69992

Expanded Site Investigation
Southern Resins, A Div. of Lawter
Tuscaloosa County, Alabama

Ref. # 00137 ALD004034138

NFRAP APPROVED
BJ 1/12/99

Southern Resins/ Lawter Site Investigation Narrative

Prepared by Phillip Skaggs

EPA ID # ALD004034138

Ref # 00137

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) the Superfund Amendments Reauthorization Act of 1986 (SARA) and a cooperative agreement between the U.S Environmental Protection Agency and the Alabama Department of Environmental Management, (ADEM) has conducted a Site Investigation of the Southern Resins/ Lawter Site in Tuscaloosa County, Alabama. Southern Resins is located in the small community of Moundville, at the end of Cracker Road, off of Hwy. 69. . The purpose of the investigation was to assess the threat to human health and the environment the site may pose. This included reviewing existing information, limited sampling, and evaluating the site under the Hazard Ranking System (HRS).

Site Description and History:

The Southern Resins Site, a Division of Lawter International is an active facility. Currently the facility produces resins. The facility began operations in 1966 and was purchased by Lawter International in 1976, at the time the facility manufactured both resin and varnish. Since 1976 the facility has produced only resins, including tall oil resins, ketone resins and polyamide resins, which are used in paints, inks and adhesives. There are currently two resin manufacturing plants at the facility. A wastewater treatment plant, constructed in 1980, is located directly north of the two resin plants. In 1990, an incinerator located east of the wastewater treatment plant was installed. (please see site layout map) Southern Resins is located off Alabama highway 69, on Cracker Road in Northern Moundville, Tuscaloosa County Ala. The facility encompasses approximately 64 acres, about half of which is developed.

The facility has been sited for violations of environmental regulations since 1981 by the Alabama Department of Environmental Management (ADEM). These violations include improper waste storage and violations of the NPDES permit. In 1981 ADEM notified the facility that an onsite open dump of 55-gallon drums containing waste resin and other unspecified substances was not acceptable under State solid waste regulations due to the toxic characteristics of the resins. (Ref.3) In May 1983, resin-like material, reportedly was spilled from the facility into an unnamed perennial tributary of the Black Warrior River.

On October 31, 1984, ADEM issued a Consent Order to the facility for the companies violations of its NPDES permit. The Consent Order stated that the facility had to implement changes in waste handling procedures due to the inadequate spill containment and exceeding parameter limits for phenol compounds in the plants discharge water. The procedures included additional treatment of wastewater and the development of a method to store, handle and dispose of filter cake waste.(NUS, Summary attached). A Notice of Violation (NOV) was issued by ADEM to the facility in 1985 for improper storage of filter cake waste (ADEM files). In response to the order the facility removed all filter cakes stored onsite to a licensed

hazardous waste landfill in Emelle, Alabama, by June 1985. (Ref. 9) In June of 1993 another NOV was issued for a failed onsite inspection. The facility installed a vapor liquid incinerator to burn its waste, it is assumed to avoid a build up of the filter cake that has been a part of the facilities past regulatory problems.

The manufacture of resins at the facility generates wastewater and waste filter cake. Before 1980, wastewater generated at the facility was discharged to several onsite surface impoundments. (Ref. 3) After 1980, this wastewater was discharged to the onsite wastewater treatment plant. Treated water from the wastewater treatment plant is currently discharged into an onsite wastewater treatment pond prior to entering the Black Warrior River under the facilities NPDES permit. The north bluff pond was apparently emptied of water and sediment and closed by the facility. No records could be located to verify the clean closure of the area. The facility generates approximately 185,900 gallons of filter cake waste each year. (Ref.3,6,7,8) The filter cakes contain metals (barium, manganese and Zinc) and numerous organic compounds and solvents such as xylene, methyl ethyl benzene and naphthalene. (Ref. 8) In the past filter cake waste was stored at the rear of the property in three areas: a three-sided concrete waste filter cake bin, a filter cake waste pile and a filter cake debris pile. The concrete bin did not have a cover and was cracked in several locations (Ref. 7) During a July 18, 1984, site inspection ADEM personnel observed what appeared to be solvent pooled on the ground next to the concrete cake bin(Ref. 7) Currently the waste piles have been removed and disposed of in a certified landfill. A solvent recovery system has been installed and allows solvents to be removed from the filter cake and recycled back into the manufacturing process at the facility (Ref. 3) The solid filter cake waste along with off-specification resins produced by the plant are stored onsite in 55-gallon drums prior to incineration in the facility incinerator.

A listing of the investigations, and a summary of findings, on the southern resins site from 1983 to 1998 follows.

Ground Water Use:

There are a total of 70 houses within the four mile target distance that are assumed to be on well water due to well houses and the lack of city water in the area they are located. The City of Moundville has two wells 3.75 miles north East from the site at 244 ft. deep. The city of Moundvile has 1,348 connections on its system. The Moundville Water Works supplies 40% of Hale Counties water. Hale county serves 2,500 people. This amounts to approximately 300,000 gallons a day.

Generalized Hydrogeology:. The Lawter/Southern Resins site lies within the Alluvial- Deltic Plain district of the East Gulf Coastal Plain physiographic section. The prominent physiographic feature of this area is the broad, well developed, flat flood plains and terraces that have been formed by the meandering Black Warrior River. (U.S.G.S)

The geologic units that outcrop in Moundville and the surrounding area are of sedimentary origin and consist of gravel, sand, silt and clay (SI on Cracker Ref.6243) At the Southern Resins site alluvium and terrace deposits of Quaternary age overlie the Cretaceous age Gordo and Coker formations of the Tuscaloosa Group.

The Quaternary flood plain deposits can be as much as 100 feet thick, and consist mainly of gravel, sand, silt and clay. The Gordo Formation, which lies beneath the flood plain deposits, is as much as 400 feet thick, and consists of sand and gravel overlain by alternating lenticular beds of sand and mottled clay. The Coker formation, which lies beneath the Gordo Formation, ranges in thickness from less than 100 feet to up to 1,000 feet. The Coker Formation consists of a nonmarine zone of gravel overlain by marine sand and clay. The nonmarine basal zone is generally separated from the marine sand beds by 50 feet or more of clay.

Sand and gravel beds of the Tuscaloosa group are the major sources of ground water in the study area. Aluvium and terrace deposits may also contain sand and gravel aquifers that are capable of yielding enough water for a private domestic or stock supply. (U.S.G.S). According to the outcrops along the river bank and the bore logs from the monitoring wells on site, the terrace deposits consist of an upper fine grained unit and

a basal coarse-grained unit that lies unconformably atop the eroded remnants of the Gordo Formation. The base of the terrace deposit is considered to be the lowest occurrence of gravel.

The Gordo Formation, as seen in the bore hole logs consist of an upper unit of sand having zones of high iron content intermingled with layers of sandy clay and clayey sand and a basal unit of fine to medium sand. The contact between the Gordo Formation and the Coker Formation, as seen in the outcrops along the river bank, is a ½ inch layer of iron cemented sanstone underlain by massive red, purple, gray and brown mottled clay.

The terrace and Gordo deposits thicken in a westward direction and are estimated to 35 to 120 feet in thickness underneath the Lawter/Southern Resins Site.

While there is evidence that the Terrace/Gordo aquifer at the Lawter site and adjacent Cracker Asphalt Site, is contaminated, the likelihood of any known municipal wells becoming contaminated is thought to be minimal because: 1) The nearest public well is 1.4 miles to the southwest of the site. 2) The flow direction of ground water in the shallow terrace deposit aquifer beneath the site is, according to three independent studies (ADEM, NUS, and U.S Environmental Engineering Inc.) to the South west away from the municipal wells and toward the Black Warrior River and Carthage Branch. 3) The contaminate aquifer is horizontallly discontinuous in nature and the aquifer discharges its ground water to the surface in areas where erosional features have cut the land surface to a depth below the Terrace/Gordo aquifer. 4) The public water supply wells located within the 4-mile target radius are screened in the Coker aquifer and not the Terrace/Gordo aquifer. 5)The upper units of the Coker Formation are massive clays that help protect the aquifer from the contaminants above. 6) The Coker aquifer has a higher water pressure than the Terrace/Gordo aquifer above. Therefore ground water from the Terrace/Gordo aquifer can not migrate downward into the Coker aquifer

The ground water flow, potentiometric maps generated by three consulting agents (One U.S Environmental, for Cracker another for Lawter, and one developed by ADEM in an SI investigation of Cracker Asphalt agree with the general flow toward the river. The data on the monitoring wells nearest the Cracker Asphalt sediment pond have the highest average contaminate levels, the farther away from this pond the lower the levels get. The ground water exits the bluffs in several locations at the Black Warrior and the Carthage Branch. Contaminates have been detected at low levels in some of these seeps.

Surface Water Pathway:

The surface water run-off from the site flows to the west to northwest, approximately 500 feet to the Carthage branch Creek. The surface run off takes place in at least six distinct depressions, several of which go direct to the Black Warrior. The Cartage Branch flows approximately 500 feet and enters the Black Warrior River. The 15-mile downstream surface water pathway (swp) ends in the Black Warrior.). The Black Warrior River has a seven day consecutive low flow of 935 cubic feet per second . There are no known drinking water intakes located along the swp Approximately 26 of the 30 miles of river bank along the swp is considered to be wetlands. The adjacent wetlands to the east and the land along the surface water pathways may be critical to the support of many threatened and endangered species.

Contaminates have been detected in the Carthage Branch, that appear to come from this site or the site next to it, the former Cracker Asphalt plant, (now owned by a different company). The contaminates of concern are butylbenzenic acid, elimthyloxy methane and ethyl methylbenzene.

Surface Water Conclusions:

The high dilution factor of the Black Warrior and the lack of any drinking water intakes on the river within 15 miles, mitigate much of the risk measured under the HRS.

Soil Exposure:

The site is currently an active facility. The area is not readily accessible to the public. There is no resident population. The main concern, which is slight, is for the workers on site.

Conclusions:

Comments: TheLawter/Southern Resins site, does not possess the necessary targets and hazardous waste quantity to qualify it for the NPL, but the site, still represents a minor threat to the environment immediately down stream from the site, in the form of ground water, and surface water drainage leaving the site. The writer recommends the Lawter /Southern Resins site Ref. #6243 be considered for NFRAP. In regards to the CERLA program. The Water Division of ADEM is in the process of investigation of the Lawter Site and has ordered a Risk Assessment be done on the site. A portion of the Cracker Asphalt site is included in this risk assessment study, because Lawter once leased a large storage tank from Cracker to store a solvent byproduct.

Recommendations: The old sediment impoundment on the Cracker facility should be excavated and the contaminate levels in the wells on both sites should be monitored. If the levels do not decrease further investigation of the site may be needed.

OVERSIZED

DOCUMENT

6999E

SITE ASSESSMENT DECISION - EPA REGION IV

Site Name: Southern Resins Division **EPA ID#:** ALD 004034138

Alias Sits Names:

City: Moundville **County or Parish:** Tuscaloosa **State:** AL

Refer to Report Dated: PA: _____ **SI:** _____ **Other (report type & date):** SIP 12/06/93

Report developed by: Dynamac

DECISION:

| | **1. Further Action under Superfund (CERCLA) is not appropriate or required because:**

| | 1a. Site Evaluation Accomplished (SEA). | | 1 b. Action Deferred to: | | RCRA | | NRC

|x| **2. Further Investigation Needed Under Superfund:** 2a. Priority: | | Higher |x| Lower

2b. Activity Type: | | PA | | SI |x| ESI evaluate HRS score

| | Other: _____

DISCUSSION/RATIONALE: NPDES permit violations and improper waste handling. Ground water contamination detected. The nearest private well is 1.4 miles from the facility. Onsite drainage ditches discharge to Carthage Branch, a documented fishery. No background samples were collected upstream.

Sediment and surface water samples need to be collected during the ESI.

Report Reviewed and Approved by: Cynthia K. Gurley **Signature:** Cynthia Gurley **Date:** 12/06/93

Site Decision Made by: _____ **Signature:** _____ **Date:** _____

EPA Form # 9100-3

Summary of Previous Investigations

Two sampling investigations have been conducted at the facility. In April 1985, CH2M Hill collected waste samples from filter cakes generated at the facility (Ref. 8). The sampling event was conducted to characterize the composition of filter cakes produced at the facility to ensure proper disposal. NUS conducted an SI at the facility in December 1990. Table 1 summarizes investigations conducted at the facility from 1983 to 1990.

TABLE 1

SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

Summary of Previous Investigations

DATE	AGENCY	EVENT	SAMPLES COLLECTED	REFERENCE(S)
July 12, 1983	ADEM	Site Inspection	No samples collected	11
August 16, 1984	ADEM	Compliance Inspection	No samples collected	11
July 18, 1984	ADEM	Site Evaluation	No samples collected	7
January 11, 1984	ADEM	Unannounced Inspection	No samples collected	6

Note: Footnotes for Table 1 appear at the end of the table of page 7.

TABLE 1, concluded

SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

Summary of Previous Investigations

DATE	AGENCY	EVENT	SAMPLES COLLECTED	REFERENCE(S)
April 1985	CH2M Hill	Filter Cake Sampling Investigation	1 FFC 1 FCB 1 FCWP 1 DP	8
December 1990	NUS Corporation	Site Inspection	5 SS 5 GW 5 SW 5 SD	3; 4; 5

GW = Groundwater
SW = Surface water
SD = Sediment
SS = Surface soil
DP = Debris pile
FFC = Fresh filter cake
FCB = Filter cake bin
FCWP = Filter cake waste pile
ADEM = Alabama Department of Environmental Management

During April 1985, CH2M Hill collected waste filer cake samples at the facility during a filter cake sampling investigation. CH2M Hill collected a fresh filter cake sample and filter cake samples from onsite disposal areas including the filter cake bin, the filter cake waste pile and the filter cake debris pile. Analyses of the fresh filter cake sample indicated detectable levels of barium, chromium, manganese, copper, zinc, nickel, cyanide, xylene, methyl ethyl benzene, trinethylbenzene, 2-methyl styrene, dimethyl ethyl benzene, naphthalene, dicylopentadiene, toluene, ethyl benzene, 1,3-cyclopentadiene and styrene. Analyses of the filter cake samples collected from the onsite disposal areas indicated the presence of similar contaminants; however, the concentrations of contaminants were greatest in the analyses of the fresh filter cake sample (Ref. 8, pp. 1, 13, 14).

Table 2 describes elevated levels of hazardous constituents detected in surface soil, groundwater, surface water and sediment samples collected during the NUS SI. The concentration of an analyte is considered elevated if the concentration is greater than or equal to three times the concentration in the background or control sample or greater than or equal to the Minimum Quantitation Limit (MQL)

if the analyte was not detected in the background or control sample. Background samples were collected for all media.

TABLE 2

SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA
SITE INSPECTION
DECEMBER 1990

Summary of Analytical Data

SAMPLE NUMBER	SAMPLE LOCATION	ANALYTICAL RESULTS		REFERENCE(S)
SR-SS-01 (Background)	North of plant buildings.	Arsenic	2 (U) mg/kg	3, pp. 19-21
		Barium	45 mg/kg	
		Copper	6(U) mg/kg	
		Lead	8.1 mg/kg	
		Manganese	130 mg/kg	
		Vanadium	7.4 mg/kg	
		Zinc	20 (U) mg/kg	
		Benzene	11 (U) ug/kg	
		Benzo(a)anthracene	360 (U) ug/kg	
		Dihydromethylindene	800 (J) ug/kg	
		Ethylbenzene	11 (U) ug/kg	
		Ethyldimethylbenzene	6,000 (J) ug/kg	
		2-Methylnaphthalene	140 (J) ug/kg	
		Naphthalene	3,600 ug/kg	
		Octohydromethanoindene	400 (J) ug/kg	
		Styrene	11 (U) ug/kg	
		Tetramethylbenzene	2,00 (J) ug/kg	
		Toluene	11 (U) ug/kg	
		Xylene	11 (U) ug/kg	
SR-SS-02	Waste piles north of plant building.	Vanadium	22 mg/kg	3, pp. 19-21
SR-SS-03	West of wastewater treatment plant.	Ethyldimethylbenzene	1,000 ug/kg	3, pp. 19-21
SR-SS-04	Storage pond north of wastewater treatment plant.	Ethylbenzene	1,900 ug/kg	3, pp. 19-21
		Ethyldimethylbenzene	40,000 (J) ug/kg	
		Ethenylmethylbenzene	10,000 (J) ug/kg	
		Ethylmethylbenzene	60,000 (J) ug/kg	
		2-Methylnaphthalene	5,100 (J) ug/kg	
		Naphthalene	64,000 ug/kg	
		Propenylbenzene	50,000 (J) ug/kg	
		Styrene	1,600 ug/kg	
		Trimethylbenzene	100,000 (J) ug/kg	
		Tetramethylbenzene	40,000 (J) ug/kg	
		Tetrahydromethanoindene	90,000 (J) ug/kg	
		Xylene	16,000 ug/kg	

Note: Footnotes for Table 2 appear at the end of the table on page 11.

TABLE 2, continued

SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA
SITE INSPECTION
DECEMBER 1990

Summary of Analytical Data

SAMPLE NUMBER	SAMPLE LOCATION	ANALYTICAL RESULTS		REFERENCE(S)
SR-SS-05	West of plant building.	Zinc	210 mg/kg	3, pp. 19-21
		Dimethylethylethoxybenzene	4,000 (J) ug/kg	
		Dimethylethylphenol	30,000 (J) ug/kg	
		Hydroxyphenylmethylethylphenol	30,000 (J) ug/kg	
		Trimethylphenylethanone	5,000(J) ug/kg	
SR-MW-01 (Background)	North of waste piles.	Barium	180 ug/l	3, pp. 22-25
		Cadmium	3(U) ug/l	
		Chromium	82 ug/l	
		Copper	53 ug/l	
		Lead	14 ug/l	
		Manganese	120 ug/l	
		Nickel	20 (U) ug/l	
		Vanadium	1990 ug/l	
		Zinc	120 ug/l	
		Benzene	220 ug/l	
		Ethylbenzene	75 ug/l	
		Ethylmethylbenzene	200 (J) ug/l	
		Propylbenzene	60 (J) ug/l	
		Propenylbenzene	50 (J) ug/l	
		Styrene	62 ug/l	
		Xylene	370 ug/l	
SR-MW-03	East of storage pond.	Manganese	410 ug/l	3, pp. 22-25
		Ethyldimethylbenzene	100 (J) ug/l	
		Methylindene	40 (J) ug/l	
		Propadienylbenzene	80 (J) ug/l	
		Trimethylbenzene	80 (J) ug/l	
SR-MW-04	Southeast of incinerator.	Manganese	770 ug/l	3, pp. 22-25
		Ethylbenzene	410 ug/l	
		Ethyldimethylbenzene	500 (J) ug/l	
		Ethylmethylbenzene	2,000 (J) ug/l	
		Ethenylethylbenzene	200 (J) ug/l	
		Methylindene	100 (J) ug/l	
		Methylbenzoic Acid	100 (J) ug/l	
		Methylenepropenylbenzene	70 (J) ug/l	
		Naphthalene	750 ug/l	
		Propylbenzene	400 (J) ug/l	
		Propenylbenzene	400 (J) ug/l	
		Propadienylbenzene	700 (J) ug/l	
		Styrene	280 ug/l	
		Tetrahydrocyclopropindene	100 (J) ug/l	
		Xylene	2,300 ug/l	

Note: Footnotes for Table 2 appear at the end of the table on page 11.

TABLE 2, continued

SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA
SITE INSPECTION
DECEMBER 1990

Summary of Analytical Data

SAMPLE NUMBER	SAMPLE LOCATION	ANALYTICAL RESULTS		REFERENCE(S)
SR-MW-05	Northeast of plant building.	Barium	890 ug/l	3, pp. 22-25
		Cadmium	9 ug/l	
		Chromium	430 ug/l	
		Manganese	1,300 ug/l	
		Vanadium	570 ug/l	
		Ethyldimethylbenzene	90 (J) ug/l	
		Ethylmethylbenzene	700 (J) ug/l	
		Propadienylbenzene	90 (J) ug/l	
		Tetramethylbenzene	50 (J) ug/l	
		Trimethylbenzene	600 (J) ug/l	
SR-SD-01 (Background)	Carthage Branch, upstream from facility.	Barium	5 mg/kg	3, pp. 26-27
		Lead	1.1 mg/kg	
		Manganese	67 mg/kg	
		Vanadium	2.5 mg/kg	
		Zinc	5 (U) mg/kg	
		Ethylbenzene	12 (U) mg/kg	
		2-Methylnaphthalene	410 (U) mg/kg	
		Naphthalene	410 (U) mg/kg	
		Styrene	12 (U) mg/kg	
		Toluene	12 (U) mg/kg	
		Xylene	12 (U) mg/kg	
SR-SD-05	Sludge pond in central portion of facility.	Barium	20 mg/kg	3, pp. 26-27
		Lead	4 mg/kg	
		Vanadium	7.7 mg/kg	
		Diethylbenzene	100,000 (J) mg/kg	
		Ethylbenzene	3,000 mg/kg	
		Ethyldimethylbenzene	200,000 (J) mg/kg	
		Ethylmethylbenzene	70,000 (J) mg/kg	
		2-Methylnaphthalene	7,500 mg/kg	
		Methylpropylbenzene	50,000 (J) mg/kg	
		Naphthalene	190,000 mg/kg	
		Propylbenzene	10,000 (J) mg/kg	
		Propenylbenzene	9,000 (J) mg/kg	
		Styrene	1,900 mg/kg	
		Tetramethylbenzene	90,000 (J) mg/kg	
		Toluene	420 (J) mg/kg	
		Trimethylbenzene	30,000 (J) mg/kg	
		Xylene	22,000 mg/kg	
SR-SW-01 (Background)	Carthage Branch, upstream from facility.	Barium	56 ug/l	3, pp. 28-30

Note: Footnotes for Table 2 appear at the end of the table on page 11.

TABLE 2, continued

SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA
SITE INSPECTION
DECEMBER 1990

Summary of Analytical Data

SAMPLE NUMBER	SAMPLE LOCATION	ANALYTICAL RESULTS		REFERENCE(S)
SR-SW-02	Carthage Branch, onsite.	Butylbenzoic Acid	900 (J) ug/l	3, pp. 28-30
		Decane	30 (J) ug/l	
		Dimethyloxymethane	20 (J) ug/l	
		Dimethylbutanone	50 (J) ug/l	
		Ethylmethylbenzene	100 (J) ug/l	
		Methylpropenal	30 (J) ug/l	
		Methylcyclopentanone	80 (J) ug/l	
		Tetramethylpentanone	600 (J) ug/l	
SR-SW-05	Sludge pond in central portion of facility.	Ethylmethylbenzene	8,000 (J) ug/l	3, pp. 28-30
		Methylbenzofuran	100 (J) ug/l	
		Methylenepropenylbenzene	100 (J) ug/l	
		Propenylbenzene	70 (J) ug/l	
		Propylbenzene	40 (J) ug/l	
		Trimethylbenzene	300 (J) ug/l	

J = Estimated value
U = Material analyzed for but not detected. Value given is the Minimum Quantitation Limit.
ug/l = Micrograms per liter
mg/kg = Milligrams per kilogram
ug/kg = Micrograms per kilogram

cracker's lagoon

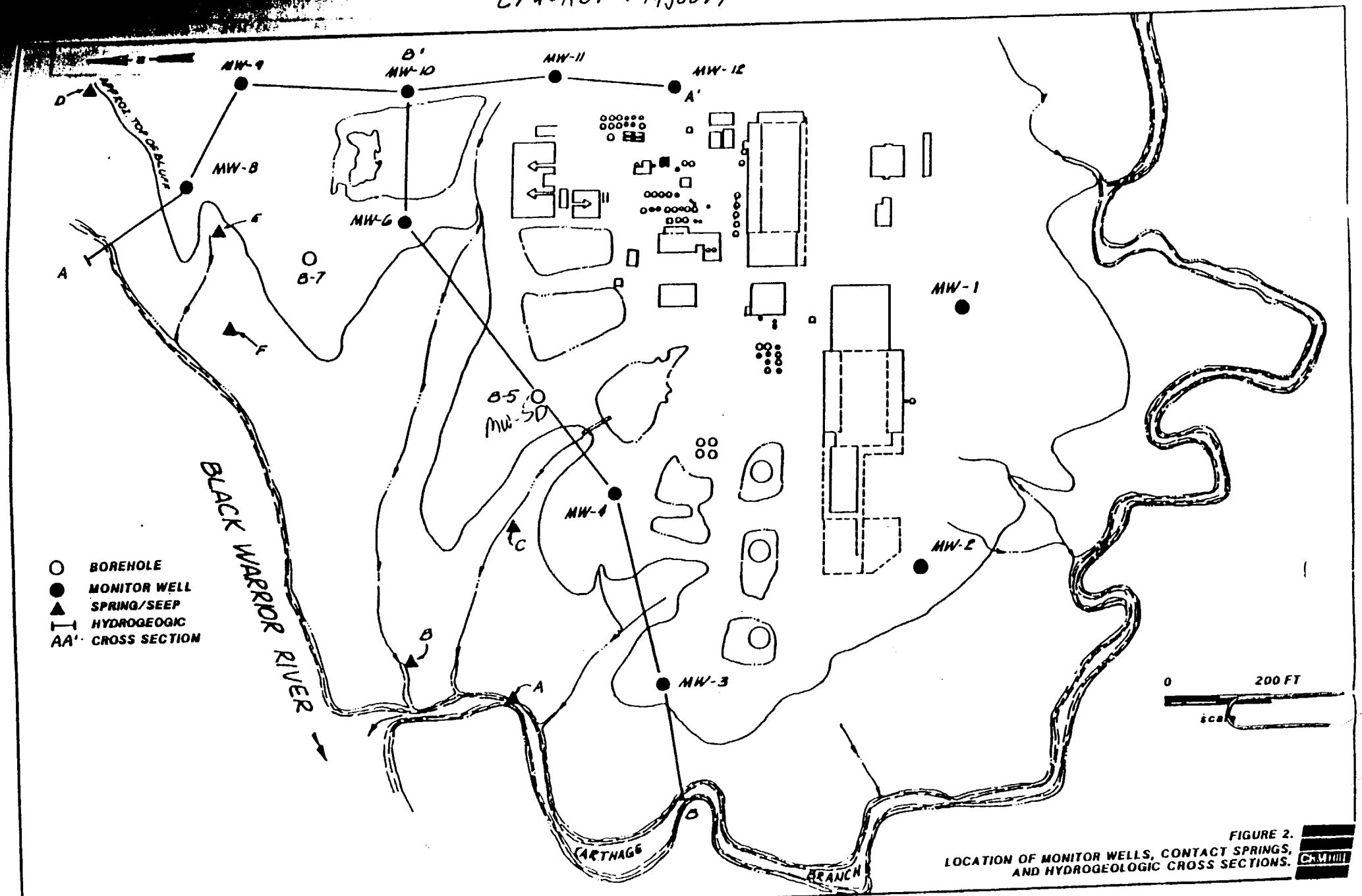
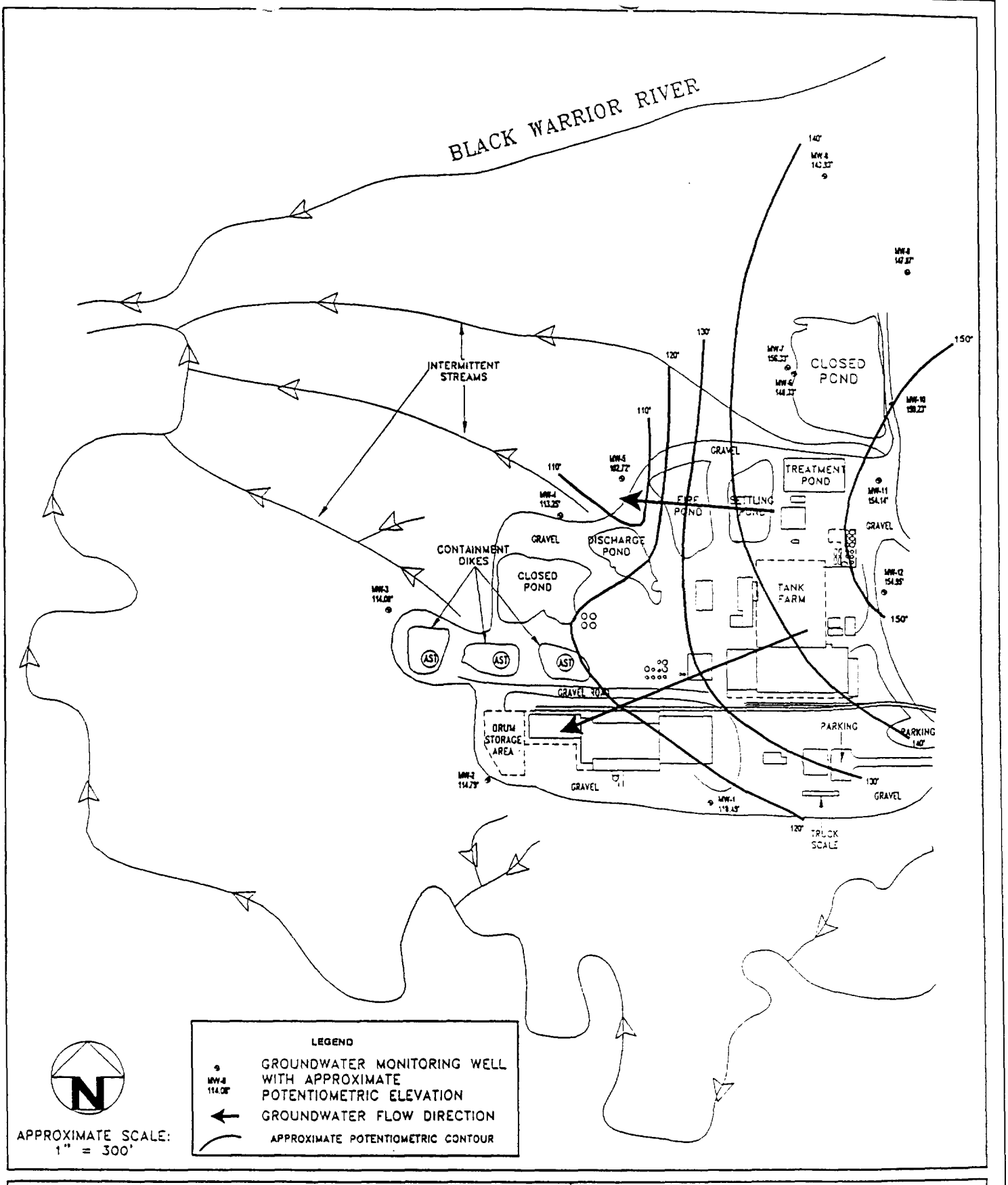


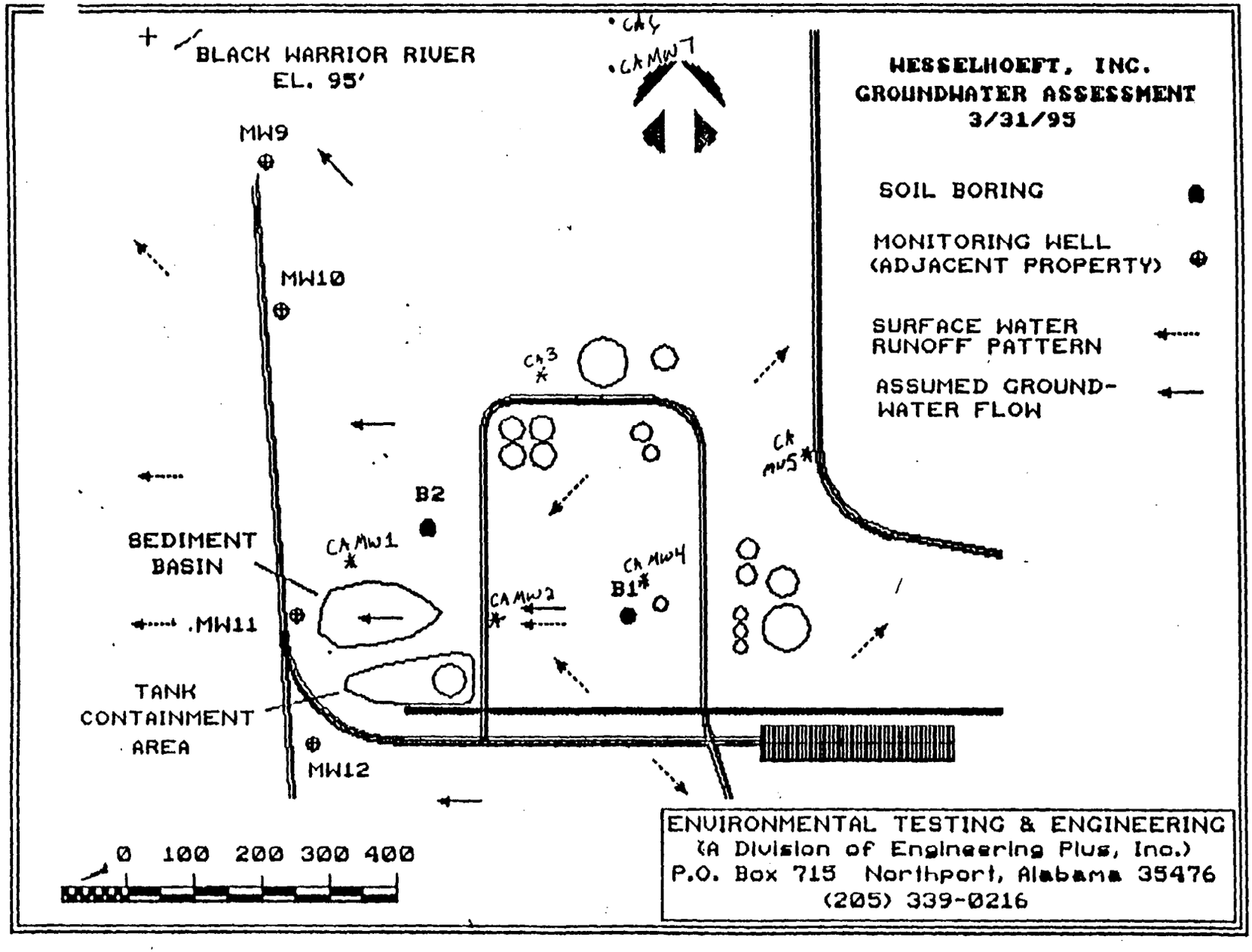
FIGURE 2.
LOCATION OF MONITOR WELLS, CONTACT SPRINGS, AND HYDROGEOLOGIC CROSS SECTIONS.



POTENTIOMETRIC SURFACE MAP
SOUTHERN RESINS FACILITY
MOUNDVILLE, ALABAMA
PROJECT NO.: J0522

NORTH AMERICAN ENVIRONMENTAL CORP.

well locations as of 10/25/95



7. REFERENCES

1. U.S.G.S. 7.5 Minute Series Topographic Quadrangle Maps of Alabama: Englewood 1970 (Photorevised 1983); Foster 1969 (Photorevised 1978); Moundville West 1980; Moundville East 1980 (Photorevised 19843. Scale 1:24,000.

2. U.S. Environmental Protection Agency, Standard Operating Procedure to Determine Site Latitude and Longitude Coordinates, 1991. Calculation worksheet for the Perdido Tire Dump Site.

3. Johnson, Kenneth W., et al., United States Department of Agriculture Soil Conservation Service and Forest Service in cooperation with Alabama Department of Agriculture and Industries and Alabama Agricultural Experiment Station, 1981, Soil Survey of Tuscaloosa County, Alabama.

4. Moore, James D., et al, Geological Survey of Alabama, 1991, Water in Alabama, 1990: Circular 122H.

5. Alabama Department of Environmental Management, Federal Reporting Data System (FRDS-II), Public Water Supply Summary.

6. DeJarnette, Sydney S., and Crownover, Jo E., 1987, Geohydrology and Susceptibility of Major Aquifers to Surface Contamination in Alabama; Area 6: U.S. Geological Survey Water-Resources Investigations Report 87-4113.

