process waste hauled from your facility since 1950? (Yes=1; no=2) .... |2| (70)

IF NO, COMPLETE ONE FORM "D" FOR EACH FIRM OR CONTRACTOR WHO TOOK WASTE TO AN UNKNOWN LOCATION

8. Specify the earliest year represented by information from company or facility records supplied on this and other forms .... 19|7|1| (71-72)

9. Specify the earliest year represented by information from employee knowledge supplied on this and other forms .... 19|6|7| (73-74)

FORM B: DISPOSAL SITE INFORMATION

(DO NOT USE) (1-8)

COMPLETE THIS FORM FOR EVERY SITE (INCLUDING THE LOCATION OF THIS FACILITY AS ONE SITE) USED FOR THE DISPOSAL OF PROCESS WASTES GENERATED BY THIS FACILITY SINCE 1950.

Company Name: Hercules Incorporated Division/Subsidiary
Facility Name: Hattiesburg Plant
Name of Site: Back 40
Address of Site: West 7th St.
no. street
Hattiesburg Mississippi 39401
city state zip code

Name of Owner (while used by facility): Hercules Incorporated
Address: West 7th St.
no. street
Hattiesburg Mississippi 39401
city state zip code

Current Owner (if different from above): Same
Address:
no. street

city state zip code

1. Location (1= the property on which facility is located; 2= off-site)..... [1] (10)
2. Ownership at time of use (1= company ownership; 2=private but not company ownership) 3=public ownership) ..... [1] (11)
3. Current status (1= closed; 2= still in use; 9=don't know) ..... [2] (12)
   IF CLOSED, specify year closed ..... 19[ ] (13-14)
4. Year first used for process waste from this facility ..... 19[2 3] (15-16)
5. Year last used for process waste from this facility (enter "79" if still in use) ..... 19[7 9] (17-18)
6. Total amount of process waste from this facility disposed at site:
   USE TONS ONLY IF POSSIBLE
   Right justify response
   thousand gallons ..... [ ] (19-26)
   hundred tons ..... [3 4 7 1] (27-33)
   thousand cubic yards ..... [ ] (34-41)
7. Specify type(s) of disposal method(s) used at site and whether method is still in use (1=currently in use; 2=no longer in use; 3=never used; 9=don't know)
   - landfill, mono industrial waste ..... [1] (42)
   - landfill, mixed industrial waste ..... [1] (43)
   - landfill, drummed waste ..... [1] (44)
   - landfill, municipal refuse co-disposed ..... [3] (45)
   - pits/ponds/lagoons ..... [1] (46)
   - deep well injection ..... [3] (47)
   - land farming ..... [3] (48)
   - incineration ..... [2] (49)
   - treatment (eg. neutralizing) ..... [3] (50)
   - reprocessing/recycling ..... [3] (51)
   - other (specify) ..... [3] (52)
8. Users of this site (1=this facility; 2=this facility and other company facilities only; 3=this company and others; 9=don't know) ..... [1] (53)

LIST NAMES AND ADDRESSES OF OTHER KNOWN USERS BELOW

FORM B CONTINUED ON SECOND PAGE

[1] (80)

FORM B - Page 2

Company Name: Hercules Incorporated
Division/Subsidiary
Facility Name: ~~Hattiesburg Plant~~

Site Name: Back 40

(DO NOT USE)

9. Components (or characteristics) of process waste from this facility disposed at site: (1=present in waste; 2=not present in waste; 9=don't know)

FILL IN EVERY BLOCK SPACE

Component	Code	Column	
Acid solutions, with $pH < 3$	2	(10)	
pickling liquor	2	(11)	
metal plating waste	2	(12)	
circuit etchings	2	(13)	
inorganic acid manufacture	2	(14)	
organic acid manufacture	2	(15)	
Base solutions, with $pH > 12$	2	(16)	
caustic soda manufacture	2	(17)	
nylon and similar polymer generation	2	(18)	
scrubber residual	2	(19)	
Heavy metals & trace metals (bonded organically & inorganically)	2	(20)	
arsenic, selenium, antimony	2	(21)	
mercury	2	(22)	
✓iron, manganese, magnesium	1	(23)	Trace
✓zinc, cadmium, copper, chromium (trivalent)	1	(24)	Trace
chromium (hexavalent)	2	(25)	
lead	2	(26)	
Radioactive residues, >50pico curies/liter	2	(27)	
uranium residuals & residuals for UF_6 recycling	2	(28)	
lathanide series elements and rare earth salts	2	(29)	
phosphate slag	2	(30)	
thorium	2	(31)	
radium	2	(32)	
other alpha, beta & gamma emitters	2	(33)	
✓Organics	1	(34)	
✓pesticides & intermediates	1	(35)	Trace
herbicides & intermediates	2	(36)	
fungicides & intermediates	2	(37)	
rodenticides & intermediates	2	(38)	
✓halogenated aliphatics	1	(39)	Trace
halogenated aromatics	2	(40)	
acrylates & latex emulsions	2	(41)	
PCB/PBB's	2	(42)	
amides, amines, imides	1	(43)	Trace
plastizers	2	(44)	
✓resins	1	(45)	
✓elastomers	1	(46)	
✓solvents polar (except water)	1	(47)	Trace
carbontetrachloride	2	(48)	
trichloroethylene	2	(49)	
✓other solvents nonpolar	1	(50)	Trace
✓solvents halogenated aliphatic	1	(51)	Trace
solvents halogenated aromatic	2	(52)	
✓oils and oil sludges	1	(53)	
✓esters and ethers	1	(54)	
✓alcohols	1	(55)	Trace
✓ketones & aldehydes	1	(56)	Trace
dioxins	2	(57)	
✓Inorganics	1	(58)	
✓salts	1	(59)	
✓mercaptans	1	(60)	
Misc	2	(61)	
pharmaceutical wastes	2	(62)	
paints & pigments	2	(63)	
catalysts (eg. vanadium, platinum, palladium)	2	(64)	
asbestos	2	(65)	
shock sensitive wastes (eg. nitrated toluenes)	2	(66)	
air water reactive wastes (eg. P_4, aluminum chloride)	2	(67)	
wastes with flash point below 100° F	2	(68)	

FORM C: HAULER INFORMATION

(DO NOT USE) (1-5)

PROVIDE A COMPLETE LIST OF ALL FIRMS AND INDEPENDENT CONTRACTORS, INCLUDING THE COMPANY AND ITS AFFILIATES AND SUBSIDIARIES, USED TO REMOVE PROCESS WASTES FROM THIS FACILITY SINCE 1950.

Company Name: Hercules Incorporated
Division/Subsidiary
Facility Name: Hattiesburg Plant

Name of Firm or Contractor	Address	ICC # (If Known)	Years Used
Hercules Incorporated	Hattiesburg, Mississippi		9
Rollings Enviromental Services Inc.	Baton Rouge, LA.		9
City of Hattiesburg	Hattiesburg, Mississippi		7
Hover Gravel Co.	Hattiesburg, Mississippi		3
Chem Dyne Corp.	Hamilton, Ohio		1

Please print or type in the unshaded areas only
(fill–in areas are spaced for elite type, i.e., 12 chara... inch).

Form Approved OMB No. 158-S80004

FORM 3 RCRA

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

HAZARDOUS WASTE PERMIT APPLICATION

Consolidated Permits Program

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

I. EPA I.D. NUMBER

S												T/A	C
F	M	S	D	0	0	8	1	8	2	0	8	1	

FOR OFFICIAL USE ONLY

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

Reference 9

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 firs... 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	42	03	20

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	PRO-CESS 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

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.

S		T/A	C
C	DUP		1

LINE NUMBER	A. PRO-CESS CODE *(from list above)*	B. PROCESS DESIGN CAPACITY 1. AMOUNT *(specify)*	2. UNIT OF MEASURE *(enter code)*	FOR OFFICIAL USE ONLY	LINE NUMBER	A. PRO-CESS 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	T 0 2	5,900	U		7				
2	S 0 2	28,000	G		8				
3					9				
4					10				

ntinued from the front.

. PROCESSES *(continued)*

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

T02 - The plant neutralizes ~~5,000~~ 5900 gals./day of waste H_2SO_4 from the rosin polymerization operation.

should be design capacity

. DESCRIPTION OF HAZARDOUS WASTES

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.

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.

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.

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.

)TE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER — Hazardous wastes that can be described by re 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.

AMPLE 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 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 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 0 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

O Z	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	K 0 5 4	900	P	T 0 3 D 8 0	
-2	D 0 0 2	400	P	T 0 3 D 8 0	
-3	D 0 0 1	100	P	T 0 3 D 8 0	
	0 0 2				included with above

CONTINUE ON PAGE 3

Continued from page 2.
NOTE: Photocopy this page before completing if you [have] more than 26 wastes to list.

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EPA I.D. NUMBER (enter from page 1)	T/A	C	FOR OFFICIAL USE ONLY	T/A	C	
W M S D 0 0 8 1 8 2 0 8 1		1	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	D002	3,500	T	S02	T02			
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								

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)													T/A	C
F	M	S	D	0	0	8	1	8	2	0	8	1		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)
89 18 30	31 20 30

VIII. FACILITY OWNER

[X] 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	

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

IX. OWNER CERTIFICATION

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

A. NAME (print or type)	B. SIGNATURE	C. DATE SIGNED
D. H. Little Vice President - Production	D H Little	Nov. 18, 1980

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
D. H. Little Vice President - Production	D H Little	Nov. 18, 1980

CONTINUE ON PAGE 5

...tinued from page 4.

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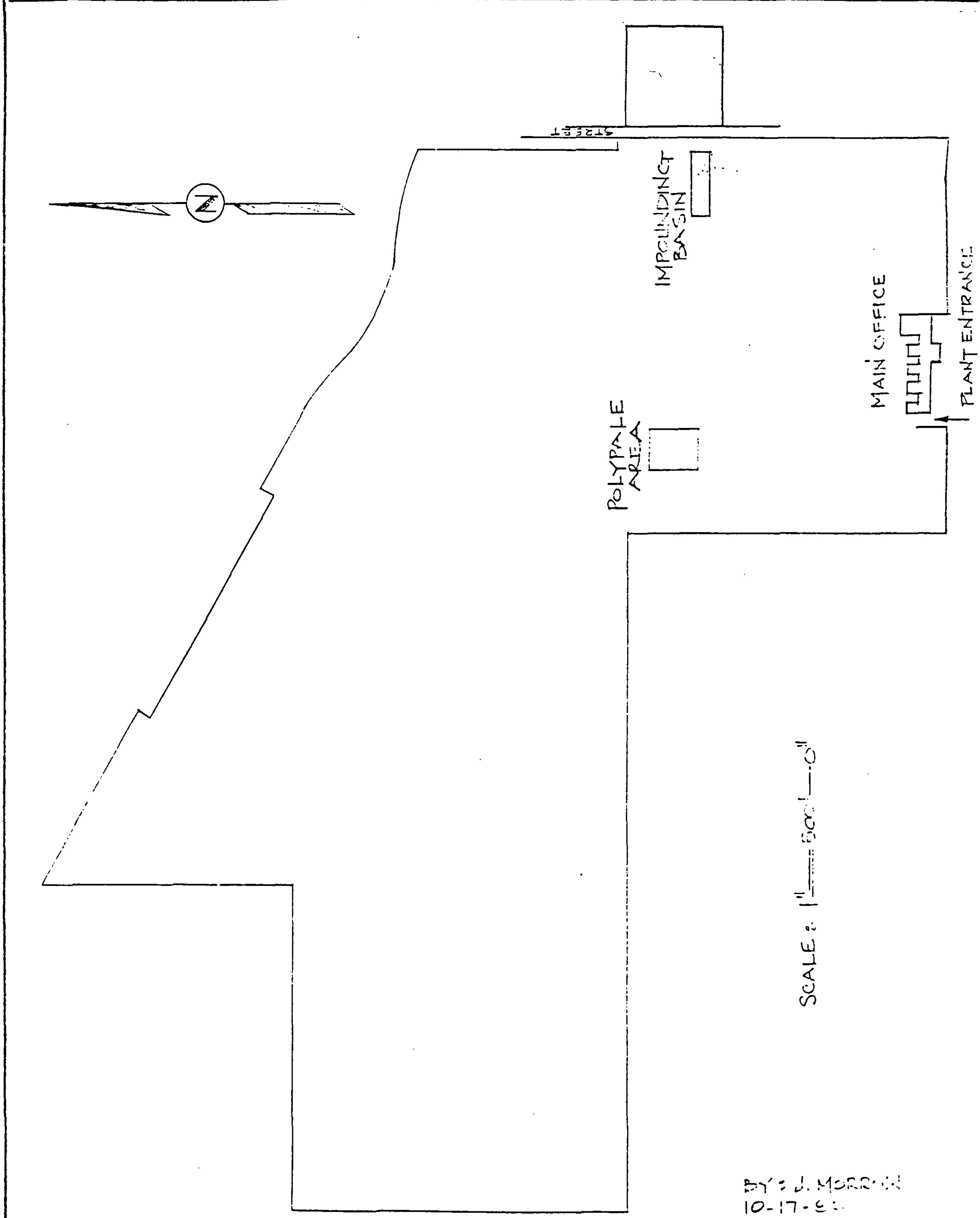
V. FACILITY DRAWING *(see page 4)*



Reference 10

HERCULES

Hercules Incorporated
West 7th Street
P.O. Box 1937
Hattiesburg, MS 39401
(601) 545-3450

February 18, 1983

RECEIVED
1983 FEB 22 AM 9:38
AIR & WATER POLLUTION CONTROL COMMISSION
STATE OF MISSISSIPPI

Mississippi Department of Natural Resources
Bureau of Pollution Control
Division of Solid Waste Management
P. O. Box 10385
Jackson, MS 39209
Attn: Mr. John Herrmann

Dear Mr. Herrmann:

On January 27, 1983, we met with you to review our initial notification of hazardous waste activity and subsequent hazardous waste permit application. The meeting was very beneficial with your clarification of several aspects of hazardous waste activity.

In summary, we agreed that our initial notification and subsequent hazardous waste permit application as a storer and treater of hazardous waste (spent sulfuric acid) was misleading. All of the acid is beneficially used for pH control during primary wastewater treatment and supplemented with the purchase of additional fresh acid. In fact, the spent acid does not meet any of the criteria in part 261.2 (definition of a solid waste) and therefore we conclude if it is not a solid waste it is not a hazardous waste. The "storage" tanks are only used to control optimum discharge of the spent acid. As you requested, we also looked at heavy metals, using the EP toxicity procedure, in our impounding basin sludge (the continuous flowthrough basin is for wastewater equalization and pH control) and also in the wastewater from the process generating the spent acid. No levels were found anywhere near the levels listed as maximum concentration of contaminants characteristic of EP toxicity. Also, the only reason underground injection was marked on our original notification was because of sanitary septic tanks and after talking to David Lee on February 17, 1983, we concur that underground injection should also be removed. Therefore, we are submitting the enclosed amended notification of hazardous waste activity.

With your concurrence that the spent sulfuric acid is not a hazardous waste, we respectfully request that we be removed as a storer and treater of hazardous waste and be listed only as a generator of hazardous waste. Although we are not generating any hazardous waste on a regular basis we do feel that in the future we may generate non-specific hazardous waste from non-specific sources on occasions as the result of process malfunctions, contamination, etc., and therefore we wish to retain our EPA ID number. Please advise us on the procedure to accomplish being removed as a storer and treater of hazardous waste (eliminating the hazardous waste permit application) while retaining our EPA ID number.

If I can answer any questions or be of any help, please call me.

Yours truly,

Charles S Jordan

Charles S. Jordan
Environmental Coordinator

CSJ:ps

Enclosure

Reference 11

FILE COPY

State of Mississippi
Water Pollution Control
PERMIT

TO DISCHARGE WASTEWATER IN ACCORDANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

THIS CERTIFIES THAT

HERCULES, INC.
Hattiesburg, Mississippi

has been granted permission to discharge wastewater into

Bowie River

in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts I, II, and III hereof. This permit is issued in accordance with the provisions of the Mississippi Water Pollution Control Law (Section 49-17-1 et seq., Mississippi Code of 1972), and the regulations and standards adopted and promulgated thereunder, and under authority granted pursuant to Section 402 (b) of the Federal Water Pollution Control Act.

MISSISSIPPI NATURAL RESOURCES PERMIT BOARD

Original Signed By
CHARLES H. CHISOLM

DIRECTOR, BUREAU OF POLLUTION CONTROL
MISSISSIPPI DEPARTMENT OF NATURAL RESOURCES

Issued: September 29, 1986

Permit No . MS0001830

Expires: September 28, 1991

1 601 584 3226

NOV 3 '92 10:43 FROM HERCULES INC

Reference 12

HERCULES

HERCULES INCORPORATED
P.O.DRAWER 1937
HATTIESBURG, MS. 39401
601-545-3450
FAX # 601-584-3226

FAX COVER SHEET

MESSAGE TO: CARTER HELM (NAME) Ph - 404 901 5106

(DATE:) 11-3-92

(FIRM NAME)

(FAX #) 404 392 9289

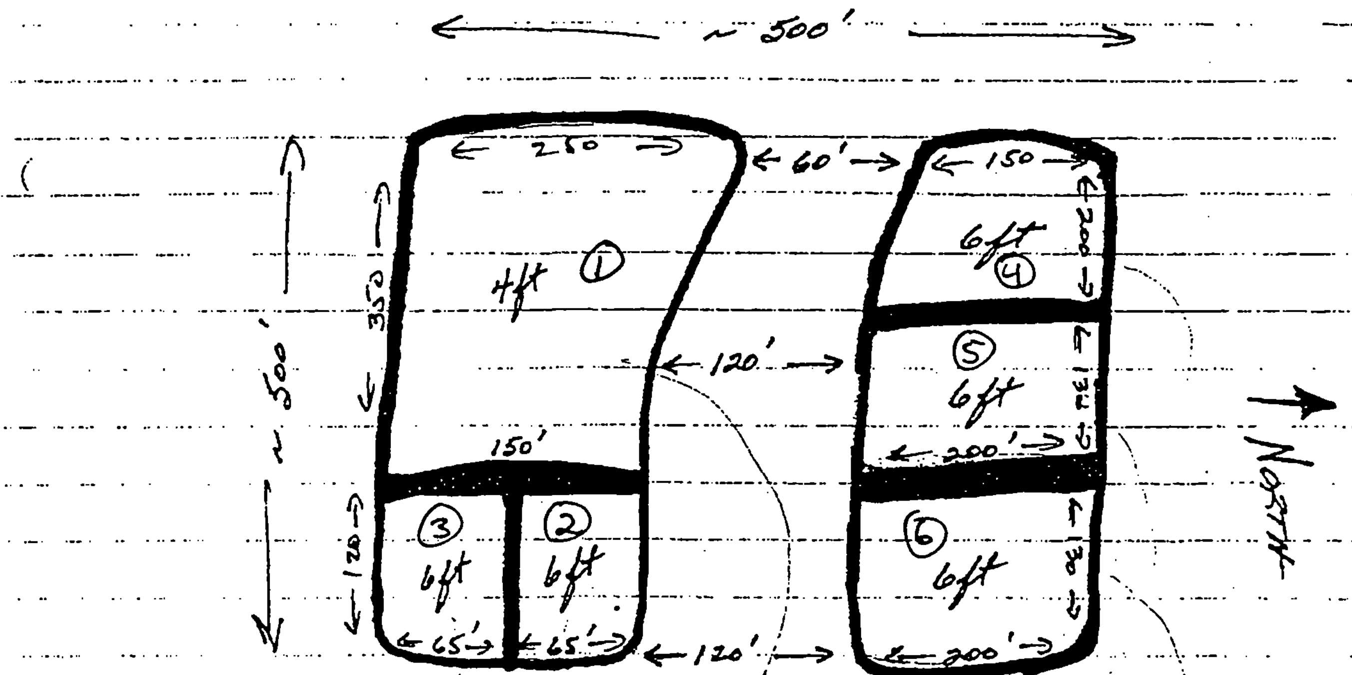
(CITY)

(STATE)

FROM CHARLES JORDAN

SHT. 1 OF 1

MESSAGE: "ALL ESTIMATES"



Here is Rough Est.

1) 350 × 200 × 4 = 280,000 FT³

2) 120 × 65 × 6 = 46,800

3) 120 × 65 × 6 = 46,800

4) 175 × 200 × 6 = 210,000

5) 200 × 130 × 6 = 156,000

6) 200 × 130 × 6 = 156,000

895,600 FT³

** TOTAL PAGE.001 **

Reference 13

MISSISSIPPI STATE GEOLOGICAL SURVEY

WILLIAM CLIFFORD MORSE, Ph.D.

DIRECTOR

BULLETIN 41

FORREST COUNTY MINERAL RESOURCES

GEOLOGY

By

VELLORA MEEK FOSTER, M.Sc.

TESTS

By

THOMAS EDWIN McCUTCHEON, B.S., Cer. Engr.

UNIVERSITY, MISSISSIPPI

[illegible]

EK FOSTER

1941

OLOGIST FRIEND MAN

MISSISSIPPI
STATE GEOLOGICAL SURVEY

WILLIAM CLIFFORD MORSE, Ph.D.
DIRECTOR

BULLETIN 44

FORREST COUNTY MINERAL RESOURCES

GEOLOGY
By
VELLORA MEEK FOSTER, M.Sc.

TESTS
By
THOMAS EDWIN McCUTCHEON, B.S., Cer.Engr.

Prepared in cooperation with the Forrest citizens and the WPA as a report on O. P. 465-62-3-275.

UNIVERSITY, MISSISSIPPI
1941

TESTS

ILLUSTRATIONS

CONTENTS

GEOLOGY

FORREST COUNTY MINERAL RESOURCES
GEOLOGY

VELLORA MEEK FOSTER, M.S.

INTRODUCTION

GENERAL

Forrest County is located in the southeastern part of the State and is bounded by Covington and Jones Counties on the north, Perry County on the east, Stone County on the south, and Pearl River and Lamar Counties on the west (Figure 1). It is made up of 13 townships and embraces an area of 460 square miles.[1]

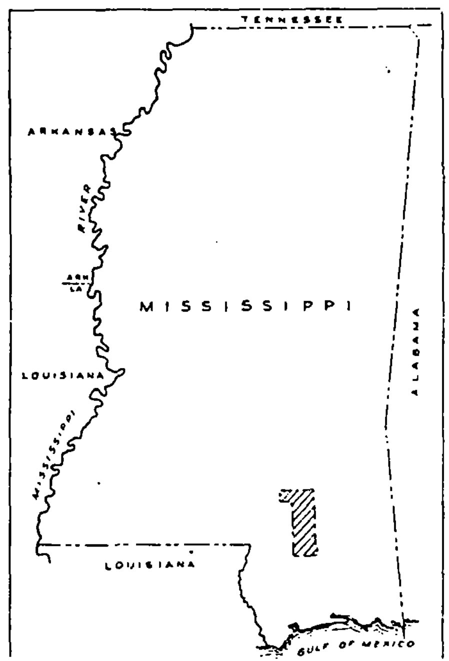


Figure 1.—Map showing location of Forrest County.

The entire county lies within the drainage area of the Leaf-Pascagoula River. The major streams all traverse the county in a southeasterly direction in strikingly parallel courses which follow approximately along the strike of the underlying formations. Named in succession, beginning with the most northeasterly, they are: Tallahala Creek, Leaf River, Bouie River, Black Creek, and Red River. The smaller streams, tributary to those named, are less regular in their courses, but in general they follow a northerly or southerly direction.

According to the 1940 census the county had a population of 34,894, of which about 63 percent were white and the remainder negro. Hattiesburg, the county seat, having a population of 21,024, is the commercial and manufacturing center of a large agricultural and lumbering area. Most of its industrial activity is based on the processing of agricultural and forestry products. There are several establishments, however, engaged in mining or manufacture of local mineral resources. Three companies mine sand and gravel from the river terraces, one makes common brick and tile from alluvial clay, and one uses local sand and gravel as an aggregate in the manufacture of cement tile.

Hattiesburg and its suburbs are supplied with natural gas from the Jackson gas field via the pipe line of a local company, and high tension electric lines of both the Mississippi Power & Light Company and the Rural Electrification Authority traverse the county.

Forrest County is served by four railroads and three paved highways all of which intersect at Hattiesburg. No part of the county, therefore, is more than six or eight miles from both railway and highway connections. In addition to the paved highways there is a network of excellent gravel roads extending to all parts of the county. The Leaf-Pascagoula River is considered navigable as far north as Hattiesburg and, although there is no longer any commercial traffic on the river, a channel can be established and maintained if the commerce of the future is sufficient to warrant periodic dredging.

TOPOGRAPHY

CUESTAS

The entire county lies within the Pine Hills physiographic region. The topography is essentially that of a maturely dissected plain sloping gently toward the southeast. Into this plain the major streams have cut broad terraced valleys separated by cuesta-shaped divides having steep northeasterly and gentle southwesterly slopes. In Forrest County cuestas are well developed between Leaf River and Black Creek and between Black Creek and Red River. The divides between Tallahala Creek and Leaf River and between Leaf and Bouie Rivers do not exhibit the typical cuesta shape and are described in connection with the stream terraces.

The crest of the divide between Leaf River and Black Creek enters the county about five miles southwest of Hattiesburg. It passes in a general southeasterly direction through the town of McLaurin and into Perry County. Although parts of the crest rise to elevations of more than 350 feet above sea level, much of the highland has been dissected by the headwaters of numerous tributary streams, and the general elevation of the crest is probably not more than 300 feet. The northward facing slope is relatively rugged and steep in character though somewhat modified by the terraces of the Leaf River. The back-slope, on the other hand, is more gentle, the streams longer, the valleys broader, and the topography more rolling. It is essentially a dip slope and toward the southwest it merges almost imperceptibly into the high terraces of Black Creek. Along parts of their courses some streams of the back-slope follow a southeasterly course and subsidiary or secondary cuestas have been developed. Thus the major watershed is in reality a composite of a complex cuesta.

The cuesta-shaped divide between Black Creek and Red River is similar to that described above, but even more complex. The main crest, which rises to an elevation of about 330 feet above sea level, enters the county north of Elder and extends in a general southeasterly direction through a point about two miles southwest of Maxie and thence to the southeastern corner of the county. The north slopes are rather abrupt in most places, but the face of the cuesta is modified by three or more prongs, or secondary cuestas, which form the divides between Black Creek and its major tributaries from the south: Little Black Creek, Big Creek, and Beaver Dam Creek. Thus the land surface appears to rise in two or more steps from the level of Black Creek to the top of the divide. The back-slopes of the secondary cuestas are in some places so gentle as to appear almost terrace-like. The back-slope of the major divide is less modified by stream erosion than is that of the cuesta between Leaf River and Black Creek and large areas are composed of very gently rolling upland. Within the limits of Forrest County the only well developed secondary cuesta on the backslope is the divide between Double Branch and Red River which occupies an area of about nine square miles in the extreme southwestern part of the county.

TERRACES

Among the most striking topographic features of Forrest County are the valleys of Bouie and Leaf Rivers and their bordering terraces. The modern valleys average respectively about two and four miles in width including the lowermost of the high terraces (elevation about 175 feet) on which Hattiesburg is built. At least two additional terraces are present at lower altitudes. Remnants of several higher terraces may also be seen in the northern part of the county.

Between Bouie and Leaf Rivers and between Leaf River and Tallahala Creek, at elevations ranging from about 200 to 290 feet, there are two fairly large areas of flat or gently rolling terraced upland (Figure 2) bordered by somewhat lower and more highly dissected areas. The cuesta shape, so characteristic of most interstream areas in the Pine Hills region, is not developed on these divides. Although they reach elevations of 125 feet or more above the floodplains these flat uplands nevertheless lie more than 75 feet below the cuesta crests to the northeast and southwest. Furthermore, the sediments on which the high plain is developed resemble lower terrace deposits rather than the gravelly sands which cap the typical cuestas in the southern half of the county. It seems evident, therefore, that the high flat divides of northern Forrest County should be considered terrace plains formed during an old erosion-deposition cycle of the associated streams.

The terraced character of the upland is best seen between the Leaf and Bouie Rivers where it is locally known as the Eatonville Flat. Along a road southeast from the town of Eatonville at least four major terraces may be seen above the first of the low terraces and including the highest level, on which Eatonville is situated. Also, the lowermost of the high terraces appears in some places to consist of three levels, separated one from the other by six-foot and eight-foot terrace scarps (Figures 3, 4, and 5B). Remnants of the several terraces are also

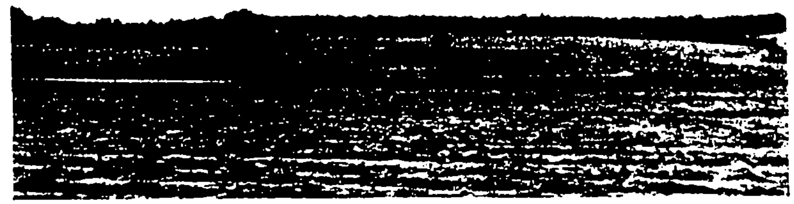


Figure 2.—High Terrace on Eatonville Flat, one mile east of Eatonville (NE.1/4, Sec. 8, T.5 N., R.13 W.). March 23, 1941.

present along other parts of the two valleys, but recent erosion has interrupted their continuity and somewhat modified their character. A proper description and correlation of the terraces, therefore, are impossible in the absence of topographic maps.

Southwest of Bouie River and extending about five miles south of Hattiesburg, there is another rather large rolling highland, some parts of which reach elevations corresponding to those of the Eatonville Flat terraces, and some parts of which are covered with terrace sand and gravel. Throughout most of that area, however, the typical silty clays of the Hattiesburg formation are at or near the surface, the elevations of which are between 200 and 250 feet, and correspond roughly with that of the clay underlying the terrace deposits north of the river. Along the outer edge of this series of terraces, thick deposits of sand and gravel, containing silt and clay in the basal part, overlap the lower part of the cuesta face.

Remnants of similar deposits are to be found along the south side of the Leaf River valley from Hattiesburg southeast into Perry County. This part of the valley wall is highly dissected and the terrace character is obscured. It is extremely difficult,

Figure 3.—High Terraces on Eatonville Flat, one mile southeast of Eatonville, showing terrace scarp between second and third terraces in right background (SW.1/4, SE.1/4, Sec. 8, T.5 N., R.13 W.). March 23, 1941.

Figure 4.—Terrace scarp between Second and Third High Terraces, 0.7 mile southeast of Eatonville (SE.1/4, SW.1/4, Sec. 8, T.5 N., R.13 W.). March 23, 1941.

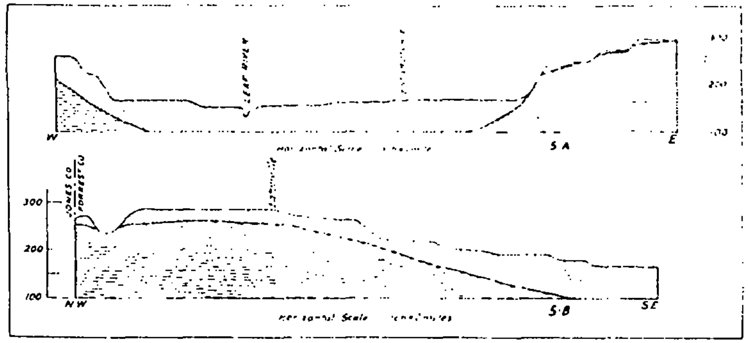


Figure 5.—Profile sections of Leaf River Valley
A. East-west section along Forrest-Jones County line.
B. Northwest-southeast section through Eatonville.

therefore, to distinguish between high terrace deposits and reworked sediments of the Citronelle formation which may have collected on the slopes as colluvium in recent times. The crests of many of the hills, however, correspond in general with the elevations of the high terraces described above, and the sediments more nearly resemble those of the high terraces than those of the Citronelle formation where the latter is undisturbed. It is believed, therefore, that most of the sand and gravel deposits which lie at elevation of less than 280 or 300 feet are remnants of former high terraces or more recent colluvium.

No attempt is made in this report to describe the terrace deposits along the other streams of the county. It is known, however, that both high and low terraces are present along Black Creek, Red River, and a few smaller streams. They closely resemble those of the Leaf and Bouie Rivers, though neither is as extensive nor as well preserved as those bordering the larger streams. Wherever the terraces were seen in the course of the present survey they are shown on the accompanying map. (Plate 1)

STRATIGRAPHIC AND AREAL GEOLOGY

GENERAL

The bedrock of Forrest County consists of a great thickness of massive blue clay, silt, and clayey fine-grained sand of Miocene age, and red gravelly sand probably Pliocene in age. The bedding is indistinct and the lithology remarkably uniform. No key beds or fossiliferous zones are known. The contact between the two Miocene formations (Hattiesburg and Pascagoula) is either covered or gradational and so obscure that it could not be definitely located. The only stratigraphic marker noted, therefore, is the unconformable contact between the Miocene clays and silts and the Pliocene sand.

Outcrops of the Miocene formations are most common on the lower slopes of the cuestas and in the deep narrow valleys which dissect the crests. The Pliocene sand crops out near the crest of the Leaf River-Black Creek divide and along the back-slope of the cuesta between Black Creek and Red River. Colluvium derived from the Pliocene and High Terrace sand extends down the slope in many places, masking the outcrops of the underlying clay.

As previously mentioned high terrace deposits of the larger streams cover the lower cuesta slopes in many places and almost completely cover the bedrock geology over large areas in the northern third of the county. Furthermore, because of the ease with which sands of the Pliocene and High Terrace deposits are eroded, the valley floors of the streams, both large and small, are commonly buried under a considerable thickness of river alluvium and low terrace deposits. For these reasons, good exposures of Miocene clay and silt are rare and of limited extent. The absence of extensive outcrops and the uniform lithology of the formations render a stratigraphic study difficult. In the descriptions which follow, therefore, considerable reliance is placed on test holes and well logs, representative examples of which are cited.

MIOCENE SYSTEM

CLASSIFICATION

That part of Mississippi's geologic section now considered to be of Miocene age was first described in 1854 by B. L. C.

Wailes.[2] In his report on the agriculture and geology of Mississippi he described certain prominent ledges of sandstone which, together with associated sandy clay and siltstone, crop out in the bluffs of the Mississippi River in the vicinity of Fort Adams, Wilkinson County, and near Grand Gulf, Claiborne County. To the former he applied the name "Davion Rock," and to the latter, "Grand Gulf Sandstone." He apparently believed the rocks in the two areas of outcrop to be of the same age and traced them up the Homochitto River and its tributaries into central Franklin County and up the Big Black River and Bayou Pierre to the vicinity of Clinton and Raymond in Hinds County. Dr. Wailes did not assign an age designation to these rocks, but from his description it appears that he recognized their stratigraphic position above the limestones at Vicksburg and Jackson (now known to be Oligocene in age) and below the "Orange Sand" (Citronelle).

Dr. L. Harper in 1857[3] did not describe the rocks included in the outcrop area of "The Grand Gulf Sandstone," but erroneously considered the "Lignitic" (Eocene) and the "Orange Sand" (Eocene, Pliocene, and Pleistocene?) to be Miocene in age. The geologic map, which accompanied the report, shows rocks of Eocene age in all that part of the State now known to be underlain by younger sediments. From Dr. Harper's description of the limestones and marls of central Mississippi (Jackson and Vicksburg formations of more recent reports) it appears that he believed them to be continuous southward to the vicinity of the coast.[4]

In 1860 Dr. Eugene W. Hilgard[5] proposed the name Grand Gulf Group for the series of sandstone and sandy clay which crop out in the vicinity of Grand Gulf and Fort Adams. He traced these beds, and described numerous outcrops showing the lithologic character and stratigraphic relations as far eastward as the Chickasawhay and Pascagoula Rivers. Hilgard recognized the age equivalency, and hence the lateral gradation lithologically, of the Grand Gulf sediments at the type locality and the more clayey less consolidated sediments farther east. He also described a change in lithology from north to south. Throughout the outcrop area, his descriptions show the more northerly outcrops to consist of alternating sand or sandstone and sandy clay or siltstone, succeeded toward the south by more massive blue and gray clays, and finally, in the most southerly outcrops, by alternating layers of greenish-gray and light-gray sand or siltstone and sandy clay. Furthermore, the gentle southerly and southwesterly dips are described at a number of localities, and presumably he recognized that the more southerly outcrops were the younger. It is precisely these lithologic differences which were used by later geologists in making the threefold division of the Miocene which is followed in present day usage. Inasmuch as the only fossils found were lignitized plant remains and poorly preserved leaf prints, Hilgard did not definitely specify the age of the sediments except as being post Vicksburg and pre-Pleistocene. He suggested, however, that on the basis of the available data they might logically be considered Eocene in age.[6] Later work led him, in 1881, to suggest the Miocene age of the Grand Gulf Group.[7]

Prior to the work of L. C. Johnson in 1888 all attempts at establishing the age of the Grand Gulf were based entirely on its supposed stratigraphic relations. No fossils, other than a few poorly preserved *Unios* and plant remains of a non-diagnostic character, had been discovered in the sediments of the Grand Gulf. Furthermore, good exposures of the formation were so uncommon, and the contacts so obscured by superficial sediments, that there were those who questioned the stratigraphic relationships described by Hilgard and others. On the basis of a detailed study of stratigraphic relations in Louisiana, Mississippi, and Alabama, Johnson, in 1889, definitely established the age of the Grand Gulf as "not older than Miocene" and "as certainly not Quaternary."[8]

Johnson also discovered Miocene fossils in the section of the Grand Gulf along the lower Chickasawhay and Pascagoula Rivers. He considered these fossiliferous beds as the equivalent of the upper part or the whole of the Grand Gulf in other parts of the State and proposed that, pending the determination of their precise relation, they be called the Pascagoula formation.[9] In 1893 Johnson described the Grand Gulf sediments of Mississippi and Alabama in more detail[10] and traced them into fossiliferous beds in eastern Alabama and adjacent parts of Florida and Georgia. He proposed that in eastern Mississippi the Grand Gulf be divided, in ascending order, into the Ellisville phase, the Hattiesburg phase or formation, and the Pascagoula phase

or formation. The division was made on the basis of the lithology, and boundaries described by Johnson do not everywhere include exact age equivalents. In eastern Mississippi, however, they correspond approximately with the contacts of the three Miocene formations as recognized by later authors.

Following the work of Johnson, and coincident with a study of the fossiliferous beds with which he and others had correlated the Grand Gulf, the age of these beds came into question. Dall,[11] Maury,[12] Harris,[13, 14] and others considered the lower part of the section, that part lying uncomformably below the Pascagoula, to be Oligocene in age. Smith,[15] and others of the Alabama Survey, erroneously correlated the mottled clays and sands, they found overlying the Pascagoula fossiliferous beds in southern Alabama, with the "typical Grand Gulf" of Mississippi. This they considered as proof that the "Grand Gulf" was a blanket formation younger than the Pascagoula but older than the "Lafayette," and, therefore, Pliocene in age. Subsequently the name "Grand Gulf" was used with various shades of meaning by a number of authors.

Because of the confusion which existed in the use of the name to designate sediments ranging in age from Eocene in western Texas[16] to Pliocene or later in southern Alabama,[15] Veach,[17] in 1906, proposed the name Catahoula formation to replace the "typical Grand Gulf" of Dall and the "Grand Gulf proper" of Harris. The name was taken from the numerous good outcrops of the formation in Catahoula Parish, Louisiana, and special reference was made to an early description which antedated the naming of the Grand Gulf by Wailes.[2]

The term Grand Gulf Group was revived in 1940 by the Mississippi Geological Society[18] and is now used by commercial geologists of the State in much the same sense as originally defined by Hilgard. The validity of the threefold division of the Group as proposed by Johnson, Matson, and others was recognized and, in addition, certain fossiliferous beds of questionable age, lying between the Vicksburg limestone and the Catahoula sands and clays, were tentatively included with the other formations of the Grand Gulf Group. The correlation chart illustrates the changing classification of these strata and the modern usage and correlation of the Miocene formation of Mississippi.

CATAHOULA FORMATION

The Catahoula formation is not exposed at the surface in Forrest County but is reached by numerous wells at depths of 300 to 400 feet in the valleys of the Leaf and Bouie Rivers.

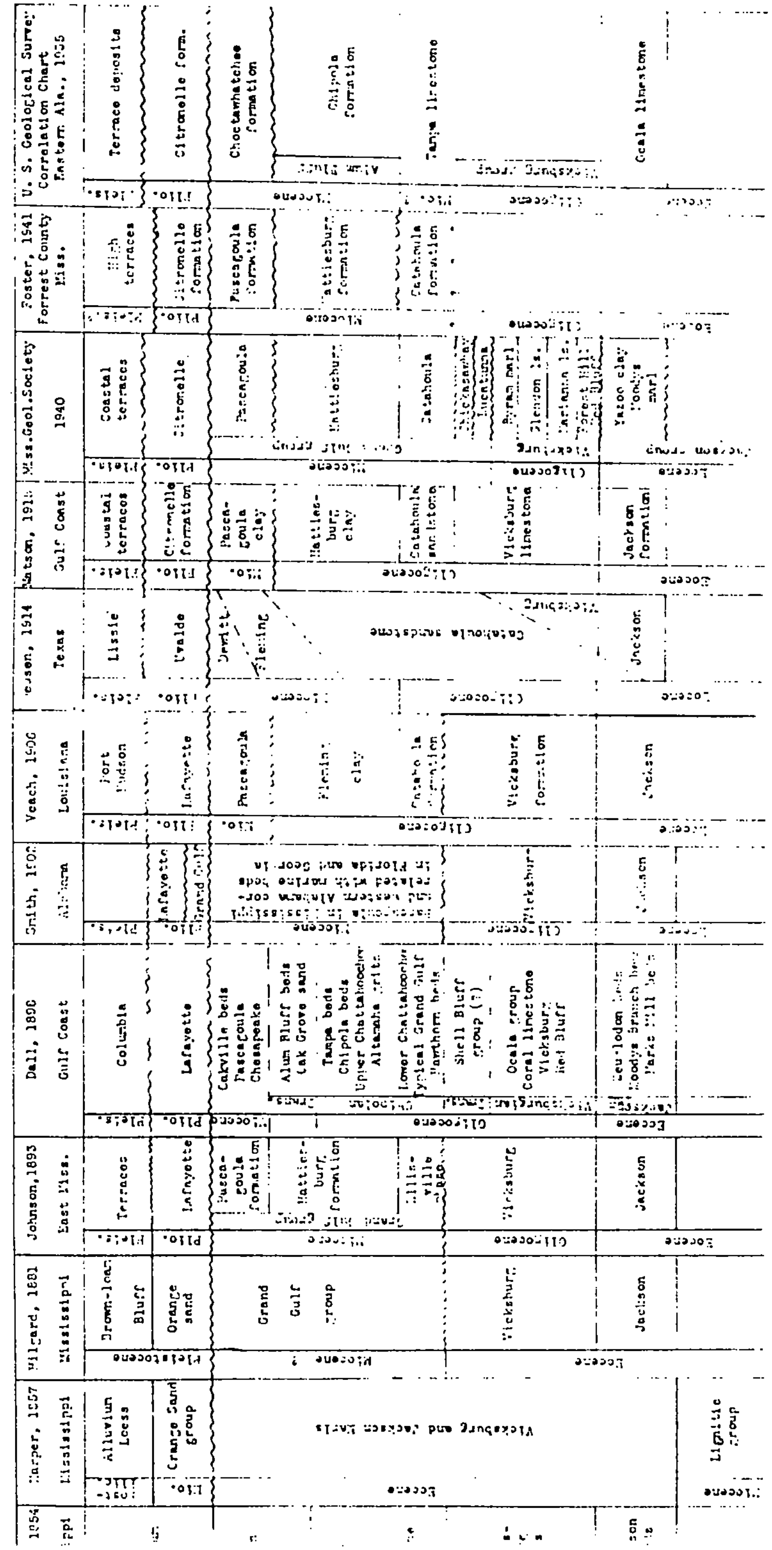
HATTIESBURG FORMATION

At Hattiesburg, the Hattiesburg formation, as exposed in the river bluffs, consists of thick beds of massive clays—150 or 200 feet thick—which contain some lime but very little sand. Wells in the vicinity of Hattiesburg and outcrops in the extreme northeastern corner of the county—as well as outcrops in the adjacent parts of Jones County—show that this thick clay bed is underlain by interbedded sands and clays, the sands increasing in prominence and becoming gravelly toward the base. Outcrops along the higher parts of the river bluffs at Hattiesburg and wells at Camp Shelby show that the thick clay bed is overlain by and grades upward into alternating fine-grained silty sands and clays similar to outcrops of the Pascagoula farther south. In some places this upper sand-clay zone—40 or 50 feet thick—is partly consolidated to a soft sandstone. This interval has usually been considered the uppermost member of the Hattiesburg formation and has been so mapped in the past. That is also the present conception of the oil geologists who have worked in the territory. The burning tests in the laboratory, however, show that the pyro-physical properties of this upper interval more closely resemble the burning properties of the known Pascagoula than of the underlying thick clay. Accordingly, one would be inclined to draw the Hattiesburg-Pascagoula contact at the top of the massive clay bed. However, in the absence of definite proof, it can only be stated that the contact between the two Miocene formations—the Hattiesburg and the Pascagoula—is either covered or gradational and so obscure that it cannot be definitely located.

PASCAGOULA FORMATION

Along the Pascagoula River, the type locality of the Pascagoula formation, an unconformity between the Hattiesburg formation and the overlying Pascagoula formation is supposed to be present. A search along the Pascagoula River from Pascagoula to Merrill and along the Leaf River from Hattiesburg to Beaumont failed to locate an unconformity. Although the out-

CORRELATION CHART



crops are few and usually obscured by terrace deposits, all consist from top to bottom of interbedded fine-grained silty sands, silts, and sandy clays similar to the outcrops of the Pascagoula near Brooklyn in Forrest County. In contrast to the typical Hattiesburg clay, which is blue at or near the surface and light chocolate in the deeper test holes, the Pascagoula clay is more nearly sky blue and commonly has a somewhat greenish tint. Furthermore, the clays of the Pascagoula are more sandy, and sand beds several feet in thickness are not uncommon.

PLIOCENE SYSTEM

CLASSIFICATION

Because of the confusion in the use of all prior names, Matson in 1916, proposed the name Citronelle formation for those beds of sand, gravel, and clay which disconformably overlie the Miocene sediments of southern Alabama and Mississippi and are in turn disconformably overlain by the coastal terrace deposits. The name was derived from typical exposures in the vicinity of Citronelle, Mobile County, Alabama.

CITRONELLE (?) FORMATION

In Forrest County most of the material formerly mapped as Citronelle is, in reality, River Terrace. Possibly the entire formation, with the exception of one or two outcrops, could logically be referred to terrace deposits—as in Louisiana where the name Citronelle has been abandoned. In Forrest County, one or two outcrops of interbedded sand and clay unconformably overlie the Pascagoula and seemingly have the same regional dip as the lower formation. In appearance these outcrops are the same as those described near the type locality of the Citronelle formation. On the geologic map of Forrest County, the Citronelle is shown as capping the highest parts of the cuestas. From the character of the sediments, however, and the stratigraphic relations of these sediments, they could just as logically be considered high terrace deposits.

PLIOCENE (?) OR PLEISTOCENE (?) SYSTEM

HIGH TERRACES

As stated under the heading of "Topography" where the physiographic expression of the High Terraces was described in some detail, these high terraces may be seen best between the Bouie and Leaf Rivers where the uppermost is known as the Eatonville flat. Along a road extending through the Village of Eatonville southeastward toward the Leaf, four major terraces including the Eatonville plain are visible above the first of the Low Terraces—and the lowest of the four major terraces consists in places of three levels, separated the one from the other by six-foot and eight-foot terrace scarps (Figure 5B). Although the underlying Hattiesburg clay was not seen on October 18, 1941, yet there is no doubt of the correctness of this Eatonville cross section by Foster, for the reason that the underlying Hattiesburg clay is well exposed beneath the terrace material along the Forrest-Jones County line section (Figure 5A), and because of spring water that pours out beneath the sand into Providence Branch near the northwestern end of the Eatonville cross section.

Material of the Eatonville terrace near the Jones County line consists in descending order of soil, subsoil, weathered sand, and fresh sand associated with which is a small amount of fine gravel—all surficial. Both the sand and the gravel are somewhat cross-bedded and otherwise irregularly bedded. Material of the second terrace consists likewise of soil, subsoil, weathered sand, fresh sand and a very small quantity of fine gravel. Both the sand and the gravel are likewise cross-bedded. Materials of each of the succeeding major terraces and minor terraces consist, so far as determinable at the surface, of soil and weathered sand subsoil.

RECENT SYSTEM

LOW TERRACES—ALLUVIUM

It may not be possible to differentiate the materials of the lower of the low terraces or even of the upper of the low terraces from the alluvium on topographic evidence, for the reason that in extreme high waters all may be flooded. Accordingly, they are, in reality, not materials of terraces but of higher bottoms of the flood plain still subjected to coverage. Perhaps it is well, therefore, to consider the material of all of them as alluvium. As alluvium, it consists of the ordinary flood plain sand and gravel, and silts and clays. Between the Bouie and the Leaf, the sands and gravels have been deposited in great thicknesses. If to the 18.5 feet of sand and gravel above the present low water (stream level) in the gravel pits be added some 40 to 60 feet of sand, gravel, and clay that are being pumped from beneath the pit water, the total thickness is 60 to 80 feet of sand and gravel.

TEST HOLE RECORDS

A total of 191 test holes were drilled within the limits of Forrest County. A part of these were drilled to assist in a study of the stratigraphic relations and areal distribution of the several geologic formations, a part were drilled in order to discover deposits of possible economic value, and a part were drilled to determine the extent of known deposits. It was not thought to be worthwhile to reproduce the records (logs) of all test holes drilled, as many encountered nothing of economic value and others served only to confirm the presence and lateral extent of beds encountered and sampled in other holes. In the several pages which follow there are reproduced the records (logs) of all test holes from which samples were tested in the laboratory. In addition there are included records of other representative test holes from virtually every part of the county. These records serve to illustrate the stratigraphic and economic geology of the county and reference is made to them by number in both the Geology and Tests sections of the report. The records (logs) of all test holes drilled within the county may be consulted in the files of the Mississippi Geological Survey at University, Mississippi.

The ceramic tests do not show significant differences in the pyrophysical characteristics of the several formations, and no attempt is made, therefore, to group the test hole records (logs) according to formations, or according to the ceramic qualities of the samples collected. Rather, the records are numbered consecutively in the order in which the test holes were drilled. The test hole numbers and sample numbers constitute a cross index between the several parts of the report.

Hattiesburg Brick Works Property

Test Hole 1

Location: T.5 N., R.13 W., Sec. 32, SW.1/4, SW.1/4; 250 feet east of the east side of Hattiesburg Water Works Pumping Station

Drilled: October 9, 1939

Elevation: 239 feet

Water level: 30.5 feet

No.	Depth	Thick.	Description of strata
			High Terrace (?)
1	1.0	1.0	Sand, coarse grained
			Hattiesburg formation
2	3.1	2.1	Sand, reddish brown semi-plastic medium grained clayey; C-1
3	7.3	4.2	Clay, variegated red, gray, and yellow, plastic sandy, slightly carbonaceous; P-1
4	19.5	12.2	Clay, brownish gray semi-plastic sandy, slightly carbonaceous; P-2
5	33.0	13.5	Clay, dark gray semi-plastic sandy, carbonaceous, slightly limey, very silty; C-2
6	40.5	7.5	Clay, light gray and yellow semi-plastic silty, carbonaceous; C-3

Hattiesburg Brick Works Property

Test Hole 1A

Location: T.5 N., R.13 W., Sec. 32, SW.1/4, SW.1/4; 250 feet east of the east side of Hattiesburg Water Works Pumping Station

Drilled: October 9, 1939

Elevation: 239 feet

Water level: 30.5 feet

No.	Depth	Thick.	Description of strata
			High Terrace (?)
1	1.0	1.0	Sand, brownish gray
			Hattiesburg formation
2	3.7	2.7	Sand, reddish brown semi-plastic clayey
3	50.6	46.9	Clay, light gray sandy, slightly micaceous, slightly limey; mottled with red and yellow limonite stains; P-1

HATTIESBURG BRICK WORKS PROPERTY

TEST HOLE 2A

Location: T.5 N., R.13 W., Sec. 32, NW.1/4, SW.1/4; 350 feet north and 40 feet east of the northeast corner of the Hattiesburg Water Works Pumping Station

Drilled: October 5, 1939

Water level: 40.5 feet

Elevation: 204 feet

No.	Depth	Thick.	Description of strata
			Hattiesburg formation
1	1.6	1.6	Clay, light brown and gray plastic silty
2	13.9	12.3	Silt, light gray semi-plastic clayey, slightly micaceous, slightly carbonaceous; C-1
3	59.1	45.2	Clay, light gray silty, micaceous; P-1

Remarks: Intervals 1 and 2 correspond to the lower part of interval 3 in Test Hole 1A.

HATTIESBURG BRICK WORKS PROPERTY

TEST HOLE 3

Location: T.5 N., R.13 W., Sec. 32, NW.1/4, SW.1/4; 125 feet north of Test Hole 2A

Drilled: March 15, 1939

Water level: 12.0 feet

Elevation: 156 feet

No.	Depth	Thick.	Description of strata
			Hattiesburg formation
1	36.0	36.0	Clay, light gray to dark bluish gray plastic silty, limonitic, slightly limey; P-1
2	47.5	11.5	Clay, dark bluish gray plastic silty, carbonaceous; interbedded with white limey clay; P-2
3	66.0	18.5	Clay, same as interval 2; P-3
4	67.8	1.8	Sand, light bluish gray fine grained semi-plastic clayey; slightly micaceous

Remarks: Sample F-3A-P-1 is a composite sample of intervals 1, 2, and 3.

A. R. SUMRALL PROPERTY

TEST HOLE 5

Location: T.5 N., R.13 W., Sec. 31, NW.1/4, SE.1/4; 75 feet east of residence

Drilled: October 17, 1939

Elevation: 267 feet

Water level: 20.1 feet

No.	Depth	Thick.	Description of strata
			High Terrace
1	1.3	1.3	Topsoil
2	24.0	22.7	Sand, variegated red, brown, and yellow, fine grained lignite; C-1
			Hattiesburg formation
3	43.0	19.0	Clay, gray plastic sandy, carbonaceous; upper part stained with limonite; 5A-P-1
4	60.5	17.5	Clay, same as interval 3

Remarks: Sample F-5-P-1 is a composite sample of intervals 3 and 4.

MRS. J. T. BURCH PROPERTY

TEST HOLE 6

Location: T.5 N., R.14 W., Sec. 25, SW.1/4, SE.1/4; 450 feet southeast of highway crossing and 30 feet east of the center line of the road

Drilled: March 17, 1939

Elevation: 225 feet

Water level: 54.0 feet

No.	Depth	Thick.	Description of strata
			High Terrace (?)
1	3.1	3.1	Topsoil
2	4.2	1.1	Sand, variegated light gray, orange, and red, clayey; C-1
3	12.3	8.1	Clay, light gray and brown semi-plastic; P-1
4	77.2	64.9	Sand and silt, fine grained clayey, micaceous

Mississippi Southern College Property

Test Hole 7

Location: T.4 N., R.13 W., Sec. 7, NW.1/4, NW.1/4; 500 feet northwest of bridge crossing the Mississippi Central Railroad and 70 feet south of the railroad

Drilled: March 22, 1939

Elevation: 247 feet

Water level: 24.4 feet

No.	Depth	Thick.	Description of strata
			Hattiesburg formation (?)
1	0.5	0.5	Topsoil
2	7.0	6.5	Clay, reddish brown and gray sandy; contains scattered small chert gravels embedded in clay; C-1
3	55.5	48.5	Clay, light gray slightly sandy, carbonaceous slightly limey; contains a few scattered quartz and chert pebbles as large as 0.5 inches in diameter; P-1

A. R. Sumrall Property

Test Hole 8

Location: T.5 N., R.13 W., Sec. 31, NE.1/4, SW.1/4; 175 feet southeast of Mixon Creek bridge and 30 feet west of Highway U. S. 49 center line

Drilled: October 11, 1939

Elevation: 211 feet

Water level: 50.5 feet

No.	Depth	Thick.	Description of strata
			Hattiesburg formation (?)
1	0.2	0.2	Topsoil
2	2.7	2.5	Clay, gray-brown plastic slightly sandy, slightly carbonaceous; C-1
3	50.8	48.1	Silt, light gray plastic clayey; limey carbonaceous; P-1
4	51.8	1.0	Sand, light bluish gray coarse grained

Markie E. Stevens Property

Test Hole 12A

Location: T.4 N., R.13 W., Sec. 6, NW.1/4, NE.1/4; 0.4 mile south of Highway U. S. 49 and 80 feet east of center line of north-south road

Drilled: October 16, 1939

Elevation: 215 feet

Water level: 28.2 feet

No.	Depth	Thick.	Description of strata
			Hattiesburg formation
1	0.8	0.8	Topsoil
2	43.6	42.8	Clay, light gray carbonaceous, limey, silty, micaceous; stained with limonite; P-1

J. J. Newman Lumber Co. Property

Test Hole 14A

Location: T.5 N., R.14 W., Sec. 27, NW.1/4, NE.1/4; 0.4 mile west of road junction at section corner and 30 feet south of section line

Drilled: October 12, 1939

Elevation: 238 feet

Water level: Dry

No.	Depth	Thick.	Description of strata
			Hattiesburg formation (?)
1	0.7	0.7	Topsoil
2	4.8	4.1	Sand, light brown and gray very fine grained; contains pea-gravel
3	44.8	40.0	Clay, light gray to light brown plastic sandy, carbonaceous; contains scattered pea-gravel; P-1

McCaughey and Calhoun Property

Test Hole 20

Location: T.5 N., R.14 W., Sec. 11, SE.1/4, SE.1/4; 0.95 mile north of Bouie River bridge and 50 feet west of road

Drilled: April 17, 1939

Elevation: 240 feet

Water level: 19.3 feet

No.	Depth	Thick.	Description of strata
			Low Terrace (?)
1	0.7	0.7	Topsoil
2	5.0	4.3	Clay, dark reddish brown sandy; contains scattered pea-gravel; C-1
3	13.0	8.0	Sand, reddish brown semi-plastic clayey, gravelly; C-2
4	19.3	6.3	Sand, red, brown, and gray, clayey; C-3
			Hattiesburg formation
5	42.0	22.7	Clay, light gray plastic carbonaceous, very sandy; contains scattered pea-gravel; P-1

Tatum Lumber Co. Property

Test Hole 43

Location: T.4 N., R.13 W., Sec 29, SW.1/4, SW.1/4; 0.9 mile south of Southern Railway overpass on Highway U. S. 11 and 60 feet west of pavement
Drilled: May 3, 1939

Elevation: 251 feet — Water level: 20.0 feet

No.	Depth	Thick.	Description of strata
			Hattiesburg formation
1	0.7	0.7	Topsoil
2	5.8	5.1	Sand, light brown and red slightly clayey
3	13.4	7.6	Clay, light brown and gray sandy; stained with limonite; P-1
4	26.1	12.7	Clay, gray plastic carbonaceous, limey; C-2

J. S. Turner Property

Test Hole 46A

Location: T.3 N., R.13 W., Sec. 6, SW.1/4, SW.1/4; 0.7 mile south of Highway U. S. 11 at road intersection and 50 feet west of road
Drilled: October 18, 1939

Elevation: 353 feet — Water level: 15.4 feet

No.	Depth	Thick.	Description of strata
			Citronelle formation (?)
1	1.2	1.2	Topsoil
2	13.0	11.8	Sand, dark brown fine grained; contains scattered pea gravel; C-1
			Hattiesburg formation (?)
3	47.3	34.3	Clay, variegated red and gray plastic sandy; contains scattered gravel; P-1

W. J. Morris Property

Test Hole 47

Location: T.4 N., R.13 W., Sec. 20, NW.1/4, NE.1/4; 800 feet north of road junction on Highway U. S. 11 and 100 feet east of the highway
Drilled: May 11, 1939

Elevation: 217 feet — Water level: 16.6 feet

No.	Depth	Thick.	Description of strata
			High Terrace (?)
1	0.8	0.8	Topsoil
2	5.9	5.1	Sand, light brown and gray coarse grained slightly clayey; contains scattered gravel; C-1
3	11.1	5.2	Sand, light gray fine grained very clayey; limonite stained; C-2
			Hattiesburg formation
4	18.7	7.6	Clay, light gray to light brown semi-plastic sandy, micaceous; P-1
5	35.2	16.5	Clay, light brown carbonaceous, limey; P-2
6	45.1	9.9	Clay, same as interval 5; P-3

P. B. Johnson Property

Test Hole 51

Location: T.4 N., R.13 W., Sec. 34, SW.1/4, SE.1/4; 0.8 mile south of road junction with Highway U. S. 49 and 300 feet west of the highway
Drilled: *May 17, 1939*

Elevation: 188 feet — Water level: 21.4 feet

No.	Depth	Thick.	Description of strata
			Hattiesburg formation
1	0.2	0.2	Topsoil
2	14.5	14.3	Clay, light gray sandy limonitic; P-1
3	30.4	15.9	Clay, light gray lignitic, limey; C-1

Mrs. M. L. Rogers Property

Test Hole 57

Location: T.3 N., R.13 W., Sec. 11, SE.1/4, SW.1/4, 0.4 mile south of road junction with Highway U. S. 11 and 70 feet west of the highway

Drilled: May 24, 1939

Elevation: 207 feet

Water level: 11.6 feet

No.	Depth	Thick.	Description of strata
			High Terrace
1	0.4	0.4	Topsoil
2	3.2	2.8	Sand, red clayey, gravelly; C-1
			Hattiesburg formation
3	11.6	8.4	Clay, light brown sandy, micaceous; mottled with red, yellow, and gray; C-2
4	12.5	0.9	Sand, light gray fine grained clayey, micaceous
5	13.7	1.2	Clay, red silty; interlaminated with gray clay; C-3
6	27.6	13.9	Clay, light gray plastic sandy; P-1

City of Hattiesburg Property

Test Hole 86

Location: T.4 N., R.13 W., Sec. 14, SW.1/4, SW.1/4; 80 feet north of gravel pit road at Mississippi Central Railroad spur and 40 feet west of the track

Drilled: June 19, 1939

Elevation:

Water level: 8.2 feet

No.	Depth	Thick.	Description of strata
			Low Terrace
1	1.4	1.4	Topsoil
2	2.6	1.2	Sand, light brown fine grained, grit-bearing
3	8.2	5.6	Sand and gravel, light yellow and white coarse grained; the pebbles range in size upward to about 0.7 inch; C-2. Sample P-1 is a sample of the washed sand from the pit

Remarks: Hole drilled on banks of gravel pit said to be 40 or 50 feet in depth. Drilling below the water level was not feasible with hand tools. It is estimated that between 1,500,000 and 2,000,000 cubic yards of the washed sand are available.

The Dixie Tung Empire Corp. Property

Test Hole 90

Location: T.1 S., R.12 W., Sec. 4, NW.1/4, SW.1/4; 0.25 mile north of overpass at abandoned railroad grade and 100 feet west of Highway U. S. 49

Drilled: June 20, 1939

Elevation: 215 feet

Water level: 4.8 feet

No.	Depth	Thick.	Description of strata
			Alluvium
1	0.6	0.6	Topsoil
2	7.4	6.8	Sand, light brown to white very fine grained; C-1
3	32.7	25.3	Clay, light gray to blue-gray plastic very sandy; contains isolated quartz and chert pebbles and fragments of white chalky material; P-1

Luther Lovett Property

Test Hole 91

Location: T.5 N., R.14 W., Sec. 3, NE.1/4, NW.1/4; west side of gravel pit road, 0.3 mile north of Gulf and Ship Island Railroad crossing

Drilled: June 20, 1939

Elevation:

Water level: 7.1 feet

No.	Depth	Thick.	Description of strata
			Low Terrace of Bouie River
1	0.7	0.7	Topsoil
2	2.3	1.6	Sand, light yellow to gray very fine grained silty, limonitic; C-1
3	6.5	4.2	Sand, light gray very fine grained silty; limonitic in part; C-2
4	7.7	1.2	Sand, gray to white coarse grained, gravel bearing; C-3. Sample P-1 is from the washed sand.

Remarks: Hole drilled near edge of gravel pit. It is estimated that a minimum of 1,000,000 to 1,500,000 cubic yards of the washed sand are available in the old pit.

FORREST COUNTY SAND AND GRAVEL CO. PROPERTY

TEST HOLE 93

Location: T.5 N., R.13 W., Sec. 33, NE.1/4, SE.1/4; 0.35 mile southeast of road junction at Hickory Grove Church and on the eastern bank of the gravel pit. Drilled: June 20, 1939

Elevation. Water level: 24.6 feet

No.	Depth	Thick.	Description of strata
			River alluvium
1	0.2	0.2	Topsoil
2	2.3	2.1	Clay, dark red sandy; contains scattered pea-gravel
3	9.1	6.8	Sand and gravel, very clayey; C-2
4	25.2	16.1	Sand and gravel, very clayey; C-3. Sample P-1 is from the washed sand in the old pit

Remarks: It is estimated that 3,500,000 to 4,000,000 cubic yards of the washed sand are available.

U. S. FORESTRY SERVICE PROPERTY

TEST HOLE 100

Location: T.2 N., R.12 W., Sec. 20, SW.1/4, SE.1/4; 1.6 miles south of bridge, 37987 and 300 feet east of Highway U. S. 49

Drilled: July 6, 1939

Elevation: Water level: 8.3 feet

No.	Depth	Thick.	Description of strata
			Pascagoula formation
1	0.6	0.6	Clay light gray slightly sandy
2	1.8	1.2	Clay, dark brown sandy
3	17.1	15.3	Clay, dark to light gray plastic sandy, micaceous, carbonaceous; lower 2.0 feet stained with limonite; P-1
4	25.9	8.8	Sand, light red to gray clayey, micaceous, limonitic

TATUM LUMBER CO. PROPERTY

TEST HOLE 102

Location: T.4 N., R.13 W., Sec. 20, NE.1/4, SW.1/4; 190 feet west of road intersection and 40 feet east of road. Drilled: July 11, 1939

Elevation: 235 feet. Water level: 10.6 feet

No.	Depth	Thick.	Description of strata
			Hattiesburg formation (?)
1	0.6	0.6	Topsoil
2	4.6	4.0	Clay, gray semi-plastic, sandy; C-1
3	19.6	15.0	Clay, variegated gray and red slightly carbonaceous; grades downward to light gray; P-1
4	20.5	0.9	Clay, variegated gray and red very plastic slightly sandy; C-2
5	21.5	1.0	Clay, variegated red and gray limey, sandy

TATUM LUMBER CO. PROPERTY

TEST HOLE 105

Location: T.4 N., R.13 W., Sec. 20, SE.1/4, SW.1/4, 0.2 mile west of road junction with Highway U. S. 11 and 70 feet south of road

Drilled: July 14, 1939

Elevation: 231 feet. Water level: 12.0 feet

No.	Depth	Thick.	Description of strata
			Hattiesburg formation (?)
1	0.4	0.4	Topsoil
2	12.0	11.6	Sand, brown, gray, and white slightly clayey; C-1
3	17.5	5.5	Clay, light gray sandy; contains scattered small pebbles. In part consists of interbedded sand and clay; C-2
4	33.6	16.1	Clay, light brown and gray sandy, carbonaceous, limonitic; contains scattered gravel as large as 2 x 2½ inches; P-1
5	44.9	11.3	Clay, same as interval 4, C-3

Tatum Lumber Co. Property

Test Hole 106A

Location: T.4 N., R.13 W., Sec. 20, NE.1/4, SW.1/4, 0.4 mile north of Southern Railway overpass and 60 feet west of Highway U. S. 11

Drilled: October 4, 1939

Elevation: 214 feet — Water level: 30.0 feet

No.	Depth	Thick.	Description of strata
			Hattiesburg formation
1	0.5	0.5	Topsoil
2	6.7	6.2	Clay, light gray and brown plastic slightly sandy, limonitic
3	21.7	15.0	Silt, variegated red, brown, yellow, and gray, plastic clayey, micaceous
4	25.5	3.8	Clay, light gray plastic sandy, limonitic
5	41.6	16.1	Silt, light gray clayey, limonitic
6	65.5	23.9	Clay, light bluish gray to brown carbonaceous, sandy, limonitic, some parts semi-consolidated; P-1

Tatum Lumber Co. Property

Test Hole 108

Location: T.4 N., R.13 W., Sec. 21, NW.1/4, SW.1/4, 100 feet south of Bonhomie, Hattiesburg and Southern Railroad and 150 feet east of gravel road

Drilled: July 19, 1939

Elevation: 202 feet — Water level: 32.0 feet

No.	Depth	Thick.	Description of strata
			Hattiesburg formation
1	0.6	0.6	Topsoil
2	32.0	31.4	Clay, light gray sandy, limey; mottled with brown limonitic stains; P-1
3	52.3	20.3	Clay, light gray plastic carbonaceous, very sandy; P-2
4	61.5	9.2	Clay, gray plastic sandy; partly limonite stained; C-1

John B. Burkett Property

Test Hole 117

Location: T.4 N., R.12 W., Sec. 29, NW.1/4, SE.1/4, 0.25 mile southeast of Carter's Creek bridge and feet northeast of gravel road

Drilled: July 25, 1939

Elevation: — Water level: Dry

No.	Depth	Thick.	Description of strata
			High Terrace
1	1.2	1.2	Topsoil
2	6.7	5.5	Sand, brownish gray fine grained clayey, grades downward to clay
3	8.8	2.1	Clay, variegated gray, red, and yellow, sandy
4	28.6	19.8	Sand, variegated light brown and white; contains pea gravel; P-1

Mississippi Southern College Property

Test Hole 121

Location: T.4 N., R.13 W., Sec. 7, SE.1/4, NW.1/4; 0.5 mile west of Administration Building at Mississippi Southern College and 90 feet south of road center

Drilled: July 26, 1939

Elevation: 232 feet — Water level: 30.4 feet

No.	Depth	Thick.	Description of strata
			Hattiesburg formation
1	1.0	1.0	Topsoil
2	6.6	5.6	Sand, light brownish gray semi-plastic limonitic; grades downward to clay; C-1
3	30.4	23.8	Clay, gray plastic sandy; stained red, purple, and light brown with limonite; P-1
4	31.3	0.9	Sand, gray clayey
5	37.6	6.3	Clay, gray semi-plastic sandy; C-2
6	49.8	12.2	Clay, gray and light brown hard massive sandy; P-2
7	57.5	7.7	Clay, same as interval 6; C-3
8	60.7	3.2	Clay, same as interval 6

Mississippi Southern College Property

Test Hole 121A

Location: T.4 N., R.13 W., Sec. 7, SE.1/4, NW.1/4; 5.0 feet east of Test Hole 121

Drilled: October 26, 1939

Elevation: 232 feet — Water level: 26.5 feet

No.	Depth	Thick.	Description of strata
			Hattiesburg formation
1	0.6	0.6	Topsoil
2	10.4	9.8	Sand, gray and brown slightly clayey; C-4
3	30.1	19.7	Clay, light gray to light brown very sandy, micaceous, P-1
4	36.4	6.3	Sand, light gray coarse grained clayey, micaceous; C-2
5	61.4	25.0	Clay, light gray very sandy, carbonaceous; P-2

W. J. Morris Property

Test Hole 155

Location: T.4 N., R.13 W., Sec. 20, NW.1/4, NE.1/4; 800 feet north of road junction on Highway U. S. 11 and 400 feet east of the highway

Drilled: Sept. 20, 1939

Elevation: 217 feet — Water level: 6.0 feet

No.	Depth	Thick.	Description of strata
			High Terrace
1	0.8	0.8	Topsoil
2	11.4	10.6	Sand and gravel, light brown and gray clayey
3	27.7	16.3	Clay, light gray plastic very sandy; bears scattered small pebbles and limonite stains throughout; P-1
4	35.8	8.1	Clay, same as interval 3; P-2

W. J. Morris Property

Test Hole 156

Location: T.4 N., R.13 W., Sec. 20, NW.1/4, NE.1/4; 950 feet north of road junction on Highway U. S. 11 and 100 feet east of highway

Drilled: Sept. 21, 1939

Elevation: 231 feet — Water level: 18.5 feet

No.	Depth	Thick.	Description of strata
			High Terrace (?)
1	0.6	0.6	Topsoil
2	9.4	8.8	Sand, light brown slightly clayey
3	17.4	8.0	Clay, light gray semi-plastic silty, very limonitic; P-1
4	20.5	3.1	Sand, light gray coarse grained; stained with limonite
5	29.0	8.5	Clay, light gray plastic sandy, gravel-bearing; P-2
6	48.7	19.7	Clay, light brown; same as interval 5; P-3
7	58.8	10.1	Clay, brown; same as interval 6; P-4

Tatum Lumber Co. Property

Test Hole 157

Location: T.4 N., R.13 W., Sec. 20, NE.1/4, SW.1/4; 0.2 mile north of Southern Railway overpass and 60 feet west of Highway U. S. 11

Drilled: Sept. 20, 1939

Elevation: 216 feet — Water level: Dry

No.	Depth	Thick.	Description of strata
			Hattiesburg formation
1	0.5	0.5	Topsoil
2	3.7	3.2	Silt, light gray and brown semi-plastic
3	37.3	33.6	Clay, bluish gray and brown massive plastic very silty, sandy, limey; P-1

W. J. Morris Property

Test Hole 158

Location: T.4 N., R.13 W., Sec. 20, NE.1/4, NW.1/4; 800 feet north of road junction on Highway U. S. 11 and 200 feet west of the highway

Drilled: Sept. 22, 1939

Elevation: 219 feet — Water level: 22.8 feet

No.	Depth	Thick.	Description of strata
			High Terrace
1	2.0	2.0	Topsoil
2	3.2	1.2	Sand, light brown clayey
3	41.0	37.8	Clay, interlaminated red, yellow, and gray, plastic sandy; contains a few scattered gravel in upper part; P-1

W. J. MORRIS PROPERTY

TEST HOLE 165

Location: T.4 N., R.13 W., Sec. 20, NE.1/4, NW.1/4; 0.45 mile west along road crossing Highway U. S. 11 and 0.15 mile south of road

Drilled: Oct. 1, 1939

Elevation: Water level: 14.0 feet

No.	Depth	Thick	Description of strata
			High Terrace
1	0.9	0.9	Topsoil
2	6.8	5.9	Sand, light brown fine grained grit-bearing, clayey
3	9.3	2.5	Clay, light gray plastic sandy, limonitic
4	10.1	0.8	Sand, light brown grit-bearing
			Hattiesburg formation
5	49.2	39.1	Clay, light gray plastic carbonaceous, slightly sandy; P-1

TATUM LUMBER CO. PROPERTY

TEST HOLE 166

Location: T.4 N., R.13 W., Sec. 29, NE.1/4, NW.1/4; 0.25 mile south of Southern Railway overpass and 50 feet west of Highway U. S. 11

Drilled: Oct. 24, 1939

Elevation: 237 feet Water level: 40.0 feet

No.	Depth	Thick	Description of strata
			Hattiesburg formation
1	0.7	0.7	Topsoil
2	2.2	1.5	Sand, light brown slightly clayey; C-1
3	76.1	73.9	Clay, bluish gray massive plastic and semi-plastic slightly carbonaceous, slightly limey, limonitic; P-1
4	105.6	29.5	Clay, same as interval 3; P-2
5	120.6	15.0	Clay, brown and gray, same as interval 4

TATUM LUMBER CO. PROPERTY

TEST HOLE 167

Location: T.4 N., R.13 W., Sec. 29, NE.1/4, NW.1/4; 0.35 mile south of Southern Railway underpass and 50 feet west of Highway U. S. 11

Drilled: Oct. 6, 1939

Elevation: 242 feet Water level: 12.0 feet

No.	Depth	Thick.	Description of strata
			Hattiesburg formation
1	0.2	0.2	Topsoil
2	63.9	63.7	Clay, light gray plastic sandy; upper few feet are streaked and mottled with limonite stains; P-1

TATUM LUMBER CO. PROPERTY

TEST HOLE 168

Location: T.4 N., R.13 W., Sec. 29, SE.1/4, NW.1/4; 0.5 mile south of Southern Railway overpass and 200 feet west of Highway U. S. 11

Drilled: Oct. 3, 1939

Elevation: 244 feet Water level: 24.6 feet

No.	Depth	Thick.	Description of strata
			Hattiesburg formation (?)
1	0.9	0.9	Topsoil
2	3.5	2.6	Clay, light brown plastic sandy, limonitic; P-1
3	15.8	12.3	Sand, light gray and brown clayey
4	23.3	7.5	Clay, light brown plastic sandy, limonitic; P-2
5	34.5	11.2	Sand, light gray grit-bearing, clayey, limonitic

A. R. SUMRALL PROPERTY

TEST HOLE 169

Location: T.5 N., R.13 W., Sec. 31, SE.1/4, SW.1/4; 0.3 mile west of Hilltop House Nite Club and 30 feet south of gravel road

Drilled: Oct. 17, 1939

Elevation: Water level: Dry

No.	Depth	Thick.	Description of strata
			Hattiesburg formation
1	0.7	0.7	Topsoil
2	31.5	30.8	Clay, light gray and brown massive plastic very limey, limonitic; P-1
3	53.8	22.3	Silt, light bluish gray semi-plastic clayey, slightly micaceous; C-1

A. R. SUMRALL PROPERTY

TEST HOLE 170

Location: T.5 N., R.13 W., Sec. 31, NW.1/4, SW.1/4; 0.44 mile west of Hilltop House Nite Club and 50 feet north of gravel road

Drilled: Oct. 16, 1939

Elevation: 188 feet Water level: 41.2 feet

No.	Depth	Thick.	Description of strata
			Hattiesburg formation
1	0.9	0.9	Topsoil
2	45.6	44.7	Clay, light gray plastic sandy, micaceous; P-1
3	48.4	2.8	Sand, light bluish gray very fine grained clayey

STATE OF MISSISSIPPI PROPERTY

TEST HOLE 187

Location: T.1 N., R.12 W., Sec. 16, SE.1/4, NE.1/4, 0.15 mile south of road intersection and 80 feet east of gravel road Drilled: Nov. 7, 1939

Elevation: Water level: 3.4 feet

No.	Depth	Thick.	Description of strata
			Pascagoula formation
1	0.7	0.7	Topsoil
2	31.0	30.3	Clay, gray brown and red very plastic limonitic slightly sandy; P-1
3	32.4	1.4	Sand, light gray fine grained silty, limonitic

LAURA KNOX PROPERTY

TEST HOLE 189

Location: T.3 N., R.13 W., Sec. 3, NE.1/4, SE.1/4; 200 feet northeast of Test Hole 188 Drilled: Nov. 8, 1939

Elevation: Water level: 10.1 feet

No.	Depth	Thick.	Description of strata
			Hattiesburg formation
1	0.2	0.2	Topsoil
2	1.9	1.7	Sand, light brown fine grained semi-plastic slightly clayey; C-1
3	9.5	7.6	Clay, light brown and gray plastic slightly sandy; P-1
4	10.2	0.7	Sand, light gray very fine grained; C-2
5	34.1	23.9	Clay, light gray plastic sandy, limonitic; P-2
6	35.0	0.9	Sand, light brown fine grained silty, very micaceous

P. B. JOHNSON PROPERTY

TEST HOLE 190

Location: T.4 N., R.13 W., Sec. 34, SE.1/4, SE.1/4; 0.7 mile south of road crossing on Highway U. S. 49 and 500 feet east of highway

Drilled: Nov. 8, 1939

Elevation: Water level: 25.0 feet

No.	Depth	Thick.	Description of strata
			Hattiesburg formation
1	1.2	1.2	Topsoil
2	37.9	36.7	Clay, light gray and brown semi-plastic slightly sandy, carbonaceous; P-1

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Reference 14

WATER FOR

INDUSTRIAL DEVELOPMENT

IN

Forrest, Greene, Jones, Perry, and Wayne Counties
Mississippi

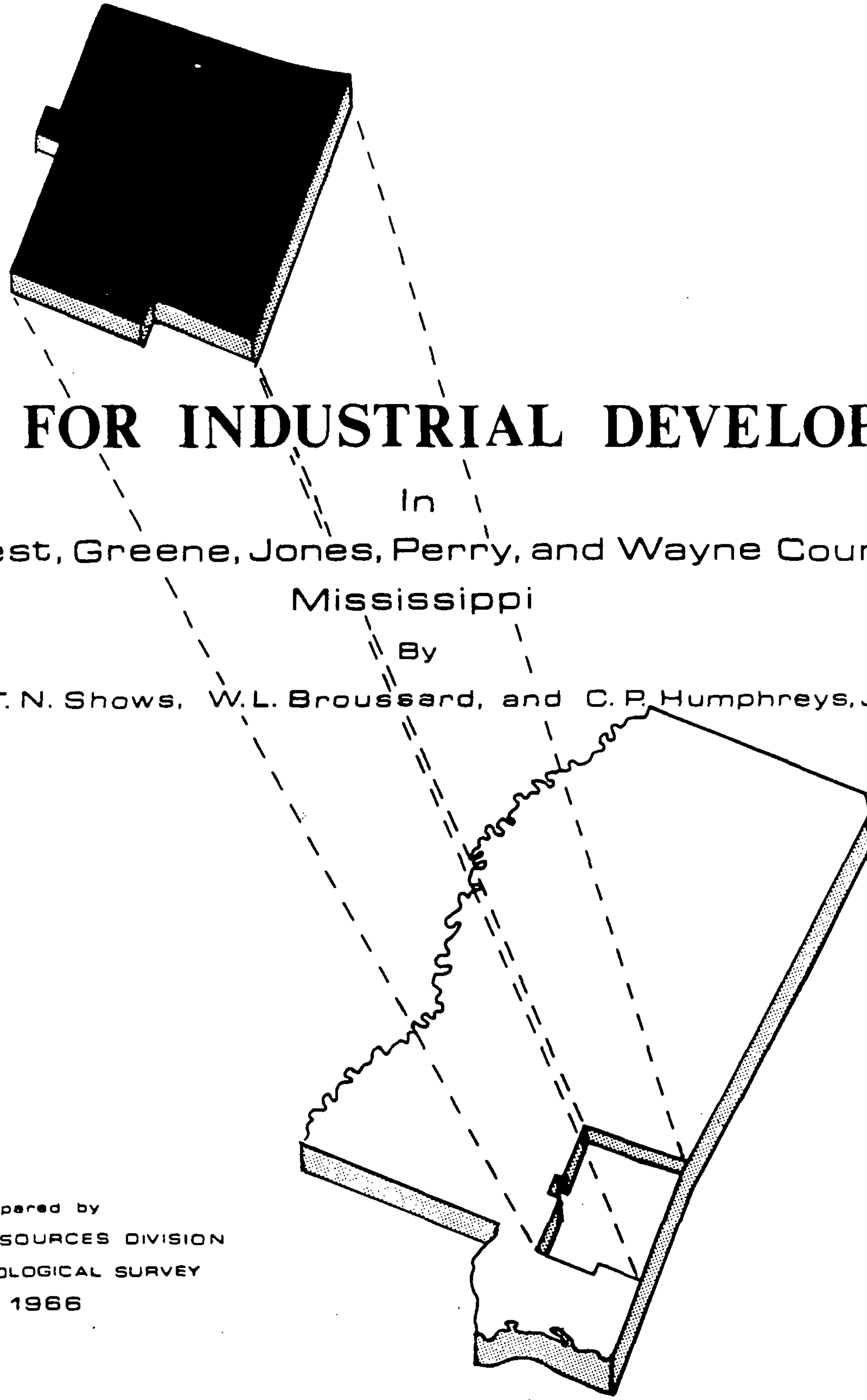
A COOPERATIVE STUDY SPONSORED JOINTLY BY
WATER RESOURCES DIVISION, U. S. GEOLOGICAL SURVEY
and

Mississippi Research and Development Center
JACKSON, MISSISSIPPI

WATER FOR INDUSTRIAL DEVELOPMENT

In

Forrest, Greene, Jones, Perry, and Wayne Counties, Mississippi



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Prepared by

WATER RESOURCES DIVISION

U. S. GEOLOGICAL SURVEY

1966

many municipal and industrial water managers, well owners, water-well contractors, and oil company personnel. The Mississippi Power Company supplied daily temperature readings on the Leaf River at Hattiesburg.