7. Mooty, Will S., 1987, Geohydrology and Susceptibility of Major Aquifers to Surface Contamination in Alabama; Area 7: U.S. Geological Survey Water-Resources Investigations Report 87-4109.

8. Federal Emergency Management Agency, Flood Insurance Rate Maps, Hale and Tuscaloosa Counties; Moundville, Alabama. Panel Number 010096 0005 B.

9. Davis, Martin E., et al., Geological Survey of Alabama, 1975, Water Availability and Geology of Hale County, Alabama, Map 136.

REFERENCES CONTINUED

10. State of Alabama-Department of Education, LEA Personnel System (EDLP471), 1992, Total Number of Pupils and Faculty by School and County.

11. Alabama State Data Center, Center for Business and Economic Research, College of Commerce and Business Administration, The University of Alabama. 1990 CENSUS Alabama Counties and Cities By Race.

12. Teem, David H., et al., Alabama Agricultural Experiment Station, 1986, Vertebrate Animals of Alabama in Need of Special Attention.

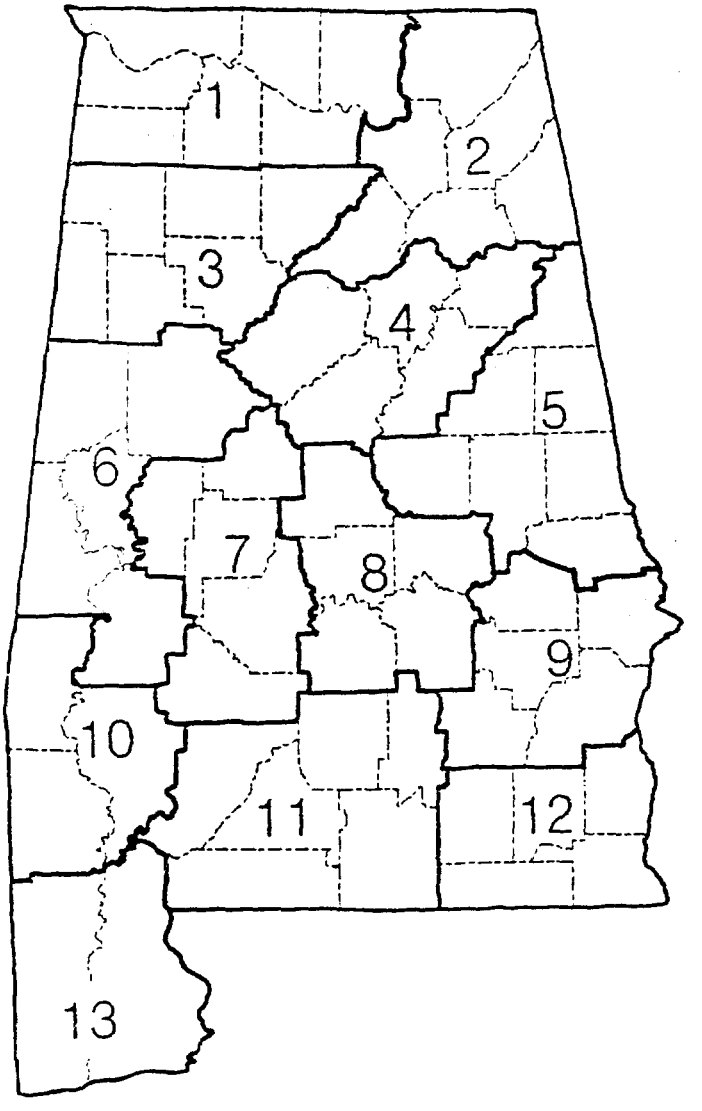
13. U.S. Fish and Wildlife Services, 1991, Counties in Alabama with Federally Listed Species.

14. Department of Conservation and Natural Resources, 1991 Federally Listed Endangered/Threatened Species.

15. Alabama Department of Environmental Management; Water Division - Water Quality Program, 1993, Water Use Classification for Interstate and Intrastate Waters, Chapter 335-6-11.

WATER-RESOURCES INVESTIGATIONS REPORT 87-4113

GEOHYDROLOGY AND SUSCEPTIBILITY OF MAJOR AQUIFERS TO SURFACE CONTAMINATION IN ALABAMA; AREA 6



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ALABAMA DEPARTMENT OF
ENVIRONMENTAL MANAGEMENT

The terrace deposits and alluvium merge near the edges of the flood plains and in places the contact between them cannot be distinguished because of lithological similarity; therefore, some of the lower terrace deposits are mapped as alluvium (pl. 2).

SOURCE AND OCCURRENCE OF WATER

The source of all fresh water in Hale County is precipitation which occurs mainly in the form of rain. Annual rainfall averages about 52 inches and is fairly evenly distributed throughout the year. Part of the rainfall runs off directly into streams; part is returned to the atmosphere by evapotranspiration; and part percolates downward to replenish underground reservoirs. The average annual runoff from the county is about 17 inches or 0.82 mgd (million gallons per day) per square mile.

The occurrence of ground water and the flow of streams in Hale County are governed largely by the physical characteristics of geologic units. A summary of the geologic units in the county, their water-bearing characteristics, and chemical quality of water obtained from aquifers are given in table 1.

AVAILABILITY OF WATER

GROUND WATER

The major aquifers that yield water to wells in Hale County are beds of sand in the Coker, Gordo, and Eutaw Formations. Terrace deposits and alluvium contain sand and gravel aquifers that yield small quantities of water for domestic and stock supplies; however, they may yield larger supplies. The Mooreville and Demopolis Chalks consist of relatively impermeable chalk and clay beds and generally do not yield water to wells; however, they have a significant influence on ground-water conditions because they confine water in underlying aquifers and retard downward percolation of water from overlying aquifers.

The evaluation of the availability of ground water in Hale County is based on records for 308 wells and 2 springs. Their locations are shown on plate 2 and the data collected are tabulated in table 2.

Water table conditions occur throughout Hale County except in lowland areas near the Black Warrior River and near streams in the outcrop area of the Mooreville and Demopolis Chalks (pl. 1). Where the aquifers are overlain by relatively impermeable beds of chalk, the water becomes confined and is under hydrostatic pressure exerted by the weight of water in the same aquifer at higher elevations. Water in a well tapping a confined aquifer will rise above the top of the aquifer and in lowland areas will flow at the land surface. Such aquifers are termed artesian and the imaginary surface to which the water will rise under artesian conditions is called the potentiometric surface. An artesian well will flow if the potentiometric surface is above the land surface. The area of artesian flow in Hale County is shown on plate 2.

Ground water generally moves from areas of recharge toward areas of discharge. The rate of movement is dependent on the hydraulic gradient and permeability of the aquifer. The direction of flow of ground water in Hale County is generally southwestward and downdip from areas of outcrop. Recharge to the aquifers is derived from rainfall on these outcrop areas within and immediately north of the county.

The generalized bases of the three major aquifers are shown by contour lines on plate 2. A subsurface profile of the southwestward-dipping aquifers and their potentiometric surfaces are shown on plate 2. To estimate the depth below land surface necessary to drill to the base of a major aquifer, add the elevation
the proposed wel
nearest the site.
tion of the well
level and the ne

and clay. Alluvial deposits along the flood plains of the Black Warrior, Sipsey, and Tombigbee Rivers are shown on the geologic map (fig. 2). Remnants of older alluvial deposits (usually mapped as high terrace deposits) are not shown on the geologic map, but form relatively flat uplands in several parts of the study area. The alluvial deposits generally range in thickness from 30 to 60 feet. They are not a major aquifer in the study area.

HYDROLOGY OF THE MAJOR AQUIFERS

The major aquifers in the study area are sand and gravel beds in the Coker, Gordo, Eutaw, and Nanafalia Formations. Water in these aquifers occurs under artesian conditions in most parts of the study area. Municipal wells that tap the major aquifers are shown in table 2 and their locations are shown on plate 1.

Recharge and Movement of Ground Water

Rainfall, which averages about 50 inches per year, is the source of recharge to the major aquifers. A large part of the rainfall runs off during and directly after rainstorms or is returned to the atmosphere by evaporation and transpiration of trees and other plants; a small part infiltrates to the water table to recharge aquifers. The recharge area for the Coker aquifer is mainly in Tuscaloosa County; the Gordo aquifer mainly in Pickens and Tuscaloosa Counties; and the Eutaw aquifer in Pickens and Greene Counties. The recharge area for the Nanafalia aquifer is in Sumter and Marengo Counties (see plate 1). These recharge areas consist largely of rolling sandhills, parts of which are wooded and parts cultivated. In Tuscaloosa and Pickens Counties remnants of high terrace deposits overlie significant parts of the recharge areas. These terrace remnants form relatively flat, permeable landscapes that impede runoff and probably increase recharge to the aquifers. Alluvial deposits overlie the major aquifers along the flood plains in the Black Warrior, Sipsey, and Tombigbee Rivers. These permeable deposits may provide increased recharge to the aquifers. Water moves downdip from areas of recharge to areas of natural discharge or areas of ground-water withdrawals, generally perpendicular to the potentiometric contour lines shown on figures 4, 5, and 6.

Natural Discharge and Ground-Water Withdrawals

The aquifers discharge through seeps and springs to provide the base (dry weather) flow of streams. Discharge to the rivers also occurs where streams are entrenched into the aquifers. Discharge to streams can occur by upward leakage through the confining unit between aquifers or by passing through fractures in the Mooreville and Demopolis Chalks (Gardner, 1981). Most of the remainder of the discharge is through wells. The largest pumping center in the study area is the city of Demopolis. In 1985, it was estimated to pump 1.3 Mgal/d (million gallons per day). The other pumping centers in the study area pump less than 1 Mgal/d each.

ADEM

ALABAMA
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

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May 6, 1986

MEMORANDUM

TO: J.P. Martin
Industrial Branch

FROM: Fred Mason FCM
Groundwater Section

SUBJECT: Southern Resins/Lawter Chemicals/Cracker Asphalt Inspections
Tuscaloosa County

On Tuesday April 29, 1986, I conducted a follow-up evaluation of the Southern Resins plant near Moundville, Alabama. The following observations were made:

1. Red leachate with a hydrocarbon sheen appearance was discharging above a clay layer below the north bluff lagoon. This leachate disappears to the subsurface either to creek bed alluvium or to a gray sand below the clay layer.

2. Leachate was also observed in the drainage below the middle/polishing pond.

3. Sludge deposits were observed in the north bluff pond, the middle pond, and the "u" shaped pond.

4. Sludge spillage was observed in the containment area around the storage tank used by Southern Resins on the Cracker Asphalt plant site. This could affect the wells on the property line, i.e. wells 12, 11, 10, and 9. The Cracker Asphalt lagoon sludge level is low due to lack of rainfall.

5. Discharge from the T-pipe lagoon to Carthage Branch was excessively foamy. This foam discharge has been reported by the public in the past and by a worker at Mound State Park.

Southern Resins/Lawter Chemicals proposes to close the north bluff lagoon, and clean up and dispose of contaminated soils defined by the CH_2M Hill study. They propose, further, to continue monitoring the contaminated terrace and Gordo aquifers, assuming they will discharge contaminants naturally. This proposal should be considered since a massive clay confining unit outcrops along the Black Warrior River and leachate springs are discharging from above this clay layer.

U.S. ENVIRONMENTAL ENGINEERING, INC.
REMEDIATION

1100 Northmeadow Pkwy.
Suite 108
Roswell, GA 30076
(404) 740-1000
FAX (404) 740-0700
1-800-989-0200

April 30, 1997

Lawter International, Inc.
P.O. Box 128
Moundville, AL 35474

Attention: Mr. Darrin Hull
Plant Manager

SUBJECT: Southern Resins Facility
Groundwater Incident GW94-5-7
Moundville, Tuscaloosa County

US Environmental Engineering, Inc. (USEE) a subsidiary of North American Environmental Corporation, respectfully submits this letter report in response to the April 3, 1997 correspondence from Mr. Joe R. Kelly of the Alabama Department of Environmental Management (ADEM) Groundwater Branch.

The ADEM correspondence requests a potentiometric surface map, contaminant plume maps and time versus contaminant concentration plots for each monitoring well with conclusions.

On April 25, 1997 USEE personnel visited the site in order to survey well elevations relative to each other and obtain depth to water measurements. Monitor well MW-1 was assumed to have a top of casing (TOC) elevation of 160.0 feet MSL. Using a surveyors level and measuring rod, the elevations of each well's TOC was determined relative to this arbitrary datum. Depth to water from the TOC was measured for each well using an electronic water level indicator. This data was tabulated in Table 1 and used to calculate a potentiometric surface elevation for each well. A potentiometric surface map for the site was then produced and is attached. The potentiometric surface map shows overall groundwater flow to the south and west toward the adjacent Black Warrior river.

No depth to water measurements were taken during previous sampling events and; therefore, no past potentiometric maps could be produced. All future monitoring events will involve depth to water measurements and production of a resulting potentiometric surface map.

Past analytical results were provided to USEE by Lawter International and results were tabulated for each well as attached.

As is shown on the attached Time vs. Contaminant Concentration Plots, it is apparent concentrations have varied with time. The following is a well by well discussion of each plot. The attached Site Plan should be consulted to identify well locations.

Well #1 has not shown any detectable concentrations of contaminants analyzed to date.

MW-2 has shown only one detectable concentration of styrene on 6/9/93 at just over detection levels. Since this contaminant has not been detected in subsequent sampling events, this well should be considered contaminant free at this time.

MW-3 has also shown low levels of three contaminants in both the 6/21/94 and 12/13/94 monitoring events; however, no contaminants were detected in any of the last 4 monitoring events. Therefore, this well should be considered contaminant free at this time.

MW-4 has remained mostly contaminant free with the exception of low levels of total xylene and dicyclopentadiene detected over the past three years. Since xylene has not been detected over the past two events (1 year) and dicyclopentadiene has decreased to 10ppb over the last three monitoring events, the well is largely contaminant free; however, the well should continue to be sampled with special notice given to these contaminants in the future.

MW-5 has shown concentrations of various contaminants consistently since sampling began on 6/7/91. While contaminant concentrations have varied, as is common in groundwater monitoring wells, there does not appear to be any increasing trends. It would appear contaminant concentrations are stabilized with an apparent downward trend over the last year.

MW-6 has shown concentrations of various contaminants consistently since sampling began on 6/7/91. Contaminant concentrations have increased with the last sampling event over the previous event; however, this appears to be a natural variation with no increasing trend apparent. Overall, concentrations are roughly a third of initial concentrations indicating an overall downward trend.

MW-7 has not shown any detectable concentrations of contaminants analyzed to date.

MW-8 has shown contaminant concentrations in the past, namely the 12/13/94 and 12/11/95 sampling events; however, the last two sampling events have shown non-detectable concentrations of contaminants. This would suggest variability in groundwater and although the well appears contaminant free at this time, continued monitoring is recommended.

MW-9 has shown concentrations of various contaminants consistently since sampling began on 6/7/91. While concentrations have varied, an apparent overall downward trend is evident. Continued monitoring should confirm this trend.

MW-10 has shown concentrations of various contaminants consistently since sampling began on 6/7/91. While concentrations have varied, an apparent overall downward trend is evident. Continued monitoring should confirm this trend.

MW-11 has shown concentrations of various contaminants consistently since sampling began on 6/7/91. While concentrations have varied with time, no overall trend is evident. Continued monitoring will be necessary to establish any trend if present.

MW-12 has shown concentrations of various contaminants consistently since sampling began on 6/7/91. While concentrations have varied with tine, no overall trend is evident. Continued monitoring will be necessary to establish any trend if present.

Also attached is a contaminant plume map for the site for the last monitoring event on 12/18/96. The map shows contaminants largely in the northeast portion of the site with highest concentrations in the central east portion (i.e. MW-11 and MW-12). While the contaminant plume is not completely defined, it appears the highest concentrations are confined to the immediate east plant area.

Based on the attached potentiometric map it appears the wells with the highest contaminant concentrations are also the upgradient most wells. As noted in previous correspondence with ADEM, Lawter has raised concern over the adjacent property east of the site as a possible off- site source of contamination. Based on the attached potentiometric map and contaminant plume map, this appears to be a plausible source for on-site contamination.

Based on the plume map and historical concentrations it would appear the plume, as it is defined, is mostly stabilized.

Should you have any questions, please do not hesitate to call.

Sincerely,

Patrick M. Gagen, P.G., REM
Senior Environmental Geologist

Al. Reg. # 167

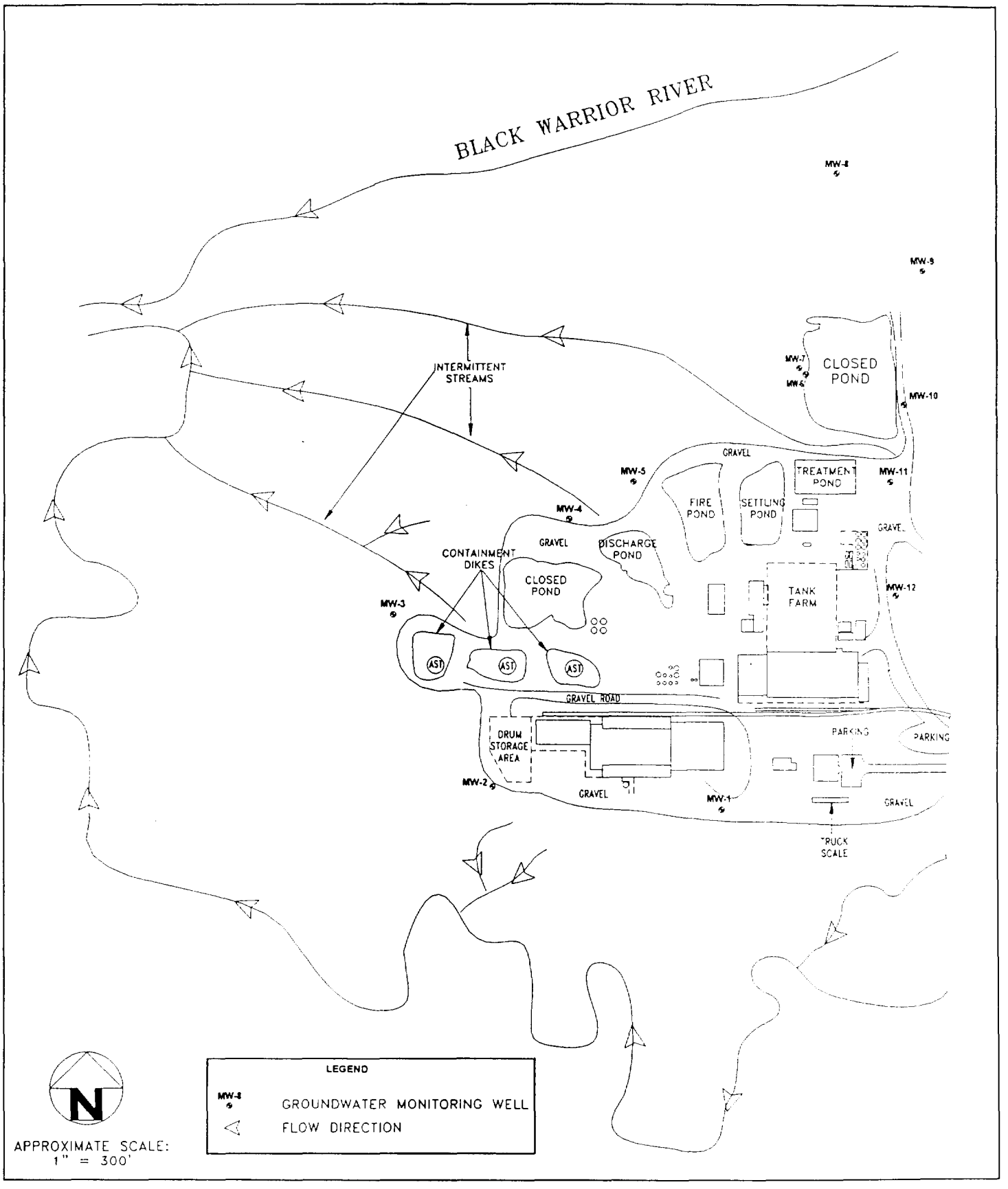
PMG:cj C:\DOCUMENT\REPORTS\LSEERPT\J0522.WPD

TABLE 1

WELL ID	TOC ELEVATION	DTW	POTENTIOMETRIC
MW-1	160.00	41.51'	118.49
MW-2	156.95	42.16'	114.79
MW-3	150.38	36.30	114.08
MW-4	155.88	42.63	113.25
MW-5	153.87	51.15'	102.72
MW-6	170.68	22.66'	148.02
MW-7	169.10	12.77' *	156.33
MW-8	182.23	38.30'	143.93
MW-9	189.63	41.76'	147.87
MW-10	175.07	24.84'	150.23
MW-11	180.60	28.46'	154.14
MW-12	181.79	26.84'	154.95

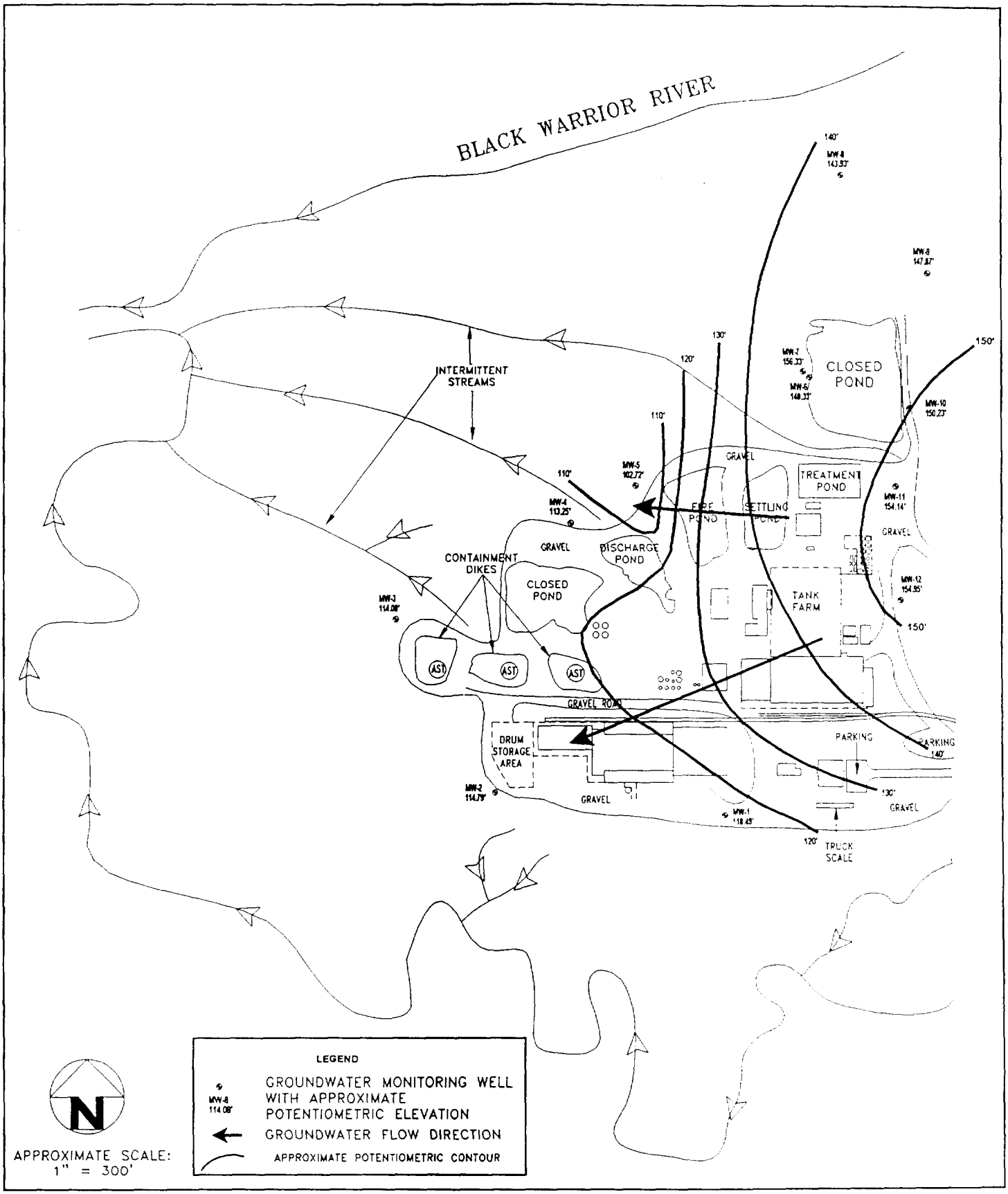
* Probe was muddy.

All numbers are in feet.
Elevations are in feet above Mean Sea Level (MSL) based on the assumed arbitrary datum of MW-1 Top of Casing (TOC) elevation.



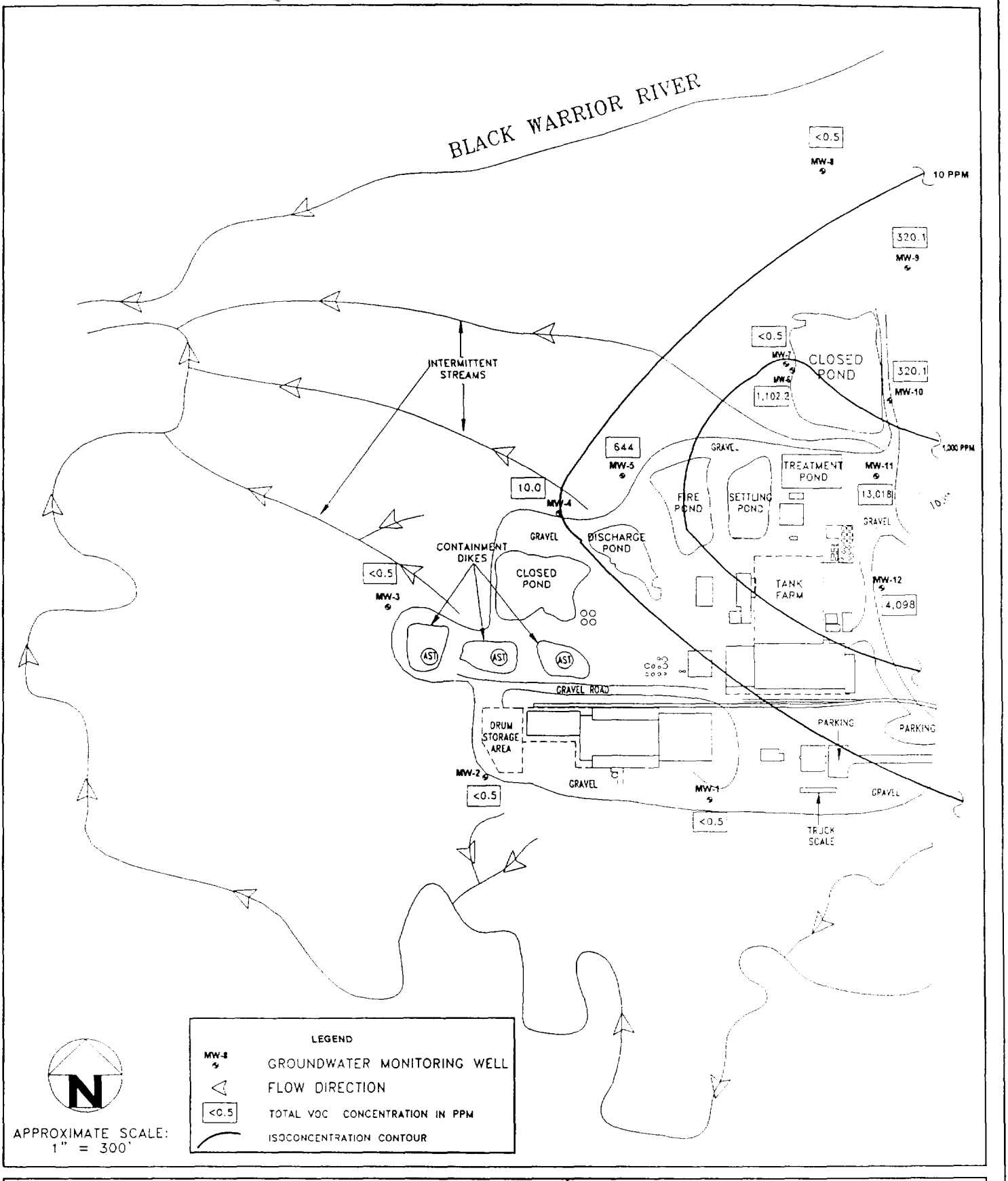
SITE PLAN
SOUTHERN RESINS FACILITY
MOUNDVILLE, ALABAMA
PROJECT NO.: J0522

NORTH AMERICAN ENVIRONMENTAL CORP.



POTENTIOMETRIC SURFACE MAP
SOUTHERN RESINS FACILITY
MOUNDVILLE, ALABAMA
PROJECT NO.: J0522

NORTH AMERICAN ENVIRONMENTAL CORP.

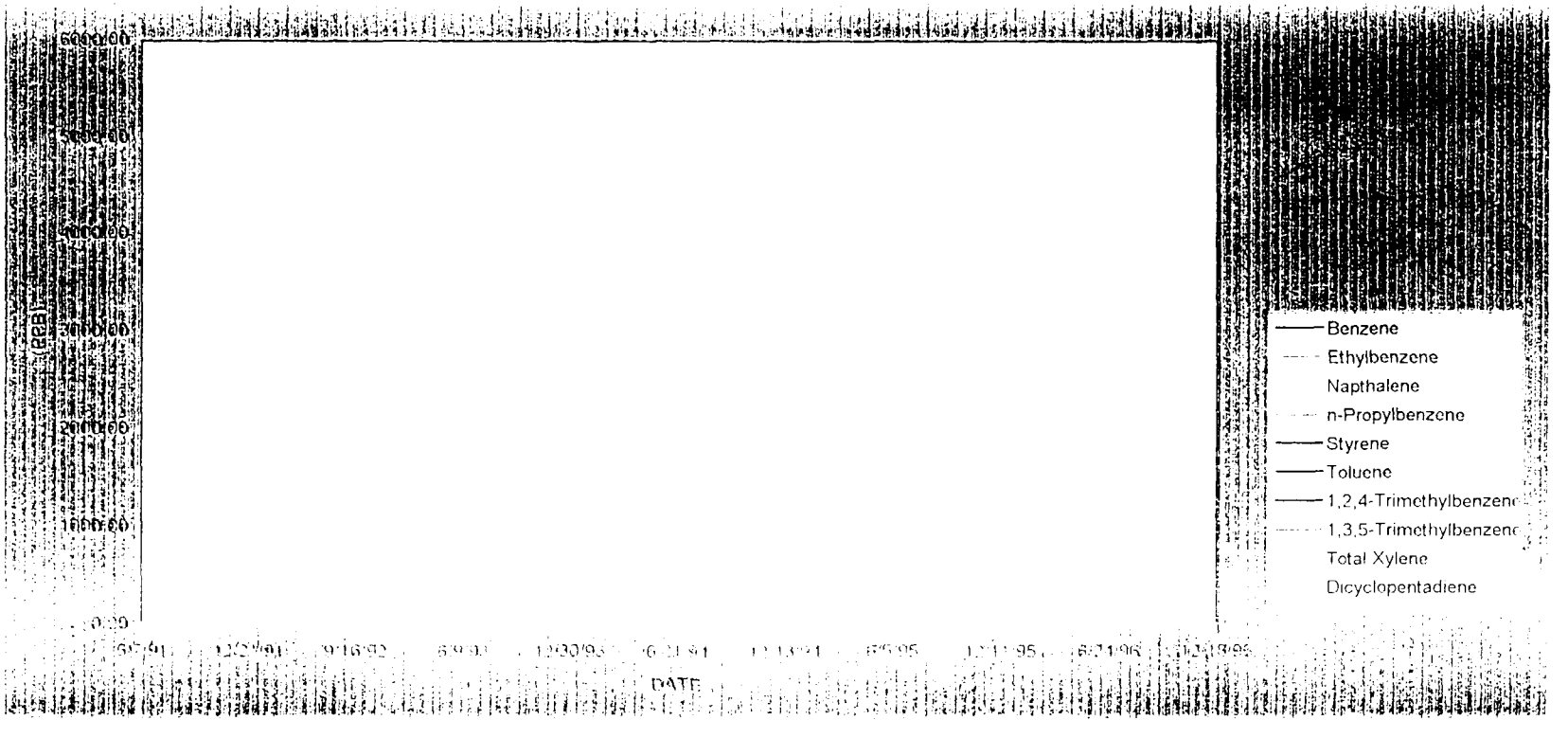


CONTAMINANT PLUME MAP
SOUTHERN RESINS FACILITY
MOUNDVILLE, ALABAMA
PROJECT NO.: J0522

NORTH AMERICAN
ENVIRONMENTAL
CORP.