HYDROLOGIC SETTING

Climate

The climate of southeastern Mississippi is humid and semitropical. Average annual rainfall ranges from 56 inches in the northwest corner of the five-county area to 64 inches in southern Forrest and Perry Counties. Average annual runoff from the numerous streams in the area ranges from 18 inches in the north to 26 inches in the south (fig. 1). The remainder of the precipitation seeps into the ground or is dissipated by evapotranspiration. The mean annual temperature in the five-county area is about 66° F; the mean monthly temperature ranges from 82° F in July to 51° F in January at Hattiesburg. On the average, Hattiesburg has 106 days annually with temperatures equal to or greater than 90° F, and only 41 days annually with temperatures equal to or less than 32° F.

Geology and Topography

The study area is within the Pascagoula River basin in the East Gulf Coastal Plain. Exposed rocks are of sedimentary deposition and most are unconsolidated. The exposed sediments range in age from late Eocene to Recent with Miocene and younger sediments forming the majority of the exposed sediments (fig. 3). The geologic units containing fresh-water aquifers range in age from early Eocene to Recent alluvial deposits. Most geologic units are traceable from the surface deep into the subsurface (figs. 2 and 20).

The geologic units have a regional southwestward dip of 20-45 feet per mile (fig. 23 and 24). The dip of the beds is steep (40-45 feet per mile) in Wayne and Jones Counties, but it flattens (20-25 feet per mile) in Greene, Perry, and Forrest Counties owing to the major structural uplift of the Wiggins anticline south of the study area.

Several shallow piercement salt domes in the area locally affect the dip, strike, and thickness of formations. The formations display gentle arching or uplifting across these structures. Caution should be exercised in drilling wells in the vicinity of the shallow domes, especially near the shallow Richton dome (depth of caprock 497 feet, fig. 32) because the base of fresh water is shallow over some of these domes.

One recognizable subsurface fault (figs. 2, 23, and 24) is in southern Forrest County. It is an east-west trending fault associated with the Wiggins anticline, which is south of Forrest County in Stone County. The fault causes an offset in the deep beds but no movement is apparent in the shallower Miocene deposits.

Lithology varies between geologic units, but typically consist of interbedded clay, sand, and gravel. Sand and clay in various proportions constitute most of the sediments; however a few consolidated limestone layers occur in some units, particularly in the Vicksburg Group. The formations thicken downdip to the west and south toward the Mississippi River and the Gulf of Mexico.

The deposits, particularly Miocene and younger, are lenticular (figs. 21 and 22), and lithology changes in short distances. The sands, which are irregular and thicken or thin in short distances, are difficult to trace down the dip. Most of the water bearing units were deposited in a deltaic environment.

Topography reflects the geology and drainage of the region and results from erosion of the gently dipping unconsolidated sedimentary beds. The landform is characterized by low, dissected, rounded hills and a few large streams in wide, flat valleys. Swamps are common in the lowland areas adjacent to the larger streams. There are many small man-made stock ponds in the area.

Elevation in the area ranges from less than 100 feet above sea level in the southern part along the Leaf River to 430 feet in western Jones County. Local relief is gentle; elevations vary only a small amount in short distances.

Drainage

The five-county area lies within the central part of the Pascagoula River basin. The major sub-basins in the area are the Leaf River, Chickasawhay River, and Black Creek (fig. 3). The Leaf River enters northwestern Jones County and flows generally southward to the vicinity of Hattiesburg in northern Forrest County, thence southeastward to meet the Chickasawhay River south of the Greene County line to form the main stem of the Pascagoula River. The Chickasawhay River drains the eastern parts of Wayne and Greene Counties. Black Creek flows through southern Forrest and Perry Counties and enters the Pascagoula River south of the study area. The streams are typical of those found in the southern United States, having winding meanders, broad, wooded flood plains, and many oxbow lakes along the larger rivers.

Occurrence of Ground Water

Ground water is any water in the ground that is in the zone of saturation. An aquifer is any water-bearing unit capable of yielding water to wells; in the study area most aquifers are composed of sand and gravel. The unconsolidated sediments have openings, or voids, between grains which are saturated with water below the water table. The shape, size, assortment, and degree of compaction of the grains determines the ease with which water moves through the material.

Water enters the permeable geologic units in their areas of outcrop (fig. 3) and moves generally southwestward in the direction of the dip toward areas of discharge which may be wells, springs, seeps, or adjacent permeable

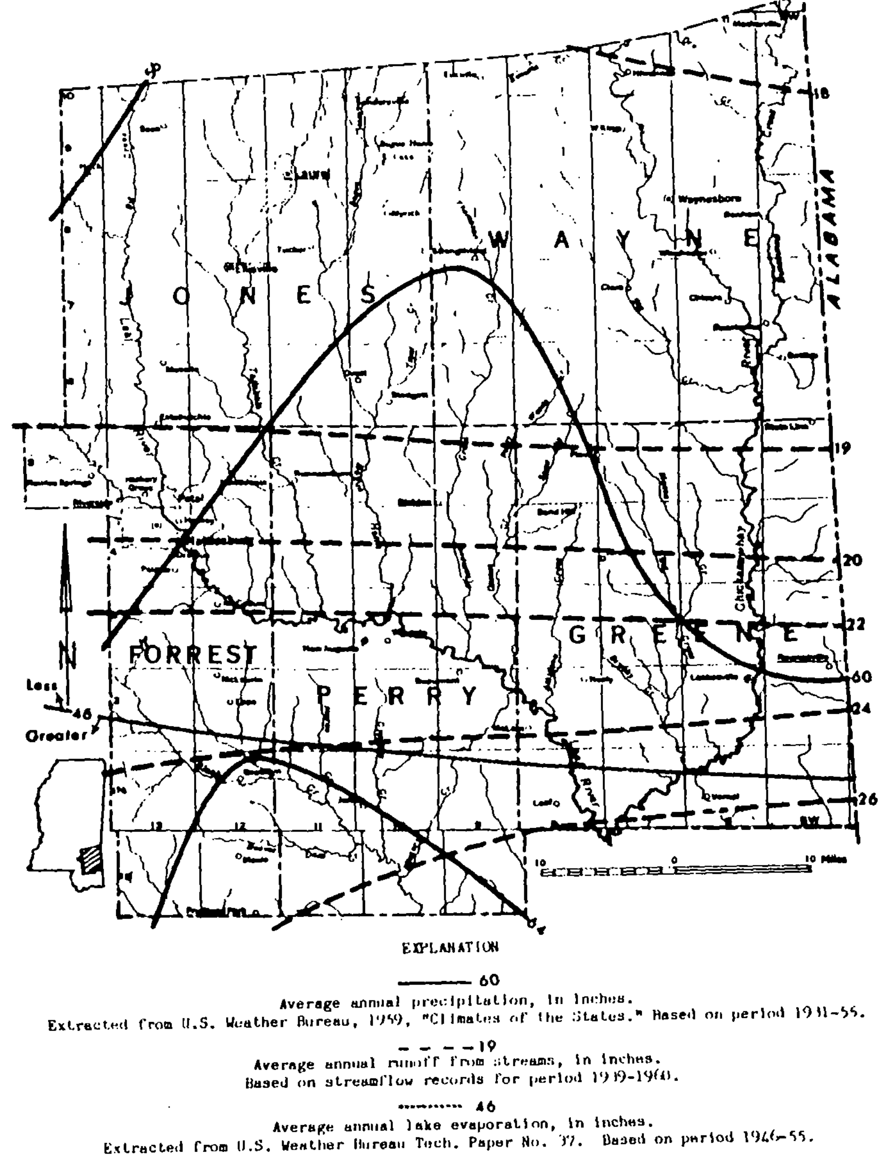


Fig. 1. Map showing annual precipitation, evaporation, and run-off

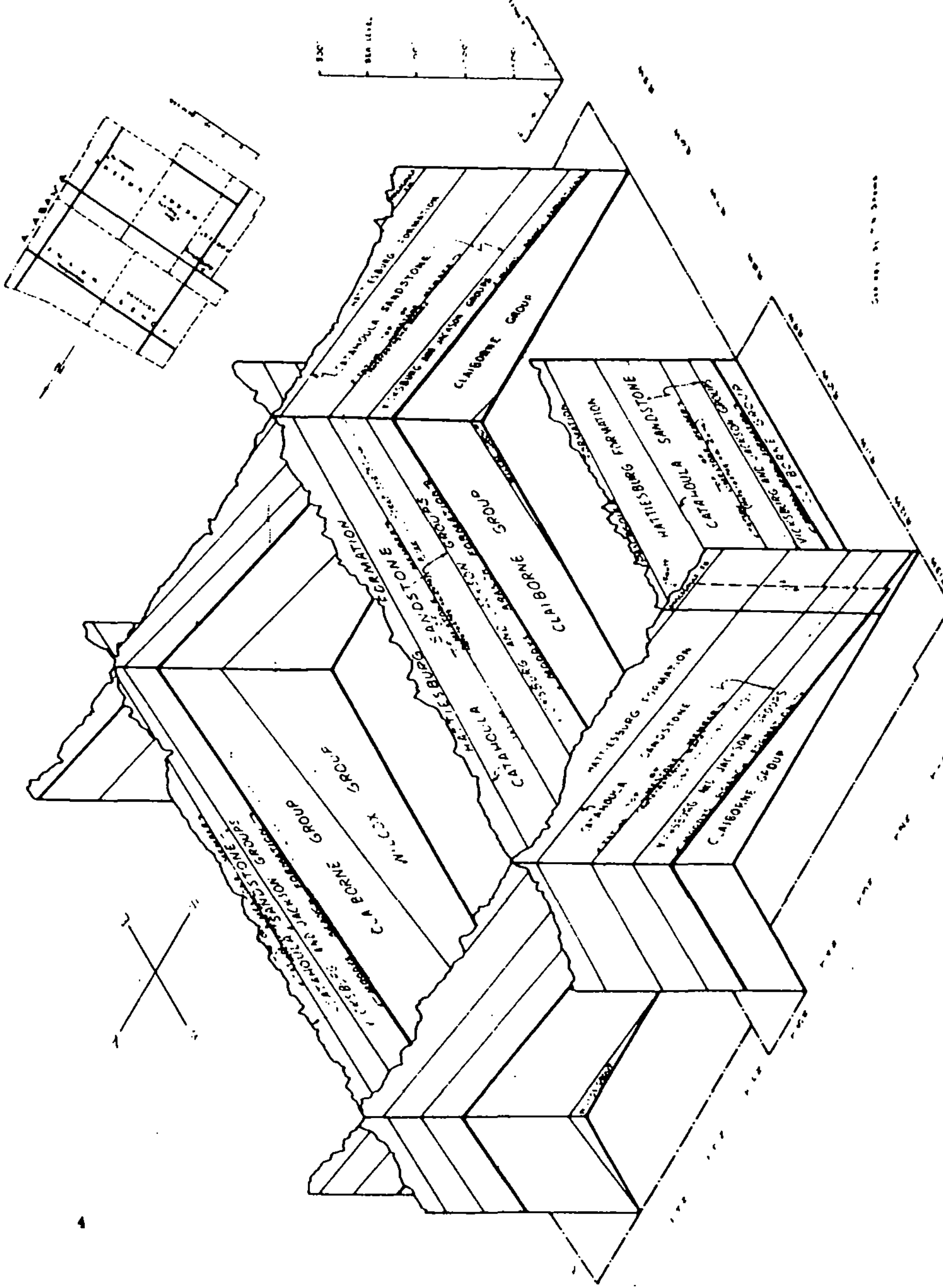


Fig. 2. Fence diagram showing geology of area

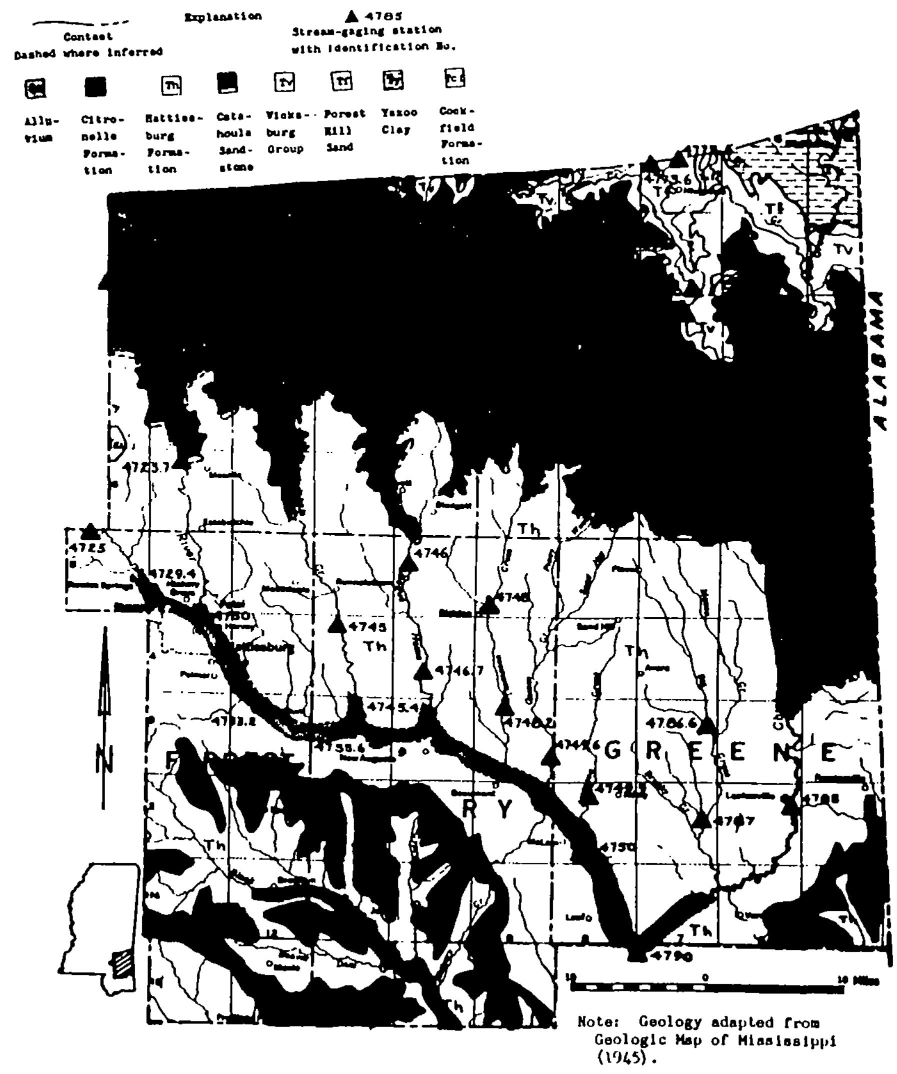


Fig. 3. Geologic map showing principal streams and gaging stations

Table 1.--Stratigraphic column and water resources in Forrest, Greene, Jones, Perry, and Wayne Counties, Miss.

System	Series	Group	Formation	Thickness (feet)	Lithology	Water resources
Quaternary	Holocene		Alluvium	0-175	Clay, sand, and gravel in the larger stream valleys, particularly in Forrest, Greene, and Perry Counties.	Important aquifer at certain locations in the larger stream valleys, as at Hattiesburg on the Leaf River. Supplies domestic wells along the streams.
	Pleistocene		Terrace deposits	[illegible]	Red and gray sand and gravel with clay lens. Deposits cap the hills and form terraces along the streams.	Not an important aquifer, except for shallow dug wells.
Tertiary	Pliocene		Citronelle	[illegible]	Clay, sand, gravel, and ferruginous layers. These deposits usually are red. Deposits cap the higher hills in the area, particularly in the southern counties.	Not an important aquifer. Supplies shallow domestic wells, particularly in southern part of area.
	Miocene		Pascagoula	[illegible]	Clay, sandy clay, sand, and gravel, with some thin ferruginous layers. Sand beds occur at various horizons and vary in thickness from thin layers to 200 feet. A thin zone of limestone ([illegible] Limestone Member) occurs in the lower half of the unit.	An important source of water in the extreme southern part of Forrest, Greene, and Perry Counties. Sands capable of supplying large quantities of water.
			Hattiesburg	[illegible]		An important source of water in Forrest, Greene, and Perry Counties. Sands and gravels capable of yielding large amounts of water.
	Miocene(?)		Catahoula Sandstone	[illegible]		An important source of water in all but northern third of area. Majority of wells throughout the area are completed in the Catahoula. Large yielding wells are possible in most locations from the thick sands.
	Oligocene	Vicksburg	Undifferentiated	[illegible]	Limestone beds alternating with clay sand and clay beds. Thick sand layers, 10-30 feet, occur locally at Waynesboro and Sandersville.	Generally not an aquifer. A fair aquifer in certain locations such as Waynesboro and Sandersville, where there are beds of sand up to 40 feet thick. The clay interval yields water to domestic wells in central Wayne and northeastern Jones Counties.
			Forest Hill Sand	80-110	Thin sand and clay layers with silt.	Not used as an aquifer, except for shallow domestic wells near outcrop.
	Eocene	Jackson	Yazoo Clay	300-375	Clay and calcareous sand with thin limestone layers. The Cocoa Sand Member, near the bottom, is generally 10 to 15 feet thick and composed of clay sand. In eastern Wayne County, the unit is about 40 feet thick and composed of sand with thin layers of limestone.	Not an aquifer, except in eastern Wayne County, where the Cocoa Sand Member is an important local source of water supply. The Cocoa Sand Member supplies domestic wells and one community water system in the vicinity of Buckatunna.
			Moodys Branch	15-20	Glauconitic, fossiliferous marl and sand. Indurated beds occur near the outcrop.	Not an aquifer.
		Claiborne	Cockfield	[illegible]	Sand and clay with lignite. Thin to thick beds of sand alternating with clay. Lignite is common but not as prevalent as in the Sparta. Sand beds are 30 feet thick in northeastern Wayne County and 30 feet thick at Laurel.	A potential important source of water in northern Wayne and Jones Counties. Several large industrial wells tap this aquifer at Laurel. Water is colored except near outcrop in northern Wayne County.
			Cook Mountain		Shale, clay, limestone, and sandstone. Top of formation is usually a limestone and bottom is a clay or shale.	Not an aquifer.
			Sparta Sand		Sand, sandy clay and clay, with lignitic layers. Sand thickness ranges from 45 feet in eastern Wayne County to 80 feet in central Jones County. Lithology in northern counties is primarily clay and differentiation from the underlying Zilpha Clay is difficult.	An important source of water in parts of northern Jones and Wayne Counties. Colored water is common in this aquifer.
			Zilpha Clay		Shale and brown clay, with glauconite.	Not an aquifer.
			Winona Sand		Calcareous sandstone and clay with thin beds of sand.	Not an aquifer.
			Tallahatta		Brittle clay and sandstone (buhrstone). Thick sand occurs near bottom of section.	Not an aquifer, except for lower sand (Meridian Sand Member) which is usually not differentiated from the underlying Wilcox. The Meridian Sand Member is unused but is potentially an important source of water in the northern third of Wayne and Jones Counties.
		Wilcox	Undifferentiated	[illegible]	Sand, sandy shale, clay and shale. Beds of lignite occur in the sand and clay. Sand beds compose 30 percent of the unit. Sands are micaceous, medium to coarse-grained. Sand thickness ranges from 150 to 250 feet in northern Wayne County.	Potentially an important source of water in northern third of Wayne County but is untapped in study area. Best aquifers are probably in lower third of the unit.

beds. Water levels are lowered in the aquifers in the vicinity of discharge, and the lower water levels change the direction of ground-water movement. Some of the geologic units are relatively impermeable (aquicludes) and allow little movement of water. Permeability (Glossary) within an aquifer is usually greater horizontally than vertically because of horizontal stratification.

Aquifers are classified as water-table or artesian depending on whether the water level is within the aquifer and unconfined or whether it is confined. Water in a water-table well stands at about the same level as in the aquifer outside the well. Water-table aquifers receive recharge from local precipitation. Discharge from water-table aquifers supplies most of the base flow of the streams, especially during droughts. Water in the terrace and alluvial aquifers in most places occurs under water-table conditions.

In artesian aquifers the water-bearing material is confined by impermeable beds and water is confined under hydrostatic pressure or head; thus, water in wells will rise above the top of the water-bearing material. Water in the majority of aquifers in the study area occurs under artesian conditions, except for small areas in the outcrops.

Changes in quality of water occur as the water moves down the dip from the outcrop to areas of discharge. Dissolved-solids content usually increases down the dip (fig. 20) and the type of the water changes from calcium to sodium bicarbonate. The deeper water is usually softer because the calcium and magnesium content has been decreased by ionic exchange for sodium. The pH of the water increases down the dip, and iron problems are reduced.

The temperature of shallow ground water is about 66° F, which is the mean annual temperature of the air. The temperature of the water increases 1° F for each additional 65 to 100 feet of depth in the five-county area. Ground water temperature, except in shallow water-table wells, does not vary with seasonal changes in air temperature.

PRESENT WATER USE

Total water use in the five-county area is estimated to be 152 mgd (million gallons per day); ground-water use is 28 mgd and surface water use is 124 mgd. Most water is used for cooling purposes, and only a small percentage is actually consumed. All municipal and most industrial supplies are obtained from wells (fig. 4). The Mississippi Power Company and the Hercules Powder Company at Hattiesburg use both ground and surface water. These two plants use an estimated 124 mgd of surface water for industrial cooling.

The heaviest withdrawal of ground water occurs in the Hattiesburg (9.3 mgd) and Laurel (12.5 mgd) areas. Most other areas are rural with no appreciable concentration of water withdrawal, except for public supply in the smaller towns. The many rural water systems that have been installed or proposed will cause an increase in the use of ground water in the rural areas.

Ground water is used for irrigation at two tree seedling nurseries, one near Waynesboro and the other near Brooklyn. Surface water is used for crop irrigation along a few of the streams, but the total surface-water withdrawal for irrigation is small and restricted to infrequent dry periods.

Geiger Lake at Paul B. Johnson State Park, 12 miles south of Hattiesburg, is a 300-acre lake operated by the Mississippi Park Commission for recreational purposes. The Mississippi Game and Fish Commission operates Lake Bogue Homo, a 1,500-acre lake 5½ miles east of Laurel. The Leaf, Bowie, and Chickasawhay Rivers and many oxbow lakes along the Leaf and Chickasawhay are also used extensively for boating and fishing. Numerous private lakes and farm ponds throughout the area afford private fishing areas. The U. S. Department of Agriculture has developed scenic float routes on reaches of Black Creek and its tributaries in De Soto National Forest. The Pat Harrison Waterway District, in cooperation with other agencies, is planning several projects in southeastern Mississippi which include facilities for swimming, fishing, and boating.

At present there is no commercial water traffic, but it has long been the aim of local interests to link the cities of Meridian, Hattiesburg, and Laurel with the Gulf of Mexico through a system of barge canals. The Pat Harrison Waterway District is empowered by legislative act to develop plans for such navigation facilities in conjunction with Federal or State agencies.

SURFACE WATER

An abundant supply of surface water of good quality suitable for most industries is available. During an average year, more than two trillion gallons of water flows from the Leaf and Chickasawhay River basins. This large volume of water flows at an average rate of about 9,600 cfs (cubic feet per second), or 6,200 mgd, past a gaging station (No. 4790) on the Pascagoula River just downstream from the confluence of the Leaf and Chickasawhay Rivers. The quantity and quality of streamflow, however, vary with time and place and this variability requires the collection and interpretation of a mass of data to appraise adequately the surface-water resources of the five-county area.

Water shortages that will increase the pollution problem and adversely affect recreational interests can occur at some locations on various streams. Often the period of deficient flow coincides with a time of maximum water demand. On the other hand, too much water during floods may cause loss of life and property damage and create many problems in transportation, commerce, and agriculture. Streamflow and water-quality data have been collected and analyzed from a network of continuous-record gaging stations supplemented by partial-record sites (fig. 3 and table 2).

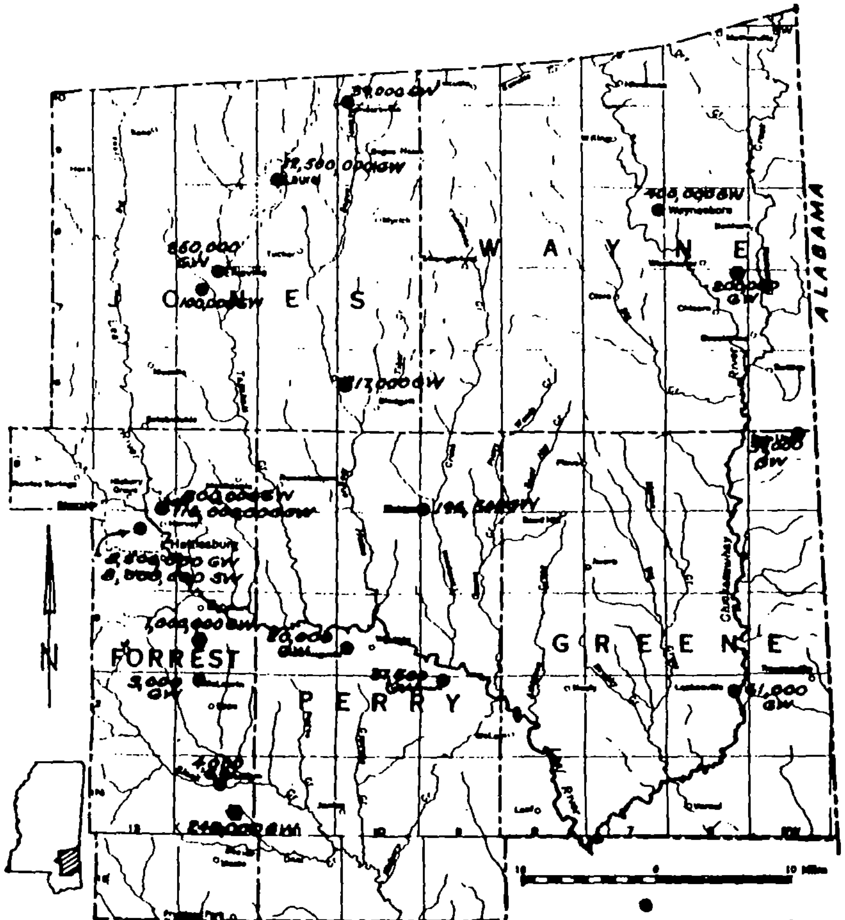
Flow Duration

Flow duration data for continuous-record gaging stations were computed from the daily discharges by the total-period method. A flow-duration curve based on these data shows, without regard to chronological order, the flow variability of a stream. Estimates of the duration of flows at short-time continuous-record stations were obtained by using methods described by Searcy (1959).

A tabulation of flow-duration data, adjusted to base period October 1928-September 1957, for stations in the area is shown in table 3. These data can be plotted on logarithmic-probability paper if graphical presentation is desired. The data in table 3 are reliable long-term predictions of the future flow patterns of the streams in the area if no unusual climatological or man-made changes occur; however, values for individual years will deviate, sometimes considerably, from the long-term period.

Flow-duration data may be used for comparing flow characteristics of different streams. If the effect of drainage-area size is removed (by dividing discharge by drainage area) a direct comparison may be made. Flow-duration curves for Bowie Creek at U. S. Highway 49 near Hattiesburg, Leaf River near McLain, Pascagoula River at Merrill, Chickasawhay River at Leakesville, and Tallahala Creek at Laurel are shown on figure 5. These stations were selected to illustrate the variation in base flow of streams in the area. Bowie Creek has a much higher low-flow yield per square mile than the other streams on figure 5. The slope of the lower end of the flow-duration curve for Bowie Creek is flatter than those of the low-yielding streams. Slope of the duration curve is a measure of the variability of that stream.

Although the information in figure 5 is expressed as discharge per square mile, it does not imply that each drainage basin internally has uniform yield. The streamflow yields of



Average daily withdrawal, in gallons
GW - ground water
SW - surface water

Seasonal daily withdrawal, in gallons
GW - ground water
SW - surface water

Fig. 4. Map showing major water withdrawals

Table 2.--Stream-gaging stations and water-sampling sites

[Type of record: 1, continuous-record gaging station; 2, low-flow partial-record station; 3, daily sampling site; 4, periodic sampling site; 5, continuous conductivity site; 6, DO and BOD sampling site; 7, sediment sampling site.]

Identification No.	Station	Drainage area (sq mi)	Period of streamflow record	Type of record: Stream-flow	Type of record: Chemical quality	Location
024720	Leaf River near Collins	752	Sept. 1938-	1	4	NE¼ sec. 13, T. 9 N., R. 14 W., at bridge on U.S. Highway 84, 9½ miles northeast of Collins.
024721	Big Creek near Laurel	* 100	1942-43 1951 1953-56 1958 1960 1963-	2	--	SW¼ sec. 4, T. 8 N., R. 13 W., at bridge on U.S. Highway 84, 10½ miles west of Laurel.
024721.5	Leaf River near Ellisville	* 910	1953-54 1956 1960 1963-	2	--	Sec. 12, T. 8 N., R. 13 W., at bridge on State Highway 588, 8 miles west of Ellisville.
024721.7	Leaf River near Moselle	1,030	1963-	2	4	NW¼ sec. 9, T. 6 N., R. 13 W., at bridge on Interstate Route 59, 1 mile west of Moselle.
024725	Bouie Creek near Hattiesburg	306	Sept. 1938-	1	4,6,7	Sec. 5, T. 5 N., R. 14 W., at bridge on U.S. Highway 49, 10 miles northwest of Hattiesburg.
024729.4	Bouie River at Hattiesburg	456	1963-	2	--	Sec. 30, T. 5 N., R. 13 W., at bridge on Interstate Route 59, 1½ miles north of intersection of U.S. Highway 49 and 11 in Hattiesburg.
024730	Leaf River at Hattiesburg	*1,760	Sept. 1938-	1	*3,*4,7	NW¼ sec. 2, T. 4 N., R. 13 W., at bridge on U.S. Highway 11, at eastern city limits of Hattiesburg.
024731.2	Leaf River at McCallum	*1,890	1963-	2	4,6	NW¼ sec. 10, T. 3 N., R. 12 W., at county highway bridge, 1 mile east of McCallum.
024731.6	Leaf River near Mahned	*1,880	1963-	2	4,5,6,7	NW¼ sec. 15, T. 3 N., R. 11 W., at county highway bridge, 1½ miles north of Mahned.
024735	Tallahala Creek at Laurel	233	1938-40 1964-	1	4	NW¼ sec. 8, T. 8 N., R. 11 W., at bridge on State Highway 15 and ½ mile southeast of Laurel.
024740	Tallahoma Creek near Laurel	* 130	1954-56 1958 1960 1963-	2	--	SW¼ sec. 26, T. 9 N., R. 12 W., at bridge on county highway, 2 miles northwest of Laurel.
024745	Tallahala Creek near Runnelstown	612	Oct. 1939-	1	4,6	NW¼ sec. 8, T. 4 N., R. 11 W., at county highway bridge between Sunrise and Runnelstown, 3 miles south of Runnelstown.
024745.4	Tallahala Creek near Mahned	640	1963-	2	4,6	SW¼ sec. 10, T. 3 N., R. 11 W., at bridge on county highway, 2 miles north of Mahned.
024746	Bogue Homo near Richton	190	1943 1954 1956 1963-	2	--	NE¼ sec. 17, T. 5 N., R. 10 W., at bridge on county highway, 3 miles northwest of Richton.
024748	Thompson Creek near Richton	* 186	1942-43 1951-56 1956 1960 1961 1963-	2	--	NW¼ sec. 12, T. 5 N., R. 9 W., at bridge on State Highway 42, ½ mile east of Richton.
024748.2	Thompson Creek near Hintonville	* 212	1963-	2	--	SW¼ sec. 11, T. 4 N., R. 9 W., at county highway bridge, 1½ miles east of Hintonville.
024749.6	Gaines Creek near Beaumont	* 132	1963-	2	--	SE¼ sec. 25, T. 3 N., R. 9 W., at county highway bridge, 5 miles east of Beaumont.
024749.9	Atkinson Creek near McLain	* 55	1963-	2	--	NW¼ sec. 16, T. 2 N., R. 8 W., at county highway bridge, 1 miles north of McLain.
024750	Leaf River near McLain	*3,510	Oct. 1939-	1	4,6,7	SE¼ sec. 20, T. 2 N., R. 8 W., at bridge on U.S. Highway 98, 1½ miles east of McLain.
024771.1	Shubuta Creek near Shubuta	95	1939 1963-	2	--	NW¼ sec. 15, T. 1 N., R. 15 E., at county highway bridge, 1½ miles northeast of Shubuta.
024771.5	Chickasawhay River at Shubuta	*1,460	1943 1957 1963-	2	--	On line between secs. 9 and 10, T. 10 N., R. 7 W., at bridge on U.S. Highway 45, 1 mile southeast of Shubuta.
024771.6	Eucutta Creek near Shubuta	* 70	1963-	2	--	NE¼ sec. 18, T. 10 N., R. 7 W., at bridge on county highway, 2 miles southwest of Shubuta.
024774.9	Yellow Creek at Waynesboro	* 90	1963-	2	--	SE¼ sec. 35, T. 9 N., R. 7 W., at bridge on county highway, ½ mile northwest of Waynesboro.
024775	Chickasawhay River near Waynesboro	*1,660	*1938-50 1957-58 1963-	1,2	3,*6,7	NW¼ sec. 10, T. 8 N., R. 7 W., at bridge on U.S. Highway 84, 2 miles west of Waynesboro.
024776	Patton Creek near Waynesboro	* 10	1956 1958 1960 1963-	2	--	SE¼ sec. 18, T. 8 N., R. 6 W., at bridge on U.S. Highway 45, 1¼ miles southeast of Waynesboro.
024780	Buckatunna Creek at Denham	468	*1938-49 1952-56 1958 1960 1963-	1,2	--	S½ sec. 18, T. 8 N., R. 5 W., at bridge on county highway, 0.3 mile east of Denham.
024780.2	Big Red Creek near Buckatunna	* 40	1963-	2	--	NW¼ sec. 21, T. 7 N., R. 5 W., at bridge on county highway, 1 miles northeast of Buckatunna.

able time, as specified by the Board in its authorization, to the stream at a point downstream from the place of withdrawal. This appropriation can be made only if the Board shall find that such action will not result in any substantial detriment to property owners affected thereby or to the public interest.

Average minimum flows calculated for streams in the area are presented in table 11. Data for the period 1941-60 were used for the determinations of the average minimum flows.

The law states that the Board has authority to enter into compacts and agreements concerning the State's share of water flowing in streams, where parts of such water courses are contained within the territorial limits of a neighboring state.

GROUND WATER

Location, Extent, and Lithology of Aquifers

Fresh-water aquifers in the five county area are mostly beds of sand or zones of sandy beds. The beds dip gently to the southwest and contain fresh water as much as 40 miles from the outcrops and as much as 3,000 feet below land surface. Aquifers of Miocene age are available in practically the entire area, except in the northern third of Jones and Wayne Counties (fig. 19), but no single geologic unit contains fresh water throughout the five counties. Aquifers in Claiborne and Wilcox groups are available in the northern third of the area, but the great depth (1,200-3,000 feet) of the Wilcox has limited its use owing to the higher cost of deep wells. Shallow alluvial deposits in the larger stream valleys are potentially important aquifers in the three southern counties.

Lithology and thickness of aquifers is shown in table 1 and in a northeast-southwest cross-section (fig. 20) parallel to the general dip of the beds. Detailed sections through Laurel and Hattiesburg show the lenticular bedding of the Miocene beds (figs. 21 and 22). Depth and thickness of aquifers can be estimated from the sections for places in the vicinity of the sections, but structure contour maps drawn on mappable geologic horizons are useful for estimating aquifer depths at any place in the area. Because the Moodys Branch Formation is thin (15-20 feet), a contour map showing the configuration of the top of the mappable Moodys Branch Formation (fig. 23) is essentially the top of the Cockfield Formation. Another contour map, showing the configuration of the base of the Catahoula Sandstone (fig. 24), can be used to determine the depth of a well necessary to penetrate the Catahoula.

Thickness of geologic units increase from the outcrop toward the southwest in the direction of the center of deposition. The thickness of the Sparta Sand ranges from 110 feet in northeastern Wayne County to 190 feet in north-central Jones County. Thickness of the Cockfield Formation ranges from 80 feet in northern Wayne County to 150 feet in north-central Jones County. Miocene beds range in thickness from about 100 feet in northern Jones County to about 2,000 feet in southern Forrest County. The alluvium underlying the major flood plains in the area is as much as 125 feet thick, as in the Leaf River flood plain at Hattiesburg.

Most of the aquifers are composed of sand or gravel mixed with varying proportions of silt and clay. Lignite is common in the Claiborne and Wilcox Groups. The alluvium is composed mostly of unstratified coarse sand and gravel. The beds of sand in the Miocene sediments, the principal source of ground water in the area, may be thinner than 2 feet or thicker than 200 feet. Commonly there are several beds of sand in each water-bearing geologic unit.

The marine Vicksburg Groups and Cocoa Sand are more uniform in lithology than most of the other water bearing units. The Cocoa Sand in eastern Wayne County is about 60 feet thick and is composed of thin layers (2-10 feet) of fine- to medium-grained sand alternating with thin layers (4-8 feet) of calcareous sandstone and limestone. The Vicksburg is generally composed of limestone beds alternating with thin beds (2-4 feet) of limy sand and clay. The Vicksburg at particular locations, as at Waynesboro and Sandersville, is composed of relatively thick sand beds (30-50 feet) interspersed with thin layers (1-2 feet) of limestone. The limestone or limy sand section of the Vicksburg (known locally as "Honeycomb rock") yields water to domestic wells across central Wayne and northeastern Jones Counties.

Prediction of aquifer thickness and lithology is difficult because of the lenticular bedding of most units. Lithologic changes occur in short distances and individual sands are difficult to trace, especially along the dip of the beds (figs. 21 and 22); sand beds in the Miocene are characteristically lens shaped or wedge shaped. Construction of a well where water is needed may be a problem because of the lenticular bedding of most sands, and test drilling is recommended to determine the depth, thickness, and character of aquifers underlying a particular site.

The depth of drilled water wells ranges from 20 to 1,316 feet (table 12). A well at Laurel is 1,316 feet deep, but most wells are less than 800 feet deep. At most places more than one aquifer is available.

Aquifer and Well Hydraulics

Transmissibility, Permeability, and Storage

Aquifers vary considerably in their ability to transmit and store water. Transmission and storage of water by an aquifer depends on the porosity (Glossary), size of open spaces between grains of the aquifer material, and interconnection of the open spaces; all of which are related to the depositional history of the aquifer. Coefficients of permeability and transmissibility (Glossary) are measures of the ability of an aquifer to transmit water. The coefficient of

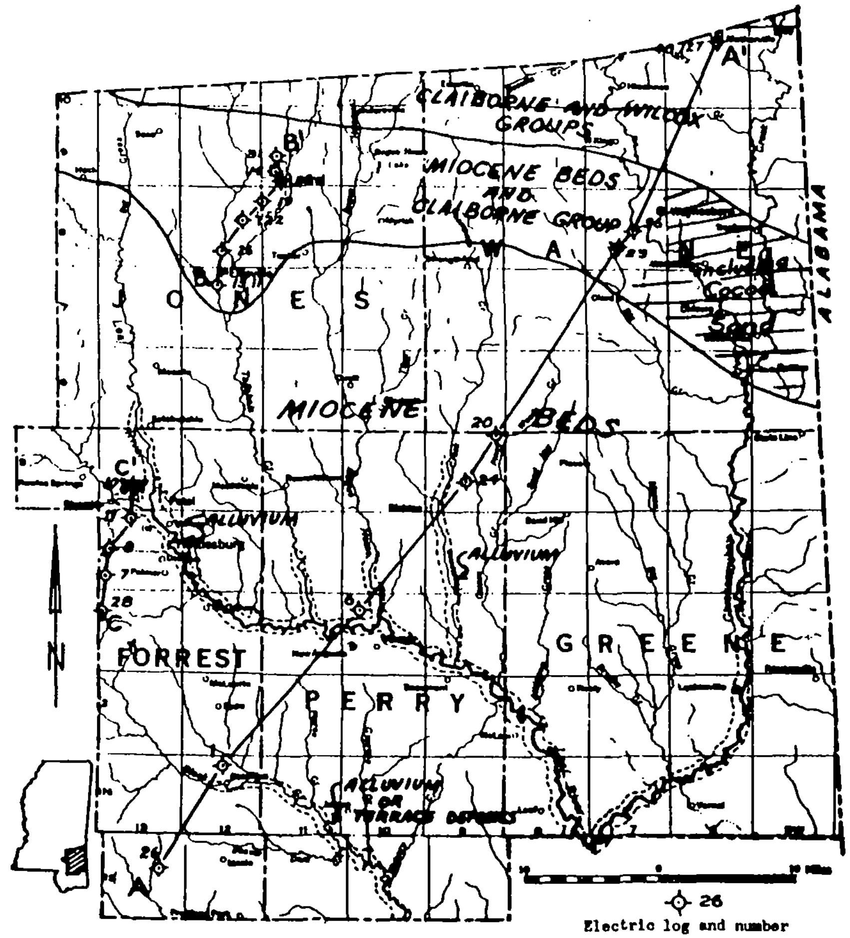


Fig. 19. Map showing distribution of fresh-water aquifers and location of geohydrologic sections

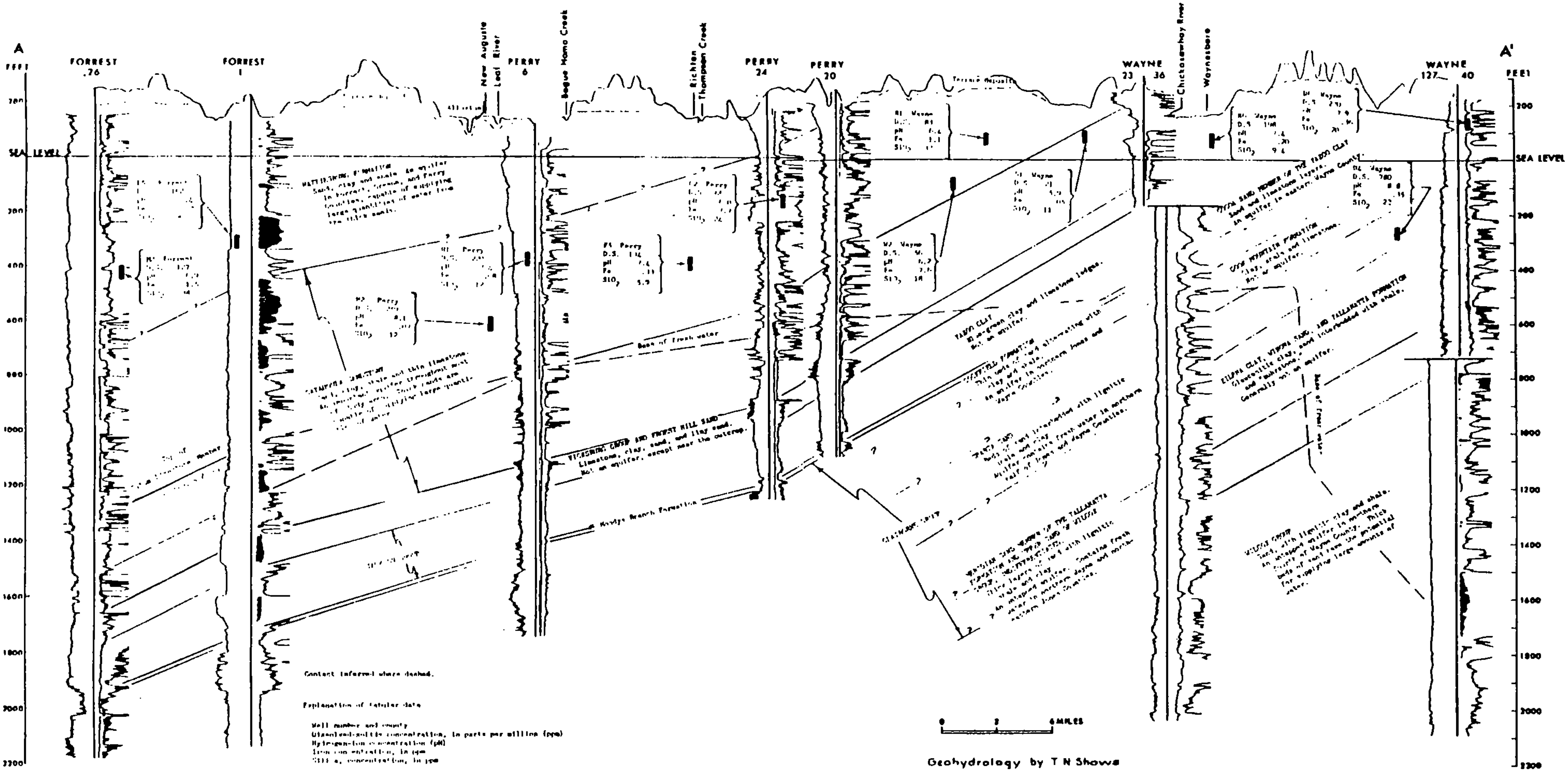


Fig. 20. Geohydrologic section (A-A') from southwestern Forrest County to northeastern Wayne County

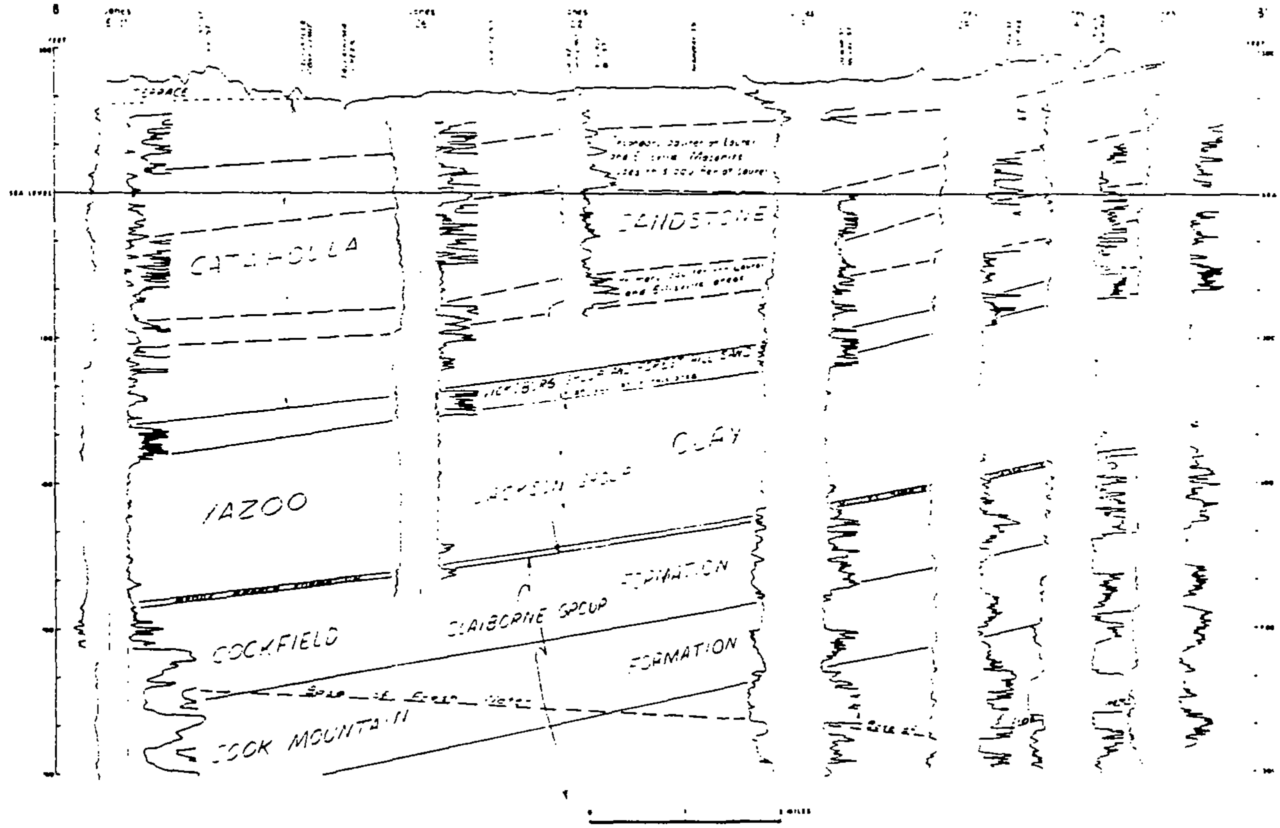


Fig. 21. Geohydrologic section (B-B') from Ellisville to Laurel

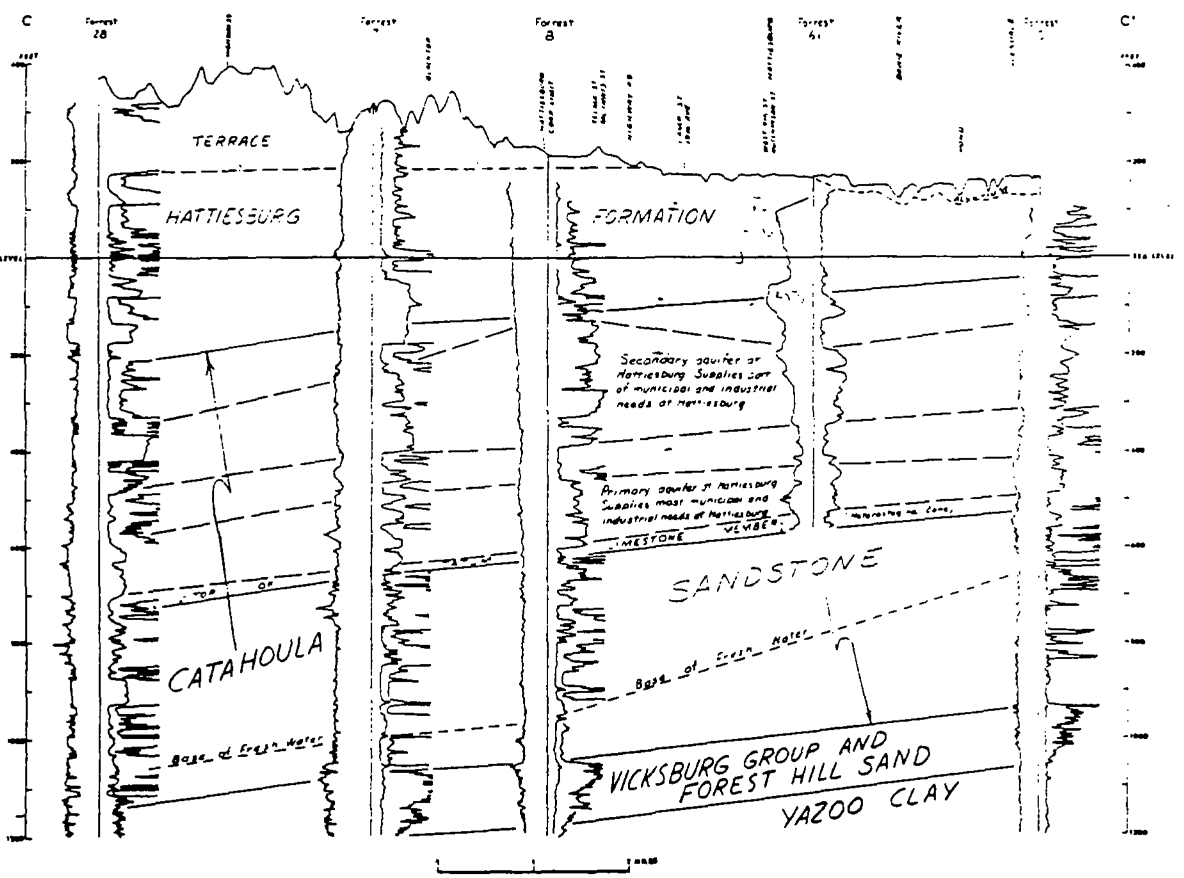
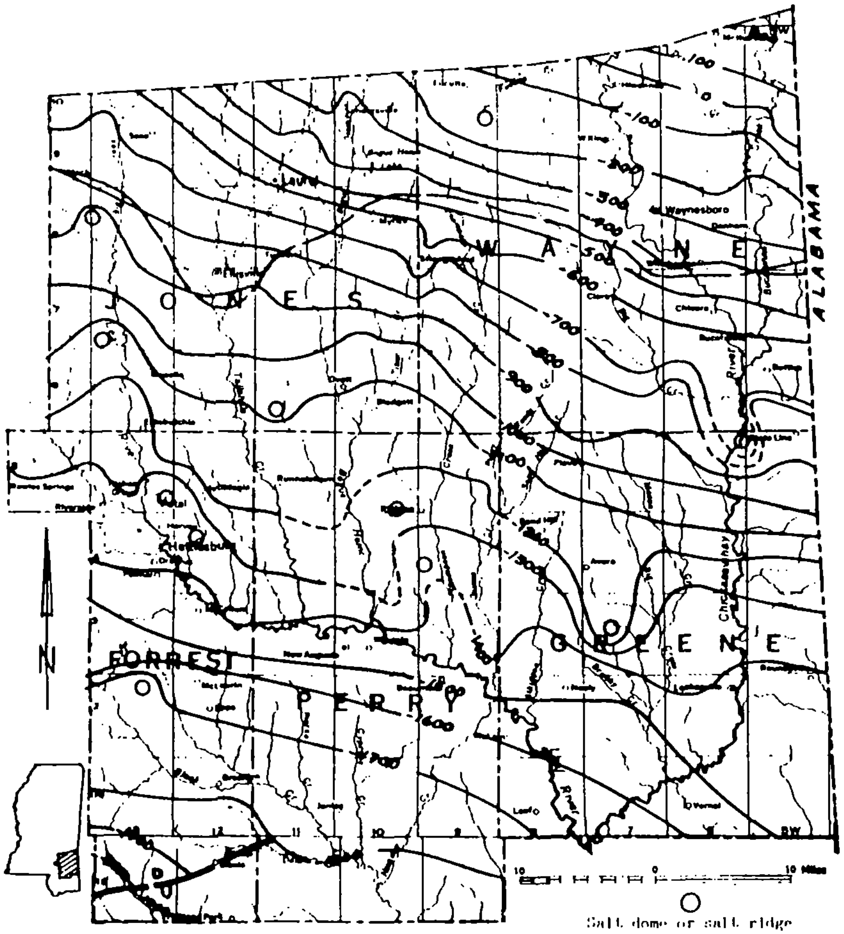


Fig. 22. Geohydrologic section (C-C') through the Hattiesburg area



Salt dome or salt ridge

Approximate limit of fresh water in Cockfield Formation.

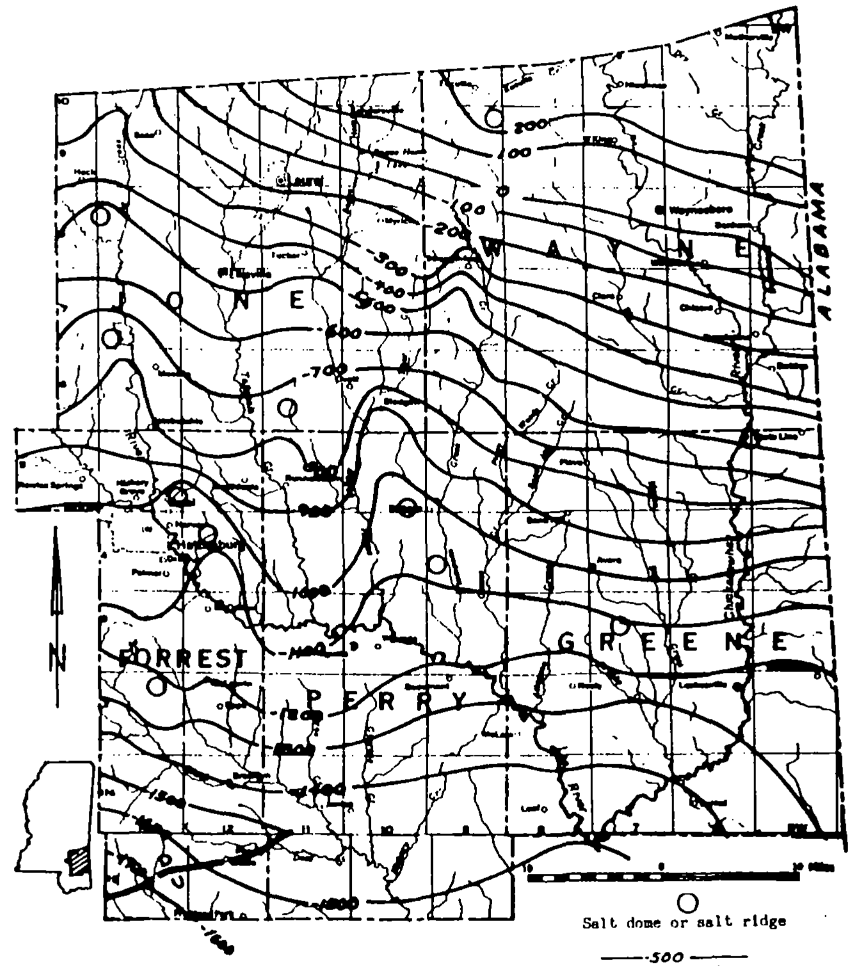
Approximate location of fault.

-200

Structure contour, dashed where inferred.

Contour interval 100 feet, datum is mean sea level.

Fig. 23. Contour map showing configuration of the top of the Moodys Branch Formation



Salt dome or salt ridge

Approximate location of fault

-500

Structure contour

Contour interval 100 feet, datum is mean sea level.

Fig. 24. Contour map showing configuration of the base of the Catahoula Sandstone

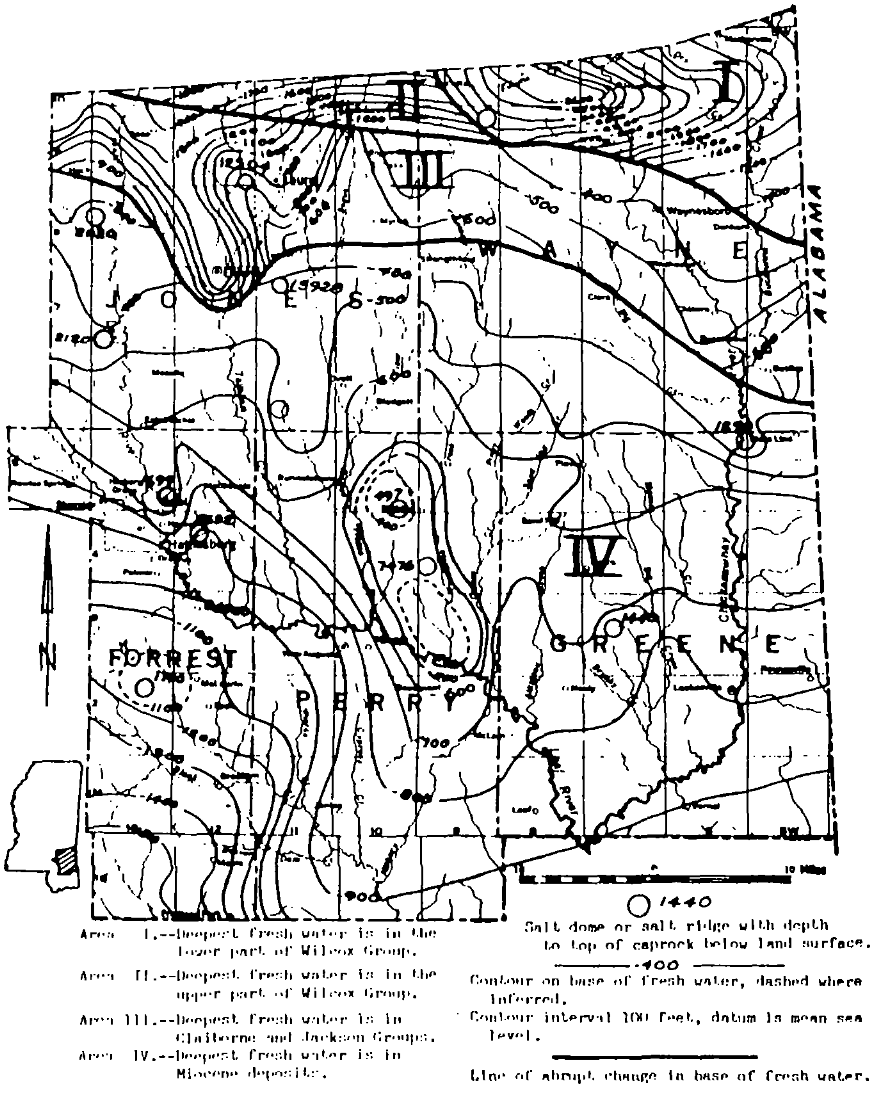


Fig. 32. Contour map showing configuration of the base of the fresh-water section

are several fresh-water-bearing sands (fig. 20, 21, and 22) above the base of fresh water.

Ground-water quality varies with locality and is affected by contact with the sediments through which it slowly moves. Chemical composition of the sediments are different between zones of an individual aquifer and from one aquifer to another. Consequently the chemical quality of water pumped from a well is the result of many environmental factors. Water moves down dip in a southwesterly direction through aquifers containing clay, sand, gravel and other sedimentary material of varying size, compaction, and mineral content from which it dissolves various concentrations of the different mineral constituents. Time of contact of the water with the aquifer materials affects the amounts of the different minerals that are dissolved. In general, water from wells screened in highly permeable sands contain less dissolved solids than water from wells screened in sands with low permeabilities, if the wells are the same depth.

As water moves down the dip it exchanges calcium to the aquifer material for sodium, and changes from a moderately hard water having low dissolved solids near the outcrop areas to soft water having higher sodium and dissolved-solids concentrations at greater distance down dip. The change in water type and the increase in sodium concentration at greater distance down the dip of the Catahoula Sandstone is shown in figure 33.

Water percolating through the soil zone gathers carbon dioxide from organic matter in exchange for oxygen dissolved from the air. Most shallow wells (less than 125 feet deep) and some deeper wells in the Miocene contain water having sizable carbon dioxide concentrations (0-80 ppm) which acidify the water and render it corrosive to most metals. This corrosive water dissolves iron when in contact with iron-bearing minerals or with iron in the well system. Wells screened in the Sparta Sand, Cockfield Formation, Vicksburg Group, and Cocoa Sand member of the Yazoo Clay, in northern Wayne and Jones Counties, produce water having lower iron concentrations (0.00-0.42 ppm) than found in other formations of the study area. Iron concentrations in water from Miocene wells range from 0.00 ppm (03 Perry, 320-foot well near Janice) to 32 ppm (D5 Jones, 126-foot well near Sandersville). Treatment of iron-bearing ground water usually consists of aeration to remove carbon dioxide and to raise the pH; followed by settling and filtration to remove the iron precipitates.

Ground water usually contains higher silica concentrations than surface water because it remains in contact with silicate minerals under conditions favorable to solution for a longer period of time. Measured silica concentrations in the Miocene sediments range from 3 to 71 ppm. Silica concentrations measured in other aquifers of the study area ranged from 8 to 84 ppm with approximately 90 percent of the samples having concentrations less than 40 ppm.

Ground water which contains anaerobic bacteria or decaying vegetation has a reducing effect upon minerals if there is no oxygen supply. The unpleasant taste and smell of hydrogen sulfide gas noted in water from the 564-foot sand at Richton and the Cockfield at Waynesboro indicate that sulfate minerals have been reduced to sulfides at these places. Hydrogen sulfide can be removed successfully by aeration of waters with a low pH or by chlorination of waters having a pH greater than 7.

Passage of water through decaying vegetation (including lignite beds) imparts color to the water. Color of water from the Cockfield Formation ranges from 5 to 240 units and color of water from one well screened in the Sparta Sand was 450 units. About 95 percent of the wells in the Miocene sediments show color of 20 units and less. Color may be removed by pH adjustment and coagulation by alum. Chemical analyses and well depths (table 14 and 15) and a map showing well locations (fig. 27) can be used to locate ground water of desirable quality.

None of the water samples collected from wells during the study indicated pollution by man's activity. Analysis of spring water in the vicinity of a brine disposal pit in the Chaprell Oil Field, Wayne County, indicated seepage of brine into the shallow ground water in that area. Potential hazard of pollution by chemicals and bacteria exists in wells screened in shallow aquifers. This hazard could be controlled by proper well location and design.

Water-Supply Potential

The water-supply potential is generally good; the largest potential supplies are in several formations of Miocene age and in the Wilcox Group. Aquifers of Miocene age underlie the southern two-thirds of the area and the Wilcox contains important aquifers in the northern one-third (fig. 19). Beds of Miocene age and the Claiborne Group contain important aquifers in the northern parts of Jones and Wayne Counties, but nearly all water supplies are obtained from the shallow beds of Miocene age. This band of shallow Miocene and deep Claiborne beds has less water-supply potential than other areas, partly because the water in the deeper aquifers is moderately mineralized (500 to 1,000 ppm dissolved solids). The water-supply potential for most municipal localities is summarized in appendix II.