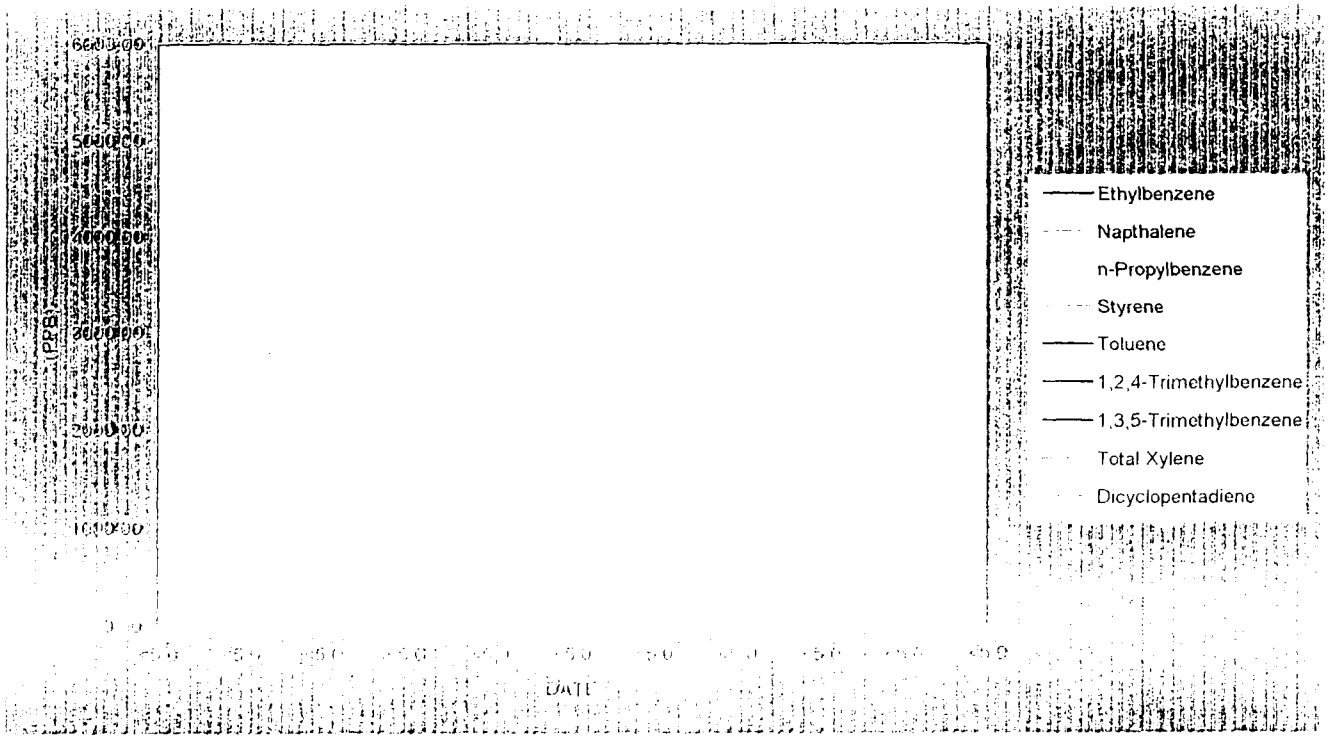
Moundville Semi-Annual Groundwater Monitoring Results for Groundwater Well #1

Contaminant	6/7/91	12/21/91	9/16/92	6/9/93	12/30/93	6/21/94	12/13/94	6/5/95	12/11/95	6/24/96	12/18/96
Benzene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Napthalene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
n-Propylbenzene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Styrene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Toluene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2,4-Trimethylbenzene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,3,5-Trimethylbenzene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Total Xylene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Dicyclopentadiene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0



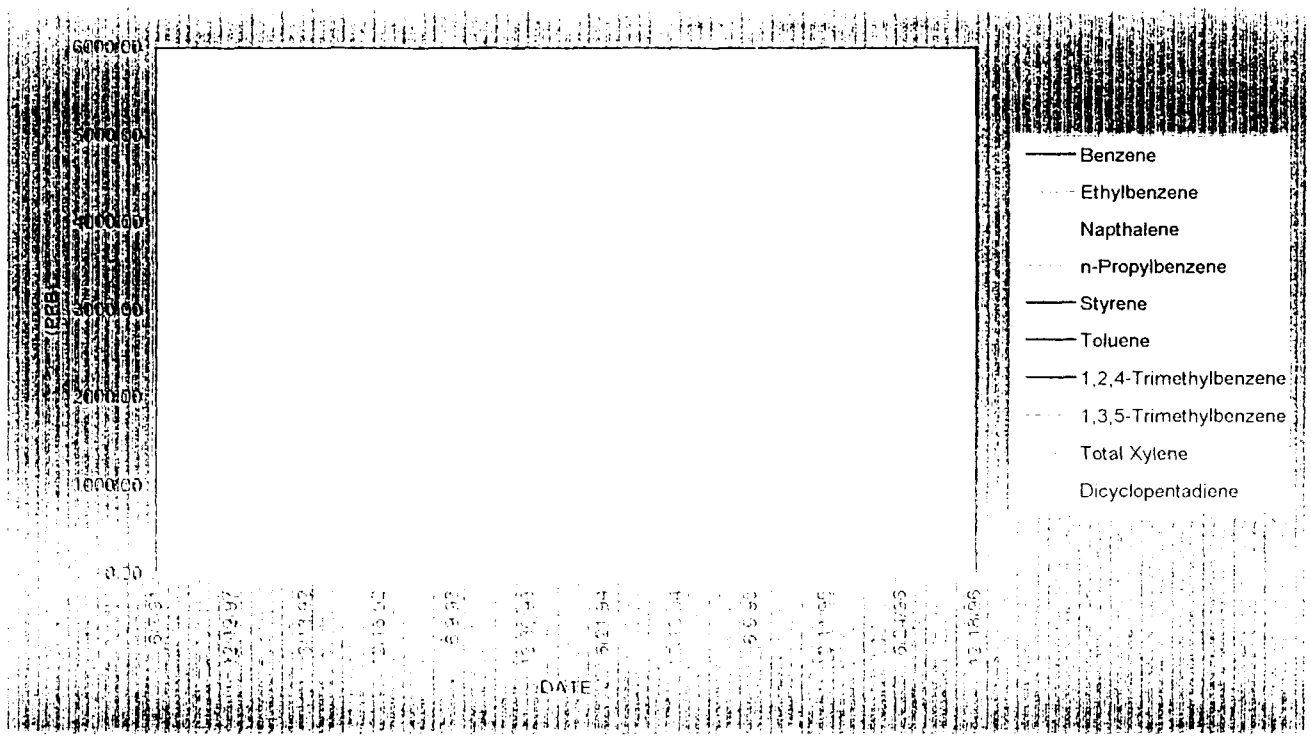
Moundville Semi-Annual Groundwater Monitoring Results for Groundwater Well #2

Contaminant	6/7/91	12/21/91	9/16/92	6/9/93	12/30/93	6/21/94	12/13/94	6/5/95	12/11/95	6/24/96	12/18/96
Benzene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Napthalene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
n-Propylbenzene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Styrene	<5.0	<5.0	<5.0	7.10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Toluene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2,4-Trimethylbenzene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,3,5-Trimethylbenzene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Total Xylene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Dicyclopentadiene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0



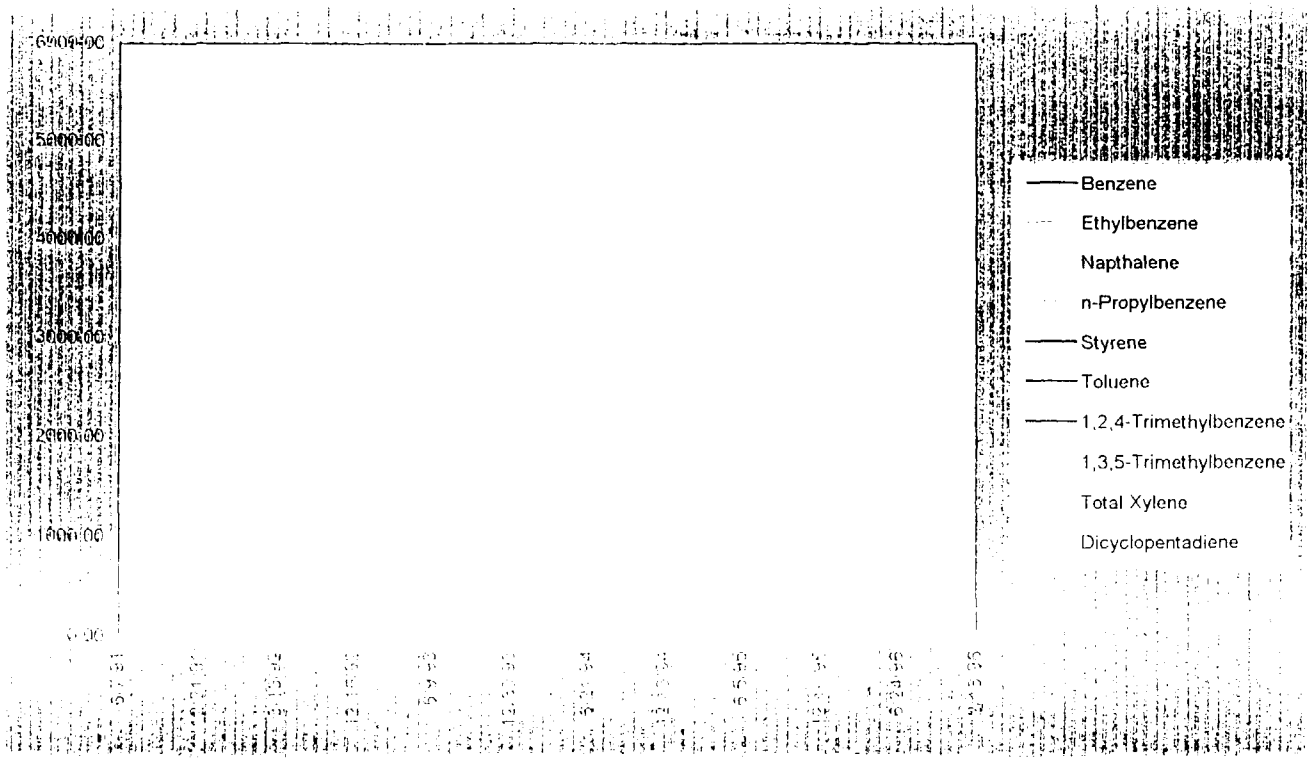
Moundville Semi-Annual Groundwater Monitoring Results for Groundwater Well #3

Contaminant	6/7/91	12/12/97	3/13/92	12/16/92	6/9/93	12/30/93	6/21/94	12/13/94	6/5/95	12/11/95	6/24/96	12/18/96
Benzene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Napthalene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
n-Propylbenzene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Styrene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Toluene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2,4-Trimethylbenzene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	6.20	5.31	<5.0	<5.0	<5.0	<5.0
1,3,5-Trimethylbenzene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Total Xylene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	18.60	6.53	<5.0	<5.0	<5.0	<5.0
Dicyclopentadiene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	22.10	7.32	<5.0	<5.0	<5.0	<5.0



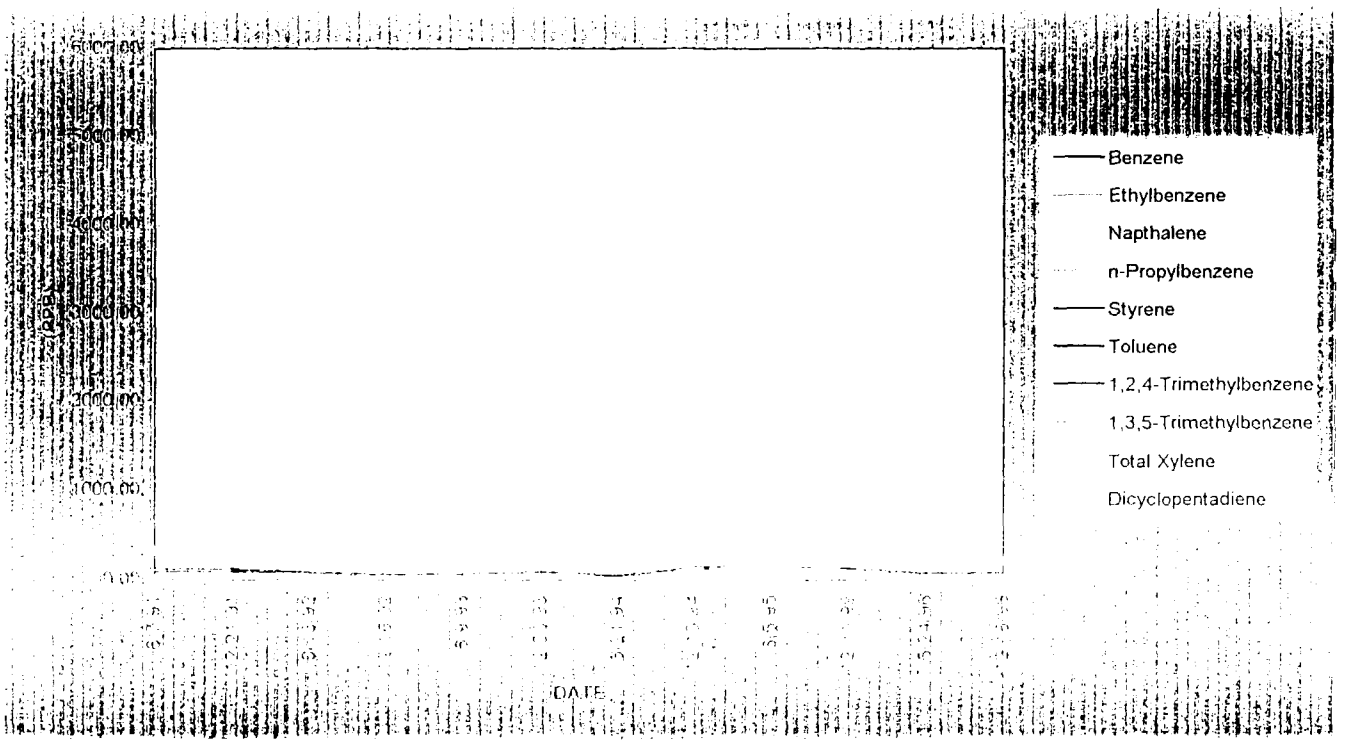
Moundville Semi-Annual Groundwater Monitoring Results for Groundwater Well #4

Contaminant	6/7/91	12/21/91	3/13/92	12/16/92	6/9/93	12/30/93	6/21/94	12/13/94	6/5/95	12/11/95	6/24/96	12/18/96
Benzene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Napthalene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
n-Propylbenzene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Styrene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Toluene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2,4-Trimethylbenzene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,3,5-Trimethylbenzene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Total Xylene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	6.29	<5.0	6.10	<5.0	<5.0
Dicyclopentadiene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	19.70	14.60	10.00



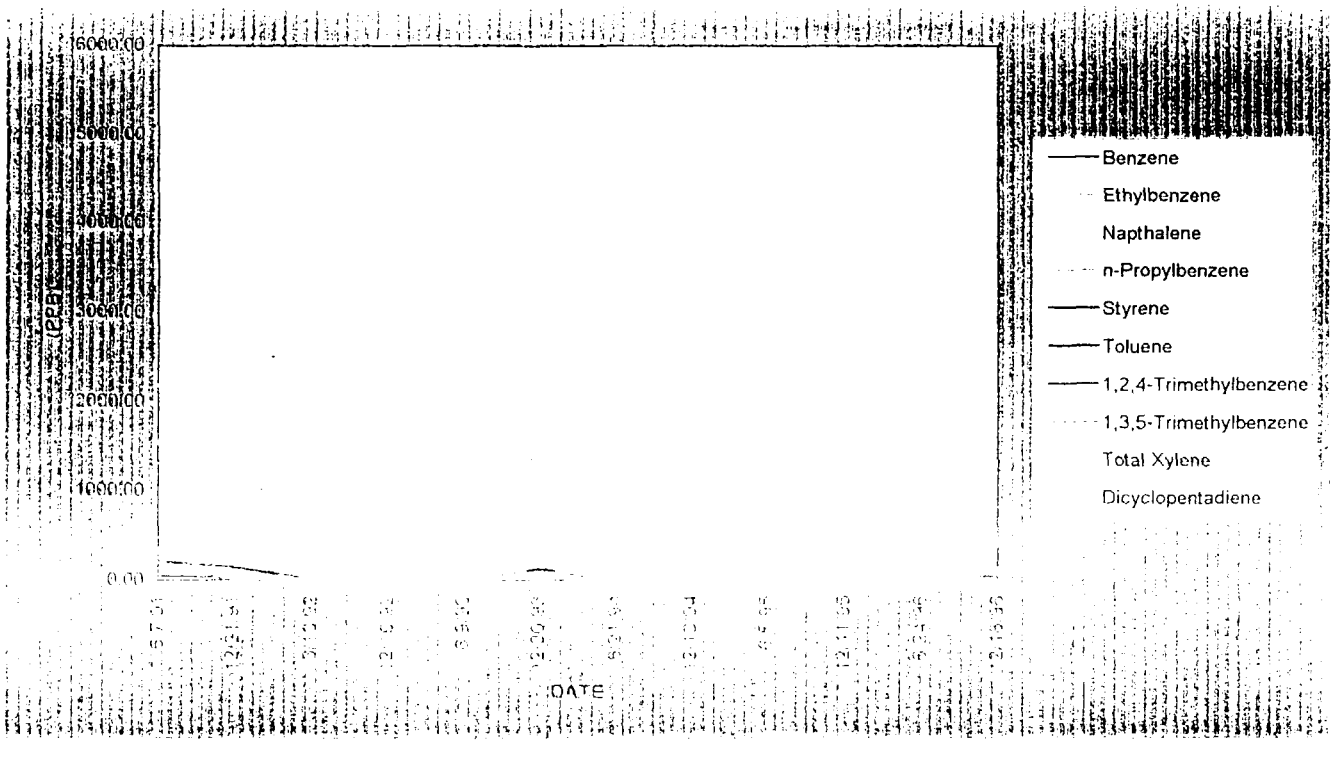
Moundville Semi-Annual Groundwater Monitoring Results for Groundwater Well #5

Contaminant	6/7/91	12/21/91	3/13/92	12/16/92	6/9/93	12/30/93	6/21/94	12/13/94	6/5/95	12/11/95	6/24/96	12/18/96
Benzene	85.90	87.70	83.70	39.60	60.90	105.00	43.80	113.00	86.60	85.00	55.10	60.80
Ethylbenzene	<5.0	52.80	12.60	46.70	43.50	77.60	8.90	109.00	79.33	78.50	46.10	47.10
Napthalene	6.70	805.00	241.00	183.00	410.00	388.00	207.00	866.00	878.00	778.00	403.00	228.00
n-Propylbenzene	<5.0	21.40	<5.0	<5.0	17.60	25.80	<5.0	44.10	29.90	31.40	<25.0	<25.0
Styrene	9.45	16.20	10.30	5.80	7.70	10.00	<5.0	<5.0	<5.0	<25	<25.0	<25.0
Toluene	15.40	23.00	17.10	<5.0	19.80	28.40	13.10	49.00	34.20	33.40	<25.0	<25.0
1,2,4-Trimethylbenzene	134.00	124.00	97.50	67.80	69.70	92.30	58.70	144.00	151.00	134.00	83.30	88.00
1,3,5-Trimethylbenzene	45.50	31.40	37.70	26.80	24.60	26.10	18.40	<5.0	<5.0	41.80	<25	32.30
Total Xylene	287.00	324.00	264.00	186.00	173.00	361.00	145.00	420.00	299.00	286.00	153.00	188.00
Dicyclopentadiene	20.30	20.00	25.70	18.20	17.70	25.90	15.80	41.40	26.00	29.80	<25	<25.0



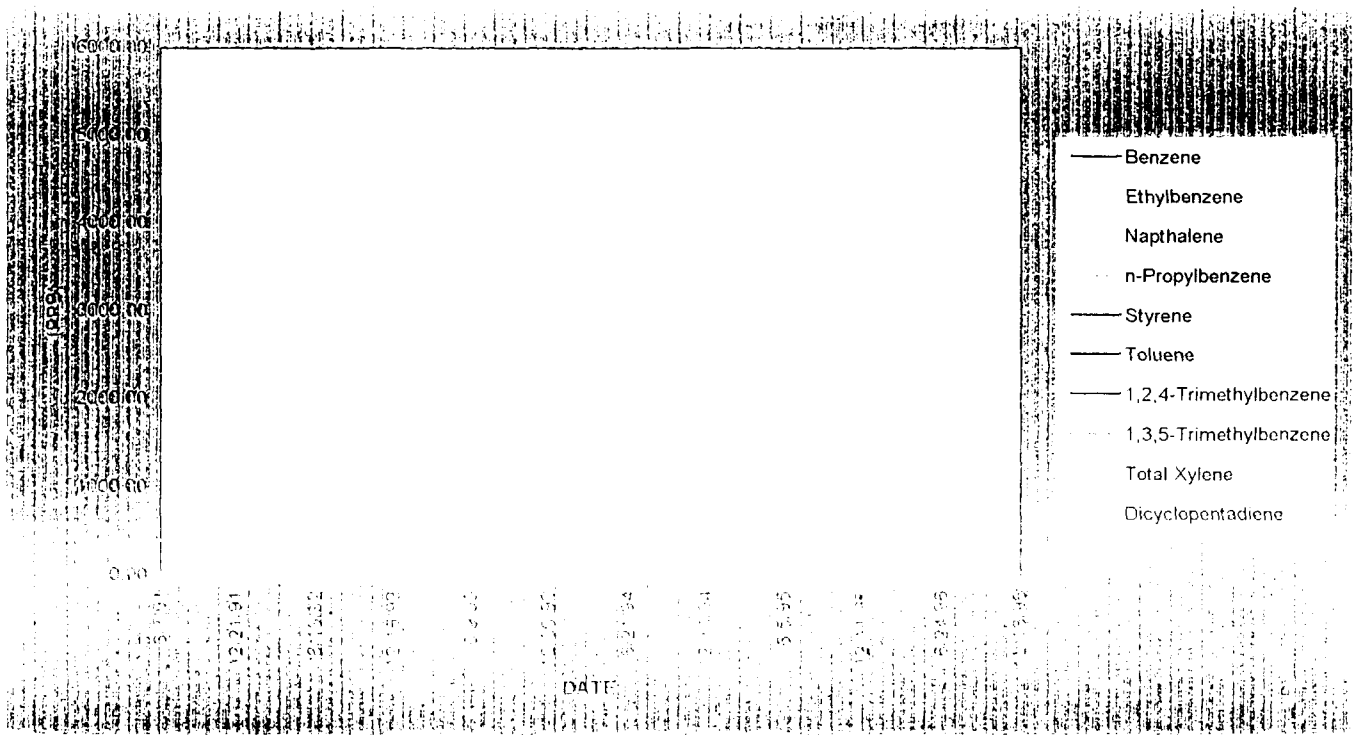
Moundville Semi-Annual Groundwater Monitoring Results for Groundwater Well #6

Contaminant	6/7/91	12/21/91	3/13/92	12/16/92	6/9/93	12/30/93	6/21/94	12/13/94	6/5/95	12/11/95	6/24/96	12/18/96
Benzene	<25	<12.5	<12.5	<5.0	<5.0	9.60	<5.0	<5.0	<5.0	<12.5	<12.5	<12.5
Ethylbenzene	22.90	<12.5	<12.5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<12.5	<12.5	<12.5
Napthalene	2180.00	2450.00	131.00	225.00	16.30	465.00	70.90	310.00	377.00	1190.00	91.80	473.00
n-Propylbenzene	9.51	<12.5	<12.5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<12.5	<12.5	<12.5
Styrene	56.40	33.80	<12.5	7.15	<5.0	9.50	<5.0	<5.0	<5.0	<12.5	<12.5	12.60
Toluene	<25	<12.5	<12.5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<12.5	<12.5	<12.5
1,2,4-Trimethylbenzene	219.00	148.00	19.40	31.30	<5.0	128.00	<5.0	11.40	10.40	38.80	<12.5	58.60
1,3,5-Trimethylbenzene	198.00	19.50	<12.5	<5.0	<5.0	18.30	<5.0	<5.0	<5.0	<12.5	<12.5	<12.5
Total Xylene	314.00	213.00	44.10	39.90	<5.0	169.00	10.30	17.70	16.80	40.80	<12.5	100.00
Dicyclopentadiene	1540.00	1420.00	433.00	247.00	502.00	1460.00	565.00	104.00	376.00	388.00	451.00	458.00



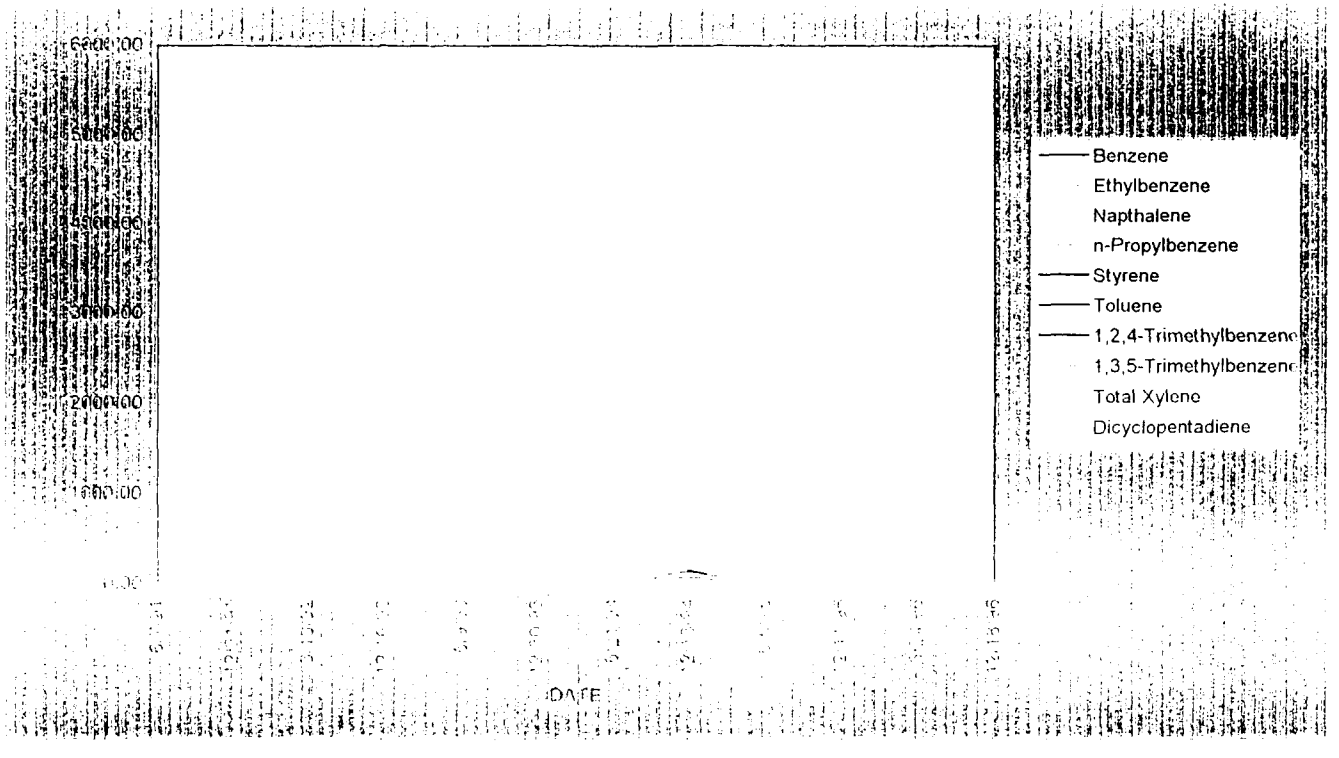
Moundville Semi-Annual Groundwater Monitoring Results for Groundwater Well #7

Contaminant	6/7/91	12/21/91	3/13/92	12/16/92	6/9/93	12/30/93	6/21/94	12/13/94	6/5/95	12/11/95	6/24/96	12/18/96
Benzene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	
Ethylbenzene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	
Napthalene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	
n-Propylbenzene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	
Styrene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	
Toluene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	
1,2,4-Trimethylbenzene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	
1,3,5-Trimethylbenzene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	
Total Xylene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	
Dicyclopentadiene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	



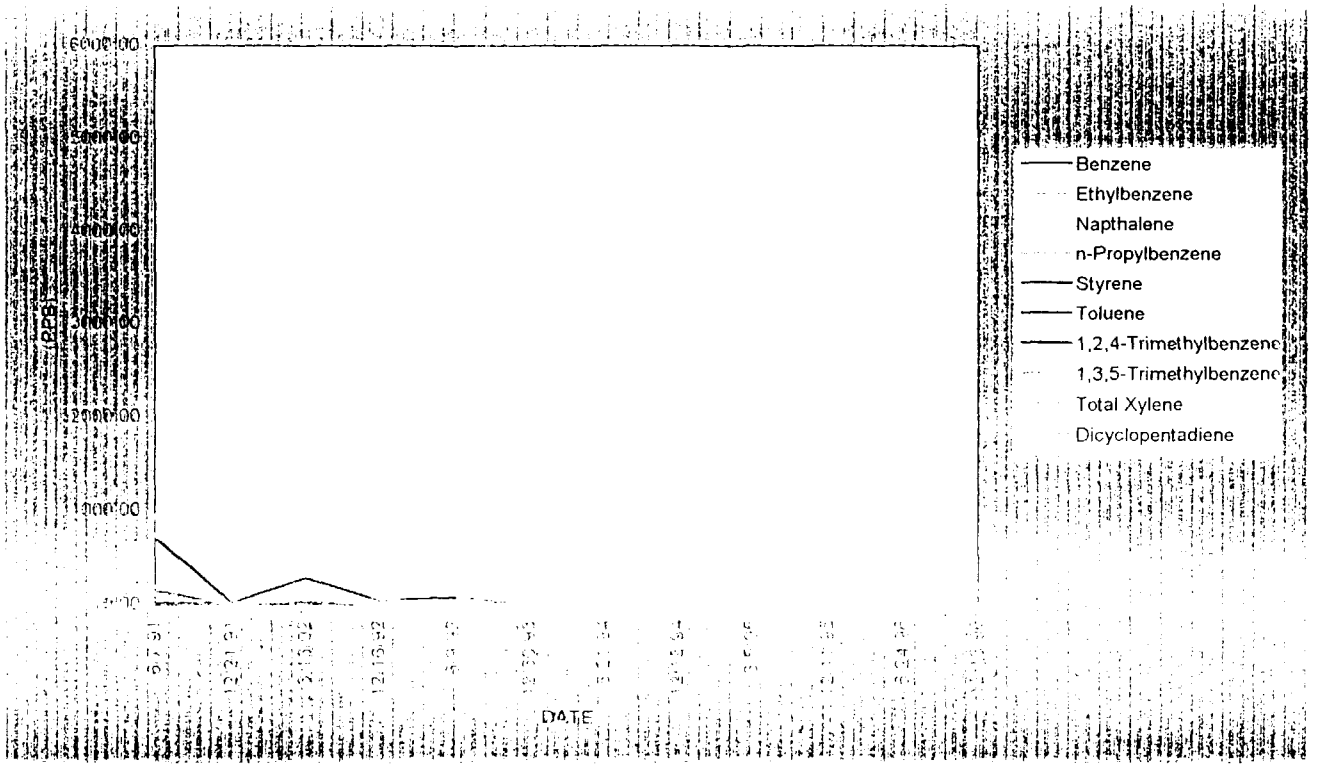
Moundville Semi-Annual Groundwater Monitoring Results for Groundwater Well #8

Contaminant	6/7/91	12/21/91	3/13/92	12/16/92	6/9/93	12/30/93	6/21/94	12/13/94	6/5/95	12/11/95	6/24/96	12/18/96
Benzene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	80.10	<5.0	40.70	<5.0	<5.0
Ethylbenzene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	22.30	<5.0	20.80	<5.0	<5.0
Napthalene	<5.0	11.90	<5.0	24.90	<5.0	39.20	<5.0	374.00	6.30	220.00	<5.0	<5.0
n-Propylbenzene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	17.50	<5.0	10.90	<5.0	<5.0
Styrene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	13.30	<5.0	<5.0
Toluene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	18.10	<5.0	8.00	<5.0	<5.0
1,2,4-Trimethylbenzene	<5.0	5.11	<5.0	<5.0	<5.0	11.30	<5.0	148.00	<5.0	88.90	<5.0	<5.0
1,3,5-Trimethylbenzene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	23.30	<5.0	<5.0
Total Xylene	<5.0	6.10	<5.0	<5.0	<5.0	11.70	<5.0	183.00	<5.0	90.60	<5.0	<5.0
Dicyclopentadiene	<5.0	7.95	<5.0	<5.0	<5.0	<5.0	<5.0	40.70	<5.0	20.50	<5.0	<5.0



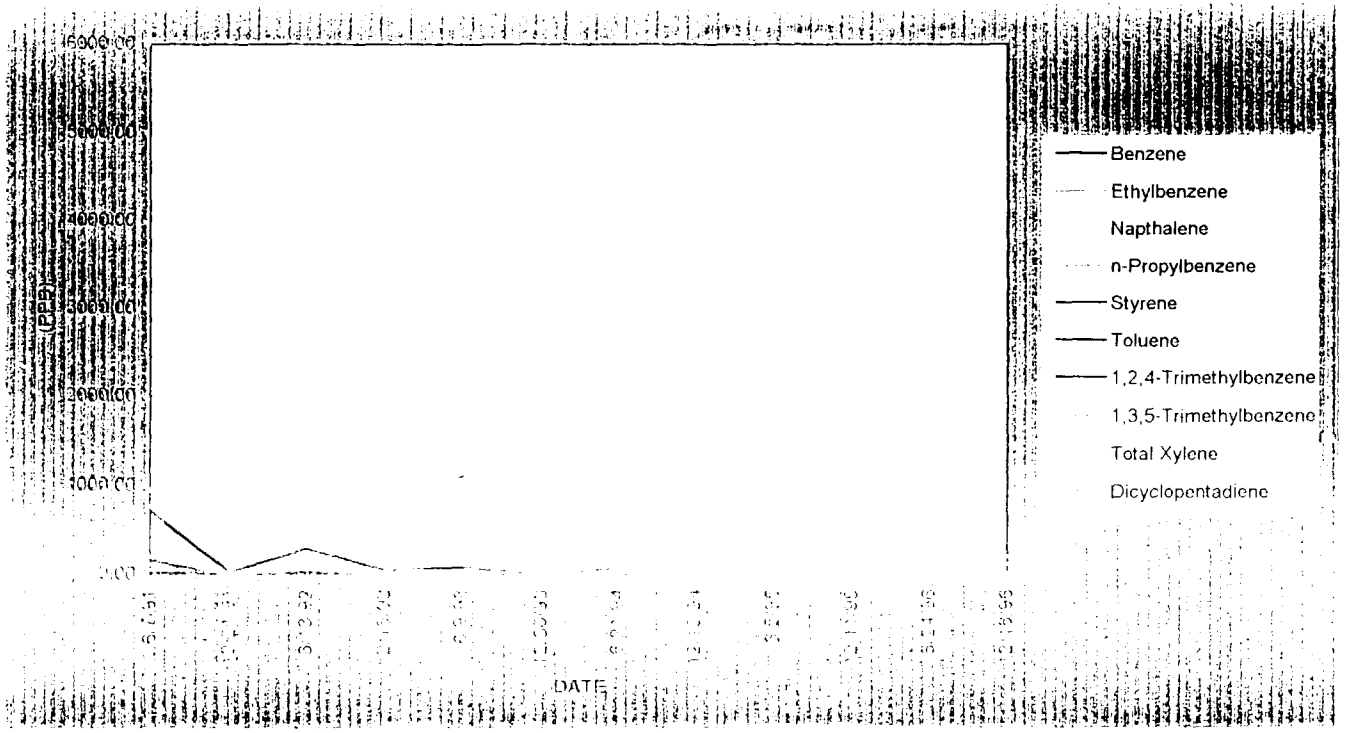
Moundville Semi-Annual Groundwater Monitoring Results for Groundwater Well #9

Contaminant	6/7/91	12/21/91	3/13/92	12/16/92	6/9/93	12/30/93	6/21/94	12/13/94	6/5/95	12/11/95	6/24/96	12/18/96
Benzene	43.70	<25	40.00	<12.5	8.80	<8.5	<8.5	<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	120.00	<25	106.00	18.50	17.40	25.30	9.10	13.10	27.80	10.10	10.10	<5.0
Napthalene	943.00	1550.00	1080.00	633.00	2760.00	390.00	1500.00	219.00	698.00	418.00	316.00	198.00
n-Propylbenzene	44.50	<25	39.60	<12.5	N.D.	16.20	<8.5	11.70	14.90	11.80	5.10	<5.0
Styrene	152.00	<25	51.90	<12.5	N.D.	<8.5	<8.5	<5.0	<5.0	<5.0	<5.0	<5.0
Toluene	31.90	<25	35.40	<12.5	N.D.	<8.5	<8.5	<5.0	<5.0	<5.0	<5.0	<5.0
1,2,4-Trimethylbenzene	715.00	30.80	289.00	49.30	82.00	<8.5	88.00	6.24	44.90	18.30	10.70	6.50
1,3,5-Trimethylbenzene	199.00	<25	55.30	<12.5	14.70	<8.55	14.20	<5.0	<5.0	<5.0	<5.0	<5.0
Total Xylene	761.00	128.00	367.00	121.00	108.00	28.80	88.60	11.40	32.60	14.90	9.60	6.60
Dicyclopentadiene	943.00	343.00	468.00	321.00	380.00	178.00	415.00	111.00	184.00	140.00	181.00	109.00



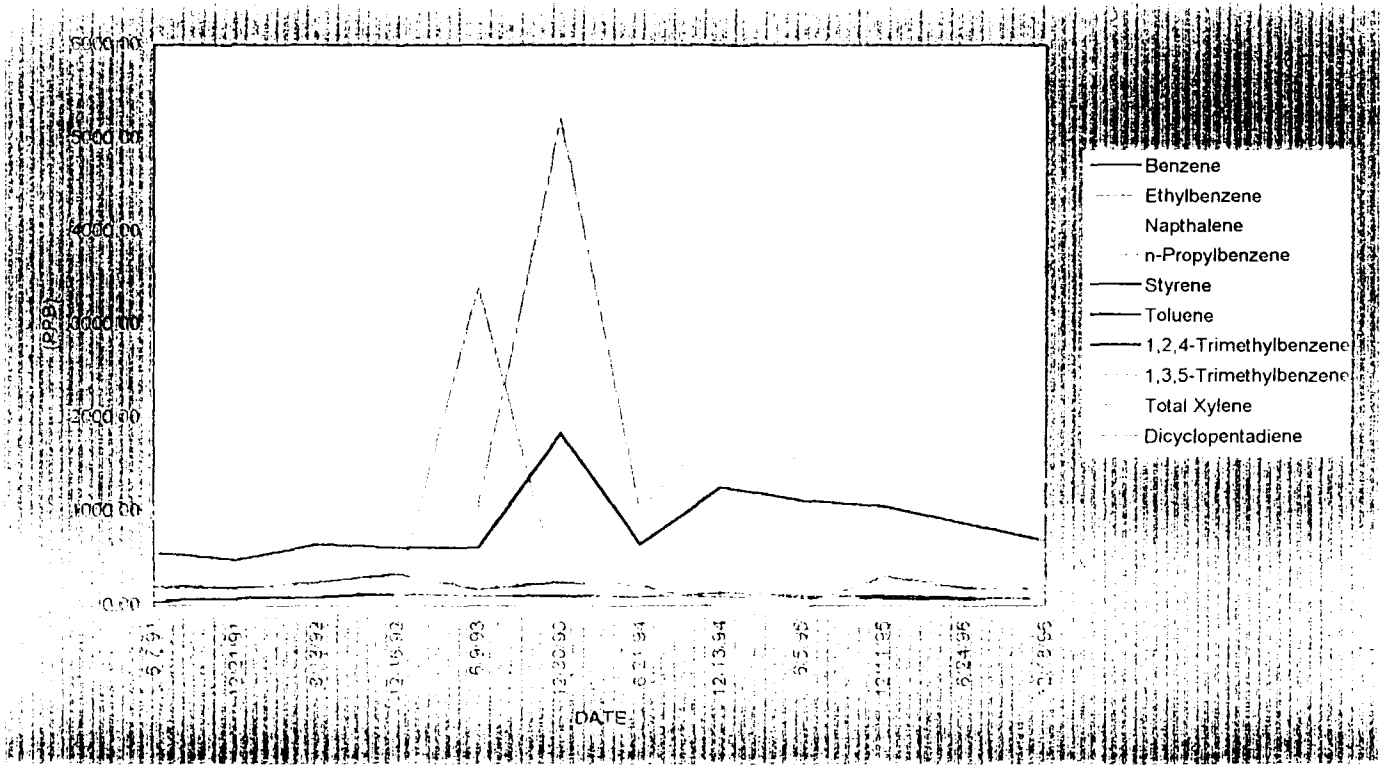
Moundville Semi-Annual Groundwater Monitoring Results for Groundwater Well #10

Contaminant	6/7/91	12/21/91	3/13/92	12/16/92	6/9/93	12/30/93	6/21/94	12/13/94	6/5/95	12/11/95	6/24/96	12/18/96
Benzene	43.70	<25	40.00	<12.5	8.80	<8.5	<8.5	<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	120.00	<25	106.00	18.50	17.40	25.30	9.10	13.10	27.80	10.10	10.10	<5.0
Napthalene	943.00	1550.00	1080.00	633.00	2760.00	390.00	1500.00	219.00	698.00	418.00	316.00	198.00
n-Propylbenzene	44.50	<25	39.60	<12.5	N.D.	16.20	<8.5	11.70	14.90	11.80	5.10	<5.0
Styrene	152.00	<25	51.90	<12.5	N.D.	<8.5	<8.5	<5.0	<5.0	<5.0	<5.0	<5.0
Toluene	31.90	<25	35.40	<12.5	N.D.	<8.5	<8.5	<5.0	<5.0	<5.0	<5.0	<5.0
1,2,4-Trimethylbenzene	715.00	30.80	289.00	49.30	82.00	<8.5	88.00	6.24	44.90	18.30	10.70	6.50
1,3,5-Trimethylbenzene	199.00	<25	55.30	<12.5	14.70	<8.55	14.20	<5.0	<5.0	<5.0	<5.0	<5.0
Total Xylene	761.00	128.00	367.00	121.00	108.00	28.80	88.60	11.40	32.60	14.90	9.60	6.60
Dicyclopentadiene	943.00	343.00	468.00	321.00	380.00	178.00	415.00	111.00	184.00	140.00	181.00	109.00



Moundville Semi-Annual Groundwater Monitoring Results for Groundwater Well #12

Contaminant	6/7/91	12/21/91	3/13/92	12/16/92	6/9/93	12/30/93	6/21/94	12/13/94	6/5/95	12/11/95	6/24/96	12/18/96
Benzene	43.60	96.90	91.10	133.00	105.00	116.00	93.00	102.00	90.50	80.60	70.70	80.00
Ethylbenzene	164.00	194.00	238.00	272.00	163.00	395.00	190.00	403.00	132.00	334.00	239.00	233.00
Napthalene	1040.00	937.00	723.00	732.00	1360.00	1080.00	1200.00	1630.00	1650.00	1870.00	1320.00	1330.00
n-Propylbenzene	74.10	82.80	127.00	129.00	3407.00	129.00	40.10	164.00	41.70	131.00	93.20	77.10
Styrene	206.00	194.00	248.00	339.00	172.00	255.00	211.00	<10	<10	299.00	193.00	179.00
Toluene	69.10	78.40	100.00	127.00	104.00	111.00	97.40	138.00	110.00	105.00	84.40	79.70
1,2,4-Trimethylbenzene	567.00	482.00	650.00	614.00	610.00	1850.00	653.00	1260.00	1120.00	1060.00	872.00	690.00
1,3,5-Trimethylbenzene	236.00	208.00	237.00	290.00	238.00	275.00	188.00	<10	<10	270.00	211.00	157.00
Total Xylene	932.00	1110.00	1220.00	1310.00	1030.00	5230.00	1030.00	1950.00	1540.00	1420.00	1230.00	983.00
Dicyclopentadiene	75.20	113.00	115.00	186.00	132.00	181.00	147.00	198.00	148.00	138.00	143.00	89.20



GROUNDWATER ASSESSMENT

ON PROPERTY OWNED BY WESSELHOEFT, INC.

NEAR MOUNDVILLE, ALABAMA

June 7, 1997

PREPARED BY

ENVIRONMENTAL TESTING & ENGINEERING
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GROUNDWATER ASSESSMENT
ON PROPERTY OWNED BY WESSELHOEFT, INC.
NEAR MOUNDVILLE, ALABAMA

June 7, 1997

INTRODUCTION

A groundwater assessment has been requested at the Wesselhoeft, Inc. property in Moundville, Alabama due to indications of groundwater contamination in monitoring wells on adjacent property. It has been theorized that the source of the contamination in the wells is the inactive sediment basin used by the former asphalt plant operations on the Wesselhoeft property. Based upon topographical features the wells were assumed to be downgradient of the sediment basin in which water is still impounded. There are no other obvious contaminant sources on the property. The property is located in a highly industrialized area. There are no known water wells in the area and the nearest public water source is located greater than one mile away.

In late 1995 the Alabama Department of Environmental Management (ADEM), through its Special Projects Division, performed some field and analytical work in an effort to determine the source of the problem. Borings were performed in order to obtain water samples from the aquifer for analysis. These borings were then used to install monitoring wells which were used to prepare this report. These wells, along with other data were used to characterize the subsurface conditions and to establish a groundwater gradient beneath the site and the area. In a letter dated April 1, 1997, ADEM requested the submittal of an assessment report.

This report will summarize data which has indicated the contamination problem and will document investigative activities performed in an effort to locate the source of the problem and to determine its extent.

SITE DESCRIPTION

The property is situated on a high plateau adjacent to the Black Warrior River Near Moundville, Alabama. The property is located in Tuscaloosa County near the Hale County line. Lawter Chemical Company is located immediately to the west of the property. A Southern Railway railroad adjoins the site to the south and the site slopes off to lowlands along the north and east of the property. Carthage Branch, a small flowing stream, runs to the south of the site and enters the Black Warrior River on the Lawter property to the west of the Wesselhoeft site. The north half of the property is wooded and slopes gently down to the river, though there is a steep bluff on the northwest corner where the river has cut into the plateau. The south half of the site is cleared and is an industrial setting. Surface soils are dark silty sandy loams.

The property was the site of the former operations of the Cracker Asphalt Company which produced and stored asphalt from petroleum crude oil and refinery by-products. The site included petroleum distillation equipment and asphalt oxidation equipment. A large

cooling water holding pond was located in the center of the site and has now been closed and the site has been graded. There are numerous steel tanks of various sizes across the site, the largest of these tanks being in excess of one million gallons in capacity. While most of the tanks have been cleaned and are free of product, some of the tanks still contain solidified asphalt. One of the tanks has been leased out for storage of petroleum-related products within the past several years. A visual inspection of the area revealed no indications of releases other than hardened asphalt from the past operations. Current site operations consist of steel fabrication operations, however, the contamination problem was noted prior to the start of the current fabrication operations and the company uses few, if any products with contamination potential.

FIELD OPERATIONS

Based upon shallow soil borings performed in the past along with public information from an assessment on the adjacent property, it was theorized that there was probably an aquifer located between 30 and 40 feet deep beneath the plateau on the Wesselhoeft site. The earlier borings had located a shallow aquifer which was probably perched upon some low permeability clays in the center of the site but this perched aquifer was not found in other borings away from the center of the site so it was assumed to be localized.

In October, 1997, ADEM's Special Projects Division, in an effort to reach the deeper aquifer in order to collect some water samples, performed 4" diameter soil borings with a small trailer-mounted drill rig. Environmental Testing & Engineering provided logging services (see attached well logs) and installed 2" PVC well pipe, 2" PVC slotted pipe, and 4" PVC surface casing around the wells. An attached drawing details the well installation procedures. The wells were purged and sampled and a summary of the analytical results are included.

The wells, along with groundwater "seeps" and on-site surface water sources were then surveyed to establish their horizontal and vertical locations. The ground surface at each well and the tops of the well pipes were located relative to an onsite bench mark and were then related to the existing wells on the adjacent Lawter property. The wells were plotted on a site base map which had been prepared using field measurements and aerial photographic information.

OBSERVATIONS AND CONCLUSIONS

Based upon the stabilized water depths in the wells a potentiometric map of the water table surface was prepared. As shown on the attached map, the groundwater gradient slopes away from the Wesselhoeft site to the north and to the west. The aquifer can be seen to outcrop in several locations to the west and the north. Springs have been noted in the valley of Carthage Branch on the Lawter property to the west. Springs and seeps have also been noted on the steep bluffs at the northwest corner of the Wesselhoeft property and along the downslope to the north of the site near the river. These outcrops were included in the groundwater gradient calculations.

cracker Asphalt

Several of the wells in a general line were used to construct a cross section across the site. The well elevations and horizontal locations were plotted and the boring log information was used to plot a general subsurface characterization. As can be seen from the attached cross section plot, beneath portions of the site the loamy surface soils are underlain by a silty clay of low permeability. This explains the high perched water table in CAMW#4. This well was not deep enough to reach the saturated sands of the subsurface aquifer. Wells CAMW#1, CAMW#2, and CAMW#5 reached the saturated sands of the aquifer. CAMW#3 encountered the clays but was not quite deep enough to penetrate the saturated sands and remained dry. CAMW#6 at the north of the site was drilled into the tight red/gray clays beneath the sandy aquifer and was found to be dry. When the outcrop of the aquifer was found, well CAMW#7 was drilled back up the hill and the saturated sands were again found above the confining clays.

As can be seen in the attached analytical data summary, wells MW#10 and MW#11 on the Lawter property have been found to contain some of the light petroleum fractions which originally indicated the presence of the contamination. Wells CAMW#1 and CAMW#2 also contain some of these contaminants but wells CAMW#4, CAMW#5, and CAMW#7 were found to be clean. Obviously the water from CAMW#4 which was also clean is from a different aquifer. When compared to the MCL (maximum contaminant level) column on the table, the only wells with any exceedances were CAMW#1 and CAMW#2. Parameters exceeded were benzene (CAMW#1 and #2), toluene (CAMW#1), and 1,2,4-trimethylbenzene (CAMW#1), though naphthalene and ethylbenzene were also found in concentrations which were high enough to indicate the presence of contamination. These same parameters were also found in the MW#11 and MW#12 wells on the Lawter property.

Though previous analyses have shown the water in the sediment pond to be free of the light petroleum fractions, it is likely that the contaminants can be found in high concentrations in the sediments beneath the water. Surface water from the site passes through the pond and probably keeps the pond flushed out. The impounded water may, however, be flowing downward through the sediments, acting to carry the contaminants from the sediment through the silty soils and into the aquifer. It is likely that the sediment basin is also the source of the contaminants in CAMW#2, even though the well is located upgradient from the basin. The contaminant plume from the basin could move horizontally in any direction along strata of low permeability to reach the upgradient well.

Though it may cover an area of several hundred acres, there are probably some very definite boundaries of the affected aquifer. No deep wells were drilled in an effort to sample a deeper aquifer but the tight dry red/gray clay encountered in well CAMW#6 and seen on the bluff near the river appears to be a confining strata. None of the other wells were deep enough to encounter the clay and there is no data about its consistency but it is probably a good assumption that this same clay strata is confining the water in the saturated sands beneath the entire area.

Also it is quite unlikely that water from the aquifer would cross

Carthage Branch to the south or west or pass the marshy area .to the east. Obviously the aquifer does not extend as far as the river to the north, as it is seen to outcrop before reaching that far. It is very likely indeed that the aquifer is confined strictly to the plateau upon which the site is situated. Being so close to the river outcrop, it is most likely that, as is shown by the hydraulic gradient map, the contaminants will flow in that direction.

Considering the limited nature of the aquifer, the fact that there is no use of the aquifer as a potable water supply, and the fact that it is in what has been established as an industrial area and there are numerous other sources of contamination other than this particular site, the aquifer should be considered a "low risk" aquifer in a risk-based assessment. This is not to say that the problem should be ignored or that no remedial activities should be done, but that the problem is not of particularly high priority and that recommended remediation efforts should take into consideration the financial abilities of the property owner.

RECOMMENDATIONS FOR FURTHER ACTIONS

In order to further define the horizontal extents of the contamination it is recommended that three new wells be installed in the area of the sedimentation basin. Another round of water sampling is also recommended in order to establish current contaminant levels and assure that the contaminant level is stable or on the decline.

The obvious course of action to begin remediation of the site is the removal of the most likely source of contamination - the contaminated sediment from the sediment basin. Though no detailed estimates have been made as to the quantity of contaminated material in the basin, a rough estimate would be in the range of 1,500 to 3,000 cubic yards. Without the use of some form of on-site treatment and/or stabilization the disposal of such quantities would be quite expensive. If, within the bounds of the RCRA regulations the material could be removed, aerated, and treated by bioremediation/bioaugmentation technologies, this phase of remediation could possibly be economically feasible.

There appears to be a considerable amount of flow in the aquifer and in the absence of a continued source of contamination, natural attenuation would probably eventually remove the contaminants from the aquifer. The initial recommendation for aquifer cleanup is to maintain monitoring to insure that the contaminant level is being reduced by natural attenuation.

Pump and treat and/or vapor extraction technologies may be recommended at some point in the event that the contaminant level does not continue to drop due to natural attenuation. Injection and recovery of biostimulation fluids may also be future possible remediation measures before clean closure is accomplished.

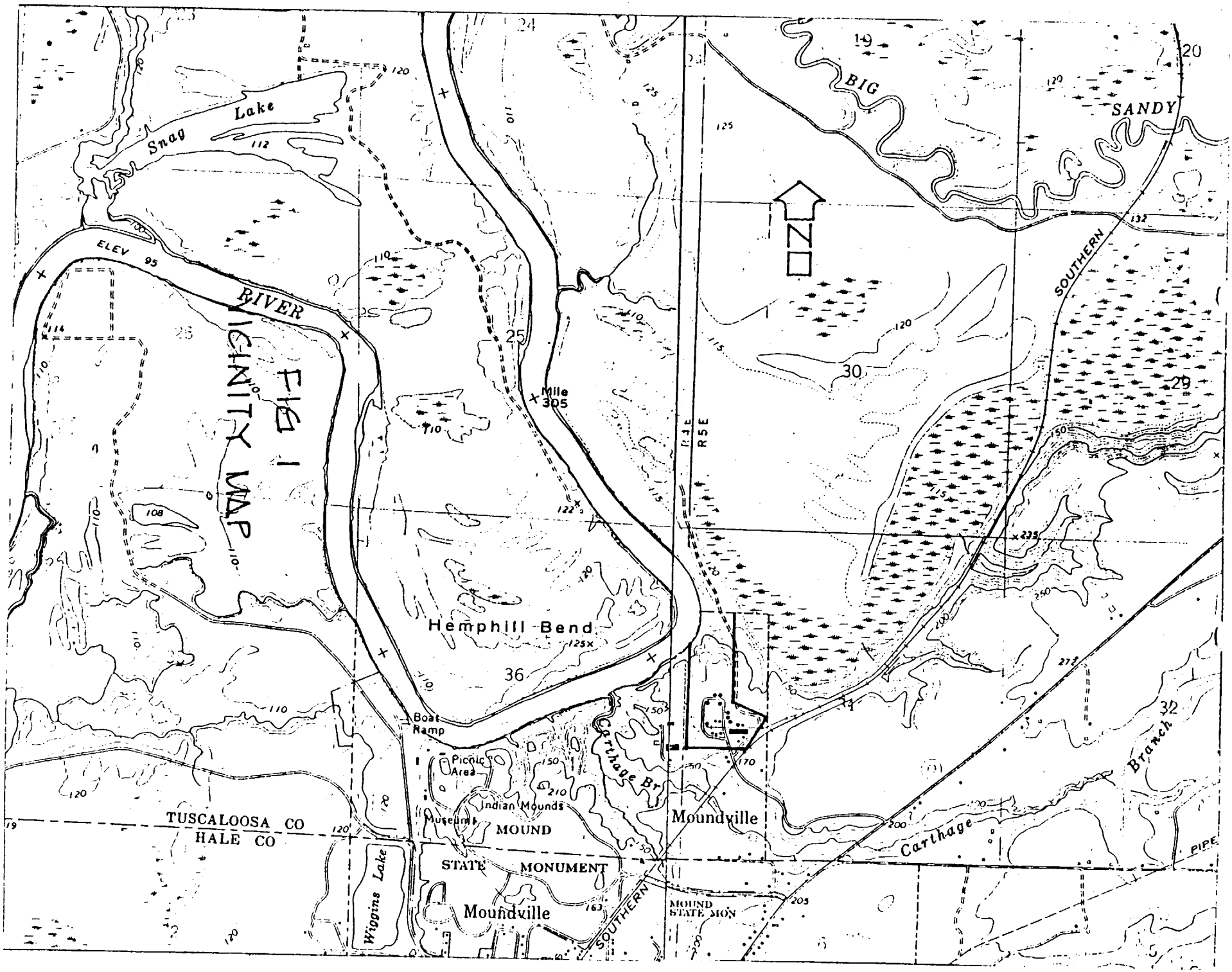
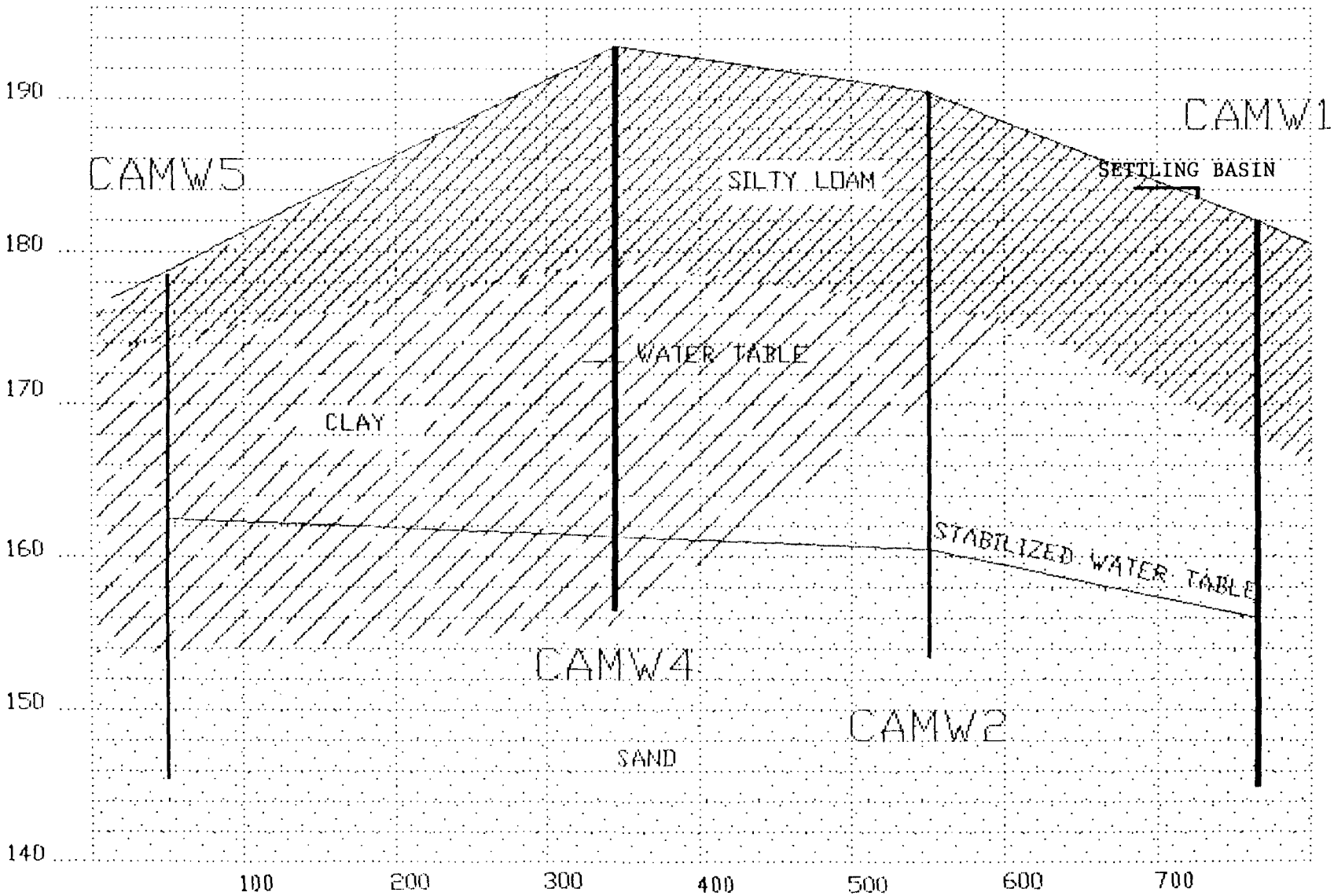
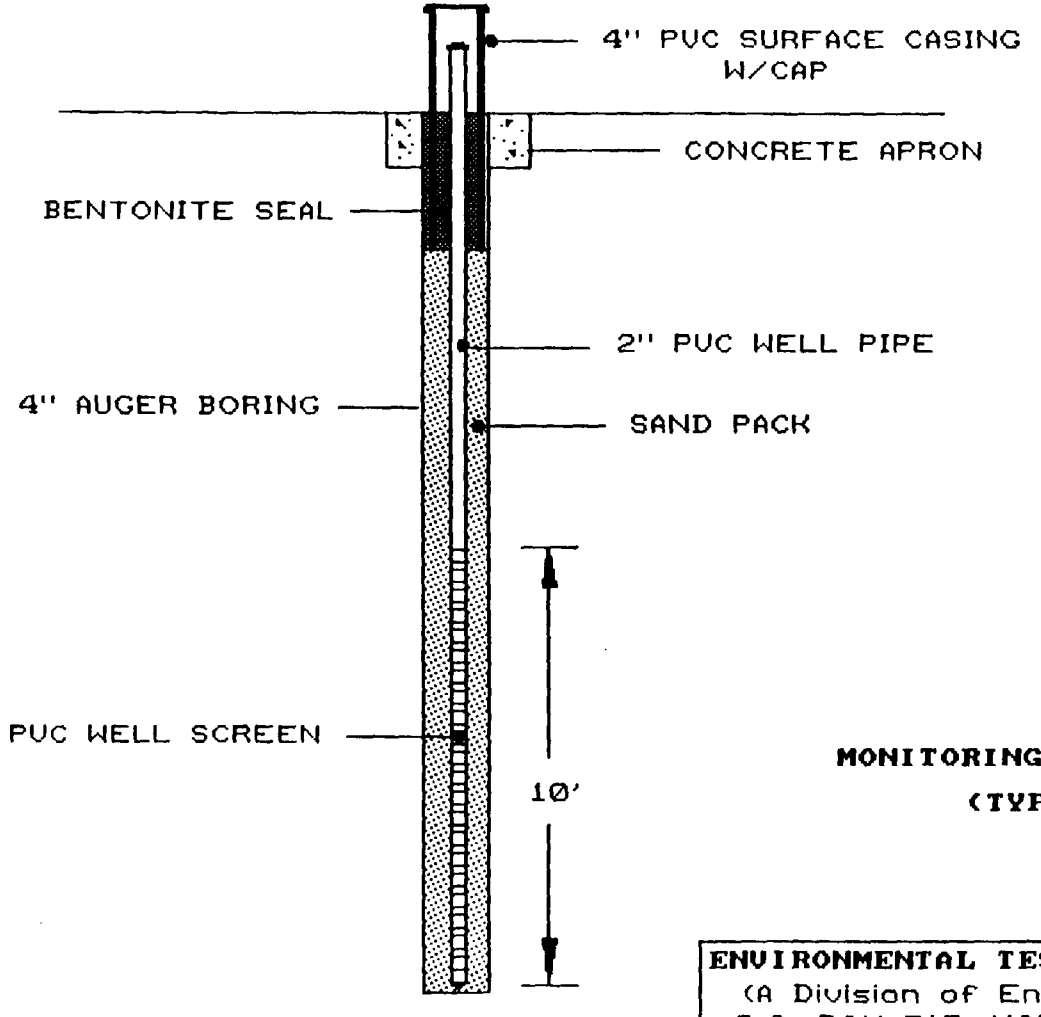


FIG 1
VICINITY MAP
Snag Lake
ELEV 95
RIVER
BIG
SANDY
SOUTHERN
Mile 305
Hemphill Bend
Boat Ramp
Picnic Area
Indian Mounds
Museum
MOUND
STATE MONUMENT
Moundville
Carthage Br
Carthage
Branch
TUSCALOOSA CO
HALE CO
Wiggins Lake
MOUND STATE MON
R4E
R5E
N



GENERAL SUBSURFACE CROSS-SECTION

SECTION A-A



MONITORING WELL DESIGN
(TYPICAL)

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(205) 339-0216

ANALYTICAL RESULTS
OF MONITORING WELL SAMPLES

FACILITY: Wesselhoeft, Inc.
PROJECT: Groundwater Assessment

PARAMETER	MCL (ppb)	10/95 SAMPLES CAMW1	CAMW2	CAMW3	CAMW4	CAMW5	CAMW6	CAMW7	AVERAGE VALUES MW#9	MW#10	MW#11
Benzene	5	139.9	9.8	DRY	BDL	BDL	DRY	BDL	BDL	31.9	223.3
Ethylbenzene	700	121.0	37.5	DRY	BDL	BDL	DRY	BDL	BDL	54.6	676.3
Naphthalene		1,134	662.7	DRY	BDL	1.7	DRY	0.9	17.3	1,209.3	3,080.0
N-Propylbenzene		BDL	53.2	DRY	0.8	BDL	DRY	BDL	BDL	34.3	344.6
Styrene	100			DRY			DRY		BDL	103.3	441.1
Toluene	1000	1,320	7.5	DRY	BDL	BDL	DRY	BDL	BDL	37.8	131.2
1,2,4-Trimethylbenzene	70	111.1	50.6	DRY	1.6	BDL	DRY	BDL	9.3	200.6	3,983.8
1,3,5-Trimethylbenzene		BDL	BDL	DRY	BDL	BDL	DRY	BDL	BDL	70.0	1,099.8
Xylene	10000	57.6	108.8	DRY	BDL	BDL	DRY	BDL	6.8	258.1	3,562.5
Dicyclopentadiene									5	418.8	541.8

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BORING LOG

CLIENT: Wesselhoeft, Inc.
PROJECT: Groundwater Assessment
HOLE #: CAMW #1 DATE: 10/23/97
BORING EQUIPMENT:
SURFACE ELEV.: 184.76' STABILIZED WATER TABLE: 25.92'
CREW SUPERVISOR: J. Stamps (ADEM), E. Wiggins (ETE)

(ft)		SOIL DESCRIPTION	STD. PEN. (BLOWS/FT) 0 10 20 30
		Gray/Brown Sandy Silt	
2			
4			
6			
8			
10			
12			
		Yellow/White Sand	
14			
16			
18			
20			
		Sand w/gravel	
22			
24		Sand	
26	====	Stabilized Water Table	
28			
30			
32			
34			
		Wet	
36			
	---	Boring Terminated	
38			
40			

E[illegible]IRONMENTAL TESTING & ENGI[illegible]ERING
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BORING LOG

CLIENT: Wesselhoeft, Inc.
PROJECT: Groundwater Assessment
HOLE #: CAMW #2 DATE: 10/23/97
BORING EQUIPMENT:
SURFACE ELEV.: 190.44' STABILIZED WATER TABLE: 29.96'
CREW SUPERVISOR: J. Stamps (ADEM), E. Wiggins (ETE)

(ft)		SOIL DESCRIPTION	STD. PEN. (BLOWS/FT) 0 10 20 30
		Brown Silty Sand (Fill?)	
2			
4			
6			
8			
10		Light Brown Sand/Silt/Clay Loam	
12			
14		Light Brown Silty Clay (High Clay %)	
16			
18			
		Brown Clay w/sand	
20			
		Brown Clay	
22			
		Light Brown Sandy Clay	
24			
26			
		Clean White Sand	
28			
30	===	Stabilized Water Table	
32			
34		Wet	
36			
	---	Boring Terminated	
38			
40			

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BORING LOG

CLIENT: Wesselhoeft, Inc.
PROJECT: Groundwater Assessment
HOLE #: CAMW #3 DATE: 10/23/97
BORING EQUIPMENT:
SURFACE ELEV.: 199' STABILIZED WATER TABLE: Dry
CREW SUPERVISOR: J. Stamps (ADEM), E. Wiggins (ETE)

(ft)		SOIL DESCRIPTION	ESTIMATED STD. PEN. (BLOWS/FT) 0 10 20 30
		Brown/Yellow Sandy Loam	
2			
4			
6			
8			
10		Brown/Yellow Sandy Silty Clay	
12			
		Tight Brown/Yellow Silty Clay	
14			
16			
18			
20			
22			
24			
26			
		Dark Brown Sand	
28		Yellowish/Brown Sand	
30			
32			
34			
36			
		Boring Terminated	
38			
40			

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BORING LOG

CLIENT: Wesselhoeft, Inc.
PROJECT: Groundwater Assessment
HOLE #: CAMW #4 DATE: 10/23/97
BORING EQUIPMENT:
SURFACE ELEV.: 193.81' STABILIZED WATER TABLE: 19.42 '
CREW SUPERVISOR: J. Stamps (ADEM), E. Wiggins (ETE)

(ft)		SOIL DESCRIPTION	STD. PEN. (BLOWS/FT) 0 10 20 30
		Yellow Sandy Silty Clay Loam	
2			
4			
6			
8			
10			
12			
14		Wet Sandy Silty Clay	
16			
18			
	===	Stabilized Water Table	
20			
22			
24			
26			
28			
30			
32			
34			
36			
	---	Boring Terminated	
38			
40			

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BORING LOG

CLIENT: Wesselhoeft, Inc.
PROJECT: Groundwater Assessment
HOLE #: CAMW #5 DATE: 10/23/97
BORING EQUIPMENT:
SURFACE ELEV.: 178.67' STABILIZED WATER TABLE: 15.75'
CREW SUPERVISOR: J. Stamps (ADEM), E. Wiggins (ETE)

(ft)		SOIL DESCRIPTION	STD. PEN. (BLOWS/FT) 0 10 20 30
		Brown Sandy Silty Clay Loam	
2			
4		Tight Gray/Brown Silty Clay	
6			
		Tight Gray Silty Clay	
8			
10			
12			
14			
16	===	Stabilized Water Table	
18			
20			
22			
24		Gray/Brown Sand	
26			
		Moist	
28			
30			
32			
	---	Boring Terminated	
34			
36			
38			
40			

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BORING LOG

CLIENT: Wesselhoeft, Inc.
PROJECT: Groundwater Assessment
HOLE #: CAMW #6 DATE: 10/23/97
BORING EQUIPMENT:
SURFACE ELEV.: 142' STABILIZED WATER TABLE: Dry
CREW SUPERVISOR: J. Stamps (ADEM), E. Wiggins (ETE)

(ft)		SOIL DESCRIPTION	STD. PEN. (BLOWS/FT) 0 10 20 30
		Silty Topsoil w/Gravel	
2		Gray Silty Clay w/Gravel	
		Tight Dry Red/Gray Clay	
4			
6			
8			
10			
12	---	Boring Terminated (Dry)	
14			
16			
18			
20			
22			
24			
26			
28			
30			
32			
34			
36			
38			
40			

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BORING LOG

CLIENT: Wesselhoeft, Inc.
PROJECT: Groundwater Assessment
HOLE #: CAMW #7 DATE: 10/23/97
BORING EQUIPMENT:
SURFACE ELEV.: 162' STABILIZED WATER TABLE: 4.08'
CREW SUPERVISOR: J. Stamps (ADEM), E. Wiggins (ETE)

(ft)		SOIL DESCRIPTION	STD. PEN. (BLOWS/FT) 0 10 20 30
		Sandy/Silty Topsoil	
2		Yellow Sandy Loam	
4	===|	Stabilized Water Table	
6			
		Sand/Gravel	
8			
		Wet Yellow Sand	
10		Tight Red Clay	
12			
14			
16	---|	Boring Terminated	
18			
20			
22			
24			
26			
28			
30			
32			
34			
36			
38			
40			

Tuscaloosa Co. 's old site

ENVIRONMENTAL TESTING & ENGINEERING
(A Division of Engineering Plus, Inc.)
P.O. Box 715
Highway 69 North
Northport, Alabama 35476
(205)339-0216

March 31, 1995

Ms. Kathleen Keller
Alabama Department of Environmental Management
1751 Dickinson Dr.
Montgomery, AL 36109

Dear Ms. Keller:

Re: Wesselhoeft, Inc. Groundwater Assessment
Moundville, Alabama
Grounwater Incident No. GW94-5-6

Enclosed is a report on the first quarterly stage of the groundwater assessment at the above-referenced site. We are now proceeding with the next stage of the investigation and will file the report for the second quarter of 1995 as soon as the work is completed.

Please feel free to contact me should you have comments or require further information. Thank you for your cooperation.

Sincerely,

Environmental Testing & Engineering
(A Division of Engineering Plus, Inc.)

John K. Haddock

John K. Haddock, P.E.
Alabama Reg. No. 12998
President

cc: Mr. Conrad Wesselhoeft, Wesselhoeft, Inc.

GROUNDWATER ASSESSMENT AT THE SITE OF WESSELHOEFT, INC. IN MOUNDVILLE, ALABAMA

MARCH 31, 1995

INTRODUCTION

A groundwater assessment has been requested at the Wesselhoeft, Inc. property in Moundville, Alabama due to indications of groundwater contamination in monitoring wells on adjacent property. Mr. Conrad Wesselhoeft of Wesselhoeft, Inc. has requested and received permission to perform the assessment in stages in order to control the costs of the investigative work. This report summarizes the work completed in the first stage of the assessment project at the site.

It has been theorized that the source of the contamination in the downgradient wells is the sediment basin used by the former asphalt operations on the property. This theory is based upon the following:

1. The contaminants were found in wells which are assumed to be downgradient from the sediment basin.
2. The basin has a silty clay liner which is probably allowing the contained water to percolate out.
3. There are petroleum odors in the area of the basin.
4. In previous site investigations petroleum-based contaminants were found to be present in the sediments contained in the basin.
5. There are no other known sources on the site.