Multiple aquifers underlie most places in the five-county area, and usually one or more of these aquifers will yield more than 2,000 gpm (2.9 mgd) to properly constructed wells. The mean transmissibility of the aquifers in the area as determined by 40 pumping tests is about 50,000 gpd per foot. The following well field layout in an average aquifer is used to illustrate the im-

Table 12.--Records of selected wells in Forrest, Greene, Jones, Perry, and Wayne Counties--Continued

Well no.	Owner	Year completed	Depth (ft)	Casing diameter (in)	Water-bearing unit	Elevation of land surface datum (ft)	Water level: Above (+) or below land surface (ft)	Water level: Date of measurement	Method of lift	Use	Yield: Gallons per minute	Yield: Date	Temperature (°F)	Remarks
	FORREST COUNTY--Continued													
J1	Johnson State Park	1960	111	6,4	Hattiesburg	235	41	1960	T	D	--	—	--	C
J2	Town of McLaurin, No. 2	1959	181	4	do	155	109.1	10- 9-64	T	P	—	—	80	--
J3	do No. 1	1954	185	4	do	160	110	1954	T	P	—	--	80	C
J5	Johnson State Park	1952	115	4	do	220	40	--	T	D	—	--	—	--
J6	Shelby State Park	1953	115	2	do	215	35	1953	J	D,S	—	--	72	C
J7	Johnson State Park	1960	132	4	do	240	60	1960	B	D	--	—	--	--
K2	U.S. Forest Service (Ashe Nursery)	1936	775	8	Catahoula	290	151	1936	T	Ir	100	1936	—	—
K3	do	1957	737	10,8	do	300	155	1962	T	Ir	—	--	--	—
K5	South Forrest Attendance Center	1962	525	4	Hattiesburg	155	30	1962	T	D,S	50	1964	77	C
K17	Brooklyn Water Assoc.	1964	581	8,4	do	210	88	5- 6-64	S	P	252	1964	74	P
K19	U.S. Forest Service (Ashe Nursery)	1936	720	4	do	290	142	1936	C	C	—	-	—	C
M2	Maloma School, Carnes	1952	400	4	do	325	80	1952	T	D,S	—	--	71	C
N1	Camp Tiak, Boy Scout Camp	1955	290	4	do	280	182	2- -55	T	D	—	—	72	C
N2	Marathon Oil Co.	1954	579	6,4	do	280	94	1- 2-54	T	D,S	41	1954	71	C
N4	U.S. Forest Service, Black Creek Work Center	1961	117	4	do	300	65	6-21-61	S	D,S	—	--	--	--
	GREENE COUNTY													
A2	Sand Hill School	1949	535	4	Catahoula	310	180	1949	T	P	30	—	—	C
A4	Lester Brewer	1961	418	2	do	265	97	1961	J	D,S	—	—	—	C
A9	Mrs. Margie Brewer	1964	430	2	do	271	112	1965	J	D,S	—	--	80	C
A11	James C. Mills	1955	80	2	Terrace	290	40	1955	J	D,S	—	--	71	C
A15	James E. McLain	1964	430	2	Catahoula	333	160	12- -64	J	D,S	—	--	67	—
A16	Mrs. Margie Brewer	1960	38	8	Terrace	271	11.8	1-10-61	B	D,S	—	—	--	C
A17	Sandhill Teachers Home	1964	91	2	do	314	65	1964	J	D,S	—	--	--	C
A18	Mrs. Margie Brewer	1965	510	2	Catahoula	275	112	6- -65	J	--	—	--	70	C
B1	Mrs. S. B. Henderson	1962	300	2	do	150	—	--	C	D,S	--	--	--	—
C1	L. D. Clark	1957	170	3	do	90	20	1961	P	D,S	1	1965	66	C
D1	Town of State Line	1962	305	8,4	do	260	97	6- -62	T	P	80	1965	70	C,P
E3	Clifton Watson	1960	399	2	do	185	71	10- -60	J	D,S	—	—	69	C
E4	Cities Service Co., No. 62	1961	485	3	do	240	31.1	3-12-65	A	I	—	—	—	C
F3	Guy Amory	1964	305	2	do	275	80	1964	C	D,S	—	—	—	—
F4	E. D. Dubose	1965	302	2	do	215	70	3-12-65	J	D,S	7	1965	--	C
G1	Samuel D. Givens	1938	480	3	do	330	100	1938	C	D,S	—	--	68	C
G2	Mort Hall, Jr	1974	75	2	Terrace	265	60	1965	C	D,S	—	--	67	C
G3	J. M. Clark	1955	190	4	Catahoula	112	+10	6- 1-65	F	D	25	1965	68	C
G4	do	1957	155	2	do	112	+20	1957	F	D,S	41	1965	68	C
J1	C. O. Conn	1955	360	2	Hattiesburg	185	15	1955	C	D,S	—	—	--	—
J3	Grover Anderson	1964	133	2	Catahoula	228	38	8- 6-64	J	D,S	—	--	68	C
J6	Ben Turner	1965	377	2	do	229	84	2- -65	J	D,S	—	--	70	C
J7	Elgin Turner	1959	90	2	Terrace	165	15	1959	J	D,S	—	--	—	C
K2	Baptist Parsonage	1961	110	2	Hattiesburg	75	+11	5-24-64	J	D,S	--	—	--	-
L4	Shell Oil Co., Horne No. 1	1965	450	1	Catahoula	140	20.6	3-12-65	A	U	20	1965	--	C
N1	W. W. Bufkin, Jr.	1958	585	2	do	185	25	1958	J	D,S	—	—	70	C
N6	J. L. Freeman	1929	164	2	Hattiesburg	76	+6	1964	J	D,S	—	--	68	C
N10	R. W. Bufkin, Sr.	1965	420	2	do	135	65	2-20-65	J	D,S	--	--	71	C
P1	Town of Leakesville, No. 1	1962	180	6	do	100	33.2	11-12-64	S	P	100	1965	—	C,P
P2	do No. 3	1950	125	6	do	100	30	2- -61	T	D,S	150	1965	--	—
P3	do No. 2	1957	160	6	do	100	60	1957	T	P	86	1965	70	C
P11	do	1955	407	4	Catahoula	100	+5	11-12-64	F	P	2	1965	71	C
Q1	Leakesville Colored School	1960	180	4	Hattiesburg	70	+10	1960	J	P	--	--	—	—
Q2	do	1960	160	6	do	70	+10	1960	J	P	--	—	--	--
Q3	B. S. Cornelson	1960	286	2	do	270	40	1962	C	D,S	--	--	70	C
R1	T. J. Edwards	1958	58	2	Terrace	105	30	1958	J	D,S	—	--	68	C
	JONES COUNTY													
A1	A. J. Green, Jr.	1955	46	2	Terrace	300	30	5-25-55	J	D	--	—	70	C
A3	Ba-Ba Water Assoc.	1965	470	6,4	Catahoula	310	72	7-20-65	S	P	150	1965	69	C,P
B13	Dr. J. W. Alinger	--	120	1	do	270	40	7- -55	C	D	—	--	68	C
B24	Shady Grove Water Assoc.	1965	504	6,4	do	310	173	8-26-65	B	P	165	1965	69	C,P
B25	do	1965	170	6,4	do	290	153	2-15-65	B	P	162	1965	69	P
C8	Transcontinental Gas Pipe Line Corp.	1950	233	6	do	361	54	1950	T	D	35	--	--	C
C7	Henry D. Tate	1953	158	2	do	291	85	6-27-55	C	D,S	—	—	—	C
C27	B. M. Foster	1948	70	2	Terrace	300	60	1955	J	D,S	—	—	68	C
C31	City of Laurel, No. 14	1954	318	24,16	Catahoula	242	103	9- -54	T	P	700	1960	73	C
C33	do No. 24	1949	340	24,10	do	290	112	3- 5-49	B	B	—	—	--	—
C34	do No. 5	1945	381	10,12	do	276	127	10- -45	B	P	800	1965	72	C
C35	do No. 6	1949	481	18,10	do	241	156	8- -49	T	P	850	1965	—	—
C37	do No. 8	1954	363	10,12	do	275	110	8- -54	T	P	900	1965	68	C
C38	Southern United Ice Co.	1946	346	10,8	do	271	126	1946	T	D	—	—	—	—
C44	Powers Water Assoc.	1965	383	6,4	do	282	164	3-29-65	B	P	—	—	68	P
C45	C. M. Beals	1963	243	2	do	295	115	5- -63	C	D,S	3	—	67	C
C46	Powers Water Assoc.	1966	309	6	do	295	168.9	6- 6-66	B	P	204	1966	—	P
C53	City of Laurel	1900	318	10	do	248	53	1949	B	B	—	--	—	—
C55	City of Laurel, No. 2	1930	350	26,10	do	237	100.5	1930	B	B	900	1960	—	C
C63	do No. 7	1965	327	18,10	do	274	111.5	1930	T	P	912	1966	--	C,P
D3	Southland Refinery	1946	640	10,6	Cookfield	293	60	6-27-55	T	Ir	175	1955	76	C
D4	C. W. McKenzie	1945	70	2	Catahoula	385	—	--	J	D	—	—	—	C
D5	Miss Bellye C. Perkins	1953	186	2	do	395	—	—	C	D	30	1955	69	C
D6	R. D. Mayo	1955	226	4	do	275	30	3- -55	C	D	1	1955	66	C
D7	C. W. McKenzie	1946	210	4	Vicksburg	360	6.8	6-29-55	B	J	—	—	72	C
D26	Magnolia Boys Town	1955	100	4	Catahoula	252	44	1956	T	D,S	—	—	—	--
D28	R. F. Mayo	1950	76	2	Terrace	335	10	3- -55	C	D,S	—	—	--	C
D29	Rogue Home School	1936	56	6	do	343	39	9- 8-56	C	D	—	—	--	C
D33	R. B. Stevens	1960	100	2	do	345	—	--	C	D,S	—	—	—	C
D34	Bill McDonald	1963	620	2	Cookfield	315	80	11-26-63	J	D,S	—	—	—	C
D35	Town of Sandersville	1961	130	18	Vicksburg	270	35	1-24-64	T	P	—	—	68	C
D37	Sinclair Oil Co., Plant No. 10	1962	626	6	Sparta	322	—	—	B	I	80	1962	—	C
D38	Humble Oil Co.	1960	80	2	Vicksburg	365	—	—	J	I	11	1962	—	C
D43	Town of Sandersville	1962	710	8	Cookfield	289	14	6- -62	B	P	114	1962	76	--

Table 15.--Aquifer and well-data tests ... in Forrest, Greene, Jones, Perry, and Wayne Counties

Well No.	Location of test	Water-bearing unit	Depth of well (ft)	Length of screen (ft)	Transmissivity (gal/d/ft)	Hydraulic conductivity	Coefficient of storage	Specific capacity (gal/min/ft at the end of 1 day)
				FORREST COUNTY				
[illegible]	Hattiesburg	Catahoula	[illegible]	[illegible]	[illegible]	540	--	[illegible]
[illegible]	do.	do.	[illegible]	[illegible]	[illegible]	--	--	[illegible]
[illegible]	do.	do.	[illegible]	[illegible]	[illegible]	[illegible]	0.0003	[illegible]
[illegible]	do.	Hattiesburg	[illegible]	[illegible]	44,000	440	.0002	--
[illegible]	do.	Catahoula	[illegible]	[illegible]	100,000	1,000	--	40
[illegible]	do.	do.	[illegible]	[illegible]	[illegible]	175	.0001	[illegible]
[illegible]	Petal	Alluvium	[illegible]	100	247,000	2,400	.0005	[illegible]
[illegible]	Hattiesburg	Catahoula	[illegible]	76	14,000	190	--	7.5
[illegible]	do.	do.	[illegible]	150	[illegible]	430	--	[illegible]
[illegible]	Eatonville crossing	do.	[illegible]	[illegible]	110,000	510	.0002	20
[illegible]	Hattiesburg	do.	[illegible]	[illegible]	[illegible]	430	--	--
[illegible]	do.	do.	[illegible]	[illegible]	[illegible]	540	.0002	11
[illegible]	Camp Shelby	Hattiesburg	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	--
[illegible]	[illegible]	do.	[illegible]	130	[illegible]	1,190	--	22
				GREENE COUNTY				
[illegible]	State Line	Catahoula	[illegible]	[illegible]	27,000	460	--	15
[illegible]	Leakesville	Hattiesburg	[illegible]	[illegible]	2,800	94	--	.9
				JONES COUNTY				
[illegible]	[illegible]	Catahoula	[illegible]	120	[illegible]	615	--	6.8
[illegible]	Shady Grove	do.	[illegible]	46	72,000	1,540	0.0002	5.5
[illegible]	do.	do.	[illegible]	[illegible]	72,000	1,990	.0002	12
[illegible]	[illegible]	do.	[illegible]	55	60,000	1,090	--	12
[illegible]	do.	do.	[illegible]	55	55,000	1,000	--	[illegible]
[illegible]	Laurel	do.	[illegible]	[illegible]	[illegible]	1,160	--	21
[illegible]	do.	do.	[illegible]	[illegible]	44,000	1,100	.0001	[illegible]
[illegible]	do.	do.	[illegible]	56	[illegible]	910	.0003	15
[illegible]	[illegible]	do.	[illegible]	56	55,000	1,020	.0002	11
[illegible]	[illegible]	do.	[illegible]	[illegible]	[illegible]	190	--	8
[illegible]	do.	do.	[illegible]	[illegible]	[illegible]	110	--	1
[illegible]	Laurel	do.	[illegible]	[illegible]	[illegible]	485	--	14
[illegible]	do.	do.	[illegible]	55	[illegible]	290	--	6.5
[illegible]	do.	do.	[illegible]	100	44,000	440	.0003	8.6
[illegible]	Ellisville	do.	[illegible]	[illegible]	[illegible]	500	.0002	12
				PERRY COUNTY				
[illegible]	[illegible]	Catahoula	[illegible]	--	6,100	--	--	1.4
[illegible]	New Augusta	do.	[illegible]	[illegible]	2,600	130	0.0002	1.8
[illegible]	Beaumont	do.	[illegible]	148	100,000(?)	675(?)	--	24
[illegible]	do.	do.	[illegible]	[illegible]	2,700	[illegible]	--	.6
				WAYNE COUNTY				
[illegible]	Waynesboro	Vicksburg	[illegible]	[illegible]	25,000	450	--	12
[illegible]	Waynesboro [illegible] Center	Catahoula	[illegible]	[illegible]	[illegible]	[illegible]	--	6.1
[illegible]	Waynesboro [illegible] Tree Nursery	do.	[illegible]	[illegible]	58,000	1,035	.0001	21

Table 16.--Chemical analyses of water from wells in Forrest, Greene, Jones, Perry, and Wayne Counties, Miss.

[illegible]

Table 16.--Chemical analyses of water from wells in Forrest, Greene, Jones, Perry, and Wayne Counties, Miss.--Continued

[illegible]

Reference 15

CERCLA
SECTION

Water Resources of Mississippi

THAD N. SHOWS

BULLETIN 113

MISSISSIPPI GEOLOGICAL, ECONOMIC AND
TOPOGRAPHICAL SURVEY

WILLIAM HALSELL MOORE
DIRECTOR AND STATE GEOLOGIST

JACKSON, MISSISSIPPI
1970

PRICE $2.00

to be associated with the organic material (lignite, leaves, roots, etc.) deposited in the aquifer material. The Kosciusko and Cockfield aquifers are known to contain colored water of varying degrees in the Jackson area, Bay Springs, Waynesboro and other locations.

Treatment for color removal (coagulation with alum) is expensive and uneconomical for most purposes. Aquifers that contain colored water are not recommended for well development provided shallower aquifers are available for use. Most people prefer clear water for domestic use.

An investigation in 1969 determined that the high chlorides in a city well at Prentiss was caused by industrial pollution from a local plant. The situation is serious at that particular area and should not be allowed to continue.

GROUND WATER

AREA VI

South Mississippi is underlain by several thick aquifer systems and at most locations multiple aquifers are present. The aquifers present in Area VI include the Catahoula, Hattiesburg, Pascagoula, Graham Ferry and Citronelle (fig. 10 and Table 18). Recent publications on the ground water resources in Harrison and Hancock Counties referred to "Miocene aquifers" for the fresh water section in those areas. The Graham Ferry aquifer is recognized in Jackson County and is the principal aquifer for industrial and municipal supplies in the vicinity of Pascagoula.

The aquifers in the coastal counties consist of thick beds of sand or gravel separated by clay layers. The sands are generally lenticular, thereby are not continuous over a large area. Most of these aquifers are capable of supplying large volumes of water to wells in the coastal counties.

The base of fresh water is about 500 feet below sea level across the northeastern part of Area VI in Covington, Jones, Wayne and part of Greene and Perry Counties (fig. 2). The deepest fresh water is present in northwestern Hancock and southwestern Pearl River Counties to a depth of 3,000 feet below sea level. Very few water wells have penetrated the entire freshwater section in the southern half of Area VI (Table 19). A number of shallow piercement-type salt domes are located in

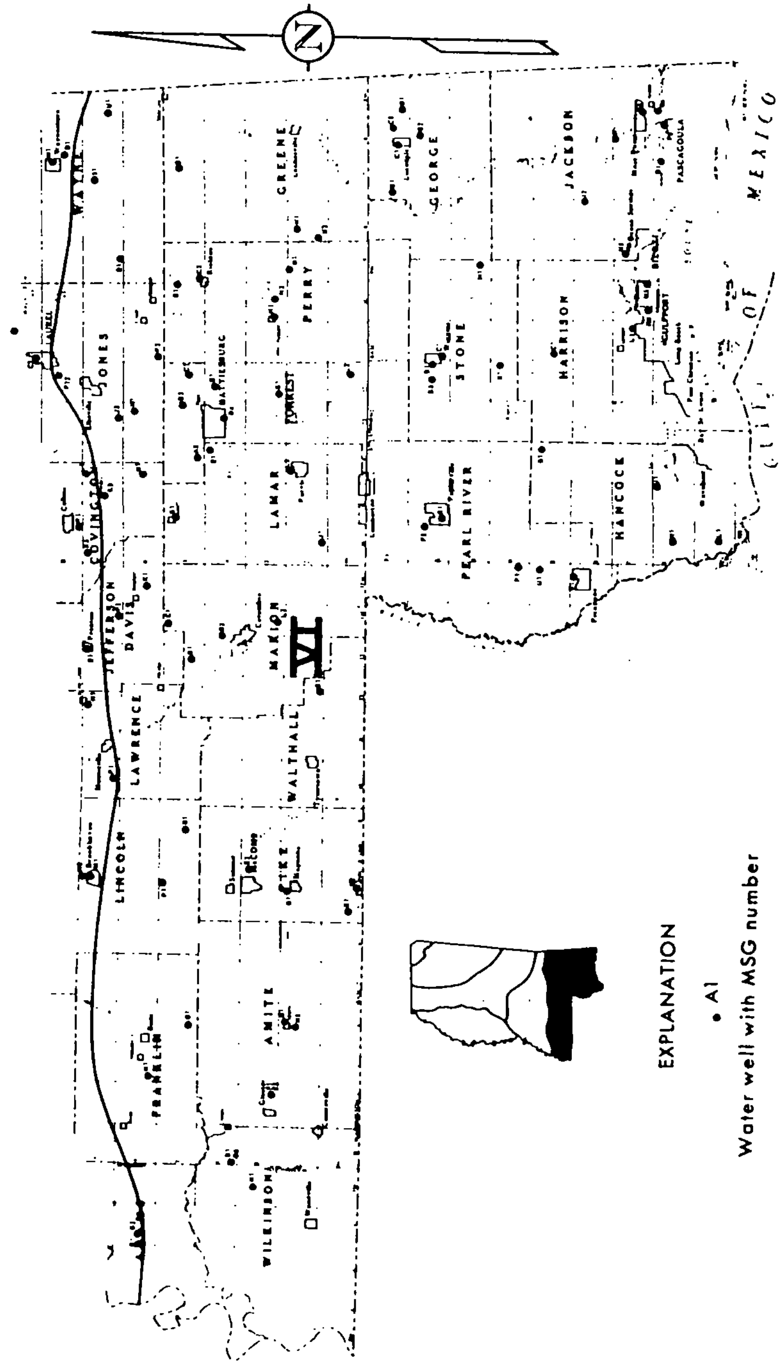


Figure 10.—Location of selected wells in Area VI.

Table 18.—Stratigraphic column and water resources in Area VI.

ERA	SYSTEM	SERIES	GROUP	STRATIGRAPHIC UNIT	THICKNESS (feet)	WATER RESOURCES
Cenozoic	Quaternary	Holocene		Alluvium	0-80	Not an important aquifer. A few large wells may be possible along some of the major streams in local areas. Salt water has intruded this aquifer adjacent to the Mississippi Sound.
		Pleistocene		Terrace Deposits	0-100	Some local wells tap this aquifer, but is not used over a very extensive area. Large quantities of water may be available in the southern part where a number of these deposits are developed in a staircase fashion. Salty water is present along the coast in some of these deposits.
				Citronelle	0-100	Supplies shallow domestic wells throughout most of the area. A few municipal wells are completed in this aquifer. Quality of water is fair. The water usually contains low dissolved solids and has a low pH.
	Tertiary	Pliocene		Graham Ferry	0-200	Main source of water supply for municipal and industrial wells in the vicinity of Pascagoula. A number of wells in western Jackson and eastern Harrison Counties utilize this aquifer. Quality of water is generally good. Water is slightly alkaline and iron is seldom a problem in the wells at Pascagoula.
		Miocene		Pascagoula	0-1000	An important source of water supply for the municipal, industrial and domestic wells in Hancock, Harrison and Jackson Counties. The Pascagoula, Hattiesburg and the Catahoula are difficult to differentiate in the subsurface. Recent publications have placed all of the aquifers into "Miocene aquifers." Quality of water is good from this aquifer. Color is high in a number of wells adjacent to the Mississippi Sound. Hydrogen sulfide content may be a local problem.
				Hattiesburg	0-400	An important source of water supply for the municipal wells at Lucedale. This aquifer has the potential of supplying large volumes of water to wells in Pearl River, Stone and George Counties. Numerous domestic wells tap this aquifer in the central part of the area (southern Forrest, Greene, Perry, Pearl River, Stone and George Counties). The quality of water is generally good.
				Catahoula	500-900	An important source of water in the northern half of the area. The aquifer supplies numerous municipal, industrial, and domestic water supplies as far south as northern Pearl River, Stone and George Counties. The aquifer is fresh farther south but because of the depth and availability of shallower aquifers is not generally used. The quality of water is generally good.

Area VI and to the north in Area V. The base of fresh water is shallow over some of the domes. Therefore caution should be exercised in drilling deep water wells on these structures. Deep aquifers are present in Harrison and Hancock Counties which have the ability of supplying large volumes of fresh water to properly constructed wells. A test well 2,460 feet deep (USGS) located in Gulfport's industrial park had a water level of about 100 feet above land surface.

CATAHOULA AQUIFER

Most of the water supplies in the northern part of Area VI are from the Catahoula aquifer. The wells are generally shallow (100 to 1,000 feet deep) and yield large volumes of water. The aquifer consists of beds of sand or gravel separated by clay layers. The sand and gravel beds thicken toward the Gulf and are several hundred feet thick in south Mississippi.

Numerous municipal, industrial, and domestic water supplies are completed in the Catahoula aquifer across this area. The aquifer is used as far south as northern Pearl River, Stone and George Counties. The use of this aquifer has been limited south of the above mentioned area because of the availability of shallower aquifers. Wells yielding up to 2,000 gpm are possible from this aquifer at some locations such as Carson in Jefferson Davis County and Wiggins in Stone County. The sands are generally lenticular in the northern part of Area VI. Test drilling is recommended for most locations because of the lenticular deposits.

Large volumes of water are pumped from the Catahoula aquifer at Hattiesburg, Richton, Purvis, and McComb. A large number of wells for rural water systems and domestic supplies utilize this aquifer in the northern part of Area VI.

Water levels are above the land surface along some of the streams. Flowing wells are primarily located in the Bogue Chitto, Okatoma Creek, Pearl River, Pascagoula River, Chickasawhay River, and some of the smaller creeks across the area. Some of the deeper water levels reported are from 250 to 380 feet. A well which is 796 feet deep in the Catahoula aquifer at Baxterville, Lamar County, had a water level of 264 feet in 1964. A well 425 feet deep at Bassfield, Jefferson Davis County, had a water level of 380 feet in 1964. Slightly deeper water levels may be expected on tops of high hills. Water levels are depressed in areas of heavy pumpage in a small area such as the Hattiesburg well field located at the new water plant.

HATTIESBURG AQUIFER

The Hattiesburg aquifer is not as widely used as the Catahoula aquifer. The Hattiesburg aquifer has the potential of supplying large wells in the central and southern part of Area VI. A number of shallow domestic and small municipal wells utilize this aquifer in southern Lamar, southern Forrest, Perry and Greene Counties. The municipal wells at Lucedale and two community supply wells north of Lucedale are completed in the Hattiesburg aquifer at a depth of about 1,000 feet. Most of the ground-water development from this aquifer is in Pearl River, Stone and George Counties and slightly north of these counties. The extreme depth is the limiting factor south of these counties. The aquifer is presently being used for ground-water supplies in Wilkinson, Amite, Pike, Walthall, and Marion Counties, which are along the Louisiana boundary.

Separating the Hattiesburg from the underlying Catahoula or the overlying Pascagoula is extremely difficult in the subsurface in Area VI. One solution to this problem is to refer to these units as "Miocene aquifers" and not designate particular aquifers.

Water levels will be similar to those in the Catahoula aquifer. The higher water levels will be located along the streams. A well 1,008 feet deep for the Town of Lucedale had a water level of 100 feet in 1960.

PASCAGOULA AQUIFER

The Pascagoula aquifer is an important source of water supply in the three coastal counties, Hancock, Harrison, and Jackson. Numerous municipal, industrial and domestic wells utilize this aquifer in these counties. Most of the municipalities along the coast have wells completed in this aquifer. Yields from this aquifer are as much as 3,000 gpm at the NASA Test Site. The aquifer consists of thick sands and gravels at a number of locations along the coast. Multiple aquifers or zones of sands are present at most locations.

Water levels are generally above or near the land surface except in areas of concentrated withdrawals. A number of the

Reference 16

Forrest
D 109
1-15-88

Coded

MISSISSIPPI DEPARTMENT OF NATURAL RESOURCES
Bureau of Land and Water Resources
Southport Mall
P.O. Box 10631
Jackson, Mississippi 39209
WATER WELL DRILLERS LOG

Jan. 15 1988 (date well completed) — Layne-Central Co (firm name) — Forrest (county well located)

LANDOWNER: B.F. Goodrich Chemical Group
C/o Hercules, Inc / Herclor Unit
West 7th St., PO Box 1897
Hattiesburg, MS 39403
(mailing address)

WELL LOCATION: SW 1/4 of SW 1/4 of NW 1/4
sec. 4 T. 4 N R. 13 E

___ miles ___ of ___
(distance) (direction) (nearest town)

WELL PURPOSE: Industrial
(home, irrigation, municipal, industrial)

WELL COMPLETION DATA:

(1) diameter (inches) 8"
(2) total depth (feet) 650'
(3) static water level (feet) 59' below ~~above~~ top of ground.
(4) casing Steel (material), 610'10" (depth),
8" (size) if telescope see back.
(5) screen 30'4" (length), 610'10" (depth to top)
4" (size), Stainless Steel (material)
(6) pump 15 (HP) 150 gpm (yield gpm)
Electrical (type power)
(7) electric log Yes (yes or no)
Layne-Central Co. (organization running log)
(8) how well bottom plugged Cement

DRILLERS REMARKS:
Permit No MSGW07463

description of formations encountered	from	to
Fill Dirt	0	3'
Clay	3'	45'
Sand	45'	50'
Clay	50'	225'
Sandy Clay	225'	275'
Sand	275'	295
Sand & Clay	295'	335'
Hard Clay	335'	367'
Sand	367'	460'
Shale	460'	565
Sand	565'	591'
Shale	591'	611'
Sand	611'	680'
Sandy Shale	680'	702

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APR 18 1988
Department of Natural Resources
Bureau of Land & Water Resources

FORREST MISSISSIPPI BOARD OF WATER COMMISSIONERS
D 38 ③ USGS File
9-21-65

WATER WELL DRILLERS LOG

Date: 9-21-, 19 65, Driller: Layne-Central Co. (Name) County Forrest

(1) Owner of Land: Hercules Powder Co (Name)
Hattiesburg, Miss. (Address)

(2) Location: NW ¼, SW ¼, Sec. 4 T 4N R 13W

___ miles (distance) ___ (direction), of ___ (Nearest Town)

(3) Topography: ___ (Hilly) (Flat) (Level)

(4) Purpose of Well: Industrial (Domestic Irrigation Municipal, Industrial, Other)

Information upon completion of well:

(1) Diameter 18 inches.

(2) Total Depth 687 feet.

(3) Water Level 24 feet below top of ground.

(4) Cased to 591', Size 18"

(5) Screen: Size 10", Length 70'.

(6) Were any formations sealed against pollution?

x yes, ___ no.

If YES depth of formation 591'

Why required

Drillers Remarks:

Description & Color of Materials Sand, Clay, Red Clay, Shell, etc.	thickness		Depth Feet
top soil	3	0-	3
pipe clay	187	3-	190
shale	50	190-	240
fine sand-stks shale	29	240-	269
sand	22	269-	291
shale, stks sand	71	291-	362
sand	138	362-	500
hard shale	28	500-	528
sand-shale	57	528-	585
sand	105	585-	690
shale	15	690-	705

(Use Back Side)

Well No.

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FORREST MISSISSIPPI BOARD OF WATER COMMISSIONERS

D 37 ③ USGS file

WATER WELL DRILLERS LOG

6-18-65

Date: June 18, 1965, Driller: Layne-Central Co. (Name) County Forrest

(1) Owner of Land: Coastal Chem. Co. (Name)

Hattiesburg, Miss. (Address)

(2) Location: NW ¼, SW ¼, Sec. 2 T 4N R 13W

_____ miles _____, of _____
(distance) (direction) (Nearest Town)

(3) Topography: _____ (Hilly) (Flat) (Level)

(4) Purpose of Well: Industrial (Domestic Irrigation Municipal, Industrial, Other)

Description & Color of Materials Sand, Clay, Red Clay, Shell, etc.		Thick-ness Feet	Depth Feet
top soil	0-5	5	
sand & gravel	5-10	5	
blue clay	10-75	65	
shale stks sand	75-100	25	
blue clay	100-120	20	
sandy shale	120-148	28	
sand rock	148-158	10	
shale	158-200	42	
fine sand-shale	200-224	24	
sand	224-352	128	

Information upon completion of well:

(1) Diameter 12" inches.

(2) Total Depth 353' feet.

(3) Water Level 5' feet below top of ground.

(4) Cased to 310', Size 8",

(5) Screen: Size 6", Length 40'.

(6) Were any formations sealed against pollution?

X yes, _____ no.

If YES depth of formation 353',

Why required

Drillers Remarks: _____

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Well No.

Mail this copy to Board of Water Commissioners 429 Miss. St. Jackson, Miss.

C. P. CLARK
WATER WELL DRILLIN
ROUTE 2
LAUREL, MISS. 3944C

CODED

Forrest
B 6 ?
6-27-69

MISSISSIPPI
BOARD OF WATER COMMISSIONERS
416 North State Street
Jackson, Mississippi 39201

WATER WELL DRILLERS LOG

6/27 19 69 — date well completed
C. P. Clark — firm name
Forrest — county well located

LANDOWNER: Laurel Halmij Inc
Laurel Miss
(mailing address)

WELL LOCATION:
sec. 34 T. 5 N R 13 W
1 miles N of Hattiesburg
(distance) (direction) (nearest town)

WELL PURPOSE: Ind
(home, irrigation, municipal, industrial)

WELL COMPLETION DATA:
(1) diameter (inches) 2
(2) total depth (feet) 106
(3) static water level (feet) 34 below / above top of ground.
(4) casing Gala Drow (material), (depth),
(size) if telescope see back.
(5) screen 10 (length), 86 (depth to top)
1 1/4 (size), S.S. (material)
(6) pump 1 H.P. (HP) 18 (yield gpm)
230 S.P. (type power)
(7) electric log No (yes or no)
(organization running log)
(8) how well bottom plugged

DRILLERS REMARKS:

description of formations encountered	from	to
Sand	0	11
Blue Clay	11	17
Sand & Gravel	17	106
Blue Clay	106	11

JUL 3 - 1969
MISS. BD. OF WATER COMM.

Forrest
D 85
6-20-70

MISSISSIPPI
BOARD OF WATER COMMISSIONERS
416 North State Street
Jackson, Mississippi 39201

CODED

WATER WELL DRILLERS LOG

June 20 1970 L. E. [illegible] Forrest
date well completed — firm name — county well located

LANDOWNER: M. Brewer
Rt 6 Hattiesburg Miss
Lake Giger
(mailing address)

WELL LOCATION:
sec. 10 T. 4 S R 13 W
5 miles West of McLain
(distance) (direction) (nearest town)

WELL PURPOSE: House use
(home, irrigation, municipal, industrial)

WELL COMPLETION DATA:

(1) diameter (inches) 4"
(2) total depth (feet) 358'
(3) static water level (feet) 70 below ~~above~~ top of ground.
(4) casing PVC (material), 348' (depth)
_____ (size) If telescope see back.
(5) screen 10' (length), 348-358 (depth to top)
2" (size), PVC (material)
(6) pump 1 (HP) 14 (yield gpm)
220 (type power)
(7) electric log NO (yes or no)
_____ (organization running log)
(8) how well bottom plugged _____

DRILLERS REMARKS:
Well in use
June 21-1970

description of formations encountered	from	to
Surface Sand	0	50
Blue Clay	50	300
Sand	300	35[illegible]

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JUL 14 1970
MISS. BD. OF
WATER COMM.

Forrest
D100
11-10-79
Flug #144

MISSISSIPPI
BOARD OF WATER COMMISSIONERS
416 North State Street
Jackson, Mississippi 39201

CODED

WATER WELL DRILLERS LOG

Nov 10 1979 — Roy West Water Wells — Forrest
date well completed — firm name — county well located

LANDOWNER: Miss Power

Co Hattiesburg Miss

(mailing address)

WELL LOCATION:

sec 10 T 4 (N) S R 13 E (W)

0 miles 0 of Hattiesburg
(distance) (direction) (nearest town)

WELL PURPOSE:
(home, irrigation, municipal, industrial)

WELL COMPLETION DATA:

(1) diameter (inches) 6

(2) total depth (feet) 650

(3) static water level (feet) 80 below / above top of ground.

(4) casing Blk pipe 620
(material) (depth),

_____ If telescope see back.
(size)

(5) screen 30, 620
(length) (depth to top)

4, St steel
(size) (material)

(6) pump 5 70
(HP) (yield gpm)

Miss Power
(type power)

(7) electric log _____
(yes or no)

Miss Geo Survey
(organization running log)

(8) how well bottom plugged Washwater

description of formations encountered	from	to
Clay	0	4
sand gravel	4	14
Blue Clay	14	60
sand gravel	60	120
Clay	120	275
sand	275	300
Clay	300	340
sand	340	540
clay	550	560
sand	560	585
Clay	585	605
sand	605	670
Clay	670	675
sand	675	710

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DEPT. OF NATURAL RESOURCES
BUREAU OF LAND & WATER RESOURCES

NOV 24 1980

RECEIVED

DRILLERS REMARKS: This log is for two wells
The formation is same
well about 200 ft apart

FORREST
D104
12-10-80
E Log #167

CODED

MISSISSIPPI
BOARD OF WATER COMMISSIONERS
416 North State Street
Jackson, Mississippi 39201

RECEIVED FEB 11 1981 MISSISSIPPI DEPT. OF NATURAL RESOURCES

WATER WELL DRILLERS LOG

12-10-80 19 BRADEN PUMP AND WELL SERVICE Forrest
date well completed — firm name — county well located

LANDOWNER: Miss. Tank Company
4th Street
Hattiesburg, MS
(mailing address)

WELL LOCATION:
sec. 6 T. 4 N R 13 W
10 miles (distance) — (direction) of Hattiesburg (nearest town)

WELL PURPOSE: Industrial
(home, irrigation, municipal, industrial)

WELL COMPLETION DATA:
(1) diameter (inches) 6"
(2) total depth (feet) 700'
(3) static water level (feet) 80 below top of ground.
(4) casing PVC (material), total (depth)
6" (size) If telescope see back.
(5) screen 40' (length), 660 (depth to top)
4" (size), stainless steel (material)
(6) pump 20 (HP) ~~B10~~ 300 (yield gpm) @ 40#
230 (type power)
(7) electric log yes (yes or no)
(organization running log)
(8) how well bottom plugged 4" Backwash

DRILLERS REMARKS: no tail pipe

description of formations encountered	from	to
White clay	0	120
Sand	120	150
Clay & Rock	150	300
Sand	300	430
Clay	430	580
Sand	580	700
160 pump setting		

CODED

Forrest
D73
7-68
Miss Geo. Sur.

MISSISSIPPI
BOARD OF WATER COMMISSIONERS
416 North State Street
Jackson, Mississippi 39201

CODED

WATER WELL DRILLERS LOG

7/11 1968 — date well completed
SHR — firm name
Forrest. — county well located

LANDOWNER: Masonite Box Co
Hattiesburg, Miss.
(mailing address)

WELL LOCATION:
sec. 4 T 4 N R 13 W
___ miles ___ of ___ (distance) (direction) (nearest town)

WELL PURPOSE: (home, irrigation, municipal, industrial)

WELL COMPLETION DATA:

(1) diameter (inches) 6"

(2) total depth (feet) 422

(3) static water level (feet) 21 below top of ground.

(4) casing Steel (material), 402 (depth), 6 X 4 (size) if telescope see back.

(5) screen 20 (length), 402 (depth to top), 4" (size), S/S (material)

(6) pump 10 (HP) 158 (yield gpm) Sub (type power)

(7) electric log YES (yes or no) M A S (organization running log)

(8) how well bottom plugged Valve

DRILLERS REMARKS:

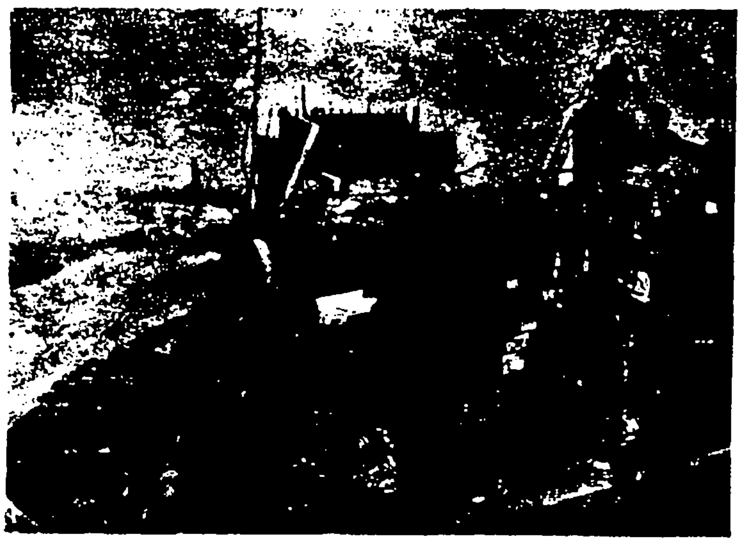
description of formations encountered	from	to
Blue Clay	0	85
Sand	88	10[illegible]
White Clay	105	1[illegible]
Rock Hard	155	17[illegible]
Blue Clay	172	22[illegible]
Blue Sand	225	27[illegible]
Shell	277	28[illegible]
Sand Fine	281	3[illegible]
Sand & Clay Strips	3[illegible]	3[illegible]
C W B Sand	370	4[illegible]

AUG 13 1968
MISS. BD. OF WATER COMM.

Reference 17

Results of Aquifer Tests in Mississippi

Compiled by
Roy Newcome, Jr.



Prepared by the
U. S. Geological Survey
Water Resources Division

in cooperation with the
Mississippi Board of Water Commissioners

Bulletin 71-2
1971

ABBREV.	ABBREV.	STANDARD FULL NAME	REMARKS
TRCS	110TRCS	Terrace dposits, undifferentiated	(111,112)
MRVA	112MRVA	Mississippi River alluvial aquifer	
CRNL	121CRNL	Citronelle aquifers	
GRMF	121GRMF	Graham Ferry aquifer	
MOCN	122MOCN	Miocene aquifer system	
PCGL	122PCGL	Pascagoula aquifer	
HBRG	122HBRG	Hattiesburg aquifer	
CTHL	122CTHL	Catahoula aquifer	
OLGC	123OLGC	Oligocene aquifer system	
MSPG	123MSPG	Mint Spring aquifer	
FRHL	123FRHL	Forest Hill aquifer	
MDBC	124MDBC	Moodys Branch aquifer	
CCKF	124CCKF	Cockfield aquifer	
CKMN	124CKMN	Cook Mountain aquifer	
SPRT	124SPRT	Sparta aquifer system	
WNON	124WNON	Winona aquifer	
TLLT	124TLLT	Tallahatta aquifer	
MUWX	124MUWX	Meridian-upper Wilcox aquifer	
WLCXU	124WLCXU	Upper Wilcox aquifer	
WLCXM	124WLCXM	Middle Wilcox aquifer	
WLCXL	124WLCXL	Lower Wilcox aquifer	
WLCX	124WLCX	Wilcox aquifer	(undifferentiated)
RPLY	211RPLY	Ripley aquifer	
COFF	211COFF	Coffee Sand aquifer	
EUTW	211EUTW	Eutaw aquifer	
MCSN	211MCSN	McShan aquifer	
? ETMS	?	Eutaw-McShan aquifer	
GORD	211GORD	Gordo aquifer	
COKR	211COKR	Coker aquifer	
PLZC	300PLZC	Paleozoic aquifer system	

GEOLOGIC UNIT CODE FOR MISSISSIPPI

Alphabetical List

Aquifers

Alluvial aquifer, Mississippi River	QGMA
Alluvium, Pleistocene	QGOA
Alluvium, Quaternary, undifferentiated	Q-OA
Alluvium, Recent	QROA
Byram Formation, Glendon Limestone Member	TØGM
Camden Chert	D2CA
Catahoula Sandstone	TMCA
Catahoula Sandstone, upper part	TMUM
middle part	TMMM
lower part	TMBM
Citronelle Formation	TPCI
Claiborne Group	TECG
Clayton Formation	TLCL
Coastal Deposits	QBCD
Cockfield Formation	TECØ
Cook Mountain Formation	TECK
Potterchitto Sand Member	TEDM
Coffee Sand	K3CS
Coker Formation	K3CØ
upper unnamed member	K37M
Eoline member	K3EM
"massive sand"	K3MM
Eocene Series, undifferentiated	TESZ
Eutaw Formation, (unrestricted)	K3EZ
Tombigbee Sand Member	K3TM
Unnamed member	K36M
Eutaw Formation, (restricted)	K3EU
lower part	K38M
Forest Hill Sand	TØFH
Fort Payne Chert	M1FP
Gordo Formation	K3GØ
Graham Ferry Formation	TPGF
Hatchetigbee Formation	TEHA
Hattiesburg Formation	TMHA
High terrace deposits	QGHT
Intermediate terrace deposits	QGIT
Low terrace deposits	QGLT
Lower Cretaceous	K1
Lower Tuscaloosa	K3TL
Lower Wilcox aquifer	TELW
Marianna Limestone	TØMA
Mint Spring Marl Member	TØMS
McShan Formation	K3MS
Meridian-upper Wilcox aquifer	TEMW
Middle Tuscaloosa	K3TC
Middle Wilcox aquifer	TETW
Midway Group	TLMG
Miocene Series, undifferentiated	TMMZ
Mississippi River alluvial aquifer	QGMA
Moodys Branch Formation	TEMB
Naheola Formation	TLMA
Nanafalia Formation	TENA
Fearn Springs Member	TEFM
Paleozoic rocks	Y
Pascagoula Formation	TMPA
Fort Adams Member	TMFM
Homochitto Sand	TMHM
lower part	TMLM
Paynes Hammock Sand	TMPH
Pleistocene	QG
Pleistocene-Pliocene	AQ
Pleistocene-Recent	QB
Pliocene	TP
Porters Creek Clay, Tippah Sand Lentil	TLTL
Matthews Landing Marl Member	TLMM
Pottsville Formation	N6PO
Quaternary alluvium	Q-OA
Quaternary deposits	Q-OD
Quaternary sand, undifferentiated	Q-1S
Quaternary sand and gravel, undifferentiated	Q-1G
Quaternary terraces, undifferentiated	Q-OT
Recent alluvium	QROA
Recent terrace deposits	QROT
Ripley Formation	K3RI
Chiwapa Member	K3CM
McNairy Sand Member	K3SM
Coon Creek Tongue	K3KM
Selma Group	K3SG
Sparta Sand	TESS
upper part	TEST
middle part	TESX
lower part	TESB
Tallahatta Formation	TETA
Neshoba Sand Member	TEJM
Basic City Shale Member	TETM
Meridian Sand Member	TEMM
Tertiary	T
Tertiary-Quaternary	A
Tuscahoma Formation	TETU
Tuscaloosa Group	K3TG
Unnamed Group (Eutaw and McShan Formations)	K32G
Upper Wilcox aquifer	TEUW
Upper Cretaceous	K3
Upper Tuscaloosa	K3TU
Vicksburg Group	TØVG
Wilcox Group	TEWG
Winona-Neshoba aquifer	TEWN
Winona Sand	TEWS
Yazoo Clay, Cocoa Sand Member	TECM
Zilpha Clay	TEZC

SUMMARY OF PUMPING TESTS IN COVINGTON COUNTY

WELL NO.	OWNER	DATE	DEPTH FT	AQUI-FER	AQUI-FER THICK-NESS FT	SCREEN LENGTH FT	PUMP. PERIOD HRS	TEST YIELD GPM	SPEC. CAPA-CITY GPM/FT 1-DAY	TRANS-MISSI-BILITY GPD/FT	PERMEA-BILITY GPD/FT2	STOR. COEF.	TRANS-MISS-IVITY FT2/D	HYDR. CON-DUCT-IVITY FT/D
F002	COLLINS	5-67	217	TMUM	100	60	5	435	22	37000	370	.0004	4900	49
F003	COLLINSWOOD PRO	5-67	741	TMCA			1	740	37	80000			10000	
F005	COLLINSWOOD PRO	2-67	164	TMCA	100		4	711		17000	170	.0003	2200	22
K001	SEMINARY	N-66	249	TMCA	95	67	2	351	29	80000	840		10000	110
N001	SANFORD	4-66	802	TMMZ	43	30	1	111		25000	580		3300	77

SUMMARY OF PUMPING TESTS IN DE SOTO COUNTY

NO TESTS

SUMMARY OF PUMPING TESTS IN FORREST COUNTY

WELL NO.	OWNER	DATE	DEPTH FT	AQUI-FER	AQUI-FER THICK-NESS FT	SCREEN LENGTH FT	PUMP. PERIOD HRS	TEST YIELD GPM	SPEC. CAPA-CITY GPM/FT 1-DAY	TRANS-MISSI-BILITY GPD/FT	PERMEA-BILITY GPD/FT2	STOR. COEF.	TRANS-MISS-IVITY FT2/D	HYDR. CON-DUCT-IVITY FT/D
A023	HATTIESBURG C C	3-65	752	TMCA	50		4	84	7.3	27000	540		3600	72
B017	HATTIESBURG	1-65	607	TMCA	80		9	995	9.7	48000	600	.0003	6400	80
D001	HATTIESBURG AP	6-42	194	TMHA	100	30	3	297	24	120000	1200	.0001	16000	160
D004	HATTIESBURG	4-64	485	TMCA	130	50	12	1030	40	170000	1300		22000	170
D005	HATTIESBURG	4-64	678	TMCA	80	50	11	1050	13	30000	370	.0001	4000	50
D029	E FORREST UTIL	N-62	134	O-OA	100	31	12	750		200000	2000	.0006	26000	260
D038	HERCULES POWDER	9-65	687	TMCA	105	96	8	1016	7.5	15000	140		2000	18
D039	COASTAL CHEM CO	5-65	353	TMCA	150	40	2	483	5.7	70000	460		9300	62
D042	PALMERS CROSSNG	3-66	642	TMCA	216	42	2	285	20	110000	500	.0002	14000	68
D045	CENTRAL UTILITY	4-66	694	TMCA	90	40	1	206	12	39000	430		5200	57
D046	CENTRAL UTILITY	4-66	672	TMCA	90	40	1	252	11	39000	430	.0002	5200	57
G014	CAMP SHELBY	5-43	402	TMHA	86	80	73	550	29	70000	810	.0004	9300	100
G016	CAMP SHELBY	5-43	409	TMHA		80	26	532	19	70000			9300	
G022	CAMP SHELBY	5-43	404	TMHA	83	80	31	522	26	69000	830		9200	110
H006	PAUL B JOHNSON	1-68	330	TMHA	47	20	1	80	4.7	34000	720		4500	96
L017	BROOKLYN W A	5-66	580	TMHA	170	40	1	240	22	230000	1300		30000	180
M035	CARNES UTILITY	0-70	820	TMCA	70	40	2	145		36000	510		4800	68

TELEPHONE MEMORANDUM

USEPA Region IV

BVWST Project 52011.040
BVWST File
June 5, 1992
10:30

Water supply and Use for the Hattiesburg Water District

To: Bob West, General Manager
Company: Hattiesburg Public Utility
Phone No.: (601) 545-4536

Recorded by: Carter Helm

Summary of conversation: Mr. West said that the City of Hattiesburg operates 16 wells which supply water to the City District and surrounding areas. The Hattiesburg Water District services 15,965 connections. The water is blended prior to distribution. There are no surface water intakes for potable water. The water district does not have a list of the private wells in the Hattiesburg District. Mr. West did not have a well location and water line map available to send to BVWST, however, water information from the Dynamac Corporation proved useful for well locations and water line distribution. Well depths average 825 feet bls.

Mr. West's water municipality does serve industries which process and preserve food products for commercial food preparation plants. Mr. West is also aware of wells in the community that supply water for livestock watering and crop irrigation. Hattiesburg Public Utility service extends southward into Palmers Crossing, south of Hattiesburg. The only surface water intakes located on the Bowie and Leaf Rivers are utilized for industrial use. Mr. West knows of three intakes which are operated by: Hercules, Inc., Mississippi Power Plant Eaton, and the Petromill Corporation.

Please see Appendix A for Hattiesburg Public Utility Service areas and their municipal well locations.

B&V WASTE SCIENCE AND TECHNOLOGY CORP. Reference 19

TELEPHONE MEMORANDUM

USEPA Region IV

BVWST Project 52011.040
BVWST File
June 9, 1992
10:00

Water supply and use for the Glendale Water District

To:	Jeanette Rudder, Superintendent
Company:	Glendale Public Utility
Phone No.:	(601) 583-0647

Recorded by: Carter Helm

Summary of conversation: Ms. Rudder said that the city of Glendale operates 2 wells which supply water to the Glendale Water District. The two wells are both located on Eatonville Road near the North Forrest High School. The depth of the wells are 895 and 902 feet below land surface (bls). Both of these wells are in use and service the area equally (blended system). There are 1196 connections in the Glendale Water District.

The Glendale Water District does not sell water to any other utility company. The Glendale Water District does not buy water from any other utility company. The water is treated and mixed with chlorine, then blended prior to distribution. There are no surface water intakes for potable water.

Ms. Rudder said that Glendale Public Utility does not keep a list of the private wells in the water district. Ms. Rudder was not able to send BVWST a well location and water line map.

Please send Appendix A for Glendale Public Utility Service areas and the municipal well locations.

TELEPHONE MEMORANDUM

USEPA Region IV

BVWST Project 52011.040
BVWST File

Water Supply and Use for the Petal Water District

June 10, 1992
14:45

To: Ralph Eddleman, Operator/Manager
Company: Petal Public Utility
Phone No.: (601) 544-6982

Recorded by: Carter Helm

Summary of conversation: Mr. Eddleman said that the City of Petal operates four wells which supply water to the City District. Petal Public Utility services 2700 connections. Wells number 1 and 2 are located at 114 Hill Crest Loop. Well number 3 is located at 115 South Main Street. Well number 4 is located at 1830 Old Richton Road. Wells number 1 and 2 have well depths of 720 and 730 feet below land surface (bls). The depth of well number 3 is 134 feet below land surface (bls). The depth of well number 4 is 130 feet below land surface (bls). Wells number 1 and 2 serve 80% of the total connections and the water is blended prior to distribution. Wells number 3 and 4 serve 20% of the total connections and the water is blended prior to distribution.

Wells 1 and 2 are located 4.4 miles northeast of Hercules and wells 3 and 4 are located 2.7 miles east of Hercules.

Petal Public Utility does not sell water to any other utility company. Petal Public Utility does not buy water from any other utility company. Mr. Eddleman does not have a list of the private wells in the Petal Utility District.

Mr. Eddleman said there are no surface water intakes for potable water. Lime and chlorine are added to the water at two of the wells and then distributed. Chlorine and phosphate are added to the water at the other two wells and then distributed.

Please refer to Appendix A for Petal Utility Service areas and the municipal well locations.

TELEPHONE MEMORANDUM

USEPA Region IV

BVWST Project 52011.040
BVWST File
June 10, 1992
11:50

Water Supply and use for the Eastabuchie Water District

To: James W. Manning, Manager/Operator
Company: Eastabuchie Utility Association
Phone No.: (601) 545-7629

Recorded by: Carter Helm

Summary of conversation: Mr. Manning said that the Eastabuchie Utility Association operates 2 wells which supply water to the Eastabuchie Water District. The depth of the two wells are 801 and 692 feet below land surface (bls). The Eastabuchie Water District serves 390 connections. There are no surface water intakes for potable water.

The water association does not have a list of private wells in the Eastabuchie District. Ninety percent of the water distributed comes from the 801 feet bls well. The other ten percent comes from the 692 feet bls well.

The Eastabuchie Utility Association is located at the private residence of James Manning at 74-A Chevis Lee Road, Petal, Mississippi. Mr. Manning did not have a well location and waterline map available to send to BVWST.

Please refer to Appendix A for Eastabuchie Utility Service areas and the municipal well locations.

jv

B&V WASTE SCIENCE AND TECHNOLOGY CORP.

Reference 22

TELEPHONE MEMORANDUM

US EPA -- Region IV
Hercules, Inc.
Municipal Water Information for Rawls Springs Public Utility

BVWST Project 52011.040
BVWST File
October 14, 1992
10:33 a.m.

To: Tony Bryant, Supervisor
Company: Rawls Springs Public Utility
Phone No.: (601) 268-2248

Recorded by: Carter Helm

Mr. Bryant offered the following facts about the Rawls Springs Public Utility:

- Distributes to 775 connections.
- Four wells are utilized.
- The wells are blended.
- The wells are located 3.2 miles northwest of the Hercules site.

Refer to Appendix A for water distribution areas and well locations.

ms

B&V WASTE SCIENCE AND TECHNOLOGY CORP.

Reference 23

TELEPHONE MEMORANDUM

US EPA -- Region IV
Hercules, Inc.
Municipal Water Information for Arnold
Line Water Association

BVWST Project 52011.040
BVWST File
October 14, 1992
15:15

To:	Sue Morgan, Secretary-Treasurer
Company:	Arnold Line Water Association
Phone No.:	(601) 264-7111

Recorded by: Carter Helm

Ms. Morgan stated that she had the knowledge to answer my questions. This utility company operates three wells which are located 2.9 miles west of the Hercules facility. The water is blended, treated, stored in two tanks, then distributed to 1,105 connections. This system serves homes between Rawls Springs Public Utility and North Lamar Water Association.

Please refer to Appendix A for water distribution areas and well locations.

ms

B&V WASTE SCIENCE AND TECHNOLOGY CORP.

Reference 24

TELEPHONE MEMORANDUM

US EPA -- Region IV
Hercules, Inc.
Municipal Water Information from
the City of North Lamar

BVWST Project 52011.040
BVWST File
October 8, 1992
10:50 a.m.

To: Mr. W. L. Moore, Superintendent
Company: North Lamar Water Association
Phone No.: (601) 543-8052 (Mobile) or 601-264-1157

Recorded by: Carter Helm

Mr. Moore operates the municipal water system for the town of North Lamar, three miles southwest of the Hercules site. Four wells serve the system. These wells are 170 feet deep and are blended. They are situated five miles southwest of the site and serve 1,685 connections. Part of the North Lamar municipal service area is in our four-mile radius area surrounding the site. Refer to Appendix A for water distribution areas and well locations.

ms

B&V WASTE SCIENCE AND TECHNOLOGY CORP.

Reference 25

TELEPHONE MEMORANDUM

US EPA -- Region IV
Hercules, Inc.
Municipal Water Information for Lamar
Park Water Association

BVWST Project 52011.040
BVWST File
October 19, 1992
16:40

To:	Susan Rowland, Secretary
Company:	Lamar Park Water Association
Phone No.:	(601) 264-5933

Recorded by: Carter Helm

Ms. Rowland had filled me in on municipal water information from the Lamar Park utility. The Lamar Park Water Association retrieves water from three wells (which are blended), then distributes to 775 connections. These three wells are located 3.2 miles southwest of the Hercules property.

Refer to Appendix A for water distribution areas and well locations.

ms

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

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

State County Place and [In Selected States] County Subdivision	Persons in households	All households	Family households: Total	Family households: Married-couple family	Family households: Female householder, no husband present	Nonfamily households: Total	Nonfamily households: Householder living alone: Total	Householder living alone: 65 years and over: Total	Householder living alone: 65 years and over: Female	Persons per—: Household	Persons per—: Family	Persons in group quarters: Total	Persons in group quarters: Institutionalized persons	Persons in group quarters: Other persons in group quarters
The State	2 512 499	911 374	674 378	498 260	145 221	236 996	212 949	98 180	77 054	2.75	3.27	60 717	29 733	30 984
COUNTY														
Adams County	34 961	13 262	9 690	6 619	2 624	3 572	3 328	1 554	1 190	2.64	3.16	395	328	67
Alcorn County	31 403	12 449	9 150	7 503	1 305	3 299	3 107	1 640	1 313	2.52	3.02	319	290	29
Amite County	13 308	4 830	3 594	2 734	694	1 236	1 173	870	491	2.76	3.30	20	20	-
Attala County	18 299	6 945	5 027	3 843	949	1 918	1 825	1 130	874	2.63	3.20	182	160	22
Benton County	8 025	2 842	2 192	1 684	394	650	617	343	254	2.82	3.32	21	6	15
Bolivar County	40 100	13 292	9 692	5 873	3 497	3 600	3 191	1 456	1 243	3.02	3.64	1 775	524	1 251
Calhoun County	14 711	5 662	4 187	3 273	717	1 475	1 410	841	691	2.60	3.10	197	192	5
Carroll County	9 213	3 352	2 556	1 947	484	796	749	431	294	2.75	3.24	24	18	6
Chickasaw County	17 946	6 480	4 902	3 687	991	1 578	1 469	822	654	2.77	3.28	139	139	-
Choctaw County	8 864	3 217	2 436	1 804	437	781	744	435	348	2.76	3.26	207	207	-
Claiborne County	9 419	3 342	2 359	1 340	838	983	922	462	319	2.82	3.48	1 951	14	1 937
Clarke County	17 136	6 334	4 780	3 600	981	1 554	1 469	777	599	2.71	3.20	177	164	13
Clay County	20 527	7 251	5 451	3 807	1 405	1 800	1 670	870	675	2.83	3.37	593	231	362
Coahoma County	30 897	10 530	7 538	4 478	2 647	2 992	2 775	1 533	1 186	2.93	3.60	768	512	256
Copiah County	26 295	9 304	6 993	4 928	1 732	2 311	2 153	1 136	901	2.83	3.36	1 297	159	1 138
Covington County	16 458	5 786	4 441	3 407	836	1 345	1 281	700	536	2.84	3.35	69	66	3
DeSoto County	67 601	23 273	19 340	16 031	2 502	3 933	3 441	1 296	982	2.91	3.23	219	182	37
Forrest County	63 871	25 150	16 726	11 739	4 233	8 424	6 947	2 517	2 043	2.54	3.15	4 443	1 019	3 424
Franklin County	8 310	3 086	2 284	1 731	439	802	761	424	316	2.69	3.22	67	67	-
George County	16 536	5 779	4 610	3 855	509	1 169	1 090	564	445	2.86	3.28	137	137	-
Greene County	9 635	3 327	2 635	2 111	429	692	652	340	285	2.90	3.35	585	585	-
Grenada County	21 211	7 701	5 738	4 168	1 330	1 963	1 820	923	751	2.75	3.28	344	286	58
Hancock County	31 164	11 817	8 717	6 958	1 331	3 100	2 748	1 219	871	2.64	3.11	596	252	344
Harrison County	157 921	59 557	42 921	32 618	8 264	16 636	14 401	5 291	4 087	2.65	3.17	7 444	2 594	4 850
Hinds County	245 738	91 023	64 032	43 365	17 458	26 991	23 300	8 223	6 622	2.70	3.29	8 703	2 426	6 277
Holmes County	21 205	7 139	5 207	2 858	2 023	1 932	1 818	1 054	784	2.97	3.61	399	112	287
Humphreys County	12 083	3 926	2 878	1 736	950	1 048	929	449	385	3.07	3.67	71	71	-
Issaquena County	1 909	633	476	346	94	157	147	62	44	3.02	3.57	-	-	-
Itawamba County	18 428	7 497	5 790	4 870	606	1 707	1 640	931	763	2.50	3.02	589	212	377
Jackson County	114 240	40 454	31 583	24 777	5 453	8 871	7 822	2 857	2 221	2.82	3.25	994	635	359
Jasper County	17 016	5 956	4 606	3 408	952	1 350	1 287	734	576	2.86	3.34	96	96	-
Jefferson County	8 649	2 814	2 114	1 174	784	700	651	322	229	3.07	3.67	4	-	4
Jefferson Davis County	13 833	4 787	3 674	2 610	873	1 113	1 054	585	454	2.91	3.43	118	111	7
Jones County	60 441	22 506	16 976	13 214	3 081	5 530	5 161	2 696	2 169	2.69	3.17	1 590	628	962
Kemper County	10 039	3 626	2 642	1 864	620	984	933	508	371	2.77	3.37	317	91	226
Lafayette County	27 387	11 086	6 964	5 434	1 229	4 122	2 972	981	763	2.47	3.08	4 430	477	3 953
Lamar County	30 288	10 883	8 497	6 933	1 265	2 386	2 083	848	805	2.78	3.21	136	136	-
Lauderdale County	73 091	28 232	20 032	14 397	4 820	8 200	7 455	3 405	2 764	2.59	3.15	2 464	1 188	1 276
Lawrence County	12 356	4 508	3 418	2 898	611	1 090	1 055	568	443	2.74	3.26	102	77	25
Leake County	18 284	6 788	5 054	3 926	905	1 734	1 651	838	745	2.69	3.22	152	150	2
Lee County	64 732	24 450	18 116	14 208	3 209	6 334	5 727	2 348	1 907	2.65	3.14	849	722	127
Leflore County	35 916	12 749	8 977	5 490	3 014	3 772	3 456	1 783	1 369	2.82	3.47	1 423	509	914
Lincoln County	29 787	11 089	8 318	6 459	1 550	2 771	2 640	1 396	1 108	2.69	3.20	491	330	161
Lowndes County	57 916	21 402	15 698	11 518	3 568	5 704	5 037	1 972	1 601	2.71	3.23	1 392	324	1 068
Madison County	52 756	19 276	13 638	9 791	3 214	5 638	4 833	1 508	1 173	2.74	3.34	1 038	574	464
Marion County	25 096	9 110	6 897	5 378	1 244	2 213	2 096	1 157	908	2.75	3.27	448	448	-
Marshall County	29 554	10 077	7 790	5 540	1 806	2 287	2 091	985	733	2.93	3.41	607	149	458
Monroe County	36 246	13 348	10 077	7 627	2 000	3 271	3 061	1 664	1 370	2.72	3.22	336	336	-
Montgomery County	12 248	4 532	3 349	2 417	774	1 183	1 130	676	526	2.70	3.25	140	132	8
Neshoba County	24 469	8 848	6 754	5 211	1 208	2 094	1 937	1 103	854	2.77	3.22	331	225	106
Newton County	19 700	7 358	5 579	4 337	995	1 779	1 680	932	738	2.68	3.15	591	173	418
Noxubee County	12 572	4 140	3 092	1 971	937	1 048	1 000	581	420	3.04	3.65	32	20	12
Oktibbeha County	33 338	12 916	8 261	6 031	1 842	4 655	3 315	1 044	795	2.58	3.18	5 037	173	4 864
Panola County	29 478	10 130	7 652	5 418	1 820	2 478	2 290	1 218	937	2.91	3.44	520	212	308
Pearl River County	38 150	13 780	10 699	8 609	1 673	3 081	2 796	1 336	1 066	2.77	3.21	564	220	344
Perry County	10 809	3 802	2 951	2 331	497	851	806	410	318	2.84	3.32	56	45	11
Pike County	36 185	13 408	9 709	6 630	2 464	3 699	3 450	1 787	1 404	2.70	3.27	687	346	341
Pontotoc County	22 090	8 346	6 379	5 241	882	1 967	1 857	1 057	857	2.65	3.11	147	147	-
Prentiss County	22 727	8 647	6 570	5 318	1 000	2 077	1 939	1 093	875	2.63	3.09	551	81	470
Quitman County	10 403	3 521	2 569	1 711	693	952	883	541	425	2.95	3.58	87	87	-
Rankin County	84 159	29 854	23 884	19 648	3 338	5 970	5 270	1 829	1 427	2.82	3.21	3 002	2 863	139
Scott County	23 965	8 511	6 480	4 792	1 354	2 031	1 875	960	752	2.82	3.31	172	163	9
Sharkey County	7 003	2 084	1 601	992	485	483	424	243	195	3.36	3.92	63	63	-
Simpson County	23 240	8 357	6 347	4 940	1 118	2 010	1 888	994	784	2.78	3.28	713	671	42
Smith County	14 671	5 276	4 105	3 443	495	1 171	1 119	624	406	2.78	3.25	127	127	-
Stone County	10 175	3 695	2 796	2 223	457	899	810	406	325	2.75	3.25	575	165	410
Sunflower County	29 501	9 650	7 039	4 404	2 254	2 611	2 440	1 400	1 089	3.06	3.71	3 366	2 946	420
Tallahatchie County	15 128	5 034	3 717	2 436	1 018	1 317	1 230	711	539	3.01	3.60	82	82	-
Tate County	20 515	7 024	5 576	4 347	983	1 448	1 316	700	538	2.92	3.35	917	153	764
Tippah County	19 208	7 158	5 487	4 500	754	1 671	1 567	847	666	2.68	3.14	314	211	103
Tishomingo County	17 513	7 059	5 314	4 506	637	1 745	1 661	959	758	2.48	2.93	170	170	-
Tunica County	8 138	2 526	1 876	1 050	667	650	580	299	223	3.22	3.84	26	26	-
Union County	21 952	8 367	6 339	5 278	814	2 028	1 921	1 128	923	2.62	3.09	133	133	-
Walthall County	14 173	4 929	3 771	2 859	726	1 158	1 092	616	489	2.88	3.38	179	135	44
Warren County	47 354	17 407	12 671	9 236	2 864	4 736	4 335	1 872	1 538	2.72	3.28	526	496	30
Washington County	67 232	22 693	16 764	10 434	5 348	5 929	5 243	2 464	1 929	2.96	3.54	703	635	68
Wayne County	19 434	6 854	5 336	4 022	1 082	1 522	1 449	717	552	2.83	3.31	83	83	-
Webster County	10 057	3 826	2 814	2 186	507	1 012	975	566	442	2.63	3.17	165	104	61
Wilkinson County	9 546	3 347	2 520	1 548	813	827	783	416	323	2.85	3.30	132	132	-
Winston County	19 284	7 061	5 251	3 888	1 119	1 810	1 730	874	702	2.73	3.27	169	168	1
Yalobusha County	11 951	4 614	3 244	2 371	722	1 370	1 297	764	622	2.59	3.20	82	58	24
Yazoo County	25 170	8 813	6 463	4 329	1 780	2 350	2 208	1 213	920	2.86	3.45	336	313	23
PLACE AND COUNTY SUBDIVISION														
Abbeville town, Lafayette County	398	151	118	97	19	33	32	18	14	2.64	3.09	-	-	-
Aberdeen city, Monroe County	6 632	2 463	1 760	1 093	578	703	657	329	264	2.69	3.29	205	205	-
Ackerman town, Choctaw County	1 508	605	406	288	116	199	193	123	110	2.49	3.14	67	67	-
Algoma town, Pontotoc County	420	159	124	101	20	35	34	21	15	2.64	3.09	-	-	-
Alligator town, Bolivar County	187	56	41	20	17	15	15	8	5	3.34	4.15	-	-	-
Amory city, Monroe County	6 973	2 829	1 975	1 418	482	854	800	462	395	2.46	3.04	120	120	-
Anguilla town, Sharkey County	883	269	199	120	63	70	63	37	29	3.29	3.88	-	-	-
Arcola town, Washington County	564	171	125	53	57	46	42	17	14	3.30	3.89	-	-	-
Artesia town, Lowndes County	484	160	114	65	40	46	44	24	17	3.03	3.77	-	-	-
Ashland town, Benton County	484	227	146	121	20	81	78	53	43	2.13	2.73	6	6	-

TPS8 (POSTSCRIPT) CPH128 CENSUS90 72580800 04/23/91 2:28 PM MACHINE C DATA CENSUS90*PH1TPSDAT28 04/23/91 14:18:03 OUTPUT ONSITE P9177 PAGE: 60
TSF CENSUS90*82 04/23/91 14:18:18 UTF CENSUS90*82 04/23/91 14:18:19 META CENSUS90*PH1TABLES28 04/23/91 14:24:58

NOTE: The population counts set forth herein are subject to possible correction for undercount or overcount. The United States Department of Commerce is considering whether to correct these counts and will publish corrected counts, if any, not later than July 15, 1991.

B&V WASTE SCIENCE AND TECHNOLOGY CORP. Reference 27

TELEPHONE MEMORANDUM

USEPA Region IV

BVWST Project 52011.040
BVWST File

Private Well Information

June 9, 1992
11:30

To: Mr. Freeman, Public Health Environmentalist
Company: Forrest County Health Department
Phone No.: (601) 583-0291

Recorded by: Carter Helm

Summary of conversation: Mr. Freeman said that the Forrest County Health Department does not retain a list of the private wells in Forrest County. Mr. Freeman said there are very few private wells in the county. He said the Health Department receives very few complaints regarding the drinking water for Forrest County.

B&V WASTE SCIENCE AND TECHNOLOGY CORP.

Reference 28

TELEPHONE MEMORANDUM

US EPA -- Region IV
Hercules, Inc.
River and Surface Water Intake Information

BVWST Project 52011.040
BVWST File
October 30, 1992
09:30 a.m.

To: Lloyd Long, Hydrologist
Company: Office of Land and Water Resources, State of MS
Phone No.: (601) 961-5209

Recorded by: Carter Helm

Mr. Long stated that no wetlands exist along the 15-mile surface water pathway that I described for the site. He estimated the flow rate for the Bowie River (also spelled Bouie River) to be approximately 910 cfs (cubic feet per second). Also, Greens Creek is under 100 cfs. He has documented data for the Leaf River which he will mail to me.

Surface water intakes along the pathway exist for industrial use only (cooling water). Three companies utilize surface water from the study area. They include: Hercules, Inc., Mississippi Power's Eaton Plant, and the Petromill Corporation.

ms

Reference 29

STATE OF MISSISSIPPI
DEPARTMENT OF ENVIRONMENTAL QUALITY
JAMES I. PALMER, JR.
EXECUTIVE DIRECTOR

November 2, 1992

Mr. Carter Helm
B & V Waste Science
1117 Perimeter Penter W.
Suite W 212
Atlanta, GA 30338

Dear Mr. Helm:

In response to your request for information on permitted surface water withdrawals from the Leaf River near Hattiesburg and also streamflow data on the Leaf River at Hattiesburg, enclosed are the following data:

1. Surface Water Withdrawals

   A map with withdrawal sites highlighted and also a computer printout of the pertinent data on these sites.

2. Streamflow Data

   Leaf River Gage at Hattiesburg on U.S. Highway 11.

   Mean Annual Flow is 2,725 cubic feet per second with 52 years of record.

   Established minimum flow (7 Day Q_{10}) is 374 cubic feet per second.

Should you have any questions please call me at (601) 961-5209.

Yours very truly,

Lloyd Long

Lloyd Long,
Hydrologist

HATTIESBURG QUADRANG
MISSISSIPPI
7.5 MINUTE SERIES (TOPOGRAP

BLW-NC-1

RETURN COMPLETED FORM TO:

Bureau of Land and Water Resources
P.O. Box 10631
Jackson, Mississippi 39209
Telephone (601) 961-5200

For Office Use Only:	
County:	Forrest
Date Received:	1-15-86
Permit No:	MS-SW00238
Quad Map:	
Water Management Dist:	
Hydrologic River Basin:	

NOTICE OF CLAIM FOR CONTINUED USE OF SURFACE/GROUND WATERS FOR BENEFICIAL USE

Pursuant to the laws of the State of Mississippi, namely §51-3-5 (2) or (3), as amended, I, the landowner,

HERCULES INC. (Name) 51-0023450 (S/S or Tax ID No.)

West 7th Street (Address), HATTIESBURG (City or Town), MS 39401 (State and Zip)

(601) 545 3450 (Telephone Number), do hereby file claim for the continued use of: (circle one)

surface water   ground water   for the following beneficial use: (circle one or more)

municipal; irrigation; recreation; livestock water; fish culture; industrial;

Other ______ (Specify)

1. Name & Address of agent or applicant if different from landowner.

(Name) ______ (S/S or Tax ID No.) ______ (Address) ______

(City or Town) ______ (State and Zip) ______ ( ) (Telephone Number) ______

2. Location of point of diversion/withdrawal (include location map with claim)

SE ¼ of SW ¼ of Section 33, Township 5N, Range 13W, County Forrest

3. Volume of water diverted/withdrawn:

(1) ______ acre feet per year, diverted/withdrawn at a maximum rate of ______ gallons per minute; or

(2) 2628 million gallons per ~~day~~ Year diverted/withdrawn at a maximum rate of 8500 gallons per minute.

4. Description of lands on which water will be used:
(a) Copy legal description of property upon which water is to be used (may be copied word for word from your deed).
Attach separate sheet if necessary Section 4 and 5, Township 4N, Range 13W

(b) Has the above described land any water right or source of water supply other than that herein applied for?

(Water Rights Number(s) ______) Describe the nature and amount of any additional supply

Three (3) Layne wells - 1000 gpm each

SECTION A (to be completed if source of water is from surface supply)

1. Prior water rights permit/license number 0003, dated August 23, 1957
2. Source of supply is Bowie River which drains into Leaf River
   ______ which drains into Pascagoula River
3. Description of diversion works:
   (a) Water obtained directly from stream: Bowie River (Name)
   Pump Four (4) centrifugal (Size and type) Power Unit 2-150HP and 2-75HP (Size and type)
   Lift 2-180FT and 2-140FT ft. Maximum capacity 2-2500gpm and 2-175gpm gpm
   (b) Storage reservoir ______ (Name)
   Height of dam ______ feet. Surface area at normal pool ______ acres
   Storage capacity at normal pool ______ acre feet

SECTION B (to be completed if source of water is from underground supply)

1. Source of supply: ______________________ aquifer(s)
2. Description of water well:

(a) **Well data:**
- (1) Date well completed ______________
- (2) Depth drilled ______________ feet
- (3) Type of completion ______________
- (4) Surface elevation ______________ feet

(b) **Screen data:**
- (1) Depth to bottom ______________ feet
- (2) Length ______________ feet
- (3) Diameter ______________ inches
- (4) Type ______________
- (5) Slot ______________ inches

(c) **Casing data:**
- (1) Length(s) ______________ feet; Diameter(s) ______________ inches
- (2) Type ______________

(d) **Pump data:**
- (1) Type & Size ______________
- (2) Capacity ______________ gpm
- (3) No. stages ______________
- (4) Setting depth ______________ feet

Well Driller ______________________
(Name of Company)

WATER USE DATA

1. IRRIGATION use: (a) *Show number of acres to be irrigated by 40-acre blocks:*

TOWN-SHIP	RANGE	SEC.	NE¼				NW¼				SW¼				SE¼				TOTALS
			NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	

(b) List the acres to be irrigated: Rice ______; Cotton ______; Corn ______; Pasture ______; Truck ______

Other crops (______________) ______________ acres.

2. If for MUNICIPAL use: (a) Present population ______________, (based on 19____ Census)
   (b) Estimated average daily consumption during periods of maximum use at the end of each five-year period in next twenty years:
   ________ 19____; ________ 19____; ________ 19____; ________ 19____

3. If for INDUSTRIAL use: (a) If water is to be released into a watercourse, indicate: Amount released each year 2280, rate of release MGY; location of release point in reference to diversion point 3000 FEET DOWNSTREAM (show location on map)
   (b) Explain any change in quality of water to be released: PORTIONS OF SURFACE, GROUND, AND city waters comprise INDUSTRIAL EFFLUENT AND NON-CONTACT COOLING WATER DISCHARGES.

4. If for RECREATIONAL use: Explain how water will be used ______________

5. If for FISH CULTURE use: (a) Explain in detail how water will be used ______________
   (b) Number of times reservoir will be emptied and filled annually: ______________

6. If for ANY OTHER use: (a) Explain in detail ______________

REMARKS ______________________

List below the name and address of person to be contacted for additional information, if required.

Charles JORDAN
(Name)
PO Box 1937 HATTIESBURG MS 39401
(Address)

The accompanying map is hereby declared a part of this application.