FIELD WORK PERFORMED DURING THIS INVESTIGATIVE STAGE

In an effort to locate and delineate shallow groundwater or perched water tables immediately below the surface of the site, borings were done in two locations. In one of the borings, saturated soils were immediately encountered. The boring, located in about the middle of the site and well away to the east (presumably upgradient) from the settling basin was continued down to a depth of 12 feet, purged, and sampled. The attached analytical report on the sample shows that the sample is free of the contaminants found down gradient from the basin. The other boring, located to the north of the sediment basin was continued to a depth of 20 feet and was found to be dry, with no obvious petroleum contamination at any depth.

PROPOSED WORK, FUTURE INVESTIGATIVE STAGES

Continuing the assessment of the surface aquifer prior to proceeding to the second water-bearing strata, it is proposed that two more shallow borings be performed nearer to the basin. One of the borings will be done in the (presumed) upgradient direction while the other will be done in the downgradient direction. In the event that either or both of the borings (wells) are found to be contaminated, additional borings would be done further away from the basin in an effort to determine the horizontal extent of the contamination. If the groundwater were found to be clean, borings would be done closer in. All borings/wells, including those done in the present stage of the investigation will be located vertically (to an accuracy of 0.1 inch) and the borings correlated.

When the engineer and the regulatory agency is confident that the contaminant plume in the upper strata has been located, deeper wells will be installed to begin to locate the contaminants in the lower strata.

CONCLUSIONS

At the completion of the first investigative stage there are strong indications that the majority of the site is clean and that the contaminant source is indeed the sediment basin. There is the possibility that the groundwater encountered in Boring #1 is isolated from the lower strata by a layer of low permeability soil.

WELL/BORING DESIGN AND CONSTRUCTION TECHNIQUES

An attached drawing shows details of the three types of wells or borings proposed for the investigative work. The present stage is being done in the upper aquifer or saturated surface soils. In this stage the borings are being done with a small trailer-mounted auger rig with 4" diameter auger stems. The boring is completed to the desired depth and if there is no obvious contamination and if the walls of the boring appear to be stable (will not cave in or slough off), or if no water is encountered, the well will remain undeveloped until the samples may be analyzed. If the samples do indicate contamination the well will be developed as shown in the drawing labeled "Shallow Well". The undeveloped borings will be temporarily cased with a short piece of 6" PVC and capped to allow temporary observation.

Upon completion of the project or in the event that the boring is found to be unnecessary, the borings will be closed by filling them with a low permeability natural soil or clay.

PURGED WATER, DECONTAMINATION RINSATE, AND CONTAMINATED SOIL MANAGEMENT AND DISPOSITION PROCEDURES

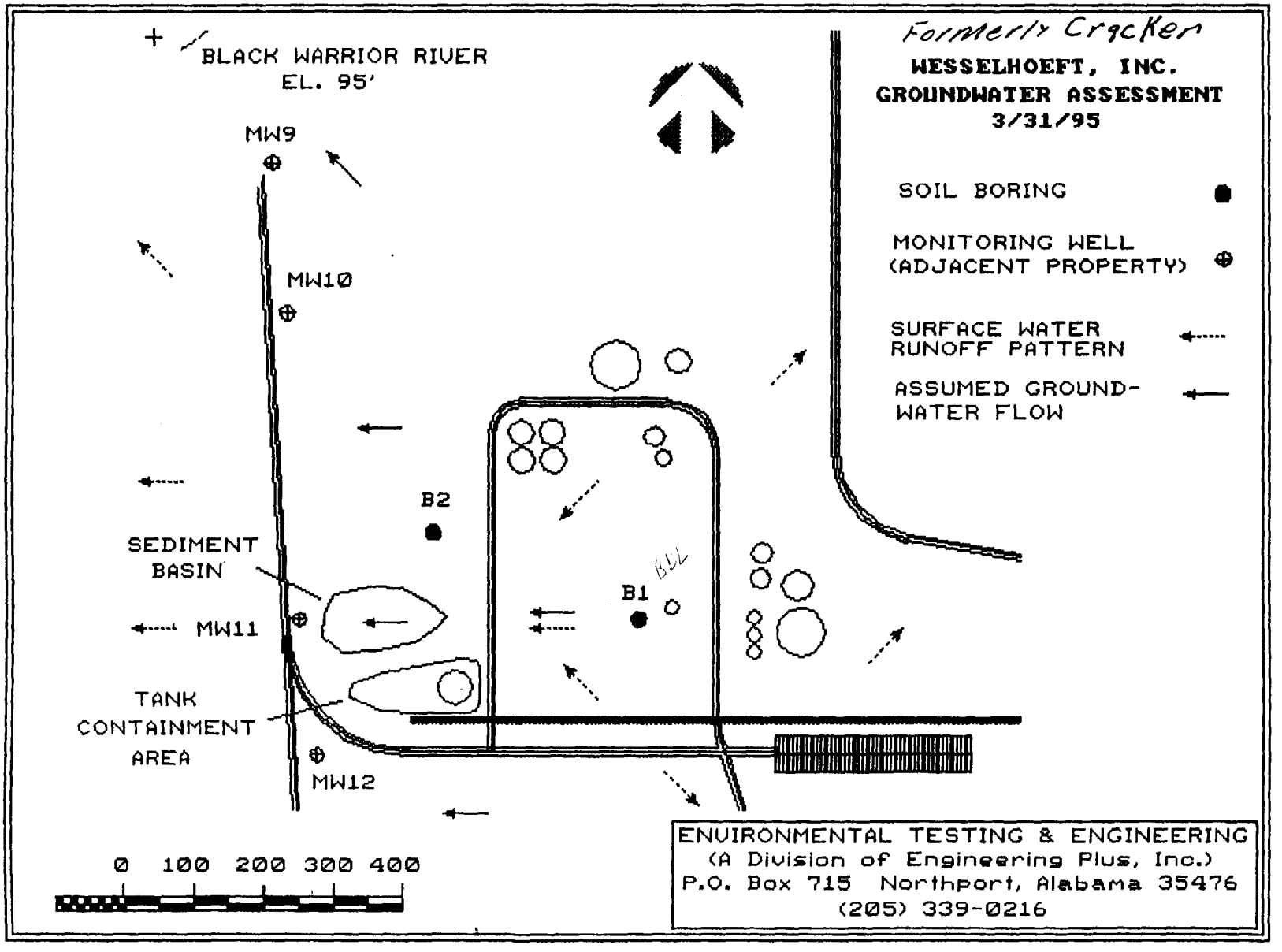
Since the water and soil in the abandoned sediment basin is known to be contaminated and since remediation will probably be required at some time, the purged water, the decontamination rinsates, and any mildly contaminated soils encountered will be placed in the sediment pond area. More heavily contaminated fluids and solids will be remediated on site by activated carbon filtration, by aeration treatment, or by bioremediation. The treated water will be released into the basin and the remediated soils will be spread on the ground in the basin area. The site has a stormwater permit (under the name of B&W Heads which is operating on the property) which would be used to monitor the discharge from the site and would pick up any contaminants released under the investigative work.

SAMPLE PROCEDURES

Borings will be performed as shown in the attached drawings. Soil samples will be collected at various depths and analyzed for total petroleum hydrocarbons (TPH) according to standard procedures. If groundwater is encountered the well will be purged and then sampled with a teflon bailer and analyzed for volatile organics, pH, conductivity, iron and manganese. Samples will be preserved and transported strictly according to standard procedures. A chain of custody record will be maintained for all samples.

ATTACHMENTS:

TYPICAL BORING/WELL CONSTRUCTION
SITE PLAN, BORING/WELL LOCATION
SOIL BORING LOGS
ANALYTICAL RESULTS


Formerly Cracker
WESSELHOEFT, INC.
GROUNDWATER ASSESSMENT
3/31/95
BLACK WARRIOR RIVER
EL. 95'
MW9
MW10
B2
B1
SEDIMENT BASIN
MW11
TANK CONTAINMENT AREA
MW12
SOIL BORING
MONITORING WELL (ADJACENT PROPERTY)
SURFACE WATER RUNOFF PATTERN
ASSUMED GROUND-WATER FLOW
0 100 200 300 400
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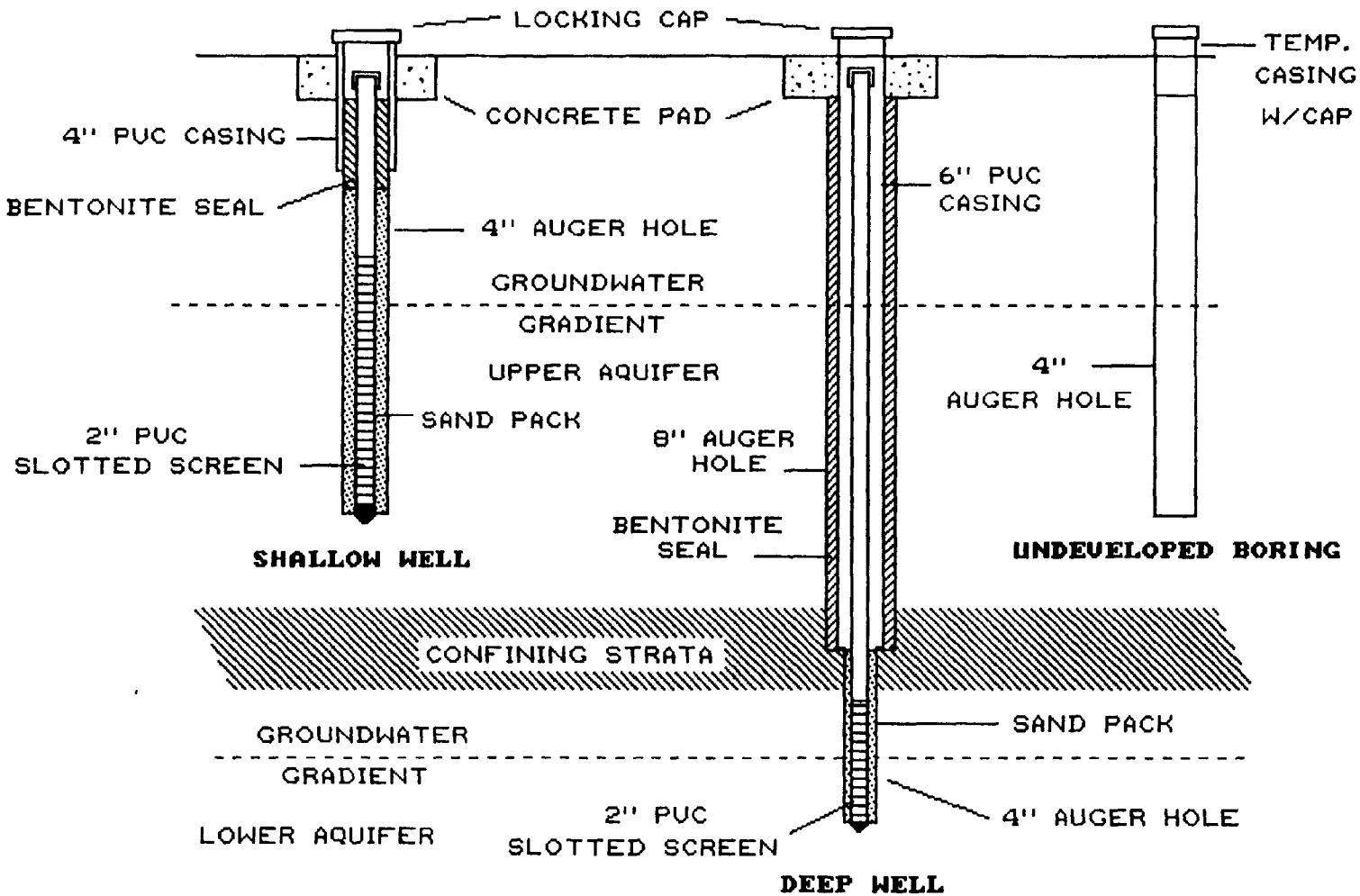

GROUNDWATER MONITORING WELL DETAILS

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W&TC

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(205) 339 - 0216

LABORATORY REPORT FORM

CLIENT: Wesselhoeft

SAMPLE DATE: 02/03/95

PROJECT: Groundwater Monitoring

SAMPLED BY: JKH

REMARKS: February 1995

REPORT DATE: 02/17/95

	ANALYTICAL PARAMETERS								
SAMPLE DESIGNATION	pH s.u.	Cond. mg/l	Chlorides mg/l	Hardness mg/l	Alkalinity mg/l	Fe, T mg/l	Mn, T mg/l	Fe, D mg/l	
Well #1	5.58	113	2.5	18	22	19.83	< 0.014	9.55	
ANALYTICAL METHOD	4500-H+B	205	407 B	314 B	403	315 A	303 A	315 A	
TECHNICIAN	EW	EW	ASD	EW	EW	ASD	ASD	ASD	
ANALYTICAL DATE	02/03/95	02/06/95	02/06/95	02/06/95	02/06/95	02/06/95	02/06/95	02/06/95	

TEST REFERENCE: Standard Methods for the Examination of Water and Wastewater, 16th Edition, 1985.
Standard Methods for the Examination of Water and Wastewater, 18th Edition, 1992.

Andrew S. Dolan
LABORATORY MANAGER

ENVIRONMENTAL TESTING & ENGINEERING
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P.O. Box 715
Northport, Alabama 35476
(205)339-0216

CLIENT : Wesselhoeft, Inc.
ET&E PROJECT NAME : Groundwater Assessment
SAMPLE DATE : 2/3/95
SAMPLE DESIGNATION: Groundwater #1
SAMPLED BY : Haddock

REPORT DATE : 2/17/95
TCE PROJECT : 040ABR-0295
DATE RECEIVED: 2/6/95
DATE ANALYZED: 2/9/95
SAMPLE MATRIX: Water
TCE LAB I.D. : 7855

METHOD 8260 COMPOUND	UG/L CONC	DETECTION LIMIT
Benzene	U	5.00
Bromobenzene	U	5.00
Bromochloromethane	U	5.00
Bromodichloromethane	U	5.00
Bromoform	U	5.00
Bromomethane	U	5.00
n-Butylbenzene	U	5.00
sec-Butylbenzene	U	5.00
tert-Butylbenzene	U	5.00
Carbon disulfide	U	5.00
Carbon tetrachloride	U	5.00
Chlorobenzene	U	5.00
Chloroethane	U	5.00
Chloroform	U	5.00
Chloromethane	U	5.00
2-Chlorotoluene	U	5.00
4-Chlorotoluene	U	5.00
1,2-Dibromo-3-chloropropane	U	5.00
Dibromochloromethane	U	5.00
1,2-Dibromoethane	U	5.00
Dibromomethane	U	5.00
1,2-Dichlorobenzene	U	5.00
1,3-Dichlorobenzene	U	5.00
1,4-Dichlorobenzene	U	5.00
Dichlorodifluoromethane	U	5.00
1,1-Dichloroethane	U	5.00
1,2-Dichloroethane	U	5.00
1,1-Dichloroethene	U	5.00
cis-1,2-Dichloroethene	U	5.00
trans-1,2-Dichloroethene	U	5.00
1,2-Dichloropropane	U	5.00
1,3-Dichloropropane	U	5.00
2,2-Dichloropropane	U	5.00
1,1-Dichloropropene	U	5.00

E. IRONMENTAL TESTING & ENGINEERING
(A Division of Engineering Plus, Inc.)
P.O. Box 715
Northport, Alabama 35476
(205)339-0216

CLIENT	: Wesselhoeft, Inc.	REPORT DATE	: 2/17/95
ET&E PROJECT NAME	: Groundwater Assessment	TCE PROJECT	: 040ABR-0295
SAMPLE DATE	: 2/3/95	DATE RECEIVED	: 2/6/95
SAMPLE DESIGNATION	: Groundwater #1	DATE ANALYZED	: 2/9/95
SAMPLED BY	: Haddock	SAMPLE MATRIX	: Water
		TCE LAB I.D.	: 7855

METHOD 8260 COMPOUND (continued)	UG/L CONC	DETECTION LIMIT
Ethylbenzene	U	5.00
Hexachlorobutadiene	U	5.00
Isopropylbenzene	U	5.00
p-Isopropyltoluene	U	5.00
Methyl ethyl ketone	U	5.00
Methylene Chloride	U	5.00
Naphthalene	U	5.00
n-Propylbenzene	U	5.00
Styrene	U	5.00
1,1,1,2-Tetrachloroethane	U	5.00
1,1,2,2-Tetrachloroethane	U	5.00
Tetrachloroethene	U	5.00
Toluene	U	5.00
1,2,3-Trichlorobenzene	U	5.00
1,2,4-Trichlorobenzene	U	5.00
1,1,1-Trichloroethane	U	5.00
1,1,2-Trichloroethane	U	5.00
Trichloroethene	U	5.00
Trichlorofluoromethane	U	5.00
1,2,3-Trichloropropane	U	5.00
1,2,4-Trimethylbenzene	U	5.00
1,3,5-Trimethylbenzene	U	5.00
Vinyl Chloride	U	5.00
Xylene (total)	U	5.00

U - NOT DETECTED AT SPECIFIED LEVEL.
Method Reference: SW-846, 1990.
Analyst: TPM

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LABORATORY REPORT FORM

CLIENT: Wesselhoeft, Inc.

SAMPLE DATE: SEE BELOW

PROJECT: Groundwater Assessment

SAMPLED BY: E. Wiggins

REMARKS: February 1995

REPORT DATE: 02/03/95

	ANALYTICAL PARAMETERS								
SAMPLE DESIGNATION	Sample Date	TPH mg/l	Analytical Date						
#1 @ 4' - 6'	02/02/95	8	02/03/95						
#2 @ 5'	02/02/95	2	02/03/95						
ANALYTICAL METHOD TECHNICIAN		5520 F ASD							

TEST REFERENCE: Standard Methods for the Examination of Water and Wastewater, 18th Edition, 1992.

Andrew S. Dolan
LABORATORY MANAGER

ENVIRONMENTAL TESTING & ENGINEERING
(A Division of Engineering Plus, Inc.)

BORING LOG

CLIENT: Wesselhoeft, Inc. DATE: 2/2/95
PROJECT: Groundwater Assessment
HOLE #: Boring #1
BORING EQUIPMENT: 4" Trailer-Mounted Auger Rig
SURFACE ELEV.: STABILIZED WATER TABLE: 25"
CREW SUPERVISOR: Wiggins

(ft)		SOIL DESCRIPTION	ESTIMATED STD. PEN. (BLOWS/FT) 0 10 20 30
		Moist Red Sandy Silty Clay	
1			
2	====	Stabilized Groundwater Table	
3			
4	----	Yellow Sandy Silty Clay - Moist, More Sand	
5			
	----	Wet Sandy Silty Clay, More Sand	
6			
7			
8			
9			
10			
11			
12	----	Boring Terminated	
13			
14			
15			
16			
17			
18			
19			
20			

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(A Division of Engineering Plus, Inc.)

BORING LOG

CLIENT: Wesselhoeft, Inc. DATE: 2/2/95
PROJECT: Groundwater Assessment
HOLE #: Boring #2
BORING EQUIPMENT: 4" Trailer-Mounted Auger Rig
SURFACE ELEV.: STABILIZED WATER TABLE: None
CREW SUPERVISOR: Wiggins

(ft)	SOIL DESCRIPTION	ESTIMATED STD. PEN. (BLOWS/FT) 0 10 20 30
	Red Sandy Silty Clay, Damp	
1		
2		
3		
4		
5		
6	Reddish-Brown Sandy silty Clay	
7		
8		
9		
10	Gray/Brown Sandy Silt	
11		
12		
13		
14		
15		
16		
17		
	Boring Terminated	
18		
19		
20		

APPENDICES

APPENDIX A

WELL # 2	MCL (ppb)	6/90	9/90	12/90	6/91	12/91	3/92	9/92	9/93	12/93	6/94	Average
Benzene	5.0	<5	<5	<5	<5	<12.5	<5	<5	<5	<5	<5	NA
Ethylbenzene	700.0	<5	<5	<5	<5	<12.5	<5	<5	<5	<5	<5	NA
Napthalene		<5	<5	<5	<5	<12.5	<5	<5	<5	<5	<5	NA
N-Propylbenzene		<5	<5	<5	<5	<12.5	<5	<5	<5	<5	<5	NA
Styrene	100.0	<5	<5	<5	<5	<12.5	<5	<5	7	<5	<5	7.10
Toluene	1000.0	<5	<5	<5	<5	<12.5	<5	<5	<5	<5	<5	NA
1,2,4-Trimethylbenzene	70.0	<5	<5	<5	<5	<12.5	<5	<5	<5	<5	<5	NA
1,3,5-Trimethylbenzene		<5	<5	<5	<5	<12.5	<5	<5	<5	<5	<5	NA
Total Xylene	10000.0	<5	<5	<5	<5	<12.5	<5	<5	<5	<5	<5	NA
Dicyclopentadiene		<5	<5	<5	<5	<12.5	<5	<5	<5	<5	<5	NA

WELL # 4	MCL (ppb)	6/90	9/90	12/90	6/91	12/91	3/92	9/92	9/93	12/93	6/94	Average
Benzene	5.0	<5	<5	<5	<5	<12.5	<5	<5	<5	<5	<5	NA
Ethylbenzene	700.0	<5	<5	<5	<5	<12.5	<5	<5	<5	<5	<5	NA
Napthalene		<5	<5	<5	<5	<12.5	<5	<5	<5	<5	<5	NA
N-Propylbenzene		<5	<5	<5	<5	<12.5	<5	<5	<5	<5	<5	NA
Styrene	100.0	<5	<5	<5	<5	<12.5	<5	<5	<5	<5	<5	NA
Toluene	1000.0	<5	<5	<5	<5	<12.5	<5	<5	<5	<5	<5	NA
1,2,4-Trimethylbenzene	70.0	<5	<5	<5	<5	<12.5	<5	<5	<5	<5	<5	NA
1,3,5-Trimethylbenzene		<5	<5	<5	<5	<12.5	<5	<5	<5	<5	<5	NA
Total Xylene	10000.0	<5	<5	<5	<5	<12.5	<5	<5	<5	<5	<5	NA
Dicyclopentadiene		<5	<5	<5	<5	<12.5	<5	<5	<5	<5	<5	NA

WELL # 5	MCL (ppb)	6/90	9/90	12/90	6/91	12/91	3/92	9/92	9/93	12/93	6/94	Average
Benzene	5.0	97	74	73	86	88	84	40	61	105	44	72.45
Ethylbenzene	700.0	35	6	30	<5	53	13	47	44	78	9	38.87
Napthalene		303	98	266	670	805	241	183	410	388	207	396.25
N-Propylbenzene		16	<5	11	<5	21	<5	<5	18	26	<5	18.95
Styrene	100.0	<5	<5	<5	9	16	10	6	8	10	<5	9.91
Toluene	1000.0	27	11	21	15	23	17	<5	20	28	13	19.69
1,2,4-Trimethylbenzene	70.0	98	86	109	134	124	97	68	70	92	59	94.10
1,3,5-Trimethylbenzene		27	35	43	46	31	38	27	25	26	18	31.69
Total Xylene	10000.0	200	211	220	287	324	264	186	173	361	145	245.00
Dicyclopentadiene		12	8	15	20	20	26	18	17	26	16	19.75

WELL # 6	MCL (ppb)	6/90	9/90	12/90	6/91	12/91	3/92	9/92	9/93	12/93	6/94	Average
Benzene	5.0	<500	<25	379	<25	<12.5	<12.5	<5	<5	10	<5	194.30
Ethylbenzene	700.0	<500	<25	186	23	<12.5	<12.5	<5	<5	<5	<5	104.45
Napthalene		10100	<25	<5	2180	2450	131	225	163	465	71	812.13
N-Propylbenzene		<500	<25	46	10	<12.5	<12.5	<5	<5	<5	<5	27.76
Styrene	100.0	<500	<25	328	56	<12.5	7	<5	<5	10	<5	100.26
Toluene	1000.0	<500	<25	41	<25	<12.5	<12.5	<5	<5	<5	<5	41.00
1,2,4-Trimethylbenzene	70.0	2700	188	373	219	148	19	31	<5	128	<5	153.12
1,3,5-Trimethylbenzene		<500	206	347	198	20	<12.5	<5	<5	18	<5	145.70
Total Xylene	10000.0	1900	418	669	314	213	44	40	<5	169	10	208.47
Dicyclopentadiene		1400	876	1004	1540	1420	433	247	502	1460	565	896.38

WELL # 8	MCL (ppb)	6/90	9/90	12/90	6/91	12/91	3/92	9/92	9/93	12/93	6/94	Average
Benzene	5.0	<5	<5	7	<5	<5	<5	<5	<5	7	<5	6.83
Ethylbenzene	700.0	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA
Napthalene		<5	<5	15	<5	12	<5	<5	<5	39	<5	22.03
N-Propylbenzene		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA
Styrene	100.0	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA
Toluene	1000.0	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA
1,2,4-Trimethylbenzene	70.0	<5	<5	10	<5	5	<5	<5	<5	11	<5	8.87
1,3,5-Trimethylbenzene		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA
Total Xylene	10000.0	<5	<5	11	<5	6	<5	<5	<5	12	<5	9.50
Dicyclopentadiene		<5	<5	<5	<5	8	<5	<5	<5	<5	<5	7.95

WELL # 9	MCL (ppb)	6/90	9/90	12/90	6/91	12/91	3/92	9/92	9/93	12/93	6/94	Average
Benzene	5.0	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA
Ethylbenzene	700.0	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA
Napthalene		<5	<5	<5	<5	<5	<5	<5	<5	17	<5	17.30
N-Propylbenzene		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA
Styrene	100.0	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA
Toluene	1000.0	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA
1,2,4-Trimethylbenzene	70.0	<5	<5	<5	<5	<5	<5	<5	<5	9	<5	9.30
1,3,5-Trimethylbenzene		<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA
Total Xylene	10000.0	<5	<5	<5	<5	<5	<5	<5	<5	7	<5	6.80
Dicyclopentadiene		<5	<5	<5	<5	<5	<5	<5	<5	5	<5	5.00

WELL # 10	MCL (ppb)	6/90	9/90	12/90	6/91	12/91	3/92	9/92	9/93	12/93	6/94	Average
Benzene	5.0	<100	12	35	44	<25	40	<12.5	9	<8.5	<8.5	31.88
Ethylbenzene	700.0	<100	<10	86	120	<25	106	19	17	25	9	54.61
Napthalene		1080	53	818	943	1550	1080	633	2760	390	1500	1209.25
N-Propylbenzene		<100	<10	37	45	<25	40	<12.5	<8.5	16	<8.5	34.33
Styrene	100.0	<100	<10	106	152	<25	52	<12.5	<8.5	<8.5	<8.5	103.30
Toluene	1000.0	<100	<10	46	32	<25	35	<12.5	<8.5	<8.5	<8.5	37.77
1,2,4-Trimethylbenzene	70.0	121	112	150	715	31	289	49	82	<8.5	88	200.59
1,3,5-Trimethylbenzene		<100	39	67	199	<25	55	<12.5	15	<8.5	14	70.04
Total Xylene	10000.0	453	269	462	761	128	367	121	108	29	89	258.05
Dicyclopentadiene		266	211	302	943	343	468	321	380	178	415	418.75

WELL # 11	MCL (ppb)	6/90	9/90	12/90	6/91	12/91	3/92	9/92	9/93	12/93	6/94	Average
Benzene	5.0	<250	<100	232	198	<250	<250	217	225	253	215	223.33
Ethylbenzene	700.0	402	669	860	817	443	739	629	702	649	571	676.25
Napthalene		2590	2060	2940	5590	2590	2390	2960	2590	2940	2480	3060.00
N-Propylbenzene		<250	211	439	430	<250	415	396	205	256	271	344.57
Styrene	100.0	514	815	714	614	337	500	392	366	330	276	441.13
Toluene	1000.0	<250	162	162	132	<250	<250	<125	147	112	103	131.20
1,2,4-Trimethylbenzene	70.0	3420	2240	4740	5240	3860	3860	3300	3190	4980	2700	3983.75
1,3,5-Trimethylbenzene		<250	946	1610	1400	746	1100	1050	1120	993	778	1099.63
Total Xylene	10000.0	4090	4760	4580	3830	2830	4130	3400	3540	3490	2700	3562.50
Dicyclopentadiene		390	391	596	485	436	542	485	656	600	534	541.75

WELL # 12	MCL (ppb)	6/90	9/90	12/90	6/91	12/91	3/92	9/92	9/93	12/93	6/94	Average
Benzene	5.0	<100	<25	56	44	97	91	133	105	116	93	91.83
Ethylbenzene	700.0	<100	101	191	164	194	238	272	163	395	190	225.88
Napthalene		460	461	774	1040	937	723	732	1360	1080	1200	980.75
N-Propylbenzene		<100	46	96	74	83	127	129	35	129	40	89.09
Styrene	100.0	<100	122	217	206	194	248	339	172	255	211	230.25
Toluene	1000.0	<100	36	78	69	78	100	127	104	111	97	95.61
1,2,4-Trimethylbenzene	70.0	339	348	607	567	482	650	614	610	1850	653	754.13
1,3,5-Trimethylbenzene		<100	135	250	236	208	237	290	238	275	188	240.25
Total Xylene	10000.0	710	737	1040	932	1110	1220	1310	1030	5230	1030	1612.75
Dicyclopentadiene		<100	27	72	75	113	115	186	132	181	147	127.65

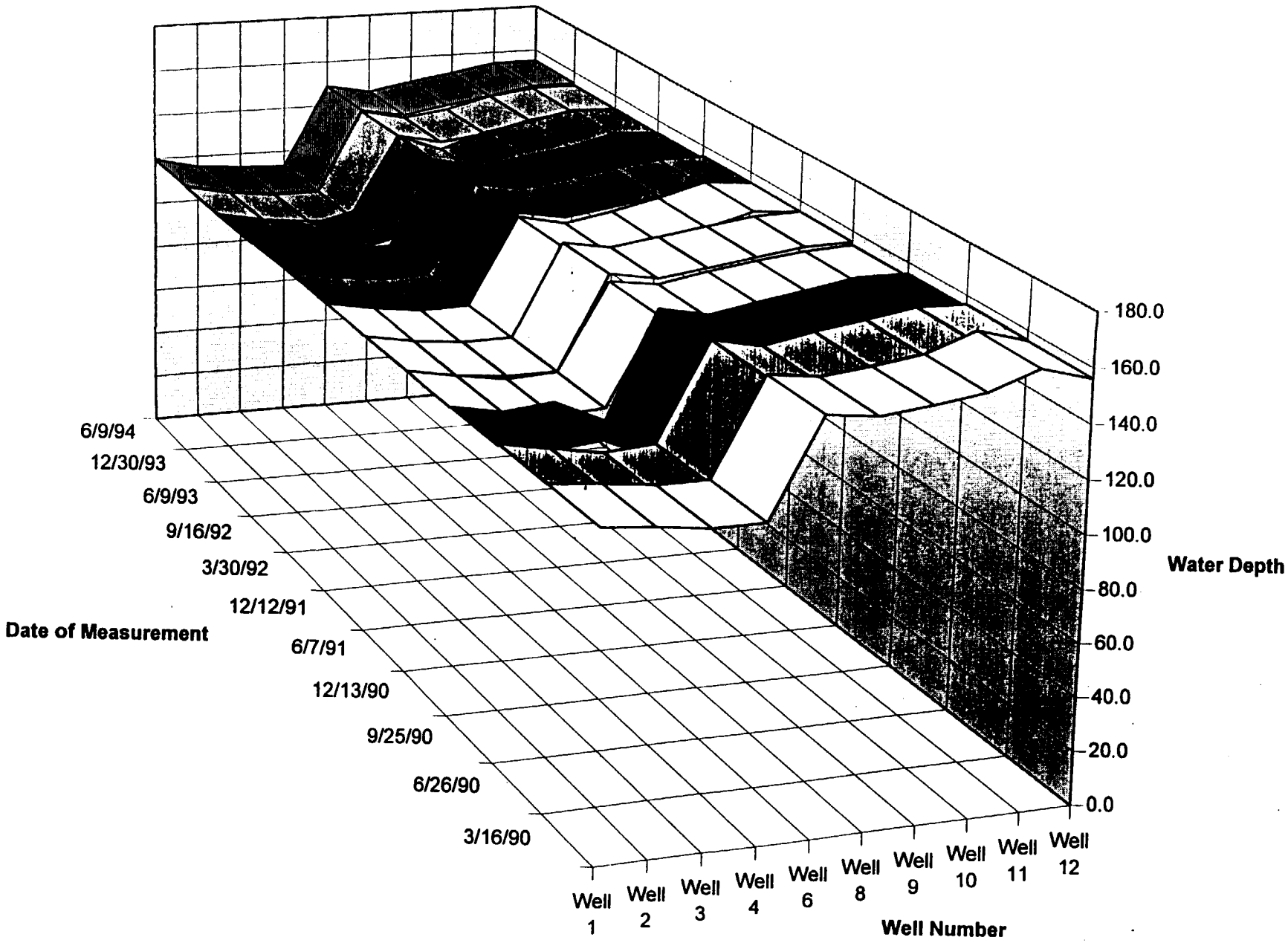
WATI _EVELS

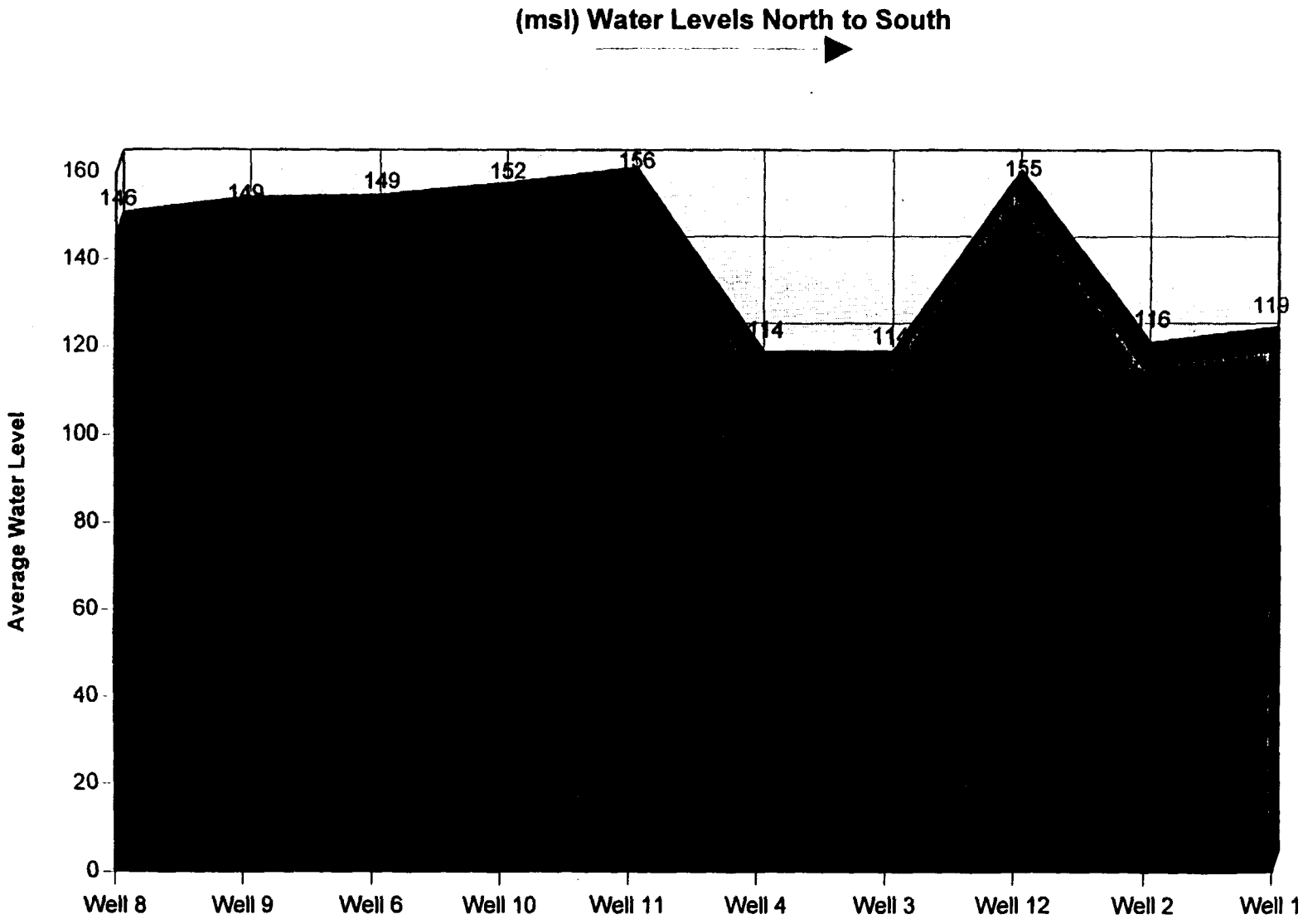
	WATER LEVELS												TOP OF
	3/16/90	6/26/90	9/25/90	12/13/90	6/7/91	12/12/91	3/30/92	9/16/92	6/9/93	12/30/93	6/9/94	Average	CASING (msl)
Well 1	120.1	119.9	119.2	118.9	118.9	118.9	118.9	119.1	118.7	119.0	119.5	119.2	159.94
Well 2	118.4	116.4	115.5	115.4	115.4	115.4	115.4	115.4	114.4	115.4	115.3	115.7	157.42
Well 3	116.1	113.1	117.6	112.4	113.5	113.0	113.0	113.3	111.7	113.1	113.8	113.7	150.06
Well 4	116.2	114.6	108.9	113.5	113.6	113.6	113.6	113.4	116.3	113.3	113.1	113.6	156.57
Well 6	152.3	151.3	149.9	147.3	150.3	148.6	150.3	148.9	148.2	148.3	149.0	149.5	171.26
Well 8	149.8	147.5	145.9	144.7	147.0	144.5	147.0	144.5	141.1	144.3	145.5	145.6	182.51
Well 9	152.0	151.2	149.4	148.2	149.7	147.9	149.7	147.9	147.5	147.0	148.7	149.0	190.19
Well 10	154.7	154.1	152.5	151.1	152.6	152.1	152.6	150.6	150.9	151.8	151.8	152.3	176.14
Well 11	161.5	157.2	155.9	153.4	155.2	157.2	155.2	155.6	155.0	154.2	155.1	156.0	183.17
Well 12	156.3	156.7	155.7	154.6	155.7	155.7	155.7	154.5	154.3	154.2	155.1	155.3	181.73
Well 5	116.6	104.1	103.7	103.7	105.1	104.6	105.1	103.5	102.5	104.4	103.8	105.2	155.12