[illegible]
(Signature)

Subscribed and sworn to before me this 13th day of January 19 86, at Hattiesburg, Mi.
County of Forrest, Mississippi. My commission expires My Commission [illegible] Feb. 22, 19[illegible]

Janice Reid Notary Public

ENDANGERED AND THREATENED SPECIES

Reference 31

U.S. FISH AND WILDLIFE SERVICE

REGION 4 - ATLANTA

PREFACE

The materials in this notebook are provided as an aid to anyone having a continuing need for current information on Federally listed endangered and threatened species found within Region 4 of the U.S. Fish and Wildlife Service. This area includes the Carolinas, Georgia, Florida, Alabama, Tennessee, Kentucky, Mississippi, Arkansas, Louisiana, Puerto Rico, and the Virgin Islands.

Recipients of the notebook are placed on a permanent mailing list and will automatically receive updated information whenever listing or other changes occur. Questions or comments pertaining to the notebook should be directed to the Endangered Species Office, U.S. Fish and Wildlife Service, Richard B. Russell Federal Building, 75 Spring St., S.W., Atlanta, Georgia 30303; telephone 404/221-3583 or FTS 242-3583. Other questions pertaining to endangered species matters should be addressed to one of the Service field stations listed at the end of this Preface.

The notebook is divided into two primary sections. Materials in the first section provide quick reference as to what species are listed, proposed, or under review, the states where they occur, the location of critical habitat areas, and other related information. The second part of the notebook contains species accounts which briefly discuss such things as the status, range, life history, and management needs of listed species. Please note that the range maps for these species generally reflect current distribution, but in many cases they reflect distribution rather broadly and should only be interpreted in relation to other information included in the species account.

The Endangered Species Act - General

Passage of the Endangered Species Act of 1973 gave the United States one of the most far-reaching laws ever enacted by any country to prevent the extinction of imperiled animals and plants. Under the law, the Secretary of the Interior (acting through the U.S. Fish and Wildlife Service) has broad powers to protect and conserve all forms of wildlife and plants he finds in serious jeopardy. The Secretary of Commerce, acting through the National Marine Fisheries Service, has similar authority for protecting and conserving most marine life.

Congress addressed the question of why we should save endangered species in the preamble to the Endangered Species Act, holding that endangered and threatened species of fish, wildlife and plants "are of esthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people." In making this statement, Congress was summarizing a number of convincing arguments advanced by thoughtful scientists, conservationists, and others who are greatly concerned by the disappearance of wildlife.

Protecting endangered species and restoring them to the point where their existence is no longer jeopardized is the primary objective of the U.S. Fish and Wildlife Service's Endangered Species Program.

The Listing Process

The Fish and Wildlife Service follows a formal "rulemaking" procedure in determining which species should be placed on the U.S. List of Endangered and Threatened Wildlife and Plants. The Act defines an "endangered" species as one that is in danger of extinction throughout all or a significant portion of its range. A "threatened" species is defined as one that is likely to become endangered within the foreseeable future.

A "rulemaking" is the process used by Federal agencies (and many states) to propose and later adopt regulations which have the effect of law, and apply to all U.S. residents. The proposed rule is published in the Federal Register, a daily Government publication, to provide for public notification and a period for comments. The proposal is then reevaluated, and if adopted it is published again as a final rule. Endangered or threatened species are placed on the list, reclassified, or deleted through this process.

Protection Under the Act

Section 9 of the Act prohibits the illegal possession, import, export, or interstate or foreign sale of listed species (including their parts and products). It is also illegal to kill, harrass, harm, or remove listed species of animals from the wild. Taking of plants is prohibited only on Federal lands. Under Section 7 of the Act, Federal agencies are required to insure that actions they authorize (by permit), fund, or carry out do not jeopardize the existence of listed species or adversely affect critical habitat.

Penalties for violations can range from a warning and seizure of illegally held wildlife specimens and products to a maximum of $20,000 and/or a year in jail for criminal offenses.

Critical Habitat

The Endangered Species Act, as amended, calls for the conservation of what is termed "critical habitat"--the areas of land, water, and air space an [illegible] threatened species needs for survival. These areas include such things as food and water, breeding sites, cover or shelter, and sufficient habitat to provide for normal population growth and behavior. Critical habitat is usually included with the proposal to list a species. However, if it is determined separately at a later date, the rulemanking procedure is the same as for classifying a species as endangered or threatened.

One of the primary threats to most species is the destruction or modification of essential habitat areas by uncontrolled land and water development. Accordingly, the law requires all Federal agencies to insure that actions they authorize (by permit), fund, or carry out do not jeopardize the existence of listed species or adversely affect critical habitat.

It should be emphasized, however, that not all Federal actions will necessarily be detrimental to critical habitat. There may be many kinds of actions which can be carried out within a critical habitat area without reducing the species' numbers or distribution, or otherwise posing jeopardy to it.

In summary, the designation of critical habitat does not create a nature preserve or refuge. It does not affect private, local, or state projects unless Federal funds or permits are involved. It does provide a means by which listed species can be protected from adverse impacts resulting from Federal action.

Consultation

Section 7 of the Act requires all Federal agencies to review their actions, and if they determine that their actions may affect a listed species or its habitat, they must enter into consultation with the Fish and Wildlife Service. During the course of such consultation the involved agency and the Fish and Wildlife Service will try to determine a course of action which will allow for completion of the agency's project and at the same time not jeopardize the species. Most consultations accomplish this goal.

In the case of a conflict, the Act provides a means whereby under certain conditions the affected Federal agency may be exempted from the requirements of Section 7. Exemption applications must be submitted to the Secretary of the Interior for consideration. If the Secretary decides the application meets exemption criteria, it is then passed on to a seven-member cabinet-level Endangered Species Committee for a final decision.

Conservation and Recovery

A main aim of the Service's Endangered Species Program is to restore populations of listed species to a point where they are no longer in danger of extinction and are again self-sustaining members of their ecosystem. Recovery plans for a number of these species are already being carried out. The plans may recommend the acquisition of land, new research, captive breeding, or may call for special wildlife and habitat management techniques.

In addition to overseeing the development and implementation of recovery plans, the Fish and Wildlife Service utilizes the authorities and funding provided under the Act to provide for technical assistance, management, law enforcement, land acquisition, research, status surveys, and financial assistance to state agencies which have entered into a cooperative agreement with the Service.

Permits

The Service's Wildlife Permit Office can issue permits for certain activities involving endangered or threatened species. Permits for endangered species are issued only for scientific or breeding purposes. In addition to these purposes, permits for threatened species may be issued for educational activities, zoo exhibitions, and other special purposes.

U.S. Fish and Wildlife Service Endangered Species Field Offices - Region 4

U.S. Fish and Wildlife Service (serves KY, NC, SC, TN)
100 Otis Street, Room 224
Asheville, NC 28801
Phone: 704/259-0321
FTS 672-0321

KY, TN - Jim Widlak

U.S. Fish and Wildlife Service (serves AL, AR, LA, MS)
Jackson Mall Office Center
300 Woodrow Wilson Avenue, Suite 316
Jackson, MS 39213
Phone: 601/960-4900
FTS 490-4900

U.S. Fish and Wildlife Service (serves GA and FL)
2747 Art Museum Drive
Jacksonville, Florida 32207
Phone: 904/791-2580
FTS 946-2580

U.S. Fish and Wildlife Service (serves PR and VI)
Post Office Box 491
Boqueron, PR 00622
Phone: 809/851-7297

12/16/87

Endangered and Threatened Species in Region 4*

(E=Endangered; T=Threatened)

Mammals:	Distribution:
Bat, gray (E)	AL,AR,FL,GA,KY,NC,TN
Bat, Indiana (E)	AL,AR,FL,GA,KY,NC,TN
Bat, Ozark big-eared (E)	AR
Bat, Virginia big-eared (E)	KY,NC
Cougar, Eastern (E)	KY,NC,SC,TN
Deer, Key (E)	FL
Manatee, West Indian (E)	AL,FL,GA,NC,PR,SC
Mouse, Alabama beach (E)	AL
Mouse, Choctawhatchee beach (E)	FL
Mouse, Key Largo cotton (E)	FL
Mouse, Perdido Key beach (E)	AL, FL
Panther, Florida (E)	AL,AR,FL,GA,LA,MS,SC,TN
Shrew, Dismal Swamp southeastern (T)	NC
Squirrel, Carolina northern flying (E)	NC,TN
Whale, finback (E)	Oceanic
Whale, humpback (E)	Oceanic
Whale, right (E)	Oceanic
Whale, sei (E)	Oceanic
Whale, sperm (E)	Oceanic
Wolf, red (E)	LA
Woodrat, Key Largo (E)	FL

Birds:	
Blackbird, yellow-shouldered (E)	PR
Caracara, Audubon's Crested (T)	FL
Crane, Mississippi Sandhill (E)	MS
Curlew, Eskimo (E)	LA (historic, near extinction)
Eagle, bald Southeastern (E)	AL,AR,FL,GA,KY,LA,MS,NC,SC,TN
Falcon, American peregrine Eastern (E)	AL,GA,KY,NC,SC,TN
Falcon, Arctic peregrine (T)	AL,AR,FL,GA,KY,LA,MS,NC,PR, SC,TN
Jay, Florida scrub (T)	FL
Kite, Everglade (E)	FL
Parrot, Puerto Rican (E)	PR
Pelican, brown (E)	LA,MS,PR,VI

*Includes the Carolinas, Georgia, Florida, Alabama, Tennessee, Kentucky, Mississippi, Arkansas, Louisiana, Puerto Rico, and the Virgin Islands.

12/16/87

Birds (cont'd):	Distribution
Pigeon, Puerto Rican plain (E)	PR
Plover, piping (T)	AL,FL,GA,LA,MS,NC,PR,SC
Sparrow, Cape Sable (E)	FL
Sparrow, dusky seaside (E)	FL (near extinction)
Sparrow, Florida grasshopper (E)	FL
Stork, wood (E)	FL,GA,SC
Tern, least; interior population (E)	AR,KY,LA,MS,TN
Tern, roseate (T)	FL,PR,VI
Warbler (wood), Bachman's (E)	AL,AR,FL,GA,KY,LA,MS,NC,SC,TN (historic, possibly extinct)
Warbler (wood), Kirtland's (E)	FL,GA,KY,NC,SC,TN
Whip-poor-will, Puerto Rican (E)	PR
Woodpecker, ivory-billed (E)	AL,AR,FL,GA,KY,LA,MS,NC,SC,TN (historic, probably extinct)
Woodpecker, red-cockaded (E)	AL,AR,FL,GA,KY,LA,MS,NC,SC,TN

Reptiles and Amphibians:	
Alligator, American (T,S/A) *	AL,AR,FL,GA,LA,MS,NC,SC
Anole, giant (E)	PR
Boa, Mona (T)	PR
Boa, Puerto Rican (E)	PR
Boa, Virgin Islands tree (E)	VI
Coqui, golden (T)	PR
Crocodile, American (E)	FL
Florida bonamia (T)	FL
Heller's blazing star (T)	NC
Higuero de Sierra (E)	PR
Gecko, Monito (E)	PR
Iguana, Mona ground (T)	PR
Lizard, St. Croix ground (E)	VI
Salamander, Red Hills (T)	AL
Shiner, Cape Fear (E)	NC
Skink, blue-tailed mole (T)	FL
Skink, sand (T)	FL
Snake, Atlantic salt marsh (T)	FL
Snake, eastern indigo (T)	AL,FL,GA,MS,SC
Toad, Puerto Rican crested (T)	PR
Tortoise, gopher (T)	AL,LA,MS

* Alligators are biologically neither endangered nor threatened and may be hunted as permitted under State law. For law enforcement purposes they are classified as "Threatened due to Similarity of Appearance."

Reptiles and Amphibians (cont'd):	Distribution
Turtle, Alabama red-bellied (E)	AL
Turtle, flattened musk (T)	AL
Turtle, green (T) (E in Florida)	AL,FL,GA,LA,MS,NC,PR,SC,VI
Turtle, hawksbill (E)	AL,FL,GA,LA,MS,NC,PR,SC,VI
Turtle, Kemp's (Atlantic) ridley (E)	AL,FL,GA,LA,MS,NC,SC
Turtle, leatherback (E)	AL,FL,GA,LA,MS,NC,PR,SC,VI
Turtle, loggerhead (T)	AL,FL,GA,LA,MS,NC,PR,SC,VI
Turtle, ringed sawback (T)	LA,MS
Fishes:	
Cavefish, Alabama (T)	AL
Cavefish, Ozark (T)	AR
Chub, slender (T)	TN
Chub, spotfin (T)	NC,TN
Dace, blackside (T)	KY,TN
Darter, amber (E)	TN,GA
Darter, Bayou (T)	MS
Darter, leopard (T)	AR
Darter, Okaloosa (E)	FL
Darter, slackwater (T)	AL,TN
Darter, snail (T)	GA,TN,AL
Darter, watercress (E)	AL
Logperch, Conasauga (E)	TN,GA
Madtom, smoky (E)	TN
Madtom, yellowfin (T)	TN
Shiner, Cape Fear (E)	NC
Silverside, Waccamaw (T)	NC
Sturgeon, shortnose (E)	FL,GA,NC,SC
Mollusks:	
Mussel, Alabama lamp pearly (E)	AL,TN
Mussel, Appalachian monkeyface (E)	TN
Mussel, birdwing pearly (E)	TN
Mussel, Cumberland bean pearly (E)	KY,TN
Mussel, Cumberland monkeyface pearly (E)	TN
Mussel, Curtus' (E)	MS
Mussel, dromedary pearly (E)	TN
Mussel, fat pocketbook pearly (E)	AR
Mussel, fine-rayed pigtoe pearly (E)	AL,TN
Mussel, green-blossom pearly (E)	TN
Mussel, Judge Tait's (E)	AL,MS
Mussel, Marshall's (E)	AL

Mollusks (Cont'd.):	Distribution
Mussel, orange-footed pearly (E)	AL,TN,KY
Mussel, pale lilliput pearly (E)	AL
Mussel, penitent (E)	AL,MS
Mussel, pink mucket pearly (E)	AL,KY,TN,AR
Mussel, rough pigtoe pearly (E)	KY,TN,AL
Mussel, shiny pigtoe pearly (E)	AL,TN
Mussel, stirrup shell (E)	AL
Mussel, tan riffle shell (E)	KY,TN (historic occurrence)
Mussel, Tar River spiny (E)	NC
Mussel, tuberculed-blossom pearly (E)	KY,TN (historic, possibly extinct)
Mussel, turgid-blossom pearly (E)	TN,AL,AR (historic, possibly extinct)
Mussel, white warty-back pearly (E)	TN
Mussel, yellow-blossom pearly (E)	AL,KY,TN (historic, possibly extinct)
Snail, noonday (T)	NC
Snail, painted snake coiled forest (T)	TN
Snail, Stock Island tree (T)	FL

Arthropods

Butterfly, Schaus swallowtail (E)	FL
Crayfish (cave species; no common name) (E)	AR
Crayfish, Nashville (E)	TN
Shrimp, Kentucky cave (E)	KY

Plants:

Alabama leather flower (E)	AL
Beautiful goetzea (E)	PR
Beautiful pawpaw (E)	FL
Blue Ridge goldenrod (T)	NC,TN
Bunched arrowhead (E)	NC,SC
Canby's dropwort (E)	NC,SC,GA
Carter's mustard (E)	FL
Chapman's rhododendron (E)	FL
Cook's holly (E)	PR
Crenulate lead-plant (E)	FL
Deltoid spurge (E)	FL
Elfin tree fern (E)	PR
Florida bonamia (T)	FL
Florida golden aster (E)	FL
Florida torreya (E)	FL,GA

Plants (cont'd):	Distribution
Four-petal pawpaw (E)	FL
Fragrant prickly-apple (E)	FL
Garber's spurge (T)	FL
Geocarpon minimum (T)	AR
Green pitcher plant (E)	AL,GA,NC
Hairy rattleweed (E)	GA
Harper's beauty (E)	FL
Heller's blazing star (T)	NC
Highlands scrub hypericum (E)	FL
Higuero de Sierra (E)	PR
Key tree-cactus (E)	FL
Lakela's mint (E)	FL
Large-flowered skullcap (E)	GA,TN
Longspurred mint (E)	FL
Miccosukee gooseberry (T)	FL,SC
Mountain golden heather (T)	NC
Palo de Ramon (E)	PR
Papery whitlow-wort (T)	FL
Persistent trillium (E)	GA,SC
Pondberry (E)	AR,GA,MS,NC,SC
Prickly-ash (E)	PR, VI
Pygmy fringe tree (E)	FL
Rough-leaved loosestrife (E)	NC
Rugel's pawpaw (E)	FL
Ruth's golden aster (E)	TN
Scrub lupine (E)	FL
Scrub mint (E)	FL
Scrub plum (E)	FL
Short's goldenrod (E)	KY
Small whorled pogonia (E)	GA,NC,SC,TN
Small's milkpea (E)	FL
Snakeroot (E)	FL
Tennessee coneflower (E)	TN
Tiny polygala (E)	FL
Vahl's boxwood (E)	PR
Wheeler's peperomia (E)	PR
Wide-leaf warea (E)	FL
Wireweed (E)	FL

Federally Listed Species by State

MISSISSIPPI

(E=Endangered; T=Threatened; CH=Critical Habitat determined)

Mammals	General Distribution
Panther, Florida (*Felis concolor coryi*) - E	Entire state
Whale, right (*Eubalaena glacialis*) - E	Coastal waters
Whale, finback (*Balaenoptera physalus*) - E	Coastal waters
Whale, humpback (*Megaptera novaeangliae*) - E	Coastal waters
Whale, sei (*Balaenoptera borealis*) - E	Coastal waters
Whale, sperm (*Physeter catodon*) - E	Coastal waters
Birds	
Crane, Mississippi sandhill (*Grus canadensis pulla*) - E,CH	Southern Jackson County
Eagle, bald (*Haliaeetus leucocephalus*) - E	Entire state
Falcon, Arctic peregrine (*Falco peregrinus tundrius*) - T	Entire state
Pelican, brown (*Pelecanus occidentalis*) - E	Coast
Plover, piping (*Charadrius melodus*) - T	Coast
Tern, least (*Sterna antillarum*); interior population - E	Mississippi River
Warbler, Bachman's (*Vermivora bachmanii*) - E	Entire state
Woodpecker, ivory-billed (*Campephilus principalis*) - E	West, South, East Central
Woodpecker, red-cockaded (*Picoides* (=*Dendrocopos*) *borealis*) - E	Entire state
Reptiles	
Alligator, American (*Alligator mississippiensis*) - T (S/A)*	South and West
Snake, eastern indigo (*Drymarchon corais couperi*) - T	South
Tortoise, gopher (*Gopherus polyphemus*) - T	Lower Gulf Coastal Plain (14 counties)
Turtle, Kemp's (Atlantic) ridley (*Lepidochelys kempii*) - E	Coastal waters
Turtle, green (*Chelonia mydas*) - T	Coastal waters

MISSISSIPPI (cont'd)

	General Distribution
Turtle, hawksbill (Eretmochelys imbricata) - E	Coastal waters
Turtle, loggerhead (Caretta caretta) - T	Coastal waters
Turtle, ringed sawback (Graptemys oculifera) - T	Pearl River
Fishes	
Darter, bayou (Etheostoma rubrum) - T	Bayou Pierre drainage
Mollusks	
Mussel, Curtus' (Pleurobema curtum) - E	East Fork Tombigbee River
Mussel, Judge Tait's (Pleurobema taitianum) - E	East Fork Tombigbee River and Buttahatchie River
Mussel, penitent (Epioblasma [=Dysnomia] penita) - E	East Fork
Plants	
Lindera melissifolia (Pondberry) - E	Sharkey and Sunflower Counties

*Alligators are biologically neither endangered nor threatened enforcement purposes they are classified as "Threatened due ... ty of Appearance." Alligator hunting is regulated in accordance with State law.

B&V WASTE SCIENCE AND TECHNOLOGY CORP.

TELEPHONE MEMORANDUM

USEPA Region IV

BVWST Project 52011.040
BVWST File
July 6, 1992
14:00

State Endangered and Threatened Species
within the Target Area of Hercules, Inc.

To:	Kathy Luncheford, Biologist
Company:	U. S. Fish and Wildlife Service
Phone No.:	(601) 638-1891

Recorded by: Carter Helm

Summary of conversation: Ms. Luncheford said that the Gopher Tortoise is a threatened species found in very dry areas with steep terrain. The Red Cockaded Woodpecker is the only endangered species in the state of Mississippi. The Eastern Indigo Snake is a threatened species in Mississippi, but typically not found in Forrest County. The Yellow Blotched Map Turtle *(Graptemys flavimaculata)* is a threatened species found in all of the Leaf River in Forrest County, Mississippi. The Yellow Blotched Map Turtle sighting area is from the U. S. Highway 84 bridge in Covington County, downstream to the Leaf River and Chickasawhay River. It occurs in the Chickasawhay River upstream to Enterprise, Clarke County. It is present in Pascagoula River from Merrill, George County, south into east and west Pascagoula channels in Jackson County. The Yellow Blotched Map Turtle is the only threatened species sighting located along the 15-mile migration pathway of the site.

TELEPHONE MEMORANDUM

US EPA -- Region IV
Hercules, Inc.
Uses of the Leaf and Bowie Rivers and Endangered or Threatened Species Within the Target Area of the Hercules Facility

BVWST Project 52011.040
BVWST File
June 8, 1992
11:50 a.m.

To: Mr. Richard Hill, Conservation Officer
Company: Department of Wildlife, Fisheries and Parks
Phone No.: (601) 362-9212

Recorded by: Carter Helm

Summary of conversation: Mr. Hill said that the Leaf and Bowie Rivers are used basically for sport and commercial fishing. The rivers are not deep enough for pleasure activities such as boating. However, Mr. Hill does state that Greens Creek is too small for fishing and recreational swimming; however, the Bowie and Leaf River have been used for recreational swimming. He said the Leaf River is not classified a sensitive environment. The Gopher Tortoise is endangered in the dry areas of Mississippi. Mr. Hill was not able to give the exact location of the endangered species sighting. Mr. Hill said many years ago a fish kill took place in the Leaf River, but he did not have any details regarding the fish kill.

ms

i

Hercules
LATITUDE 31:20:20 LONGITUDE 89:18:25 1980 POPULATION

KM	0.00-.400	.400-.810	.810-1.60	1.60-3.20	3.20-4.80	4.80-6.40	SECTOR TOTALS
S 1	0	0	0	0	1079	0	1079
S 2	0	0	490	0	1148	0	1638
S 3	0	0	1560	1892	2512	4468	10432
S 4	580	0	0	2649	4216	1346	8791
S 5	0	0	1229	4611	2689	0	8529
S 6	0	0	1224	4524	6106	1200	13054
S 7	0	0	1224	2065	3747	3211	10247
S 8	0	0	0	0	1953	0	1953
RING TOTALS	580	0	5727	15741	23450	10225	55723

press RETURN to continue
MENU: Geodata Handling Data List procedures
[illegible]ename (in parentheses) ([illegible])
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
HTW logged out at 25-SEP-1992 09:35:47.17
Itemized resource charges, for this session, follow:

NODE: VAXTM1
ACCT: 9040
PROJ: GEMS0001
USER: HTW
UIC: [000710,000012]
BAUD:

START TIME: 25-SEP-1992 09:33:26.79
FINISH TIME: 25-SEP-1992 09:35:47.17
BILLING PERIOD: 920901
WEEKDAY: FRIDAY
TERMINAL PORT: VTA1787

DESCRIPTION OF CHARGE		QUANTITY	EXPENDITURE
ALL CHARGE LEVELS			
300 baud	(Seconds)	140	0.0000
CPU TIME	(Seconds)	9	0.5000
TOTAL FOR THIS SESSION			$ 0.5000

** Note: This total reflects the charges for this process only, subprocesses created during this session are accounted for separately
Enter selection:

APPENDIX A

Topographic Map

jv\CH
January 12, 1993
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U.S. EPA REGION IV

SDMS

Unscannable Material Target Sheet

DocID: 10706407 Site ID: MSD008182081

Site Name: Hercules, Inc.

Nature of Material:

Map:	☑	Computer Disks:	☐
Photos:	☐	CD-ROM:	☐
Blueprints:	☐	Oversized Report:	☐
Slides:	☐	Log Book:	☐

Other (describe): Radius Map (Appendix A)

Amount of material:

* Please contact the appropriate Records Center to view the material *

IISD00/82081
Hercules, Inc.

APPENDIX B

Photodocumentation Log

JMCH
January 12, 1993
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Photo № 1　　Roll № 1　　Frame №: 0　　Date: 6/24/92
Subject: Greens Creek exit off of Hercules Property. Northeast portion of site property. Notice the leachate flowing from the south bank potentially originating from inactive landfill (Geophysical area 2). Locale of HI-SD-02.

Photo № 2　　Roll № 1　　Frame №: 1　　Date: 6/24/92
Subject: Greens Creek exit off site property. Notice the "security gate" limiting public access to site property - Location of HI-SW-02

Photo № 3 Roll № 1 Frame №: 2 Date: 6/24/92
Subject: South bank of Greens Creek, near the exit off of site property.
Green and brown leachate present.

Photo № 4 Roll № 1 Frame №: 3 Date: 6/25/92
Subject: West view of the former pinetree stump pile area, west portion of site property.

Photo № 5 Roll № 1 Frame №: 4 Date: 6/24/92
Subject: An abandoned drum stuck in the sludge pits in the "back forty" portion of site property.

Photo № 6 Roll № 1 Frame №: 5 Date: 6/24/92
Subject: Location of HI-SD-03, within the "back forty" sludge pits.

Photo № 7 Roll № 1 Frame №: 6 Date: 6/24/92
Subject: "Back forty" sludge pits.

Photo № 8 Roll № 1 Frame №: 7 Date: 6/24/92
Subject: "Back forty" sludge pits.

Photo № 9 Roll № 1 Frame №: 10 Date: 6/24/92
Subject: "Back forty" sludge pits.

Photo № 10 Roll № 1 Frame №: 11 Date: 6/24/92
Subject: "Back forty" sludge pits - partially dried.

Photo № 11 Roll № 1 Frame №: 12 Date: 6/24/92
Subject: Dried "back forty" sludge pits.

Photo № 12 Roll № 1 Frame №: 13 Date: 6/24/92
Subject: Foreground shows dumped boiler ash, background lies another sludge pit.

Photo № 13 Roll № 1 Frame №: 14 Date: 6/24/92
Subject: Drainage ditch along the eastern portion of site property. Location of HI-SD-04.

Photo № 14 Roll № 1 Frame №: 15 Date: 6/25/92
Subject: A dike breach in the sludge pits located near the E-O tank, northeast corner of site property.

Photo № 15 Roll № 1 Frame №: 16 Date: 6/25/92
Subject: Sludge pits located near the E-O tank.

Photo № 16 Roll № 1 Frame №: 17 Date: 6/25/92
Subject: Sludge pit material that has flowed out of the diked areas, and has hardened. This sludge exhibits increased viscosity with ambient temperature.

Photo № 17 Roll № 1 Frame №: 18 Date: 6/25/92
Subject: The E-O Tank (Ethylene Oxide) located in the northeast portion of site property.

Photo № 18 Roll № 1 Frame №: 19 Date: 6/25/92
Subject: Sludge flow near E-O tank - overflow from the diked pond.

Photo № 19 Roll № 1 Frame №: 20 Date: 6/25/92
Subject: Sludge flow through a breach in the containing dike. Near the E-O tank.

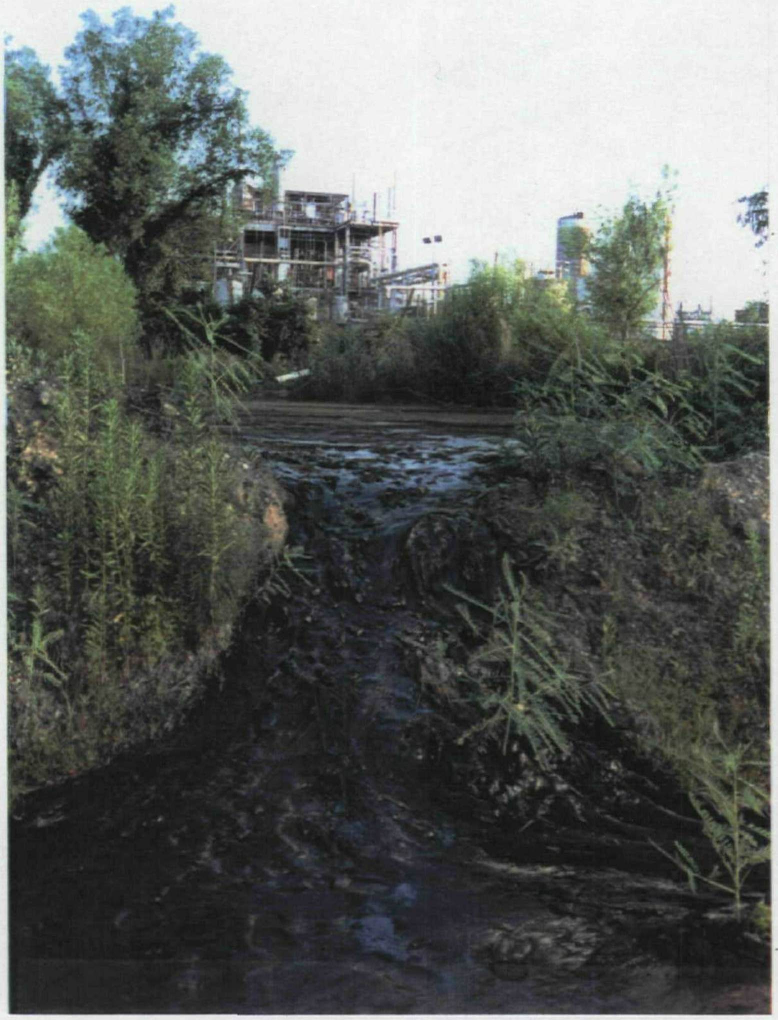

Photo № 20 Roll № 1 Frame №: 21 Date: 6/25/92
Subject: Looking south from E-O tank area, of breached dike wall.

Photo № 21 Roll № 1 Frame №: 23 Date: 6/25/92
Subject: The unloading dock located near the drum recycling area. Location of HI-SS-02. Notice the stained soil and stressed vegetation.

Photo № 22 Roll № 1 Frame №: 24 Date: 6/25/92
Subject: Dumpster on left (covered with a tarp) which has been filled off the unloading dock. Note: Dumpster was removed, area was "clean" during the second site visit in August 1992.

Photo № 23 Roll № 1 Frame №: 25 Date: 6/25/92
Subject: Piles of recycled galvanized 55-gallon drums, located at the center of site property.

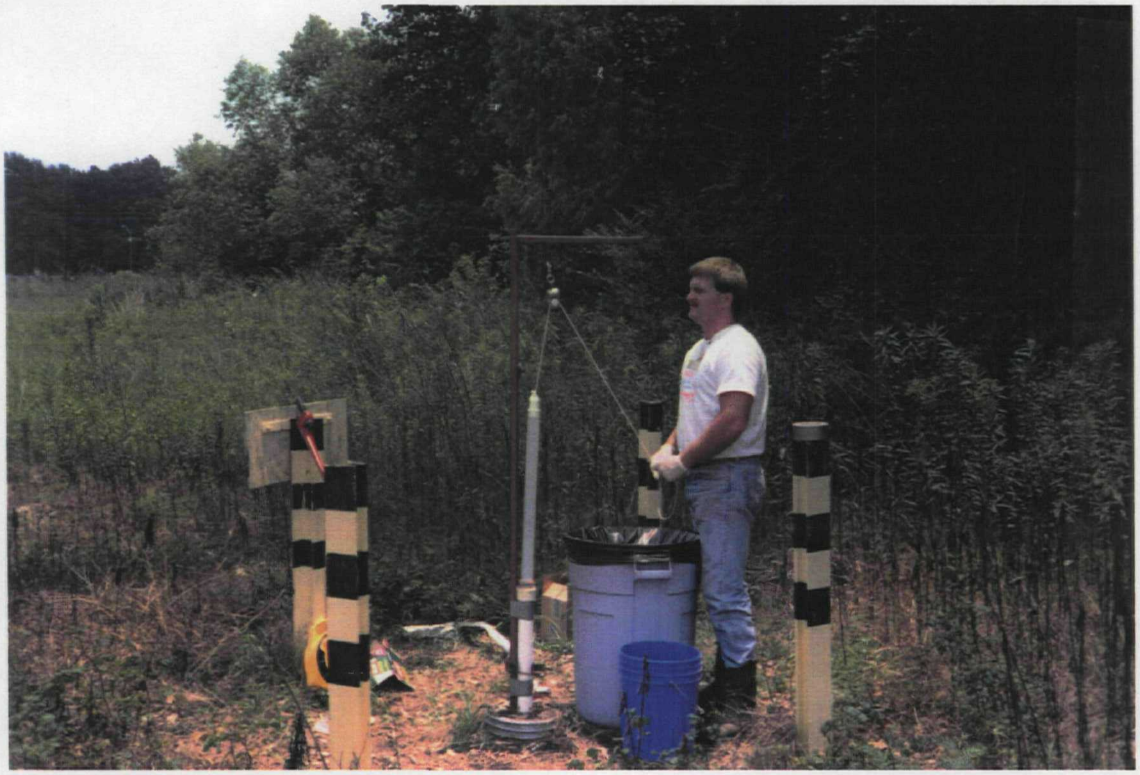

Photo № 24 Roll № 2 Frame №: 1 Date: 6/25/92
Subject: Purging monitoring well B-1, in the "back forty" portion of site property. Preparing for Sample HI-MW-B1

Photo № 25 Roll № 2 Frame №: 3 Date: 6/25/92
Subject: A neighbor that exists on the east side of Providence Street - Solar Supply.

Photo № 26 Roll № 2 Frame №: 4 Date: 6/25/92
Subject: The drainage ditch in which sample Hi-SD-04 was collected. Runoff flows north.

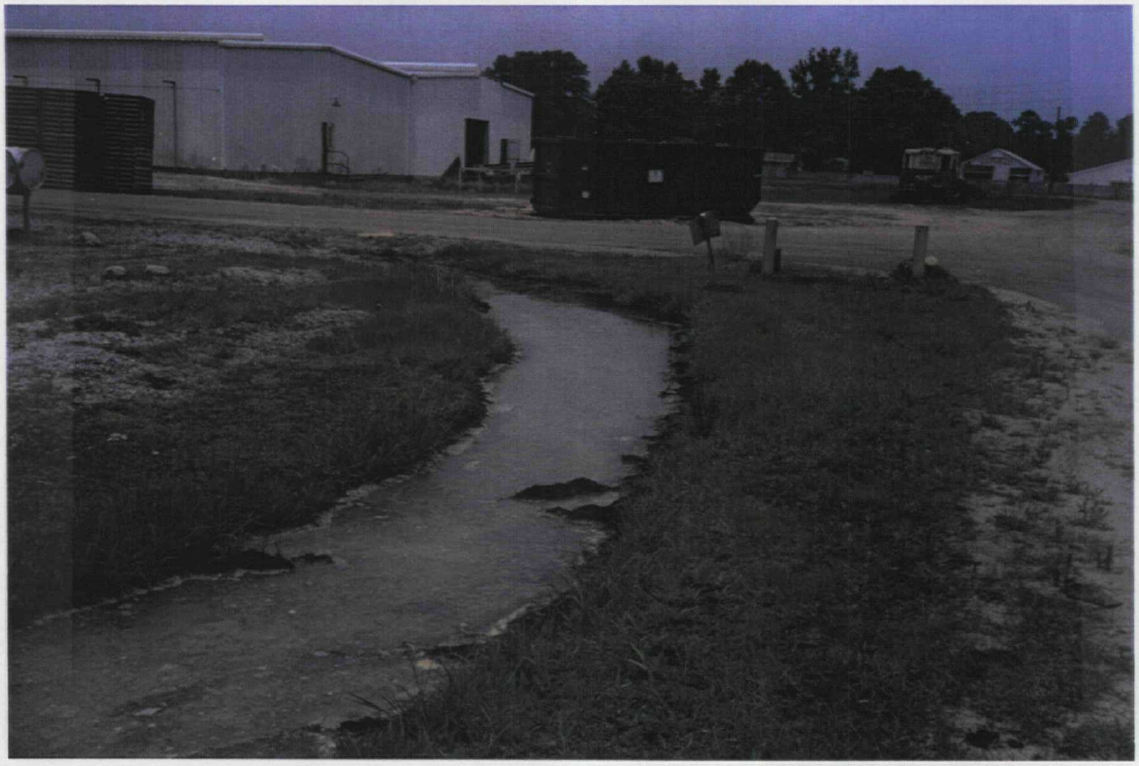

Photo № 27 Roll № 2 Frame №: 6 Date: 6/25/92
Subject: North view of drainage ditch which lies along eastern portion of site property. Location of HI-SD-04.

Photo № 28 Roll № 2 Frame №: 13 Date: 6/25/92
Subject: The well obstruction found within monitoring well MW-B2- near the water treatment plant (east of Providence Street).

Photo № 29 - 32 Roll № 2 Frame №: 8 - 11 Date: 6/25/92
Subject: Panoramic view along drainage ditch on the east side of site property. View is from south to west to north.

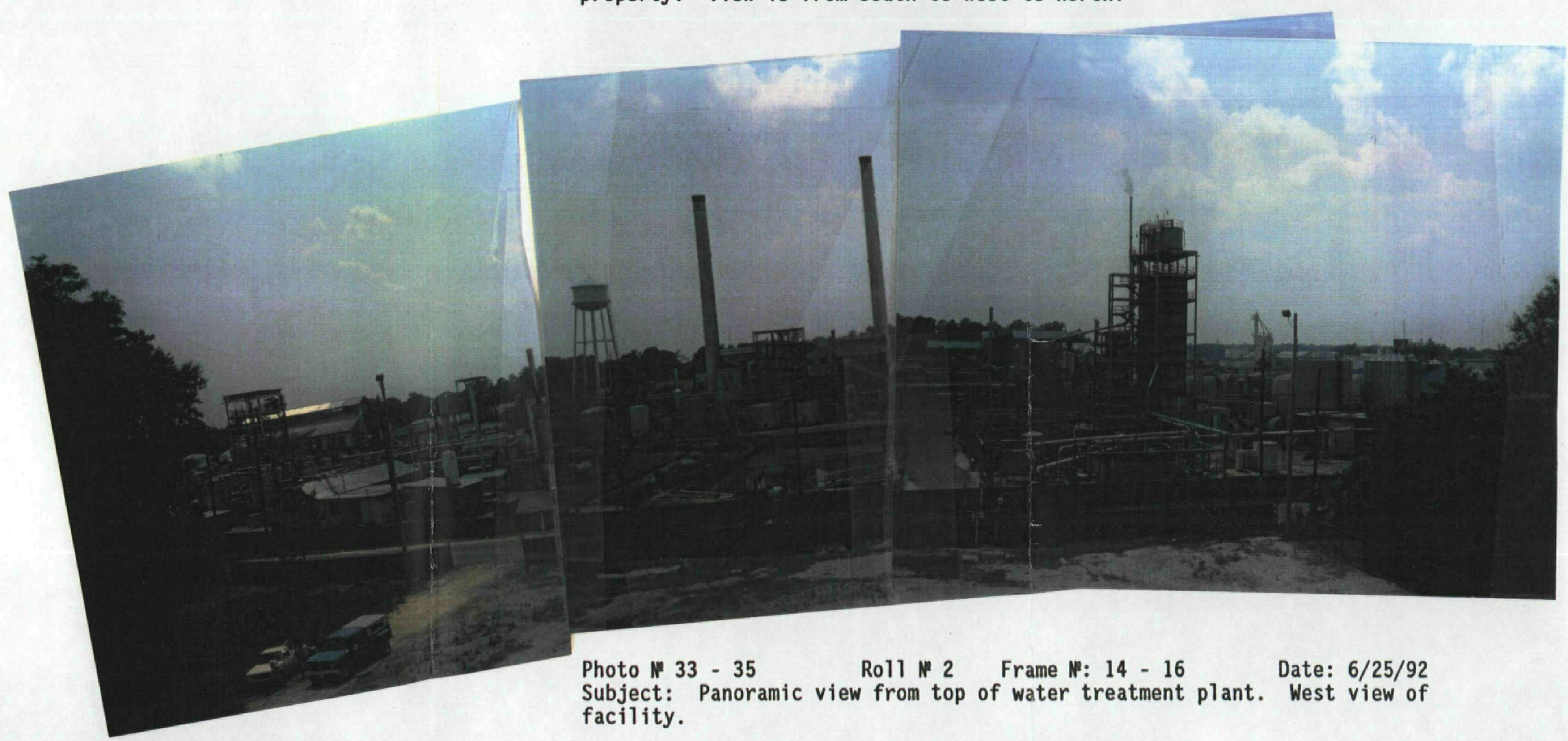

Photo № 33 - 35 Roll № 2 Frame №: 14 - 16 Date: 6/25/92
Subject: Panoramic view from top of water treatment plant. West view of facility.

Photo № 2
Subject:
property.

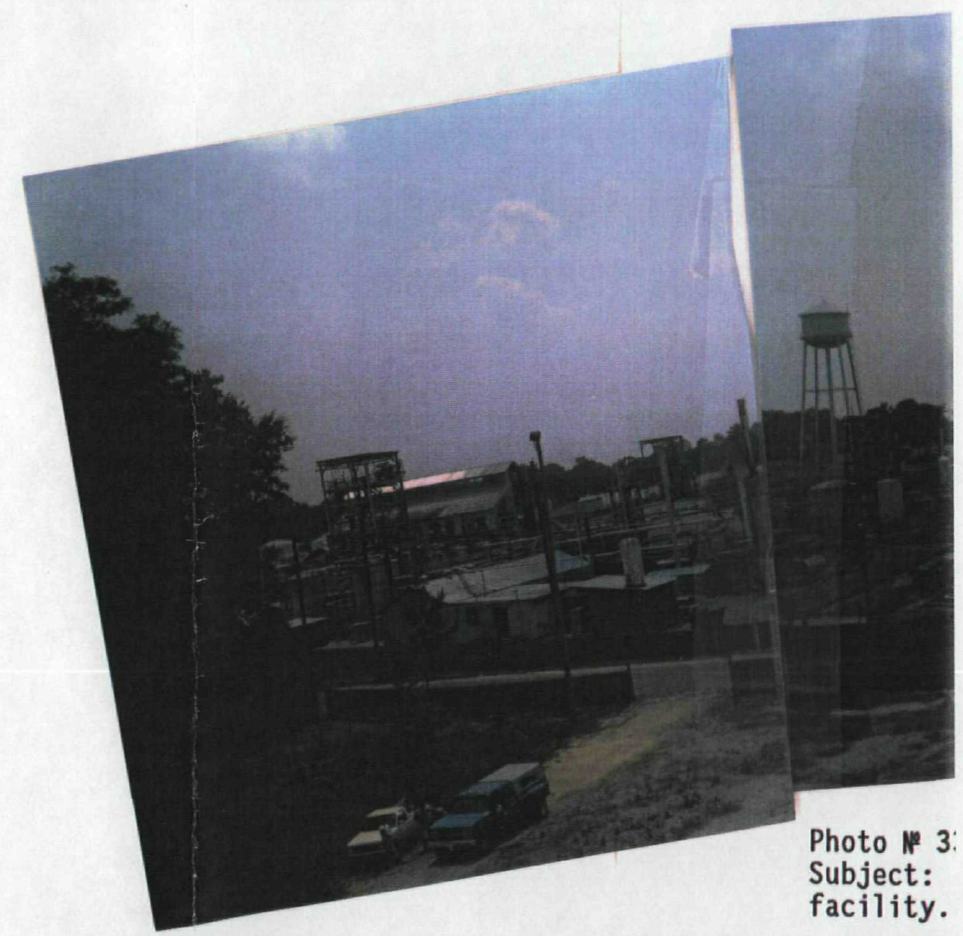

Photo № 3
Subject:
facility.

APPENDIX C

Summary of Geophysical Methods

JMCH
January 12, 1993
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SUMMARY OF GEOPHYSICAL METHODS

The following sections are from "Geophysical Techniques for Sensing Buried Wastes and Waste Migration" by Glaccum, R. A., and M. R. Noel, August, 1983, Technos, Inc., for Environmental Monitoring Systems Laboratory, ORD., USEPA, Las Vegas, Nevada.

ELECTROMAGNETICS (EM)*

The electromagnetic (EM) method provides a means of measuring the electrical conductivity of subsurface soil, rock, and ground water. Electrical conductivity is a function of the type of soil and rock, its porosity, its permeability, and the fluids which fill the pore space. In most cases the conductivity (specific conductance) of the pore fluids will dominate the measurement. Accordingly, the EM method is applicable both to assessment of natural geohydrologic conditions and to mapping of many types of contaminant plumes. Additionally, trench boundaries, buried wastes and drums, as well as metallic utility lines can be located with EM techniques.

Natural variations in subsurface conductivity may be caused by changes in soil moisture content, ground water specific conductance, depth of soil cover over rock, and thickness of soil and rock layers. Changes in basic soil or rock types, and structural features such as fractures or voids may also produce changes in conductivity. Localized deposits of natural organic, clay, sand, gravel, or saltrich zones will also affect subsurface conductivity.

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*The term electromagnetic has been used in contemporary literature as a descriptive term for other geophysical methods, including GPR and metal detectors which are based on electromagnetic principles. However, this document will use electromagnetic (EM) to specifically imply the measurement of subsurface conductivities by low-frequency electromagnetic induction. This is in keeping with the traditional use of the term in the geophysical industry from which the EM methods originated. While the authors recognize that there are many electromagnetic systems and manufacturers, the discussion in this section is based solely on instruments which are calibrated to read in electrical conductivity units and which have been effectively and extensively used at hazardous waste sites. There is only one manufacturer of such instruments at the time of this writing.

Many contaminants will produce an increase in free ion concentration when introduced into the soil or ground water systems. This increase over background conductivity enables detection and mapping of contaminated soil and ground water at Hazardous Waste Sites (HWS), landfills, and impoundments. Large amounts of organic fluids such as diesel fuel can displace the normal soil moisture, causing a decrease in conductivity which may also be mapped, although this is not commonly done. The mapping of a plume will usually define the local flow direction of contaminants. Contaminant migration rates can be established by comparing measurements taken at different times.

The absolute values of conductivity for geologic materials (and contaminants) are not necessarily diagnostic in themselves, but the variations in conductivity, laterally and with depth, are significant. It is these variations which enable the investigator to rapidly find anomalous conditions.

Since the EM method does not require ground contact, measurements may be made quite rapidly. Lateral variations in conductivity can be detected and mapped by a field technique called profiling. Profiling measurements may be made to depths ranging from 0.75 to 60 meters. The data is recorded using strip chart and magnetic tape recorders. This continuous measurement allows increased rates of data acquisition and improved resolution for mapping small geohydrologic features. Further, recorded data enhanced by computer processing has proved invaluable in the evaluation of complex hazardous waste sites. The excellent lateral resolution obtained from EM profiling data has been used to advantage in efforts to outline closely-spaced burial pits, to reveal the migration of contaminants into the surrounding soil, and to delineate fracture patterns.

Vertical variations in conductivity can also be detected by the EM method. A station measurement technique called sounding is employed for this purpose. Data can be acquired from depths by combining results from a variety of EM instruments, each requiring different field application techniques. Other EM systems are capable of sounding to depth of one-thousand feet or more, but have not yet been used at HWS and are not adaptable to continuous measurements.

Profiling is the most cost-effective use of the EM method. Continuous profiling can be used in many applications to increase resolution, data density, and permit total site coverage at critical sites.

At HWS, applications of EM can provide:

- Assessment of natural geohydrologic conditions;
- Locating and mapping of burial trenches and pits containing drums and/or bulk wastes;
- Determination of flow direction in both unsaturated and saturated zones;
- Rate of plume movement by comparing measurement taken at different times;
- Locating and mapping of utility pipes and cables which may affect other geophysical measurements, or whose trench may provide a permeable pathway for contaminant flow.

Although there is available a wide variety of EM equipment, most of it is intended for geophysical exploration of mineral deposits. These units have not been used at HWS and do not provide a simple conductivity reading. This document discusses only those instruments which are designed and calibrated to read directly in units of conductivity.

Conductance is measured with electronic instrumentation consisting of a transmitter coil and receiver coil. The transmitter coil radiates an electromagnetic field which induces eddy currents in the earth below the instrument. Each of these eddy current loops, in turn, generates a secondary electromagnetic field which is proportional to the magnitude of the current flowing within that loop. A part of the secondary magnetic field from each loop is intercepted by the receiver coil and produces an output voltage which (within limits) is linearly related to subsurface conductivity. This reading is a bulk measurement of conductivity, e.g., the cumulative response to subsurface conditions ranging all the way from the surface to the effective depth of the instrument.

The sampling depth of EM equipment is related to the instrument's coil spacing. Instruments with coil spacings of one, four, ten, twenty, and forty meters are commercially available. The nominal sampling depth of an EM system is taken to be approximately 1.5 times the coil spacing.

The EM sounding method can rarely identify more than two or three layers with reasonable confidence. The greater the contrast in the conductivity values of each layer, the better the results. Often, the more detailed resistivity sounding method is used to complement EM profiling data.

The results of sounding analysis are usually presented as a vertical section, in which the conductivity layers are identified as a function of depth. The analyst may be able to correlate these layers to geohydrologic units believed to exist at the site.

Although the EM technique can be used for profiling or sounding, profiling is the most effective use of the EM method. Profiling makes possible the rapid mapping of subsurface conductivity changes, and the location, delineation, and assessment of spatial variables resulting from changes in the natural setting or from many contaminants.

EM is a very effective reconnaissance tool. The use of qualitative non-recorded data can provide initial interpretation in the field. If site conditions are complex, the use of a high-density survey grid, continuously-recording instruments, and computer processing may be necessary, in order to properly evaluate subsurface conditions. When continuously-recording instruments are used, total site coverage is feasible. More quantitative information can be obtained by using conductivity data from different depth ranges. At present, three different systems must be used to acquire data from 0.75 to 60 meters. Very often, however, data from two standard depths, e.g. six and fifteen meters, is adequate to furnish depth information.

Capabilities

- The EM profile method permits rapid data acquisition, resulting in high-density and high-resolution surveys.
- Profiling data may be acquired from various discrete depths, ranging from 0.75 meters to 60 meters.
- Continuously-recording instruments (to fifteen meter depth) can increase survey speed, density, and resolution permitting total site coverage, if required.
- EM reads directly in conductivity units (mm/m) permitting use of raw data in the field, and correlation to specific conductance of ground water samples.
- EM can map local and general changes in the natural geohydrologic setting.
- EM can detect and measure the boundaries of a conductivity plume.
- Direction of plume flow can be determined from an EM conductivity map.
- EM measurements taken at different times can provide the means to compute movement rates of conservative contaminants.
- EM can detect and map burial pits and trenches of both bulk and drummed wastes.
- EM can detect and map the location of buried metallic utility lines.

Limitations

- EM has less sounding (vertical) resolution than the resistivity method due to its limited number of depth intervals.
- The acquisition of data from depths of 0.75 to 60 meters requires the use of three different EM systems.
- Continuous data can be obtained only to depths up to approximately fifteen meters.
- An EM measurement is influenced by the shallower materials more than the deeper ones; this must be considered when evaluating the data.
- EM measurements become non-linear in zones of very high conductivity.
- The EM method is susceptible to noise from a number of sources, including natural atmospheric noise, powerlines, radio transmitters, buried metallic trash, pipes, cables, nearby fences, vehicles, and buildings.

MAGNETOMETER

Magnetic measurements are commonly used to map regional geologic structure and to explore for minerals. They are also used to locate pipes and survey stakes or to map archeological sites. They are commonly used at HWS to locate buried drums and trenches.

A magnetometer measures the intensity of the earth's magnetic field. The presence of ferrous metals creates variations in the local strength of that field, permitting their detection. A magnetometer's response is proportional to the mass of the ferrous target. Typically, a single drum can be detected at distances up to six meters, while massive piles of drums can be detected at distances up to twenty meters or more.

Some magnetometers require the operator to stop and take discrete measurements; other instruments permit the acquisition of continuous data as the magnetometer is moved across the site. This continuous coverage is much more suitable for high resolution requirements and the mapping of extensive areas.

The effectiveness of a magnetometer can be reduced or totally inhibited by noise or interference from time-variable changes in the earth's field and spatial variations caused by magnetic minerals in the soil, or iron and steel debris, ferrous pipes, fences, buildings, and vehicles. Many of these problems can be avoided by careful selection of instruments and field techniques.

At HWS, magnetometers may be used to:

- Locate buried steel containers, such as 55-gallon drums;
- Define boundaries of trenches filled with ferrous containers;
- Locate ferrous underground utilities, such as iron piles or tanks, and the permeable pathways often associated with them;
- Select drilling locations that are clear of buried drums, underground utilities, and other obstructions.

A magnetometer measures the intensity of the earth's magnetic field. Variations in this field may be caused by the natural distribution of iron oxides within the soil and rock or by the presence of buried iron or steel objects. (The magnetometer does not respond to nonferrous metals such as aluminum, copper, tin, and brass).

The earth's magnetic field behaves much as if there were a large bar magnet embedded in the earth. Although the earth's field intensity varies considerably throughout the United States, its average value is approximately 50,000 gammas.* The angle of the magnetic field with respect to the earth's surface also varies. In the U.S., this angle of inclination ranges approximately sixty to seventy-five degrees from the horizontal.

The intensity of the earth's magnetic field changes daily with sunspots and ionospheric conditions which can cause large and sometimes rapid variations. With time, these variations produce unwanted signals (noise) and can substantially affect magnetic measurements.

If the magnetic properties of the soil and rock were perfectly uniform, there would be no local magnetic anomalies; however, a concentration of natural iron minerals, or a buried iron object, will cause a local magnetic anomaly which can be detected at the surface.

Typical magnetic anomalies at HWS will range from one to hundreds of gammas for small discrete targets, depending on their depth. Massive piles of buried drums will result in anomalies of from one-hundred to one-thousand gammas or more.

---

*The unit of magnetic measurement is the gamma. Recently, the gamma unit has been renamed the Nano Tesla. At this time, most instruments are still labeled in gammas, as are specification sheets, existing literature, and field data; hence all references to magnetic data in this document are expressed in gammas.

While several factors influence the response of a magnetometer, the mass of a buried target and its depth are the most important. A magnetometer's response is directly proportional to the mass of ferrous metal present and varies by one over the distance cubed ($1/d^3$) for total measurements. If a gradiometer is used, the response falls off even faster, as one over the distance to the fourth power ($1d^4$). With sensors of equal sensitivity, the total field system provides the greater working range. Typically a single drum can be detected at distances up to six meters or more. There is a wide variety of magnetometers available commercially; specific performance is highly dependent upon the type of magnetometer and the field conditions. Theoretically, the number of drums may be calculated, however, such results should be considered only approximations because of the number of variables associated with targets, site conditions, and calculations. Actual results may vary considerably.

A magnetometer with continuous recording capabilities can be used to produce a strip chart of the field data, which is helpful in assessing signal-to-noise ratio, anomaly shape, target location, and provides a means of exercising quality control over field data. This continuous coverage is much more suitable for high-resolution requirements and the mapping of extensive areas.

The effectiveness of a magnetometer can be reduced or totally inhibited by noise or interference from time-variable changes in the earth's field and spatial variations caused by magnetic minerals in the soil, or iron and steel debris, ferrous pipes, fences, buildings, and vehicles. Many of these problems can be avoided by careful selection of instruments and field techniques.

Capabilities

- Magnetometers respond to ferrous metals (iron or steel) only.
- Individual drums can be detected at depths up to six meters.
- Large masses of drums can be detected at depths of six to twenty meters.
- Magnetometers can provide a greater depth range than metal detectors.
- Interpretation of their data may be used to provide estimates of the number and depth of buried drums.
- They can provide a continuous response along a traverse line.
- They may be mounted on vehicles for coverage of a large site.

Limitations

- In general, magnetometers are susceptible to noise from many different sources, including steel fences, vehicles, buildings, iron debris, natural soil minerals, and underground utilities.
- Low cost units are limited in depth range (but their limitations make them insensitive to many of the above sources of noise).
- Total field instruments are also sensitive to fluctuations in the earth's magnetic field which can seriously affect data.
- Data is of limited use in determining the number and depth of targets.
- Complex site conditions may require the use of highly skilled operators, special equipment, and the recording and processing of data, along with skilled interpretation.

APPENDIX D

Analytical Data

JMCH
January 12, 1993
A:\52011\040.SI

SEDIMENT ORGANICS

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

08/20/92

PURGEABLE ORGANICS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69714 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SD-01 COLLECTION START: 06/24/92 1620 STOP: 00/00/00 **
** **
** CASE NO.: 18341 SAS NO.: D. NO.: DH64 **
*** ***

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
13U	CHLOROMETHANE	13U	1,2-DICHLOROPROPANE
13U	BROMOMETHANE	13U	CIS-1,3-DICHLOROPROPENE
13U	VINYL CHLORIDE	13U	TRICHLOROETHENE(TRICHLOROETHYLENE)
13U	CHLOROETHANE	13U	DIBROMOCHLOROMETHANE
40U	METHYLENE CHLORIDE	13U	1,1,2-TRICHLOROETHANE
30U	ACETONE	13U	BENZENE
13U	CARBON DISULFIDE	13U	TRANS-1,3-DICHLOROPROPENE
13U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	13U	BROMOFORM
13U	1,1-DICHLOROETHANE	13U	METHYL ISOBUTYL KETONE
13U	1,2-DICHLOROETHENE (TOTAL)	13U	METHYL BUTYL KETONE
13U	CHLOROFORM	13U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
13U	1,2-DICHLOROETHANE	13U	1,1,2,2-TETRACHLOROETHANE
13U	METHYL ETHYL KETONE	13U	TOLUENE
13U	1,1,1-TRICHLOROETHANE	13U	CHLOROBENZENE
13U	CARBON TETRACHLORIDE	13U	ETHYL BENZENE
13U	BROMODICHLOROMETHANE	13U	STYRENE
		13U	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 08/20/92

PROJECT NO. 92-0629 SAMPLE NO. 69714 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: SD-01 COLLECTION START: 06/24/92 1620 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH64

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
420UR	PHENOL	1000U	3-NITROANILINE
420U	BIS(2-CHLOROETHYL) ETHER	420U	ACENAPHTHENE
420UR	2-CHLOROPHENOL	1000UR	2,4-DINITROPHENOL
420U	1,3-DICHLOROBENZENE	1000UR	4-NITROPHENOL
420U	1,4-DICHLOROBENZENE	420U	DIBENZOFURAN
420U	1,2-DICHLOROBENZENE	420U	2,4-DINITROTOLUENE
420UR	2-METHYLPHENOL	420U	DIETHYL PHTHALATE
420U	2,2'-CHLOROISOPROPYLETHER	420U	4-CHLOROPHENYL PHENYL ETHER
420UR	(3-AND/OR 4-)METHYLPHENOL	420U	FLUORENE
420U	N-NITROSODI-N-PROPYLAMINE	1000U	4-NITROANILINE
420U	HEXACHLOROETHANE	1000UR	2-METHYL-4,6-DINITROPHENOL
420U	NITROBENZENE	420U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
420U	ISOPHORONE	420U	4-BROMOPHENYL PHENYL ETHER
420UR	2-NITROPHENOL	420U	HEXACHLOROBENZENE (HCB)
420UR	2,4-DIMETHYLPHENOL	1000UR	PENTACHLOROPHENOL
420U	BIS(2-CHLOROETHOXY) METHANE	420U	PHENANTHRENE
420UR	2,4-DICHLOROPHENOL	420U	ANTHRACENE
420U	1,2,4-TRICHLOROBENZENE	420U	CARBAZOLE
420U	NAPHTHALENE	420U	DI-N-BUTYLPHTHALATE
420U	4-CHLOROANILINE	420U	FLUORANTHENE
420U	HEXACHLOROBUTADIENE	420U	PYRENE
420UR	4-CHLORO-3-METHYLPHENOL	420U	BENZYL BUTYL PHTHALATE
420U	2-METHYLNAPHTHALENE	420U	3,3'-DICHLOROBENZIDINE
420U	HEXACHLOROCYCLOPENTADIENE (HCCP)	420U	BENZO(A)ANTHRACENE
420UR	2,4,6-TRICHLOROPHENOL	420U	CHRYSENE
1000UR	2,4,5-TRICHLOROPHENOL	420U	BIS(2-ETHYLHEXYL) PHTHALATE
420U	2-CHLORONAPHTHALENE	420U	DI-N-OCTYLPHTHALATE
1000U	2-NITROANILINE	420U	BENZO(B AND/OR K)FLUORANTHENE
420U	DIMETHYL PHTHALATE	420U	BENZO-A-PYRENE
420U	ACENAPHTHYLENE	420U	INDENO (1,2,3-CD) PYRENE
420U	2,6-DINITROTOLUENE	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
*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.

08/20/92

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69714 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SD-01 COLLECTION START: 06/24/92 1620 STOP: 00/00/00 **
** CASE.NO.: 18341 SAS NO.: D. NO.: DH64 MD NO: DC64 **
** **
*** ***

ANALYTICAL RESULTS UG/KG

6000J 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.

08/20/92

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69714 SAMPLE TYPE: SOIL
SOURCE: HERCULES INC
STATION ID: SD-01
CASE NUMBER: 18341 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: C HELM
CITY: HATIESBURG ST: MS
COLLECTION START: 06/24/92 1620 STOP: 00/00/00
D. NUMBER: DH64

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
2.2U	ALPHA-BHC	22U	METHOXYCHLOR
2.2U	BETA-BHC	4.2U	ENDRIN KETONE
2.2U	DELTA-BHC	4.2U	ENDRIN ALDEHYDE
2.2U	GAMMA-BHC (LINDANE)	--	CHLORDANE (TECH. MIXTURE) /1
2.2U	HEPTACHLOR	2.2U	GAMMA-CHLORDANE /2
2.2U	ALDRIN	1.7JN	ALPHA-CHLORDANE /2
2.2U	HEPTACHLOR EPOXIDE	220U	TOXAPHENE
2.2U	ENDOSULFAN I (ALPHA)	42U	PCB-1016 (AROCLOR 1016)
4.2U	DIELDRIN	85U	PCB-1221 (AROCLOR 1221)
4.2U	4,4'-DDE (P,P'-DDE)	42U	PCB-1232 (AROCLOR 1232)
4.2U	ENDRIN	42U	PCB-1242 (AROCLOR 1242)
4.2U	ENDOSULFAN II (BETA)	42U	PCB-1248 (AROCLOR 1248)
4.2U	4,4'-DDD (P,P'-DDD)	42U	PCB-1254 (AROCLOR 1254)
4.2U	ENDOSULFAN SULFATE	39J	PCB-1260 (AROCLOR 1260)
4.2U	4,4'-DDT (P,P'-DDT)	22	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
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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.

08/20/92

PURGEABLE ORGANICS DATA REPORT

*** ***

** PROJECT NO. 92-0629 SAMPLE NO. 69717 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SD-02 COLLECTION START: 06/24/92 1730 STOP: 00/00/00 **
** **
** CASE NO.: 18341 SAS NO.: D. NO.: DH67 **

*** ***

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
13U	CHLOROMETHANE	13U	1,2-DICHLOROPROPANE
13U	BROMOMETHANE	13U	CIS-1,3-DICHLOROPROPENE
13U	VINYL CHLORIDE	13U	TRICHLOROETHENE(TRICHLOROETHYLENE)
13U	CHLOROETHANE	13U	DIBROMOCHLOROMETHANE
80U	METHYLENE CHLORIDE	13U	1,1,2-TRICHLOROETHANE
80U	ACETONE	13U	BENZENE
13U	CARBON DISULFIDE	13U	TRANS-1,3-DICHLOROPROPENE
13U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	13U	BROMOFORM
13U	1,1-DICHLOROETHANE	13U	METHYL ISOBUTYL KETONE
13U	1,2-DICHLOROETHENE (TOTAL)	13U	METHYL BUTYL KETONE
13U	CHLOROFORM	13U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
13U	1,2-DICHLOROETHANE	13U	1,1,2,2-TETRACHLOROETHANE
13U	METHYL ETHYL KETONE	13U	TOLUENE
13U	1,1,1-TRICHLOROETHANE	13U	CHLOROBENZENE
13U	CARBON TETRACHLORIDE	13U	ETHYL BENZENE
13U	BROMODICHLOROMETHANE	13U	STYRENE
		13U	TOTAL XYLENES
		21	PERCENT MOISTURE

REMARKS ***REMARKS***

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

08/20/92

EXTRACTABLE ORGANICS DATA REPORT

*** ***

** PROJECT NO. 92-0629 SAMPLE NO. 69717 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SD-02 COLLECTION START: 06/24/92 1730 STOP: 00/00/00 **
** **
** CASE NO.: 18341 SAS NO.: D. NO.: DH67 **

*** ***

UG/KG	ANALYTICAL RESULTS
410U	PHENOL
410U	BIS(2-CHLOROETHYL) ETHER
410U	2-CHLOROPHENOL
410U	1,3-DICHLOROBENZENE
410U	1,4-DICHLOROBENZENE
410U	1,2-DICHLOROBENZENE
410U	2-METHYLPHENOL
410U	2,2'-CHLOROISOPROPYLETHER
410U	(3-AND/OR 4-)METHYLPHENOL
410U	N-NITROSODI-N-PROPYLAMINE
410U	HEXACHLOROETHANE
410U	NITROBENZENE
410U	ISOPHORONE
410U	2-NITROPHENOL
410U	2,4-DIMETHYLPHENOL
410U	BIS(2-CHLOROETHOXY) METHANE
410U	2,4-DICHLOROPHENOL
410U	1,2,4-TRICHLOROBENZENE
410U	NAPHTHALENE
410U	4-CHLOROANILINE
410U	HEXACHLOROBUTADIENE
410U	4-CHLORO-3-METHYLPHENOL
410U	2-METHYLNAPHTHALENE
410U	HEXACHLOROCYCLOPENTADIENE (HCCP)
410U	2,4,6-TRICHLOROPHENOL
1000U	2,4,5-TRICHLOROPHENOL
410U	2-CHLORONAPHTHALENE
1000U	2-NITROANILINE
410U	DIMETHYL PHTHALATE
410U	ACENAPHTHYLENE
410U	2,6-DINITROTOLUENE

UG/KG	ANALYTICAL RESULTS
1000UR	3-NITROANILINE
410U	ACENAPHTHENE
1000U	2,4-DINITROPHENOL
1000U	4-NITROPHENOL
410U	DIBENZOFURAN
410U	2,4-DINITROTOLUENE
410U	DIETHYL PHTHALATE
410U	4-CHLOROPHENYL PHENYL ETHER
410U	FLUORENE
1000U	4-NITROANILINE
1000U	2-METHYL-4,6-DINITROPHENOL
410U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
410U	4-BROMOPHENYL PHENYL ETHER
410U	HEXACHLOROBENZENE (HCB)
1000U	PENTACHLOROPHENOL
410U	PHENANTHRENE
410U	ANTHRACENE
410U	CARBAZOLE
410U	DI-N-BUTYLPHTHALATE
410U	FLUORANTHENE
410U	PYRENE
410U	BENZYL BUTYL PHTHALATE
410U	3,3'-DICHLOROBENZIDINE
410U	BENZO(A)ANTHRACENE
410U	CHRYSENE
410U	BIS(2-ETHYLHEXYL) PHTHALATE
410U	DI-N-OCTYLPHTHALATE
410U	BENZO(B AND/OR K)FLUORANTHENE
410U	BENZO-A-PYRENE
410U	INDENO (1,2,3-CD) PYRENE
410U	DIBENZO(A,H)ANTHRACENE
410U	BENZO(GHI)PERYLENE
21	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.

08/20/92

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69717 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SD-02 COLLECTION START: 06/24/92 1730 STOP: 00/00/00 **
** CASE.NO.: 18341 SAS NO.: D. NO.: DH67 MD NO: DC67 **
** **
*** ***

ANALYTICAL RESULTS UG/KG

3000J	6 UNIDENTIFIED COMPOUNDS
300JN	NONYLPHENOL
500JN	HEXADECANOIC ACID
500JN	METHYLANTHRACENE
*	OCTAHYDRODIMETHYL(METHYLETHYL)PHENANTHRENE
500JN	CARBOXALDEHYDE

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

08/20/92

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 92-0629   SAMPLE NO. 69717   SAMPLE TYPE: SOIL
SOURCE: HERCULES INC
STATION ID: SD-02
CASE NUMBER: 18341   SAS NUMBER:

PROG ELEM: NSF   COLLECTED BY: C HELM
CITY: HATIESBURG   ST: MS
COLLECTION START: 06/24/92 1730   STOP: 00/00/00
D. NUMBER: DH67

UG/KG	ANALYTICAL RESULTS
2.2U	ALPHA-BHC
2.2U	BETA-BHC
2.2U	DELTA-BHC
2.2U	GAMMA-BHC (LINDANE)
2.2U	HEPTACHLOR
2.2U	ALDRIN
2.2U	HEPTACHLOR EPOXIDE
2.2U	ENDOSULFAN I (ALPHA)
4.2U	DIELDRIN
2.2J	4,4'-DDE (P,P'-DDE)
4.2U	ENDRIN
4.2U	ENDOSULFAN II (BETA)
4.2U	4,4'-DDD (P,P'-DDD)
4.2U	ENDOSULFAN SULFATE
4.2U	4,4'-DDT (P,P'-DDT)

UG/KG	ANALYTICAL RESULTS
3.6J	METHOXYCHLOR
4.2U	ENDRIN KETONE
4.2U	ENDRIN ALDEHYDE
--	CHLORDANE (TECH. MIXTURE) /1
2.2U	GAMMA-CHLORDANE /2
2.2U	ALPHA-CHLORDANE /2
220U	TOXAPHENE
42U	PCB-1016 (AROCLOR 1016)
85U	PCB-1221 (AROCLOR 1221)
42U	PCB-1232 (AROCLOR 1232)
42U	PCB-1242 (AROCLOR 1242)
42U	PCB-1248 (AROCLOR 1248)
42U	PCB-1254 (AROCLOR 1254)
42U	PCB-1260 (AROCLOR 1260)
21	PERCENT MOISTURE

REMARKS

REMARKS

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

08/20/92

PURGEABLE ORGANICS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69718 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SD-03 COLLECTION START: 06/24/92 1815 STOP: 00/00/00 **
**
** CASE NO.: 18341 SAS NO.: D. NO.: DH68 **
*** ***

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
18000U	CHLOROMETHANE	18000U	1,2-DICHLOROPROPANE
18000U	BROMOMETHANE	18000U	CIS-1,3-DICHLOROPROPENE
18000U	VINYL CHLORIDE	18000U	TRICHLOROETHENE(TRICHLOROETHYLENE)
18000U	CHLOROETHANE	18000U	DIBROMOCHLOROMETHANE
18000U	METHYLENE CHLORIDE	18000U	1,1,2-TRICHLOROETHANE
30000U	ACETONE	18000U	BENZENE
18000U	CARBON DISULFIDE	18000U	TRANS-1,3-DICHLOROPROPENE
18000U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	18000U	BROMOFORM
18000U	1,1-DICHLOROETHANE	18000U	METHYL ISOBUTYL KETONE
18000U	1,2-DICHLOROETHENE (TOTAL)	18000U	METHYL BUTYL KETONE
18000U	CHLOROFORM	18000U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
18000U	1,2-DICHLOROETHANE	18000U	1,1,2,2-TETRACHLOROETHANE
18000U	METHYL ETHYL KETONE	31000	TOLUENE
18000U	1,1,1-TRICHLOROETHANE	18000U	CHLOROBENZENE
18000U	CARBON TETRACHLORIDE	18000U	ETHYL BENZENE
18000U	BROMODICHLOROMETHANE	18000U	STYRENE
		18000U	TOTAL XYLENES
		34	PERCENT MOISTURE

REMARKS

REMARKS

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

08/20/92

MISCELLANEOUS PURGEABLE ORGANICS - DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69718 SAMPLE TYPE: SOIL	PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC	CITY: HATIESBURG ST: MS
STATION ID: SD-03	COLLECTION START: 06/24/92 1815 STOP: 00/00/00
CASE.NO.: 18341 SAS NO.:	D. NO.: DH68 MD NO: DC68

ANALYTICAL RESULTS UG/KG

50000JN	CYCLOHEXANE
30000JN	CARENE
30000JN	DIMETHYLMETHYLENEBICYCLOHEPTANE
30000JN	TRIMETHYLBICYCLOHEPTANE

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

08/20/92

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69718 SAMPLE TYPE: SOIL
SOURCE: HERCULES INC
STATION ID: SD-03

PROG ELEM: NSF COLLECTED BY: C HELM
CITY: HATIESBURG ST: MS
COLLECTION START: 06/24/92 1815 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH68

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
2700000U	PHENOL	6700000U	3-NITROANILINE
2700000U	BIS(2-CHLOROETHYL) ETHER	2700000U	ACENAPHTHENE
2700000U	2-CHLOROPHENOL	6700000U	2,4-DINITROPHENOL
2700000U	1,3-DICHLOROBENZENE	6700000U	4-NITROPHENOL
2700000U	1,4-DICHLOROBENZENE	2700000U	DIBENZOFURAN
2700000U	1,2-DICHLOROBENZENE	2700000U	2,4-DINITROTOLUENE
2700000U	2-METHYLPHENOL	2700000U	DIETHYL PHTHALATE
2700000U	2,2'-CHLOROISOPROPYLETHER	2700000U	4-CHLOROPHENYL PHENYL ETHER
2700000U	(3-AND/OR 4-)METHYLPHENOL	2700000U	FLUORENE
2700000U	N-NITROSODI-N-PROPYLAMINE	6700000U	4-NITROANILINE
2700000U	HEXACHLOROETHANE	6700000U	2-METHYL-4,6-DINITROPHENOL
2700000U	NITROBENZENE	2700000U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
2700000U	ISOPHORONE	2700000U	4-BROMOPHENYL PHENYL ETHER
2700000U	2-NITROPHENOL	2700000U	HEXACHLOROBENZENE (HCB)
2700000U	2,4-DIMETHYLPHENOL	6700000U	PENTACHLOROPHENOL
2700000U	BIS(2-CHLOROETHOXY) METHANE	2700000U	PHENANTHRENE
2700000U	2,4-DICHLOROPHENOL	2700000U	ANTHRACENE
2700000U	1,2,4-TRICHLOROBENZENE	2700000U	CARBAZOLE
2700000U	NAPHTHALENE	2700000U	DI-N-BUTYLPHTHALATE
2700000U	4-CHLOROANILINE	2700000U	FLUORANTHENE
2700000U	HEXACHLOROBUTADIENE	2700000U	PYRENE
2700000U	4-CHLORO-3-METHYLPHENOL	2700000U	BENZYL BUTYL PHTHALATE
2700000U	2-METHYLNAPHTHALENE	2700000U	3,3'-DICHLOROBENZIDINE
2700000U	HEXACHLOROCYCLOPENTADIENE (HCCP)	2700000U	BENZO(A)ANTHRACENE
2700000U	2,4,6-TRICHLOROPHENOL	2700000U	CHRYSENE
6700000U	2,4,5-TRICHLOROPHENOL	2700000U	BIS(2-ETHYLHEXYL) PHTHALATE
2700000U	2-CHLORONAPHTHALENE	2700000U	DI-N-OCTYLPHTHALATE
6700000U	2-NITROANILINE	2700000U	BENZO(B AND/OR K)FLUORANTHENE
2700000U	DIMETHYL PHTHALATE	2700000U	BENZO-A-PYRENE
2700000U	ACENAPHTHYLENE	2700000U	INDENO (1,2,3-CD) PYRENE
2700000U	2,6-DINITROTOLUENE	2700000U	DIBENZO(A,H)ANTHRACENE
		2700000U	BENZO(GHI)PERYLENE
		34	PERCENT MOISTURE

REMARKS

REMARKS

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

08/20/92

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69718 SAMPLE TYPE: SOIL
SOURCE: HERCULES INC
STATION ID: SD-03
CASE.NO.: 18341 SAS NO.:

PROG ELEM: NSF COLLECTED BY: C HELM
CITY: HATIESBURG ST: MS
COLLECTION START: 06/24/92 1815 STOP: 00/00/00
D. NO.: DH68 MD NO: DC68

ANALYTICAL RESULTS UG/KG

4+E06JN	METHYL(METHYLETHYL)CYCLOHEXANE
3+E06JN	OXYBISBENZENE
4+E06JN	HEXAHYDROTETRAMETHYLMETHANONAPHTHALENE
1.0E08JN	17 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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*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.

08/20/92

PESTICIDES/PCB'S DATA REPORT

*** ***

** PROJECT NO. 92-0629 SAMPLE NO. 69718 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SD-03 COLLECTION START: 06/24/92 1815 STOP: 00/00/00 **
** CASE NUMBER: 18341 SAS NUMBER: D. NUMBER: DH68 **
** **
*** ***

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
100U	ALPHA-BHC	7100U	METHOXYCHLOR
100U	BETA-BHC	430U	ENDRIN KETONE
100U	DELTA-BHC	200U	ENDRIN ALDEHYDE
100U	GAMMA-BHC (LINDANE)	--	CHLORDANE (TECH. MIXTURE) /1
210U	HEPTACHLOR	2700U	GAMMA-CHLORDANE /2
310U	ALDRIN	100U	ALPHA-CHLORDANE /2
100U	HEPTACHLOR EPOXIDE	10000U	TOXAPHENE
430U	ENDOSULFAN I (ALPHA)	2000U	PCB-1016 (AROCLOR 1016)
470U	DIELDRIN	4100U	PCB-1221 (AROCLOR 1221)
200U	4,4'-DDE (P,P'-DDE)	2000U	PCB-1232 (AROCLOR 1232)
200U	ENDRIN	2000U	PCB-1242 (AROCLOR 1242)
200U	ENDOSULFAN II (BETA)	2000U	PCB-1248 (AROCLOR 1248)
200U	4,4'-DDD (P,P'-DDD)	2000U	PCB-1254 (AROCLOR 1254)
1800U	ENDOSULFAN SULFATE	2000U	PCB-1260 (AROCLOR 1260)
650U	4,4'-DDT (P,P'-DDT)	34	PERCENT MOISTURE

REMARKS

REMARKS

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

PURGEABLE ORGANICS DATA REPORT 08/20/92

PROJECT NO. 92-0629 SAMPLE NO. 69725 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: SD-04 COLLECTION START: 06/25/92 1245 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH75

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
NA	CHLOROMETHANE	NA	1,2-DICHLOROPROPANE
NA	BROMOMETHANE	NA	CIS-1,3-DICHLOROPROPENE
NA	VINYL CHLORIDE	NA	TRICHLOROETHENE(TRICHLOROETHYLENE)
NA	CHLOROETHANE	NA	DIBROMOCHLOROMETHANE
NA	METHYLENE CHLORIDE	NA	1,1,2-TRICHLOROETHANE
NA	ACETONE	NA	BENZENE
NA	CARBON DISULFIDE	NA	TRANS-1,3-DICHLOROPROPENE
NA	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	NA	BROMOFORM
NA	1,1-DICHLOROETHANE	NA	METHYL ISOBUTYL KETONE
NA	1,2-DICHLOROETHENE (TOTAL)	NA	METHYL BUTYL KETONE
NA	CHLOROFORM	NA	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
NA	1,2-DICHLOROETHANE	NA	1,1,2,2-TETRACHLOROETHANE
NA	METHYL ETHYL KETONE	NA	TOLUENE
NA	1,1,1-TRICHLOROETHANE	NA	CHLOROBENZENE
NA	CARBON TETRACHLORIDE	NA	ETHYL BENZENE
NA	BROMODICHLOROMETHANE	NA	STYRENE
		NA	TOTAL XYLENES
			PERCENT MOISTURE

REMARKS ***REMARKS***

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

08/20/92

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69725 SAMPLE TYPE: SOIL
SOURCE: HERCULES INC
STATION ID: SD-04

PROG ELEM: NSF COLLECTED BY: C HELM
CITY: HATIESBURG ST: MS
COLLECTION START: 06/25/92 1245 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH75

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

REMARKS

REMARKS

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

08/20/92

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69725 SAMPLE TYPE: SOIL
SOURCE: HERCULES INC
STATION ID: SD-04
CASE NUMBER: 18341 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: C HELM
CITY: HATIESBURG ST: MS
COLLECTION START: 06/25/92 1245 STOP: 00/00/00
D. NUMBER: DH75

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

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

REMARKS

REMARKS

FOOTNOTES

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region IV
Environmental Services Division
College Station Road, Athens, Ga. 30613

*****MEMORANDUM******

DATE: 09/30/92

SUBJECT: Results of Purgeable Organic Analysis;
92-0781 HERCULES, INC
HATTIESBUR MS
CASE NO: 18613

FROM: Robert W. Knight
Chief, Laboratory Evaluation/Quality Assurance Section

TO: JOE SLYKERMAN

Attached are the results of analysis of samples collected as part of the subject project.

As a result of the Quality Assurance Review, certain data qualifiers may have been placed on the data. Attached is a DATA QUALIFIER REPORT which explains the reasons that these qualifiers were required.

If you have any questions please contact me.

ATTACHMENT

ORGANIC DATA QUALIFIER REPORT

Case Number 18613 Project Number 92-0781 SAS Number
Site ID. Hercules, Inc., Hattiesburg, MS.

Affected Samples	Compound or Fraction	Flag Used	Reason
Volatiles			
71240	styrene	J	<quantitation limit
	xylenes	J	<quantitation limit
71242	chloroform	J	<quantitation limit
Extractables			
all soil samples	2-chlorophenol	J	low blind spike recovery
	acenaphthene	J	low blind spike recoveru
71241	1,2-dichlorobenzene	J	<quantitation limit
Pesticides			
none			

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

09/29/92

PURGEABLE ORGANICS DATA REPORT

*** ***
** PROJECT NO. 92-0781 SAMPLE NO. 71238 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: R JORDAN **
** SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS **
** STATION ID: HI-SW-01 COLLECTION START: 08/18/92 0910 STOP: 00/00/00 **
** **
** CASE NO.: 18613 SAS NO.: D. NO.: DN52 **
*** ***

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

REMARKS ***REMARKS***

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

09/29/92

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 92-0781 SAMPLE NO. 71239 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: R JORDAN
SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS
STATION ID: HI-SW-02 COLLECTION START: 08/18/92 0940 STOP: 00/00/00

CASE NO.: 18613 SAS NO.: D. NO.: DN53

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

REMARKS

REMARKS

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

09/29/92

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 92-0781 SAMPLE NO. 71240 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: R JORDAN
SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS
STATION ID: HI-SD-04 COLLECTION START: 08/18/92 1030 STOP: 00/00/00

CASE NO.: 18613 SAS NO.: D. NO.: DN54

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
150U	CHLOROMETHANE	150U	1,2-DICHLOROPROPANE
150U	BROMOMETHANE	150U	CIS-1,3-DICHLOROPROPENE
150U	VINYL CHLORIDE	150U	TRICHLOROETHENE(TRICHLOROETHYLENE)
150U	CHLOROETHANE	150U	DIBROMOCHLOROMETHANE
150U	METHYLENE CHLORIDE	150U	1,1,2-TRICHLOROETHANE
7100U	ACETONE	180	BENZENE
150U	CARBON DISULFIDE	150U	TRANS-1,3-DICHLOROPROPENE
150U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	150U	BROMOFORM
150U	1,1-DICHLOROETHANE	230U	METHYL ISOBUTYL KETONE
150U	1,2-DICHLOROETHENE (TOTAL)	150U	METHYL BUTYL KETONE
150U	CHLOROFORM	150U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
150U	1,2-DICHLOROETHANE	150U	1,1,2,2-TETRACHLOROETHANE
470	METHYL ETHYL KETONE	14000	TOLUENE
150U	1,1,1-TRICHLOROETHANE	150U	CHLOROBENZENE
150U	CARBON TETRACHLORIDE	150U	ETHYL BENZENE
150U	BROMODICHLOROMETHANE	15J	STYRENE
		21J	TOTAL XYLENES
		66	PERCENT MOISTURE

REMARKS ***REMARKS***

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

09/29/92

PURGEABLE ORGANICS DATA REPORT

*** ***
** PROJECT NO. 92-0781 SAMPLE NO. 71241 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: R JORDAN **
** SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS **
** STATION ID: HI-SD-03 COLLECTION START: 08/18/92 1145 STOP: 00/00/00 **
** **
** CASE NO.: 18613 SAS NO.: D. NO.: DN55 **
*** ***

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
1600000U	CHLOROMETHANE	1600000U	1,2-DICHLOROPROPANE
1600000U	BROMOMETHANE	1600000U	CIS-1,3-DICHLOROPROPENE
1600000U	VINYL CHLORIDE	1600000U	TRICHLOROETHENE(TRICHLOROETHYLENE)
1600000U	CHLOROETHANE	1600000U	DIBROMOCHLOROMETHANE
1600000U	METHYLENE CHLORIDE	1600000U	1,1,2-TRICHLOROETHANE
1600000U	ACETONE	1600000U	BENZENE
1600000U	CARBON DISULFIDE	1600000U	TRANS-1,3-DICHLOROPROPENE
1600000U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	1600000U	BROMOFORM
1600000U	1,1-DICHLOROETHANE	1600000U	METHYL ISOBUTYL KETONE
1600000U	1,2-DICHLOROETHENE (TOTAL)	1600000U	METHYL BUTYL KETONE
1600000U	CHLOROFORM	1600000U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
1600000U	1,2-DICHLOROETHANE	1600000U	1,1,2,2-TETRACHLOROETHANE
1600000U	METHYL ETHYL KETONE	18000000	TOLUENE
1600000U	1,1,1-TRICHLOROETHANE	1600000U	CHLOROBENZENE
1600000U	CARBON TETRACHLORIDE	1600000U	ETHYL BENZENE
1600000U	BROMODICHLOROMETHANE	1600000U	STYRENE
		1600000U	TOTAL XYLENES
		25	PERCENT MOISTURE

REMARKS ***REMARKS***

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

09/29/92

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 92-0781 SAMPLE NO. 71242 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: R JORDAN
SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS
STATION ID: HI-SS-04 COLLECTION START: 08/18/92 1010 STOP: 00/00/00

CASE NO.: 18613 SAS NO.: D. NO.: DN56

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
10U	CHLOROMETHANE	10U	1,2-DICHLOROPROPANE
10U	BROMOMETHANE	10U	CIS-1,3-DICHLOROPROPENE
10U	VINYL CHLORIDE	10U	TRICHLOROETHENE(TRICHLOROETHYLENE)
10U	CHLOROETHANE	10U	DIBROMOCHLOROMETHANE
10U	METHYLENE CHLORIDE	10U	1,1,2-TRICHLOROETHANE
30U	ACETONE	10U	BENZENE
10U	CARBON DISULFIDE	10U	TRANS-1,3-DICHLOROPROPENE
10U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	10U	BROMOFORM
10U	1,1-DICHLOROETHANE	10U	METHYL ISOBUTYL KETONE
10U	1,2-DICHLOROETHENE (TOTAL)	10U	METHYL BUTYL KETONE
2J	CHLOROFORM	10U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
10U	1,2-DICHLOROETHANE	10U	1,1,2,2-TETRACHLOROETHANE
10U	METHYL ETHYL KETONE	11	TOLUENE
10U	1,1,1-TRICHLOROETHANE	10U	CHLOROBENZENE
10U	CARBON TETRACHLORIDE	10U	ETHYL BENZENE
10U	BROMODICHLOROMETHANE	10U	STYRENE
		10U	TOTAL XYLENES
		1	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.   09/29/92

PURGEABLE ORGANICS DATA REPORT

*** ***
** PROJECT NO. 92-0781 SAMPLE NO. 71243 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: R JORDAN **
** SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS **
** STATION ID: HI-SS-05 COLLECTION START: 08/18/92 1125 STOP: 00/00/00 **
** **
** CASE NO.: 18613 SAS NO.: D. NO.: DN57 **
*** ***

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
12U	CHLOROMETHANE	12U	1,2-DICHLOROPROPANE
12U	BROMOMETHANE	12U	CIS-1,3-DICHLOROPROPENE
12U	VINYL CHLORIDE	12U	TRICHLOROETHENE(TRICHLOROETHYLENE)
12U	CHLOROETHANE	12U	DIBROMOCHLOROMETHANE
12U	METHYLENE CHLORIDE	12U	1,1,2-TRICHLOROETHANE
12U	ACETONE	12U	BENZENE
12U	CARBON DISULFIDE	12U	TRANS-1,3-DICHLOROPROPENE
12U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	12U	BROMOFORM
12U	1,1-DICHLOROETHANE	12U	METHYL ISOBUTYL KETONE
12U	1,2-DICHLOROETHENE (TOTAL)	12U	METHYL BUTYL KETONE
12U	CHLOROFORM	12U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
12U	1,2-DICHLOROETHANE	12U	1,1,2,2-TETRACHLOROETHANE
12U	METHYL ETHYL KETONE	12U	TOLUENE
12U	1,1,1-TRICHLOROETHANE	12U	CHLOROBENZENE
12U	CARBON TETRACHLORIDE	12U	ETHYL BENZENE
12U	BROMODICHLOROMETHANE	12U	STYRENE
		12U	TOTAL XYLENES
		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
*U-MATERIAL WAS ANALYZED FOR BUT NOT DETECTED. THE NUMBER IS THE MINIMUM QUANTITATION LIMIT.
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

09/29/92

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 92-0781 SAMPLE NO. 71244 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: R JORDAN
SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS
STATION ID: HI-SB-05 COLLECTION START: 08/18/92 1145 STOP: 00/00/00

CASE NO.: 18613 SAS NO.: D. NO.: DN58

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
12U	CHLOROMETHANE	12U	1,2-DICHLOROPROPANE
12U	BROMOMETHANE	12U	CIS-1,3-DICHLOROPROPENE
12U	VINYL CHLORIDE	12U	TRICHLOROETHENE(TRICHLOROETHYLENE)
12U	CHLOROETHANE	12U	DIBROMOCHLOROMETHANE
12U	METHYLENE CHLORIDE	12U	1,1,2-TRICHLOROETHANE
12U	ACETONE	12U	BENZENE
12U	CARBON DISULFIDE	12U	TRANS-1,3-DICHLOROPROPENE
12U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	12U	BROMOFORM
12U	1,1-DICHLOROETHANE	12U	METHYL ISOBUTYL KETONE
12U	1,2-DICHLOROETHENE (TOTAL)	12U	METHYL BUTYL KETONE
12U	CHLOROFORM	12U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
12U	1,2-DICHLOROETHANE	12U	1,1,2,2-TETRACHLOROETHANE
12U	METHYL ETHYL KETONE	12U	TOLUENE
12U	1,1,1-TRICHLOROETHANE	12U	CHLOROBENZENE
12U	CARBON TETRACHLORIDE	12U	ETHYL BENZENE
12U	BROMODICHLOROMETHANE	12U	STYRENE
		12U	TOTAL XYLENES
		18	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.
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

09/29/92

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 92-0781 SAMPLE NO. 71250 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: R JORDAN
SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS
STATION ID: HI-TB-01 COLLECTION START: 08/18/92 0720 STOP: 00/00/00

CASE NO.: 18613 SAS NO.: D. NO.: DN51

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
10U	CHLOROMETHANE	10U	1,2-DICHLOROPROPANE
10U	BROMOMETHANE	10U	CIS-1,3-DICHLOROPROPENE
10U	VINYL CHLORIDE	10U	TRICHLOROETHENE(TRICHLOROETHYLENE)
10U	CHLOROETHANE	10U	DIBROMOCHLOROMETHANE
10U	METHYLENE CHLORIDE	10U	1,1,2-TRICHLOROETHANE
30U	ACETONE	10U	BENZENE
10U	CARBON DISULFIDE	10U	TRANS-1,3-DICHLOROPROPENE
10U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	10U	BROMOFORM
10U	1,1-DICHLOROETHANE	10U	METHYL ISOBUTYL KETONE
10U	1,2-DICHLOROETHENE (TOTAL)	10U	METHYL BUTYL KETONE
10U	CHLOROFORM	10U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
10U	1,2-DICHLOROETHANE	10U	1,1,2,2-TETRACHLOROETHANE
10U	METHYL ETHYL KETONE	10U	TOLUENE
10U	1,1,1-TRICHLOROETHANE	10U	CHLOROBENZENE
10U	CARBON TETRACHLORIDE	10U	ETHYL BENZENE
10U	BROMODICHLOROMETHANE	10U	STYRENE
		10U	TOTAL XYLENES

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

09/29/92

MISCELLANEOUS PURGEABLE ORGANICS - DATA REPORT

*** ***
** PROJECT NO. 92-0781 SAMPLE NO. 71240 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: R JORDAN **
** SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS **
** STATION ID: HI-SD-04 COLLECTION START: 08/18/92 1030 STOP: 00/00/00 **
** CASE.NO.: 18613 SAS NO.: D. NO.: DN54 MD NO: DN54 **
** **
*** ***

ANALYTICAL RESULTS UG/KG

100JN	CARENE
400JN	DIMETHYLMETHYLENEBICYCLOHEPTANE
3000JN	MENTHANE (2 ISOMERS)
500JN	TRIMETHYLBICYCLOHEPTANE
8000JN	METHYL(METHYLETHYL)CYCLOHEXANE
30000JN	METHYL(METHYLETHYL)BENZENE

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

09/29/92

MISCELLANEOUS PURGEABLE ORGANICS - DATA REPORT

*** ***
** PROJECT NO. 92-0781 SAMPLE NO. 71241 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: R JORDAN **
** SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS **
** STATION ID: HI-SD-03 COLLECTION START: 08/18/92 1145 STOP: 00/00/00 **
** CASE.NO.: 18613 SAS NO.: D. NO.: DN55 MD NO: DN55 **
** **
*** ***

ANALYTICAL RESULTS UG/KG

8+E06JN	CYCLOHEXANE
1+E06JN	CAMPHENE
2+E07JN	MENTHANE
6+E06JN	METHYL(METHYLETHYL)CYCLOHEXANE
2+E06JN	METHYL(METHYLETHYL)BENZENE
2+E07JN	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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GROUNDWATER INORGANICS

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

08/10/92

METALS DATA REPORT

*** ***

** PROJECT NO. 92-0629 SAMPLE NO. 69710 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: TB-01 COLLECTION START: 06/24/92 0725 STOP: 00/00/00 **
** CASE NUMBER: 18341 SAS NUMBER: MD NUMBER: DC60 **
** **

*** ***

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
120U	ALUMINUM	2U	MANGANESE
14U	ANTIMONY	.20U	MERCURY
4U	ARSENIC	8U	NICKEL
14U	BARIUM	400U	POTASSIUM
1U	BERYLLIUM	2U	SELENIUM
2U	CADMIUM	3UJ	SILVER
400U	CALCIUM	500U	SODIUM
3U	CHROMIUM	3UJ	THALLIUM
6U	COBALT	NA	TIN
6U	COPPER	4U	VANADIUM
40U	IRON	3U	ZINC
2UJ	LEAD		
390U	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.
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

07/31/92

SPECIFIED ANALYSIS DATA REPORT

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*************************************************************************************************
**   PROJECT NO. 92-0629   SAMPLE NO. 69710  SAMPLE TYPE: GROUNDWA    PROG ELEM: NSF   COLLECTED BY: C HELM                  **
**   SOURCE: HERCULES INC                                              CITY: HATIESBURG              ST: MS                   **
**   STATION ID: TB-01                                                 COLLECTION START: 06/24/92  0725   STOP: 00/00/00     **
**   CASE.NO.: 18341          SAS NO.:                                 D. NO.: DH60                 MD NO: DC60              **
**                                                                                                                            **
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RESULTS	UNITS	PARAMETER
10U	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.

08/10/92

METALS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69713 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: TW-01 COLLECTION START: 06/24/92 1045 STOP: 00/00/00 **
** CASE NUMBER: 18341 SAS NUMBER: MD NUMBER: DC63 **
** **
*** ***

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
36000	ALUMINUM	300	MANGANESE
14U	ANTIMONY	.45	MERCURY
4U	ARSENIC	39	NICKEL
1800	BARIUM	3200	POTASSIUM
11	BERYLLIUM	20U	SELENIUM
2U	CADMIUM	3UJ	SILVER
24000	CALCIUM	21000	SODIUM
94	CHROMIUM	3UJ	THALLIUM
19	COBALT	NA	TIN
23	COPPER	160	VANADIUM
15000	IRON	160	ZINC
380J	LEAD		
9000	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.

07/31/92

SPECIFIED ANALYSIS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69713 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: TW-01 COLLECTION START: 06/24/92 1045 STOP: 00/00/00 **
** CASE.NO.: 18341 SAS NO.: D. NO.: DH63 MD NO: DC63 **
** **
*** ***

RESULTS	UNITS	PARAMETER
10U	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.

08/10/92

METALS DATA REPORT

*** ***

** PROJECT NO. 92-0629 SAMPLE NO. 69724 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: TW-05 COLLECTION START: 06/25/92 1050 STOP: 00/00/00 **
** CASE NUMBER: 18341 SAS NUMBER: MD NUMBER: DC74 **
** **

*** ***

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
77000J	ALUMINUM	4100J	MANGANESE
14UJ	ANTIMONY	2.0J	MERCURY
4UJ	ARSENIC	53J	NICKEL
3600J	BARIUM	4400J	POTASSIUM
21J	BERYLLIUM	20UJ	SELENIUM
3J	CADMIUM	3UJ	SILVER
45000J	CALCIUM	11000UJ	SODIUM
40J	CHROMIUM	3UJ	THALLIUM
59J	COBALT	NA	TIN
140J	COPPER	100J	VANADIUM
47000J	IRON	170J	ZINC
380J	LEAD		
17000J	MAGNESIUM		

REMARKS
SAMPLE IMPROPERLY PRESERVED

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.

07/31/92

SPECIFIED ANALYSIS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69724 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: TW-05 COLLECTION START: 06/25/92 1050 STOP: 00/00/00
CASE.NO.: 18341 SAS NO.: D. NO.: DH74 MD NO: DC74

RESULTS	UNITS	PARAMETER
10U	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.

08/10/92

METALS DATA REPORT

PROJECT NO. 92-0629   SAMPLE NO. 69726   SAMPLE TYPE: GROUNDWA   PROG ELEM: NSF   COLLECTED BY: C HELM
SOURCE: HERCULES INC   CITY: HATIESBURG   ST: MS
STATION ID: MW-81   COLLECTION START: 06/25/92 1330   STOP: 00/00/00
CASE NUMBER: 18341   SAS NUMBER: MD NUMBER: DC76

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
320U	ALUMINUM	451	MANGANESE
14U	ANTIMONY	.20U	MERCURY
12	ARSENIC	8U	NICKEL
320	BARIUM	400	POTASSIUM
1U	BERYLLIUM	2U	SELENIUM
2U	CADMIUM	3UJ	SILVER
27000	CALCIUM	17000	SODIUM
3U	CHROMIUM	3UJ	THALLIUM
6U	COBALT	NA	TIN
7	COPPER	4U	VANADIUM
530	IRON	110	ZINC
6J	LEAD		
6200	MAGNESIUM		

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

07/31/92

SPECIFIED ANALYSIS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69726 SAMPLE TYPE: GROUNDWA	PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC	CITY: HATIESBURG ST: MS
STATION ID: MW-81	COLLECTION START: 06/25/92 1330 STOP: 00/00/00
CASE.NO.: 18341 SAS NO.:	D. NO.: DH76 MD NO: DC76

RESULTS	UNITS	PARAMETER
10U	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.

SURFACE WATER INORGANICS

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

08/10/92

METALS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69715 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: SW-01 COLLECTION START: 06/24/92 1610 STOP: 00/00/00
CASE NUMBER: 18341 SAS NUMBER: MD NUMBER: DC65

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
170U	ALUMINUM	24	MANGANESE
14U	ANTIMONY	.20U	MERCURY
4U	ARSENIC	8U	NICKEL
51	BARIUM	2000	POTASSIUM
1U	BERYLLIUM	2U	SELENIUM
2U	CADMIUM	3UJ	SILVER
10000	CALCIUM	14000	SODIUM
3U	CHROMIUM	3UJ	THALLIUM
6U	COBALT	NA	TIN
6U	COPPER	4U	VANADIUM
350	IRON	9U	ZINC
4J	LEAD		
2000	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.

07/31/92

SPECIFIED ANALYSIS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69715 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SW-01 COLLECTION START: 06/24/92 1610 STOP: 00/00/00 **
** CASE.NO.: 18341 SAS NO.: D. NO.: DH65 MD NO: DC65 **
** **
*** ***

RESULTS	UNITS	PARAMETER
10U	UG/L	CYANIDE

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.

08/10/92

METALS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69716 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: SW-2 COLLECTION START: 06/24/92 1700 STOP: 00/00/00
CASE NUMBER: 18341 SAS NUMBER: MD NUMBER: DC66

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
200U	ALUMINUM	1400	MANGANESE
14U	ANTIMONY	.20U	MERCURY
4U	ARSENIC	18	NICKEL
160	BARIUM	5000	POTASSIUM
1U	BERYLLIUM	2U	SELENIUM
2U	CADMIUM	3UJ	SILVER
33000	CALCIUM	29000	SODIUM
3U	CHROMIUM	3UJ	THALLIUM
6U	COBALT	NA	TIN
7	COPPER	4U	VANADIUM
4800	IRON	28	ZINC
3J	LEAD		
6500	MAGNESIUM		

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.

07/31/92

SPECIFIED ANALYSIS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69716 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SW-2 COLLECTION START: 06/24/92 1700 STOP: 00/00/00 **
** CASE.NO.: 18341 SAS NO.: D. NO.: DH66 MD NO: DC66 **
** **
*** ***

RESULTS	UNITS	PARAMETER
10U	UG/L	CYANIDE

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
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SOIL INORGANICS

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

08/10/92

METALS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69711 SAMPLE TYPE: SOIL
SOURCE: HERCULES INC
STATION ID: SS-01
CASE NUMBER: 18341 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: C HELM
CITY: HATIESBURG ST: MS
COLLECTION START: 06/24/92 0855 STOP: 00/00/00
MD NUMBER: DC61

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
3900J	ALUMINUM	230J	MANGANESE
8.5U	ANTIMONY	.17	MERCURY
3.7	ARSENIC	1.5U	NICKEL
88J	BARIUM	140	POTASSIUM
.39	BERYLLIUM	1U	SELENIUM
.65U	CADMIUM	1.7U	SILVER
990	CALCIUM	180U	SODIUM
5.1J	CHROMIUM	.65U	THALLIUM
1.5	COBALT	NA	TIN
20	COPPER	15	VANADIUM
9000J	IRON	110J	ZINC
39J	LEAD	08	PERCENT MOISTURE
180	MAGNESIUM		

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was used
for tables

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.

07/31/92

SPECIFIED ANALYSIS DATA REPORT

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**   PROJECT NO. 92-0629   SAMPLE NO. 69711  SAMPLE TYPE: SOIL         PROG ELEM: NSF    COLLECTED BY: C HELM              **
**   SOURCE: HERCULES INC                                              CITY: HATIESBURG             ST: MS                 **
**   STATION ID: SS-01                                                 COLLECTION START: 06/24/92  0855   STOP: 00/00/00   **
**   CASE.NO.: 18341          SAS NO.:                                 D. NO.: DH61                MD NO: DC61             **
**                                                                                                                         **
*** * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * ***
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RESULTS	UNITS	PARAMETER
.54U	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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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/10/92

METALS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69712 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SB-01 COLLECTION START: 06/24/92 0925 STOP: 00/00/00 **
** CASE NUMBER: 18341 SAS NUMBER: MD NUMBER: DC62 **
** **
*** ***

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
1800J	ALUMINUM	3UJ	MANGANESE
9.5U	ANTIMONY	.12U	MERCURY
.98U	ARSENIC	1.7U	NICKEL
9.1J	BARIUM	87J	POTASSIUM
.24U	BERYLLIUM	.49U	SELENIUM
.73U	CADMIUM	2U	SILVER
96	CALCIUM	210U	SODIUM
4.6J	CHROMIUM	.73U	THALLIUM
1.2U	COBALT	NA	TIN
2.2U	COPPER	4.1	VANADIUM
1100J	IRON	3UJ	ZINC
2.5J	LEAD	18	PERCENT MOISTURE
84	MAGNESIUM		

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.

07/31/92

SPECIFIED ANALYSIS DATA REPORT

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**   PROJECT NO. 92-0629   SAMPLE NO. 69712   SAMPLE TYPE: SOIL          PROG ELEM: NSF   COLLECTED BY: C HELM                 **
**   SOURCE: HERCULES INC                                                CITY: HATIESBURG             ST: MS                   **
**   STATION ID: SB-01                                                   COLLECTION START: 06/24/92  0925   STOP: 00/00/00     **
**   CASE.NO.: 18341            SAS NO.:                                 D. NO.: DH62                 MD NO: DC62              **
**                                                                                                                             **
*** * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * ***
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RESULTS	UNITS	PARAMETER
.61U	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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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/10/92

METALS DATA REPORT

*** ***

** PROJECT NO. 92-0629 SAMPLE NO. 69719 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SS-02 COLLECTION START: 06/24/92 1915 STOP: 00/00/00 **
** CASE NUMBER: 18341 SAS NUMBER: MD NUMBER: DC69 **

*** ***

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
1700J	ALUMINUM	170J	MANGANESE
9.3U	ANTIMONY	.35	MERCURY
2.8	ARSENIC	460	NICKEL
80J	BARIUM	240	POTASSIUM
.24U	BERYLLIUM	.47U	SELENIUM
2.4	CADMIUM	1.9U	SILVER
3100	CALCIUM	960	SODIUM
12J	CHROMIUM	.71U	THALLIUM
260	COBALT	NA	TIN
820	COPPER	5.2	VANADIUM
9600J	IRON	390J	ZINC
370J	LEAD	16	PERCENT MOISTURE
1200	MAGNESIUM		

REMARKS ***REMARKS***

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

07/31/92

SPECIFIED ANALYSIS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69719 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SS-02 COLLECTION START: 06/24/92 1915 STOP: 00/00/00 **
** CASE.NO.: 18341 SAS NO.: D. NO.: DH69 MD NO: DC69 **
**   **
*** ***

RESULTS	UNITS	PARAMETER
.59U	MG/KG	CYANIDE

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

08/10/92

METALS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69720 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: SS-03 COLLECTION START: 06/25/92 0725 STOP: 00/00/00
CASE NUMBER: 18341 SAS NUMBER: MD NUMBER: DC70

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
4000J	ALUMINUM	92J	MANGANESE
10U	ANTIMONY	.13U	MERCURY
2U	ARSENIC	1.8U	NICKEL
26J	BARIUM	130	POTASSIUM
.26U	BERYLLIUM	.51U	SELENIUM
.77U	CADMIUM	2.1U	SILVER
1100	CALCIUM	220U	SODIUM
5.1J	CHROMIUM	.77U	THALLIUM
1.3U	COBALT	NA	TIN
7.1	COPPER	10	VANADIUM
5100J	IRON	16J	ZINC
22J	LEAD	22	PERCENT MOISTURE
240	MAGNESIUM		

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.

07/31/92

SPECIFIED ANALYSIS DATA REPORT

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**   PROJECT NO. 92-0629   SAMPLE NO. 69720  SAMPLE TYPE: SOIL        PROG ELEM: NSF   COLLECTED BY: C HELM                        **
**   SOURCE: HERCULES INC                                             CITY: HATIESBURG                ST: MS                         **
**   STATION ID: SS-03                                                COLLECTION START: 06/25/92  0725   STOP: 00/00/00              **
**   CASE.NO.: 18341           SAS NO.:                               D. NO.: DH70                    MD NO: DC70                    **
**                                                                                                                                   **
*** * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * ***
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RESULTS	UNITS	PARAMETER
.64U	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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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/10/92

METALS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69721 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: SS-04 COLLECTION START: 06/25/92 0845 STOP: 00/00/00
CASE NUMBER: 18341 SAS NUMBER: MD NUMBER: DC71

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
2300J	ALUMINUM	74J	MANGANESE
8.1U	ANTIMONY	.10U	MERCURY
2U	ARSENIC	1.5U	NICKEL
41J	BARIUM	150	POTASSIUM
.21U	BERYLLIUM	.42U	SELENIUM
.62U	CADMIUM	1.7U	SILVER
570	CALCIUM	180U	SODIUM
14J	CHROMIUM	.62U	THALLIUM
1U	COBALT	NA	TIN
11	COPPER	6.3	VANADIUM
3500J	IRON	11J	ZINC
20J	LEAD	04	PERCENT MOISTURE
120	MAGNESIUM		

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.

07/31/92

SPECIFIED ANALYSIS DATA REPORT

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**   PROJECT NO. 92-0629   SAMPLE NO. 69721  SAMPLE TYPE: SOIL        PROG ELEM: NSF   COLLECTED BY: C HELM                **
**   SOURCE: HERCULES INC                                              CITY: HATIESBURG              ST: MS                  **
**   STATION ID: SS-04                                                 COLLECTION START: 06/25/92  0845   STOP: 00/00/00     **
**   CASE.NO.: 18341          SAS NO.:                                 D. NO.: DH71                  MD NO: DC71             **
**                                                                                                                           **
*** * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * ***
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RESULTS	UNITS	PARAMETER
.52U	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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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/10/92

METALS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69722 SAMPLE TYPE: SOIL
SOURCE: HERCULES INC
STATION ID: SS-05
CASE NUMBER: 18341 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: C HELM
CITY: HATIESBURG ST: MS
COLLECTION START: 06/25/92 0945 STOP: 00/00/00
MD NUMBER: DC72

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
4500J	ALUMINUM	300J	MANGANESE
8.4U	ANTIMONY	.11U	MERCURY
2U	ARSENIC	1.5U	NICKEL
27J	BARIUM	120	POTASSIUM
.22U	BERYLLIUM	1U	SELENIUM
.65U	CADMIUM	1.7U	SILVER
230	CALCIUM	180U	SODIUM
4.5J	CHROMIUM	.65U	THALLIUM
2.3	COBALT	NA	TIN
3.2	COPPER	8.9	VANADIUM
3900J	IRON	11J	ZINC
14J	LEAD	08	PERCENT MOISTURE
160	MAGNESIUM		

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.

07/31/92

SPECIFIED ANALYSIS DATA REPORT

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**   PROJECT NO. 92-0629   SAMPLE NO. 69722  SAMPLE TYPE: SOIL       PROG ELEM: NSF   COLLECTED BY: C HELM                          **
**   SOURCE: HERCULES INC                                            CITY: HATIESBURG              ST: MS                            **
**   STATION ID: SS-05                                               COLLECTION START: 06/25/92  0945   STOP: 00/00/00               **
**   CASE.NO.: 18341          SAS NO.:                               D. NO.: DH72                 MD NO: DC72                        **
**                                                                                                                                   **
*** * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * ***
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RESULTS	UNITS	PARAMETER
.54U	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.

08/10/92

METALS DATA REPORT

*** ***

** PROJECT NO. 92-0629 SAMPLE NO. 69723 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SB-05 COLLECTION START: 06/25/92 0955 STOP: 00/00/00 **
** CASE NUMBER: 18341 SAS NUMBER: MD NUMBER: DC73 **
** **
*** ***

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
6800J	ALUMINUM	80J	MANGANESE
9.5U	ANTIMONY	.12U	MERCURY
2U	ARSENIC	1.7U	NICKEL
26J	BARIUM	190	POTASSIUM
.26	BERYLLIUM	.49U	SELENIUM
.73U	CADMIUM	2U	SILVER
55	CALCIUM	1800	SODIUM
5.1J	CHROMIUM	.73U	THALLIUM
1.9J	COBALT	NA	TIN
3.1	COPPER	10	VANADIUM
6200J	IRON	8.7J	ZINC
21J	LEAD	18	PERCENT MOISTURE
260	MAGNESIUM		

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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*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.

07/31/92

SPECIFIED ANALYSIS DATA REPORT

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**   PROJECT NO. 92-0629   SAMPLE NO. 69723  SAMPLE TYPE: SOIL        PROG ELEM: NSF   COLLECTED BY: C HELM                 **
**   SOURCE: HERCULES INC                                             CITY: HATIESBURG              ST: MS                  **
**   STATION ID: SB-05                                                COLLECTION START: 06/25/92  0955  STOP: 00/00/00      **
**   CASE.NO.: 18341          SAS NO.:                                D. NO.: DH73                MD NO: DC73               **
**                                                                                                                          **
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RESULTS	UNITS	PARAMETER
.61U	MG/KG	CYANIDE

FOOTNOTES
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SOIL ORGANICS

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

PURGEABLE ORGANICS DATA REPORT 08/20/92

PROJECT NO. 92-0629 SAMPLE NO. 69711 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: SS-01 COLLECTION START: 06/24/92 0855 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH61

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
11U	CHLOROMETHANE	11U	1,2-DICHLOROPROPANE
11U	BROMOMETHANE	11U	CIS-1,3-DICHLOROPROPENE
11U	VINYL CHLORIDE	11U	TRICHLOROETHENE(TRICHLOROETHYLENE)
11U	CHLOROETHANE	11U	DIBROMOCHLOROMETHANE
50U	METHYLENE CHLORIDE	11U	1,1,2-TRICHLOROETHANE
50U	ACETONE	11U	BENZENE
11U	CARBON DISULFIDE	11U	TRANS-1,3-DICHLOROPROPENE
11U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	11U	BROMOFORM
11U	1,1-DICHLOROETHANE	11U	METHYL ISOBUTYL KETONE
11U	1,2-DICHLOROETHENE (TOTAL)	11U	METHYL BUTYL KETONE
11U	CHLOROFORM	11U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
11U	1,2-DICHLOROETHANE	11U	1,1,2,2-TETRACHLOROETHANE
11U	METHYL ETHYL KETONE	11U	TOLUENE
11U	1,1,1-TRICHLOROETHANE	11U	CHLOROBENZENE
11U	CARBON TETRACHLORIDE	11U	ETHYL BENZENE
11U	BROMODICHLOROMETHANE	11U	STYRENE
		11U	TOTAL XYLENES
		9	PERCENT MOISTURE

REMARKS ***REMARKS***

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

08/20/92

EXTRACTABLE ORGANICS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69711 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SS-01 COLLECTION START: 06/24/92 0855 STOP: 00/00/00 **
** **
** CASE NO.: 18341 SAS NO.: D. NO.: DH61 **
*** ***

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
360U	PHENOL	870UR	3-NITROANILINE
360U	BIS(2-CHLOROETHYL) ETHER	360U	ACENAPHTHENE
360U	2-CHLOROPHENOL	870U	2,4-DINITROPHENOL
360U	1,3-DICHLOROBENZENE	870U	4-NITROPHENOL
360U	1,4-DICHLOROBENZENE	360U	DIBENZOFURAN
360U	1,2-DICHLOROBENZENE	360U	2,4-DINITROTOLUENE
360U	2-METHYLPHENOL	360U	DIETHYL PHTHALATE
360U	2,2'-CHLOROISOPROPYLETHER	360U	4-CHLOROPHENYL PHENYL ETHER
360U	(3-AND/OR 4-)METHYLPHENOL	360U	FLUORENE
360U	N-NITROSODI-N-PROPYLAMINE	870U	4-NITROANILINE
360U	HEXACHLOROETHANE	870U	2-METHYL-4,6-DINITROPHENOL
360U	NITROBENZENE	360U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
360U	ISOPHORONE	360U	4-BROMOPHENYL PHENYL ETHER
360U	2-NITROPHENOL	360U	HEXACHLOROBENZENE (HCB)
360U	2,4-DIMETHYLPHENOL	870U	PENTACHLOROPHENOL
360U	BIS(2-CHLOROETHOXY) METHANE	55J	PHENANTHRENE
360U	2,4-DICHLOROPHENOL	360U	ANTHRACENE
360U	1,2,4-TRICHLOROBENZENE	360U	CARBAZOLE
360U	NAPHTHALENE	360U	DI-N-BUTYLPHTHALATE
360U	4-CHLOROANILINE	110J	FLUORANTHENE
360U	HEXACHLOROBUTADIENE	100J	PYRENE
360U	4-CHLORO-3-METHYLPHENOL	360U	BENZYL BUTYL PHTHALATE
360U	2-METHYLNAPHTHALENE	360U	3,3'-DICHLOROBENZIDINE
360U	HEXACHLOROCYCLOPENTADIENE (HCCP)	360U	BENZO(A)ANTHRACENE
360U	2,4,6-TRICHLOROPHENOL	360U	CHRYSENE
870U	2,4,5-TRICHLOROPHENOL	360U	BIS(2-ETHYLHEXYL) PHTHALATE
360U	2-CHLORONAPHTHALENE	360U	DI-N-OCTYLPHTHALATE
870U	2-NITROANILINE	360U	BENZO(B AND/OR K)FLUORANTHENE
360U	DIMETHYL PHTHALATE	360U	BENZO-A-PYRENE
360U	ACENAPHTHYLENE	360U	INDENO (1,2,3-CD) PYRENE
360U	2,6-DINITROTOLUENE	360U	DIBENZO(A,H)ANTHRACENE
		360U	BENZO(GHI)PERYLENE
		9	PERCENT MOISTURE

REMARKS ***REMARKS***

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

08/20/92

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69711 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: SS-01 COLLECTION START: 06/24/92 0855 STOP: 00/00/00
CASE.NO.: 18341 SAS NO.: D. NO.: DH61 MD NO: DC61

ANALYTICAL RESULTS UG/KG

2000J	4 UNIDENTIFIED COMPOUNDS
200JN	DIMETHYLPHENANTHRENE
700JN	TETRAMETHYLPHENANTHRENE
*	OCTAHYDRODIMETHYL(METHYLETHYL)PHENANTHRENE'
1000JN	CARBOXYLIC ACID

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

08/20/92

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69711 SAMPLE TYPE: SOIL
SOURCE: HERCULES INC
STATION ID: SS-01
CASE NUMBER: 18341 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: C HELM
CITY: HATIESBURG ST: MS
COLLECTION START: 06/24/92 0855 STOP: 00/00/00
D. NUMBER: DH61

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
9.2U	ALPHA-BHC	92U	METHOXYCHLOR
9.2U	BETA-BHC	18U	ENDRIN KETONE
9.2U	DELTA-BHC	18U	ENDRIN ALDEHYDE
1.6J	GAMMA-BHC (LINDANE)	--	CHLORDANE (TECH. MIXTURE) /1
9.2U	HEPTACHLOR	26N	GAMMA-CHLORDANE /2
3.6J	ALDRIN	26	ALPHA-CHLORDANE /2
9.2U	HEPTACHLOR EPOXIDE	920U	TOXAPHENE
9.2U	ENDOSULFAN I (ALPHA)	180U	PCB-1016 (AROCLOR 1016)
61	DIELDRIN	360U	PCB-1221 (AROCLOR 1221)
130C	4,4'-DDE (P,P'-DDE)	180U	PCB-1232 (AROCLOR 1232)
18U	ENDRIN	180U	PCB-1242 (AROCLOR 1242)
18U	ENDOSULFAN II (BETA)	180U	PCB-1248 (AROCLOR 1248)
68	4,4'-DDD (P,P'-DDD)	180U	PCB-1254 (AROCLOR 1254)
18U	ENDOSULFAN SULFATE	180U	PCB-1260 (AROCLOR 1260)
31	4,4'-DDT (P,P'-DDT)	9	PERCENT MOISTURE

REMARKS

REMARKS

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

08/20/92

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69712 SAMPLE TYPE: SOIL
SOURCE: HERCULES INC
STATION ID: SB-01

PROG ELEM: NSF COLLECTED BY: C HELM
CITY: HATIESBURG ST: MS
COLLECTION START: 06/24/92 0925 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH62

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
12U	CHLOROMETHANE	12U	1,2-DICHLOROPROPANE
12U	BROMOMETHANE	12U	CIS-1,3-DICHLOROPROPENE
12U	VINYL CHLORIDE	12U	TRICHLOROETHENE(TRICHLOROETHYLENE)
12U	CHLOROETHANE	12U	DIBROMOCHLOROMETHANE
80U	METHYLENE CHLORIDE	12U	1,1,2-TRICHLOROETHANE
50U	ACETONE	12U	BENZENE
12U	CARBON DISULFIDE	12U	TRANS-1,3-DICHLOROPROPENE
12U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	12U	BROMOFORM
12U	1,1-DICHLOROETHANE	12U	METHYL ISOBUTYL KETONE
12U	1,2-DICHLOROETHENE (TOTAL)	12U	METHYL BUTYL KETONE
12U	CHLOROFORM	12U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
12U	1,2-DICHLOROETHANE	12U	1,1,2,2-TETRACHLOROETHANE
12U	METHYL ETHYL KETONE	12U	TOLUENE
12U	1,1,1-TRICHLOROETHANE	12U	CHLOROBENZENE
12U	CARBON TETRACHLORIDE	12U	ETHYL BENZENE
12U	BROMODICHLOROMETHANE	12U	STYRENE
		12U	TOTAL XYLENES
		17	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA. 08/20/92

EXTRACTABLE ORGANICS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69712 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SB-01 COLLECTION START: 06/24/92 0925 STOP: 00/00/00 **
**
** CASE NO.: 18341 SAS NO.: D. NO.: DH62 **
*** ***

UG/KG	ANALYTICAL RESULTS
390U	PHENOL
390U	BIS(2-CHLOROETHYL) ETHER
390U	2-CHLOROPHENOL
390U	1,3-DICHLOROBENZENE
390U	1,4-DICHLOROBENZENE
390U	1,2-DICHLOROBENZENE
390U	2-METHYLPHENOL
390U	2,2'-CHLOROISOPROPYLETHER
390U	(3-AND/OR 4-)METHYLPHENOL
390U	N-NITROSODI-N-PROPYLAMINE
390U	HEXACHLOROETHANE
390U	NITROBENZENE
390U	ISOPHORONE
390U	2-NITROPHENOL
390U	2,4-DIMETHYLPHENOL
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
950U	2,4,5-TRICHLOROPHENOL
390U	2-CHLORONAPHTHALENE
950U	2-NITROANILINE
390U	DIMETHYL PHTHALATE
390U	ACENAPHTHYLENE
390U	2,6-DINITROTOLUENE

UG/KG	ANALYTICAL RESULTS
950U	3-NITROANILINE
390U	ACENAPHTHENE
950U	2,4-DINITROPHENOL
950U	4-NITROPHENOL
390U	DIBENZOFURAN
390U	2,4-DINITROTOLUENE
390U	DIETHYL PHTHALATE
390U	4-CHLOROPHENYL PHENYL ETHER
390U	FLUORENE
950U	4-NITROANILINE
950U	2-METHYL-4,6-DINITROPHENOL
390U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
390U	4-BROMOPHENYL PHENYL ETHER
390U	HEXACHLOROBENZENE (HCB)
950U	PENTACHLOROPHENOL
390U	PHENANTHRENE
390U	ANTHRACENE
390U	CARBAZOLE
390U	DI-N-BUTYLPHTHALATE
390U	FLUORANTHENE
390U	PYRENE
390U	BENZYL BUTYL PHTHALATE
390U	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
17	PERCENT MOISTURE

REMARKS

REMARKS

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

08/20/92

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69712 SAMPLE TYPE: SOIL
SOURCE: HERCULES INC
STATION ID: SB-01
CASE NUMBER: 18341 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: C HELM
CITY: HATIESBURG ST: MS
COLLECTION START: 06/24/92 0925 STOP: 00/00/00
D. NUMBER: DH62

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
2.0U	ALPHA-BHC	20U	METHOXYCHLOR
2.0U	BETA-BHC	3.9U	ENDRIN KETONE
2.0U	DELTA-BHC	3.9U	ENDRIN ALDEHYDE
2.0U	GAMMA-BHC (LINDANE)	--	CHLORDANE (TECH. MIXTURE) /1
2.0U	HEPTACHLOR	2.0U	GAMMA-CHLORDANE /2
2.0U	ALDRIN	2.0U	ALPHA-CHLORDANE /2
2.0U	HEPTACHLOR EPOXIDE	200U	TOXAPHENE
2.0U	ENDOSULFAN I (ALPHA)	39U	PCB-1016 (AROCLOR 1016)
3.9U	DIELDRIN	79U	PCB-1221 (AROCLOR 1221)
3.9U	4,4'-DDE (P,P'-DDE)	39U	PCB-1232 (AROCLOR 1232)
3.9U	ENDRIN	39U	PCB-1242 (AROCLOR 1242)
3.9U	ENDOSULFAN II (BETA)	39U	PCB-1248 (AROCLOR 1248)
3.9U	4,4'-DDD (P,P'-DDD)	39U	PCB-1254 (AROCLOR 1254)
3.9U	ENDOSULFAN SULFATE	39U	PCB-1260 (AROCLOR 1260)
3.9U	4,4'-DDT (P,P'-DDT)	17	PERCENT MOISTURE

REMARKS

REMARKS

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

PURGEABLE ORGANICS DATA REPORT 08/20/92

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69719 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SS-02 COLLECTION START: 06/24/92 1915 STOP: 00/00/00 **
**
** CASE NO.: 18341 SAS NO.: D. NO.: DH69 **
*** ***

UG/KG	ANALYTICAL RESULTS
12U	CHLOROMETHANE
12U	BROMOMETHANE
12U	VINYL CHLORIDE
12U	CHLOROETHANE
60U	METHYLENE CHLORIDE
3000J	ACETONE
12U	CARBON DISULFIDE
12U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)
12U	1,1-DICHLOROETHANE
12U	1,2-DICHLOROETHENE (TOTAL)
12U	CHLOROFORM
12U	1,2-DICHLOROETHANE
80	METHYL ETHYL KETONE
12U	1,1,1-TRICHLOROETHANE
12U	CARBON TETRACHLORIDE
12U	BROMODICHLOROMETHANE

UG/KG	ANALYTICAL RESULTS
12U	1,2-DICHLOROPROPANE
12U	CIS-1,3-DICHLOROPROPENE
12U	TRICHLOROETHENE(TRICHLOROETHYLENE)
12U	DIBROMOCHLOROMETHANE
12U	1,1,2-TRICHLOROETHANE
4J	BENZENE
12U	TRANS-1,3-DICHLOROPROPENE
12U	BROMOFORM
830J	METHYL ISOBUTYL KETONE
12U	METHYL BUTYL KETONE
12U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
12U	1,1,2,2-TETRACHLOROETHANE
2500	TOLUENE
12U	CHLOROBENZENE
4J	ETHYL BENZENE
12U	STYRENE
21	TOTAL XYLENES
17	PERCENT MOISTURE

REMARKS

REMARKS

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

08/20/92

MISCELLANEOUS PURGEABLE ORGANICS - DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69719 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SS-02 COLLECTION START: 06/24/92 1915 STOP: 00/00/00 **
** CASE.NO.: 18341 SAS NO.: D. NO.: DH69 MD NO: DC69 **
** **
*** ***

ANALYTICAL RESULTS UG/KG

30JN	TETRAHYDROFURAN
10JN	METHYLPENTANOL
30JN	CARENE
30JN	DIMETHYLMETHYLENEBICYCLOHEPTANE
20JN	TRIMETHYLBICYCLOHEPTANE
90J	2 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.

EXTRACTABLE ORGANICS DATA REPORT 08/20/92

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69719 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SS-02 COLLECTION START: 06/24/92 1915 STOP: 00/00/00 **
** **
** CASE NO.: 18341 SAS NO.: D. NO.: DH69 **
*** ***

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
1200000U	PHENOL	3000000U	3-NITROANILINE
1200000U	BIS(2-CHLOROETHYL) ETHER	1200000U	ACENAPHTHENE
1200000U	2-CHLOROPHENOL	3000000U	2,4-DINITROPHENOL
1200000U	1,3-DICHLOROBENZENE	3000000U	4-NITROPHENOL
1200000U	1,4-DICHLOROBENZENE	1200000U	DIBENZOFURAN
1200000U	1,2-DICHLOROBENZENE	1200000U	2,4-DINITROTOLUENE
1200000U	2-METHYLPHENOL	1200000U	DIETHYL PHTHALATE
1200000U	2,2'-CHLOROISOPROPYLETHER	1200000U	4-CHLOROPHENYL PHENYL ETHER
1200000U	(3-AND/OR 4-)METHYLPHENOL	1200000U	FLUORENE
1200000U	N-NITROSODI-N-PROPYLAMINE	3000000U	4-NITROANILINE
1200000U	HEXACHLOROETHANE	3000000U	2-METHYL-4,6-DINITROPHENOL
1200000U	NITROBENZENE	1200000U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
1200000U	ISOPHORONE	1200000U	4-BROMOPHENYL PHENYL ETHER
1200000U	2-NITROPHENOL	1200000U	HEXACHLOROBENZENE (HCB)
1200000U	2,4-DIMETHYLPHENOL	3000000U	PENTACHLOROPHENOL
1200000U	BIS(2-CHLOROETHOXY) METHANE	1200000U	PHENANTHRENE
1200000U	2,4-DICHLOROPHENOL	1200000U	ANTHRACENE
1200000U	1,2,4-TRICHLOROBENZENE	1200000U	CARBAZOLE
1200000U	NAPHTHALENE	1200000U	DI-N-BUTYLPHTHALATE
1200000U	4-CHLOROANILINE	1200000U	FLUORANTHENE
1200000U	HEXACHLOROBUTADIENE	1200000U	PYRENE
1200000U	4-CHLORO-3-METHYLPHENOL	1200000U	BENZYL BUTYL PHTHALATE
1200000U	2-METHYLNAPHTHALENE	1200000U	3,3'-DICHLOROBENZIDINE
1200000U	HEXACHLOROCYCLOPENTADIENE (HCCP)	1200000U	BENZO(A)ANTHRACENE
1200000U	2,4,6-TRICHLOROPHENOL	1200000U	CHRYSENE
3000000U	2,4,5-TRICHLOROPHENOL	1200000U	BIS(2-ETHYLHEXYL) PHTHALATE
1200000U	2-CHLORONAPHTHALENE	1200000U	DI-N-OCTYLPHTHALATE
3000000U	2-NITROANILINE	1200000U	BENZO(B AND/OR K)FLUORANTHENE
1200000U	DIMETHYL PHTHALATE	1200000U	BENZO-A-PYRENE
1200000U	ACENAPHTHYLENE	1200000U	INDENO (1,2,3-CD) PYRENE
1200000U	2,6-DINITROTOLUENE	1200000U	DIBENZO(A,H)ANTHRACENE
		1200000U	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.

08/20/92

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

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**   PROJECT NO. 92-0629   SAMPLE NO. 69719  SAMPLE TYPE: SOIL        PROG ELEM: NSF   COLLECTED BY: C HELM                    **
**   SOURCE: HERCULES INC                                             CITY: HATIESBURG               ST: MS                   **
**   STATION ID: SS-02                                                COLLECTION START: 06/24/92  1915   STOP: 00/00/00       **
**   CASE.NO.: 18341          SAS NO.:                                D. NO.: DH69                 MD NO: DC69                **
**                                                                                                                            **
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ANALYTICAL RESULTS UG/KG

9.0E06JN	10 UNIDENTIFIED COMPOUNDS
500000JN	METHYL(METHYLETHENYL)CYCLOHEXENE
500000JN	METHYL(METHYLETHYL)BENZENE
600000JN	TRIMETHYLCYCLOHEXANEMETHANOL
500000JN	TRIMETHYLBICYCLOHEPTANONE
800000JN	ISOBORNEOL
1.0E07JN	TRIMETHYLCYCLOHEENEMETHANOL
700000JN	PROPYLPHENOL
2.0E07JN	TERPIN HYDRATE
700000JN	OXYBISBENZENE
*	OCTAHYDRODIMETHYL(METHYLETHYL)PHENANTHRENE
1+E06JN	CARBOXYLIC ACID, METHYLESTER

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.

08/20/92

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69719 SAMPLE TYPE: SOIL
SOURCE: HERCULES INC
STATION ID: SS-02
CASE NUMBER: 18341 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: C HELM
CITY: HATIESBURG ST: MS
COLLECTION START: 06/24/92 1915 STOP: 00/00/00
D. NUMBER: DH69

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
40U	ALPHA-BHC	400U	METHOXYCHLOR
60U	BETA-BHC	100U	ENDRIN KETONE
40U	DELTA-BHC	340N	ENDRIN ALDEHYDE
40U	GAMMA-BHC (LINDANE)	--	CHLORDANE (TECH. MIXTURE) /1
40U	HEPTACHLOR	40U	GAMMA-CHLORDANE /2
40U	ALDRIN	40U	ALPHA-CHLORDANE /2
40U	HEPTACHLOR EPOXIDE	4000U	TOXAPHENE
40U	ENDOSULFAN I (ALPHA)	780U	PCB-1016 (AROCLOR 1016)
78U	DIELDRIN	1600U	PCB-1221 (AROCLOR 1221)
78U	4,4'-DDE (P,P'-DDE)	780U	PCB-1232 (AROCLOR 1232)
78U	ENDRIN	780U	PCB-1242 (AROCLOR 1242)
140U	ENDOSULFAN II (BETA)	780U	PCB-1248 (AROCLOR 1248)
78U	4,4'-DDD (P,P'-DDD)	780U	PCB-1254 (AROCLOR 1254)
390N	ENDOSULFAN SULFATE	780U	PCB-1260 (AROCLOR 1260)
78U	4,4'-DDT (P,P'-DDT)	17	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES

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

08/20/92

PURGEABLE ORGANICS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69720 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SS-03 COLLECTION START: 06/25/92 0725 STOP: 00/00/00 **
** **
** CASE NO.: 18341 SAS NO.: D. NO.: DH70 **
*** ***

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
13U	CHLOROMETHANE	13U	1,2-DICHLOROPROPANE
13U	BROMOMETHANE	13U	CIS-1,3-DICHLOROPROPENE
13U	VINYL CHLORIDE	13U	TRICHLOROETHENE(TRICHLOROETHYLENE)
13U	CHLOROETHANE	13U	DIBROMOCHLOROMETHANE
130U	METHYLENE CHLORIDE	13U	1,1,2-TRICHLOROETHANE
210U	ACETONE	13U	BENZENE
13U	CARBON DISULFIDE	13U	TRANS-1,3-DICHLOROPROPENE
13U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	13U	BROMOFORM
13U	1,1-DICHLOROETHANE	13U	METHYL ISOBUTYL KETONE
13U	1,2-DICHLOROETHENE (TOTAL)	13U	METHYL BUTYL KETONE
13U	CHLOROFORM	13U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
13U	1,2-DICHLOROETHANE	13U	1,1,2,2-TETRACHLOROETHANE
23	METHYL ETHYL KETONE	46	TOLUENE
13U	1,1,1-TRICHLOROETHANE	13U	CHLOROBENZENE
13U	CARBON TETRACHLORIDE	13U	ETHYL BENZENE
13U	BROMODICHLOROMETHANE	13U	STYRENE
		13U	TOTAL XYLENES
		22	PERCENT MOISTURE

REMARKS ***REMARKS***

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

08/20/92

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69720 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: SS-03 COLLECTION START: 06/25/92 0725 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH70

UG/KG	ANALYTICAL RESULTS
4200U	PHENOL
4200U	BIS(2-CHLOROETHYL) ETHER
4200U	2-CHLOROPHENOL
4200U	1,3-DICHLOROBENZENE
4200U	1,4-DICHLOROBENZENE
4200U	1,2-DICHLOROBENZENE
4200U	2-METHYLPHENOL
4200U	2,2'-CHLOROISOPROPYLETHER
4200U	(3-AND/OR 4-)METHYLPHENOL
4200U	N-NITROSODI-N-PROPYLAMINE
4200U	HEXACHLOROETHANE
4200U	NITROBENZENE
4200U	ISOPHORONE
4200U	2-NITROPHENOL
4200U	2,4-DIMETHYLPHENOL
4200U	BIS(2-CHLOROETHOXY) METHANE
4200U	2,4-DICHLOROPHENOL
4200U	1,2,4-TRICHLOROBENZENE
4200U	NAPHTHALENE
4200U	4-CHLOROANILINE
4200U	HEXACHLOROBUTADIENE
4200U	4-CHLORO-3-METHYLPHENOL
4200U	2-METHYLNAPHTHALENE
4200U	HEXACHLOROCYCLOPENTADIENE (HCCP)
4200U	2,4,6-TRICHLOROPHENOL
10000U	2,4,5-TRICHLOROPHENOL
4200U	2-CHLORONAPHTHALENE
10000U	2-NITROANILINE
4200U	DIMETHYL PHTHALATE
4200U	ACENAPHTHYLENE
4200U	2,6-DINITROTOLUENE

UG/KG	ANALYTICAL RESULTS
10000U	3-NITROANILINE
4200U	ACENAPHTHENE
10000U	2,4-DINITROPHENOL
10000U	4-NITROPHENOL
4200U	DIBENZOFURAN
4200U	2,4-DINITROTOLUENE
4200U	DIETHYL PHTHALATE
4200U	4-CHLOROPHENYL PHENYL ETHER
4200U	FLUORENE
10000U	4-NITROANILINE
10000U	2-METHYL-4,6-DINITROPHENOL
4200U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
4200U	4-BROMOPHENYL PHENYL ETHER
4200U	HEXACHLOROBENZENE (HCB)
10000U	PENTACHLOROPHENOL
4200U	PHENANTHRENE
4200U	ANTHRACENE
4200U	CARBAZOLE
4200U	DI-N-BUTYLPHTHALATE
4200U	FLUORANTHENE
4200U	PYRENE
4200U	BENZYL BUTYL PHTHALATE
4200U	3,3'-DICHLOROBENZIDINE
4200U	BENZO(A)ANTHRACENE
4200U	CHRYSENE
4200U	BIS(2-ETHYLHEXYL) PHTHALATE
4200U	DI-N-OCTYLPHTHALATE
4200U	BENZO(B AND/OR K)FLUORANTHENE
4200U	BENZO-A-PYRENE
4200U	INDENO (1,2,3-CD) PYRENE
4200U	DIBENZO(A,H)ANTHRACENE
4200U	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
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/20/92

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69720 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SS-03 COLLECTION START: 06/25/92 0725 STOP: 00/00/00 **
** CASE.NO.: 18341 SAS NO.: D. NO.: DH70 MD NO: DC70 **
** **
*** ***

ANALYTICAL RESULTS UG/KG

*	OCTAHYDRODIMETHYL(METHYLETHYL)PHENANTHRENE
40000JN	CARBOXALDEHYDE
20000JN	TETRAMETHYLPHENANTHRENE
*	OCTAHYDRODIMETHYL(METHYLETHYL)PHENANTHRENE
90000JN	C CARBOXYLIC ACID, METHYLESTER
*	OCTAHYDRODIMETHYL(METHYLETHYL)PHENANTHRENE
10000JN	CARBOXYLIC ACID
500000J	16 UNIDENTIFIED COMPOUNDS

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

08/20/92

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69720 SAMPLE TYPE: SOIL
SOURCE: HERCULES INC
STATION ID: SS-03
CASE NUMBER: 18341 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: C HELM
CITY: HATIESBURG ST: MS
COLLECTION START: 06/25/92 0725 STOP: 00/00/00
D. NUMBER: DH70

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
2.2U	ALPHA-BHC	60U	METHOXYCHLOR
2.2U	BETA-BHC	67	ENDRIN KETONE
2.2U	DELTA-BHC	4.2U	ENDRIN ALDEHYDE
2.2U	GAMMA-BHC (LINDANE)	—	CHLORDANE (TECH. MIXTURE) /1
2.2U	HEPTACHLOR	2.4U	GAMMA-CHLORDANE /2
2.2U	ALDRIN	2.2U	ALPHA-CHLORDANE /2
4.6	HEPTACHLOR EPOXIDE	220U	TOXAPHENE
2.2U	ENDOSULFAN I (ALPHA)	42U	PCB-1016 (AROCLOR 1016)
4.2U	DIELDRIN	86U	PCB-1221 (AROCLOR 1221)
4.2U	4,4'-DDE (P,P'-DDE)	42U	PCB-1232 (AROCLOR 1232)
4.2U	ENDRIN	42U	PCB-1242 (AROCLOR 1242)
4.2U	ENDOSULFAN II (BETA)	42U	PCB-1248 (AROCLOR 1248)
4.2U	4,4'-DDD (P,P'-DDD)	42U	PCB-1254 (AROCLOR 1254)
70U	ENDOSULFAN SULFATE	42U	PCB-1260 (AROCLOR 1260)
4.2U	4,4'-DDT (P,P'-DDT)	22	PERCENT MOISTURE

REMARKS

REMARKS

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

08/20/92

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69721 SAMPLE TYPE: SOIL
SOURCE: HERCULES INC
STATION ID: SS-04

PROG ELEM: NSF COLLECTED BY: C HELM
CITY: HATIESBURG ST: MS
COLLECTION START: 06/25/92 0845 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH71

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
10U	CHLOROMETHANE	10U	1,2-DICHLOROPROPANE
10U	BROMOMETHANE	10U	CIS-1,3-DICHLOROPROPENE
10U	VINYL CHLORIDE	10U	TRICHLOROETHENE(TRICHLOROETHYLENE)
10U	CHLOROETHANE	10U	DIBROMOCHLOROMETHANE
60U	METHYLENE CHLORIDE	10U	1,1,2-TRICHLOROETHANE
60U	ACETONE	10U	BENZENE
10U	CARBON DISULFIDE	10U	TRANS-1,3-DICHLOROPROPENE
10U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	10U	BROMOFORM
10U	1,1-DICHLOROETHANE	10U	METHYL ISOBUTYL KETONE
10U	1,2-DICHLOROETHENE (TOTAL)	10U	METHYL BUTYL KETONE
10U	CHLOROFORM	10U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
10U	1,2-DICHLOROETHANE	10U	1,1,2,2-TETRACHLOROETHANE
10U	METHYL ETHYL KETONE	6J	TOLUENE
10U	1,1,1-TRICHLOROETHANE	10U	CHLOROBENZENE
10U	CARBON TETRACHLORIDE	10U	ETHYL BENZENE
10U	BROMODICHLOROMETHANE	10U	STYRENE
		10U	TOTAL XYLENES
		2	PERCENT MOISTURE

REMARKS

REMARKS

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

08/20/92

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69721 SAMPLE TYPE: SOIL
SOURCE: HERCULES INC
STATION ID: SS-04

PROG ELEM: NSF COLLECTED BY: C HELM
CITY: HATIESBURG ST: MS
COLLECTION START: 06/25/92 0845 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH71

UG/KG	ANALYTICAL RESULTS
330U	PHENOL
330U	BIS(2-CHLOROETHYL) ETHER
330U	2-CHLOROPHENOL
330U	1,3-DICHLOROBENZENE
330U	1,4-DICHLOROBENZENE
330U	1,2-DICHLOROBENZENE
330U	2-METHYLPHENOL
330U	2,2'-CHLOROISOPROPYLETHER
330U	(3-AND/OR 4-)METHYLPHENOL
330U	N-NITROSODI-N-PROPYLAMINE
330U	HEXACHLOROETHANE
330U	NITROBENZENE
330U	ISOPHORONE
330U	2-NITROPHENOL
330U	2,4-DIMETHYLPHENOL
330U	BIS(2-CHLOROETHOXY) METHANE
330U	2,4-DICHLOROPHENOL
330U	1,2,4-TRICHLOROBENZENE
330U	NAPHTHALENE
330U	4-CHLOROANILINE
330U	HEXACHLOROBUTADIENE
330U	4-CHLORO-3-METHYLPHENOL
330U	2-METHYLNAPHTHALENE
330U	HEXACHLOROCYCLOPENTADIENE (HCCP)
330U	2,4,6-TRICHLOROPHENOL
810U	2,4,5-TRICHLOROPHENOL
330U	2-CHLORONAPHTHALENE
810U	2-NITROANILINE
330U	DIMETHYL PHTHALATE
330U	ACENAPHTHYLENE
330U	2,6-DINITROTOLUENE

UG/KG	ANALYTICAL RESULTS
810U	3-NITROANILINE
330U	ACENAPHTHENE
810U	2,4-DINITROPHENOL
810U	4-NITROPHENOL
330U	DIBENZOFURAN
330U	2,4-DINITROTOLUENE
330U	DIETHYL PHTHALATE
330U	4-CHLOROPHENYL PHENYL ETHER
330U	FLUORENE
810U	4-NITROANILINE
810U	2-METHYL-4,6-DINITROPHENOL
330U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
330U	4-BROMOPHENYL PHENYL ETHER
330U	HEXACHLOROBENZENE (HCB)
810U	PENTACHLOROPHENOL
48J	PHENANTHRENE
330U	ANTHRACENE
330U	CARBAZOLE
330U	DI-N-BUTYLPHTHALATE
330U	FLUORANTHENE
330U	PYRENE
330U	BENZYL BUTYL PHTHALATE
330U	3,3'-DICHLOROBENZIDINE
330U	BENZO(A)ANTHRACENE
330U	CHRYSENE
330U	BIS(2-ETHYLHEXYL) PHTHALATE
330U	DI-N-OCTYLPHTHALATE
330U	BENZO(B AND/OR K)FLUORANTHENE
330U	BENZO-A-PYRENE
330U	INDENO (1,2,3-CD) PYRENE
330U	DIBENZO(A,H)ANTHRACENE
330U	BENZO(GHI)PERYLENE
2	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.
08/20/92

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

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**   PROJECT NO. 92-0629   SAMPLE NO. 69721   SAMPLE TYPE: SOIL        PROG ELEM: NSF   COLLECTED BY: C HELM                      **
**   SOURCE: HERCULES INC                                              CITY: HATIESBURG           ST: MS                           **
**   STATION ID: SS-04                                                 COLLECTION START: 06/25/92  0845   STOP: 00/00/00           **
**   CASE.NO.: 18341          SAS NO.:                                 D. NO.: DH71                MD NO: DC71                     **
**                                                                                                                                 **
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ANALYTICAL RESULTS UG/KG

10000J	18 UNIDENTIFIED COMPOUNDS
*	OCTAHYDRODIMETHYL(METHYLETHYL)PHENANTHRENE
2000JN	CARBOXYLIC ACID, METHYLESTER

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

08/20/92

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69721 SAMPLE TYPE: SOIL
SOURCE: HERCULES INC
STATION ID: SS-04
CASE NUMBER: 18341 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: C HELM
CITY: HATIESBURG ST: MS
COLLECTION START: 06/25/92 0845 STOP: 00/00/00
D. NUMBER: DH71

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
1.7U	ALPHA-BHC	17U	METHOXYCHLOR
1.7U	BETA-BHC	3.4U	ENDRIN KETONE
1.7U	DELTA-BHC	5.0U	ENDRIN ALDEHYDE
1.7U	GAMMA-BHC (LINDANE)	--	CHLORDANE (TECH. MIXTURE) /1
1.7U	HEPTACHLOR	1.7U	GAMMA-CHLORDANE /2
1.7U	ALDRIN	1.7U	ALPHA-CHLORDANE /2
1.7U	HEPTACHLOR EPOXIDE	170U	TOXAPHENE
1.7U	ENDOSULFAN I (ALPHA)	34U	PCB-1016 (AROCLOR 1016)
3.4U	DIELDRIN	68U	PCB-1221 (AROCLOR 1221)
3.4U	4,4'-DDE (P,P'-DDE)	34U	PCB-1232 (AROCLOR 1232)
3.4U	ENDRIN	34U	PCB-1242 (AROCLOR 1242)
3.4U	ENDOSULFAN II (BETA)	34U	PCB-1248 (AROCLOR 1248)
3.4U	4,4'-DDD (P,P'-DDD)	810	PCB-1254 (AROCLOR 1254)
3.4U	ENDOSULFAN SULFATE	34U	PCB-1260 (AROCLOR 1260)
3.4U	4,4'-DDT (P,P'-DDT)	2	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.

08/20/92

PURGEABLE ORGANICS DATA REPORT

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PROJECT NO. 92-0629 SAMPLE NO. 69722 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: SS-05 COLLECTION START: 06/25/92 0945 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH72

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
11U	CHLOROMETHANE	11U	1,2-DICHLOROPROPANE
11U	BROMOMETHANE	11U	CIS-1,3-DICHLOROPROPENE
11U	VINYL CHLORIDE	11U	TRICHLOROETHENE(TRICHLOROETHYLENE)
11U	CHLOROETHANE	11U	DIBROMOCHLOROMETHANE
30U	METHYLENE CHLORIDE	11U	1,1,2-TRICHLOROETHANE
30U	ACETONE	11U	BENZENE
11U	CARBON DISULFIDE	11U	TRANS-1,3-DICHLOROPROPENE
11U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	11U	BROMOFORM
11U	1,1-DICHLOROETHANE	11U	METHYL ISOBUTYL KETONE
11U	1,2-DICHLOROETHENE (TOTAL)	11U	METHYL BUTYL KETONE
11U	CHLOROFORM	11U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
11U	1,2-DICHLOROETHANE	11U	1,1,2,2-TETRACHLOROETHANE
11U	METHYL ETHYL KETONE	11U	TOLUENE
11U	1,1,1-TRICHLOROETHANE	11U	CHLOROBENZENE
11U	CARBON TETRACHLORIDE	11U	ETHYL BENZENE
11U	BROMODICHLOROMETHANE	11U	STYRENE
		11U	TOTAL XYLENES
		6	PERCENT MOISTURE

REMARKS

REMARKS

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

08/20/92

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69722 SAMPLE TYPE: SOIL
SOURCE: HERCULES INC
STATION ID: SS-05

PROG ELEM: NSF COLLECTED BY: C HELM
CITY: HATIESBURG ST: MS
COLLECTION START: 06/25/92 0945 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH72

UG/KG	ANALYTICAL RESULTS
350U	PHENOL
350U	BIS(2-CHLOROETHYL) ETHER
350U	2-CHLOROPHENOL
350U	1,3-DICHLOROBENZENE
350U	1,4-DICHLOROBENZENE
350U	1,2-DICHLOROBENZENE
350U	2-METHYLPHENOL
350U	2,2'-CHLOROISOPROPYLETHER
350U	(3-AND/OR 4-)METHYLPHENOL
350U	N-NITROSODI-N-PROPYLAMINE
350U	HEXACHLOROETHANE
350U	NITROBENZENE
350U	ISOPHORONE
350U	2-NITROPHENOL
350U	2,4-DIMETHYLPHENOL
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
840U	2,4,5-TRICHLOROPHENOL
350U	2-CHLORONAPHTHALENE
840U	2-NITROANILINE
350U	DIMETHYL PHTHALATE
350U	ACENAPHTHYLENE
350U	2,6-DINITROTOLUENE

UG/KG	ANALYTICAL RESULTS
840U	3-NITROANILINE
350U	ACENAPHTHENE
840U	2,4-DINITROPHENOL
840U	4-NITROPHENOL
350U	DIBENZOFURAN
350U	2,4-DINITROTOLUENE
350U	DIETHYL PHTHALATE
350U	4-CHLOROPHENYL PHENYL ETHER
350U	FLUORENE
840U	4-NITROANILINE
840U	2-METHYL-4,6-DINITROPHENOL
350U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
350U	4-BROMOPHENYL PHENYL ETHER
350U	HEXACHLOROBENZENE (HCB)
840U	PENTACHLOROPHENOL
350U	PHENANTHRENE
350U	ANTHRACENE
350U	CARBAZOLE
350U	DI-N-BUTYLPHTHALATE
350U	FLUORANTHENE
350U	PYRENE
350U	BENZYL BUTYL PHTHALATE
350U	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
6	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.
08/20/92

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69722 SAMPLE TYPE: SOIL	PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC	CITY: HATIESBURG ST: MS
STATION ID: SS-05	COLLECTION START: 06/25/92 0945 STOP: 00/00/00
CASE.NO.: 18341 SAS NO.:	D. NO.: DH72 MD NO: DC72

ANALYTICAL RESULTS UG/KG

*	OCTAHYDRODIMETHYL(METHYLETHYL)PHENANTHRENE
400JN	CARBOXYLIC ACID, METHYLESTER
4000J	4 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.