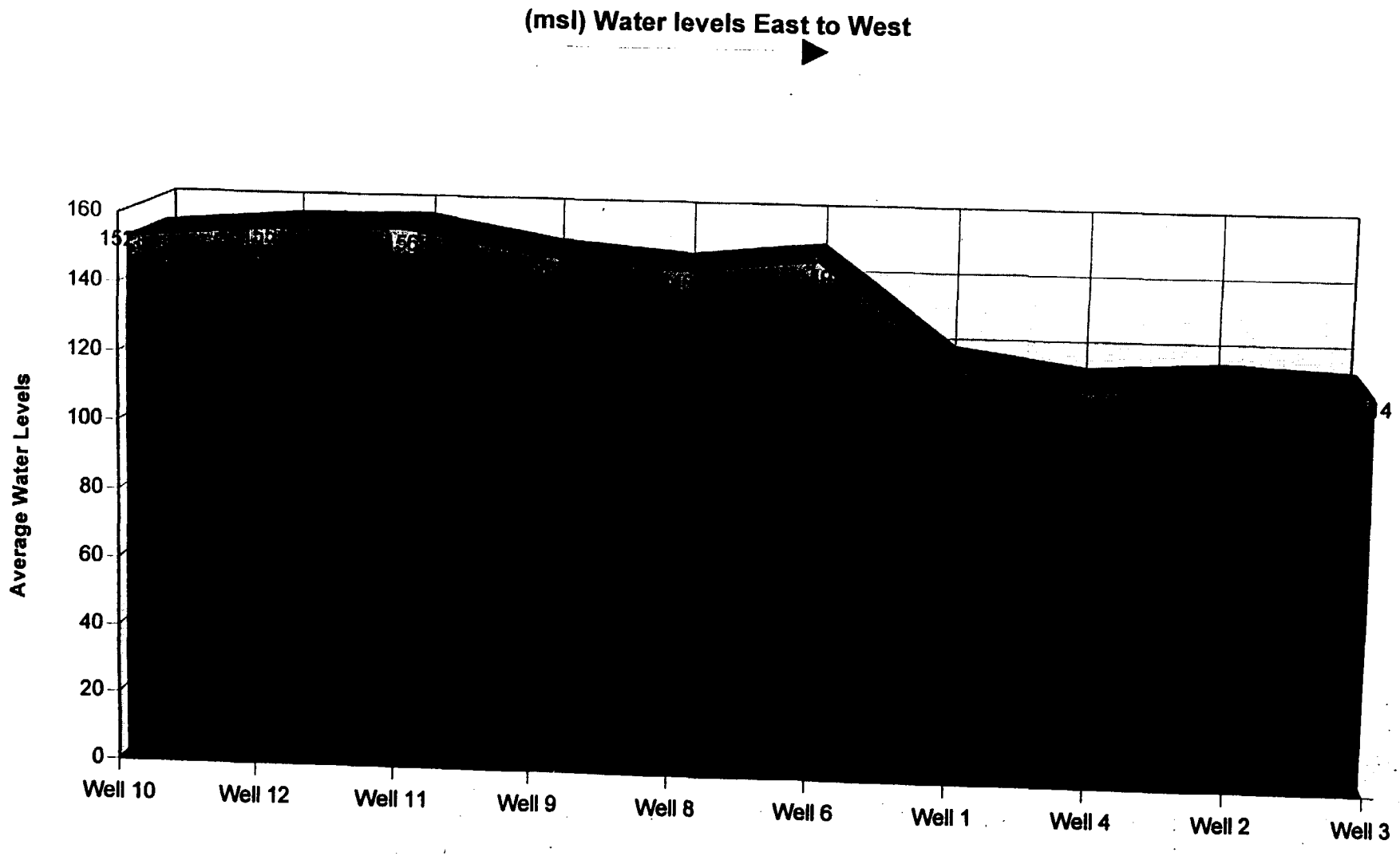
FIELD MONITORING DATA

WELL #	CASING ELEVATION	WATER LEVEL	WATER DEPTH	TOTAL WELL DEPTH	SURFACE ELEVATION
1	159.94	120.11	39.83	56.50	157.80
2	157.42	118.42	39.00	55.10	156.00
3	150.06	116.06	34.00	54.00	148.40
4	156.57	116.15	40.42	54.00	154.30
5	155.12	116.62	38.50	86.00	
6	171.26	152.26	19.00	27.80	167.20
8	182.51	149.84	32.67	52.70	179.90
9	190.19	152.02	38.17	62.70	187.70
10	176.14	154.72	21.42	40.20	174.10
11	183.17	161.50	21.67	40.10	180.10
12	181.73	156.31	25.42	40.30	179.50

Water Levels




(msl) Water Levels North to South
Average Water Level
160
140
120
100
80
60
40
20
0
146
149
149
152
156
114
114
155
116
119
Well 8
Well 9
Well 6
Well 10
Well 11
Well 4
Well 3
Well 12
Well 2
Well 1


(msl) Water levels East to West
Average Water Levels
160
140
120
100
80
60
40
20
0
Well 10
Well 12
Well 11
Well 9
Well 8
Well 6
Well 1
Well 4
Well 2
Well 3

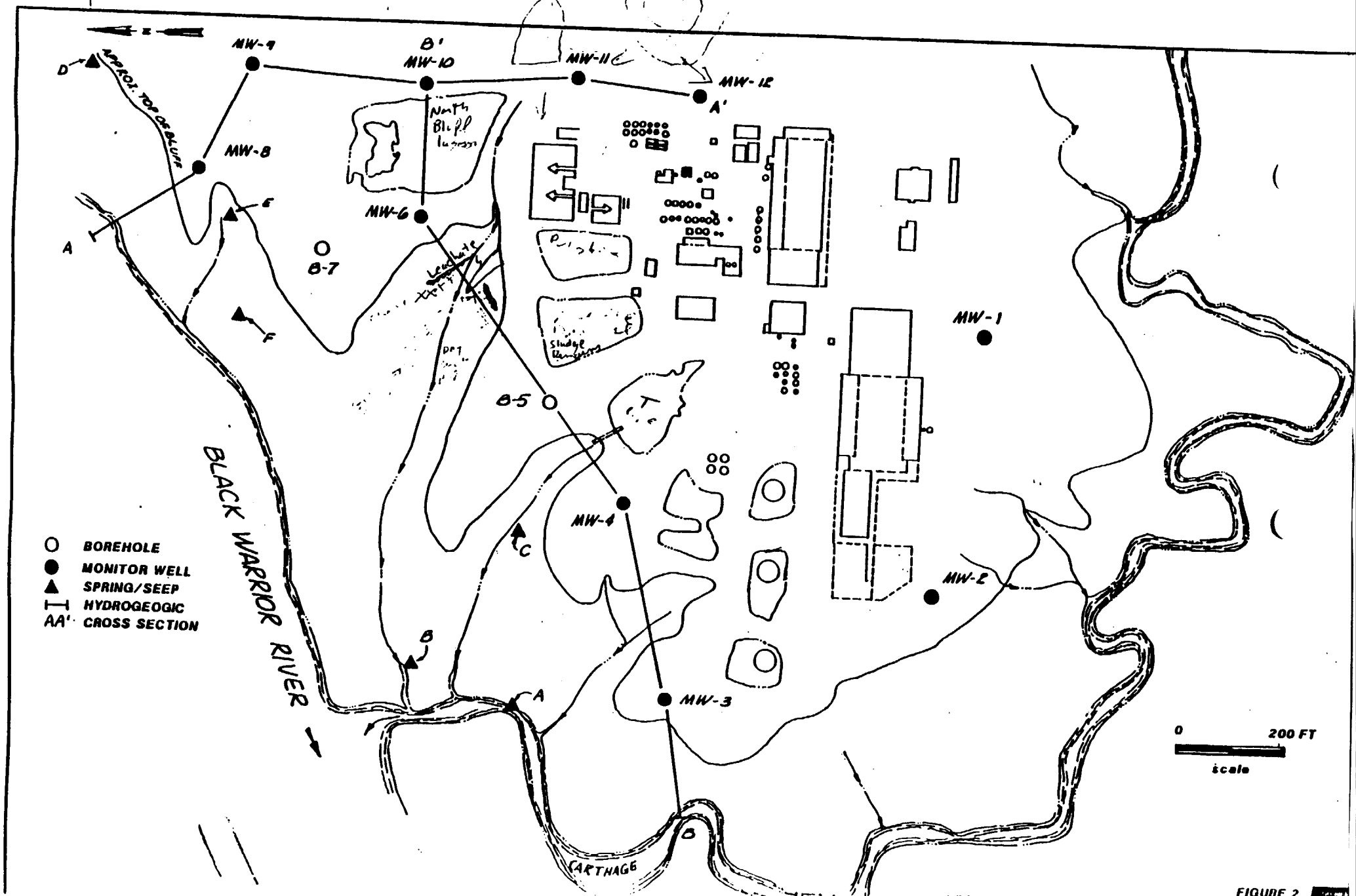


FIGURE 2.
LOCATION OF MONITOR WELLS CONTACT SPRINGS

APPENDIX B

CRACKER ASPHALT
GROUNDWATER
RESULTS

Constituents (ug/l = ppb)	Well Number				
	CA-MW1	CA-MW2	CA-MW4	CA-MW5	CA-MW7
1,2,4 - Trimethylbenzene	111.1	50.6	1.6	---	---
Benzene	139.9	37.5	---	---	---
Ethylbenzene	121.9	---	---	---	---
m+p Xylene	57.6	20.8	---	---	---
Naphthalene (VOC)	1134.0	662.7	---	1.7	0.9
Toluene	13.2	7.5	---	---	---
n - Propylbenzene	---	53.2	0.8	---	---
o - Xylene	---	88.0	---	---	---
Naphthalene (BNA)	558.69	338.064	---	---	---

ADEM CENTRAL LABORATORY

- SAMPLE ANALYSIS REPORT -
11/03/95

To: Alabama Hazardous Cleanup
1751-W.L. Dickinson Drive
Montgomery AL 36109

NOV 1995
RECEIVED
ADEM - FO
MONTGOMERY

Attn: Dan Cooper

Lab number : 6100453
Sample number : 348-9144
Sample matrix : WATER

Report Date: 11/03/95

COLLECTION INFORMATION
Date/Time/By: 10/25/95 2:10 SMITH
Location : CA. MW-1

ADEM CENTRAL LABORATORY
- RESULTS REPORT - November 3, 1995

Lab#	Test	Result	Units	DL*	Analdate
6100453	1,1,1,2-Tetrachloroetha	0.5000	ug/L	U	10/31/95
	1,1,1-Trichloroethane	0.5000	ug/L	U	10/31/95
	1,1,2,2-Tetrachloroetha	0.5000	ug/L	U	10/31/95
	1,1,2Trichloroethane	0.5000	ug/L	U	10/31/95
	1,1-Dichloroethane	0.5000	ug/L	U	10/31/95
	1,1-Dichloroethylene	0.5000	ug/L	U	10/31/95
	1,1-Dichloropropene	0.5000	ug/L	U	10/31/95
	1,2,3-Trichlorobenzene	0.5000	ug/L	U	10/31/95
	1,2,3-Trichloropropane	0.5000	ug/L	U	10/31/95
	1,2,4-Trichlorobenzene	0.5000	ug/L	U	10/31/95
	1,2,4-Trimethylbenzene	111.1000	ug/L		10/31/95
	1,2-Dicholoethane	0.5000	ug/L	U	10/31/95
	1,2-Dichloropropane	0.5000	ug/L	U	10/31/95
	1,3,5-Trimethylbenzene	0.5000	ug/L	U	10/31/95
	1,3-Dichloropropane	0.5000	ug/L	U	10/31/95
	1,3-Dichloropropene	0.5000	ug/L	U	10/31/95
	2,2-Dichloropropane	0.5000	ug/L	U	10/31/95
	Tetrachloroethylene	0.5000	ug/L	U	10/31/95
	Bromobenzene	0.5000	ug/L	U	10/31/95
	Bromochloromethane	0.5000	ug/L	U	10/31/95
	Bromodichloromethane	0.5000	ug/L	U	10/31/95

NOV 1995
ADEM
SPECIAL PROJECTS

COPY

* U denotes results less than the instrument detection limit. < less than sample detection limit.

ADEM CENTRAL LABORATORY
- RESULTS REPORT

November 3, 1995

Lab#	Test	Result	Units	DL*	Analdate
9100488	Benzene	139.9000	ug/L	H	10/31/95
	Bromomethane	0.5000	ug/L	U	10/31/95
	cis-1,2-Dichloroethylen	0.5000	ug/L	U	10/31/95
	Chlorobenzene	0.5000	ug/L	U	10/31/95
	Chlorodibromomethane	0.5000	ug/L	U	10/31/95
	Chloroethane	0.5000	ug/L	U	10/31/95
	Bromoform	0.5000	ug/L	U	10/31/95
	Chloroform	0.5000	ug/L	U	10/31/95
	Chloromethane	0.5000	ug/L	U	10/31/95
	Carbon Tetrachloride	0.5000	ug/L	U	10/31/95
	Dibromomethane	0.5000	ug/L	U	10/31/95
	Dichlorodifluoromethane	0.5000	ug/L	U	10/31/95
	Dichloromethane	0.5000	ug/L	U	10/31/95
	Ethylbenzene	121.9000	ug/L		10/31/95
	Fluorotrichloromethane	0.5000	ug/L	U	10/31/95
	Hexachlorobutadiene	0.5000	ug/L	U	10/31/95
	Isopropylbenzene	0.5000	ug/L	U	10/31/95
	m-Dichlorobenzene	0.5000	ug/L	U	10/31/95
	m+p Xylene	57.6000	ug/L		10/31/95
	Naphthalene	1134.000	ug/L		10/31/95
		0			
	n-Butylbenzene	0.5000	ug/L	U	10/31/95
	n-Propylbenzene	0.5000	ug/L	U	10/31/95
	o-Chlorotoluene	0.5000	ug/L	U	10/31/95
	o-Dichlorobenzene	0.5000	ug/L	U	10/31/95
	o-Xylene	0.5000	ug/L	U	10/31/95
	p-Chlorotoluene	0.5000	ug/L	U	10/31/95
	p-Dichlorobenzene	0.5000	ug/L	U	10/31/95
	p-Isopropyltoluene	0.5000	ug/L	U	10/31/95
	Secbutylbenzene	0.5000	ug/L	U	10/31/95
	Styrene	0.5000	ug/L	U	10/31/95
	t-1,2-Dichloroethylene	0.5000	ug/L	U	10/31/95
	Tertbutylbenzene	0.5000	ug/L	U	10/31/95
	Trichloroethylene	0.5000	ug/L	U	10/31/95
	Toluene	13.2000	ug/L		10/31/95
	Vinyl Chloride	0.5000	ug/L	U	10/31/95

* U denotes results less than the instrument detection limit. < less than sample reporting limit.

- SAMPLE ANALYSIS REPORT -
11/22/95

To: Alabama Hazardous Cleanup
1751-W.L. Dickinson Drive
Montgomery AL 36109

NOV 1995
RECEIVED
ADEM - FO
MONTGOMERY

Attn: Dan Cooper

Lab number : 6100458
Sample number : 348-9144
Sample matrix : WATER

Report Date: 11/22/95

COLLECTION INFORMATION
Date/Time/By: 10/25/95 2:10 SMITH
Location : CA, MW-1

ADEM CENTRAL LABORATORY
- RESULTS REPORT - November 22, 1995

Lab#	Test	Result	Units	DL*	Analdate
6100458	1,2,4-Trichlorobenzene	<20	ug/L		11/17/95
	1,2-Dichlorobenzene	<20	ug/L		11/17/95
	1,2-Diphenylhydrazine	<20	ug/L		11/17/95
	1,3-Dichlorobenzene	<20	ug/L		11/17/95
	1,4-Dichlorobenzene	<20	ug/L		11/17/95
	2,3,7,8-Tetrachlorodibe	<20	ug/L		11/17/95
	2,4,6-Trichlorophenol	<20	ug/L		11/17/95
	2,4-Dichlorophenol	<20	ug/L		11/17/95
	2,4-Dimethylphenol	<20	ug/L		11/17/95
	2,4-Dinitrophenol	<200	ug/L		11/17/95
	2,4-Dinitrotoluene	<20	ug/L		11/17/95
	2,6-Dinitrotoluene	<20	ug/L		11/17/95
	2-Chloronaphthalene	<20	ug/L		11/17/95
	2-Chlorophenol	<20	ug/L		11/17/95
	2-Methyl-4,6-dinitrophe	<100	ug/L		11/17/95
	2-Nitrophenol	<20	ug/L		11/17/95
	3,3'-Dichlorobenzidine	<20	ug/L		11/17/95
	4-Bromophenyl phenyl et	<20	ug/L		11/17/95
	4-Chloro-3-methylphenol	<20	ug/L		11/17/95
	4-Chlorophenyl phenyl e	<20	ug/L		11/17/95
	4-Nitrophenol	<20	ug/L		11/17/95

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SPECIAL PROJECTS

* U denotes results less than the instrument detection limit, < less than sample detection limit.

Lab#	Test	Result	Units	DL*	Analdate
6100458	Acenaphthylene	<20	ug/L		11/17/95
	Acenaphthene	<20	ug/L		11/17/95
	Anthracene	<20	ug/L		11/17/95
	Benzo(a)anthracene	<20	ug/L		11/17/95
	Benzo(a)pyrene	<20	ug/L		11/17/95
	Benzo(b)fluoranthene	<20	ug/L		11/17/95
	Butyl benzyl phthalate	<20	ug/L		11/17/95
	Bis(2-chlorethyl)ether	<20	ug/L		11/17/95
	Bis(2-chloroethoxy)meth	<20	ug/L		11/17/95
	Bis(2-chloroisopropyl)e	<20	ug/L		11/17/95
	Bis(2-ethylhexyl)phthal	<20	ug/L		11/17/95
	Benzo(g,h,i)perylene	<20	ug/L		11/17/95
	Benzidine	<20	ug/L		11/17/95
	Benzo(k)fluoranthene	<20	ug/L		11/17/95
	Chrysene	<20	ug/L		11/17/95
	Dibenzo(a,h)anthracene	<20	ug/L		11/17/95
	Dibutyl phthalate	<20	ug/L		11/17/95
	Diethyl phthalate	<20	ug/L		11/17/95
	Dimethylphthalate	<20	ug/L		11/17/95
	Di-n-octyl phthalate	<20	ug/L		11/17/95
	Fluoranthene	<20	ug/L		11/17/95
	Fluorene	<20	ug/L		11/17/95
	Hexachlorobutadiene	<20	ug/L		11/17/95
	Hexachlorobenzene	<20	ug/L		11/17/95
	Hexachlorocyclopentadie	<20	ug/L		11/17/95
	Hexachloroethane	<20	ug/L		11/17/95
	Isophorone	<20	ug/L		11/17/95
	Indeno(1,2,3-cd)pyrene	<20	ug/L		11/17/95
	Naphthalene	558.6900	ug/L		11/17/95
	Nitrobenzene	<20	ug/L		11/17/95
	N-nitroso-di-n-propylam	<20	ug/L		11/17/95
	N-nitrosodimethylamine	<20	ug/L		11/17/95
	N-nitrosodiphenylamine	<20	ug/L		11/17/95
	Pyrene	<20	ug/L		11/17/95
	Phenanthrene	<20	ug/L		11/17/95
	Pentachlorophenol	<20	ug/L		11/17/95
	Phenol	<20	ug/L		11/17/95

* U denotes results less than the instrument detection limit, < less than sample detection limit.

ADEM CENTRAL LABORATORY

- SAMPLE ANALYSIS REPORT -
11/03/95

To: Alabama Hazardous Cleanup
1751-W.L. Dickinson Drive
Montgomery AL 36109

Attn: Dan Cooper

Lab number : 6100454
Sample number : 348-9144
Sample matrix : WATER

Report Date: 11/03/95

COLLECTION INFORMATION
Date/Time/By: 10/25/95 2:25 SMITH
Location : CA. MW-2

ADEM CENTRAL LABORATORY
- RESULTS REPORT - November 3, 1995

Lab#	Test	Result	Units	DL*	Analdate
6100454	1,1,1,2-Tetrachloroetha	0.5000	ug/L	U	10/31/95
	1,1,1-Trichloroethane	0.5000	ug/L	U	10/31/95
	1,1,2,2-Tetrachloroetha	0.5000	ug/L	U	10/31/95
	1,1,2Trichloroethane	0.5000	ug/L	U	10/31/95
	1,1-Dichloroethane	0.5000	ug/L	U	10/31/95
	1,1-Dichloroethylene	0.5000	ug/L	U	10/31/95
	1,1-Dichloropropene	0.5000	ug/L	U	10/31/95
	1,2,3-Trichlorobenzene	0.5000	ug/L	U	10/31/95
	1,2,3-Trichloropropane	0.5000	ug/L	U	10/31/95
	1,2,4-Trichlorobenzene	0.5000	ug/L	U	10/31/95
	1,2,4-Trimethylbenzene	50.6000	ug/L		10/31/95
	1,2-Dicholoethane	0.5000	ug/L	U	10/31/95
	1,2-Dichloropropane	0.5000	ug/L	U	10/31/95
	1,3,5-Trimethylbenzene	0.5000	ug/L	U	10/31/95
	1,3-Dichloropropane	0.5000	ug/L	U	10/31/95
	1,3-Dichloropropene	0.5000	ug/L	U	10/31/95
	2,2-Dichloropropane	0.5000	ug/L	U	10/31/95
	Tetrachloroethylene	0.5000	ug/L	U	10/31/95
	Bromobenzene	0.5000	ug/L	U	10/31/95
	Bromochloromethane	0.5000	ug/L	U	10/31/95
	Bromodichloromethane	0.5000	ug/L	U	10/31/95

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* U denotes results less than the instrument detection limit. < less than sample detection limit.

ADEM CENTRAL LABORATORY
- RESULTS REPORT

November 3, 1995

Lab#	Test	Result	Units	DL*	Analdate
8100454	Benzene	9.8000	ug/L	H	10/31/95
	Bromomethane	0.5000	ug/L	U	10/31/95
	cis-1,2-Dichloroethylen	0.5000	ug/L	U	10/31/95
	Chlorobenzene	0.5000	ug/L	U	10/31/95
	Chlorodibromomethane	0.5000	ug/L	U	10/31/95
	Chloroethane	0.5000	ug/L	U	10/31/95
	Bromoform	0.5000	ug/L	U	10/31/95
	Chloroform	0.5000	ug/L	U	10/31/95
	Chloromethane	0.5000	ug/L	U	10/31/95
	Carbon Tetrachloride	0.5000	ug/L	U	10/31/95
	Dibromomethane	0.5000	ug/L	U	10/31/95
	Dichlorodifluoromethane	0.5000	ug/L	U	10/31/95
	Dichloromethane	0.5000	ug/L	U	10/31/95
	Ethylbenzene	37.5000	ug/L		10/31/95
	Fluorotrichloromethane	0.5000	ug/L	U	10/31/95
	Hexachlorobutadiene	0.5000	ug/L	U	10/31/95
	Isopropylbenzene	0.5000	ug/L	U	10/31/95
	m-Dichlorobenzene	0.5000	ug/L	U	10/31/95
	m-p Xylene	20.8000	ug/L		10/31/95
	Naphthalene	662.7000	ug/L		10/31/95
	n-Butylbenzene	0.5000	ug/L	U	10/31/95
	n-Propylbenzene	53.2000	ug/L		10/31/95
	o-Chlorotoluene	0.5000	ug/L	U	10/31/95
	o-Dichlorobenzene	0.5000	ug/L	U	10/31/95
	o-Xylene	88.0000	ug/L		10/31/95
	p-Chlorotoluene	0.5000	ug/L	U	10/31/95
	p-Dichlorobenzene	0.5000	ug/L	U	10/31/95
	p-Isopropyltoluene	0.5000	ug/L	U	10/31/95
	Secbutylbenzene	0.5000	ug/L	U	10/31/95
	Styrene	0.5000	ug/L	U	10/31/95
	t-1,2-Dichloroethylene	0.5000	ug/L	U	10/31/95
	Tertbutylbenzene	0.5000	ug/L	U	10/31/95
	Trichloroethylene	0.5000	ug/L	U	10/31/95
	Toluene	7.5000	ug/L		10/31/95
	Vinyl Chloride	0.5000	ug/L	U	10/31/95

* U denotes results less than the instrument detection limit. H less than sample detection limit.

- SAMPLE ANALYSIS REPORT -
11/22/95

To: Alabama Hazardous Cleanup
1751-W.L. Dickinson Drive
Montgomery AL 36109

NOV 1995
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MONTGOMERY

Attn: Dan Cooper

Lab number : 6100459
Sample number : 348-9144
Sample matrix : WATER

Report Date: 11/22/95

COLLECTION INFORMATION
Date/Time/By: 10/25/95 2:25 SMITH
Location : CA, MW-2

ADEM CENTRAL LABORATORY
- RESULTS REPORT - November 22, 1995

Lab#	Test	Result	Units	DL*	Analdate
6100459	1,2,4-Trichlorobenzene	<20	ug/L		11/17/95
	1,2-Dichlorobenzene	<20	ug/L		11/17/95
	1,2-Diphenylhydrazine	<20	ug/L		11/17/95
	1,3-Dichlorobenzene	<20	ug/L		11/17/95
	1,4-Dichlorobenzene	<20	ug/L		11/17/95
	2,3,7,8-Tetrachlorodibe	<20	ug/L		11/17/95
	2,4,6-Trichlorophenol	<20	ug/L		11/17/95
	2,4-Dichlorophenol	<20	ug/L		11/17/95
	2,4-Dimethylphenol	<20	ug/L		11/17/95
	2,4-Dinitrophenol	<200	ug/L		11/17/95
	2,4-Dinitrotoluene	<20	ug/L		11/17/95
	2,6-Dinitrotoluene	<20	ug/L		11/17/95
	2-Chloronaphthalene	<20	ug/L		11/17/95
	2-Chlorophenol	<20	ug/L		11/17/95
	2-Methyl-4,6-dinitrophe	<100	ug/L		11/17/95
	2-Nitrophenol	<20	ug/L		11/17/95
	3,3'-Dichlorobenzidine	<20	ug/L		11/17/95
	4-Bromophenyl phenyl et	<20	ug/L		11/17/95
	4-Chloro-3-methylphenol	<20	ug/L		11/17/95
	4-Chlorophenyl phenyl e	<20	ug/L		11/17/95
	4-Nitrophenol	<20	ug/L		11/17/95

NOV 1995
ADEM
SPECIAL PROJECTS

* U denotes results less than the instrument detection limit, < less than sample detection limit.

Lab#	Test	Result	Units	DL*	Analdate
6100459	Acenaphthylene	<20	ug/L		11/17/95
	Acenaphthene	<20	ug/L		11/17/95
	Anthracene	<20	ug/L		11/17/95
	Benzo(a)anthracene	<20	ug/L		11/17/95
	Benzo(a)pyrene	<20	ug/L		11/17/95
	Benzo(b)fluoranthene	<20	ug/L		11/17/95
	Butyl benzyl phthalate	<20	ug/L		11/17/95
	Bis(2-chlorethyl)ether	<20	ug/L		11/17/95
	Bis(2-chloroethoxy)meth	<20	ug/L		11/17/95
	Bis(2-chloroisopropyl)e	<20	ug/L		11/17/95
	Bis(2-ethylhexyl)phthal	<20	ug/L		11/17/95
	Benzo(g,h,i)perylene	<20	ug/L		11/17/95
	Benzidine	<20	ug/L		11/17/95
	Benzo(k)fluoranthene	<20	ug/L		11/17/95
	Chrysene	<20	ug/L		11/17/95
	Dibenzo(a,h)anthracene	<20	ug/L		11/17/95
	Dibutyl phthalate	<20	ug/L		11/17/95
	Diethyl phthalate	<20	ug/L		11/17/95
	Dimethylphthalate	<20	ug/L		11/17/95
	Di-n-octyl phthalate	<20	ug/L		11/17/95
	Fluoranthene	<20	ug/L		11/17/95
	Fluorene	<20	ug/L		11/17/95
	Hexachlorobutadiene	<20	ug/L		11/17/95
	Hexachlorobenzene	<20	ug/L		11/17/95
	Hexachlorocyclopentadie	<20	ug/L		11/17/95
	Hexachloroethane	<20	ug/L		11/17/95
	Isophorone	<20	ug/L		11/17/95
	Indeno(1,2,3-cd)pyrene	<20	ug/L		11/17/95
	Naphthalene	338.0640	ug/L		11/17/95
	Nitrobenzene	<20	ug/L		11/17/95
	N-nitroso-di-n-propylam	<20	ug/L		11/17/95
	N-nitrosodimethylamine	<20	ug/L		11/17/95
	N-nitrosodiphenylamine	<20	ug/L		11/17/95
	Pyrene	<20	ug/L		11/17/95
	Phenanthrene	<20	ug/L		11/17/95
	Pentachlorophenol	<20	ug/L		11/17/95
	Phenol	<20	ug/L		11/17/95

* U denotes results less than the instrument detection limit, < less than sample detection limit.

ADEM CENTRAL LABORATORY

- SAMPLE ANALYSIS REPORT -
11/03/95

To: Alabama Hazardous Cleanup
1751-W.L. Dickinson Drive
Montgomery AL 36109

Attn: Dan Cooper

Lab number : 6100455
Sample number : 348-9144
Sample matrix : WATER

Report Date: 11/03/95

COLLECTION INFORMATION
Date/Time/By: 10/25/95 2:40 SMITH
Location : CA. MW-4

ADEM CENTRAL LABORATORY
- RESULTS REPORT - November 3, 1995

Lab#	Test	Result	Units	DL*	Analdate
6100455	1,1,1,2-Tetrachloroetha	0.5000	ug/L	U	10/31/95
	1,1,1-Trichloroethane	0.5000	ug/L	U	10/31/95
	1,1,2,2-Tetrachloroetha	0.5000	ug/L	U	10/31/95
	1,1,2Trichloroethane	0.5000	ug/L	U	10/31/95
	1,1-Dichloroethane	0.5000	ug/L	U	10/31/95
	1,1-Dichloroethylene	0.5000	ug/L	U	10/31/95
	1,1-Dichloropropene	0.5000	ug/L	U	10/31/95
	1,2,3-Trichlorobenzene	0.5000	ug/L	U	10/31/95
	1,2,3-Trichloropropane	0.5000	ug/L	U	10/31/95
	1,2,4-Trichlorobenzene	0.5000	ug/L	U	10/31/95
	1,2,4-Trimethylbenzene	1.6000	ug/L		10/31/95
	1,2-Dicholoethane	0.5000	ug/L	U	10/31/95
	1,2-Dichloropropane	0.5000	ug/L	U	10/31/95
	1,3,5-Trimethylbenzene	0.5000	ug/L	U	10/31/95
	1,3-Dichloropropane	0.5000	ug/L	U	10/31/95
	1,3-Dichloropropene	0.5000	ug/L	U	10/31/95
	2,2-Dichloropropane	0.5000	ug/L	U	10/31/95
	Tetrachloroethylene	0.5000	ug/L	U	10/31/95
	Bromobenzene	0.5000	ug/L	U	10/31/95
	Bromochloromethane	0.5000	ug/L	U	10/31/95
	Bromodichloromethane	0.5000	ug/L	U	10/31/95

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* U denotes results less than the instrument detection limit. < less than sample detection limit.

ADEM CENTRAL LABORATORY
- RESULTS REPORT

November 3, 1995

Lab#	Test	Result	Units	DL*	Analdate
9100455	Benzene	0.5000	ug/L	U	10/31/95
	Bromomethane	0.5000	ug/L	U	10/31/95
	cis-1,2-Dichloroethylen	0.5000	ug/L	U	10/31/95
	Chlorobenzene	0.5000	ug/L	U	10/31/95
	Chlorodibromomethane	0.5000	ug/L	U	10/31/95
	Chloroethane	0.5000	ug/L	U	10/31/95
	Bromoform	0.5000	ug/L	U	10/31/95
	Chloroform	0.5000	ug/L	U	10/31/95
	Chloromethane	0.5000	ug/L	U	10/31/95
	Carbon Tetrachloride	0.5000	ug/L	U	10/31/95
	Dibromomethane	0.5000	ug/L	U	10/31/95
	Dichlorodifluoromethane	0.5000	ug/L	U	10/31/95
	Dichloromethane	0.5000	ug/L	U	10/31/95
	Ethylbenzene	0.5000	ug/L	U	10/31/95
	Fluorotrichloromethane	0.5000	ug/L	U	10/31/95
	Hexachlorobutadiene	0.5000	ug/L	U	10/31/95
	Isopropylbenzene	0.5000	ug/L	U	10/31/95
	m-Dichlorobenzene	0.5000	ug/L	U	10/31/95
	m-p Xylene	0.5000	ug/L	U	10/31/95
	Naphthalene	0.5000	ug/L	U	10/31/95
	n-Butylbenzene	0.5000	ug/L	U	10/31/95
	n-Propylbenzene	0.8000	ug/L		10/31/95
	o-Chlorotoluene	0.5000	ug/L	U	10/31/95
	o-Dichlorobenzene	0.5000	ug/L	U	10/31/95
	o-Xylene	0.5000	ug/L	U	10/31/95
	p-Chlorotoluene	0.5000	ug/L	U	10/31/95
	p-Dichlorobenzene	0.5000	ug/L	U	10/31/95
	p-Isopropyltoluene	0.5000	ug/L	U	10/31/95
	Secbutylbenzene	0.5000	ug/L	U	10/31/95
	Styrene	0.5000	ug/L	U	10/31/95
	t-1,2-Dichloroethylene	0.5000	ug/L	U	10/31/95
	Tertbutylbenzene	0.5000	ug/L	U	10/31/95
	Trichloroethylene	0.5000	ug/L	U	10/31/95
	Toluene	0.5000	ug/L	U	10/31/95
	Vinyl Chloride	0.5000	ug/L	U	10/31/95

* U denotes results less than the instrument detection limit. L less than sample detection limit.