08/20/92

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69722 SAMPLE TYPE: SOIL
PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC
CITY: HATIESBURG ST: MS
STATION ID: SS-05
COLLECTION START: 06/25/92 0945 STOP: 00/00/00
CASE NUMBER: 18341 SAS NUMBER:
D. NUMBER: DH72

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
1.8U	ALPHA-BHC	18U	METHOXYCHLOR
1.8U	BETA-BHC	3.5U	ENDRIN KETONE
1.8U	DELTA-BHC	3.5U	ENDRIN ALDEHYDE
1.8U	GAMMA-BHC (LINDANE)	--	CHLORDANE (TECH. MIXTURE) /1
1.8U	HEPTACHLOR	1.8U	GAMMA-CHLORDANE /2
1.8U	ALDRIN	1.8U	ALPHA-CHLORDANE /2
1.8U	HEPTACHLOR EPOXIDE	180U	TOXAPHENE
1.8U	ENDOSULFAN I (ALPHA)	35U	PCB-1016 (AROCLOR 1016)
3.5U	DIELDRIN	71U	PCB-1221 (AROCLOR 1221)
3.5U	4,4'-DDE (P,P'-DDE)	35U	PCB-1232 (AROCLOR 1232)
3.5U	ENDRIN	35U	PCB-1242 (AROCLOR 1242)
3.5U	ENDOSULFAN II (BETA)	35U	PCB-1248 (AROCLOR 1248)
3.5U	4,4'-DDD (P,P'-DDD)	35U	PCB-1254 (AROCLOR 1254)
3.5U	ENDOSULFAN SULFATE	35U	PCB-1260 (AROCLOR 1260)
3.5U	4,4'-DDT (P,P'-DDT)	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
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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.

08/20/92

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69723 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: SB-05 COLLECTION START: 06/25/92 0955 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH73

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
12U	CHLOROMETHANE	12U	1,2-DICHLOROPROPANE
12U	BROMOMETHANE	12U	CIS-1,3-DICHLOROPROPENE
12U	VINYL CHLORIDE	12U	TRICHLOROETHENE(TRICHLOROETHYLENE)
12U	CHLOROETHANE	12U	DIBROMOCHLOROMETHANE
30U	METHYLENE CHLORIDE	12U	1,1,2-TRICHLOROETHANE
30U	ACETONE	12U	BENZENE
12U	CARBON DISULFIDE	12U	TRANS-1,3-DICHLOROPROPENE
12U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	12U	BROMOFORM
12U	1,1-DICHLOROETHANE	12U	METHYL ISOBUTYL KETONE
12U	1,2-DICHLOROETHENE (TOTAL)	12U	METHYL BUTYL KETONE
12U	CHLOROFORM	12U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
12U	1,2-DICHLOROETHANE	12U	1,1,2,2-TETRACHLOROETHANE
12U	METHYL ETHYL KETONE	12U	TOLUENE
12U	1,1,1-TRICHLOROETHANE	12U	CHLOROBENZENE
12U	CARBON TETRACHLORIDE	12U	ETHYL BENZENE
12U	BROMODICHLOROMETHANE	12U	STYRENE
		2J	TOTAL XYLENES
		18	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.

08/20/92

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69723 SAMPLE TYPE: SOIL
SOURCE: HERCULES INC
STATION ID: SB-05

PROG ELEM: NSF COLLECTED BY: C HELM
CITY: HATIESBURG ST: MS
COLLECTION START: 06/25/92 0955 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH73

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

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

08/20/92

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69723 SAMPLE TYPE: SOIL
SOURCE: HERCULES INC
STATION ID: SB-05
CASE NUMBER: 18341 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: C HELM
CITY: HATIESBURG ST: MS
COLLECTION START: 06/25/92 0955 STOP: 00/00/00
D. NUMBER: DH73

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

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

REMARKS

REMARKS

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*C-CONFIRMED BY GCMS 1. WHEN NO VALUE IS REPORTED, SEE CHLORDANE CONSTITUENTS.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region IV
Environmental Services Division
College Station Road, Athens, Ga. 30613

*****MEMORANDUM******

DATE: 08/11/92

SUBJECT: Results of Metals Analysis;
92-0629 HERCULES INC
HATIESBURG MS
CASE NO: 18341

FROM: Robert W. Knight Gary Bennett/for
Chief, Laboratory Evaluation/Quality Assurance Section

TO: JOE SLYKERMAN

Attached are the results of analysis of samples collected as part of the subject project.

As a result of the Quality Assurance Review, certain data qualifiers may have been placed on the data. Attached is a DATA QUALIFIER REPORT which explains the reasons that these qualifiers were required.

If you have any questions please contact me.

ATTACHMENT

INORGANIC DATA QUALIFIERS REPORT

Case Number: 18341
Project Number: 92-0629
Site: Hercules, Inc., Hattiesburg, MS

Element	Flag	Samples Affected	Reason
A. Water			
Sb, Pb, Mn, Ag, Zn	U	All positives > IDL, but < CRDL	Baseline instability
Al, Fe, Na	U	All positives > IDL, but < 10X contaminant level	Positives in blanks
Sb	J	All with Al or Fe concentrations in solution > 84, 000 ug/L	Suspected over correction as noted in the contractor ICS
Cu	JN	All positives with Fe concentrations in solution > 94,000 ug/L	Suspected positive interference as noted in the contractor ICS
Ag	J	All	Matrix spike recovery = 68%
Tl	J	All	Matrix spike recovery = 43.8%
Pb	J	All	Matrix duplicate RPD = 185.6%
All Metals	J	MDDC74	Sample improperly preserved
Cd	J	MDDC74	% RSD > 20% for ICP multiple exposures
B. Soil			
Sb, Pb, Mn, Ag, Zn	U	All positives > IDL, but < CRDL	Baseline instability
Al, Fe	U	All positives > IDL, but < 10X contaminant level	Positives in blanks
Sb	J	All with Al or Fe concentrations in solution > 160, 000 ug/L	Suspected over correction as noted in the contractor ICS
Cr	J R	All positives All negatives	Matrix spike recovery = -56.1% Matrix duplicate RPD = 180.6%
Mn	J R	All positives All negatives	Matrix spike recovery =-149.2% Matrix duplicate RPD = 99.5%
Zn	J R	All positives All negatives	Matrix spike recovery = -19.4% Matrix duplicate RPD = 156%
Al	J	All	Matrix duplicate RPD = 70.8%
Ba	J	All	Matrix duplicate RPD = 100.6%
Fe	J	All	Matrix duplicate RPD = 100.4%
Pb	J	All	Matrix duplicate RPD = 185.2%
Co	J	MDDC73	% RSD > 20% for ICP multiple exposures

INORGANIC DATA QUALIFIERS REPORT (continued)

Case Number: 18341
Project Number: 92-0629
Site: Hercules, Inc., Hattiesburg, MS

Element	Flag	Samples Affected	Reason
K	J	MDDC62	% RSD > 20% for ICP multiple exposures

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

08/10/92

METALS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69710 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: TB-01 COLLECTION START: 06/24/92 0725 STOP: 00/00/00 **
** CASE NUMBER: 18341 SAS NUMBER: MD NUMBER: DC60 **
** **
*** ***

UG/L	ANALYTICAL RESULTS
120U	ALUMINUM
14U	ANTIMONY
4U	ARSENIC
14U	BARIUM
1U	BERYLLIUM
2U	CADMIUM
400U	CALCIUM
3U	CHROMIUM
6U	COBALT
6U	COPPER
40U	IRON
2UJ	LEAD
390U	MAGNESIUM

UG/L	ANALYTICAL RESULTS
2U	MANGANESE
.20U	MERCURY
8U	NICKEL
400U	POTASSIUM
2U	SELENIUM
3UJ	SILVER
500U	SODIUM
3UJ	THALLIUM
NA	TIN
4U	VANADIUM
3U	ZINC

REMARKS

REMARKS

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

08/10/92

METALS DATA REPORT

*** ***

** PROJECT NO. 92-0629 SAMPLE NO. 69711 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SS-01 COLLECTION START: 06/24/92 0855 STOP: 00/00/00 **
** CASE NUMBER: 18341 SAS NUMBER: MD NUMBER: DC61 **

*** ***

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
3900J	ALUMINUM	230J	MANGANESE
8.5U	ANTIMONY	.17	MERCURY
3.7	ARSENIC	1.5U	NICKEL
88J	BARIUM	140	POTASSIUM
.39	BERYLLIUM	1U	SELENIUM
.65U	CADMIUM	1.7U	SILVER
990	CALCIUM	180U	SODIUM
5.1J	CHROMIUM	.65U	THALLIUM
1.5	COBALT	NA	TIN
20	COPPER	15	VANADIUM
9000J	IRON	110J	ZINC
39J	LEAD	08	PERCENT MOISTURE
180	MAGNESIUM		

REMARKS

REMARKS

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

08/10/92

METALS DATA REPORT

*** ***

** PROJECT NO. 92-0629 SAMPLE NO. 69712 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SB-01 COLLECTION START: 06/24/92 0925 STOP: 00/00/00 **
** CASE NUMBER: 18341 SAS NUMBER: MD NUMBER: DC62 **

*** ***

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
1800J	ALUMINUM	3UJ	MANGANESE
9.5U	ANTIMONY	.12U	MERCURY
.98U	ARSENIC	1.7U	NICKEL
9.1J	BARIUM	87J	POTASSIUM
.24U	BERYLLIUM	.49U	SELENIUM
.73U	CADMIUM	2U	SILVER
96	CALCIUM	210U	SODIUM
4.6J	CHROMIUM	.73U	THALLIUM
1.2U	COBALT	NA	TIN
2.2U	COPPER	4.1	VANADIUM
1100J	IRON	3UJ	ZINC
2.5J	LEAD	18	PERCENT MOISTURE
84	MAGNESIUM		

REMARKS ***REMARKS***

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

08/10/92

METALS DATA REPORT

*** ***

** PROJECT NO. 92-0629 SAMPLE NO. 69713 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: TW-01 COLLECTION START: 06/24/92 1045 STOP: 00/00/00 **
** CASE NUMBER: 18341 SAS NUMBER: MD NUMBER: DC63 **

*** ***

UG/L	ANALYTICAL RESULTS
36000	ALUMINUM
14U	ANTIMONY
4U	ARSENIC
1800	BARIUM
11	BERYLLIUM
2U	CADMIUM
24000	CALCIUM
94	CHROMIUM
19	COBALT
23	COPPER
15000	IRON
380J	LEAD
9000	MAGNESIUM

UG/L	ANALYTICAL RESULTS
300	MANGANESE
.45	MERCURY
39	NICKEL
3200	POTASSIUM
20U	SELENIUM
3UJ	SILVER
21000	SODIUM
3UJ	THALLIUM
NA	TIN
160	VANADIUM
160	ZINC

REMARKS

REMARKS

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

08/10/92

METALS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69714 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SD-01 COLLECTION START: 06/24/92 1620 STOP: 00/00/00 **
** CASE NUMBER: 18341 SAS NUMBER: MD NUMBER: DC64 **
** **
*** ***

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
2500J	ALUMINUM	460J	MANGANESE
20U	ANTIMONY	.13U	MERCURY
2.7	ARSENIC	1.8U	NICKEL
82J	BARIUM	240	POTASSIUM
.39	BERYLLIUM	.52U	SELENIUM
.78U	CADMIUM	2.1U	SILVER
880	CALCIUM	220U	SODIUM
83J	CHROMIUM	.78U	THALLIUM
6.8	COBALT	NA	TIN
3.6	COPPER	5.6	VANADIUM
10000J	IRON	160J	ZINC
350J	LEAD	23	PERCENT MOISTURE
380	MAGNESIUM		

REMARKS

REMARKS

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

08/10/92

METALS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69715 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SW-01 COLLECTION START: 06/24/92 1610 STOP: 00/00/00 **
** CASE NUMBER: 18341 SAS NUMBER: MD NUMBER: DC65 **
** **
*** ***

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
170U	ALUMINUM	24	MANGANESE
14U	ANTIMONY	.20U	MERCURY
4U	ARSENIC	8U	NICKEL
51	BARIUM	2000	POTASSIUM
1U	BERYLLIUM	2U	SELENIUM
2U	CADMIUM	3UJ	SILVER
10000	CALCIUM	14000	SODIUM
3U	CHROMIUM	3UJ	THALLIUM
6U	COBALT	NA	TIN
6U	COPPER	4U	VANADIUM
350	IRON	9U	ZINC
4J	LEAD		
2000	MAGNESIUM		

REMARKS

REMARKS

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

08/10/92

METALS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69716 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SW-2 COLLECTION START: 06/24/92 1700 STOP: 00/00/00 **
** CASE NUMBER: 18341 SAS NUMBER: MD NUMBER: DC66 **
** **
*** ***

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
200U	ALUMINUM	1400	MANGANESE
14U	ANTIMONY	.20U	MERCURY
4U	ARSENIC	18	NICKEL
160	BARIUM	5000	POTASSIUM
1U	BERYLLIUM	2U	SELENIUM
2U	CADMIUM	3UJ	SILVER
33000	CALCIUM	29000	SODIUM
3U	CHROMIUM	3UJ	THALLIUM
6U	COBALT	NA	TIN
7	COPPER	4U	VANADIUM
4800	IRON	28	ZINC
3J	LEAD		
6500	MAGNESIUM		

REMARKS ***REMARKS***

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

08/10/92

METALS DATA REPORT

PROJECT NO. 92-0629   SAMPLE NO. 69717   SAMPLE TYPE: SOIL   PROG ELEM: NSF   COLLECTED BY: C HELM
SOURCE: HERCULES INC   CITY: HATIESBURG   ST: MS
STATION ID: SD-02   COLLECTION START: 06/24/92 1730   STOP: 00/00/00
CASE NUMBER: 18341   SAS NUMBER: MD NUMBER: DC67

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
1900J	ALUMINUM	290J	MANGANESE
11U	ANTIMONY	.14U	MERCURY
11	ARSENIC	2U	NICKEL
66J	BARIUM	210	POTASSIUM
.38	BERYLLIUM	.57U	SELENIUM
.85U	CADMIUM	2.3U	SILVER
1900	CALCIUM	230	SODIUM
4.7J	CHROMIUM	.85U	THALLIUM
1.4U	COBALT	NA	TIN
3.8	COPPER	11	VANADIUM
24000J	IRON	19J	ZINC
11J	LEAD	29	PERCENT MOISTURE
320	MAGNESIUM		

REMARKS

REMARKS

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

08/10/92

METALS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69718 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SD-03 COLLECTION START: 06/24/92 1815 STOP: 00/00/00 **
** CASE NUMBER: 18341 SAS NUMBER: MD NUMBER: DC68 **
**   **
*** ***

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
20000J	ALUMINUM	140J	MANGANESE
20U	ANTIMONY	.26	MERCURY
33	ARSENIC	350	NICKEL
100J	BARIUM	140	POTASSIUM
.70	BERYLLIUM	.58U	SELENIUM
1.4	CADMIUM	2.3U	SILVER
4600	CALCIUM	240U	SODIUM
110J	CHROMIUM	.87U	THALLIUM
27	COBALT	NA	TIN
95	COPPER	14	VANADIUM
17000J	IRON	2400J	ZINC
100J	LEAD	31	PERCENT MOISTURE
190	MAGNESIUM		

REMARKS ***REMARKS***

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

METALS DATA REPORT 08/10/92

*** ***

** PROJECT NO. 92-0629 SAMPLE NO. 69719 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SS-02 COLLECTION START: 06/24/92 1915 STOP: 00/00/00 **
** CASE NUMBER: 18341 SAS NUMBER: MD NUMBER: DC69 **
** **

*** ***

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
1700J	ALUMINUM	170J	MANGANESE
9.3U	ANTIMONY	.35	MERCURY
2.8	ARSENIC	460	NICKEL
80J	BARIUM	240	POTASSIUM
.24U	BERYLLIUM	.47U	SELENIUM
2.4	CADMIUM	1.9U	SILVER
3100	CALCIUM	960	SODIUM
12J	CHROMIUM	.71U	THALLIUM
260	COBALT	NA	TIN
820	COPPER	5.2	VANADIUM
9600J	IRON	390J	ZINC
370J	LEAD	16	PERCENT MOISTURE
1200	MAGNESIUM		

REMARKS ***REMARKS***

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

08/10/92

METALS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69720 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SS-03 COLLECTION START: 06/25/92 0725 STOP: 00/00/00 **
** CASE NUMBER: 18341 SAS NUMBER: MD NUMBER: DC70 **
** **
*** ***

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
4000J	ALUMINUM	92J	MANGANESE
10U	ANTIMONY	.13U	MERCURY
2U	ARSENIC	1.8U	NICKEL
26J	BARIUM	130	POTASSIUM
.26U	BERYLLIUM	.51U	SELENIUM
.77U	CADMIUM	2.1U	SILVER
1100	CALCIUM	220U	SODIUM
5.1J	CHROMIUM	.77U	THALLIUM
1.3U	COBALT	NA	TIN
7.1	COPPER	10	VANADIUM
5100J	IRON	16J	ZINC
22J	LEAD	22	PERCENT MOISTURE
240	MAGNESIUM		

REMARKS

REMARKS

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*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.

08/10/92

METALS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69721 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: SS-04 COLLECTION START: 06/25/92 0845 STOP: 00/00/00
CASE NUMBER: 18341 SAS NUMBER: MD NUMBER: DC71

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
2300J	ALUMINUM	74J	MANGANESE
8.1U	ANTIMONY	.10U	MERCURY
2U	ARSENIC	1.5U	NICKEL
41J	BARIUM	150	POTASSIUM
.21U	BERYLLIUM	.42U	SELENIUM
.62U	CADMIUM	1.7U	SILVER
570	CALCIUM	180U	SODIUM
14J	CHROMIUM	.62U	THALLIUM
1U	COBALT	NA	TIN
11	COPPER	6.3	VANADIUM
3500J	IRON	11J	ZINC
20J	LEAD	04	PERCENT MOISTURE
120	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.

08/10/92

METALS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69722 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SS-05 COLLECTION START: 06/25/92 0945 STOP: 00/00/00 **
** CASE NUMBER: 18341 SAS NUMBER: MD NUMBER: DC72 **
** **
*** ***

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
4500J	ALUMINUM	300J	MANGANESE
8.4U	ANTIMONY	.11U	MERCURY
2U	ARSENIC	1.5U	NICKEL
27J	BARIUM	120	POTASSIUM
.22U	BERYLLIUM	1U	SELENIUM
.65U	CADMIUM	1.7U	SILVER
230	CALCIUM	180U	SODIUM
4.5J	CHROMIUM	.65U	THALLIUM
2.3	COBALT	NA	TIN
3.2	COPPER	8.9	VANADIUM
3900J	IRON	11J	ZINC
14J	LEAD	08	PERCENT MOISTURE
160	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.

08/10/92

METALS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69723 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SB-05 COLLECTION START: 06/25/92 0955 STOP: 00/00/00 **
** CASE NUMBER: 18341 SAS NUMBER: MD NUMBER: DC73 **
**   **
*** ***

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
6800J	ALUMINUM	80J	MANGANESE
9.5U	ANTIMONY	.12U	MERCURY
2U	ARSENIC	1.7U	NICKEL
26J	BARIUM	190	POTASSIUM
.26	BERYLLIUM	.49U	SELENIUM
.73U	CADMIUM	2U	SILVER
55	CALCIUM	1800	SODIUM
5.1J	CHROMIUM	.73U	THALLIUM
1.9J	COBALT	NA	TIN
3.1	COPPER	10	VANADIUM
6200J	IRON	8.7J	ZINC
21J	LEAD	18	PERCENT MOISTURE
260	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.

08/10/92

METALS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69724 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: TW-05 COLLECTION START: 06/25/92 1050 STOP: 00/00/00 **
** CASE NUMBER: 18341 SAS NUMBER: MD NUMBER: DC74 **
** **
*** ***

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
77000J	ALUMINUM	4100J	MANGANESE
14UJ	ANTIMONY	2.0J	MERCURY
4UJ	ARSENIC	53J	NICKEL
3600J	BARIUM	4400J	POTASSIUM
21J	BERYLLIUM	20UJ	SELENIUM
3J	CADMIUM	3UJ	SILVER
45000J	CALCIUM	11000UJ	SODIUM
40J	CHROMIUM	3UJ	THALLIUM
59J	COBALT	NA	TIN
140J	COPPER	100J	VANADIUM
47000J	IRON	170J	ZINC
380J	LEAD		
17000J	MAGNESIUM		

REMARKS
SAMPLE IMPROPERLY PRESERVED

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.

METALS DATA REPORT 08/10/92

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69725 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SD-04 COLLECTION START: 06/25/92 1245 STOP: 00/00/00 **
** CASE NUMBER: 18341 SAS NUMBER: MD NUMBER: DC75 **
**   **
*** ***

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
2900J	ALUMINUM	13J	MANGANESE
20U	ANTIMONY	.21	MERCURY
4U	ARSENIC	16	NICKEL
18J	BARIUM	140	POTASSIUM
.34U	BERYLLIUM	.68U	SELENIUM
1U	CADMIUM	2.7U	SILVER
680	CALCIUM	290U	SODIUM
7.4J	CHROMIUM	1U	THALLIUM
1.7U	COBALT	NA	TIN
27	COPPER	9.5	VANADIUM
4300J	IRON	110J	ZINC
30J	LEAD	41	PERCENT MOISTURE
120	MAGNESIUM		

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.

METALS DATA REPORT 08/10/92

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69726 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: MW-81 COLLECTION START: 06/25/92 1330 STOP: 00/00/00 **
** CASE NUMBER: 18341 SAS NUMBER: MD NUMBER: DC76 **
** **
*** ***

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
320U	ALUMINUM	451	MANGANESE
14U	ANTIMONY	.20U	MERCURY
12	ARSENIC	8U	NICKEL
320	BARIUM	400	POTASSIUM
1U	BERYLLIUM	2U	SELENIUM
2U	CADMIUM	3UJ	SILVER
27000	CALCIUM	17000	SODIUM
3U	CHROMIUM	3UJ	THALLIUM
6U	COBALT	NA	TIN
7	COPPER	4U	VANADIUM
530	IRON	110	ZINC
6J	LEAD		
6200	MAGNESIUM		

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region IV
Environmental Services Division
College Station Road, Athens, Ga. 30613

*****MEMORANDUM******

DATE: 08/01/92

SUBJECT: Results of Specified Analysis;
92-0629 HERCULES INC
HATIESBURG MS
CASE NO: 18341

FROM: Robert W. Knight Gary Bennett/for
Chief, Laboratory Evaluation/Quality Assurance Section

TO: JOE SLYKERMAN

Attached are the results of analysis of samples collected as part of the subject project.

As a result of the Quality Assurance Review, certain data qualifiers may have been placed on the data. Attached is a DATA QUALIFIER REPORT which explains the reasons that these qualifiers were required.

If you have any questions please contact me.

ATTACHMENT

INORGANIC DATA QUALIFIERS REPORT

Case Number: 18341
Project Number: 92-0629
Site: Hercules, Inc., Hattiesburg, MS

Element	Flag	Samples Affected	Reason
A. Water			
Sb, Pb, Mn, Ag, Zn	U	All positives > IDL, but < CRDL	Baseline instability
Al, Fe, Na	U	All positives > IDL, but < 10X contaminant level	Positives in blanks
Sb	J	All with Al or Fe concentrations in solution > 84, 000 ug/L	Suspected over correction as noted in the contractor ICS
Cu	JN	All positives with Fe concentrations in solution > 94,000 ug/L	Suspected positive interference as noted in the contractor ICS
Ag	J	All	Matrix spike recovery = 68%
Tl	J	All	Matrix spike recovery = 43.8%
Pb	J	All	Matrix duplicate RPD = 185.6%
All Metals	J	MDDC74	Sample improperly preserved
Cd	J	MDDC74	% RSD > 20% for ICP multiple exposures
B. Soil			
Sb, Pb, Mn, Ag, Zn	U	All positives > IDL, but < CRDL	Baseline instability
Al, Fe	U	All positives > IDL, but < 10X contaminant level	Positives in blanks
Sb	J	All with Al or Fe concentrations in solution > 160, 000 ug/L	Suspected over correction as noted in the contractor ICS
Cr	J R	All positives All negatives	Matrix spike recovery = -56.1% Matrix duplicate RPD = 180.6%
Mn	J R	All positives All negatives	Matrix spike recovery =-149.2% Matrix duplicate RPD = 99.5%
Zn	J R	All positives All negatives	Matrix spike recovery = -19.4% Matrix duplicate RPD = 156%
Al	J	All	Matrix duplicate RPD = 70.8%
Ba	J	All	Matrix duplicate RPD = 100.6%
Fe	J	All	Matrix duplicate RPD = 100.4%
Pb	J	All	Matrix duplicate RPD = 185.2%
Co	J	MDDC73	% RSD > 20% for ICP multiple exposures

INORGANIC DATA QUALIFIERS REPORT (continued)

Case Number: 18341
Project Number: 92-0629
Site: Hercules, Inc., Hattiesburg, MS

Element	Flag	Samples Affected	Reason
K	J	MDDC62	% RSD > 20% for ICP multiple exposures

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

07/31/92

SPECIFIED ANALYSIS DATA REPORT

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**   PROJECT NO. 92-0629   SAMPLE NO. 69710   SAMPLE TYPE: GROUNDWA      PROG ELEM: NSF    COLLECTED BY: C HELM                  **
**   SOURCE: HERCULES INC                                                CITY: HATIESBURG            ST: MS                     **
**   STATION ID: TB-01                                                   COLLECTION START: 06/24/92  0725   STOP: 00/00/00      **
**   CASE.NO.: 18341          SAS NO.:                                   D. NO.: DH60                MD NO: DC60                **
**                                                                                                                              **
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RESULTS	UNITS	PARAMETER
10U	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.

07/31/92

SPECIFIED ANALYSIS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69711 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SS-01 COLLECTION START: 06/24/92 0855 STOP: 00/00/00 **
** CASE.NO.: 18341 SAS NO.: D. NO.: DH61 MD NO: DC61 **
** **
*** ***

RESULTS	UNITS	PARAMETER
.54U	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.

07/31/92

SPECIFIED ANALYSIS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69712 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SB-01 COLLECTION START: 06/24/92 0925 STOP: 00/00/00 **
** CASE.NO.: 18341 SAS NO.: D. NO.: DH62 MD NO: DC62 **
** **
*** ***

RESULTS	UNITS	PARAMETER
.61U	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.

07/31/92

SPECIFIED ANALYSIS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69713 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: TW-01 COLLECTION START: 06/24/92 1045 STOP: 00/00/00 **
** CASE.NO.: 18341 SAS NO.: D. NO.: DH63 MD NO: DC63 **
** **
*** ***

RESULTS	UNITS	PARAMETER
10U	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.

07/31/92

SPECIFIED ANALYSIS DATA REPORT

PROJECT NO. 92-0629	SAMPLE NO. 69714	SAMPLE TYPE: SOIL
PROG ELEM: NSF	COLLECTED BY: C HELM	
SOURCE: HERCULES INC		
CITY: HATIESBURG	ST: MS	
STATION ID: SD-01		
COLLECTION START: 06/24/92 1620	STOP: 00/00/00	
CASE.NO.: 18341	SAS NO.:	
D. NO.: DH64	MD NO: DC64	

RESULTS	UNITS	PARAMETER
.65U	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.

07/31/92

SPECIFIED ANALYSIS DATA REPORT

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**   PROJECT NO. 92-0629   SAMPLE NO. 69715   SAMPLE TYPE: SURFACEWA   PROG ELEM: NSF    COLLECTED BY: C HELM                      **
**   SOURCE: HERCULES INC                                              CITY: HATIESBURG               ST: MS                       **
**   STATION ID: SW-01                                                 COLLECTION START: 06/24/92  1610   STOP: 00/00/00           **
**   CASE.NO.: 18341           SAS NO.:                                D. NO.: DH65                MD NO: DC65                     **
**                                                                                                                                 **
*** * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * ***
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RESULTS	UNITS	PARAMETER
10U	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.

07/31/92

SPECIFIED ANALYSIS DATA REPORT

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**   PROJECT NO. 92-0629   SAMPLE NO. 69716   SAMPLE TYPE: SURFACEWA   PROG ELEM: NSF   COLLECTED BY: C HELM                        **
**   SOURCE: HERCULES INC                                              CITY: HATIESBURG            ST: MS                          **
**   STATION ID: SW-2                                                  COLLECTION START: 06/24/92  1700   STOP: 00/00/00           **
**   CASE.NO.: 18341          SAS NO.:                                 D. NO.: DH66                MD NO: DC66                     **
**                                                                                                                                 **
*** * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * ***
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RESULTS	UNITS	PARAMETER
10U	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.

07/31/92

SPECIFIED ANALYSIS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69717 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SD-02 COLLECTION START: 06/24/92 1730 STOP: 00/00/00 **
** CASE.NO.: 18341 SAS NO.: D. NO.: DH67 MD NO: DC67 **
** **
*** ***

RESULTS	UNITS	PARAMETER
.71U	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.

07/31/92

SPECIFIED ANALYSIS DATA REPORT

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**   PROJECT NO. 92-0629   SAMPLE NO. 69718   SAMPLE TYPE: SOIL          PROG ELEM: NSF    COLLECTED BY: C HELM              **
**   SOURCE: HERCULES INC                                                CITY: HATIESBURG                ST: MS                   **
**   STATION ID: SD-03                                                   COLLECTION START: 06/24/92  1815   STOP: 00/00/00      **
**   CASE.NO.: 18341            SAS NO.:                                 D. NO.: DH68                  MD NO: DC68                **
**                                                                                                                                  **
*** * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * ***
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RESULTS	UNITS	PARAMETER
2.1	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.

07/31/92

SPECIFIED ANALYSIS DATA REPORT

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**   PROJECT NO. 92-0629   SAMPLE NO. 69719  SAMPLE TYPE: SOIL      PROG ELEM: NSF   COLLECTED BY: C HELM           **
**   SOURCE: HERCULES INC                                         CITY: HATIESBURG            ST: MS                  **
**   STATION ID: SS-02                                            COLLECTION START: 06/24/92  1915   STOP: 00/00/00   **
**   CASE.NO.: 18341          SAS NO.:                            D. NO.: DH69               MD NO: DC69              **
**                                                                                                                    **
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RESULTS	UNITS	PARAMETER
.59U	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.

07/31/92

SPECIFIED ANALYSIS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69720 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SS-03 COLLECTION START: 06/25/92 0725 STOP: 00/00/00 **
** CASE.NO.: 18341 SAS NO.: D. NO.: DH70 MD NO: DC70 **
** **
*** ***

RESULTS	UNITS	PARAMETER
.64U	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.

07/31/92

SPECIFIED ANALYSIS DATA REPORT

*** ***

** PROJECT NO. 92-0629 SAMPLE NO. 69721 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SS-04 COLLECTION START: 06/25/92 0845 STOP: 00/00/00 **
** CASE.NO.: 18341 SAS NO.: D. NO.: DH71 MD NO: DC71 **
** **

*** ***

RESULTS	UNITS	PARAMETER
.52U	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.

07/31/92

SPECIFIED ANALYSIS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69722 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SS-05 COLLECTION START: 06/25/92 0945 STOP: 00/00/00 **
** CASE.NO.: 18341 SAS NO.: D. NO.: DH72 MD NO: DC72 **
** **
*** ***

RESULTS	UNITS	PARAMETER
.54U	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.

07/31/92

SPECIFIED ANALYSIS DATA REPORT

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**   PROJECT NO. 92-0629   SAMPLE NO. 69723   SAMPLE TYPE: SOIL        PROG ELEM: NSF    COLLECTED BY: C HELM          **
**   SOURCE: HERCULES INC                                              CITY: HATIESBURG             ST: MS             **
**   STATION ID: SB-05                                                 COLLECTION START: 06/25/92  0955   STOP: 00/00/00 **
**   CASE.NO.: 18341          SAS NO.:                                 D. NO.: DH73                MD NO: DC73          **
**                                                                                                                      **
*** * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * ***
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RESULTS	UNITS	PARAMETER
.61U	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.

07/31/92

SPECIFIED ANALYSIS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69724 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: TW-05 COLLECTION START: 06/25/92 1050 STOP: 00/00/00 **
** CASE.NO.: 18341 SAS NO.: D. NO.: DH74 MD NO: DC74 **
** **
*** ***

RESULTS	UNITS	PARAMETER
10U	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.

07/31/92

SPECIFIED ANALYSIS DATA REPORT

*** ***

** PROJECT NO. 92-0629 SAMPLE NO. 69725 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SD-04 COLLECTION START: 06/25/92 1245 STOP: 00/00/00 **
** CASE.NO.: 18341 SAS NO.: D. NO.: DH75 MD NO: DC75 **
** **

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RESULTS	UNITS	PARAMETER
.85U	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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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

07/31/92

SPECIFIED ANALYSIS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69726 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: MW-81 COLLECTION START: 06/25/92 1330 STOP: 00/00/00 **
** CASE.NO.: 18341 SAS NO.: D. NO.: DH76 MD NO: DC76 **
** **
*** ***

RESULTS	UNITS	PARAMETER
10U	UG/L	CYANIDE

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region IV
Environmental Services Division
College Station Road, Athens, Ga. 30613

*****MEMORANDUM******

DATE: 08/21/92

SUBJECT: Results of Purgeable Organic Analysis;
92-0629 HERCULES INC
HATTIESBURG MS
CASE NO: 18341

FROM: Robert W. Knight
Chief, Laboratory Evaluation/Quality Assurance Section

TO: JOE SLYKERMAN

Attached are the results of analysis of samples collected as part of the subject project.

As a result of the Quality Assurance Review, certain data qualifiers may have been placed on the data. Attached is a DATA QUALIFIER REPORT which explains the reasons that these qualifiers were required.

If you have any questions please contact me.

ATTACHMENT

ORGANIC DATA QUALIFIER REPORT

Case Number 18341 Project Number 92-0629 SAS Number
Site ID. Hercules, Inc., Hatiesburg, MS.

Affected Samples	Compound or Fraction	Flag Used	Reason
Volatiles			
69710	bromodichloromethane	J	<quantitation limit
	dibromochloromethane	J	<quantitation limit
69719	acetone	J	>quantitation range
	benzene	J	<quantitation limit
	4-methyl-2-pentanone	J	<quantitation limit in dilution
	ethylbenzene	J	<quantitation limit
69721	toluene	J	<quantitation limit
69723	xylenes	J	<quantitation limit
Extractables			
69711,69721	phenanthrene	J	<quantitation limit
69711	fluoranthene	J	<quantitation limit
	pyrene	J	<quantitation limit
69711,69717	3-nitroaniline	R	low response factor
69714	all acids	R	unacceptable surrogate
Pesticides			
69711	gamma-chlordane	N	difference between column quantitations
	gamma-BHC	J	<quantitation limit
	aldrin	J	<quantitation limit
69717	methoxychlor	J	<quantitation limit
69719	endosulfan sulfate	N	difference between column quantitations
	endrin aldehyde	N	difference between column quantitations
69714	alpha-chlordane	J	<quantitation limit
	alpha-chlordane	N	difference between column quantitations
	aroclor 1260	J	<quantitation limit

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

08/20/92

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69712 SAMPLE TYPE: SOIL
SOURCE: HERCULES INC
STATION ID: SB-01

PROG ELEM: NSF COLLECTED BY: C HELM
CITY: HATIESBURG ST: MS
COLLECTION START: 06/24/92 0925 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH62

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
12U	CHLOROMETHANE	12U	1,2-DICHLOROPROPANE
12U	BROMOMETHANE	12U	CIS-1,3-DICHLOROPROPENE
12U	VINYL CHLORIDE	12U	TRICHLOROETHENE(TRICHLOROETHYLENE)
12U	CHLOROETHANE	12U	DIBROMOCHLOROMETHANE
80U	METHYLENE CHLORIDE	12U	1,1,2-TRICHLOROETHANE
50U	ACETONE	12U	BENZENE
12U	CARBON DISULFIDE	12U	TRANS-1,3-DICHLOROPROPENE
12U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	12U	BROMOFORM
12U	1,1-DICHLOROETHANE	12U	METHYL ISOBUTYL KETONE
12U	1,2-DICHLOROETHENE (TOTAL)	12U	METHYL BUTYL KETONE
12U	CHLOROFORM	12U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
12U	1,2-DICHLOROETHANE	12U	1,1,2,2-TETRACHLOROETHANE
12U	METHYL ETHYL KETONE	12U	TOLUENE
12U	1,1,1-TRICHLOROETHANE	12U	CHLOROBENZENE
12U	CARBON TETRACHLORIDE	12U	ETHYL BENZENE
12U	BROMODICHLOROMETHANE	12U	STYRENE
		12U	TOTAL XYLENES
		17	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
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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.

08/20/92

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69713 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: TW-01 COLLECTION START: 06/24/92 1045 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH63

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

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.

08/20/92

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629   SAMPLE NO. 69711   SAMPLE TYPE: SOIL   PROG ELEM: NSF   COLLECTED BY: C HELM
SOURCE: HERCULES INC   CITY: HATIESBURG   ST: MS
STATION ID: SS-01   COLLECTION START: 06/24/92 0855   STOP: 00/00/00

CASE NO.: 18341   SAS NO.:   D. NO.: DH61

UG/KG	ANALYTICAL RESULTS
11U	CHLOROMETHANE
11U	BROMOMETHANE
11U	VINYL CHLORIDE
11U	CHLOROETHANE
50U	METHYLENE CHLORIDE
50U	ACETONE
11U	CARBON DISULFIDE
11U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)
11U	1,1-DICHLOROETHANE
11U	1,2-DICHLOROETHENE (TOTAL)
11U	CHLOROFORM
11U	1,2-DICHLOROETHANE
11U	METHYL ETHYL KETONE
11U	1,1,1-TRICHLOROETHANE
11U	CARBON TETRACHLORIDE
11U	BROMODICHLOROMETHANE

UG/KG	ANALYTICAL RESULTS
11U	1,2-DICHLOROPROPANE
11U	CIS-1,3-DICHLOROPROPENE
11U	TRICHLOROETHENE(TRICHLOROETHYLENE)
11U	DIBROMOCHLOROMETHANE
11U	1,1,2-TRICHLOROETHANE
11U	BENZENE
11U	TRANS-1,3-DICHLOROPROPENE
11U	BROMOFORM
11U	METHYL ISOBUTYL KETONE
11U	METHYL BUTYL KETONE
11U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
11U	1,1,2,2-TETRACHLOROETHANE
11U	TOLUENE
11U	CHLOROBENZENE
11U	ETHYL BENZENE
11U	STYRENE
11U	TOTAL XYLENES
9	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.

08/20/92

PURGEABLE ORGANICS DATA REPORT

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**   PROJECT NO. 92-0629   SAMPLE NO. 69710   SAMPLE TYPE: GROUNDWA    PROG ELEM: NSF   COLLECTED BY: C HELM              **
**   SOURCE: HERCULES INC                                             CITY: HATIESBURG              ST: MS                 **
**   STATION ID: TB-01                                                COLLECTION START: 06/24/92  0725   STOP: 00/00/00    **
**                                                                                                                         **
**   CASE NO.: 18341                        SAS NO.:                   D. NO.: DH60                                        **
*** * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * ***
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UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
10U	CHLOROMETHANE	10U	1,2-DICHLOROPROPANE
10U	BROMOMETHANE	10U	CIS-1,3-DICHLOROPROPENE
10U	VINYL CHLORIDE	10U	TRICHLOROETHENE(TRICHLOROETHYLENE)
10U	CHLOROETHANE	1J	DIBROMOCHLOROMETHANE
10U	METHYLENE CHLORIDE	10U	1,1,2-TRICHLOROETHANE
10U	ACETONE	10U	BENZENE
10U	CARBON DISULFIDE	10U	TRANS-1,3-DICHLOROPROPENE
10U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	10U	BROMOFORM
10U	1,1-DICHLOROETHANE	10U	METHYL ISOBUTYL KETONE
10U	1,2-DICHLOROETHENE (TOTAL)	10U	METHYL BUTYL KETONE
10U	CHLOROFORM	10U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
10U	1,2-DICHLOROETHANE	10U	1,1,2,2-TETRACHLOROETHANE
10U	METHYL ETHYL KETONE	10U	TOLUENE
10U	1,1,1-TRICHLOROETHANE	10U	CHLOROBENZENE
10U	CARBON TETRACHLORIDE	10U	ETHYL BENZENE
2J	BROMODICHLOROMETHANE	10U	STYRENE
		10U	TOTAL XYLENES

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.
08/20/92

PURGEABLE ORGANICS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69714 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SD-01 COLLECTION START: 06/24/92 1620 STOP: 00/00/00 **
** **
** CASE NO.: 18341 SAS NO.: D. NO.: DH64 **
*** ***

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
13U	CHLOROMETHANE	13U	1,2-DICHLOROPROPANE
13U	BROMOMETHANE	13U	CIS-1,3-DICHLOROPROPENE
13U	VINYL CHLORIDE	13U	TRICHLOROETHENE(TRICHLOROETHYLENE)
13U	CHLOROETHANE	13U	DIBROMOCHLOROMETHANE
40U	METHYLENE CHLORIDE	13U	1,1,2-TRICHLOROETHANE
30U	ACETONE	13U	BENZENE
13U	CARBON DISULFIDE	13U	TRANS-1,3-DICHLOROPROPENE
13U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	13U	BROMOFORM
13U	1,1-DICHLOROETHANE	13U	METHYL ISOBUTYL KETONE
13U	1,2-DICHLOROETHENE (TOTAL)	13U	METHYL BUTYL KETONE
13U	CHLOROFORM	13U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
13U	1,2-DICHLOROETHANE	13U	1,1,2,2-TETRACHLOROETHANE
13U	METHYL ETHYL KETONE	13U	TOLUENE
13U	1,1,1-TRICHLOROETHANE	13U	CHLOROBENZENE
13U	CARBON TETRACHLORIDE	13U	ETHYL BENZENE
13U	BROMODICHLOROMETHANE	13U	STYRENE
		13U	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.   08/20/92

PURGEABLE ORGANICS DATA REPORT

*** ***
** PROJECT NO. 92-0629   SAMPLE NO. 69715   SAMPLE TYPE: SURFACEWA   PROG ELEM: NSF   COLLECTED BY: C HELM **
** SOURCE: HERCULES INC   CITY: HATIESBURG   ST: MS **
** STATION ID: SW-01   COLLECTION START: 06/24/92 1610   STOP: 00/00/00 **
**
** CASE NO.: 18341   SAS NO.:   D. NO.: DH65 **
*** ***

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

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

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.

08/20/92

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69716 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: SW-2 COLLECTION START: 06/24/92 1700 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH66

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

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.

08/20/92

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69717 SAMPLE TYPE: SOIL
PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC
CITY: HATIESBURG ST: MS
STATION ID: SD-02
COLLECTION START: 06/24/92 1730 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH67

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
13U	CHLOROMETHANE	13U	1,2-DICHLOROPROPANE
13U	BROMOMETHANE	13U	CIS-1,3-DICHLOROPROPENE
13U	VINYL CHLORIDE	13U	TRICHLOROETHENE(TRICHLOROETHYLENE)
13U	CHLOROETHANE	13U	DIBROMOCHLOROMETHANE
80U	METHYLENE CHLORIDE	13U	1,1,2-TRICHLOROETHANE
80U	ACETONE	13U	BENZENE
13U	CARBON DISULFIDE	13U	TRANS-1,3-DICHLOROPROPENE
13U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	13U	BROMOFORM
13U	1,1-DICHLOROETHANE	13U	METHYL ISOBUTYL KETONE
13U	1,2-DICHLOROETHENE (TOTAL)	13U	METHYL BUTYL KETONE
13U	CHLOROFORM	13U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
13U	1,2-DICHLOROETHANE	13U	1,1,2,2-TETRACHLOROETHANE
13U	METHYL ETHYL KETONE	13U	TOLUENE
13U	1,1,1-TRICHLOROETHANE	13U	CHLOROBENZENE
13U	CARBON TETRACHLORIDE	13U	ETHYL BENZENE
13U	BROMODICHLOROMETHANE	13U	STYRENE
		13U	TOTAL XYLENES
		21	PERCENT MOISTURE

REMARKS

REMARKS

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

08/20/92

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69718 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: SD-03 COLLECTION START: 06/24/92 1815 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH68

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
18000U	CHLOROMETHANE	18000U	1,2-DICHLOROPROPANE
18000U	BROMOMETHANE	18000U	CIS-1,3-DICHLOROPROPENE
18000U	VINYL CHLORIDE	18000U	TRICHLOROETHENE(TRICHLOROETHYLENE)
18000U	CHLOROETHANE	18000U	DIBROMOCHLOROMETHANE
18000U	METHYLENE CHLORIDE	18000U	1,1,2-TRICHLOROETHANE
30000U	ACETONE	18000U	BENZENE
18000U	CARBON DISULFIDE	18000U	TRANS-1,3-DICHLOROPROPENE
18000U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	18000U	BROMOFORM
18000U	1,1-DICHLOROETHANE	18000U	METHYL ISOBUTYL KETONE
18000U	1,2-DICHLOROETHENE (TOTAL)	18000U	METHYL BUTYL KETONE
18000U	CHLOROFORM	18000U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
18000U	1,2-DICHLOROETHANE	18000U	1,1,2,2-TETRACHLOROETHANE
18000U	METHYL ETHYL KETONE	31000	TOLUENE
18000U	1,1,1-TRICHLOROETHANE	18000U	CHLOROBENZENE
18000U	CARBON TETRACHLORIDE	18000U	ETHYL BENZENE
18000U	BROMODICHLOROMETHANE	18000U	STYRENE
		18000U	TOTAL XYLENES
		34	PERCENT MOISTURE

REMARKS ***REMARKS***

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

08/20/92

PURGEABLE ORGANICS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69721 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SS-04 COLLECTION START: 06/25/92 0845 STOP: 00/00/00 **
** **
** CASE NO.: 18341 SAS NO.: D. NO.: DH71 **
*** ***

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
10U	CHLOROMETHANE	10U	1,2-DICHLOROPROPANE
10U	BROMOMETHANE	10U	CIS-1,3-DICHLOROPROPENE
10U	VINYL CHLORIDE	10U	TRICHLOROETHENE(TRICHLOROETHYLENE)
10U	CHLOROETHANE	10U	DIBROMOCHLOROMETHANE
60U	METHYLENE CHLORIDE	10U	1,1,2-TRICHLOROETHANE
60U	ACETONE	10U	BENZENE
10U	CARBON DISULFIDE	10U	TRANS-1,3-DICHLOROPROPENE
10U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	10U	BROMOFORM
10U	1,1-DICHLOROETHANE	10U	METHYL ISOBUTYL KETONE
10U	1,2-DICHLOROETHENE (TOTAL)	10U	METHYL BUTYL KETONE
10U	CHLOROFORM	10U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
10U	1,2-DICHLOROETHANE	10U	1,1,2,2-TETRACHLOROETHANE
10U	METHYL ETHYL KETONE	6J	TOLUENE
10U	1,1,1-TRICHLOROETHANE	10U	CHLOROBENZENE
10U	CARBON TETRACHLORIDE	10U	ETHYL BENZENE
10U	BROMODICHLOROMETHANE	10U	STYRENE
		10U	TOTAL XYLENES
		2	PERCENT MOISTURE

REMARKS

REMARKS

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

08/20/92

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69722 SAMPLE TYPE: SOIL
SOURCE: HERCULES INC
STATION ID: SS-05

PROG ELEM: NSF COLLECTED BY: C HELM
CITY: HATIESBURG ST: MS
COLLECTION START: 06/25/92 0945 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH72

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
11U	CHLOROMETHANE	11U	1,2-DICHLOROPROPANE
11U	BROMOMETHANE	11U	CIS-1,3-DICHLOROPROPENE
11U	VINYL CHLORIDE	11U	TRICHLOROETHENE(TRICHLOROETHYLENE)
11U	CHLOROETHANE	11U	DIBROMOCHLOROMETHANE
30U	METHYLENE CHLORIDE	11U	1,1,2-TRICHLOROETHANE
30U	ACETONE	11U	BENZENE
11U	CARBON DISULFIDE	11U	TRANS-1,3-DICHLOROPROPENE
11U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	11U	BROMOFORM
11U	1,1-DICHLOROETHANE	11U	METHYL ISOBUTYL KETONE
11U	1,2-DICHLOROETHENE (TOTAL)	11U	METHYL BUTYL KETONE
11U	CHLOROFORM	11U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
11U	1,2-DICHLOROETHANE	11U	1,1,2,2-TETRACHLOROETHANE
11U	METHYL ETHYL KETONE	11U	TOLUENE
11U	1,1,1-TRICHLOROETHANE	11U	CHLOROBENZENE
11U	CARBON TETRACHLORIDE	11U	ETHYL BENZENE
11U	BROMODICHLOROMETHANE	11U	STYRENE
		11U	TOTAL XYLENES
		6	PERCENT MOISTURE

REMARKS

REMARKS

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

08/20/92

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69720 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: SS-03 COLLECTION START: 06/25/92 0725 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH70

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
13U	CHLOROMETHANE	13U	1,2-DICHLOROPROPANE
13U	BROMOMETHANE	13U	CIS-1,3-DICHLOROPROPENE
13U	VINYL CHLORIDE	13U	TRICHLOROETHENE(TRICHLOROETHYLENE)
13U	CHLOROETHANE	13U	DIBROMOCHLOROMETHANE
130U	METHYLENE CHLORIDE	13U	1,1,2-TRICHLOROETHANE
210U	ACETONE	13U	BENZENE
13U	CARBON DISULFIDE	13U	TRANS-1,3-DICHLOROPROPENE
13U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	13U	BROMOFORM
13U	1,1-DICHLOROETHANE	13U	METHYL ISOBUTYL KETONE
13U	1,2-DICHLOROETHENE (TOTAL)	13U	METHYL BUTYL KETONE
13U	CHLOROFORM	13U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
13U	1,2-DICHLOROETHANE	13U	1,1,2,2-TETRACHLOROETHANE
23	METHYL ETHYL KETONE	46	TOLUENE
13U	1,1,1-TRICHLOROETHANE	13U	CHLOROBENZENE
13U	CARBON TETRACHLORIDE	13U	ETHYL BENZENE
13U	BROMODICHLOROMETHANE	13U	STYRENE
		13U	TOTAL XYLENES
		22	PERCENT MOISTURE

REMARKS

REMARKS

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

08/20/92

PURGEABLE ORGANICS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69719 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SS-02 COLLECTION START: 06/24/92 1915 STOP: 00/00/00 **
** **
** CASE NO.: 18341 SAS NO.: D. NO.: DH69 **
*** ***

UG/KG	ANALYTICAL RESULTS
12U	CHLOROMETHANE
12U	BROMOMETHANE
12U	VINYL CHLORIDE
12U	CHLOROETHANE
60U	METHYLENE CHLORIDE
3000J	ACETONE
12U	CARBON DISULFIDE
12U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)
12U	1,1-DICHLOROETHANE
12U	1,2-DICHLOROETHENE (TOTAL)
12U	CHLOROFORM
12U	1,2-DICHLOROETHANE
80	METHYL ETHYL KETONE
12U	1,1,1-TRICHLOROETHANE
12U	CARBON TETRACHLORIDE
12U	BROMODICHLOROMETHANE

UG/KG	ANALYTICAL RESULTS
12U	1,2-DICHLOROPROPANE
12U	CIS-1,3-DICHLOROPROPENE
12U	TRICHLOROETHENE(TRICHLOROETHYLENE)
12U	DIBROMOCHLOROMETHANE
12U	1,1,2-TRICHLOROETHANE
4J	BENZENE
12U	TRANS-1,3-DICHLOROPROPENE
12U	BROMOFORM
830J	METHYL ISOBUTYL KETONE
12U	METHYL BUTYL KETONE
12U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
12U	1,1,2,2-TETRACHLOROETHANE
2500	TOLUENE
12U	CHLOROBENZENE
4J	ETHYL BENZENE
12U	STYRENE
21	TOTAL XYLENES
17	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.
08/20/92

PURGEABLE ORGANICS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69723 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SB-05 COLLECTION START: 06/25/92 0955 STOP: 00/00/00 **
** **
** CASE NO.: 18341 SAS NO.: D. NO.: DH73 **
*** ***

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

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

REMARKS

REMARKS

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

08/20/92

PURGEABLE ORGANICS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69724 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: TW-05 COLLECTION START: 06/25/92 1050 STOP: 00/00/00 **
** **
** CASE NO.: 18341 SAS NO.: D. NO.: DH74 **
*** ***

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

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.

08/20/92

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69725 SAMPLE TYPE: SOIL	PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC	CITY: HATIESBURG ST: MS
STATION ID: SD-04	COLLECTION START: 06/25/92 1245 STOP: 00/00/00
CASE NO.: 18341 SAS NO.:	D. NO.: DH75

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

08/20/92

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69726 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: MW-81 COLLECTION START: 06/25/92 1330 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH76

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

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

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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MISCELLANEOUS PURGEABLE ORGANICS - DATA REPORT

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**   PROJECT NO. 92-0629   SAMPLE NO. 69718  SAMPLE TYPE: SOIL        PROG ELEM: NSF   COLLECTED BY: C HELM             **
**   SOURCE: HERCULES INC                                             CITY: HATIESBURG          ST: MS                  **
**   STATION ID: SD-03                                                COLLECTION START: 06/24/92  1815   STOP: 00/00/00  **
**   CASE.NO.: 18341          SAS NO.:                                D. NO.: DH68              MD NO: DC68             **
**                                                                                                                      **
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ANALYTICAL RESULTS UG/KG

50000JN	CYCLOHEXANE
30000JN	CARENE
30000JN	DIMETHYLMETHYLENEBICYCLOHEPTANE
30000JN	TRIMETHYLBICYCLOHEPTANE

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.

08/20/92

MISCELLANEOUS PURGEABLE ORGANICS - DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69719 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SS-02 COLLECTION START: 06/24/92 1915 STOP: 00/00/00 **
** CASE.NO.: 18341 SAS NO.: D. NO.: DH69 MD NO: DC69 **
** **
*** ***

ANALYTICAL RESULTS UG/KG

30JN	TETRAHYDROFURAN
10JN	METHYLPENTANOL
30JN	CARENE
30JN	DIMETHYLMETHYLENEBICYCLOHEPTANE
20JN	TRIMETHYLBICYCLOHEPTANE
90J	2 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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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region IV
Environmental Services Division
College Station Road, Athens, Ga. 30613

*****MEMORANDUM******

DATE: 08/21/92

SUBJECT: Results of Purgeable Organic Analysis;
92-0629 HERCULES INC
HATTIESBURG MS
CASE NO: 18341

FROM: Robert W. Knight
Chief, Laboratory Evaluation/Quality Assurance Section

TO: JOE SLYKERMAN

Attached are the results of analysis of samples collected as part of the subject project.

As a result of the Quality Assurance Review, certain data qualifiers may have been placed on the data. Attached is a DATA QUALIFIER REPORT which explains the reasons that these qualifiers were required.

If you have any questions please contact me.

ATTACHMENT

ORGANIC DATA QUALIFIER REPORT

Case Number 18341 Project Number 92-0629 SAS Number
Site ID. Hercules, Inc., Hatiesburg, MS.

Affected Samples	Compound or Fraction	Flag Used	Reason
Volatiles			
69710	bromodichloromethane	J	<quantitation limit
	dibromochloromethane	J	<quantitation limit
69719	acetone	J	>quantitation range
	benzene	J	<quantitation limit
	4-methyl-2-pentanone	J	<quantitation limit in dilution
	ethylbenzene	J	<quantitation limit
69721	toluene	J	<quantitation limit
69723	xylenes	J	<quantitation limit
Extractables			
69711,69721	phenanthrene	J	<quantitation limit
69711	fluoranthene	J	<quantitation limit
	pyrene	J	<quantitation limit
69711,69717	3-nitroaniline	R	low response factor
69714	all acids	R	unacceptable surrogate
Pesticides			
69711	gamma-chlordane	N	difference between column quantitations
	gamma-BHC	J	<quantitation limit
	aldrin	J	<quantitation limit
69717	methoxychlor	J	<quantitation limit
69719	endosulfan sulfate	N	difference between column quantitations
	endrin aldehyde	N	difference between column quantitations
69714	alpha-chlordane	J	<quantitation limit
	alpha-chlordane	N	difference between column quantitations
	aroclor 1260	J	<quantitation limit

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

08/20/92

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629   SAMPLE NO. 69712   SAMPLE TYPE: SOIL
SOURCE: HERCULES INC
STATION ID: SB-01

PROG ELEM: NSF   COLLECTED BY: C HELM
CITY: HATIESBURG   ST: MS
COLLECTION START: 06/24/92 0925   STOP: 00/00/00

CASE NO.: 18341   SAS NO.:   D. NO.: DH62

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
12U	CHLOROMETHANE	12U	1,2-DICHLOROPROPANE
12U	BROMOMETHANE	12U	CIS-1,3-DICHLOROPROPENE
12U	VINYL CHLORIDE	12U	TRICHLOROETHENE(TRICHLOROETHYLENE)
12U	CHLOROETHANE	12U	DIBROMOCHLOROMETHANE
80U	METHYLENE CHLORIDE	12U	1,1,2-TRICHLOROETHANE
50U	ACETONE	12U	BENZENE
12U	CARBON DISULFIDE	12U	TRANS-1,3-DICHLOROPROPENE
12U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	12U	BROMOFORM
12U	1,1-DICHLOROETHANE	12U	METHYL ISOBUTYL KETONE
12U	1,2-DICHLOROETHENE (TOTAL)	12U	METHYL BUTYL KETONE
12U	CHLOROFORM	12U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
12U	1,2-DICHLOROETHANE	12U	1,1,2,2-TETRACHLOROETHANE
12U	METHYL ETHYL KETONE	12U	TOLUENE
12U	1,1,1-TRICHLOROETHANE	12U	CHLOROBENZENE
12U	CARBON TETRACHLORIDE	12U	ETHYL BENZENE
12U	BROMODICHLOROMETHANE	12U	STYRENE
		12U	TOTAL XYLENES
		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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*U-MATERIAL WAS ANALYZED FOR BUT NOT DETECTED. THE NUMBER IS THE MINIMUM QUANTITATION LIMIT.
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/20/92

PURGEABLE ORGANICS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69713 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: TW-01 COLLECTION START: 06/24/92 1045 STOP: 00/00/00 **
** **
** CASE NO.: 18341 SAS NO.: D. NO.: DH63 **
*** ***

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

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.

08/20/92

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69711 SAMPLE TYPE: SOIL
PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC
CITY: HATIESBURG ST: MS
STATION ID: SS-01
COLLECTION START: 06/24/92 0855 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH61

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
11U	CHLOROMETHANE	11U	1,2-DICHLOROPROPANE
11U	BROMOMETHANE	11U	CIS-1,3-DICHLOROPROPENE
11U	VINYL CHLORIDE	11U	TRICHLOROETHENE(TRICHLOROETHYLENE)
11U	CHLOROETHANE	11U	DIBROMOCHLOROMETHANE
50U	METHYLENE CHLORIDE	11U	1,1,2-TRICHLOROETHANE
50U	ACETONE	11U	BENZENE
11U	CARBON DISULFIDE	11U	TRANS-1,3-DICHLOROPROPENE
11U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	11U	BROMOFORM
11U	1,1-DICHLOROETHANE	11U	METHYL ISOBUTYL KETONE
11U	1,2-DICHLOROETHENE (TOTAL)	11U	METHYL BUTYL KETONE
11U	CHLOROFORM	11U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
11U	1,2-DICHLOROETHANE	11U	1,1,2,2-TETRACHLOROETHANE
11U	METHYL ETHYL KETONE	11U	TOLUENE
11U	1,1,1-TRICHLOROETHANE	11U	CHLOROBENZENE
11U	CARBON TETRACHLORIDE	11U	ETHYL BENZENE
11U	BROMODICHLOROMETHANE	11U	STYRENE
		11U	TOTAL XYLENES
		9	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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*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.

08/20/92

PURGEABLE ORGANICS DATA REPORT

*** ***

** PROJECT NO. 92-0629 SAMPLE NO. 69710 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: TB-01 COLLECTION START: 06/24/92 0725 STOP: 00/00/00 **
** **
** CASE NO.: 18341 SAS NO.: D. NO.: DH60 **

*** ***

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

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

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.

08/20/92

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69714 SAMPLE TYPE: SOIL
SOURCE: HERCULES INC
STATION ID: SD-01

PROG ELEM: NSF COLLECTED BY: C HELM
CITY: HATIESBURG ST: MS
COLLECTION START: 06/24/92 1620 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH64

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
13U	CHLOROMETHANE	13U	1,2-DICHLOROPROPANE
13U	BROMOMETHANE	13U	CIS-1,3-DICHLOROPROPENE
13U	VINYL CHLORIDE	13U	TRICHLOROETHENE(TRICHLOROETHYLENE)
13U	CHLOROETHANE	13U	DIBROMOCHLOROMETHANE
40U	METHYLENE CHLORIDE	13U	1,1,2-TRICHLOROETHANE
30U	ACETONE	13U	BENZENE
13U	CARBON DISULFIDE	13U	TRANS-1,3-DICHLOROPROPENE
13U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	13U	BROMOFORM
13U	1,1-DICHLOROETHANE	13U	METHYL ISOBUTYL KETONE
13U	1,2-DICHLOROETHENE (TOTAL)	13U	METHYL BUTYL KETONE
13U	CHLOROFORM	13U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
13U	1,2-DICHLOROETHANE	13U	1,1,2,2-TETRACHLOROETHANE
13U	METHYL ETHYL KETONE	13U	TOLUENE
13U	1,1,1-TRICHLOROETHANE	13U	CHLOROBENZENE
13U	CARBON TETRACHLORIDE	13U	ETHYL BENZENE
13U	BROMODICHLOROMETHANE	13U	STYRENE
		13U	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.

08/20/92

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69715 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: SW-01 COLLECTION START: 06/24/92 1610 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH65

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

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

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.

08/20/92

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69716 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: SW-2 COLLECTION START: 06/24/92 1700 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH66

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

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. 08/20/92

PURGEABLE ORGANICS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69717 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SD-02 COLLECTION START: 06/24/92 1730 STOP: 00/00/00 **
** **
** CASE NO.: 18341 SAS NO.: D. NO.: DH67 **
*** ***

UG/KG	ANALYTICAL RESULTS
13U	CHLOROMETHANE
13U	BROMOMETHANE
13U	VINYL CHLORIDE
13U	CHLOROETHANE
80U	METHYLENE CHLORIDE
80U	ACETONE
13U	CARBON DISULFIDE
13U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)
13U	1,1-DICHLOROETHANE
13U	1,2-DICHLOROETHENE (TOTAL)
13U	CHLOROFORM
13U	1,2-DICHLOROETHANE
13U	METHYL ETHYL KETONE
13U	1,1,1-TRICHLOROETHANE
13U	CARBON TETRACHLORIDE
13U	BROMODICHLOROMETHANE

UG/KG	ANALYTICAL RESULTS
13U	1,2-DICHLOROPROPANE
13U	CIS-1,3-DICHLOROPROPENE
13U	TRICHLOROETHENE(TRICHLOROETHYLENE)
13U	DIBROMOCHLOROMETHANE
13U	1,1,2-TRICHLOROETHANE
13U	BENZENE
13U	TRANS-1,3-DICHLOROPROPENE
13U	BROMOFORM
13U	METHYL ISOBUTYL KETONE
13U	METHYL BUTYL KETONE
13U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
13U	1,1,2,2-TETRACHLOROETHANE
13U	TOLUENE
13U	CHLOROBENZENE
13U	ETHYL BENZENE
13U	STYRENE
13U	TOTAL XYLENES
21	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.

08/20/92

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69718 SAMPLE TYPE: SOIL
SOURCE: HERCULES INC
STATION ID: SD-03

PROG ELEM: NSF COLLECTED BY: C HELM
CITY: HATIESBURG ST: MS
COLLECTION START: 06/24/92 1815 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH68

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
18000U	CHLOROMETHANE	18000U	1,2-DICHLOROPROPANE
18000U	BROMOMETHANE	18000U	CIS-1,3-DICHLOROPROPENE
18000U	VINYL CHLORIDE	18000U	TRICHLOROETHENE(TRICHLOROETHYLENE)
18000U	CHLOROETHANE	18000U	DIBROMOCHLOROMETHANE
18000U	METHYLENE CHLORIDE	18000U	1,1,2-TRICHLOROETHANE
30000U	ACETONE	18000U	BENZENE
18000U	CARBON DISULFIDE	18000U	TRANS-1,3-DICHLOROPROPENE
18000U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	18000U	BROMOFORM
18000U	1,1-DICHLOROETHANE	18000U	METHYL ISOBUTYL KETONE
18000U	1,2-DICHLOROETHENE (TOTAL)	18000U	METHYL BUTYL KETONE
18000U	CHLOROFORM	18000U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
18000U	1,2-DICHLOROETHANE	18000U	1,1,2,2-TETRACHLOROETHANE
18000U	METHYL ETHYL KETONE	31000	TOLUENE
18000U	1,1,1-TRICHLOROETHANE	18000U	CHLOROBENZENE
18000U	CARBON TETRACHLORIDE	18000U	ETHYL BENZENE
18000U	BROMODICHLOROMETHANE	18000U	STYRENE
		18000U	TOTAL XYLENES
		34	PERCENT MOISTURE

REMARKS ***REMARKS***

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

08/20/92

PURGEABLE ORGANICS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69721 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SS-04 COLLECTION START: 06/25/92 0845 STOP: 00/00/00 **
** **
** CASE NO.: 18341 SAS NO.: D. NO.: DH71 **
*** ***

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
10U	CHLOROMETHANE	10U	1,2-DICHLOROPROPANE
10U	BROMOMETHANE	10U	CIS-1,3-DICHLOROPROPENE
10U	VINYL CHLORIDE	10U	TRICHLOROETHENE(TRICHLOROETHYLENE)
10U	CHLOROETHANE	10U	DIBROMOCHLOROMETHANE
60U	METHYLENE CHLORIDE	10U	1,1,2-TRICHLOROETHANE
60U	ACETONE	10U	BENZENE
10U	CARBON DISULFIDE	10U	TRANS-1,3-DICHLOROPROPENE
10U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	10U	BROMOFORM
10U	1,1-DICHLOROETHANE	10U	METHYL ISOBUTYL KETONE
10U	1,2-DICHLOROETHENE (TOTAL)	10U	METHYL BUTYL KETONE
10U	CHLOROFORM	10U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
10U	1,2-DICHLOROETHANE	10U	1,1,2,2-TETRACHLOROETHANE
10U	METHYL ETHYL KETONE	6J	TOLUENE
10U	1,1,1-TRICHLOROETHANE	10U	CHLOROBENZENE
10U	CARBON TETRACHLORIDE	10U	ETHYL BENZENE
10U	BROMODICHLOROMETHANE	10U	STYRENE
		10U	TOTAL XYLENES
		2	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.

08/20/92

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69722 SAMPLE TYPE: SOIL
PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC
CITY: HATIESBURG ST: MS
STATION ID: SS-05
COLLECTION START: 06/25/92 0945 STOP: 00/00/00
CASE NO.: 18341 SAS NO.: D. NO.: DH72

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
11U	CHLOROMETHANE	11U	1,2-DICHLOROPROPANE
11U	BROMOMETHANE	11U	CIS-1,3-DICHLOROPROPENE
11U	VINYL CHLORIDE	11U	TRICHLOROETHENE(TRICHLOROETHYLENE)
11U	CHLOROETHANE	11U	DIBROMOCHLOROMETHANE
30U	METHYLENE CHLORIDE	11U	1,1,2-TRICHLOROETHANE
30U	ACETONE	11U	BENZENE
11U	CARBON DISULFIDE	11U	TRANS-1,3-DICHLOROPROPENE
11U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	11U	BROMOFORM
11U	1,1-DICHLOROETHANE	11U	METHYL ISOBUTYL KETONE
11U	1,2-DICHLOROETHENE (TOTAL)	11U	METHYL BUTYL KETONE
11U	CHLOROFORM	11U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
11U	1,2-DICHLOROETHANE	11U	1,1,2,2-TETRACHLOROETHANE
11U	METHYL ETHYL KETONE	11U	TOLUENE
11U	1,1,1-TRICHLOROETHANE	11U	CHLOROBENZENE
11U	CARBON TETRACHLORIDE	11U	ETHYL BENZENE
11U	BROMODICHLOROMETHANE	11U	STYRENE
		11U	TOTAL XYLENES
		6	PERCENT MOISTURE

REMARKS

REMARKS

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

08/20/92

PURGEABLE ORGANICS DATA REPORT

*** ***

** PROJECT NO. 92-0629 SAMPLE NO. 69720 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SS-03 COLLECTION START: 06/25/92 0725 STOP: 00/00/00 **
** **
** CASE NO.: 18341 SAS NO.: D. NO.: DH70 **

*** ***

UG/KG	ANALYTICAL RESULTS
13U	CHLOROMETHANE
13U	BROMOMETHANE
13U	VINYL CHLORIDE
13U	CHLOROETHANE
130U	METHYLENE CHLORIDE
210U	ACETONE
13U	CARBON DISULFIDE
13U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)
13U	1,1-DICHLOROETHANE
13U	1,2-DICHLOROETHENE (TOTAL)
13U	CHLOROFORM
13U	1,2-DICHLOROETHANE
23	METHYL ETHYL KETONE
13U	1,1,1-TRICHLOROETHANE
13U	CARBON TETRACHLORIDE
13U	BROMODICHLOROMETHANE

UG/KG	ANALYTICAL RESULTS
13U	1,2-DICHLOROPROPANE
13U	CIS-1,3-DICHLOROPROPENE
13U	TRICHLOROETHENE(TRICHLOROETHYLENE)
13U	DIBROMOCHLOROMETHANE
13U	1,1,2-TRICHLOROETHANE
13U	BENZENE
13U	TRANS-1,3-DICHLOROPROPENE
13U	BROMOFORM
13U	METHYL ISOBUTYL KETONE
13U	METHYL BUTYL KETONE
13U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
13U	1,1,2,2-TETRACHLOROETHANE
46	TOLUENE
13U	CHLOROBENZENE
13U	ETHYL BENZENE
13U	STYRENE
13U	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
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/20/92

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69719 SAMPLE TYPE: SOIL
SOURCE: HERCULES INC
STATION ID: SS-02

PROG ELEM: NSF COLLECTED BY: C HELM
CITY: HATIESBURG ST: MS
COLLECTION START: 06/24/92 1915 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH69

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
12U	CHLOROMETHANE	12U	1,2-DICHLOROPROPANE
12U	BROMOMETHANE	12U	CIS-1,3-DICHLOROPROPENE
12U	VINYL CHLORIDE	12U	TRICHLOROETHENE(TRICHLOROETHYLENE)
12U	CHLOROETHANE	12U	DIBROMOCHLOROMETHANE
60U	METHYLENE CHLORIDE	12U	1,1,2-TRICHLOROETHANE
3000J	ACETONE	4J	BENZENE
12U	CARBON DISULFIDE	12U	TRANS-1,3-DICHLOROPROPENE
12U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	12U	BROMOFORM
12U	1,1-DICHLOROETHANE	830J	METHYL ISOBUTYL KETONE
12U	1,2-DICHLOROETHENE (TOTAL)	12U	METHYL BUTYL KETONE
12U	CHLOROFORM	12U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
12U	1,2-DICHLOROETHANE	12U	1,1,2,2-TETRACHLOROETHANE
80	METHYL ETHYL KETONE	2500	TOLUENE
12U	1,1,1-TRICHLOROETHANE	12U	CHLOROBENZENE
12U	CARBON TETRACHLORIDE	4J	ETHYL BENZENE
12U	BROMODICHLOROMETHANE	12U	STYRENE
		21	TOTAL XYLENES
		17	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.

08/20/92

PURGEABLE ORGANICS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69723 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SB-05 COLLECTION START: 06/25/92 0955 STOP: 00/00/00 **
** **
** CASE NO.: 18341 SAS NO.: D. NO.: DH73 **
*** ***

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

UG/KG	ANALYTICAL RESULTS
12U	1,2-DICHLOROPROPANE
12U	CIS-1,3-DICHLOROPROPENE
12U	TRICHLOROETHENE(TRICHLOROETHYLENE)
12U	DIBROMOCHLOROMETHANE
12U	1,1,2-TRICHLOROETHANE
12U	BENZENE
12U	TRANS-1,3-DICHLOROPROPENE
12U	BROMOFORM
12U	METHYL ISOBUTYL KETONE
12U	METHYL BUTYL KETONE
12U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
12U	1,1,2,2-TETRACHLOROETHANE
12U	TOLUENE
12U	CHLOROBENZENE
12U	ETHYL BENZENE
12U	STYRENE
2J	TOTAL XYLENES
18	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.

08/20/92

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69724 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: TW-05 COLLECTION START: 06/25/92 1050 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH74

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

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.

08/20/92

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69725 SAMPLE TYPE: SOIL
PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC
CITY: HATIESBURG ST: MS
STATION ID: SD-04
COLLECTION START: 06/25/92 1245 STOP: 00/00/00
CASE NO.: 18341 SAS NO.: D. NO.: DH75

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

08/20/92

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69726 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: MW-81 COLLECTION START: 06/25/92 1330 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH76

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

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

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.

08/20/92

MISCELLANEOUS PURGEABLE ORGANICS - DATA REPORT

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**   PROJECT NO. 92-0629   SAMPLE NO. 69718  SAMPLE TYPE: SOIL       PROG ELEM: NSF   COLLECTED BY: C HELM                    **
**   SOURCE: HERCULES INC                                            CITY: HATIESBURG           ST: MS                       **
**   STATION ID: SD-03                                               COLLECTION START: 06/24/92  1815   STOP: 00/00/00        **
**   CASE.NO.: 18341          SAS NO.:                               D. NO.: DH68               MD NO: DC68                  **
**                                                                                                                            **
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ANALYTICAL RESULTS UG/KG

50000JN	CYCLOHEXANE
30000JN	CARENE
30000JN	DIMETHYLMETHYLENEBICYCLOHEPTANE
30000JN	TRIMETHYLBICYCLOHEPTANE

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.

08/20/92

MISCELLANEOUS PURGEABLE ORGANICS - DATA REPORT

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**   PROJECT NO. 92-0629   SAMPLE NO. 69719  SAMPLE TYPE: SOIL        PROG ELEM: NSF   COLLECTED BY: C HELM                **
**   SOURCE: HERCULES INC                                             CITY: HATIESBURG              ST: MS                 **
**   STATION ID: SS-02                                                COLLECTION START: 06/24/92  1915   STOP: 00/00/00   **
**   CASE.NO.: 18341          SAS NO.:                                D. NO.: DH69                MD NO: DC69              **
**                                                                                                                         **
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ANALYTICAL RESULTS UG/KG

30JN	TETRAHYDROFURAN
10JN	METHYLPENTANOL
30JN	CARENE
30JN	DIMETHYLMETHYLENEBICYCLOHEPTANE
20JN	TRIMETHYLBICYCLOHEPTANE
90J	2 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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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region IV
Environmental Services Division
College Station Road, Athens, Ga. 30613

*****MEMORANDUM******

DATE: 08/21/92

SUBJECT: Results of Pesticide/PCB Analysis;
92-0629 HERCULES INC
HATTIESBURG MS
CASE NO: 18341

FROM: Robert W. Knight
Chief, Laboratory Evaluation/Quality Assurance Section

TO: JOE SLYKERMAN

Attached are the results of analysis of samples collected as part of the subject project.