- SAMPLE ANALYSIS REPORT -
11/22/95

To: Alabama Hazardous Cleanup
1751-W.L. Dickinson Drive
Montgomery AL 36109

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MONTGOMERY

Attn: Dan Cooper

Lab number : 6100460
Sample number : 348-9144
Sample matrix : WATER

Report Date: 11/22/95

COLLECTION INFORMATION
Date/Time/By: 10/25/95 2:40 SMITH
Location : CA, MW-4

ADEM CENTRAL LABORATORY
- RESULTS REPORT - November 22, 1995

Lab#	Test	Result	Units	DL*	Analdate
6100460	1,2,4-Trichlorobenzene	<20	ug/L		11/17/95
	1,2-Dichlorobenzene	<20	ug/L		11/17/95
	1,2-Diphenylhydrazine	<20	ug/L		11/17/95
	1,3-Dichlorobenzene	<20	ug/L		11/17/95
	1,4-Dichlorobenzene	<20	ug/L		11/17/95
	2,3,7,8-Tetrachlorodibe	<20	ug/L		11/17/95
	2,4,6-Trichlorophenol	<20	ug/L		11/17/95
	2,4-Dichlorophenol	<20	ug/L		11/17/95
	2,4-Dimethylphenol	<20	ug/L		11/17/95
	2,4-Dinitrophenol	<200	ug/L		11/17/95
	2,4-Dinitrotoluene	<20	ug/L		11/17/95
	2,6-Dinitrotoluene	<20	ug/L		11/17/95
	2-Chloronaphthalene	<20	ug/L		11/17/95
	2-Chlorophenol	<20	ug/L		11/17/95
	2-Methyl-4,6-dinitrophe	<100	ug/L		11/17/95
	2-Nitrophenol	<20	ug/L		11/17/95
	3,3'-Dichlorobenzidine	<20	ug/L		11/17/95
	4-Bromophenyl phenyl et	<20	ug/L		11/17/95
	4-Chloro-3-methylphenol	<20	ug/L		11/17/95
	4-Chlorophenyl phenyl e	<20	ug/L		11/17/95
	4-Nitrophenol	<20	ug/L		11/17/95

NOV 1995
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SPECIAL PROJECTS

* U denotes results less than the instrument detection limit, < less than sample detection limit.

Lab#	Test	Result	Units	DL*	Analdate
6100460	Acenaphthylene	<20	ug/L		11/17/95
	Acenaphthene	<20	ug/L		11/17/95
	Anthracene	<20	ug/L		11/17/95
	Benzo(a)anthracene	<20	ug/L		11/17/95
	Benzo(a)pyrene	<20	ug/L		11/17/95
	Benzo(b)fluoranthene	<20	ug/L		11/17/95
	Butyl benzyl phthalate	<20	ug/L		11/17/95
	Bis(2-chlorethyl)ether	<20	ug/L		11/17/95
	Bis(2-chloroethoxy)meth	<20	ug/L		11/17/95
	Bis(2-chloroisopropyl)e	<20	ug/L		11/17/95
	Bis(2-ethylhexyl)phthal	<20	ug/L		11/17/95
	Benzo(g,h,i)perylene	<20	ug/L		11/17/95
	Benzidine	<20	ug/L		11/17/95
	Benzo(k)fluoranthene	<20	ug/L		11/17/95
	Chrysene	<20	ug/L		11/17/95
	Dibenzo(a,h)anthracene	<20	ug/L		11/17/95
	Dibutyl phthalate	<20	ug/L		11/17/95
	Diethyl phthalate	<20	ug/L		11/17/95
	Dimethylphthalate	<20	ug/L		11/17/95
	Di-n-octyl phthalate	<20	ug/L		11/17/95
	Fluoranthene	<20	ug/L		11/17/95
	Fluorene	<20	ug/L		11/17/95
	Hexachlorobutadiene	<20	ug/L		11/17/95
	Hexachlorobenzene	<20	ug/L		11/17/95
	Hexachlorocyclopentadie	<20	ug/L		11/17/95
	Hexachloroethane	<20	ug/L		11/17/95
	Isophorone	<20	ug/L		11/17/95
	Indeno(1,2,3-cd)pyrene	<20	ug/L		11/17/95
	Naphthalene	<20	ug/L		11/17/95
	Nitrobenzene	<20	ug/L		11/17/95
	N-nitroso-di-n-propylam	<20	ug/L		11/17/95
	N-nitrosodimethylamine	<20	ug/L		11/17/95
	N-nitrosodiphenylamine	<20	ug/L		11/17/95
	Pyrene	<20	ug/L		11/17/95
	Phenanthrene	<20	ug/L		11/17/95
	Pentachlorophenol	<20	ug/L		11/17/95
	Phenol	<20	ug/L		11/17/95

* U denotes results less than the instrument detection limit, < less than sample detection limit.

ADEM CENTRAL LABORATORY

- SAMPLE ANALYSIS REPORT -
11/03/95

To: Alabama Hazardous Cleanup
1751-W.L. Dickinson Drive
Montgomery AL 36109

Attn: Dan Cooper

Lab number : 6100456
Sample number : 348-9144
Sample matrix : WATER

Report Date: 11/03/95

COLLECTION INFORMATION
Date/Time/By: 10/25/95 2:55 SMITH
Location : CA. MW-5

ADEM CENTRAL LABORATORY
- RESULTS REPORT - November 3, 1995

Lab#	Test	Result	Units	DL*	Analdate
6100456	1.1.1.2-Tetrachloroetha	0.5000	ug/L	U	10/31/95
	1.1.1-Trichloroethane	0.5000	ug/L	U	10/31/95
	1.1.2.2-Tetrachloroetha	0.5000	ug/L	U	10/31/95
	1.1.2Trichloroethane	0.5000	ug/L	U	10/31/95
	1.1-Dichloroethane	0.5000	ug/L	U	10/31/95
	1.1-Dichloroethylene	0.5000	ug/L	U	10/31/95
	1.1-Dichloropropene	0.5000	ug/L	U	10/31/95
	1.2.3-Trichlorobenzene	0.5000	ug/L	U	10/31/95
	1.2.3-Trichloropropane	0.5000	ug/L	U	10/31/95
	1.2.4-Trichlorobenzene	0.5000	ug/L	U	10/31/95
	1.2.4-Trimethylbenzene	0.5000	ug/L	U	10/31/95
	1.2-Dicholoethane	0.5000	ug/L	U	10/31/95
	1.2-Dichloropropane	0.5000	ug/L	U	10/31/95
	1.3.5-Trimethylbenzene	0.5000	ug/L	U	10/31/95
	1.3-Dichloropropane	0.5000	ug/L	U	10/31/95
	1.3-Dichloropropene	0.5000	ug/L	U	10/31/95
	2.2-Dichloropropane	0.5000	ug/L	U	10/31/95
	Tetrachloroethylene	0.5000	ug/L	U	10/31/95
	Bromobenzene	0.5000	ug/L	U	10/31/95
	Bromochloromethane	0.5000	ug/L	U	10/31/95
	Bromodichloromethane	0.5000	ug/L	U	10/31/95

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* U denotes results less than the instrument detection limit. < less than sample detection limit.

AIEM CENTRAL LABORATORY
- RESULTS REPORT

November 3, 1995

Lab#	Test	Result	Units	DL*	Analdate
8130458	Benzene	0.5000	ug/L	U	10/31/95
	Bromomethane	0.5000	ug/L	U	10/31/95
	cis-1,2-Dichloroethylen	0.5000	ug/L	U	10/31/95
	Chlorobenzene	0.5000	ug/L	U	10/31/95
	Chlorodibromomethane	0.5000	ug/L	U	10/31/95
	Chloroethane	0.5000	ug/L	U	10/31/95
	Bromoform	0.5000	ug/L	U	10/31/95
	Chloroform	0.5000	ug/L	U	10/31/95
	Chloromethane	0.5000	ug/L	U	10/31/95
	Carbon Tetrachloride	0.5000	ug/L	U	10/31/95
	Dibromomethane	0.5000	ug/L	U	10/31/95
	Dichlorodifluoromethane	0.5000	ug/L	U	10/31/95
	Dichloromethane	0.5000	ug/L	U	10/31/95
	Ethylbenzene	0.5000	ug/L	U	10/31/95
	Fluorotrichloromethane	0.5000	ug/L	U	10/31/95
	Hexachlorobutadiene	0.5000	ug/L	U	10/31/95
	Isopropylbenzene	0.5000	ug/L	U	10/31/95
	m-Dichlorobenzene	0.5000	ug/L	U	10/31/95
	m+p Xylene	0.5000	ug/L	U	10/31/95
	Naphthalene	1.7000	ug/L		10/31/95
	n-Butylbenzene	0.5000	ug/L	U	10/31/95
	n-Propylbenzene	0.5000	ug/L	U	10/31/95
	o-Chlorotoluene	0.5000	ug/L	U	10/31/95
	o-Dichlorobenzene	0.5000	ug/L	U	10/31/95
	o-Xylene	0.5000	ug/L	U	10/31/95
	p-Chlorotoluene	0.5000	ug/L	U	10/31/95
	p-Dichlorobenzene	0.5000	ug/L	U	10/31/95
	p-Isopropyltoluene	0.5000	ug/L	U	10/31/95
	sec-butylbenzene	0.5000	ug/L	U	10/31/95
	Styrene	0.5000	ug/L	U	10/31/95
	t-1,2-Dichloroethylene	0.5000	ug/L	U	10/31/95
	Tertbutylbenzene	0.5000	ug/L	U	10/31/95
	Trichloroethylene	0.5000	ug/L	U	10/31/95
	Toluene	0.5000	ug/L	U	10/31/95
	Vinyl Chloride	0.5000	ug/L	U	10/31/95

* U denotes results less than the instrument detection limit. < less than sample quantitation limit.

- SAMPLE ANALYSIS REPORT -
11/22/95

To: Alabama Hazardous Cleanup
1751-W.L. Dickinson Drive
Montgomery AL 36109

NOV 1995
RECEIVED
ADEM - FO
MONTGOMERY

Attn: Dan Cooper

Lab number : 6100461
Sample number : 348-9144
Sample matrix : WATER

Report Date: 11/22/95

COLLECTION INFORMATION
Date/Time/By: 10/25/95 2:55 SMITH
Location : CA, MW-5

ADEM CENTRAL LABORATORY
- RESULTS REPORT - November 22, 1995

NOV 1995
ADEM
SPECIAL PROJECTS

Lab#	Test	Result	Units	DL*	Analdate
6100461	1,2,4-Trichlorobenzene	<10	ug/L		11/17/95
	1,2-Dichlorobenzene	<10	ug/L		11/17/95
	1,2-Diphenylhydrazine	<10	ug/L		11/17/95
	1,3-Dichlorobenzene	<10	ug/L		11/17/95
	1,4-Dichlorobenzene	<10	ug/L		11/17/95
	2,3,7,8-Tetrachlorodibe	<10	ug/L		11/17/95
	2,4,6-Trichlorophenol	<10	ug/L		11/17/95
	2,4-Dichlorophenol	<10	ug/L		11/17/95
	2,4-Dimethylphenol	<10	ug/L		11/17/95
	2,4-Dinitrophenol	<100	ug/L		11/17/95
	2,4-Dinitrotoluene	<10	ug/L		11/17/95
	2,6-Dinitrotoluene	<10	ug/L		11/17/95
	2-Chloronaphthalene	<10	ug/L		11/17/95
	2-Chlorophenol	<10	ug/L		11/17/95
	2-Methyl-4,6-dinitrophe	<50	ug/L		11/17/95
	2-Nitrophenol	<10	ug/L		11/17/95
	3,3'-Dichlorobenzidine	<10	ug/L		11/17/95
	4-Bromophenyl phenyl et	<10	ug/L		11/17/95
	4-Chloro-3-methylphenol	<10	ug/L		11/17/95
	4-Chlorophenyl phenyl e	<10	ug/L		11/17/95
	4-Nitrophenol	<10	ug/L		11/17/95

* U denotes results less than the instrument detection limit, < less than sample detection limit.

Lab#	Test	Result	Units	DL*	Analdate
6100461	Acenaphthylene	<10	ug/L		11/17/95
	Acenaphthene	<10	ug/L		11/17/95
	Anthracene	<10	ug/L		11/17/95
	Benzo(a)anthracene	<10	ug/L		11/17/95
	Benzo(a)pyrene	<10	ug/L		11/17/95
	Benzo(b)fluoranthene	<10	ug/L		11/17/95
	Butyl benzyl phthalate	<10	ug/L		11/17/95
	Bis(2-chlorethyl)ether	<10	ug/L		11/17/95
	Bis(2-chloroethoxy)meth	<10	ug/L		11/17/95
	Bis(2-chloroisopropyl)e	<10	ug/L		11/17/95
	Bis(2-ethylhexyl)phthal	<10	ug/L		11/17/95
	Benzo(g,h,i)perylene	<10	ug/L		11/17/95
	Benzidine	<10	ug/L		11/17/95
	Benzo(k)fluoranthene	<10	ug/L		11/17/95
	Chrysene	<10	ug/L		11/17/95
	Dibenzo(a,h)anthracene	<10	ug/L		11/17/95
	Dibutyl phthalate	<10	ug/L		11/17/95
	Diethyl phthalate	<10	ug/L		11/17/95
	Dimethylphthalate	<10	ug/L		11/17/95
	Di-n-octyl phthalate	<10	ug/L		11/17/95
	Fluoranthene	<10	ug/L		11/17/95
	Fluorene	<10	ug/L		11/17/95
	Hexachlorobutadiene	<10	ug/L		11/17/95
	Hexachlorobenzene	<10	ug/L		11/17/95
	Hexachlorocyclopentadie	<10	ug/L		11/17/95
	Hexachloroethane	<10	ug/L		11/17/95
	Isophorone	<10	ug/L		11/17/95
	Indeno(1,2,3-cd)pyrene	<10	ug/L		11/17/95
	Naphthalene	<10	ug/L		11/17/95
	Nitrobenzene	<10	ug/L		11/17/95
	N-nitroso-di-n-propylam	<10	ug/L		11/17/95
	N-nitrosodimethylamine	<10	ug/L		11/17/95
	N-nitrosodiphenylamine	<10	ug/L		11/17/95
	Pyrene	<10	ug/L		11/17/95
	Phenanthrene	<10	ug/L		11/17/95
	Pentachlorophenol	<10	ug/L		11/17/95
	Phenol	<10	ug/L		11/17/95

* U denotes results less than the instrument detection limit, < less than sample detection limit.

ADEM CENTRAL LABORATORY

- SAMPLE ANALYSIS REPORT -
11/03/95

To: Alabama Hazardous Cleanup
1751-W.L. Dickinson Drive
Montgomery AL 36109

Attn: Dan Cooper

Lab number : 6100457
Sample number : 348-9144
Sample matrix : WATER

Report Date: 11/03/95

COLLECTION INFORMATION
Date/Time/By: 10/25/95 8:10 SMITH
Location : CA. MW-7

ADEM CENTRAL LABORATORY
- RESULTS REPORT - November 3, 1995

Lab#	Test	Result	Units	DL*	Analdate
6100457	1.1.1.2-Tetrachloroetha	0.5000	ug/L	U	10/31/95
	1.1.1-Trichloroethane	0.5000	ug/L	U	10/31/95
	1.1.2.2-Tetrachloroetha	0.5000	ug/L	U	10/31/95
	1.1.2Trichloroethane	0.5000	ug/L	U	10/31/95
	1.1-Dichloroethane	0.5000	ug/L	U	10/31/95
	1.1-Dichloroethylene	0.5000	ug/L	U	10/31/95
	1.1-Dichloropropene	0.5000	ug/L	U	10/31/95
	1.2.3-Trichlorobenzene	0.5000	ug/L	U	10/31/95
	1.2.3-Trichloropropane	0.5000	ug/L	U	10/31/95
	1.2.4-Trichlorobenzene	0.5000	ug/L	U	10/31/95
	1.2.4-Trimethylbenzene	0.5000	ug/L	U	10/31/95
	1.2-Dicholoethane	0.5000	ug/L	U	10/31/95
	1.2-Dichloropropane	0.5000	ug/L	U	10/31/95
	1.3.5-Trimethylbenzene	0.5000	ug/L	U	10/31/95
	1.3-Dichloropropane	0.5000	ug/L	U	10/31/95
	1.3-Dichloropropene	0.5000	ug/L	U	10/31/95
	2.2-Dichloropropane	0.5000	ug/L	U	10/31/95
	Tetrachloroethylene	0.5000	ug/L	U	10/31/95
	Bromobenzene	0.5000	ug/L	U	10/31/95
	Bromochloromethane	0.5000	ug/L	U	10/31/95
	Bromodichloromethane	[illegible]	ug/L	U	10/31/95

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* U denotes results less than the instrument detection limit. [illegible] less than sample detection limit.

ACEM CENTRAL LABORATORY
- RESULTS REPORT

November 3, 1995

Lab#	Test	Result	Units	DL*	Analdate
[illegible]	Benzene	0.5000	ug/L	U	10/31/95
	Bromomethane	0.5000	ug/L	U	10/31/95
	cis-1,2-Dichloroethylen	0.5000	ug/L	U	10/31/95
	Chlorobenzene	0.5000	ug/L	U	10/31/95
	Chlorodibromomethane	0.5000	ug/L	U	10/31/95
	Chloroethane	0.5000	ug/L	U	10/31/95
	Bromoform	0.5000	ug/L	U	10/31/95
	Chloroform	0.5000	ug/L	U	10/31/95
	Chloromethane	0.5000	ug/L	U	10/31/95
	Carbon Tetrachloride	0.5000	ug/L	U	10/31/95
	Dibromomethane	0.5000	ug/L	U	10/31/95
	Dichlorodifluoromethane	0.5000	ug/L	U	10/31/95
	Dichloromethane	0.5000	ug/L	U	10/31/95
	Ethylbenzene	0.5000	ug/L	U	10/31/95
	Fluorotrichloromethane	0.5000	ug/L	U	10/31/95
	Hexachlorobutadiene	0.5000	ug/L	U	10/31/95
	Isopropylbenzene	0.5000	ug/L	U	10/31/95
	m-Dichlorobenzene	0.5000	ug/L	U	10/31/95
	m+p Xylene	0.5000	ug/L	U	10/31/95
	Naphthalene	0.9000	ug/L		10/31/95
	n-Butylbenzene	0.5000	ug/L	U	10/31/95
	n-Propylbenzene	0.5000	ug/L	U	10/31/95
	o-Chlorotoluene	0.5000	ug/L	U	10/31/95
	o-Dichlorobenzene	0.5000	ug/L	U	10/31/95
	o-Xylene	0.5000	ug/L	U	10/31/95
	p-Chlorotoluene	0.5000	ug/L	U	10/31/95
	p-Dichlorobenzene	0.5000	ug/L	U	10/31/95
	p-Isopropyltoluene	0.5000	ug/L	U	10/31/95
	Sec-butylbenzene	0.5000	ug/L	U	10/31/95
	Styrene	0.5000	ug/L	U	10/31/95
	t-1,2-Dichloroethylene	0.5000	ug/L	U	10/31/95
	Tert-butylbenzene	0.5000	ug/L	U	10/31/95
	Trichloroethylene	0.5000	ug/L	U	10/31/95
	Toluene	0.5000	ug/L	U	10/31/95
	Vinyl Chloride	0.5000	ug/L	U	10/31/95

* U denotes results less than the instrument detection limit. [illegible] less than sample detection limit.

ADEM CENTRAL LABORATORY

- SAMPLE ANALYSIS REPORT -
12/01/95

To: Alabama Hazardous Cleanup
1751-W.L. Dickinson Drive
Montgomery AL 36109

DEC 1995
RECEIVED
ADEM - FO
MONTGOMERY

Attn: Dan Cooper

Lab number : 6100462
Sample number : 348-9144
Sample matrix : WATER

Report Date: 12/01/95

COLLECTION INFORMATION
Date/Time/By: 10/25/95 3:10 SMITH
Location : CA, MW-7

ADEM CENTRAL LABORATORY
- RESULTS REPORT - December 1, 1995

Lab#	Test	Result	Units	DL*	Analdate
6100462	1,2,4-Trichlorobenzene	5.0000	ug/L	U	11/29/95
	1,2-Dichlorobenzene	5.0000	ug/L	U	11/29/95
	1,2-Diphenylhydrazine	5.0000	ug/L	U	11/29/95
	1,3-Dichlorobenzene	5.0000	ug/L	U	11/29/95
	1,4-Dichlorobenzene	5.0000	ug/L	U	11/29/95
	2,3,7,8-Tetrachlorodibe	5.0000	ug/L	U	11/29/95
	2,4,6-Trichlorophenol	5.0000	ug/L	U	11/29/95
	2,4-Dichlorophenol	5.0000	ug/L	U	11/29/95
	2,4-Dimethylphenol	5.0000	ug/L	U	11/29/95
	2,4-Dinitrophenol	50.0000	ug/L	U	11/29/95
	2,4-Dinitrotoluene	5.0000	ug/L	U	11/29/95
	2,6-Dinitrotoluene	5.0000	ug/L	U	11/29/95
	2-Chloronaphthalene	5.0000	ug/L	U	11/29/95
	2-Chlorophenol	5.0000	ug/L	U	11/29/95
	2-Methyl-4,6-dinitrophe	25.0000	ug/L	U	11/29/95
	2-Nitrophenol	5.0000	ug/L	U	11/29/95
	3,3'-Dichlorobenzidine	5.0000	ug/L	U	11/29/95
	4-Bromophenyl phenyl et	5.0000	ug/L	U	11/29/95
	4-Chloro-3-methylphenol	5.0000	ug/L	U	11/29/95
	4-Chlorophenyl phenyl e	5.0000	ug/L	U	11/29/95
	4-Nitrophenol	5.0000	ug/L	U	11/29/95

* U denotes results less than the instrument detection limit. < less than sample detection limit.

ADEM CENTRAL LABORATORY
- RESULTS REPORT - December 1, 1995

Lab#	Test	Result	Units	DL*	Analdate
6100462	Acenaphthylene	5.0000	ug/L	U	11/29/95
	Acenaphthene	5.0000	ug/L	U	11/29/95
	Anthracene	5.0000	ug/L	U	11/29/95
	Benzo(a)anthracene	5.0000	ug/L	U	11/29/95
	Benzo(a)pyrene	5.0000	ug/L	U	11/29/95
	Benzo(b)fluoranthene	5.0000	ug/L	U	11/29/95
	Butyl benzyl phthalate	5.0000	ug/L	U	11/29/95
	Bis(2-chlorethyl)ether	5.0000	ug/L	U	11/29/95
	Bis(2-chloroethoxy)meth	5.0000	ug/L	U	11/29/95
	Bis(2-chloroisopropyl)e	5.0000	ug/L	U	11/29/95
	Bis(2-ethylhexyl)phthal	5.0000	ug/L	U	11/29/95
	Benzo(g,h,i)perylene	5.0000	ug/L	U	11/29/95
	Benzidine	5.0000	ug/L	U	11/29/95
	Benzo(k)fluoranthene	5.0000	ug/L	U	11/29/95
	Chrysene	5.0000	ug/L	U	11/29/95
	Dibenzo(a,h)anthracene	5.0000	ug/L	U	11/29/95
	Dibutyl phthalate	5.0000	ug/L	U	11/29/95
	Diethyl phthalate	5.0000	ug/L	U	11/29/95
	Dimethylphthalate	5.0000	ug/L	U	11/29/95
	Di-n-octyl phthalate	5.0000	ug/L	U	11/29/95
	Fluoranthene	5.0000	ug/L	U	11/29/95
	Fluorene	5.0000	ug/L	U	11/29/95
	Hexachlorobutadiene	5.0000	ug/L	U	11/29/95
	Hexachlorobenzene	5.0000	ug/L	U	11/29/95
	Hexachlorocyclopentadie	5.0000	ug/L	U	11/29/95
	Hexachloroethane	5.0000	ug/L	U	11/29/95
	Isophorone	5.0000	ug/L	U	11/29/95
	Indeno(1,2,3-cd)pyrene	5.0000	ug/L	U	11/29/95
	Naphthalene	5.0000	ug/L	U	11/29/95
	Nitrobenzene	5.0000	ug/L	U	11/29/95
	N-nitroso-di-n-propylam	5.0000	ug/L	U	11/29/95
	N-nitrosodimethylamine	5.0000	ug/L	U	11/29/95
	N-nitrosodiphenylamine	5.0000	ug/L	U	11/29/95
	Pyrene	5.0000	ug/L	U	11/29/95
	Phenanthrene	5.0000	ug/L	U	11/29/95
	Pentachlorophenol	5.0000	ug/L	U	11/29/95
	Phenol	5.0000	ug/L	U	11/29/95

* U denotes results less than the instrument detection limit. < less than sample detection limit.

APPENDIX C

Contact Spring and Seep Sampling

Field reconnaissance prior to this program had identified groundwater discharging at the contact of the terrace deposits and the underlying Gordo Formation. These contact springs and seeps were observed along the erosional scarp adjacent to the Black Warrior River and in several locations in the banks of the tributary creeks. The spring and seep analyses were included in this program to evaluate the quality of groundwater discharge to surface water bodies and to determine if organic contaminants are reaching the receiving waters. The data also approximate groundwater quality in the vicinity of the point of discharge.

A total of six springs that exhibited sufficient flow for sample collection were mapped for sampling and analysis. Their locations are shown in Figure 2. Springs labelled D, E, and F on Figure 2 were sampled on October 29, 1985, prior to the initial round of groundwater samples and were analyzed

for the priority pollutant list of volatile organic compounds (VOC's) and the inorganic list of primary drinking water metals and fluoride. The decision was then made to expand the area of interest for this study. Therefore, springs labelled A, B, and C were sampled on November 6, 1985, prior to the second round of groundwater samples. Because of their lower flow, springs A, B, and C were only sampled and analyzed for VOC's only.

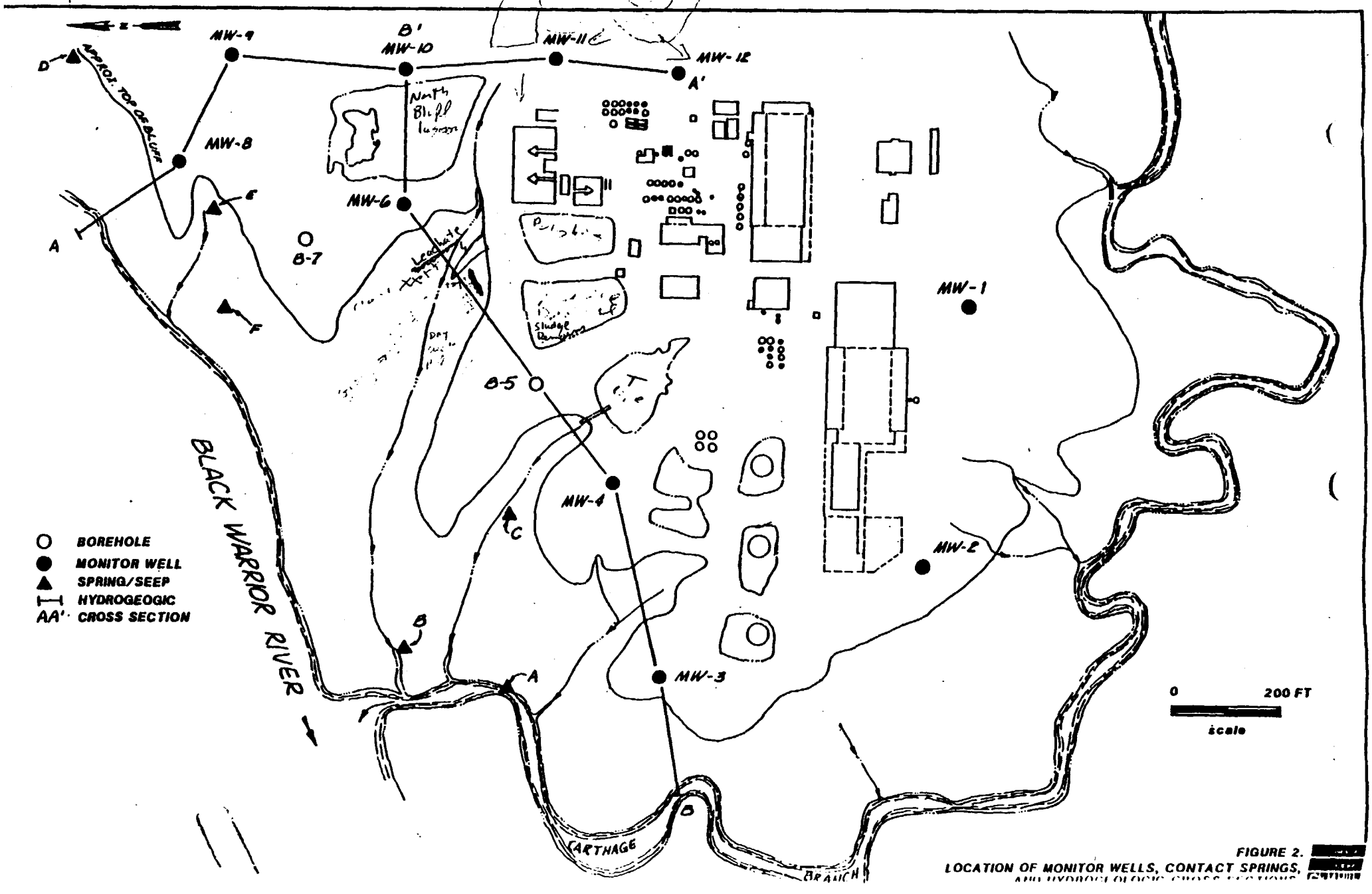


FIGURE 2.
LOCATION OF MONITOR WELLS, CONTACT SPRINGS,
AND HYDROGEOLOGIC CROSS SECTIONS

CH2M HILL

VOLATILE COMPOUNDS
GC/MS REPORT

Laboratory No.: 6781-11
Date Received: 11/11/85
Date Analyzed: 11/21/85

Client: LAWTER INTERNATIONAL

Sample Description: WATER - GROUNDWATER SEEPS A

Compounds	MDL1 PPB	Conc.2 PPB	Compounds	MDL1 PPB	Conc.3 PPB
Chloromethane	5	BMDL	Acetone	10	BMDL
Bromomethane	5	BMDL	Carbon Disulfide	5	BMDL
Vinyl Chloride	5	BMDL	2-Butanone	10	BMDL
Chloroethane	5	BMDL	Vinyl Acetate	10	BMDL
Methylene Chloride	5	BMDL	4-Methyl-2-Pentanone	10	BMDL
Trichlorofluoromethane	5	BMDL	2-Hexanone	10	BMDL
1,1-Dichloroethene	5	BMDL	Styrene	5	BMDL
1,1-Dichloroethane	5	BMDL	Total Xylenes	5	1.1*
Trans-1,2-Dichloroethene	5	BMDL			
Chloroform	5	BMDL			
1,2-Dichloroethane	5	BMDL	OTHER COMPOUNDS:**		
1,1,1-Trichloroethane	5	BMDL			
Carbon Tetrachloride	5	BMDL			
Bromodichloromethane	5	BMDL			
1,2-Dichloropropane	5	BMDL			
Trans-1,3-Dichloropropene	5	BMDL			
Trichloroethylene	5	BMDL			
Benzene	5	BMDL			
Dibromochloromethane	5	BMDL			
1,1,2-Trichloroethane	5	BMDL			
Cis-1,3-Dichloropropene	5	BMDL			
2-Chloroethyl vinyl ether	10	BMDL			
Bromoform	5	BMDL			
1,1,2,2-Tetrachloroethane	5	BMDL			
Tetrachloroethene	5	BMDL			
Toluene	5	BMDL			
Chlorobenzene	5	BMDL			
Ethyl Benzene	5	BMDL			
Acrylonitrile	100	BMDL			
Acrolein	100	BMDL			
Dichlorodifluoromethane	ND 3				

SURROGATE RECOVERIES	% Rec.
D4-1,2-Dichloroethane	95
D8-Toluene	97
1,4-Bromofluorobenzene	101

1MDL = Method Detection Limit
2BMDL = Below Method Detection Limit
3ND = Not Determined

REVIEW

Comments: * Presence indicated, but less than method detection limit.

** Tentatively identified and quantitatively estimated.

CH2M HILL

VOLATILE COMPOUNDS
GC/MS REPORT

Laboratory No.: 6781-12
Date Received: 11/11/85
Date Analyzed: 11/21/85

Client: LAWTER INTERNATIONAL

Sample Description: WATER - GROUNDWATER SEEPS B

Compounds	MDL1 PPB	Conc.2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Chloromethane	5	BMDL	Acetone	10	BMDL
Bromomethane	5	BMDL	Carbon Disulfide	5	BMDL
Vinyl Chloride	5	BMDL	2-Butanone	10	BMDL
Chloroethane	5	BMDL	Vinyl Acetate	10	BMDL
Methylene Chloride	5	7.5	4-Methyl-2-Pentanone	10	BMDL
Trichlorofluoromethane	5	BMDL	2-Hexanone	10	BMDL
1,1-Dichloroethene	5	BMDL	Styrene	5	BMDL
1,1-Dichloroethane	5	BMDL	Total Xylenes	5	BMDL
Trans-1,2-Dichloroethene	5	BMDL			
Chloroform	5	BMDL			
1,2-Dichloroethane	5	BMDL	OTHER COMPOUNDS:**		
1,1,1-Trichloroethane	5	BMDL			
Carbon Tetrachloride	5	BMDL			
Bromodichloromethane	5	BMDL			
1,2-Dichloropropane	5	BMDL			
Trans-1,3-Dichloropropene	5	BMDL			
Trichloroethylene	5	BMDL			
Benzene	5	BMDL			
Dibromochloromethane	5	BMDL			
1,1,2-Trichloroethane	5	BMDL			
Cis-1,3-Dichloropropene	5	BMDL			
2-Chloroethyl vinyl ether	10	BMDL			
Bromoform	5	BMDL			
1,1,2,2-Tetrachloroethane	5	BMDL			
Tetrachloroethene	5	BMDL			
Toluene	5	BMDL			
Chlorobenzene	5	BMDL			
Ethyl Benzene	5	BMDL			
Acrylonitrile	100	BMDL			
Acrolein	100	BMDL			
Dichlorodifluoromethane	ND 3				

SURROGATE RECOVERIES	% Rec.
D4-1,2-Dichloroethane	97
D8-Toluene	100
1,4-Bromofluorobenzene	97

1MDL = Method Detection Limit
2BMDL = Below Method Detection Limit
3ND = Not Determined

H. Cole
REVIEW

Comments: * Presence indicated, but less than method detection limit.