As a result of the Quality Assurance Review, certain data qualifiers may have been placed on the data. Attached is a DATA QUALIFIER REPORT which explains the reasons that these qualifiers were required.

If you have any questions please contact me.

ATTACHMENT

ORGANIC DATA QUALIFIER REPORT

Case Number 18341 Project Number 92-0629 SAS Number
Site ID. Hercules, Inc., Hatiesburg, MS.

Affected Samples	Compound or Fraction	Flag Used	Reason
Volatiles			
69710	bromodichloromethane	J	<quantitation limit
	dibromochloromethane	J	<quantitation limit
69719	acetone	J	>quantitation range
	benzene	J	<quantitation limit
	4-methyl-2-pentanone	J	<quantitation limit in dilution
	ethylbenzene	J	<quantitation limit
69721	toluene	J	<quantitation limit
69723	xylenes	J	<quantitation limit
Extractables			
69711,69721	phenanthrene	J	<quantitation limit
69711	fluoranthene	J	<quantitation limit
	pyrene	J	<quantitation limit
69711,69717	3-nitroaniline	R	low response factor
69714	all acids	R	unacceptable surrogate
Pesticides			
69711	gamma-chlordane	N	difference between column quantitations
	gamma-BHC	J	<quantitation limit
	aldrin	J	<quantitation limit
69717	methoxychlor	J	<quantitation limit
69719	endosulfan sulfate	N	difference between column quantitations
	endrin aldehyde	N	difference between column quantitations
69714	alpha-chlordane	J	<quantitation limit
	alpha-chlordane	N	difference between column quantitations
	aroclor 1260	J	<quantitation limit

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

08/20/92

PESTICIDES/PCB'S DATA REPORT

** PROJECT NO. 92-0629 SAMPLE NO. 69710 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: TB-01 COLLECTION START: 06/24/92 0725 STOP: 00/00/00 **
** CASE NUMBER: 18341 SAS NUMBER: D. NUMBER: DH60 **

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
0.050U	ALPHA-BHC	0.50U	METHOXYCHLOR
0.050U	BETA-BHC	0.10U	ENDRIN KETONE
0.050U	DELTA-BHC	0.10U	ENDRIN ALDEHYDE
0.050U	GAMMA-BHC (LINDANE)	--	CHLORDANE (TECH. MIXTURE) /1
0.050U	HEPTACHLOR	0.050U	GAMMA-CHLORDANE /2
0.050U	ALDRIN	0.050U	ALPHA-CHLORDANE /2
0.050U	HEPTACHLOR EPOXIDE	5.0U	TOXAPHENE
0.050U	ENDOSULFAN I (ALPHA)	1.0U	PCB-1016 (AROCLOR 1016)
0.10U	DIELDRIN	2.0U	PCB-1221 (AROCLOR 1221)
0.10U	4,4'-DDE (P,P'-DDE)	1.0U	PCB-1232 (AROCLOR 1232)
0.10U	ENDRIN	1.0U	PCB-1242 (AROCLOR 1242)
0.10U	ENDOSULFAN II (BETA)	1.0U	PCB-1248 (AROCLOR 1248)
0.10U	4,4'-DDD (P,P'-DDD)	1.0U	PCB-1254 (AROCLOR 1254)
0.10U	ENDOSULFAN SULFATE	1.0U	PCB-1260 (AROCLOR 1260)
0.10U	4,4'-DDT (P,P'-DDT)		

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.

08/20/92

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69711 SAMPLE TYPE: SOIL
SOURCE: HERCULES INC
STATION ID: SS-01
CASE NUMBER: 18341 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: C HELM
CITY: HATIESBURG ST: MS
COLLECTION START: 06/24/92 0855 STOP: 00/00/00
D. NUMBER: DH61

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
9.2U	ALPHA-BHC	92U	METHOXYCHLOR
9.2U	BETA-BHC	18U	ENDRIN KETONE
9.2U	DELTA-BHC	18U	ENDRIN ALDEHYDE
1.6J	GAMMA-BHC (LINDANE)	--	CHLORDANE (TECH. MIXTURE) /1
9.2U	HEPTACHLOR	26N	GAMMA-CHLORDANE /2
3.6J	ALDRIN	26	ALPHA-CHLORDANE /2
9.2U	HEPTACHLOR EPOXIDE	920U	TOXAPHENE
9.2U	ENDOSULFAN I (ALPHA)	180U	PCB-1016 (AROCLOR 1016)
61	DIELDRIN	360U	PCB-1221 (AROCLOR 1221)
130C	4,4'-DDE (P,P'-DDE)	180U	PCB-1232 (AROCLOR 1232)
18U	ENDRIN	180U	PCB-1242 (AROCLOR 1242)
18U	ENDOSULFAN II (BETA)	180U	PCB-1248 (AROCLOR 1248)
68	4,4'-DDD (P,P'-DDD)	180U	PCB-1254 (AROCLOR 1254)
18U	ENDOSULFAN SULFATE	180U	PCB-1260 (AROCLOR 1260)
31	4,4'-DDT (P,P'-DDT)	9	PERCENT MOISTURE

REMARKS

REMARKS

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

08/20/92

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69712 SAMPLE TYPE: SOIL
SOURCE: HERCULES INC
STATION ID: SB-01
CASE NUMBER: 18341 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: C HELM
CITY: HATIESBURG ST: MS
COLLECTION START: 06/24/92 0925 STOP: 00/00/00
D. NUMBER: DH62

UG/KG	ANALYTICAL RESULTS
2.0U	ALPHA-BHC
2.0U	BETA-BHC
2.0U	DELTA-BHC
2.0U	GAMMA-BHC (LINDANE)
2.0U	HEPTACHLOR
2.0U	ALDRIN
2.0U	HEPTACHLOR EPOXIDE
2.0U	ENDOSULFAN I (ALPHA)
3.9U	DIELDRIN
3.9U	4,4'-DDE (P,P'-DDE)
3.9U	ENDRIN
3.9U	ENDOSULFAN II (BETA)
3.9U	4,4'-DDD (P,P'-DDD)
3.9U	ENDOSULFAN SULFATE
3.9U	4,4'-DDT (P,P'-DDT)

UG/KG	ANALYTICAL RESULTS
20U	METHOXYCHLOR
3.9U	ENDRIN KETONE
3.9U	ENDRIN ALDEHYDE
--	CHLORDANE (TECH. MIXTURE) /1
2.0U	GAMMA-CHLORDANE /2
2.0U	ALPHA-CHLORDANE /2
200U	TOXAPHENE
39U	PCB-1016 (AROCLOR 1016)
79U	PCB-1221 (AROCLOR 1221)
39U	PCB-1232 (AROCLOR 1232)
39U	PCB-1242 (AROCLOR 1242)
39U	PCB-1248 (AROCLOR 1248)
39U	PCB-1254 (AROCLOR 1254)
39U	PCB-1260 (AROCLOR 1260)
17	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES

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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA. 08/20/92

PESTICIDES/PCB'S DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69713 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: TW-01 COLLECTION START: 06/24/92 1045 STOP: 00/00/00 **
** CASE NUMBER: 18341 SAS NUMBER: D. NUMBER: DH63 **
** **
*** ***

UG/L	ANALYTICAL RESULTS
0.050U	ALPHA-BHC
0.050U	BETA-BHC
0.050U	DELTA-BHC
0.050U	GAMMA-BHC (LINDANE)
0.050U	HEPTACHLOR
0.050U	ALDRIN
0.050U	HEPTACHLOR EPOXIDE
0.050U	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
0.10U	ENDRIN ALDEHYDE
--	CHLORDANE (TECH. MIXTURE) /1
0.050U	GAMMA-CHLORDANE /2
0.050U	ALPHA-CHLORDANE /2
5.0U	TOXAPHENE
1.0U	PCB-1016 (AROCLOR 1016)
2.0U	PCB-1221 (AROCLOR 1221)
1.0U	PCB-1232 (AROCLOR 1232)
1.0U	PCB-1242 (AROCLOR 1242)
1.0U	PCB-1248 (AROCLOR 1248)
1.0U	PCB-1254 (AROCLOR 1254)
1.0U	PCB-1260 (AROCLOR 1260)

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.
08/20/92

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69714 SAMPLE TYPE: SOIL
PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC
CITY: HATIESBURG ST: MS
STATION ID: SD-01
COLLECTION START: 06/24/92 1620 STOP: 00/00/00
CASE NUMBER: 18341 SAS NUMBER:
D. NUMBER: DH64

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
2.2U	ALPHA-BHC	22U	METHOXYCHLOR
2.2U	BETA-BHC	4.2U	ENDRIN KETONE
2.2U	DELTA-BHC	4.2U	ENDRIN ALDEHYDE
2.2U	GAMMA-BHC (LINDANE)	--	CHLORDANE (TECH. MIXTURE) /1
2.2U	HEPTACHLOR	2.2U	GAMMA-CHLORDANE /2
2.2U	ALDRIN	1.7JN	ALPHA-CHLORDANE /2
2.2U	HEPTACHLOR EPOXIDE	220U	TOXAPHENE
2.2U	ENDOSULFAN I (ALPHA)	42U	PCB-1016 (AROCLOR 1016)
4.2U	DIELDRIN	85U	PCB-1221 (AROCLOR 1221)
4.2U	4,4'-DDE (P,P'-DDE)	42U	PCB-1232 (AROCLOR 1232)
4.2U	ENDRIN	42U	PCB-1242 (AROCLOR 1242)
4.2U	ENDOSULFAN II (BETA)	42U	PCB-1248 (AROCLOR 1248)
4.2U	4,4'-DDD (P,P'-DDD)	42U	PCB-1254 (AROCLOR 1254)
4.2U	ENDOSULFAN SULFATE	39J	PCB-1260 (AROCLOR 1260)
4.2U	4,4'-DDT (P,P'-DDT)	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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*C-CONFIRMED BY GCMS 1. WHEN NO VALUE IS REPORTED, SEE CHLORDANE CONSTITUENTS.

SAMPLE AND ANAL
EPA-REGION

PESTICIDES/PCB'S DATA REPORT

*** *
** PROJECT NO. 92-0629 SAMPLE NO. 69716 SAMPLE TYPE: SURFA
** SOURCE: HERCULES INC
** STATION ID: SW-2
** CASE NUMBER: 18341 SAS NUMBER:
**
*** *

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

REMARKS

FOOTNOTES
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*R-QC INDICATES THAT DATA UNUSABLE. COMPOUND MAY OR MAY NOT
*C-CONFIRMED BY GCMS 1. WHEN NO VALUE IS REPC

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA. 08/20/92

PESTICIDES/PCB'S DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69715 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SW-01 COLLECTION START: 06/24/92 1610 STOP: 00/00/00 **
** CASE NUMBER: 18341 SAS NUMBER: D. NUMBER: DH65 **
** **
*** ***

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

REMARKS ***REMARKS***

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

08/20/92

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69726 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: MW-81 COLLECTION START: 06/25/92 1330 STOP: 00/00/00
CASE NUMBER: 18341 SAS NUMBER: D. NUMBER: DH76

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
0.050U	ALPHA-BHC	0.50U	METHOXYCHLOR
0.050U	BETA-BHC	0.10U	ENDRIN KETONE
0.050U	DELTA-BHC	0.10U	ENDRIN ALDEHYDE
0.050U	GAMMA-BHC (LINDANE)	--	CHLORDANE (TECH. MIXTURE) /1
0.050U	HEPTACHLOR	0.050U	GAMMA-CHLORDANE /2
0.050U	ALDRIN	0.050U	ALPHA-CHLORDANE /2
0.050U	HEPTACHLOR EPOXIDE	5.0U	TOXAPHENE
0.050U	ENDOSULFAN I (ALPHA)	1.0U	PCB-1016 (AROCLOR 1016)
0.10U	DIELDRIN	2.0U	PCB-1221 (AROCLOR 1221)
0.10U	4,4'-DDE (P,P'-DDE)	1.0U	PCB-1232 (AROCLOR 1232)
0.10U	ENDRIN	1.0U	PCB-1242 (AROCLOR 1242)
0.10U	ENDOSULFAN II (BETA)	1.0U	PCB-1248 (AROCLOR 1248)
0.10U	4,4'-DDD (P,P'-DDD)	1.0U	PCB-1254 (AROCLOR 1254)
0.10U	ENDOSULFAN SULFATE	1.0U	PCB-1260 (AROCLOR 1260)
0.10U	4,4'-DDT (P,P'-DDT)		

REMARKS

REMARKS

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region IV
Environmental Services Division
College Station Road, Athens, Ga. 30613

*****MEMORANDUM******

DATE: 08/21/92

SUBJECT: Results of Extractable Organic Analysis;
92-0629 HERCULES INC
HATTIESBURG MS
CASE NO: 18341

FROM: Robert W. Knight
Chief, Laboratory Evaluation/Quality Assurance Section

TO: JOE SLYKERMAN

Attached are the results of analysis of samples collected as part of the subject project.

As a result of the Quality Assurance Review, certain data qualifiers may have been placed on the data. Attached is a DATA QUALIFIER REPORT which explains the reasons that these qualifiers were required.

If you have any questions please contact me.

ATTACHMENT

ORGANIC DATA QUALIFIER REPORT

Case Number 18341 Project Number 92-0629 SAS Number
Site ID. Hercules, Inc., Hatiesburg, MS.

Affected Samples	Compound or Fraction	Flag Used	Reason
Volatiles			
69710	bromodichloromethane	J	<quantitation limit
	dibromochloromethane	J	<quantitation limit
69719	acetone	J	>quantitation range
	benzene	J	<quantitation limit
	4-methyl-2-pentanone	J	<quantitation limit in dilution
	ethylbenzene	J	<quantitation limit
69721	toluene	J	<quantitation limit
69723	xylenes	J	<quantitation limit
Extractables			
69711,69721	phenanthrene	J	<quantitation limit
69711	fluoranthene	J	<quantitation limit
	pyrene	J	<quantitation limit
69711,69717	3-nitroaniline	R	low response factor
69714	all acids	R	unacceptable surrogate
Pesticides			
69711	gamma-chlordane	N	difference between column quantitations
	gamma-BHC	J	<quantitation limit
	aldrin	J	<quantitation limit
69717	methoxychlor	J	<quantitation limit
69719	endosulfan sulfate	N	difference between column quantitations
	endrin aldehyde	N	difference between column quantitations
69714	alpha-chlordane	J	<quantitation limit
	alpha-chlordane	N	difference between column quantitations
	aroclor 1260	J	<quantitation limit

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.
08/20/92

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69710 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: TB-01 COLLECTION START: 06/24/92 0725 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH60

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
10U	PHENOL	25U	3-NITROANILINE
10U	BIS(2-CHLOROETHYL) ETHER	10U	ACENAPHTHENE
10U	2-CHLOROPHENOL	25U	2,4-DINITROPHENOL
10U	1,3-DICHLOROBENZENE	25U	4-NITROPHENOL
10U	1,4-DICHLOROBENZENE	10U	DIBENZOFURAN
10U	1,2-DICHLOROBENZENE	10U	2,4-DINITROTOLUENE
10U	2-METHYLPHENOL	10U	DIETHYL PHTHALATE
10U	2,2'-CHLOROISOPROPYLETHER	10U	4-CHLOROPHENYL PHENYL ETHER
10U	(3-AND/OR 4-)METHYLPHENOL	10U	FLUORENE
10U	N-NITROSODI-N-PROPYLAMINE	25U	4-NITROANILINE
10U	HEXACHLOROETHANE	25U	2-METHYL-4,6-DINITROPHENOL
10U	NITROBENZENE	10U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
10U	ISOPHORONE	10U	4-BROMOPHENYL PHENYL ETHER
10U	2-NITROPHENOL	10U	HEXACHLOROBENZENE (HCB)
10U	2,4-DIMETHYLPHENOL	25U	PENTACHLOROPHENOL
10U	BIS(2-CHLOROETHOXY) METHANE	10U	PHENANTHRENE
10U	2,4-DICHLOROPHENOL	10U	ANTHRACENE
10U	1,2,4-TRICHLOROBENZENE	10U	CARBAZOLE
10U	NAPHTHALENE	10U	DI-N-BUTYLPHTHALATE
10U	4-CHLOROANILINE	10U	FLUORANTHENE
10U	HEXACHLOROBUTADIENE	10U	PYRENE
10U	4-CHLORO-3-METHYLPHENOL	10U	BENZYL BUTYL PHTHALATE
10U	2-METHYLNAPHTHALENE	10U	3,3'-DICHLOROBENZIDINE
10U	HEXACHLOROCYCLOPENTADIENE (HCCP)	10U	BENZO(A)ANTHRACENE
10U	2,4,6-TRICHLOROPHENOL	10U	CHRYSENE
25U	2,4,5-TRICHLOROPHENOL	10U	BIS(2-ETHYLHEXYL) PHTHALATE
10U	2-CHLORONAPHTHALENE	10U	DI-N-OCTYLPHTHALATE
25U	2-NITROANILINE	10U	BENZO(B AND/OR K)FLUORANTHENE
10U	DIMETHYL PHTHALATE	10U	BENZO-A-PYRENE
10U	ACENAPHTHYLENE	10U	INDENO (1,2,3-CD) PYRENE
10U	2,6-DINITROTOLUENE	10U	DIBENZO(A,H)ANTHRACENE
		10U	BENZO(GHI)PERYLENE

REMARKS ***REMARKS***

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

08/20/92

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69711 SAMPLE TYPE: SOIL
SOURCE: HERCULES INC
STATION ID: SS-01

PROG ELEM: NSF COLLECTED BY: C HELM
CITY: HATIESBURG ST: MS
COLLECTION START: 06/24/92 0855 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH61

UG/KG	ANALYTICAL RESULTS
360U	PHENOL
360U	BIS(2-CHLOROETHYL) ETHER
360U	2-CHLOROPHENOL
360U	1,3-DICHLOROBENZENE
360U	1,4-DICHLOROBENZENE
360U	1,2-DICHLOROBENZENE
360U	2-METHYLPHENOL
360U	2,2'-CHLOROISOPROPYLETHER
360U	(3-AND/OR 4-)METHYLPHENOL
360U	N-NITROSODI-N-PROPYLAMINE
360U	HEXACHLOROETHANE
360U	NITROBENZENE
360U	ISOPHORONE
360U	2-NITROPHENOL
360U	2,4-DIMETHYLPHENOL
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
870U	2,4,5-TRICHLOROPHENOL
360U	2-CHLORONAPHTHALENE
870U	2-NITROANILINE
360U	DIMETHYL PHTHALATE
360U	ACENAPHTHYLENE
360U	2,6-DINITROTOLUENE

UG/KG	ANALYTICAL RESULTS
870UR	3-NITROANILINE
360U	ACENAPHTHENE
870U	2,4-DINITROPHENOL
870U	4-NITROPHENOL
360U	DIBENZOFURAN
360U	2,4-DINITROTOLUENE
360U	DIETHYL PHTHALATE
360U	4-CHLOROPHENYL PHENYL ETHER
360U	FLUORENE
870U	4-NITROANILINE
870U	2-METHYL-4,6-DINITROPHENOL
360U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
360U	4-BROMOPHENYL PHENYL ETHER
360U	HEXACHLOROBENZENE (HCB)
870U	PENTACHLOROPHENOL
55J	PHENANTHRENE
360U	ANTHRACENE
360U	CARBAZOLE
360U	DI-N-BUTYLPHTHALATE
110J	FLUORANTHENE
100J	PYRENE
360U	BENZYL BUTYL PHTHALATE
360U	3,3'-DICHLOROBENZIDINE
360U	BENZO(A)ANTHRACENE
360U	CHRYSENE
360U	BIS(2-ETHYLHEXYL) PHTHALATE
360U	DI-N-OCTYLPHTHALATE
360U	BENZO(B AND/OR K)FLUORANTHENE
360U	BENZO-A-PYRENE
360U	INDENO (1,2,3-CD) PYRENE
360U	DIBENZO(A,H)ANTHRACENE
360U	BENZO(GHI)PERYLENE
9	PERCENT MOISTURE

REMARKS

REMARKS

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

08/20/92

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69712 SAMPLE TYPE: SOIL
SOURCE: HERCULES INC
STATION ID: SB-01

PROG ELEM: NSF COLLECTED BY: C HELM
CITY: HATIESBURG ST: MS
COLLECTION START: 06/24/92 0925 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH62

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
390U	PHENOL	950U	3-NITROANILINE
390U	BIS(2-CHLOROETHYL) ETHER	390U	ACENAPHTHENE
390U	2-CHLOROPHENOL	950U	2,4-DINITROPHENOL
390U	1,3-DICHLOROBENZENE	950U	4-NITROPHENOL
390U	1,4-DICHLOROBENZENE	390U	DIBENZOFURAN
390U	1,2-DICHLOROBENZENE	390U	2,4-DINITROTOLUENE
390U	2-METHYLPHENOL	390U	DIETHYL PHTHALATE
390U	2,2'-CHLOROISOPROPYLETHER	390U	4-CHLOROPHENYL PHENYL ETHER
390U	(3-AND/OR 4-)METHYLPHENOL	390U	FLUORENE
390U	N-NITROSODI-N-PROPYLAMINE	950U	4-NITROANILINE
390U	HEXACHLOROETHANE	950U	2-METHYL-4,6-DINITROPHENOL
390U	NITROBENZENE	390U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
390U	ISOPHORONE	390U	4-BROMOPHENYL PHENYL ETHER
390U	2-NITROPHENOL	390U	HEXACHLOROBENZENE (HCB)
390U	2,4-DIMETHYLPHENOL	950U	PENTACHLOROPHENOL
390U	BIS(2-CHLOROETHOXY) METHANE	390U	PHENANTHRENE
390U	2,4-DICHLOROPHENOL	390U	ANTHRACENE
390U	1,2,4-TRICHLOROBENZENE	390U	CARBAZOLE
390U	NAPHTHALENE	390U	DI-N-BUTYLPHTHALATE
390U	4-CHLOROANILINE	390U	FLUORANTHENE
390U	HEXACHLOROBUTADIENE	390U	PYRENE
390U	4-CHLORO-3-METHYLPHENOL	390U	BENZYL BUTYL PHTHALATE
390U	2-METHYLNAPHTHALENE	390U	3,3'-DICHLOROBENZIDINE
390U	HEXACHLOROCYCLOPENTADIENE (HCCP)	390U	BENZO(A)ANTHRACENE
390U	2,4,6-TRICHLOROPHENOL	390U	CHRYSENE
950U	2,4,5-TRICHLOROPHENOL	390U	BIS(2-ETHYLHEXYL) PHTHALATE
390U	2-CHLORONAPHTHALENE	390U	DI-N-OCTYLPHTHALATE
950U	2-NITROANILINE	390U	BENZO(B AND/OR K)FLUORANTHENE
390U	DIMETHYL PHTHALATE	390U	BENZO-A-PYRENE
390U	ACENAPHTHYLENE	390U	INDENO (1,2,3-CD) PYRENE
390U	2,6-DINITROTOLUENE	390U	DIBENZO(A,H)ANTHRACENE
		390U	BENZO(GHI)PERYLENE
		17	PERCENT MOISTURE

REMARKS

REMARKS

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

08/20/92

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69713 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: TW-01 COLLECTION START: 06/24/92 1045 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH63

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
10U	PHENOL	25U	3-NITROANILINE
10U	BIS(2-CHLOROETHYL) ETHER	10U	ACENAPHTHENE
10U	2-CHLOROPHENOL	25U	2,4-DINITROPHENOL
10U	1,3-DICHLOROBENZENE	25U	4-NITROPHENOL
10U	1,4-DICHLOROBENZENE	10U	DIBENZOFURAN
10U	1,2-DICHLOROBENZENE	10U	2,4-DINITROTOLUENE
10U	2-METHYLPHENOL	10U	DIETHYL PHTHALATE
10U	2,2'-CHLOROISOPROPYLETHER	10U	4-CHLOROPHENYL PHENYL ETHER
10U	(3-AND/OR 4-)METHYLPHENOL	10U	FLUORENE
10U	N-NITROSODI-N-PROPYLAMINE	25U	4-NITROANILINE
10U	HEXACHLOROETHANE	25U	2-METHYL-4,6-DINITROPHENOL
10U	NITROBENZENE	10U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
10U	ISOPHORONE	10U	4-BROMOPHENYL PHENYL ETHER
10U	2-NITROPHENOL	10U	HEXACHLOROBENZENE (HCB)
10U	2,4-DIMETHYLPHENOL	25U	PENTACHLOROPHENOL
10U	BIS(2-CHLOROETHOXY) METHANE	10U	PHENANTHRENE
10U	2,4-DICHLOROPHENOL	10U	ANTHRACENE
10U	1,2,4-TRICHLOROBENZENE	10U	CARBAZOLE
10U	NAPHTHALENE	10U	DI-N-BUTYLPHTHALATE
10U	4-CHLOROANILINE	10U	FLUORANTHENE
10U	HEXACHLOROBUTADIENE	10U	PYRENE
10U	4-CHLORO-3-METHYLPHENOL	10U	BENZYL BUTYL PHTHALATE
10U	2-METHYLNAPHTHALENE	10U	3,3'-DICHLOROBENZIDINE
10U	HEXACHLOROCYCLOPENTADIENE (HCCP)	10U	BENZO(A)ANTHRACENE
10U	2,4,6-TRICHLOROPHENOL	10U	CHRYSENE
25U	2,4,5-TRICHLOROPHENOL	10U	BIS(2-ETHYLHEXYL) PHTHALATE
10U	2-CHLORONAPHTHALENE	10U	DI-N-OCTYLPHTHALATE
25U	2-NITROANILINE	10U	BENZO(B AND/OR K)FLUORANTHENE
10U	DIMETHYL PHTHALATE	10U	BENZO-A-PYRENE
10U	ACENAPHTHYLENE	10U	INDENO (1,2,3-CD) PYRENE
10U	2,6-DINITROTOLUENE	10U	DIBENZO(A,H)ANTHRACENE
		10U	BENZO(GHI)PERYLENE

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.

08/20/92

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69714 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: SD-01 COLLECTION START: 06/24/92 1620 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH64

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
420UR	PHENOL	1000U	3-NITROANILINE
420U	BIS(2-CHLOROETHYL) ETHER	420U	ACENAPHTHENE
420UR	2-CHLOROPHENOL	1000UR	2,4-DINITROPHENOL
420U	1,3-DICHLOROBENZENE	1000UR	4-NITROPHENOL
420U	1,4-DICHLOROBENZENE	420U	DIBENZOFURAN
420U	1,2-DICHLOROBENZENE	420U	2,4-DINITROTOLUENE
420UR	2-METHYLPHENOL	420U	DIETHYL PHTHALATE
420U	2,2'-CHLOROISOPROPYLETHER	420U	4-CHLOROPHENYL PHENYL ETHER
420UR	(3-AND/OR 4-)METHYLPHENOL	420U	FLUORENE
420U	N-NITROSODI-N-PROPYLAMINE	1000U	4-NITROANILINE
420U	HEXACHLOROETHANE	1000UR	2-METHYL-4,6-DINITROPHENOL
420U	NITROBENZENE	420U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
420U	ISOPHORONE	420U	4-BROMOPHENYL PHENYL ETHER
420UR	2-NITROPHENOL	420U	HEXACHLOROBENZENE (HCB)
420UR	2,4-DIMETHYLPHENOL	1000UR	PENTACHLOROPHENOL
420U	BIS(2-CHLOROETHOXY) METHANE	420U	PHENANTHRENE
420UR	2,4-DICHLOROPHENOL	420U	ANTHRACENE
420U	1,2,4-TRICHLOROBENZENE	420U	CARBAZOLE
420U	NAPHTHALENE	420U	DI-N-BUTYLPHTHALATE
420U	4-CHLOROANILINE	420U	FLUORANTHENE
420U	HEXACHLOROBUTADIENE	420U	PYRENE
420UR	4-CHLORO-3-METHYLPHENOL	420U	BENZYL BUTYL PHTHALATE
420U	2-METHYLNAPHTHALENE	420U	3,3'-DICHLOROBENZIDINE
420U	HEXACHLOROCYCLOPENTADIENE (HCCP)	420U	BENZO(A)ANTHRACENE
420UR	2,4,6-TRICHLOROPHENOL	420U	CHRYSENE
1000UR	2,4,5-TRICHLOROPHENOL	420U	BIS(2-ETHYLHEXYL) PHTHALATE
420U	2-CHLORONAPHTHALENE	420U	DI-N-OCTYLPHTHALATE
1000U	2-NITROANILINE	420U	BENZO(B AND/OR K)FLUORANTHENE
420U	DIMETHYL PHTHALATE	420U	BENZO-A-PYRENE
420U	ACENAPHTHYLENE	420U	INDENO (1,2,3-CD) PYRENE
420U	2,6-DINITROTOLUENE	420U	DIBENZO(A,H)ANTHRACENE
		420U	BENZO(GHI)PERYLENE
		22	PERCENT MOISTURE

REMARKS

REMARKS

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

08/20/92

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629   SAMPLE NO. 69715   SAMPLE TYPE: SURFACEWA   PROG ELEM: NSF   COLLECTED BY: C HELM
SOURCE: HERCULES INC   CITY: HATIESBURG   ST: MS
STATION ID: SW-01   COLLECTION START: 06/24/92 1610   STOP: 00/00/00

CASE NO.: 18341   SAS NO.:   D. NO.: DH65

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

08/20/92

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69716 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: SW-2 COLLECTION START: 06/24/92 1700 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH66

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

UG/L	ANALYTICAL RESULTS
NA	3-NITROANILINE
NA	ACENAPHTHENE
NA	2,4-DINITROPHENOL
NA	4-NITROPHENOL
NA	DIBENZOFURAN
NA	2,4-DINITROTOLUENE
NA	DIETHYL PHTHALATE
NA	4-CHLOROPHENYL PHENYL ETHER
NA	FLUORENE
NA	4-NITROANILINE
NA	2-METHYL-4,6-DINITROPHENOL
NA	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
NA	4-BROMOPHENYL PHENYL ETHER
NA	HEXACHLOROBENZENE (HCB)
NA	PENTACHLOROPHENOL
NA	PHENANTHRENE
NA	ANTHRACENE
NA	CARBAZOLE
NA	DI-N-BUTYLPHTHALATE
NA	FLUORANTHENE
NA	PYRENE
NA	BENZYL BUTYL PHTHALATE
NA	3,3'-DICHLOROBENZIDINE
NA	BENZO(A)ANTHRACENE
NA	CHRYSENE
NA	BIS(2-ETHYLHEXYL) PHTHALATE
NA	DI-N-OCTYLPHTHALATE
NA	BENZO(B AND/OR K)FLUORANTHENE
NA	BENZO-A-PYRENE
NA	INDENO (1,2,3-CD) PYRENE
NA	DIBENZO(A,H)ANTHRACENE
NA	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.   08/20/92

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629   SAMPLE NO. 69717   SAMPLE TYPE: SOIL   PROG ELEM: NSF   COLLECTED BY: C HELM
SOURCE: HERCULES INC   CITY: HATIESBURG   ST: MS
STATION ID: SD-02   COLLECTION START: 06/24/92 1730   STOP: 00/00/00

CASE NO.: 18341   SAS NO.:   D. NO.: DH67

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
410U	PHENOL	1000UR	3-NITROANILINE
410U	BIS(2-CHLOROETHYL) ETHER	410U	ACENAPHTHENE
410U	2-CHLOROPHENOL	1000U	2,4-DINITROPHENOL
410U	1,3-DICHLOROBENZENE	1000U	4-NITROPHENOL
410U	1,4-DICHLOROBENZENE	410U	DIBENZOFURAN
410U	1,2-DICHLOROBENZENE	410U	2,4-DINITROTOLUENE
410U	2-METHYLPHENOL	410U	DIETHYL PHTHALATE
410U	2,2'-CHLOROISOPROPYLETHER	410U	4-CHLOROPHENYL PHENYL ETHER
410U	(3-AND/OR 4-)METHYLPHENOL	410U	FLUORENE
410U	N-NITROSODI-N-PROPYLAMINE	1000U	4-NITROANILINE
410U	HEXACHLOROETHANE	1000U	2-METHYL-4,6-DINITROPHENOL
410U	NITROBENZENE	410U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
410U	ISOPHORONE	410U	4-BROMOPHENYL PHENYL ETHER
410U	2-NITROPHENOL	410U	HEXACHLOROBENZENE (HCB)
410U	2,4-DIMETHYLPHENOL	1000U	PENTACHLOROPHENOL
410U	BIS(2-CHLOROETHOXY) METHANE	410U	PHENANTHRENE
410U	2,4-DICHLOROPHENOL	410U	ANTHRACENE
410U	1,2,4-TRICHLOROBENZENE	410U	CARBAZOLE
410U	NAPHTHALENE	410U	DI-N-BUTYLPHTHALATE
410U	4-CHLOROANILINE	410U	FLUORANTHENE
410U	HEXACHLOROBUTADIENE	410U	PYRENE
410U	4-CHLORO-3-METHYLPHENOL	410U	BENZYL BUTYL PHTHALATE
410U	2-METHYLNAPHTHALENE	410U	3,3'-DICHLOROBENZIDINE
410U	HEXACHLOROCYCLOPENTADIENE (HCCP)	410U	BENZO(A)ANTHRACENE
410U	2,4,6-TRICHLOROPHENOL	410U	CHRYSENE
1000U	2,4,5-TRICHLOROPHENOL	410U	BIS(2-ETHYLHEXYL) PHTHALATE
410U	2-CHLORONAPHTHALENE	410U	DI-N-OCTYLPHTHALATE
1000U	2-NITROANILINE	410U	BENZO(B AND/OR K)FLUORANTHENE
410U	DIMETHYL PHTHALATE	410U	BENZO-A-PYRENE
410U	ACENAPHTHYLENE	410U	INDENO (1,2,3-CD) PYRENE
410U	2,6-DINITROTOLUENE	410U	DIBENZO(A,H)ANTHRACENE
		410U	BENZO(GHI)PERYLENE
		21	PERCENT MOISTURE

REMARKS   ***REMARKS***

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

08/20/92

EXTRACTABLE ORGANICS DATA REPORT

*** ***

** PROJECT NO. 92-0629 SAMPLE NO. 69718 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SD-03 COLLECTION START: 06/24/92 1815 STOP: 00/00/00 **
** **
** CASE NO.: 18341 SAS NO.: D. NO.: DH68 **

*** ***

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
2700000U	PHENOL	6700000U	3-NITROANILINE
2700000U	BIS(2-CHLOROETHYL) ETHER	2700000U	ACENAPHTHENE
2700000U	2-CHLOROPHENOL	6700000U	2,4-DINITROPHENOL
2700000U	1,3-DICHLOROBENZENE	6700000U	4-NITROPHENOL
2700000U	1,4-DICHLOROBENZENE	2700000U	DIBENZOFURAN
2700000U	1,2-DICHLOROBENZENE	2700000U	2,4-DINITROTOLUENE
2700000U	2-METHYLPHENOL	2700000U	DIETHYL PHTHALATE
2700000U	2,2'-CHLOROISOPROPYLETHER	2700000U	4-CHLOROPHENYL PHENYL ETHER
2700000U	(3-AND/OR 4-)METHYLPHENOL	2700000U	FLUORENE
2700000U	N-NITROSODI-N-PROPYLAMINE	6700000U	4-NITROANILINE
2700000U	HEXACHLOROETHANE	6700000U	2-METHYL-4,6-DINITROPHENOL
2700000U	NITROBENZENE	2700000U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
2700000U	ISOPHORONE	2700000U	4-BROMOPHENYL PHENYL ETHER
2700000U	2-NITROPHENOL	2700000U	HEXACHLOROBENZENE (HCB)
2700000U	2,4-DIMETHYLPHENOL	6700000U	PENTACHLOROPHENOL
2700000U	BIS(2-CHLOROETHOXY) METHANE	2700000U	PHENANTHRENE
2700000U	2,4-DICHLOROPHENOL	2700000U	ANTHRACENE
2700000U	1,2,4-TRICHLOROBENZENE	2700000U	CARBAZOLE
2700000U	NAPHTHALENE	2700000U	DI-N-BUTYLPHTHALATE
2700000U	4-CHLOROANILINE	2700000U	FLUORANTHENE
2700000U	HEXACHLOROBUTADIENE	2700000U	PYRENE
2700000U	4-CHLORO-3-METHYLPHENOL	2700000U	BENZYL BUTYL PHTHALATE
2700000U	2-METHYLNAPHTHALENE	2700000U	3,3'-DICHLOROBENZIDINE
2700000U	HEXACHLOROCYCLOPENTADIENE (HCCP)	2700000U	BENZO(A)ANTHRACENE
2700000U	2,4,6-TRICHLOROPHENOL	2700000U	CHRYSENE
6700000U	2,4,5-TRICHLOROPHENOL	2700000U	BIS(2-ETHYLHEXYL) PHTHALATE
2700000U	2-CHLORONAPHTHALENE	2700000U	DI-N-OCTYLPHTHALATE
6700000U	2-NITROANILINE	2700000U	BENZO(B AND/OR K)FLUORANTHENE
2700000U	DIMETHYL PHTHALATE	2700000U	BENZO-A-PYRENE
2700000U	ACENAPHTHYLENE	2700000U	INDENO (1,2,3-CD) PYRENE
2700000U	2,6-DINITROTOLUENE	2700000U	DIBENZO(A,H)ANTHRACENE
		2700000U	BENZO(GHI)PERYLENE
		34	PERCENT MOISTURE

REMARKS ***REMARKS***

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

08/20/92

EXTRACTABLE ORGANICS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69719 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SS-02 COLLECTION START: 06/24/92 1915 STOP: 00/00/00 **
** **
** CASE NO.: 18341 SAS NO.: D. NO.: DH69 **
*** ***

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
1200000U	PHENOL	3000000U	3-NITROANILINE
1200000U	BIS(2-CHLOROETHYL) ETHER	1200000U	ACENAPHTHENE
1200000U	2-CHLOROPHENOL	3000000U	2,4-DINITROPHENOL
1200000U	1,3-DICHLOROBENZENE	3000000U	4-NITROPHENOL
1200000U	1,4-DICHLOROBENZENE	1200000U	DIBENZOFURAN
1200000U	1,2-DICHLOROBENZENE	1200000U	2,4-DINITROTOLUENE
1200000U	2-METHYLPHENOL	1200000U	DIETHYL PHTHALATE
1200000U	2,2'-CHLOROISOPROPYLETHER	1200000U	4-CHLOROPHENYL PHENYL ETHER
1200000U	(3-AND/OR 4-)METHYLPHENOL	1200000U	FLUORENE
1200000U	N-NITROSODI-N-PROPYLAMINE	3000000U	4-NITROANILINE
1200000U	HEXACHLOROETHANE	3000000U	2-METHYL-4,6-DINITROPHENOL
1200000U	NITROBENZENE	1200000U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
1200000U	ISOPHORONE	1200000U	4-BROMOPHENYL PHENYL ETHER
1200000U	2-NITROPHENOL	1200000U	HEXACHLOROBENZENE (HCB)
1200000U	2,4-DIMETHYLPHENOL	3000000U	PENTACHLOROPHENOL
1200000U	BIS(2-CHLOROETHOXY) METHANE	1200000U	PHENANTHRENE
1200000U	2,4-DICHLOROPHENOL	1200000U	ANTHRACENE
1200000U	1,2,4-TRICHLOROBENZENE	1200000U	CARBAZOLE
1200000U	NAPHTHALENE	1200000U	DI-N-BUTYLPHTHALATE
1200000U	4-CHLOROANILINE	1200000U	FLUORANTHENE
1200000U	HEXACHLOROBUTADIENE	1200000U	PYRENE
1200000U	4-CHLORO-3-METHYLPHENOL	1200000U	BENZYL BUTYL PHTHALATE
1200000U	2-METHYLNAPHTHALENE	1200000U	3,3'-DICHLOROBENZIDINE
1200000U	HEXACHLOROCYCLOPENTADIENE (HCCP)	1200000U	BENZO(A)ANTHRACENE
1200000U	2,4,6-TRICHLOROPHENOL	1200000U	CHRYSENE
3000000U	2,4,5-TRICHLOROPHENOL	1200000U	BIS(2-ETHYLHEXYL) PHTHALATE
1200000U	2-CHLORONAPHTHALENE	1200000U	DI-N-OCTYLPHTHALATE
3000000U	2-NITROANILINE	1200000U	BENZO(B AND/OR K)FLUORANTHENE
1200000U	DIMETHYL PHTHALATE	1200000U	BENZO-A-PYRENE
1200000U	ACENAPHTHYLENE	1200000U	INDENO (1,2,3-CD) PYRENE
1200000U	2,6-DINITROTOLUENE	1200000U	DIBENZO(A,H)ANTHRACENE
		1200000U	BENZO(GHI)PERYLENE
		17	PERCENT MOISTURE

REMARKS ***REMARKS***

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

08/20/92

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69720 SAMPLE TYPE: SOIL
PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC
CITY: HATIESBURG ST: MS
STATION ID: SS-03
COLLECTION START: 06/25/92 0725 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH70

UG/KG	ANALYTICAL RESULTS
4200U	PHENOL
4200U	BIS(2-CHLOROETHYL) ETHER
4200U	2-CHLOROPHENOL
4200U	1,3-DICHLOROBENZENE
4200U	1,4-DICHLOROBENZENE
4200U	1,2-DICHLOROBENZENE
4200U	2-METHYLPHENOL
4200U	2,2'-CHLOROISOPROPYLETHER
4200U	(3-AND/OR 4-)METHYLPHENOL
4200U	N-NITROSODI-N-PROPYLAMINE
4200U	HEXACHLOROETHANE
4200U	NITROBENZENE
4200U	ISOPHORONE
4200U	2-NITROPHENOL
4200U	2,4-DIMETHYLPHENOL
4200U	BIS(2-CHLOROETHOXY) METHANE
4200U	2,4-DICHLOROPHENOL
4200U	1,2,4-TRICHLOROBENZENE
4200U	NAPHTHALENE
4200U	4-CHLOROANILINE
4200U	HEXACHLOROBUTADIENE
4200U	4-CHLORO-3-METHYLPHENOL
4200U	2-METHYLNAPHTHALENE
4200U	HEXACHLOROCYCLOPENTADIENE (HCCP)
4200U	2,4,6-TRICHLOROPHENOL
10000U	2,4,5-TRICHLOROPHENOL
4200U	2-CHLORONAPHTHALENE
10000U	2-NITROANILINE
4200U	DIMETHYL PHTHALATE
4200U	ACENAPHTHYLENE
4200U	2,6-DINITROTOLUENE

UG/KG	ANALYTICAL RESULTS
10000U	3-NITROANILINE
4200U	ACENAPHTHENE
10000U	2,4-DINITROPHENOL
10000U	4-NITROPHENOL
4200U	DIBENZOFURAN
4200U	2,4-DINITROTOLUENE
4200U	DIETHYL PHTHALATE
4200U	4-CHLOROPHENYL PHENYL ETHER
4200U	FLUORENE
10000U	4-NITROANILINE
10000U	2-METHYL-4,6-DINITROPHENOL
4200U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
4200U	4-BROMOPHENYL PHENYL ETHER
4200U	HEXACHLOROBENZENE (HCB)
10000U	PENTACHLOROPHENOL
4200U	PHENANTHRENE
4200U	ANTHRACENE
4200U	CARBAZOLE
4200U	DI-N-BUTYLPHTHALATE
4200U	FLUORANTHENE
4200U	PYRENE
4200U	BENZYL BUTYL PHTHALATE
4200U	3,3'-DICHLOROBENZIDINE
4200U	BENZO(A)ANTHRACENE
4200U	CHRYSENE
4200U	BIS(2-ETHYLHEXYL) PHTHALATE
4200U	DI-N-OCTYLPHTHALATE
4200U	BENZO(B AND/OR K)FLUORANTHENE
4200U	BENZO-A-PYRENE
4200U	INDENO (1,2,3-CD) PYRENE
4200U	DIBENZO(A,H)ANTHRACENE
4200U	BENZO(GHI)PERYLENE
22	PERCENT MOISTURE

REMARKS

REMARKS

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

08/20/92

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69721 SAMPLE TYPE: SOIL
PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC
CITY: HATIESBURG ST: MS
STATION ID: SS-04
COLLECTION START: 06/25/92 0845 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH71

UG/KG	ANALYTICAL RESULTS
330U	PHENOL
330U	BIS(2-CHLOROETHYL) ETHER
330U	2-CHLOROPHENOL
330U	1,3-DICHLOROBENZENE
330U	1,4-DICHLOROBENZENE
330U	1,2-DICHLOROBENZENE
330U	2-METHYLPHENOL
330U	2,2'-CHLOROISOPROPYLETHER
330U	(3-AND/OR 4-)METHYLPHENOL
330U	N-NITROSODI-N-PROPYLAMINE
330U	HEXACHLOROETHANE
330U	NITROBENZENE
330U	ISOPHORONE
330U	2-NITROPHENOL
330U	2,4-DIMETHYLPHENOL
330U	BIS(2-CHLOROETHOXY) METHANE
330U	2,4-DICHLOROPHENOL
330U	1,2,4-TRICHLOROBENZENE
330U	NAPHTHALENE
330U	4-CHLOROANILINE
330U	HEXACHLOROBUTADIENE
330U	4-CHLORO-3-METHYLPHENOL
330U	2-METHYLNAPHTHALENE
330U	HEXACHLOROCYCLOPENTADIENE (HCCP)
330U	2,4,6-TRICHLOROPHENOL
810U	2,4,5-TRICHLOROPHENOL
330U	2-CHLORONAPHTHALENE
810U	2-NITROANILINE
330U	DIMETHYL PHTHALATE
330U	ACENAPHTHYLENE
330U	2,6-DINITROTOLUENE

UG/KG	ANALYTICAL RESULTS
810U	3-NITROANILINE
330U	ACENAPHTHENE
810U	2,4-DINITROPHENOL
810U	4-NITROPHENOL
330U	DIBENZOFURAN
330U	2,4-DINITROTOLUENE
330U	DIETHYL PHTHALATE
330U	4-CHLOROPHENYL PHENYL ETHER
330U	FLUORENE
810U	4-NITROANILINE
810U	2-METHYL-4,6-DINITROPHENOL
330U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
330U	4-BROMOPHENYL PHENYL ETHER
330U	HEXACHLOROBENZENE (HCB)
810U	PENTACHLOROPHENOL
48J	PHENANTHRENE
330U	ANTHRACENE
330U	CARBAZOLE
330U	DI-N-BUTYLPHTHALATE
330U	FLUORANTHENE
330U	PYRENE
330U	BENZYL BUTYL PHTHALATE
330U	3,3'-DICHLOROBENZIDINE
330U	BENZO(A)ANTHRACENE
330U	CHRYSENE
330U	BIS(2-ETHYLHEXYL) PHTHALATE
330U	DI-N-OCTYLPHTHALATE
330U	BENZO(B AND/OR K)FLUORANTHENE
330U	BENZO-A-PYRENE
330U	INDENO (1,2,3-CD) PYRENE
330U	DIBENZO(A,H)ANTHRACENE
330U	BENZO(GHI)PERYLENE
2	PERCENT MOISTURE

REMARKS

REMARKS

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

08/20/92

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69722 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: SS-05 COLLECTION START: 06/25/92 0945 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH72

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
350U	PHENOL	840U	3-NITROANILINE
350U	BIS(2-CHLOROETHYL) ETHER	350U	ACENAPHTHENE
350U	2-CHLOROPHENOL	840U	2,4-DINITROPHENOL
350U	1,3-DICHLOROBENZENE	840U	4-NITROPHENOL
350U	1,4-DICHLOROBENZENE	350U	DIBENZOFURAN
350U	1,2-DICHLOROBENZENE	350U	2,4-DINITROTOLUENE
350U	2-METHYLPHENOL	350U	DIETHYL PHTHALATE
350U	2,2'-CHLOROISOPROPYLETHER	350U	4-CHLOROPHENYL PHENYL ETHER
350U	(3-AND/OR 4-)METHYLPHENOL	350U	FLUORENE
350U	N-NITROSODI-N-PROPYLAMINE	840U	4-NITROANILINE
350U	HEXACHLOROETHANE	840U	2-METHYL-4,6-DINITROPHENOL
350U	NITROBENZENE	350U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
350U	ISOPHORONE	350U	4-BROMOPHENYL PHENYL ETHER
350U	2-NITROPHENOL	350U	HEXACHLOROBENZENE (HCB)
350U	2,4-DIMETHYLPHENOL	840U	PENTACHLOROPHENOL
350U	BIS(2-CHLOROETHOXY) METHANE	350U	PHENANTHRENE
350U	2,4-DICHLOROPHENOL	350U	ANTHRACENE
350U	1,2,4-TRICHLOROBENZENE	350U	CARBAZOLE
350U	NAPHTHALENE	350U	DI-N-BUTYLPHTHALATE
350U	4-CHLOROANILINE	350U	FLUORANTHENE
350U	HEXACHLOROBUTADIENE	350U	PYRENE
350U	4-CHLORO-3-METHYLPHENOL	350U	BENZYL BUTYL PHTHALATE
350U	2-METHYLNAPHTHALENE	350U	3,3'-DICHLOROBENZIDINE
350U	HEXACHLOROCYCLOPENTADIENE (HCCP)	350U	BENZO(A)ANTHRACENE
350U	2,4,6-TRICHLOROPHENOL	350U	CHRYSENE
840U	2,4,5-TRICHLOROPHENOL	350U	BIS(2-ETHYLHEXYL) PHTHALATE
350U	2-CHLORONAPHTHALENE	350U	DI-N-OCTYLPHTHALATE
840U	2-NITROANILINE	350U	BENZO(B AND/OR K)FLUORANTHENE
350U	DIMETHYL PHTHALATE	350U	BENZO-A-PYRENE
350U	ACENAPHTHYLENE	350U	INDENO (1,2,3-CD) PYRENE
350U	2,6-DINITROTOLUENE	350U	DIBENZO(A,H)ANTHRACENE
		350U	BENZO(GHI)PERYLENE
		6	PERCENT MOISTURE

REMARKS

REMARKS

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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.
08/20/92

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69723 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: SB-05 COLLECTION START: 06/25/92 0955 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH73

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

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

REMARKS

REMARKS

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

08/20/92

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69711 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SS-01 COLLECTION START: 06/24/92 0855 STOP: 00/00/00 **
** CASE.NO.: 18341 SAS NO.: D. NO.: DH61 MD NO: DC61 **
** **
*** ***

ANALYTICAL RESULTS UG/KG

2000J	4 UNIDENTIFIED COMPOUNDS
200JN	DIMETHYLPHENANTHRENE
700JN	TETRAMETHYLPHENANTHRENE
*	OCTAHYDRODIMETHYL(METHYLETHYL)PHENANTHRENE'
1000JN	CARBOXYLIC ACID

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

08/20/92

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69725 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: SD-04 COLLECTION START: 06/25/92 1245 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH75

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

REMARKS

REMARKS

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

08/20/92

EXTRACTABLE ORGANICS DATA REPORT

*** ***

** PROJECT NO. 92-0629 SAMPLE NO. 69726 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: MW-81 COLLECTION START: 06/25/92 1330 STOP: 00/00/00 **
** **
** CASE NO.: 18341 SAS NO.: D. NO.: DH76 **

*** ***

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
10U	PHENOL	25U	3-NITROANILINE
10U	BIS(2-CHLOROETHYL) ETHER	10U	ACENAPHTHENE
10U	2-CHLOROPHENOL	25U	2,4-DINITROPHENOL
10U	1,3-DICHLOROBENZENE	25U	4-NITROPHENOL
10U	1,4-DICHLOROBENZENE	10U	DIBENZOFURAN
10U	1,2-DICHLOROBENZENE	10U	2,4-DINITROTOLUENE
10U	2-METHYLPHENOL	10U	DIETHYL PHTHALATE
10U	2,2'-CHLOROISOPROPYLETHER	10U	4-CHLOROPHENYL PHENYL ETHER
10U	(3-AND/OR 4-)METHYLPHENOL	10U	FLUORENE
10U	N-NITROSODI-N-PROPYLAMINE	25U	4-NITROANILINE
10U	HEXACHLOROETHANE	25U	2-METHYL-4,6-DINITROPHENOL
10U	NITROBENZENE	10U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
10U	ISOPHORONE	10U	4-BROMOPHENYL PHENYL ETHER
10U	2-NITROPHENOL	10U	HEXACHLOROBENZENE (HCB)
10U	2,4-DIMETHYLPHENOL	25U	PENTACHLOROPHENOL
10U	BIS(2-CHLOROETHOXY) METHANE	10U	PHENANTHRENE
10U	2,4-DICHLOROPHENOL	10U	ANTHRACENE
10U	1,2,4-TRICHLOROBENZENE	10U	CARBAZOLE
10U	NAPHTHALENE	10U	DI-N-BUTYLPHTHALATE
10U	4-CHLOROANILINE	10U	FLUORANTHENE
10U	HEXACHLOROBUTADIENE	10U	PYRENE
10U	4-CHLORO-3-METHYLPHENOL	10U	BENZYL BUTYL PHTHALATE
10U	2-METHYLNAPHTHALENE	10U	3,3'-DICHLOROBENZIDINE
10U	HEXACHLOROCYCLOPENTADIENE (HCCP)	10U	BENZO(A)ANTHRACENE
10U	2,4,6-TRICHLOROPHENOL	10U	CHRYSENE
25U	2,4,5-TRICHLOROPHENOL	10U	BIS(2-ETHYLHEXYL) PHTHALATE
10U	2-CHLORONAPHTHALENE	10U	DI-N-OCTYLPHTHALATE
25U	2-NITROANILINE	10U	BENZO(B AND/OR K)FLUORANTHENE
10U	DIMETHYL PHTHALATE	10U	BENZO-A-PYRENE
10U	ACENAPHTHYLENE	10U	INDENO (1,2,3-CD) PYRENE
10U	2,6-DINITROTOLUENE	10U	DIBENZO(A,H)ANTHRACENE
		10U	BENZO(GHI)PERYLENE

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.

08/20/92

EXTRACTABLE ORGANICS DATA REPORT

** PROJECT NO. 92-0629 SAMPLE NO. 69724 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: TW-05 COLLECTION START: 06/25/92 1050 STOP: 00/00/00 **
** CASE NO.: 18341 SAS NO.: D. NO.: DH74 **

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
10U	PHENOL	25U	3-NITROANILINE
10U	BIS(2-CHLOROETHYL) ETHER	10U	ACENAPHTHENE
10U	2-CHLOROPHENOL	25U	2,4-DINITROPHENOL
10U	1,3-DICHLOROBENZENE	25U	4-NITROPHENOL
10U	1,4-DICHLOROBENZENE	10U	DIBENZOFURAN
10U	1,2-DICHLOROBENZENE	10U	2,4-DINITROTOLUENE
10U	2-METHYLPHENOL	10U	DIETHYL PHTHALATE
10U	2,2'-CHLOROISOPROPYLETHER	10U	4-CHLOROPHENYL PHENYL ETHER
10U	(3-AND/OR 4-)METHYLPHENOL	10U	FLUORENE
10U	N-NITROSODI-N-PROPYLAMINE	25U	4-NITROANILINE
10U	HEXACHLOROETHANE	25U	2-METHYL-4,6-DINITROPHENOL
10U	NITROBENZENE	10U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
10U	ISOPHORONE	10U	4-BROMOPHENYL PHENYL ETHER
10U	2-NITROPHENOL	10U	HEXACHLOROBENZENE (HCB)
10U	2,4-DIMETHYLPHENOL	25U	PENTACHLOROPHENOL
10U	BIS(2-CHLOROETHOXY) METHANE	10U	PHENANTHRENE
10U	2,4-DICHLOROPHENOL	10U	ANTHRACENE
10U	1,2,4-TRICHLOROBENZENE	10U	CARBAZOLE
10U	NAPHTHALENE	10U	DI-N-BUTYLPHTHALATE
10U	4-CHLOROANILINE	10U	FLUORANTHENE
10U	HEXACHLOROBUTADIENE	10U	PYRENE
10U	4-CHLORO-3-METHYLPHENOL	10U	BENZYL BUTYL PHTHALATE
10U	2-METHYLNAPHTHALENE	10U	3,3'-DICHLOROBENZIDINE
10U	HEXACHLOROCYCLOPENTADIENE (HCCP)	10U	BENZO(A)ANTHRACENE
10U	2,4,6-TRICHLOROPHENOL	10U	CHRYSENE
25U	2,4,5-TRICHLOROPHENOL	10U	BIS(2-ETHYLHEXYL) PHTHALATE
10U	2-CHLORONAPHTHALENE	10U	DI-N-OCTYLPHTHALATE
25U	2-NITROANILINE	10U	BENZO(B AND/OR K)FLUORANTHENE
10U	DIMETHYL PHTHALATE	10U	BENZO-A-PYRENE
10U	ACENAPHTHYLENE	10U	INDENO (1,2,3-CD) PYRENE
10U	2,6-DINITROTOLUENE	10U	DIBENZO(A,H)ANTHRACENE
		10U	BENZO(GHI)PERYLENE

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.   08/20/92

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

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**   PROJECT NO. 92-0629   SAMPLE NO. 69714  SAMPLE TYPE: SOIL       PROG ELEM: NSF   COLLECTED BY: C HELM                **
**   SOURCE: HERCULES INC                                             CITY: HATIESBURG              ST: MS                  **
**   STATION ID: SD-01                                                COLLECTION START: 06/24/92  1620   STOP: 00/00/00   **
**   CASE.NO.: 18341          SAS NO.:                                D. NO.: DH64                 MD NO: DC64             **
**                                                                                                                          **
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ANALYTICAL RESULTS UG/KG

6000J   3 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
*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.

08/20/92

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69717 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SD-02 COLLECTION START: 06/24/92 1730 STOP: 00/00/00 **
** CASE.NO.: 18341 SAS NO.: D. NO.: DH67 MD NO: DC67 **
** **
*** ***

ANALYTICAL RESULTS UG/KG

3000J	6 UNIDENTIFIED COMPOUNDS
300JN	NONYLPHENOL
500JN	HEXADECANOIC ACID
500JN	METHYLANTHRACENE
*	OCTAHYDRODIMETHYL(METHYLETHYL)PHENANTHRENE
500JN	CARBOXALDEHYDE

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.

08/20/92

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69718 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SD-03 COLLECTION START: 06/24/92 1815 STOP: 00/00/00 **
** CASE.NO.: 18341 SAS NO.: D. NO.: DH68 MD NO: DC68 **
** **
*** ***

ANALYTICAL RESULTS UG/KG

4+E06JN	METHYL(METHYLETHYL)CYCLOHEXANE
3+E06JN	OXYBISBENZENE
4+E06JN	HEXAHYDROTETRAMETHYLMETHANONAPHTHALENE
1.0E08JN	17 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
*U-MATERIAL WAS ANALYZED FOR BUT NOT DETECTED. THE NUMBER IS THE MINIMUM QUANTITATION LIMIT.
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/20/92

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

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**   PROJECT NO. 92-0629   SAMPLE NO. 69719  SAMPLE TYPE: SOIL        PROG ELEM: NSF    COLLECTED BY: C HELM                    **
**   SOURCE: HERCULES INC                                            CITY: HATIESBURG             ST: MS                        **
**   STATION ID: SS-02                                               COLLECTION START: 06/24/92  1915   STOP: 00/00/00          **
**   CASE.NO.: 18341            SAS NO.:                             D. NO.: DH69                 MD NO: DC69                   **
**                                                                                                                              **
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ANALYTICAL RESULTS UG/KG

9.0E06JN	10 UNIDENTIFIED COMPOUNDS
500000JN	METHYL(METHYLETHENYL)CYCLOHEXENE
500000JN	METHYL(METHYLETHYL)BENZENE
600000JN	TRIMETHYLCYCLOHEXANEMETHANOL
500000JN	TRIMETHYLBICYCLOHEPTANONE
800000JN	ISOBORNEOL
1.0E07JN	TRIMETHYLCYCLOHEENEMETHANOL
700000JN	PROPYLPHENOL
2.0E07JN	TERPIN HYDRATE
700000JN	OXYBISBENZENE
*	OCTAHYDRODIMETHYL(METHYLETHYL)PHENANTHRENE
1+E06JN	CARBOXYLIC ACID, METHYLESTER

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

08/20/92

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69720 SAMPLE TYPE: SOIL
PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC
CITY: HATIESBURG ST: MS
STATION ID: SS-03
COLLECTION START: 06/25/92 0725 STOP: 00/00/00
CASE.NO.: 18341 SAS NO.:
D. NO.: DH70 MD NO: DC70

ANALYTICAL RESULTS UG/KG

*	OCTAHYDRODIMETHYL(METHYLETHYL)PHENANTHRENE
40000JN	CARBOXALDEHYDE
20000JN	TETRAMETHYLPHENANTHRENE
*	OCTAHYDRODIMETHYL(METHYLETHYL)PHENANTHRENE
90000JN	C CARBOXYLIC ACID, METHYLESTER
*	OCTAHYDRODIMETHYL(METHYLETHYL)PHENANTHRENE
10000JN	CARBOXYLIC ACID
500000J	16 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
*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.   08/20/92

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

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**   PROJECT NO. 92-0629   SAMPLE NO. 69721   SAMPLE TYPE: SOIL       PROG ELEM: NSF    COLLECTED BY: C HELM          **
**   SOURCE: HERCULES INC                                             CITY: HATIESBURG          ST: MS                 **
**   STATION ID: SS-04                                                COLLECTION START: 06/25/92  0845   STOP: 00/00/00 **
**   CASE.NO.: 18341          SAS NO.:                                D. NO.: DH71              MD NO: DC71            **
**                                                                                                                     **
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ANALYTICAL RESULTS UG/KG

10000J	18 UNIDENTIFIED COMPOUNDS
*	OCTAHYDRODIMETHYL(METHYLETHYL)PHENANTHRENE
2000JN	CARBOXYLIC ACID, METHYLESTER

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.
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.
08/20/92

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69722 SAMPLE TYPE: SOIL	PROG ELEM: NSF COLLECTED BY: C HELM	
SOURCE: HERCULES INC	CITY: HATIESBURG	ST: MS
STATION ID: SS-05	COLLECTION START: 06/25/92 0945	STOP: 00/00/00
CASE.NO.: 18341 SAS NO.:	D. NO.: DH72	MD NO: DC72

ANALYTICAL RESULTS UG/KG

*	OCTAHYDRODIMETHYL(METHYLETHYL)PHENANTHRENE
400JN	CARBOXYLIC ACID, METHYLESTER
4000J	4 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
*U-MATERIAL WAS ANALYZED FOR BUT NOT DETECTED. THE NUMBER IS THE MINIMUM QUANTITATION LIMIT.
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.
08/20/92

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

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**   PROJECT NO. 92-0629   SAMPLE NO. 69724  SAMPLE TYPE: GROUNDWA    PROG ELEM: NSF   COLLECTED BY: C HELM          **
**   SOURCE: HERCULES INC                                             CITY: HATIESBURG             ST: MS              **
**   STATION ID: TW-05                                                COLLECTION START: 06/25/92  1050  STOP: 00/00/00 **
**   CASE.NO.: 18341        SAS NO.:                                  D. NO.: DH74                MD NO: DC74          **
**                                                                                                                     **
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ANALYTICAL RESULTS UG/L

200J   7 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.

08/20/92

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69726 SAMPLE TYPE: GROUNDWA	PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC	CITY: HATIESBURG ST: MS
STATION ID: MW-81	COLLECTION START: 06/25/92 1330 STOP: 00/00/00
CASE.NO.: 18341 SAS NO.:	D. NO.: DH76 MD NO: DC76

ANALYTICAL RESULTS UG/L

30J 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.
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region IV
Environmental Services Division
College Station Road, Athens, Ga. 30613

*****MEMORANDUM******

DATE: 09/30/92

SUBJECT: Results of Extractable Organic Analysis;
92-0781 HERCULES, INC
HATTIESBUR MS
CASE NO: 18613

FROM: Robert W. Knight
Chief, Laboratory Evaluation/Quality Assurance Section

TO: JOE SLYKERMAN

Attached are the results of analysis of samples collected as part of the subject project.

As a result of the Quality Assurance Review, certain data qualifiers may have been placed on the data. Attached is a DATA QUALIFIER REPORT which explains the reasons that these qualifiers were required.

If you have any questions please contact me.

ATTACHMENT

ORGANIC DATA QUALIFIER REPORT

Case Number 18613 Project Number 92-0781 SAS Number
Site ID. Hercules, Inc., Hattiesburg, MS.

Affected Samples	Compound or Fraction	Flag Used	Reason
Volatiles			
71240	styrene	J	<quantitation limit
	xylenes	J	<quantitation limit
71242	chloroform	J	<quantitation limit
Extractables			
all soil samples	2-chlorophenol	J	low blind spike recovery
	acenaphthene	J	low blind spike recoveru
71241	1,2-dichlorobenzene	J	<quantitation limit
Pesticides			
none			

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

09/29/92

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 92-0781 SAMPLE NO. 71238 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: R JORDAN
SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS
STATION ID: HI-SW-01 COLLECTION START: 08/18/92 0910 STOP: 00/00/00

CASE NO.: 18613 SAS NO.: D. NO.: DN52

UG/L	ANALYTICAL RESULTS
10U	PHENOL
10U	BIS(2-CHLOROETHYL) ETHER
10U	2-CHLOROPHENOL
10U	1,3-DICHLOROBENZENE
10U	1,4-DICHLOROBENZENE
10U	1,2-DICHLOROBENZENE
10U	2-METHYLPHENOL
10U	2,2'-CHLOROISOPROPYLETHER
10U	(3-AND/OR 4-)METHYLPHENOL
10U	N-NITROSODI-N-PROPYLAMINE
10U	HEXACHLOROETHANE
10U	NITROBENZENE
10U	ISOPHORONE
10U	2-NITROPHENOL
10U	2,4-DIMETHYLPHENOL
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
25U	2,4,5-TRICHLOROPHENOL
10U	2-CHLORONAPHTHALENE
25U	2-NITROANILINE
10U	DIMETHYL PHTHALATE
10U	ACENAPHTHYLENE
10U	2,6-DINITROTOLUENE

UG/L	ANALYTICAL RESULTS
25U	3-NITROANILINE
10U	ACENAPHTHENE
25U	2,4-DINITROPHENOL
25U	4-NITROPHENOL
10U	DIBENZOFURAN
10U	2,4-DINITROTOLUENE
10U	DIETHYL PHTHALATE
10U	4-CHLOROPHENYL PHENYL ETHER
10U	FLUORENE
25U	4-NITROANILINE
25U	2-METHYL-4,6-DINITROPHENOL
10U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
10U	4-BROMOPHENYL PHENYL ETHER
10U	HEXACHLOROBENZENE (HCB)
25U	PENTACHLOROPHENOL
10U	PHENANTHRENE
10U	ANTHRACENE
10U	CARBAZOLE
10U	DI-N-BUTYLPHTHALATE
10U	FLUORANTHENE
10U	PYRENE
10U	BENZYL BUTYL PHTHALATE
10U	3,3'-DICHLOROBENZIDINE
10U	BENZO(A)ANTHRACENE
10U	CHRYSENE
10U	BIS(2-ETHYLHEXYL) PHTHALATE
10U	DI-N-OCTYLPHTHALATE
10U	BENZO(B AND/OR K)FLUORANTHENE
10U	BENZO-A-PYRENE
10U	INDENO (1,2,3-CD) PYRENE
10U	DIBENZO(A,H)ANTHRACENE
10U	BENZO(GHI)PERYLENE

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.

09/29/92

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 92-0781 SAMPLE NO. 71239 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: R JORDAN
SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS
STATION ID: HI-SW-02 COLLECTION START: 08/18/92 0940 STOP: 00/00/00

CASE NO.: 18613 SAS NO.: D. NO.: DN53

UG/L	ANALYTICAL RESULTS
10U	PHENOL
10U	BIS(2-CHLOROETHYL) ETHER
10U	2-CHLOROPHENOL
10U	1,3-DICHLOROBENZENE
10U	1,4-DICHLOROBENZENE
10U	1,2-DICHLOROBENZENE
10U	2-METHYLPHENOL
10U	2,2'-CHLOROISOPROPYLETHER
10U	(3-AND/OR 4-)METHYLPHENOL
10U	N-NITROSODI-N-PROPYLAMINE
10U	HEXACHLOROETHANE
10U	NITROBENZENE
10U	ISOPHORONE
10U	2-NITROPHENOL
10U	2,4-DIMETHYLPHENOL
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
25U	2,4,5-TRICHLOROPHENOL
10U	2-CHLORONAPHTHALENE
25U	2-NITROANILINE
10U	DIMETHYL PHTHALATE
10U	ACENAPHTHYLENE
10U	2,6-DINITROTOLUENE

UG/L	ANALYTICAL RESULTS
25U	3-NITROANILINE
10U	ACENAPHTHENE
25U	2,4-DINITROPHENOL
25U	4-NITROPHENOL
10U	DIBENZOFURAN
10U	2,4-DINITROTOLUENE
10U	DIETHYL PHTHALATE
10U	4-CHLOROPHENYL PHENYL ETHER
10U	FLUORENE
25U	4-NITROANILINE
25U	2-METHYL-4,6-DINITROPHENOL
10U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
10U	4-BROMOPHENYL PHENYL ETHER
10U	HEXACHLOROBENZENE (HCB)
25U	PENTACHLOROPHENOL
10U	PHENANTHRENE
10U	ANTHRACENE
10U	CARBAZOLE
10U	DI-N-BUTYLPHTHALATE
10U	FLUORANTHENE
10U	PYRENE
10U	BENZYL BUTYL PHTHALATE
10U	3,3'-DICHLOROBENZIDINE
10U	BENZO(A)ANTHRACENE
10U	CHRYSENE
10U	BIS(2-ETHYLHEXYL) PHTHALATE
10U	DI-N-OCTYLPHTHALATE
10U	BENZO(B AND/OR K)FLUORANTHENE
10U	BENZO-A-PYRENE
10U	INDENO (1,2,3-CD) PYRENE
10U	DIBENZO(A,H)ANTHRACENE
10U	BENZO(GHI)PERYLENE

REMARKS

REMARKS

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

09/29/92

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 92-0781 SAMPLE NO. 71240 SAMPLE TYPE: SOIL
SOURCE: HERCULES, INC
STATION ID: HI-SD-04
PROG ELEM: NSF COLLECTED BY: R JORDAN
CITY: HATTIESBUR ST: MS
COLLECTION START: 08/18/92 1030 STOP: 00/00/00

CASE NO.: 18613 SAS NO.: D. NO.: DN54

UG/KG	ANALYTICAL RESULTS
26000U	PHENOL
26000U	BIS(2-CHLOROETHYL) ETHER
26000UJ	2-CHLOROPHENOL
26000U	1,3-DICHLOROBENZENE
26000U	1,4-DICHLOROBENZENE
26000U	1,2-DICHLOROBENZENE
26000U	2-METHYLPHENOL
26000U	2,2'-CHLOROISOPROPYLETHER
26000U	(3-AND/OR 4-)METHYLPHENOL
26000U	N-NITROSODI-N-PROPYLAMINE
26000U	HEXACHLOROETHANE
26000U	NITROBENZENE
26000U	ISOPHORONE
26000U	2-NITROPHENOL
26000U	2,4-DIMETHYLPHENOL
26000U	BIS(2-CHLOROETHOXY) METHANE
26000U	2,4-DICHLOROPHENOL
26000U	1,2,4 TRICHLOROBENZENE
26000U	NAPHTHALENE
26000U	4-CHLOROANILINE
26000U	HEXACHLOROBUTADIENE
26000U	4-CHLORO-3-METHYLPHENOL
26000U	2-METHYLNAPHTHALENE
26000U	HEXACHLOROCYCLOPENTADIENE (HCCP)
26000U	2,4,6-TRICHLOROPHENOL
67000U	2,4,5-TRICHLOROPHENOL
26000U	2-CHLORONAPHTHALENE
67000U	2-NITROANILINE
26000U	DIMETHYL PHTHALATE
26000U	ACENAPHTHYLENE
26000U	2,6-DINITROTOLUENE

UG/KG	ANALYTICAL RESULTS
67000U	3-NITROANILINE
26000UJ	ACENAPHTHENE
67000U	2,4-DINITROPHENOL
67000U	4-NITROPHENOL
26000U	DIBENZOFURAN
26000U	2,4-DINITROTOLUENE
26000U	DIETHYL PHTHALATE
26000U	4-CHLOROPHENYL PHENYL ETHER
26000U	FLUORENE
67000U	4-NITROANILINE
67000U	2-METHYL-4,6-DINITROPHENOL
26000U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
26000U	4-BROMOPHENYL PHENYL ETHER
26000U	HEXACHLOROBENZENE (HCB)
67000U	PENTACHLOROPHENOL
26000U	PHENANTHRENE
26000U	ANTHRACENE
26000U	CARBAZOLE
26000U	DI-N-BUTYLPHTHALATE
26000U	FLUORANTHENE
26000U	PYRENE
26000U	BENZYL BUTYL PHTHALATE
26000U	3,3'-DICHLOROBENZIDINE
26000U	BENZO(A)ANTHRACENE
26000U	CHRYSENE
26000U	BIS(2-ETHYLHEXYL) PHTHALATE
26000U	DI-N-OCTYLPHTHALATE
26000U	BENZO(B AND/OR K)FLUORANTHENE
26000U	BENZO-A-PYRENE
26000U	INDENO (1,2,3-CD) PYRENE
26000U	DIBENZO(A,H)ANTHRACENE
26000U	BENZO(GHI)PERYLENE
66	PERCENT MOISTURE

REMARKS

REMARKS

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

09/29/92

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO: 92-0781 SAMPLE NO. 71241 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: R JORDAN
SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS
STATION ID: HI-SD-03 COLLECTION START: 08/18/92 1145 STOP: 00/00/00

CASE NO.: 18613 SAS NO.: D. NO.: DN55

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
130000U	PHENOL	330000U	3-NITROANILINE
130000U	BIS(2-CHLOROETHYL) ETHER	130000UJ	ACENAPHTHENE
130000UJ	2-CHLOROPHENOL	330000U	2,4-DINITROPHENOL
130000U	1,3-DICHLOROBENZENE	130000U	4-NITROPHENOL
130000U	1,4-DICHLOROBENZENE	130000U	DIBENZOFURAN
130000U	1,2-DICHLOROBENZENE	130000U	2,4-DINITROTOLUENE
22000J	2-METHYLPHENOL	130000U	DIETHYL PHTHALATE
130000U	2,2'-CHLOROISOPROPYLETHER	130000U	4-CHLOROPHENYL PHENYL ETHER
130000U	(3-AND/OR 4-)METHYLPHENOL	130000U	FLUORENE
130000U	N-NITROSODI-N-PROPYLAMINE	330000U	4-NITROANILINE
130000U	HEXACHLOROETHANE	130000U	2-METHYL-4,6-DINITROPHENOL
130000U	NITROBENZENE	130000U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
130000U	ISOPHORONE	130000U	4-BROMOPHENYL PHENYL ETHER
130000U	2-NITROPHENOL	130000U	HEXACHLOROBENZENE (HCB)
130000U	2,4-DIMETHYLPHENOL	330000U	PENTACHLOROPHENOL
130000U	BIS(2-CHLOROETHOXY) METHANE	130000U	PHENANTHRENE
130000U	2,4-DICHLOROPHENOL	130000U	ANTHRACENE
130000U	1,2,4-TRICHLOROBENZENE	130000U	CARBAZOLE
130000U	NAPHTHALENE	130000U	DI-N-BUTYLPHTHALATE
130000U	4-CHLOROANILINE	130000U	FLUORANTHENE
130000U	HEXACHLOROBUTADIENE	130000U	PYRENE
130000U	4-CHLORO-3-METHYLPHENOL	130000U	BENZYL BUTYL PHTHALATE
130000U	2-METHYLNAPHTHALENE	130000U	3,3'-DICHLOROBENZIDINE
130000U	HEXACHLOROCYCLOPENTADIENE (HCCP)	130000U	BENZO(A)ANTHRACENE
130000U	2,4,6-TRICHLOROPHENOL	130000U	CHRYSENE
330000U	2,4,5-TRICHLOROPHENOL	130000U	BIS(2-ETHYLHEXYL) PHTHALATE
130000U	2-CHLORONAPHTHALENE	130000U	DI-N-OCTYLPHTHALATE
330000U	2-NITROANILINE	130000U	BENZO(B AND/OR K)FLUORANTHENE
130000U	DIMETHYL PHTHALATE	130000U	BENZO-A-PYRENE
130000U	ACENAPHTHYLENE	130000U	INDENO (1,2,3-CD) PYRENE
130000U	2,6-DINITROTOLUENE	130000U	DIBENZO(A,H)ANTHRACENE
		130000U	BENZO(GHI)PERYLENE
		25	PERCENT MOISTURE

REMARKS

REMARKS

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

09/29/92

EXTRACTABLE ORGANICS DATA REPORT

*** ***
** PROJECT NO. 92-0781 SAMPLE NO. 71242 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: R JORDAN **
** SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS **
** STATION ID: HI-SS-04 COLLECTION START: 08/18/92 1010 STOP: 00/00/00 **
** **
** CASE NO.: 18613 SAS NO.: D. NO.: DN56 **
*** ***

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
660U	PHENOL	1600U	3-NITROANILINE
660U	BIS(2-CHLOROETHYL) ETHER	660UJ	ACENAPHTHENE
660UJ	2-CHLOROPHENOL	1600U	2,4-DINITROPHENOL
660U	1,3-DICHLOROBENZENE	1600U	4-NITROPHENOL
660U	1,4-DICHLOROBENZENE	660U	DIBENZOFURAN
660U	1,2-DICHLOROBENZENE	660U	2,4-DINITROTOLUENE
660U	2-METHYLPHENOL	660U	DIETHYL PHTHALATE
660U	2,2'-CHLOROISOPROPYLETHER	660U	4-CHLOROPHENYL PHENYL ETHER
660U	(3-AND/OR 4-)METHYLPHENOL	660U	FLUORENE
660U	N-NITROSODI-N-PROPYLAMINE	1600U	4-NITROANILINE
660U	HEXACHLOROETHANE	1600U	2-METHYL-4,6-DINITROPHENOL
660U	NITROBENZENE	660U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
660U	ISOPHORONE	660U	4-BROMOPHENYL PHENYL ETHER
660U	2-NITROPHENOL	660U	HEXACHLOROBENZENE (HCB)
660U	2,4-DIMETHYLPHENOL	1600U	PENTACHLOROPHENOL
660U	BIS(2-CHLOROETHOXY) METHANE	660U	PHENANTHRENE
660U	2,4-DICHLOROPHENOL	660U	ANTHRACENE
660U	1,2,4-TRICHLOROBENZENE	660U	CARBAZOLE
660U	NAPHTHALENE	660U	DI-N-BUTYLPHTHALATE
660U	4-CHLOROANILINE	660U	FLUORANTHENE
660U	HEXACHLOROBUTADIENE	660U	PYRENE
660U	4-CHLORO-3-METHYLPHENOL	660U	BENZYL BUTYL PHTHALATE
660U	2-METHYLNAPHTHALENE	660U	3,3'-DICHLOROBENZIDINE
660U	HEXACHLOROCYCLOPENTADIENE (HCCP)	660U	BENZO(A)ANTHRACENE
660U	2,4,6-TRICHLOROPHENOL	660U	CHRYSENE
1600U	2,4,5-TRICHLOROPHENOL	660U	BIS(2-ETHYLHEXYL) PHTHALATE
660U	2-CHLORONAPHTHALENE	660U	DI-N-OCTYLPHTHALATE
1600U	2-NITROANILINE	660U	BENZO(B AND/OR K)FLUORANTHENE
660U	DIMETHYL PHTHALATE	660U	BENZO-A-PYRENE
660U	ACENAPHTHYLENE	660U	INDENO (1,2,3-CD) PYRENE
660U	2,6-DINITROTOLUENE	660U	DIBENZO(A,H)ANTHRACENE
		660U	BENZO(GHI)PERYLENE
		1	PERCENT MOISTURE

REMARKS ***REMARKS***

FOOTNOTES
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.
09/29/92

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 92-0781 SAMPLE NO. 71243 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: R JORDAN
SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS
STATION ID: HI-SS-05 COLLECTION START: 08/18/92 1125 STOP: 00/00/00

CASE NO.: 18613 SAS NO.: D. NO.: DN57

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
390U	PHENOL	950U	3-NITROANILINE
390U	BIS(2-CHLOROETHYL) ETHER	390UJ	ACENAPHTHENE
390UJ	2-CHLOROPHENOL	950U	2,4-DINITROPHENOL
390U	1,3-DICHLOROBENZENE	950U	4-NITROPHENOL
390U	1,4-DICHLOROBENZENE	390U	DIBENZOFURAN
390U	1,2-DICHLOROBENZENE	390U	2,4-DINITROTOLUENE
390U	2-METHYLPHENOL	390U	DIETHYL PHTHALATE
390U	2,2'-CHLOROISOPROPYLETHER	390U	4-CHLOROPHENYL PHENYL ETHER
390U	(3-AND/OR 4-)METHYLPHENOL	390U	FLUORENE
390U	N-NITROSODI-N-PROPYLAMINE	950U	4-NITROANILINE
390U	HEXACHLOROETHANE	950U	2-METHYL-4,6-DINITROPHENOL
390U	NITROBENZENE	390U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
390U	ISOPHORONE	390U	4-BROMOPHENYL PHENYL ETHER
390U	2-NITROPHENOL	390U	HEXACHLOROBENZENE (HCB)
390U	2,4-DIMETHYLPHENOL	950U	PENTACHLOROPHENOL
390U	BIS(2-CHLOROETHOXY) METHANE	390U	PHENANTHRENE
390U	2,4-DICHLOROPHENOL	390U	ANTHRACENE
390U	1,2,4-TRICHLOROBENZENE	390U	CARBAZOLE
390U	NAPHTHALENE	390U	DI-N-BUTYLPHTHALATE
390U	4-CHLOROANILINE	390U	FLUORANTHENE
390U	HEXACHLOROBUTADIENE	390U	PYRENE
390U	4-CHLORO-3-METHYLPHENOL	390U	BENZYL BUTYL PHTHALATE
390U	2-METHYLNAPHTHALENE	390U	3,3'-DICHLOROBENZIDINE
390U	HEXACHLOROCYCLOPENTADIENE (HCCP)	390U	BENZO(A)ANTHRACENE
390U	2,4,6-TRICHLOROPHENOL	390U	CHRYSENE
950U	2,4,5-TRICHLOROPHENOL	390U	BIS(2-ETHYLHEXYL) PHTHALATE
390U	2-CHLORONAPHTHALENE	390U	DI-N-OCTYLPHTHALATE
950U	2-NITROANILINE	390U	BENZO(B AND/OR K)FLUORANTHENE
390U	DIMETHYL PHTHALATE	390U	BENZO-A-PYRENE
390U	ACENAPHTHYLENE	390U	INDENO (1,2,3-CD) PYRENE
390U	2,6-DINITROTOLUENE	390U	DIBENZO(A,H)ANTHRACENE
		390U	BENZO(GHI)PERYLENE
		16	PERCENT MOISTURE

REMARKS ***REMARKS***

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

09/29/92

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 92-0781 SAMPLE NO. 71244 SAMPLE TYPE: SOIL
SOURCE: HERCULES, INC
STATION ID: HI-SB-05

PROG ELEM: NSF COLLECTED BY: R JORDAN
CITY: HATTIESBUR ST: MS
COLLECTION START: 08/18/92 1145 STOP: 00/00/00

CASE NO.: 18613 SAS NO.: D. NO.: DN58

UG/KG	ANALYTICAL RESULTS
400U	PHENOL
400U	BIS(2-CHLOROETHYL) ETHER
400UJ	2-CHLOROPHENOL
400U	1,3-DICHLOROBENZENE
400U	1,4-DICHLOROBENZENE
400U	1,2-DICHLOROBENZENE
400U	2-METHYLPHENOL
400U	2,2'-CHLOROISOPROPYLETHER
400U	(3-AND/OR 4-)METHYLPHENOL
400U	N-NITROSODI-N-PROPYLAMINE
400U	HEXACHLOROETHANE
400U	NITROBENZENE
400U	ISOPHORONE
400U	2-NITROPHENOL
400U	2,4-DIMETHYLPHENOL
400U	BIS(2-CHLOROETHOXY) METHANE
400U	2,4-DICHLOROPHENOL
400U	1,2,4-TRICHLOROBENZENE
400U	NAPHTHALENE
400U	4-CHLOROANILINE
400U	HEXACHLOROBUTADIENE
400U	4-CHLORO-3-METHYLPHENOL
400U	2-METHYLNAPHTHALENE
400U	HEXACHLOROCYCLOPENTADIENE (HCCP)
400U	2,4,6-TRICHLOROPHENOL
970U	2,4,5-TRICHLOROPHENOL
400U	2-CHLORONAPHTHALENE
970U	2-NITROANILINE
400U	DIMETHYL PHTHALATE
400U	ACENAPHTHYLENE
400U	2,6-DINITROTOLUENE

UG/KG	ANALYTICAL RESULTS
970U	3-NITROANILINE
400UJ	ACENAPHTHENE
970U	2,4-DINITROPHENOL
970U	4-NITROPHENOL
400U	DIBENZOFURAN
400U	2,4-DINITROTOLUENE
400U	DIETHYL PHTHALATE
400U	4-CHLOROPHENYL PHENYL ETHER
400U	FLUORENE
970U	4-NITROANILINE
970U	2-METHYL-4,6-DINITROPHENOL
400U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
400U	4-BROMOPHENYL PHENYL ETHER
400U	HEXACHLOROBENZENE (HCB)
970U	PENTACHLOROPHENOL
400U	PHENANTHRENE
400U	ANTHRACENE
400U	CARBAZOLE
400U	DI-N-BUTYLPHTHALATE
400U	FLUORANTHENE
400U	PYRENE
400U	BENZYL BUTYL PHTHALATE
400U	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
18	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.

09/29/92

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 92-0781 SAMPLE NO. 71250 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: R JORDAN
SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS
STATION ID: HI-TB-01 COLLECTION START: 08/18/92 0720 STOP: 00/00/00

CASE NO.: 18613 SAS NO.: D. NO.: DN51

UG/L	ANALYTICAL RESULTS
10U	PHENOL
10U	BIS(2-CHLOROETHYL) ETHER
10U	2-CHLOROPHENOL
10U	1,3-DICHLOROBENZENE
10U	1,4-DICHLOROBENZENE
10U	1,2-DICHLOROBENZENE
10U	2-METHYLPHENOL
10U	2,2'-CHLOROISOPROPYLETHER
10U	(3-AND/OR 4-)METHYLPHENOL
10U	N-NITROSODI-N-PROPYLAMINE
10U	HEXACHLOROETHANE
10U	NITROBENZENE
10U	ISOPHORONE
10U	2-NITROPHENOL
10U	2,4-DIMETHYLPHENOL
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
25U	2,4,5-TRICHLOROPHENOL
10U	2-CHLORONAPHTHALENE
25U	2-NITROANILINE
10U	DIMETHYL PHTHALATE
10U	ACENAPHTHYLENE
10U	2,6-DINITROTOLUENE

UG/L	ANALYTICAL RESULTS
25U	3-NITROANILINE
10U	ACENAPHTHENE
25U	2,4-DINITROPHENOL
25U	4-NITROPHENOL
10U	DIBENZOFURAN
10U	2,4-DINITROTOLUENE
10U	DIETHYL PHTHALATE
10U	4-CHLOROPHENYL PHENYL ETHER
10U	FLUORENE
25U	4-NITROANILINE
25U	2-METHYL-4,6-DINITROPHENOL
10U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
10U	4-BROMOPHENYL PHENYL ETHER
10U	HEXACHLOROBENZENE (HCB)
25U	PENTACHLOROPHENOL
10U	PHENANTHRENE
10U	ANTHRACENE
10U	CARBAZOLE
10U	DI-N-BUTYLPHTHALATE
10U	FLUORANTHENE
10U	PYRENE
10U	BENZYL BUTYL PHTHALATE
10U	3,3'-DICHLOROBENZIDINE
10U	BENZO(A)ANTHRACENE
10U	CHRYSENE
10U	BIS(2-ETHYLHEXYL) PHTHALATE
10U	DI-N-OCTYLPHTHALATE
10U	BENZO(B AND/OR K)FLUORANTHENE
10U	BENZO-A-PYRENE
10U	INDENO (1,2,3-CD) PYRENE
10U	DIBENZO(A,H)ANTHRACENE
10U	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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*U-MATERIAL WAS ANALYZED FOR BUT NOT DETECTED. THE NUMBER IS THE MINIMUM QUANTITATION LIMIT.
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

09/29/92

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

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**   PROJECT NO. 92-0781   SAMPLE NO. 71239  SAMPLE TYPE: SURFACEWA   PROG ELEM: NSF   COLLECTED BY: R JORDAN              **
**   SOURCE: HERCULES, INC                                            CITY: HATTIESBUR          ST: MS                     **
**   STATION ID: HI-SW-02                                             COLLECTION START: 08/18/92  0940   STOP: 00/00/00    **
**   CASE.NO.: 18613          SAS NO.:                                D. NO.: DN53              MD NO: DN53                **
**                                                                                                                         **
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ANALYTICAL RESULTS UG/L

100J	4 UNIDENTIFIED COMPOUNDS
N	PETROLEUM PRODUCT

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.

09/29/92

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

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**   PROJECT NO. 92-0781   SAMPLE NO. 71240   SAMPLE TYPE: SOIL        PROG ELEM: NSF   COLLECTED BY: R JORDAN              **
**   SOURCE: HERCULES, INC                                             CITY: HATTIESBUR            ST: MS                   **
**   STATION ID: HI-SD-04                                              COLLECTION START: 08/18/92  1030   STOP: 00/00/00    **
**   CASE.NO.: 18613            SAS NO.:                               D. NO.: DN54                MD NO: DN54              **
**                                                                                                                          **
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ANALYTICAL RESULTS UG/KG

N	PETROLEUM PRODUCT
4000000J	20 UNIDENTIFIED COMPOUNDS

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

09/29/92

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

PROJECT NO. 92-0781 SAMPLE NO. 71241 SAMPLE TYPE: SOIL	PROG ELEM: NSF COLLECTED BY: R JORDAN
SOURCE: HERCULES, INC	CITY: HATTIESBUR ST: MS
STATION ID: HI-SD-03	COLLECTION START: 08/18/92 1145 STOP: 00/00/00
CASE.NO.: 18613 SAS NO.:	D. NO.: DN55 MD NO: DN55

ANALYTICAL RESULTS UG/KG

6000000J	15 UNIDENTIFIED COMPOUNDS
1+E06JN	PHOSPHORODITHIOIC ACID, DIETHYLESTER
1+E06JN	BIPHENYL

FOOTNOTES
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.
09/29/92

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

PROJECT NO. 92-0781 SAMPLE NO. 71242 SAMPLE TYPE: SOIL	PROG ELEM: NSF COLLECTED BY: R JORDAN
SOURCE: HERCULES, INC	CITY: HATTIESBUR ST: MS
STATION ID: HI-SS-04	COLLECTION START: 08/18/92 1010 STOP: 00/00/00
CASE.NO.: 18613 SAS NO.:	D. NO.: DN56 MD NO: DN56

ANALYTICAL RESULTS UG/KG

N	PETROLEUM PRODUCT
200000J	20 UNIDENTIFIED COMPOUNDS

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

09/29/92

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

*** ***
** PROJECT NO. 92-0781 SAMPLE NO. 71243 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: R JORDAN **
** SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS **
** STATION ID: HI-SS-05 COLLECTION START: 08/18/92 1125 STOP: 00/00/00 **
** CASE.NO.: 18613 SAS NO.: D. NO.: DN57 MD NO: DN57 **
** **
*** ***

ANALYTICAL RESULTS UG/KG

400J 1 UNIDENTIFIED COMPOUND

FOOTNOTES
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region IV
Environmental Services Division
College Station Road, Athens, Ga. 30613

*****MEMORANDUM******

DATE: 09/30/92

SUBJECT: Results of Pesticide/PCB Analysis:
92-0781 HERCULES, INC
HATTIESBUR MS
CASE NO: 18613

FROM: Robert W. Knight
Chief, Laboratory Evaluation/Quality Assurance Section

TO: JOE SLYKERMAN

Attached are the results of analysis of samples collected as part of the subject project.

As a result of the Quality Assurance Review, certain data qualifiers may have been placed on the data. Attached is a DATA QUALIFIER REPORT which explains the reasons that these qualifiers were required.

If you have any questions please contact me.

ATTACHMENT

ORGANIC DATA QUALIFIER REPORT

Case Number 18613 Project Number 92-0781 SAS Number
Site ID. Hercules, Inc., Hattiesburg, MS.

Affected Samples	Compound or Fraction	Flag Used	Reason
Volatiles			
71240	styrene	J	<quantitation limit
	xylenes	J	<quantitation limit
71242	chloroform	J	<quantitation limit
Extractables			
all soil samples	2-chlorophenol	J	low blind spike recovery
	acenaphthene	J	low blind spike recoveru
71241	1,2-dichlorobenzene	J	<quantitation limit
Pesticides			
none			

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

09/29/92

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 92-0781 SAMPLE NO. 71238 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: R JORDAN
SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS
STATION ID: HI-SW-01 COLLECTION START: 08/18/92 0910 STOP: 00/00/00
CASE NUMBER: 18613 SAS NUMBER: D. NUMBER: DN52

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
0.050U	ALPHA-BHC	0.50U	METHOXYCHLOR
0.050U	BETA-BHC	0.10U	ENDRIN KETONE
0.050U	DELTA-BHC	0.10U	ENDRIN ALDEHYDE
0.050U	GAMMA-BHC (LINDANE)	--	CHLORDANE (TECH. MIXTURE) /1
0.050U	HEPTACHLOR	0.050U	GAMMA-CHLORDANE /2
0.050U	ALDRIN	0.050U	ALPHA-CHLORDANE /2
0.050U	HEPTACHLOR EPOXIDE	5.0U	TOXAPHENE
0.050U	ENDOSULFAN I (ALPHA)	1.0U	PCB-1016 (AROCLOR 1016)
0.10U	DIELDRIN	2.0U	PCB-1221 (AROCLOR 1221)
0.10U	4,4'-DDE (P,P'-DDE)	1.0U	PCB-1232 (AROCLOR 1232)
0.10U	ENDRIN	1.0U	PCB-1242 (AROCLOR 1242)
0.10U	ENDOSULFAN II (BETA)	1.0U	PCB-1248 (AROCLOR 1248)
0.10U	4,4'-DDD (P,P'-DDD)	1.0U	PCB-1254 (AROCLOR 1254)
0.10U	ENDOSULFAN SULFATE	1.0U	PCB-1260 (AROCLOR 1260)
0.10U	4,4'-DDT (P,P'-DDT)		

REMARKS

REMARKS

FOOTNOTES
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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.

09/29/92

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 92-0781 SAMPLE NO. 71239 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: R JORDAN
SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS
STATION ID: HI-SW-02 COLLECTION START: 08/18/92 0940 STOP: 00/00/00
CASE NUMBER: 18613 SAS NUMBER: D. NUMBER: DN53

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
0.050U	ALPHA-BHC	0.50U	METHOXYCHLOR
0.050U	BETA-BHC	0.10U	ENDRIN KETONE
0.050U	DELTA-BHC	0.10U	ENDRIN ALDEHYDE
0.050U	GAMMA-BHC (LINDANE)	--	CHLORDANE (TECH. MIXTURE) /1
0.050U	HEPTACHLOR	0.050U	GAMMA-CHLORDANE /2
0.050U	ALDRIN	0.050U	ALPHA-CHLORDANE /2
0.050U	HEPTACHLOR EPOXIDE	5.0U	TOXAPHENE
0.050U	ENDOSULFAN I (ALPHA)	1.0U	PCB-1016 (AROCLOR 1016)
0.10U	DIELDRIN	2.0U	PCB-1221 (AROCLOR 1221)
0.10U	4,4'-DDE (P,P'-DDE)	1.0U	PCB-1232 (AROCLOR 1232)
0.10U	ENDRIN	1.0U	PCB-1242 (AROCLOR 1242)
0.10U	ENDOSULFAN II (BETA)	1.0U	PCB-1248 (AROCLOR 1248)
0.10U	4,4'-DDD (P,P'-DDD)	1.0U	PCB-1254 (AROCLOR 1254)
0.10U	ENDOSULFAN SULFATE	1.0U	PCB-1260 (AROCLOR 1260)
0.10U	4,4'-DDT (P,P'-DDT)		

REMARKS ***REMARKS***

FOOTNOTES
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.   09/29/92

PESTICIDES/PCB'S DATA REPORT

*** ***
** PROJECT NO. 92-0781 SAMPLE NO. 71240 SAMPLE TYPE: SOIL   PROG ELEM: NSF COLLECTED BY: R JORDAN **
** SOURCE: HERCULES, INC   CITY: HATTIESBUR   ST: MS **
** STATION ID: HI-SD-04   COLLECTION START: 08/18/92 1030 STOP: 00/00/00 **
** CASE NUMBER: 18613   SAS NUMBER: D. NUMBER: DN54 **
** **
*** ***

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
5.0U	ALPHA-BHC	50U	METHOXYCHLOR
5.0U	BETA-BHC	9.7U	ENDRIN KETONE
5.0U	DELTA-BHC	9.7U	ENDRIN ALDEHYDE
5.0U	GAMMA-BHC (LINDANE)	--	CHLORDANE (TECH. MIXTURE) /1
5.0U	HEPTACHLOR	5.0U	GAMMA-CHLORDANE /2
5.0U	ALDRIN	9.0U	ALPHA-CHLORDANE /2
5.0U	HEPTACHLOR EPOXIDE	500U	TOXAPHENE
5.0U	ENDOSULFAN I (ALPHA)	97U	PCB-1016 (AROCLOR 1016)
9.7U	DIELDRIN	200U	PCB-1221 (AROCLOR 1221)
9.7U	4,4'-DDE (P,P'-DDE)	97U	PCB-1232 (AROCLOR 1232)
9.7U	ENDRIN	97U	PCB-1242 (AROCLOR 1242)
9.7U	ENDOSULFAN II (BETA)	97U	PCB-1248 (AROCLOR 1248)
9.7U	4,4'-DDD (P,P'-DDD)	97U	PCB-1254 (AROCLOR 1254)
9.7U	ENDOSULFAN SULFATE	97U	PCB-1260 (AROCLOR 1260)
20U	4,4'-DDT (P,P'-DDT)	66	PERCENT MOISTURE

REMARKS
WATER MISCIBLE PHASE-94.4% :0.08U MG/KG MERCURY

REMARKS

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

09/29/92

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 92-0781 SAMPLE NO. 71241 SAMPLE TYPE: SOIL
PROG ELEM: NSF COLLECTED BY: R JORDAN
SOURCE: HERCULES, INC
CITY: HATTIESBUR ST: MS
STATION ID: HI-SD-03
COLLECTION START: 08/18/92 1145 STOP: 00/00/00
CASE NUMBER: 18613 SAS NUMBER:
D. NUMBER: DN55

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
220U	ALPHA-BHC	2200U	METHOXYCHLOR
220U	BETA-BHC	440U	ENDRIN KETONE
220U	DELTA-BHC	440U	ENDRIN ALDEHYDE
220U	GAMMA-BHC (LINDANE)	--	CHLORDANE (TECH. MIXTURE) /1
220U	HEPTACHLOR	220U	GAMMA-CHLORDANE /2
220U	ALDRIN	220U	ALPHA-CHLORDANE /2
220U	HEPTACHLOR EPOXIDE	22000U	TOXAPHENE
220U	ENDOSULFAN I (ALPHA)	4400U	PCB-1016 (AROCLOR 1016)
440U	DIELDRIN	8900U	PCB-1221 (AROCLOR 1221)
440U	4,4'-DDE (P,P'-DDE)	4400U	PCB-1232 (AROCLOR 1232)
440U	ENDRIN	4400U	PCB-1242 (AROCLOR 1242)
440U	ENDOSULFAN II (BETA)	4400U	PCB-1248 (AROCLOR 1248)
440U	4,4'-DDD (P,P'-DDD)	4400U	PCB-1254 (AROCLOR 1254)
440U	ENDOSULFAN SULFATE	4400U	PCB-1260 (AROCLOR 1260)
440U	4,4'-DDT (P,P'-DDT)	25	PERCENT MOISTURE

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.

09/29/92

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 92-0781 SAMPLE NO. 71242 SAMPLE TYPE: SOIL
SOURCE: HERCULES, INC
STATION ID: HI-SS-04
CASE NUMBER: 18613 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: R JORDAN
CITY: HATTIESBUR ST: MS
COLLECTION START: 08/18/92 1010 STOP: 00/00/00
D. NUMBER: DN56

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
1.7U	ALPHA-BHC	17U	METHOXYCHLOR
1.7U	BETA-BHC	3.3U	ENDRIN KETONE
1.7U	DELTA-BHC	3.3U	ENDRIN ALDEHYDE
1.7U	GAMMA-BHC (LINDANE)	--	CHLORDANE (TECH. MIXTURE) /1
1.7U	HEPTACHLOR	1.7U	GAMMA-CHLORDANE /2
1.7U	ALDRIN	1.7U	ALPHA-CHLORDANE /2
1.7U	HEPTACHLOR EPOXIDE	170U	TOXAPHENE
1.7U	ENDOSULFAN I (ALPHA)	33U	PCB-1016 (AROCLOR 1016)
3.3U	DIELDRIN	67U	PCB-1221 (AROCLOR 1221)
3.3U	4,4'-DDE (P,P'-DDE)	33U	PCB-1232 (AROCLOR 1232)
3.3U	ENDRIN	33U	PCB-1242 (AROCLOR 1242)
3.3U	ENDOSULFAN II (BETA)	33U	PCB-1248 (AROCLOR 1248)
3.3U	4,4'-DDD (P,P'-DDD)	33U	PCB-1254 (AROCLOR 1254)
3.3U	ENDOSULFAN SULFATE	33U	PCB-1260 (AROCLOR 1260)
3.3U	4,4'-DDT (P,P'-DDT)	1	PERCENT MOISTURE

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.
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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.
09/29/92

PESTICIDES/PCB'S DATA REPORT

*** ***
** PROJECT NO. 92-0781 SAMPLE NO. 71243 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: R JORDAN **
** SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS **
** STATION ID: HI-SS-05 COLLECTION START: 08/18/92 1125 STOP: 00/00/00 **
** CASE NUMBER: 18613 SAS NUMBER: D. NUMBER: DN57 **
** **
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UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
2.0U	ALPHA-BHC	20U	METHOXYCHLOR
2.0U	BETA-BHC	3.9U	ENDRIN KETONE
2.0U	DELTA-BHC	3.9U	ENDRIN ALDEHYDE
2.0U	GAMMA-BHC (LINDANE)	--	CHLORDANE (TECH. MIXTURE) /1
2.0U	HEPTACHLOR	2.0U	GAMMA-CHLORDANE /2
2.0U	ALDRIN	2.0U	ALPHA-CHLORDANE /2
2.0U	HEPTACHLOR EPOXIDE	200U	TOXAPHENE
2.0U	ENDOSULFAN I (ALPHA)	39U	PCB-1016 (AROCLOR 1016)
3.9U	DIELDRIN	79U	PCB-1221 (AROCLOR 1221)
3.9U	4,4'-DDE (P,P'-DDE)	39U	PCB-1232 (AROCLOR 1232)
3.9U	ENDRIN	39U	PCB-1242 (AROCLOR 1242)
3.9U	ENDOSULFAN II (BETA)	39U	PCB-1248 (AROCLOR 1248)
3.9U	4,4'-DDD (P,P'-DDD)	39U	PCB-1254 (AROCLOR 1254)
3.9U	ENDOSULFAN SULFATE	39U	PCB-1260 (AROCLOR 1260)
3.9U	4,4'-DDT (P,P'-DDT)	16	PERCENT MOISTURE

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

09/29/92

PESTICIDES/PCB'S DATA REPORT

*** ***
** PROJECT NO. 92-0781 SAMPLE NO. 71244 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: R JORDAN **
** SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS **
** STATION ID: HI-SB-05 COLLECTION START: 08/18/92 1145 STOP: 00/00/00 **
** CASE NUMBER: 18613 SAS NUMBER: D. NUMBER: DN58 **
** **
*** ***

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
2.1U	ALPHA-BHC	21U	METHOXYCHLOR
2.1U	BETA-BHC	4.1U	ENDRIN KETONE
2.1U	DELTA-BHC	4.1U	ENDRIN ALDEHYDE
2.1U	GAMMA-BHC (LINDANE)	--	CHLORDANE (TECH. MIXTURE) /1
2.1U	HEPTACHLOR	2.1U	GAMMA-CHLORDANE /2
2.1U	ALDRIN	2.1U	ALPHA-CHLORDANE /2
2.1U	HEPTACHLOR EPOXIDE	210U	TOXAPHENE
2.1U	ENDOSULFAN I (ALPHA)	41U	PCB-1016 (AROCLOR 1016)
4.1U	DIELDRIN	82U	PCB-1221 (AROCLOR 1221)
4.1U	4,4'-DDE (P,P'-DDE)	41U	PCB-1232 (AROCLOR 1232)
4.1U	ENDRIN	41U	PCB-1242 (AROCLOR 1242)
4.1U	ENDOSULFAN II (BETA)	41U	PCB-1248 (AROCLOR 1248)
4.1U	4,4'-DDD (P,P'-DDD)	41U	PCB-1254 (AROCLOR 1254)
4.1U	ENDOSULFAN SULFATE	41U	PCB-1260 (AROCLOR 1260)
4.1U	4,4'-DDT (P,P'-DDT)	19	PERCENT MOISTURE

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

09/29/92

PESTICIDES/PCB'S DATA REPORT

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** PROJECT NO. 92-0781 SAMPLE NO. 71250 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: R JORDAN **
** SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS **
** STATION ID: HI-TB-01 COLLECTION START: 08/18/92 0720 STOP: 00/00/00 **
** CASE NUMBER: 18613 SAS NUMBER: D. NUMBER: DN51 **
** **
*** ***

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
0.050U	ALPHA-BHC	0.50U	METHOXYCHLOR
0.050U	BETA-BHC	0.10U	ENDRIN KETONE
0.050U	DELTA-BHC	0.10U	ENDRIN ALDEHYDE
0.050U	GAMMA-BHC (LINDANE)	--	CHLORDANE (TECH. MIXTURE) /1
0.050U	HEPTACHLOR	0.050U	GAMMA-CHLORDANE /2
0.050U	ALDRIN	0.050U	ALPHA-CHLORDANE /2
0.050U	HEPTACHLOR EPOXIDE	5.0U	TOXAPHENE
0.050U	ENDOSULFAN I (ALPHA)	1.0U	PCB-1016 (AROCLOR 1016)
0.10U	DIELDRIN	2.0U	PCB-1221 (AROCLOR 1221)
0.10U	4,4'-DDE (P,P'-DDE)	1.0U	PCB-1232 (AROCLOR 1232)
0.10U	ENDRIN	1.0U	PCB-1242 (AROCLOR 1242)
0.10U	ENDOSULFAN II (BETA)	1.0U	PCB-1248 (AROCLOR 1248)
0.10U	4,4'-DDD (P,P'-DDD)	1.0U	PCB-1254 (AROCLOR 1254)
0.10U	ENDOSULFAN SULFATE	1.0U	PCB-1260 (AROCLOR 1260)
0.10U	4,4'-DDT (P,P'-DDT)		

FOOTNOTES
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region IV
Environmental Services Division
College Station Road, Athens, Ga. 30613

*****MEMORANDUM******

DATE: 10/06/92

SUBJECT: Results of Metals Analysis;
92-0781 HERCULES, INC
HATTIESBUR MS
CASE NO: 18613

FROM: Robert W. Knight Gary Bennett /for
Chief, Laboratory Evaluation/Quality Assurance Section

TO: JOE SLYKERMAN

Attached are the results of analysis of samples collected as part of the subject project.

As a result of the Quality Assurance Review, certain data qualifiers may have been placed on the data. Attached is a DATA QUALIFIER REPORT which explains the reasons that these qualifiers were required.

If you have any questions please contact me.

ATTACHMENT

INORGANIC DATA QUALIFIERS REPORT

Case Number: 18613
Project Number: 92-0781
Site: Hercules, Hattiesburgh, MS

Element	Flag	Samples Affected	Reason
A. Water			
Sb, Cd, Cr, Co, Pb, Mn, Ni, Se, Ag	U	All positives > IDL, but < CRDL	Baseline instability
Al, Ca, Cu, Fe, Mg, Zn	U	All positives > IDL, but < 10X contaminant level	Positives in blanks
Cr	JN	All positives with Fe concentrations in solution > 77,000 ug/L	Suspected positive interference as noted in the blind ICS
Tl	J	All	Matrix spike recovery = 58.2%
Pb	J	All	Matrix duplicate RPD = 123.5%
B. Soil			
Sb, Cd, Cr, Co, Pb, Mn, Ni, Se, Ag	U	All positives > IDL, but < CRDL	Baseline instability
Al, Ca, Cu, Fe, Mg, Na	U	All positives > IDL, but	Positives in blanks
Cr	JN	All positives with Fe concentrations in solution > 77,000 ug/L	Suspected positive interference as noted in the blind ICS
Sb	J	All	Matrix spike recovery = 47.1%
Pb	J	All	Matrix spike recovery = 74%
K	J	MDDN58	% RSD > 20% for ICP multiple exposures

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

10/05/92

METALS DATA REPORT

PROJECT NO. 92-0781 SAMPLE NO. 71237 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: R JORDAN
SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS
STATION ID: PB-01 COLLECTION START: 08/18/92 0720 STOP: 00/00/00
CASE NUMBER: 18613 SAS NUMBER: MD NUMBER: DN51

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
70U	ALUMINUM	1U	MANGANESE
11U	ANTIMONY	0.20U	MERCURY
3U	ARSENIC	8U	NICKEL
2U	BARIUM	410U	POTASSIUM
1U	BERYLLIUM	1U	SELENIUM
2U	CADMIUM	1U	SILVER
16U	CALCIUM	31U	SODIUM
4U	CHROMIUM	3UJ	THALLIUM
2U	COBALT	NA	TIN
4U	COPPER	2U	VANADIUM
90U	IRON	5U	ZINC
1UJ	LEAD		
26U	MAGNESIUM		

REMARKS ***REMARKS***

FOOTNOTES
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.   10/05/92

METALS DATA REPORT

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** PROJECT NO. 92-0781 SAMPLE NO. 71238 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: R JORDAN **
** SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS **
** STATION ID: HI-SW-01 COLLECTION START: 08/18/92 0910 STOP: 00/00/00 **
** CASE NUMBER: 18613 SAS NUMBER: MD NUMBER: DN52 **
** **

*** ***

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
90U	ALUMINUM	50	MANGANESE
20U	ANTIMONY	0.20U	MERCURY
3U	ARSENIC	8U	NICKEL
88	BARIUM	3000	POTASSIUM
1U	BERYLLIUM	1U	SELENIUM
2U	CADMIUM	2U	SILVER
19000	CALCIUM	14000	SODIUM
3U	CHROMIUM	3UJ	THALLIUM
2U	COBALT	NA	TIN
8U	COPPER	2	VANADIUM
460	IRON	7U	ZINC
2UJ	LEAD		
3200	MAGNESIUM		

REMARKS   ***REMARKS***

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

10/05/92

METALS DATA REPORT

PROJECT NO. 92-0781 SAMPLE NO. 71239 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: R JORDAN
SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS
STATION ID: HI-SW-02 COLLECTION START: 08/18/92 0940 STOP: 00/00/00
CASE NUMBER: 18613 SAS NUMBER: MD NUMBER: DN53

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
60U	ALUMINUM	920	MANGANESE
11U	ANTIMONY	0.20U	MERCURY
3U	ARSENIC	30U	NICKEL
130	BARIUM	5300	POTASSIUM
1U	BERYLLIUM	1U	SELENIUM
2U	CADMIUM	1U	SILVER
36000	CALCIUM	27000	SODIUM
26	CHROMIUM	3UJ	THALLIUM
2U	COBALT	NA	TIN
20U	COPPER	2U	VANADIUM
3700	IRON	20U	ZINC
1UJ	LEAD		
7200	MAGNESIUM		

REMARKS

REMARKS

FOOTNOTES
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA. 10/05/92

METALS DATA REPORT

** PROJECT NO. 92-0781 SAMPLE NO. 71240 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: R JORDAN **
** SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS **
** STATION ID: HI-SD-04 COLLECTION START: 08/18/92 1030 STOP: 00/00/00 **
** CASE NUMBER: 18613 SAS NUMBER: MD NUMBER: DN54 **

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
9400	ALUMINUM	47	MANGANESE
6.1UJ	ANTIMONY	0.45	MERCURY
6U	ARSENIC	82	NICKEL
45	BARIUM	470	POTASSIUM
0.56U	BERYLLIUM	3U	SELENIUM
3U	CADMIUM	0.56U	SILVER
2000	CALCIUM	9900	SODIUM
33	CHROMIUM	1.7U	THALLIUM
10U	COBALT	NA	TIN
97	COPPER	17	VANADIUM
9100	IRON	800	ZINC
79J	LEAD	64	PERCENT MOISTURE
530	MAGNESIUM		

REMARKS ***REMARKS***

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

10/05/92

METALS DATA REPORT

*** ***
** PROJECT NO. 92-0781 SAMPLE NO. 71241 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: R JORDAN **
** SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS **
** STATION ID: HI-SD-03 COLLECTION START: 08/18/92 1145 STOP: 00/00/00 **
** CASE NUMBER: 18613 SAS NUMBER: MD NUMBER: DN55 **
** **
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MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
6100	ALUMINUM	28	MANGANESE
8UJ	ANTIMONY	2.9	MERCURY
27	ARSENIC	400	NICKEL
44	BARIUM	280	POTASSIUM
0.28U	BERYLLIUM	2U	SELENIUM
1U	CADMIUM	2U	SILVER
4100	CALCIUM	380	SODIUM
48	CHROMIUM	0.85U	THALLIUM
21	COBALT	NA	TIN
210	COPPER	8.3	VANADIUM
2100	IRON	1100	ZINC
100J	LEAD	29	PERCENT MOISTURE
280	MAGNESIUM		

REMARKS

REMARKS

FOOTNOTES
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.
10/05/92

METALS DATA REPORT

PROJECT NO. 92-0781 SAMPLE NO. 71242 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: R JORDAN
SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS
STATION ID: HI-SS-04 COLLECTION START: 08/18/92 1010 STOP: 00/00/00
CASE NUMBER: 18613 SAS NUMBER: MD NUMBER: DN56

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
3700	ALUMINUM	42	MANGANESE
2.2UJ	ANTIMONY	0.10U	MERCURY
2U	ARSENIC	3U	NICKEL
19	BARIUM	190	POTASSIUM
0.20U	BERYLLIUM	1U	SELENIUM
0.41U	CADMIUM	1U	SILVER
440	CALCIUM	50U	SODIUM
5.4	CHROMIUM	0.61U	THALLIUM
2U	COBALT	NA	TIN
6U	COPPER	9	VANADIUM
3900	IRON	9.7	ZINC
8J	LEAD	01	PERCENT MOISTURE
170	MAGNESIUM		

REMARKS ***REMARKS***

FOOTNOTES
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.   10/05/92

METALS DATA REPORT

*** ***
** PROJECT NO. 92-0781   SAMPLE NO. 71243   SAMPLE TYPE: SOIL   PROG ELEM: NSF   COLLECTED BY: R JORDAN **
** SOURCE: HERCULES, INC   CITY: HATTIESBUR   ST: MS **
** STATION ID: HI-SS-05   COLLECTION START: 08/18/92 1125   STOP: 00/00/00 **
** CASE NUMBER: 18613   SAS NUMBER: MD NUMBER: DN57 **
** **
*** ***

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
5400	ALUMINUM	200	MANGANESE
2.6UJ	ANTIMONY	0.12U	MERCURY
1U	ARSENIC	4U	NICKEL
24	BARIUM	200	POTASSIUM
0.24U	BERYLLIUM	1U	SELENIUM
0.47U	CADMIUM	0.24U	SILVER
190	CALCIUM	310	SODIUM
5.6	CHROMIUM	0.71U	THALLIUM
3U	COBALT	NA	TIN
5U	COPPER	10	VANADIUM
4000	IRON	14	ZINC
8.5J	LEAD	15	PERCENT MOISTURE
270	MAGNESIUM		

REMARKS   ***REMARKS***

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

10/05/92

METALS DATA REPORT

PROJECT NO. 92-0781   SAMPLE NO. 71244   SAMPLE TYPE: SOIL   PROG ELEM: NSF   COLLECTED BY: R JORDAN
SOURCE: HERCULES, INC   CITY: HATTIESBUR   ST: MS
STATION ID: HI-SB-05   COLLECTION START: 08/18/92 1145   STOP: 00/00/00
CASE NUMBER: 18613   SAS NUMBER: MD NUMBER: DN58

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
2200	ALUMINUM	72	MANGANESE
2.7UJ	ANTIMONY	0.12U	MERCURY
0.73U	ARSENIC	2U	NICKEL
9.2	BARIUM	140J	POTASSIUM
0.24U	BERYLLIUM	1U	SELENIUM
0.49U	CADMIUM	0.24U	SILVER
50U	CALCIUM	400	SODIUM
3U	CHROMIUM	0.73U	THALLIUM
2U	COBALT	NA	TIN
4U	COPPER	3.4	VANADIUM
1400	IRON	4.7	ZINC
1.8J	LEAD	18	PERCENT MOISTURE
150	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.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region IV
Environmental Services Division
College Station Road, Athens, Ga. 30613

*****MEMORANDUM******

DATE: 10/06/92

SUBJECT: Results of Specified Analysis;
92-0781 HERCULES, INC
HATTIESBUR MS
CASE NO: 18613

FROM: Robert W. Knight /Gary Bennett/for
Chief, Laboratory Evaluation/Quality Assurance Section

TO: JOE SLYKERMAN

Attached are the results of analysis of samples collected as part of the subject project.

As a result of the Quality Assurance Review, certain data qualifiers may have been placed on the data. Attached is a DATA QUALIFIER REPORT which explains the reasons that these qualifiers were required.

If you have any questions please contact me.

ATTACHMENT

INORGANIC DATA QUALIFIERS REPORT

Case Number: 18613
Project Number: 92-0781
Site: Hercules, Hattiesburgh, MS

Element	Flag	Samples Affected	Reason
A. Water			
Sb, Cd, Cr, Co, Pb, Mn, Ni, Se, Ag	U	All positives > IDL, but < CRDL	Baseline instability
Al, Ca, Cu, Fe, Mg, Zn	U	All positives > IDL, but < 10X contaminant level	Positives in blanks
Cr	JN	All positives with Fe concentrations in solution > 77,000 ug/L	Suspected positive interference as noted in the blind ICS
Tl	J	All	Matrix spike recovery = 58.2%
Pb	J	All	Matrix duplicate RPD = 123.5%
B. Soil			
Sb, Cd, Cr, Co, Pb, Mn, Ni, Se, Ag	U	All positives > IDL, but < CRDL	Baseline instability
Al, Ca, Cu, Fe, Mg, Na	U	All positives > IDL, but	Positives in blanks
Cr	JN	All positives with Fe concentrations in solution > 77,000 ug/L	Suspected positive interference as noted in the blind ICS
Sb	J	All	Matrix spike recovery = 47.1%
Pb	J	All	Matrix spike recovery = 74%
K	J	MDDN58	% RSD > 20% for ICP multiple exposures

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

10/05/92

SPECIFIED ANALYSIS DATA REPORT

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**   PROJECT NO. 92-0781   SAMPLE NO. 71237  SAMPLE TYPE: SURFACEWA   PROG ELEM: NSF   COLLECTED BY: R JORDAN          **
**   SOURCE: HERCULES, INC                                            CITY: HATTIESBUR           ST: MS                 **
**   STATION ID: PB-01                                                COLLECTION START: 08/18/92  0720   STOP: 00/00/00 **
**   CASE.NO.: 18613         SAS NO.:                                 D. NO.:                    MD NO: DN51            **
**                                                                                                                     **
*** * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * ***
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RESULTS	UNITS	PARAMETER
10U	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.

10/05/92

SPECIFIED ANALYSIS DATA REPORT

*** ***
** PROJECT NO. 92-0781 SAMPLE NO. 71238 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: R JORDAN **
** SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS **
** STATION ID: HI-SW-01 COLLECTION START: 08/18/92 0910 STOP: 00/00/00 **
** CASE.NO.: 18613 SAS NO.: D. NO.: DN52 MD NO: DN52 **
** **
*** ***

RESULTS	UNITS	PARAMETER
10U	UG/L	CYANIDE

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

10/05/92

SPECIFIED ANALYSIS DATA REPORT

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** PROJECT NO. 92-0781 SAMPLE NO. 71239 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: R JORDAN **
** SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS **
** STATION ID: HI-SW-02 COLLECTION START: 08/18/92 0940 STOP: 00/00/00 **
** CASE.NO.: 18613 SAS NO.: D. NO.: DN53 MD NO: DN53 **

*** ***

RESULTS	UNITS	PARAMETER
10U	UG/L	CYANIDE

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

10/05/92

SPECIFIED ANALYSIS DATA REPORT

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**   PROJECT NO. 92-0781   SAMPLE NO. 71240  SAMPLE TYPE: SOIL       PROG ELEM: NSF   COLLECTED BY: R JORDAN           **
**   SOURCE: HERCULES, INC                                          CITY: HATTIESBUR             ST: MS                 **
**   STATION ID: HI-SD-04                                           COLLECTION START: 08/18/92  1030   STOP: 00/00/00   **
**   CASE.NO.: 18613           SAS NO.:                              D. NO.: DN54                MD NO: DN54            **
**                                                                                                                       **
*** * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * ***
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RESULTS	UNITS	PARAMETER
1.40U	MG/KG	CYANIDE

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

10/05/92

SPECIFIED ANALYSIS DATA REPORT

*** ***
** PROJECT NO. 92-0781 SAMPLE NO. 71241 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: R JORDAN **
** SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS **
** STATION ID: HI-SD-03 COLLECTION START: 08/18/92 1145 STOP: 00/00/00 **
** CASE.NO.: 18613 SAS NO.: D. NO.: DN55 MD NO: DN55 **
** **
*** ***

RESULTS	UNITS	PARAMETER
0.71U	MG/KG	CYANIDE

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

10/05/92

SPECIFIED ANALYSIS DATA REPORT

*** ***
** PROJECT NO. 92-0781 SAMPLE NO. 71242 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: R JORDAN **
** SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS **
** STATION ID: HI-SS-04 COLLECTION START: 08/18/92 1010 STOP: 00/00/00 **
** CASE.NO.: 18613 SAS NO.: D. NO.: DN56 MD NO: DN56 **
** **
*** ***

RESULTS	UNITS	PARAMETER
0.51U	MG/KG	CYANIDE

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

10/05/92

SPECIFIED ANALYSIS DATA REPORT

*** ***
** PROJECT NO. 92-0781 SAMPLE NO. 71243 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: R JORDAN **
** SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS **
** STATION ID: HI-SS-05 COLLECTION START: 08/18/92 1125 STOP: 00/00/00 **
** CASE.NO.: 18613 SAS NO.: D. NO.: DN57 MD NO: DN57 **
** **
*** ***

RESULTS	UNITS	PARAMETER
0.59U	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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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

10/05/92

SPECIFIED ANALYSIS DATA REPORT

*** ***
** PROJECT NO. 92-0781 SAMPLE NO. 71244 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: R JORDAN **
** SOURCE: HERCULES, INC CITY: HATTIESBUR ST: MS **
** STATION ID: HI-SB-05 COLLECTION START: 08/18/92 1145 STOP: 00/00/00 **
** CASE.NO.: 18613 SAS NO.: D. NO.: DN58 MD NO: DN58 **
** **
*** ***

RESULTS	UNITS	PARAMETER
0.61U	MG/KG	CYANIDE

FOOTNOTES
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SURFACE WATER ORGANICS

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

PURGEABLE ORGANICS DATA REPORT 08/20/92

PROJECT NO. 92-0629 SAMPLE NO. 69715 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: SW-01 COLLECTION START: 06/24/92 1610 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH65

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

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

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 08/20/92

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69715 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SW-01 COLLECTION START: 06/24/92 1610 STOP: 00/00/00 **
** **
** CASE NO.: 18341 SAS NO.: D. NO.: DH65 **
*** ***

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

REMARKS ***REMARKS***

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

08/20/92

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69715 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: SW-01 COLLECTION START: 06/24/92 1610 STOP: 00/00/00
CASE NUMBER: 18341 SAS NUMBER: D. NUMBER: DH65

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

REMARKS ***REMARKS***

FOOTNOTES
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*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.

08/20/92

PURGEABLE ORGANICS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69716 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SW-2 COLLECTION START: 06/24/92 1700 STOP: 00/00/00 **
** **
** CASE NO.: 18341 SAS NO.: D. NO.: DH66 **
*** ***

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

REMARKS

REMARKS

FOOTNOTES
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.
08/20/92

EXTRACTABLE ORGANICS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69716 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SW-2 COLLECTION START: 06/24/92 1700 STOP: 00/00/00 **
**
** CASE NO.: 18341 SAS NO.: D. NO.: DH66 **
*** ***

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

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

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.

08/20/92

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69716 SAMPLE TYPE: SURFACEWA
SOURCE: HERCULES INC
STATION ID: SW-2
CASE NUMBER: 18341 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: C HELM
CITY: HATIESBURG ST: MS
COLLECTION START: 06/24/92 1700 STOP: 00/00/00
D. NUMBER: DH66

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

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

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.

SEDIMENT ~~SOIL~~ INORGANICS

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

08/10/92

METALS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69714 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SD-01 COLLECTION START: 06/24/92 1620 STOP: 00/00/00 **
** CASE NUMBER: 18341 SAS NUMBER: MD NUMBER: DC64 **
** **
*** ***

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
2500J	ALUMINUM	460J	MANGANESE
20U	ANTIMONY	.13U	MERCURY
2.7	ARSENIC	1.8U	NICKEL
82J	BARIUM	240	POTASSIUM
.39	BERYLLIUM	.52U	SELENIUM
.78U	CADMIUM	2.1U	SILVER
880	CALCIUM	220U	SODIUM
83J	CHROMIUM	.78U	THALLIUM
6.8	COBALT	NA	TIN
3.6	COPPER	5.6	VANADIUM
10000J	IRON	160J	ZINC
350J	LEAD	23	PERCENT MOISTURE
380	MAGNESIUM		

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.

07/31/92

SPECIFIED ANALYSIS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69714 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SD-01 COLLECTION START: 06/24/92 1620 STOP: 00/00/00 **
** CASE.NO.: 18341 SAS NO.: D. NO.: DH64 MD NO: DC64 **
** **
*** ***

RESULTS	UNITS	PARAMETER
.65U	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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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

08/10/92

METALS DATA REPORT

*** ***

** PROJECT NO. 92-0629 SAMPLE NO. 69717 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SD-02 COLLECTION START: 06/24/92 1730 STOP: 00/00/00 **
** CASE NUMBER: 18341 SAS NUMBER: MD NUMBER: DC67 **
** **

*** ***

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
1900J	ALUMINUM	290J	MANGANESE
11U	ANTIMONY	.14U	MERCURY
11	ARSENIC	2U	NICKEL
66J	BARIUM	210	POTASSIUM
.38	BERYLLIUM	.57U	SELENIUM
.85U	CADMIUM	2.3U	SILVER
1900	CALCIUM	230	SODIUM
4.7J	CHROMIUM	.85U	THALLIUM
1.4U	COBALT	NA	TIN
3.8	COPPER	11	VANADIUM
24000J	IRON	19J	ZINC
11J	LEAD	29	PERCENT MOISTURE
320	MAGNESIUM		

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.

07/31/92

SPECIFIED ANALYSIS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69717 SAMPLE TYPE: SOIL	PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC	CITY: HATIESBURG ST: MS
STATION ID: SD-02	COLLECTION START: 06/24/92 1730 STOP: 00/00/00
CASE.NO.: 18341 SAS NO.:	D. NO.: DH67 MD NO: DC67

RESULTS	UNITS	PARAMETER
.71U	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. 08/10/92

METALS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69718 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: SD-03 COLLECTION START: 06/24/92 1815 STOP: 00/00/00
CASE NUMBER: 18341 SAS NUMBER: MD NUMBER: DC68

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
20000J	ALUMINUM	140J	MANGANESE
20U	ANTIMONY	.26	MERCURY
33	ARSENIC	350	NICKEL
100J	BARIUM	140	POTASSIUM
.70	BERYLLIUM	.58U	SELENIUM
1.4	CADMIUM	2.3U	SILVER
4600	CALCIUM	240U	SODIUM
110J	CHROMIUM	.87U	THALLIUM
27	COBALT	NA	TIN
95	COPPER	14	VANADIUM
17000J	IRON	2400J	ZINC
100J	LEAD	31	PERCENT MOISTURE
190	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.

07/31/92

SPECIFIED ANALYSIS DATA REPORT

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**   PROJECT NO. 92-0629   SAMPLE NO. 69718  SAMPLE TYPE: SOIL        PROG ELEM: NSF   COLLECTED BY: C HELM                  **
**   SOURCE: HERCULES INC                                              CITY: HATIESBURG            ST: MS                       **
**   STATION ID: SD-03                                                 COLLECTION START: 06/24/92  1815  STOP: 00/00/00          **
**   CASE.NO.: 18341          SAS NO.:                                 D. NO.: DH68               MD NO: DC68                  **
**                                                                                                                              **
*** * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * ***
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RESULTS	UNITS	PARAMETER
2.1	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.
08/10/92

METALS DATA REPORT

PROJECT NO. 92-0629   SAMPLE NO. 69725   SAMPLE TYPE: SOIL   PROG ELEM: NSF   COLLECTED BY: C HELM
SOURCE: HERCULES INC   CITY: HATIESBURG   ST: MS
STATION ID: SD-04   COLLECTION START: 06/25/92 1245   STOP: 00/00/00
CASE NUMBER: 18341   SAS NUMBER: MD NUMBER: DC75

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
2900J	ALUMINUM	13J	MANGANESE
20U	ANTIMONY	.21	MERCURY
4U	ARSENIC	16	NICKEL
18J	BARIUM	140	POTASSIUM
.34U	BERYLLIUM	.68U	SELENIUM
1U	CADMIUM	2.7U	SILVER
680	CALCIUM	290U	SODIUM
7.4J	CHROMIUM	1U	THALLIUM
1.7U	COBALT	NA	TIN
27	COPPER	9.5	VANADIUM
4300J	IRON	110J	ZINC
30J	LEAD	41	PERCENT MOISTURE
120	MAGNESIUM		

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.

07/31/92

SPECIFIED ANALYSIS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69725 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: SD-04 COLLECTION START: 06/25/92 1245 STOP: 00/00/00 **
** CASE.NO.: 18341 SAS NO.: D. NO.: DH75 MD NO: DC75 **
** **
*** ***

RESULTS	UNITS	PARAMETER
.85U	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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GROUNDWATER ORGANICS

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

PURGEABLE ORGANICS DATA REPORT 08/20/92

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69710 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: TB-01 COLLECTION START: 06/24/92 0725 STOP: 00/00/00 **
**
** CASE NO.: 18341 SAS NO.: D. NO.: DH60 **
*** ***

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

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

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.

08/20/92

EXTRACTABLE ORGANICS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69710 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: TB-01 COLLECTION START: 06/24/92 0725 STOP: 00/00/00 **
** **
** CASE NO.: 18341 SAS NO.: D. NO.: DH60 **
*** ***

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
10U	PHENOL	25U	3-NITROANILINE
10U	BIS(2-CHLOROETHYL) ETHER	10U	ACENAPHTHENE
10U	2-CHLOROPHENOL	25U	2,4-DINITROPHENOL
10U	1,3-DICHLOROBENZENE	25U	4-NITROPHENOL
10U	1,4-DICHLOROBENZENE	10U	DIBENZOFURAN
10U	1,2-DICHLOROBENZENE	10U	2,4-DINITROTOLUENE
10U	2-METHYLPHENOL	10U	DIETHYL PHTHALATE
10U	2,2'-CHLOROISOPROPYLETHER	10U	4-CHLOROPHENYL PHENYL ETHER
10U	(3-AND/OR 4-)METHYLPHENOL	10U	FLUORENE
10U	N-NITROSODI-N-PROPYLAMINE	25U	4-NITROANILINE
10U	HEXACHLOROETHANE	25U	2-METHYL-4,6-DINITROPHENOL
10U	NITROBENZENE	10U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
10U	ISOPHORONE	10U	4-BROMOPHENYL PHENYL ETHER
10U	2-NITROPHENOL	10U	HEXACHLOROBENZENE (HCB)
10U	2,4-DIMETHYLPHENOL	25U	PENTACHLOROPHENOL
10U	BIS(2-CHLOROETHOXY) METHANE	10U	PHENANTHRENE
10U	2,4-DICHLOROPHENOL	10U	ANTHRACENE
10U	1,2,4-TRICHLOROBENZENE	10U	CARBAZOLE
10U	NAPHTHALENE	10U	DI-N-BUTYLPHTHALATE
10U	4-CHLOROANILINE	10U	FLUORANTHENE
10U	HEXACHLOROBUTADIENE	10U	PYRENE
10U	4-CHLORO-3-METHYLPHENOL	10U	BENZYL BUTYL PHTHALATE
10U	2-METHYLNAPHTHALENE	10U	3,3'-DICHLOROBENZIDINE
10U	HEXACHLOROCYCLOPENTADIENE (HCCP)	10U	BENZO(A)ANTHRACENE
10U	2,4,6-TRICHLOROPHENOL	10U	CHRYSENE
25U	2,4,5-TRICHLOROPHENOL	10U	BIS(2-ETHYLHEXYL) PHTHALATE
10U	2-CHLORONAPHTHALENE	10U	DI-N-OCTYLPHTHALATE
25U	2-NITROANILINE	10U	BENZO(B AND/OR K)FLUORANTHENE
10U	DIMETHYL PHTHALATE	10U	BENZO-A-PYRENE
10U	ACENAPHTHYLENE	10U	INDENO (1,2,3-CD) PYRENE
10U	2,6-DINITROTOLUENE	10U	DIBENZO(A,H)ANTHRACENE
		10U	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.

08/20/92

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69710 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: TB-01 COLLECTION START: 06/24/92 0725 STOP: 00/00/00
CASE NUMBER: 18341 SAS NUMBER: D. NUMBER: DH60

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
0.050U	ALPHA-BHC	0.50U	METHOXYCHLOR
0.050U	BETA-BHC	0.10U	ENDRIN KETONE
0.050U	DELTA-BHC	0.10U	ENDRIN ALDEHYDE
0.050U	GAMMA-BHC (LINDANE)	—	CHLORDANE (TECH. MIXTURE) /1
0.050U	HEPTACHLOR	0.050U	GAMMA-CHLORDANE /2
0.050U	ALDRIN	0.050U	ALPHA-CHLORDANE /2
0.050U	HEPTACHLOR EPOXIDE	5.0U	TOXAPHENE
0.050U	ENDOSULFAN I (ALPHA)	1.0U	PCB-1016 (AROCLOR 1016)
0.10U	DIELDRIN	2.0U	PCB-1221 (AROCLOR 1221)
0.10U	4,4'-DDE (P,P'-DDE)	1.0U	PCB-1232 (AROCLOR 1232)
0.10U	ENDRIN	1.0U	PCB-1242 (AROCLOR 1242)
0.10U	ENDOSULFAN II (BETA)	1.0U	PCB-1248 (AROCLOR 1248)
0.10U	4,4'-DDD (P,P'-DDD)	1.0U	PCB-1254 (AROCLOR 1254)
0.10U	ENDOSULFAN SULFATE	1.0U	PCB-1260 (AROCLOR 1260)
0.10U	4,4'-DDT (P,P'-DDT)		

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.

08/20/92

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69713 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: TW-01 COLLECTION START: 06/24/92 1045 STOP: 00/00/00

CASE NO.: 18341 SAS NO.: D. NO.: DH63

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

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. 08/20/92

EXTRACTABLE ORGANICS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69713 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: TW-01 COLLECTION START: 06/24/92 1045 STOP: 00/00/00 **
**
** CASE NO.: 18341 SAS NO.: D. NO.: DH63 **
*** ***

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
10U	PHENOL	25U	3-NITROANILINE
10U	BIS(2-CHLOROETHYL) ETHER	10U	ACENAPHTHENE
10U	2-CHLOROPHENOL	25U	2,4-DINITROPHENOL
10U	1,3-DICHLOROBENZENE	25U	4-NITROPHENOL
10U	1,4-DICHLOROBENZENE	10U	DIBENZOFURAN
10U	1,2-DICHLOROBENZENE	10U	2,4-DINITROTOLUENE
10U	2-METHYLPHENOL	10U	DIETHYL PHTHALATE
10U	2,2'-CHLOROISOPROPYLETHER	10U	4-CHLOROPHENYL PHENYL ETHER
10U	(3-AND/OR 4-)METHYLPHENOL	10U	FLUORENE
10U	N-NITROSODI-N-PROPYLAMINE	25U	4-NITROANILINE
10U	HEXACHLOROETHANE	25U	2-METHYL-4,6-DINITROPHENOL
10U	NITROBENZENE	10U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
10U	ISOPHORONE	10U	4-BROMOPHENYL PHENYL ETHER
10U	2-NITROPHENOL	10U	HEXACHLOROBENZENE (HCB)
10U	2,4-DIMETHYLPHENOL	25U	PENTACHLOROPHENOL
10U	BIS(2-CHLOROETHOXY) METHANE	10U	PHENANTHRENE
10U	2,4-DICHLOROPHENOL	10U	ANTHRACENE
10U	1,2,4-TRICHLOROBENZENE	10U	CARBAZOLE
10U	NAPHTHALENE	10U	DI-N-BUTYLPHTHALATE
10U	4-CHLOROANILINE	10U	FLUORANTHENE
10U	HEXACHLOROBUTADIENE	10U	PYRENE
10U	4-CHLORO-3-METHYLPHENOL	10U	BENZYL BUTYL PHTHALATE
10U	2-METHYLNAPHTHALENE	10U	3,3'-DICHLOROBENZIDINE
10U	HEXACHLOROCYCLOPENTADIENE (HCCP)	10U	BENZO(A)ANTHRACENE
10U	2,4,6-TRICHLOROPHENOL	10U	CHRYSENE
25U	2,4,5-TRICHLOROPHENOL	10U	BIS(2-ETHYLHEXYL) PHTHALATE
10U	2-CHLORONAPHTHALENE	10U	DI-N-OCTYLPHTHALATE
25U	2-NITROANILINE	10U	BENZO(B AND/OR K)FLUORANTHENE
10U	DIMETHYL PHTHALATE	10U	BENZO-A-PYRENE
10U	ACENAPHTHYLENE	10U	INDENO (1,2,3-CD) PYRENE
10U	2,6-DINITROTOLUENE	10U	DIBENZO(A,H)ANTHRACENE
		10U	BENZO(GHI)PERYLENE

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.

08/20/92

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 92-0629 SAMPLE NO. 69713 SAMPLE TYPE: GROUNDWA
SOURCE: HERCULES INC
STATION ID: TW-01
CASE NUMBER: 18341 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: C HELM
CITY: HATIESBURG ST: MS
COLLECTION START: 06/24/92 1045 STOP: 00/00/00
D. NUMBER: DH63

UG/L	ANALYTICAL RESULTS
0.050U	ALPHA-BHC
0.050U	BETA-BHC
0.050U	DELTA-BHC
0.050U	GAMMA-BHC (LINDANE)
0.050U	HEPTACHLOR
0.050U	ALDRIN
0.050U	HEPTACHLOR EPOXIDE
0.050U	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
0.10U	ENDRIN ALDEHYDE
--	CHLORDANE (TECH. MIXTURE) /1
0.050U	GAMMA-CHLORDANE /2
0.050U	ALPHA-CHLORDANE /2
5.0U	TOXAPHENE
1.0U	PCB-1016 (AROCLOR 1016)
2.0U	PCB-1221 (AROCLOR 1221)
1.0U	PCB-1232 (AROCLOR 1232)
1.0U	PCB-1242 (AROCLOR 1242)
1.0U	PCB-1248 (AROCLOR 1248)
1.0U	PCB-1254 (AROCLOR 1254)
1.0U	PCB-1260 (AROCLOR 1260)

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.

08/20/92

PURGEABLE ORGANICS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69724 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: TW-05 COLLECTION START: 06/25/92 1050 STOP: 00/00/00 **
**
** CASE NO.: 18341 SAS NO.: D. NO.: DH74 **
*** ***

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

REMARKS

REMARKS

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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.   08/20/92

EXTRACTABLE ORGANICS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69724 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: TW-05 COLLECTION START: 06/25/92 1050 STOP: 00/00/00 **
** **
** CASE NO.: 18341 SAS NO.: D. NO.: DH74 **
*** ***

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
10U	PHENOL	25U	3-NITROANILINE
10U	BIS(2-CHLOROETHYL) ETHER	10U	ACENAPHTHENE
10U	2-CHLOROPHENOL	25U	2,4-DINITROPHENOL
10U	1,3-DICHLOROBENZENE	25U	4-NITROPHENOL
10U	1,4-DICHLOROBENZENE	10U	DIBENZOFURAN
10U	1,2-DICHLOROBENZENE	10U	2,4-DINITROTOLUENE
10U	2-METHYLPHENOL	10U	DIETHYL PHTHALATE
10U	2,2'-CHLOROISOPROPYLETHER	10U	4-CHLOROPHENYL PHENYL ETHER
10U	(3-AND/OR 4-)METHYLPHENOL	10U	FLUORENE
10U	N-NITROSODI-N-PROPYLAMINE	25U	4-NITROANILINE
10U	HEXACHLOROETHANE	25U	2-METHYL-4,6-DINITROPHENOL
10U	NITROBENZENE	10U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
10U	ISOPHORONE	10U	4-BROMOPHENYL PHENYL ETHER
10U	2-NITROPHENOL	10U	HEXACHLOROBENZENE (HCB)
10U	2,4-DIMETHYLPHENOL	25U	PENTACHLOROPHENOL
10U	BIS(2-CHLOROETHOXY) METHANE	10U	PHENANTHRENE
10U	2,4-DICHLOROPHENOL	10U	ANTHRACENE
10U	1,2,4-TRICHLOROBENZENE	10U	CARBAZOLE
10U	NAPHTHALENE	10U	DI-N-BUTYLPHTHALATE
10U	4-CHLOROANILINE	10U	FLUORANTHENE
10U	HEXACHLOROBUTADIENE	10U	PYRENE
10U	4-CHLORO-3-METHYLPHENOL	10U	BENZYL BUTYL PHTHALATE
10U	2-METHYLNAPHTHALENE	10U	3,3'-DICHLOROBENZIDINE
10U	HEXACHLOROCYCLOPENTADIENE (HCCP)	10U	BENZO(A)ANTHRACENE
10U	2,4,6-TRICHLOROPHENOL	10U	CHRYSENE
25U	2,4,5-TRICHLOROPHENOL	10U	BIS(2-ETHYLHEXYL) PHTHALATE
10U	2-CHLORONAPHTHALENE	10U	DI-N-OCTYLPHTHALATE
25U	2-NITROANILINE	10U	BENZO(B AND/OR K)FLUORANTHENE
10U	DIMETHYL PHTHALATE	10U	BENZO-A-PYRENE
10U	ACENAPHTHYLENE	10U	INDENO (1,2,3-CD) PYRENE
10U	2,6-DINITROTOLUENE	10U	DIBENZO(A,H)ANTHRACENE
		10U	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.

08/20/92

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69724 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: TW-05 COLLECTION START: 06/25/92 1050 STOP: 00/00/00 **
** CASE.NO.: 18341 SAS NO.: D. NO.: DH74 MD NO: DC74 **
** **
*** ***

ANALYTICAL RESULTS UG/L

200J 7 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.

08/20/92

PESTICIDES/PCB'S DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69724 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: TW-05 COLLECTION START: 06/25/92 1050 STOP: 00/00/00 **
** CASE NUMBER: 18341 SAS NUMBER: D. NUMBER: DH74 **
** **
*** ***

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
0.050U	ALPHA-BHC	0.50U	METHOXYCHLOR
0.050U	BETA-BHC	0.10U	ENDRIN KETONE
0.050U	DELTA-BHC	0.10U	ENDRIN ALDEHYDE
0.050U	GAMMA-BHC (LINDANE)	--	CHLORDANE (TECH. MIXTURE) /1
0.050U	HEPTACHLOR	0.050U	GAMMA-CHLORDANE /2
0.050U	ALDRIN	0.050U	ALPHA-CHLORDANE /2
0.050U	HEPTACHLOR EPOXIDE	5.0U	TOXAPHENE
0.050U	ENDOSULFAN I (ALPHA)	1.0U	PCB-1016 (AROCLOR 1016)
0.10U	DIELDRIN	2.0U	PCB-1221 (AROCLOR 1221)
0.10U	4,4'-DDE (P,P'-DDE)	1.0U	PCB-1232 (AROCLOR 1232)
0.10U	ENDRIN	1.0U	PCB-1242 (AROCLOR 1242)
0.10U	ENDOSULFAN II (BETA)	1.0U	PCB-1248 (AROCLOR 1248)
0.10U	4,4'-DDD (P,P'-DDD)	1.0U	PCB-1254 (AROCLOR 1254)
0.10U	ENDOSULFAN SULFATE	1.0U	PCB-1260 (AROCLOR 1260)
0.10U	4,4'-DDT (P,P'-DDT)		

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.

08/20/92

PURGEABLE ORGANICS DATA REPORT

*** ***

** PROJECT NO. 92-0629 SAMPLE NO. 69726 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: MW-81 COLLECTION START: 06/25/92 1330 STOP: 00/00/00 **
** **
** CASE NO.: 18341 SAS NO.: D. NO.: DH76 **

*** ***

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

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.

08/20/92

EXTRACTABLE ORGANICS DATA REPORT

*** ***
** PROJECT NO. 92-0629 SAMPLE NO. 69726 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: MW-81 COLLECTION START: 06/25/92 1330 STOP: 00/00/00 **
** **
** CASE NO.: 18341 SAS NO.: D. NO.: DH76 **
*** ***

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
10U	PHENOL	25U	3-NITROANILINE
10U	BIS(2-CHLOROETHYL) ETHER	10U	ACENAPHTHENE
10U	2-CHLOROPHENOL	25U	2,4-DINITROPHENOL
10U	1,3-DICHLOROBENZENE	25U	4-NITROPHENOL
10U	1,4-DICHLOROBENZENE	10U	DIBENZOFURAN
10U	1,2-DICHLOROBENZENE	10U	2,4-DINITROTOLUENE
10U	2-METHYLPHENOL	10U	DIETHYL PHTHALATE
10U	2,2'-CHLOROISOPROPYLETHER	10U	4-CHLOROPHENYL PHENYL ETHER
10U	(3-AND/OR 4-)METHYLPHENOL	10U	FLUORENE
10U	N-NITROSODI-N-PROPYLAMINE	25U	4-NITROANILINE
10U	HEXACHLOROETHANE	25U	2-METHYL-4,6-DINITROPHENOL
10U	NITROBENZENE	10U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
10U	ISOPHORONE	10U	4-BROMOPHENYL PHENYL ETHER
10U	2-NITROPHENOL	10U	HEXACHLOROBENZENE (HCB)
10U	2,4-DIMETHYLPHENOL	25U	PENTACHLOROPHENOL
10U	BIS(2-CHLOROETHOXY) METHANE	10U	PHENANTHRENE
10U	2,4-DICHLOROPHENOL	10U	ANTHRACENE
10U	1,2,4-TRICHLOROBENZENE	10U	CARBAZOLE
10U	NAPHTHALENE	10U	DI-N-BUTYLPHTHALATE
10U	4-CHLOROANILINE	10U	FLUORANTHENE
10U	HEXACHLOROBUTADIENE	10U	PYRENE
10U	4-CHLORO-3-METHYLPHENOL	10U	BENZYL BUTYL PHTHALATE
10U	2-METHYLNAPHTHALENE	10U	3,3'-DICHLOROBENZIDINE
10U	HEXACHLOROCYCLOPENTADIENE (HCCP)	10U	BENZO(A)ANTHRACENE
10U	2,4,6-TRICHLOROPHENOL	10U	CHRYSENE
25U	2,4,5-TRICHLOROPHENOL	10U	BIS(2-ETHYLHEXYL) PHTHALATE
10U	2-CHLORONAPHTHALENE	10U	DI-N-OCTYLPHTHALATE
25U	2-NITROANILINE	10U	BENZO(B AND/OR K)FLUORANTHENE
10U	DIMETHYL PHTHALATE	10U	BENZO-A-PYRENE
10U	ACENAPHTHYLENE	10U	INDENO (1,2,3-CD) PYRENE
10U	2,6-DINITROTOLUENE	10U	DIBENZO(A,H)ANTHRACENE
		10U	BENZO(GHI)PERYLENE

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.

08/20/92

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

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** PROJECT NO. 92-0629 SAMPLE NO. 69726 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM **
** SOURCE: HERCULES INC CITY: HATIESBURG ST: MS **
** STATION ID: MW-81 COLLECTION START: 06/25/92 1330 STOP: 00/00/00 **
** CASE.NO.: 18341 SAS NO.: D. NO.: DH76 MD NO: DC76 **
** **
*** ***

ANALYTICAL RESULTS UG/L

30J 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.

08/20/92

PESTICIDES/PCB'S DATA REPORT

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PROJECT NO. 92-0629 SAMPLE NO. 69726 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: C HELM
SOURCE: HERCULES INC CITY: HATIESBURG ST: MS
STATION ID: MW-81 COLLECTION START: 06/25/92 1330 STOP: 00/00/00
CASE NUMBER: 18341 SAS NUMBER: D. NUMBER: DH76

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UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
0.050U	ALPHA-BHC	0.50U	METHOXYCHLOR
0.050U	BETA-BHC	0.10U	ENDRIN KETONE
0.050U	DELTA-BHC	0.10U	ENDRIN ALDEHYDE
0.050U	GAMMA-BHC (LINDANE)	—	CHLORDANE (TECH. MIXTURE) /1
0.050U	HEPTACHLOR	0.050U	GAMMA-CHLORDANE /2
0.050U	ALDRIN	0.050U	ALPHA-CHLORDANE /2
0.050U	HEPTACHLOR EPOXIDE	5.0U	TOXAPHENE
0.050U	ENDOSULFAN I (ALPHA)	1.0U	PCB-1016 (AROCLOR 1016)
0.10U	DIELDRIN	2.0U	PCB-1221 (AROCLOR 1221)
0.10U	4,4'-DDE (P,P'-DDE)	1.0U	PCB-1232 (AROCLOR 1232)
0.10U	ENDRIN	1.0U	PCB-1242 (AROCLOR 1242)
0.10U	ENDOSULFAN II (BETA)	1.0U	PCB-1248 (AROCLOR 1248)
0.10U	4,4'-DDD (P,P'-DDD)	1.0U	PCB-1254 (AROCLOR 1254)
0.10U	ENDOSULFAN SULFATE	1.0U	PCB-1260 (AROCLOR 1260)
0.10U	4,4'-DDT (P,P'-DDT)		

REMARKS ***REMARKS***

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*C-CONFIRMED BY GCMS 1. WHEN NO VALUE IS REPORTED, SEE CHLORDANE CONSTITUENTS.