** Tentatively identified and quantitatively estimated.

CH2M HILL

V O L A T I L E C O M P O U N D S
GC/MS REPORT

Laboratory No.: 6781-1[illegible]
Date Received: 11/11/8[illegible]
Date Analyzed: 11/22/8[illegible]

Client: LAWTER INTERNATIONAL

Sample Description: WATER - GROUNDWATER SEEPS C

Compounds	MDL1 PPB	Conc.2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Chloromethane	5	BMDL	Acetone	10	BMDL
Bromomethane	5	BMDL	Carbon Disulfide	10	BMDL
Vinyl Chloride	5	BMDL	2-Butanone	10	BMDL
Chloroethane	5	BMDL	Vinyl Acetate	10	BMDL
Methylene Chloride	5	BMDL	4-Methyl-2-Pentanone	10	BMDL
Trichlorofluoromethane	5	BMDL	2-Hexanone	10	BMDL
1,1-Dichloroethene	5	BMDL	Styrene	5	BMDL
1,1-Dichloroethane	5	BMDL	Total Xylenes	5	BMDL
Trans-1,2-Dichloroethene	5	BMDL			
Chloroform	5	4.7*			
1,2-Dichloroethane	5	BMDL			
1,1,1-Trichloroethane	5	BMDL			
Carbon Tetrachloride	5	BMDL			
Bromodichloromethane	5	BMDL			
1,2-Dichloropropane	5	BMDL			
Trans-1,3-Dichloropropene	5	BMDL			
Trichloroethylene	5	BMDL			
Benzene	5	BMDL			
Dibromochloromethane	5	BMDL			
1,1,2-Trichloroethane	5	BMDL			
Cis-1,3-Dichloropropene	5	BMDL			
2-Chloroethyl vinyl ether	10	BMDL			
Bromoform	5	BMDL			
1,1,2,2-Tetrachloroethane	5	BMDL			
Tetrachloroethene	5	BMDL			
Toluene	5	BMDL			
Chlorobenzene	5	BMDL			
Ethyl Benzene	5	BMDL			
Acrylonitrile	100	BMDL			
Acrolein	100	BMDL			
Dichlorodifluoromethane	ND 3				

SURROGATE RECOVERIES	% Rec.
D4-1,2-Dichloroethane	93
D8-Toluene	99
1,4-Bromofluorobenzene	100

1MDL = Method Detection Limit
2BMDL = Below Method Detection Limit
3ND = Not Determined

REVIEW

Comments: * Presence indicated, but less than method detection limit.

** Tentatively identified and quantitatively estimated.

CH2M HILL

VOLATILE COMPOUNDS
GC/MS REPORT

Laboratory No.: 6750-1
Date Received: 11/1/85
Date Analyzed: 11/4/85

Client: LAWTER INTERNATIONAL

Sample Description: WATER - NORTH BLUFF AREA GROUDWATER SEEPS - MIDDLE

Compounds	MDL1 PPB	Conc.2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Chloromethane	5	BMDL	Acetone	10	BMDL
Bromomethane	5	BMDL	Carbon Disulfide	10	BMDL
Vinyl Chloride	5	BMDL	2-Butanone	10	BMDL
Chloroethane	5	BMDL	Vinyl Acetate	10	BMDL
Methylene Chloride	5	BMDL	4-Methyl-2-Pentanone	10	BMDL
Trichlorofluoromethane	5	BMDL	2-Hexanone	10	BMDL
1,1-Dichloroethene	5	BMDL	Styrene	5	37
1,1-Dichloroethane	5	BMDL	Total Xylenes	5	320
Trans-1,2-Dichloroethene	5	BMDL			
Chloroform	5	BMDL			
1,2-Dichloroethane	5	BMDL	OTHER COMPOUNDS:**		
1,1,1-Trichloroethane	5	BMDL			
Carbon Tetrachloride	5	BMDL	1,3-Cyclopentadiene		3.9
Bromodichloromethane	5	BMDL	Propyl Benzene		19
1,2-Dichloropropane	5	BMDL			
Trans-1,3-Dichloropropene	5	BMDL			
Trichloroethylene	5	BMDL			
Benzene	5	150			
Dibromochloromethane	5	BMDL			
1,1,2-Trichloroethane	5	BMDL			
Cis-1,3-Dichloropropene	5	BMDL			
2-Chloroethyl vinyl ether	10	BMDL			
Bromoform	5	BMDL			
1,1,2,2-Tetrachloroethane	5	BMDL			
Tetrachloroethene	5	BMDL			
Toluene	5	28			
Chlorobenzene	5	BMDL			
Ethyl Benzene	5	54			
Acrylonitrile	100	BMDL			
Acrolein	100	BMDL			
Dichlorodifluoromethane	ND 3				

SURROGATE RECOVERIES	% Rec.
D4-1,2-Dichloroethane	100
D8-Toluene	112
1,4-Bromofluorobenzene	99

1MDL = Method Detection Limit
2BMDL = Below Method Detection Limit
3ND = Not Determined

REVIEW

Comments: * Presence indicated, but less than method detection limit.

** Tentatively identified and quantitatively estimated.

CH2M HILL

VOLATILE COMPOUNDS
GC/MS REPORT

Laboratory No.: 6750-3
Date Received: 11/1/88
Date Analyzed: 11/4/88

Client: LAWTER INTERNATIONAL

Sample Description: WATER - NORTH BLUFF AREA GROUNDWATER SEEPS - WEST

Compounds	MDL1 PPB	Conc.2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Chloromethane	5	BMDL	Acetone	10	BMDL
Bromomethane	5	BMDL	Carbon Disulfide	10	BMDL
Vinyl Chloride	5	BMDL	2-Butanone	10	BMDL
Chloroethane	5	BMDL	Vinyl Acetate	10	BMDL
Methylene Chloride	5	BMDL	4-Methyl-2-Pentanone	10	BMDL
Trichlorofluoromethane	5	BMDL	2-Hexanone	10	BMDL
1,1-Dichloroethene	5	BMDL	Styrene	5	BMDL
1,1-Dichloroethane	5	BMDL	Total Xylenes	5	BMDL
Trans-1,2-Dichloroethene	5	BMDL			
Chloroform	5	BMDL			
1,2-Dichloroethane	5	BMDL	OTHER COMPOUNDS:**		
1,1,1-Trichloroethane	5	BMDL			
Carbon Tetrachloride	5	BMDL			
Bromodichloromethane	5	BMDL			
1,2-Dichloropropane	5	BMDL			
Trans-1,3-Dichloropropene	5	BMDL			
Trichloroethylene	5	BMDL			
Benzene	5	BMDL			
Dibromochloromethane	5	BMDL			
1,1,2-Trichloroethane	5	BMDL			
Cis-1,3-Dichloropropene	5	BMDL			
2-Chloroethyl vinyl ether	10	BMDL			
Bromoform	5	BMDL			
1,1,2,2-Tetrachloroethane	5	BMDL			
Tetrachloroethene	5	BMDL			
Toluene	5	BMDL			
Chlorobenzene	5	BMDL			
Ethyl Benzene	5	BMDL			
Acrylonitrile	100	BMDL			
Acrolein	100	BMDL			
Dichlorodifluoromethane	ND 3				

SURROGATE RECOVERIES	% Rec.
D4-1,2-Dichloroethane	102
D8-Toluene	109
1,4-Bromofluorobenzene	97

1MDL = Method Detection Limit
2BMDL = Below Method Detection Limit
3ND = Not Determined

REVIEW

Comments: * Presence indicated, but less than method detection limit.

** Tentatively identified and quantitatively estimated.

CH2M HILL

V O L A T I L E C O M P O U N D S
GC/MS REPORT

Laboratory No.: 6750BLK
Date Received: NA
Date Analyzed: 11/4/88

Client: LAWTER INTERNATIONAL

Sample Description: LABORATORY BLANK

Compounds	MDL1 PPB	Conc.2 PPB	Compounds	MDL1 PPB	Conc.2 PPB
Chloromethane	5	BMDL	Acetone	10	BMDL
Bromomethane	5	BMDL	Carbon Disulfide	10	BMDL
Vinyl Chloride	5	BMDL	2-Butanone	10	BMDL
Chloroethane	5	BMDL	Vinyl Acetate	10	BMDL
Methylene Chloride	5	BMDL	4-Methyl-2-Pentanone	10	BMDL
Trichlorofluoromethane	5	BMDL	2-Hexanone	10	BMDL
1,1-Dichloroethene	5	BMDL	Styrene	5	BMDL
1,1-Dichloroethane	5	BMDL	Total Xylenes	5	BMDL
Trans-1,2-Dichloroethene	5	BMDL			
Chloroform	5	BMDL			
1,2-Dichloroethane	5	BMDL	OTHER COMPOUNDS:**		
1,1,1-Trichloroethane	5	BMDL			
Carbon Tetrachloride	5	BMDL			
Bromodichloromethane	5	BMDL			
1,2-Dichloropropane	5	BMDL			
Trans-1,3-Dichloropropene	5	BMDL			
Trichloroethylene	5	BMDL			
Benzene	5	BMDL			
Dibromochloromethane	5	BMDL			
1,1,2-Trichloroethane	5	BMDL			
Cis-1,3-Dichloropropene	5	BMDL			
2-Chloroethyl vinyl ether	10	BMDL			
Bromoform	5	BMDL			
1,1,2,2-Tetrachloroethane	5	BMDL			
Tetrachloroethene	5	BMDL			
Toluene	5	BMDL			
Chlorobenzene	5	BMDL			
Ethyl Benzene	5	BMDL			
Acrylonitrile	100	BMDL			
Acrolein	100	BMDL			
Dichlorodifluoromethane	ND 3				

SURROGATE RECOVERIES	% Rec.
D4-1,2-Dichloroethane	94
D8-Toluene	108
1,4-Bromofluorobenzene	105

1MDL = Method Detection Limit
2BMDL = Below Method Detection Limit
3ND = Not Determined

W. Tucker
REVIEW

Comments: * Presence indicated, but less than method detection limit.

** Tentatively identified and quantitatively estimated.

Table 3(continued).- Summary of Water Quality Data — Volatile Organic Compounds, concentrations in ppm.

Compound	Well No.: 1	2	3	4	6 [1]	8 [1]	9	10 [2]	11 [1]	12 [1]	Contact Springs/Seep: A	B	C	D	E	F	Detection Limits
1,1,1-Trichloroethane				*													0.005
	*	*		*				*									
Methylethylketone (2-butanone)				*													0.010
Methylisobutylketone (4-methyl-2-pentanone)				*													0.010
1,3-Cyclopentadiene [8]															0.004		
					0.018	0.021		0.009									
Cyclohexane [8]							0.003										
Unidentified Compound [8]					1.300			0.380	0.290								
								0.260									
Totals [5]	0.000	0.013	0.000	0.023	2.710	1.469	0.061	1.953	3.809	0.859				0.000	0.612	0.000	
	0.000	0.000	0.000	0.140	1.106	2.067	0.073	1.170	2.914	0.716	0.000	0.000	0.000				

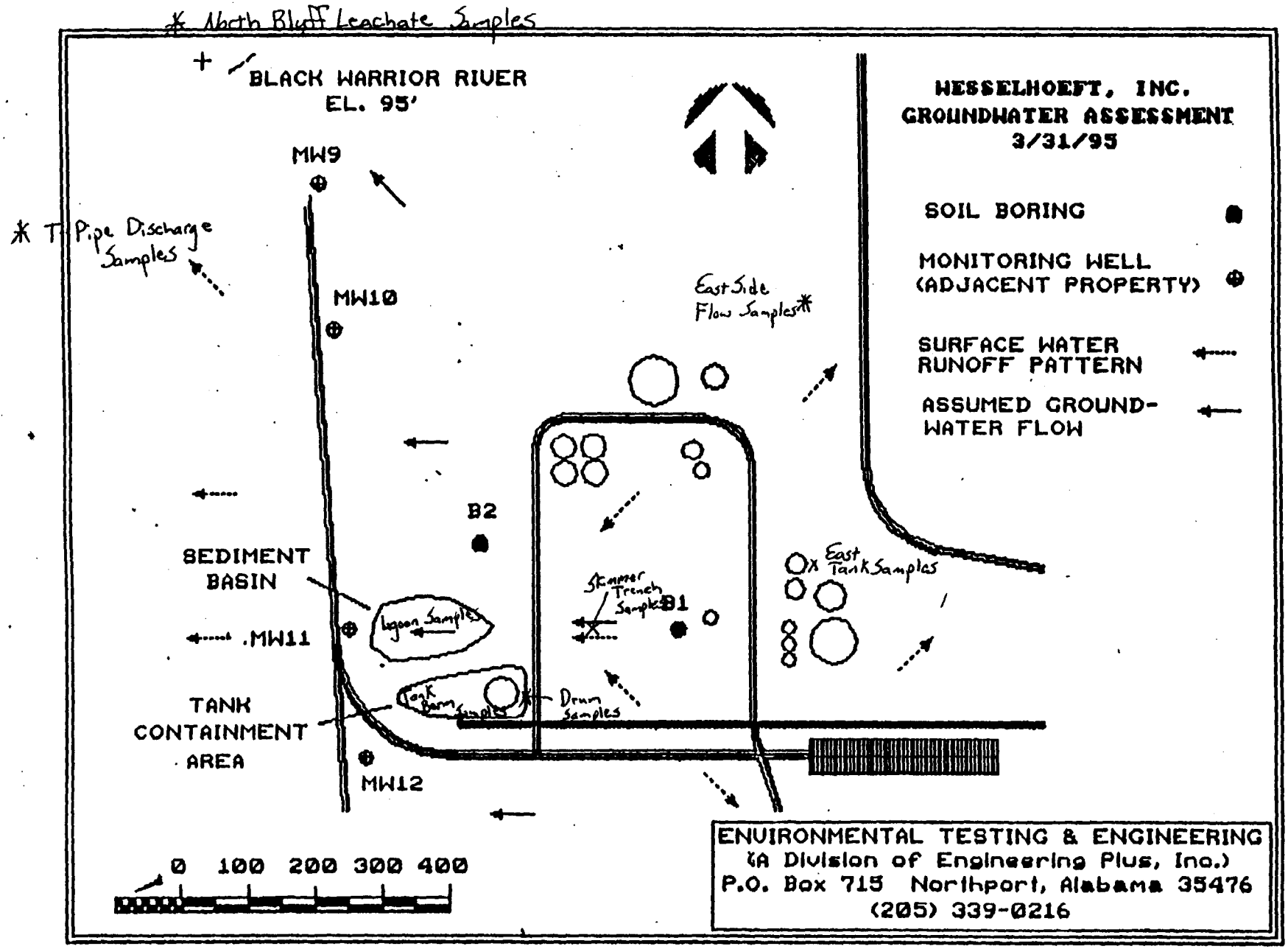
NOTES:
[1] Detection limits 5x indicated value
[2] First sample detection limit 5x indicated value
[3] blank represents compound not detected
[4] "ns" represents no sample collected
[5] "Totals" equals sum of concentrations of all VOC's
[6] Two values or symbols for each sample represent sample dates of 10-29-85 and 11-06-85
[7] Analytical accuracy is two significant figures for most samples and compounds
[8] Tentatively identified and quantitatively estimated
[9] "*" represents compounds detected at trace levels below method detection limit

Table 3.- Summary of Water Quality Data -- Volatile Organic Compounds, concentrations in ppm.

Compound	Well No.: 1	2	3	4	6 [1]	8 [1]	9	10 [2]	11 [1]	12 [1]	Contact Springs/Seep: A	B	C	D	E	F	Detection Limits
Chloroform				0.012							ns	ns	ns				0.005
				0.012					*				*	ns	ns	ns	
Benzene						0.430	0.016	0.049	0.200	*	ns	ns	ns		0.150		0.005
						0.600	0.018	0.037	0.160	*				ns	ns	ns	
1,1,2-Trichloroethane				0.011							ns	ns	ns				0.005
				0.066										ns	ns	ns	
Toluene						0.065		0.054	0.099	0.033	ns	ns	ns		0.028		0.005
						0.110	*	0.034	0.074	0.029				ns	ns	ns	
Ethyl Benzene					0.086	*	*	0.190	0.390	0.076	ns	ns	ns		0.054		0.005
					0.063	0.120	*	0.120	0.310	0.072			*	ns	ns	ns	
Acetone		0.013			0.130						ns	ns	ns				0.010
				0.047	0.160					0.074				ns	ns	ns	
Butylmethylketone (2-hexanone)											ns	ns	ns				0.010
				0.015										ns	ns	ns	
Styrene					0.150	0.064		0.160	0.250	0.100	ns	ns	ns		0.037		0.005
					0.110	0.170		0.080	0.210	0.082				ns	ns	ns	
Total Xylenes					0.950	0.910	0.045	1.000	2.400	0.650	ns	ns	ns		0.320		0.005
					0.660	1.000	0.048	0.520	1.900	0.410	*			ns	ns	ns	
Propyl Benzene [7]					0.094			0.120	0.180						0.019		
					0.095	0.046	0.005	0.110	0.260	0.049							

NOTES:
[1] Detection limits 5x indicated value
[2] First sample detection limit 5x indicated value
[3] blank represents compound not detected
[4] "ns" represents no sample collected
[5] Two values or symbols for each sample represent sample dates of 10-29-85 and 11-06-85
[6] Analytical accuracy is two significant figures for most samples and compounds
[7] Tentatively identified and quantitatively estimated
[8] "*" represents compounds detected at trace levels below method detection limit

APPENDIX D


* North Bluff Leachate Samples
BLACK WARRIOR RIVER
EL. 95'
MW9
* T Pipe Discharge Samples
MW10
East Side Flow Samples*
B2
SEDIMENT BASIN
Lagoon Samples
MW11
Skimmer Trench Samples
B1
East Tank Samples
TANK CONTAINMENT AREA
Tank Berm Samples
Drum Samples
MW12
0 100 200 300 400
WESSELHOEFT, INC.
GROUNDWATER ASSESSMENT
3/31/95
SOIL BORING
MONITORING WELL (ADJACENT PROPERTY)
SURFACE WATER RUNOFF PATTERN
ASSUMED GROUND-WATER FLOW
ENVIRONMENTAL TESTING & ENGINEERING
(A Division of Engineering Plus, Inc.)
P.O. Box 715 Northport, Alabama 35476
(205) 339-0216

ADEM CENTRAL LABORATORY

- SAMPLE ANALYSIS REPORT -
10/04/95

To: CERCLA Program
1751 Cong. W.L.Dickinson Drive
Montgomery AL 36109

OCT 1995
RECEIVED
ADEM - FO
MONTGOMERY

Attn:

Lab number : 5109202
Sample number : 521-6243
Sample matrix : WATER

Report Date: 10/04/95

COLLECTION INFORMATION
Date/Time/By: 09/26/95 2:10 STAMPS
Location : LAGOON LAGVS CRACKER ASPH

ADEM CENTRAL LABORATORY
- RESULTS REPORT - October 4, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109202	1,1,1,2-Tetrachloroetha	5.0000	ug/L	U	10/02/95
	1,1,1-Trichloroethane	5.0000	ug/L	U	10/02/95
	1,1,2,2-Tetrachloroetha	5.0000	ug/L	U	10/02/95
	1,1,2Trichloroethane	5.0000	ug/L	U	10/02/95
	1,1-Dichloroethane	5.0000	ug/L	U	10/02/95
	1,1-Dichloroethylene	5.0000	ug/L	U	10/02/95
	1,1-Dichloropropene	5.0000	ug/L	U	10/02/95
	1,2,3-Trichlorobenzene	5.0000	ug/L	U	10/02/95
	1,2,3-Trichloropropane	5.0000	ug/L	U	10/02/95
	1,2,4-Trichlorobenzene	5.0000	ug/L	U	10/02/95
	1,2,4-Trimethylbenzene	5.0000	ug/L	U	10/02/95
	1,2-Dicholoethane	5.0000	ug/L	U	10/02/95
	1,2-Dichloropropane	5.0000	ug/L	U	10/02/95
	1,3,5-Trimethylbenzene	5.0000	ug/L	U	10/02/95
	1,3-Dichloropropane	5.0000	ug/L	U	10/02/95
	1,3-Dichloropropene	5.0000	ug/L	U	10/02/95
	2,2-Dichloropropane	5.0000	ug/L	U	10/02/95
	Tetrachloroethylene	5.0000	ug/L	U	10/02/95
	Bromobenzene	5.0000	ug/L	U	10/02/95
	Bromochloromethane	5.0000	ug/L	U	10/02/95
	Bromodichloromethane	5.0000	ug/L	U	10/02/95

OCT 1995
ADEM
SPECIAL PROJECTS

* U denotes results less than the instrument detection limit. < less than sample detection limit.

COPY

ADEM CENTRAL LABORATORY
- RESULTS REPORT - October 4, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109202	Benzene	5.0000	ug/L	U	10/02/95
	Bromomethane	5.0000	ug/L	U	10/02/95
	cis-1,2-Dichloroethylen	5.0000	ug/L	U	10/02/95
	Chlorobenzene	5.0000	ug/L	U	10/02/95
	Chlorodibromomethane	5.0000	ug/L	U	10/02/95
	Chloroethane	5.0000	ug/L	U	10/02/95
	Bromoform	5.0000	ug/L	U	10/02/95
	Chloroform	5.0000	ug/L	U	10/02/95
	Chloromethane	5.0000	ug/L	U	10/02/95
	Carbon Tetrachloride	5.0000	ug/L	U	10/02/95
	Dibromomethane	5.0000	ug/L	U	10/02/95
	Dichlorodifluoromethane	5.0000	ug/L	U	10/02/95
	Dichloromethane	5.0000	ug/L	U	10/02/95
	Ethylbenzene	5.0000	ug/L	U	10/02/95
	Fluorotrichloromethane	5.0000	ug/L	U	10/02/95
	Hexachlorobutadiene	5.0000	ug/L	U	10/02/95
	Isopropylbenzene	5.0000	ug/L	U	10/02/95
	m-Dichlorobenzene	5.0000	ug/L	U	10/02/95
	m+p Xylene	5.0000	ug/L	U	10/02/95
	Naphthalene	5.0000	ug/L	U	10/02/95
	n-Butylbenzene	5.0000	ug/L	U	10/02/95
	n-Propylbenzene	5.0000	ug/L	U	10/02/95
	o-Chlorotoluene	5.0000	ug/L	U	10/02/95
	o-Dichlorobenzene	5.0000	ug/L	U	10/02/95
	o-Xylene	5.0000	ug/L	U	10/02/95
	p-Chlorotoluene	5.0000	ug/L	U	10/02/95
	p-Dichlorobenzene	5.0000	ug/L	U	10/02/95
	p-Isopropyltoluene	5.0000	ug/L	U	10/02/95
	Secbutylbenzene	5.0000	ug/L	U	10/02/95
	Styrene	5.0000	ug/L	U	10/02/95
	t-1,2-Dichloroethylene	5.0000	ug/L	U	10/02/95
	Tertbutylbenzene	5.0000	ug/L	U	10/02/95
	Trichloroethylene	5.0000	ug/L	U	10/02/95
	Toluene	5.0000	ug/L	U	10/02/95
	Vinyl Chloride	5.0000	ug/L	U	10/02/95

* U denotes results less than the instrument detection limit. < less than sample detection limit.

ADEM CENTRAL LABORATORY

- SAMPLE ANALYSIS REPORT -
11/16/95

To: CERCLA Program
1751 Cong. W.L.Dickinson Drive
Montgomery AL 36109

NOV 1995
RECEIVED
ADEM - FO
MONTGOMERY

Attn:

Lab number : 5109208
Sample number : 521-6243
Sample matrix : WATER

Report Date: 11/16/95

COLLECTION INFORMATION
Date/Time/By: 09/26/95 2:10 STAMPS
Location : LAGOON LAG WS-CRACKER ASP

ADEM CENTRAL LABORATORY
- RESULTS REPORT - November 16, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109208	1,2,4-Trichlorobenzene	<50	ug/L		11/03/95
	1,2-Dichlorobenzene	<50	ug/L		11/03/95
	1,2-Diphenylhydrazine	<50	ug/L		11/03/95
	1,3-Dichlorobenzene	<50	ug/L		11/03/95
	1,4-Dichlorobenzene	<50	ug/L		11/03/95
	2,3,7,8-Tetrachlorodibe	<50	ug/L		11/03/95
	2,4,6-Trichlorophenol	<50	ug/L		11/03/95
	2,4-Dichlorophenol	<50	ug/L		11/03/95
	2,4-Dimethylphenol	<50	ug/L		11/03/95
	2,4-Dinitrophenol	<500	ug/L		11/03/95
	2,4-Dinitrotoluene	<50	ug/L		11/03/95
	2,6-Dinitrotoluene	<50	ug/L		11/03/95
	2-Chloronaphthalene	<50	ug/L		11/03/95
	2-Chlorophenol	<50	ug/L		11/03/95
	2-Methyl-4,6-dinitrophe	<250	ug/L		11/03/95
	2-Nitrophenol	<50	ug/L		11/03/95
	3,3'-Dichlorobenzidine	<50	ug/L		11/03/95
	4-Bromophenyl phenyl et	<50	ug/L		11/03/95
	4-Chloro-3-methylphenol	<50	ug/L		11/03/95
	4-Chlorophenyl phenyl e	<50	ug/L		11/03/95
	4-Nitrophenol	<50	ug/L		11/03/95

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ADEM
SPECIAL PROJECTS

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* U denotes results less than the instrument detection limit, < less than sample detection limit.

ADEM CENTRAL LABORATORY
- RESULTS REPORT - November 16, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109208	Acenaphthylene	<50	ug/L		11/03/95
	Acenaphthene	<50	ug/L		11/03/95
	Anthracene	<50	ug/L		11/03/95
	Benzo(a)anthracene	<50	ug/L		11/03/95
	Benzo(a)pyrene	<50	ug/L		11/03/95
	Benzo(b)fluoranthene	<50	ug/L		11/03/95
	Butyl benzyl phthalate	<50	ug/L		11/03/95
	Bis(2-chlorethyl)ether	<50	ug/L		11/03/95
	Bis(2-chloroethoxy)meth	<50	ug/L		11/03/95
	Bis(2-chloroisopropyl)e	<50	ug/L		11/03/95
	Bis(2-ethylhexyl)phthal	<50	ug/L		11/03/95
	Benzo(g,h,i)perylene	<50	ug/L		11/03/95
	Benzidine	<50	ug/L		11/03/95
	Benzo(k)fluoranthene	<50	ug/L		11/03/95
	Chrysene	<50	ug/L		11/03/95
	Dibenzo(a,h)anthracene	<50	ug/L		11/03/95
	Dibutyl phthalate	<50	ug/L		11/03/95
	Diethyl phthalate	<50	ug/L		11/03/95
	Dimethylphthalate	<50	ug/L		11/03/95
	Di-n-octyl phthalate	<50	ug/L		11/03/95
	Fluoranthene	<50	ug/L		11/03/95
	Fluorene	<50	ug/L		11/03/95
	Hexachlorobutadiene	<50	ug/L		11/03/95
	Hexachlorobenzene	<50	ug/L		11/03/95
	Hexachlorocyclopentadie	<50	ug/L		11/03/95
	Hexachloroethane	<50	ug/L		11/03/95
	Isophorone	<50	ug/L		11/03/95
	Indeno(1,2,3-cd)pyrene	<50	ug/L		11/03/95
	Naphthalene	<50	ug/L		11/03/95
	Nitrobenzene	<50	ug/L		11/03/95
	N-nitroso-di-n-propylam	<50	ug/L		11/03/95
	N-nitrosodimethylamine	<50	ug/L		11/03/95
	N-nitrosodiphenylamine	<50	ug/L		11/03/95
	Pyrene	<50	ug/L		11/03/95
	Phenanthrene	<50	ug/L		11/03/95
	Pentachlorophenol	<50	ug/L		11/03/95
	Phenol	<50	ug/L		11/03/95

* U denotes results less than the instrument detection limit, < less than sample detection limit.

ADEM CENTRAL LABORATORY

- SAMPLE ANALYSIS REPORT -
10/04/95

To: CERCLA Program
1751 Cong. W.L.Dickinson Drive
Montgomery AL 36109

OCT 1995
RECEIVED
ADEM - FO
MONTGOMERY

Attn:

Lab number : 5109199
Sample number : 521-6243
Sample matrix : WATER

Report Date: 10/04/95

COLLECTION INFORMATION
Date/Time/By: 09/26/95 2:25 STAMPS
Location : WEST BERM DRUM DUP

ADEM CENTRAL LABORATORY
- RESULTS REPORT - October 4, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109199	1,1,1,2-Tetrachloroetha	<22	ug/L		10/02/95
	1,1,1-Trichloroethane	<22	ug/L		10/02/95
	1,1,2,2-Tetrachloroetha	<22	ug/L		10/02/95
	1,1,2Trichloroethane	<22	ug/L		10/02/95
	1,1-Dichloroethane	<22	ug/L		10/02/95
	1,1-Dichloroethylene	<22	ug/L		10/02/95
	1,1-Dichloropropene	<22	ug/L		10/02/95
	1,2,3-Trichlorobenzene	<22	ug/L		10/02/95
	1,2,3-Trichloropropane	<22	ug/L		10/02/95
	1,2,4-Trichlorobenzene	<22	ug/L		10/02/95
	1,2,4-Trimethylbenzene	1055.000	ug/L		10/02/95
		0			
	1,2-Dicholoethane	<22	ug/L		10/02/95
	1,2-Dichloropropane	<22	ug/L		10/02/95
	1,3,5-Trimethylbenzene	313.7200	ug/L		10/02/95
	1,3-Dichloropropane	<22	ug/L		10/02/95
	1,3-Dichloropropene	<22	ug/L		10/02/95
	2,2-Dichloropropane	<22	ug/L		10/02/95
	Tetrachloroethylene	<22	ug/L		10/02/95
	Bromobenzene	<22	ug/L		10/02/95
	Bromochloromethane	<22	ug/L		10/02/95

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SPECIAL PROJECTS

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* U denotes results less than the instrument detection limit. < less than sample detection limit.

ADEM CENTRAL LABORATORY
- RESULTS REPORT - October 4, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109199	Bromodichloromethane	<22	ug/L		10/02/95
	Benzene	<22	ug/L		10/02/95
	Bromomethane	<22	ug/L		10/02/95
	cis-1,2-Dichloroethylen	<22	ug/L		10/02/95
	Chlorobenzene	<22	ug/L		10/02/95
	Chlorodibromomethane	<22	ug/L		10/02/95
	Chloroethane	<22	ug/L		10/02/95
	Bromoform	<22	ug/L		10/02/95
	Chloroform	<22	ug/L		10/02/95
	Chloromethane	<22	ug/L		10/02/95
	Carbon Tetrachloride	<22	ug/L		10/02/95
	Dibromomethane	<22	ug/L		10/02/95
	Dichlorodifluoromethane	<22	ug/L		10/02/95
	Dichloromethane	<22	ug/L		10/02/95
	Ethylbenzene	<22	ug/L		10/02/95
	Fluorotrichloromethane	<22	ug/L		10/02/95
	Hexachlorobutadiene	<22	ug/L		10/02/95
	Isopropylbenzene	<22	ug/L		10/02/95
	m-Dichlorobenzene	32.5600	ug/L		10/02/95
	m+p Xylene	1119.400	ug/L		10/02/95
		0			
	Naphthalene	833.0000	ug/L		10/02/95
	n-Butylbenzene	<22	ug/L		10/02/95
	n-Propylbenzene	<22	ug/L		10/02/95
	o-Chlorotoluene	<22	ug/L		10/02/95
	o-Dichlorobenzene	<22	ug/L		10/02/95
	o-Xylene	1029.000	ug/L		10/02/95
		0			
	p-Chlorotoluene	<22	ug/L		10/02/95
	p-Dichlorobenzene	<22	ug/L		10/02/95
	p-Isopropyltoluene	<22	ug/L		10/02/95
	Secbutylbenzene	<22	ug/L		10/02/95
	Styrene	<22	ug/L		10/02/95
	t-1,2-Dichloroethylene	<22	ug/L		10/02/95
	Tertbutylbenzene	<22	ug/L		10/02/95
	Trichloroethylene	<22	ug/L		10/02/95
	Toluene	<22	ug/L		10/02/95
	Vinyl Chloride	<22	ug/L		10/02/95

* U denotes results less than the instrument detection limit. < less than sample detection limit.

ADEM CENTRAL LABORATORY

- SAMPLE ANALYSIS REPORT -
10/31/95

To: CERCLA Program
1751 Cong. W.L.Dickinson Drive
Montgomery AL 36109

OCT 19 95

Attn:

Lab number : 5109204
Sample number : 521-6243
Sample matrix : WATER

Report Date: 10/31/95

COLLECTION INFORMATION
Date/Time/By: 09/26/95 2:25 STAMPS
Location : DRUM-WEST BERM

ADEM CENTRAL LABORATORY
- RESULTS REPORT - October 31, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109204	1,2,4-Trichlorobenzene	<250	ug/L		10/19/95
	1,2-Dichlorobenzene	<250	ug/L		10/19/95
	1,2-Diphenylhydrazine	<250	ug/L		10/19/95
	1,3-Dichlorobenzene	<250	ug/L		10/19/95
	1,4-Dichlorobenzene	<250	ug/L		10/19/95
	2,3,7,8-Tetrachlorodibe	<250	ug/L		10/19/95
	2,4,6-Trichlorophenol	<250	ug/L		10/19/95
	2,4-Dichlorophenol	<250	ug/L		10/19/95
	2,4-Dimethylphenol	<250	ug/L		10/19/95
	2,4-Dinitrophenol	<2500	ug/L		10/19/95
	2,4-Dinitrotoluene	<250	ug/L		10/19/95
	2,6-Dinitrotoluene	<250	ug/L		10/19/95
	2-Chloronaphthalene	<250	ug/L		10/19/95
	2-Chlorophenol	<250	ug/L		10/19/95
	2-Methyl-4,6-dinitrophe	<1250	ug/L		10/19/95
	2-Nitrophenol	<250	ug/L		10/19/95
	3,3'-Dichlorobenzidine	<250	ug/L		10/19/95
	4-Bromophenyl phenyl et	<250	ug/L		10/19/95
	4-Chloro-3-methylphenol	<250	ug/L		10/19/95
	4-Chlorophenyl phenyl e	<250	ug/L		10/19/95
	4-Nitrophenol	<250	ug/L		10/19/95

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* U denotes results less than the instrument detection limit, < less than sample detection limit.

ADEM CENTRAL LABORATORY
- RESULTS REPORT - October 31, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109204	Acenaphthylene	<250	ug/L		10/19/95
	Acenaphthene	<250	ug/L		10/19/95
	Anthracene	<250	ug/L		10/19/95
	Benzo(a)anthracene	<250	ug/L		10/19/95
	Benzo(a)pyrene	<250	ug/L		10/19/95
	Benzo(b)fluoranthene	<250	ug/L		10/19/95
	Butyl benzyl phthalate	<250	ug/L		10/19/95
	Bis(2-chlorethyl)ether	<250	ug/L		10/19/95
	Bis(2-chloroethoxy)meth	<250	ug/L		10/19/95
	Bis(2-chloroisopropyl)e	<250	ug/L		10/19/95
	Bis(2-ethylhexyl)phthal	<250	ug/L		10/19/95
	Benzo(g,h,i)perylene	<250	ug/L		10/19/95
	Benzidine	<250	ug/L		10/19/95
	Benzo(k)fluoranthene	<250	ug/L		10/19/95
	Chrysene	<250	ug/L		10/19/95
	Dibenzo(a,h)anthracene	<250	ug/L		10/19/95
	Dibutyl phthalate	<250	ug/L		10/19/95
	Diethyl phthalate	<250	ug/L		10/19/95
	Dimethylphthalate	<250	ug/L		10/19/95
	Di-n-octyl phthalate	<250	ug/L		10/19/95
	Fluoranthene	<250	ug/L		10/19/95
	Fluorene	<250	ug/L		10/19/95
	Hexachlorobutadiene	<250	ug/L		10/19/95
	Hexachlorobenzene	<250	ug/L		10/19/95
	Hexachlorocyclopentadie	<250	ug/L		10/19/95
	Hexachloroethane	<250	ug/L		10/19/95
	Isophorone	<250	ug/L		10/19/95
	Indeno(1,2,3-cd)pyrene	<250	ug/L		10/19/95
	Naphthalene	1013.100	ug/L		10/19/95
		0			
	Nitrobenzene	<250	ug/L		10/19/95
	N-nitroso-di-n-propylam	<250	ug/L		10/19/95
	N-nitrosodimethylamine	<250	ug/L		10/19/95
	N-nitrosodiphenylamine	<250	ug/L		10/19/95
	Pyrene	<250	ug/L		10/19/95
	Phenanthrene	<250	ug/L		10/19/95
	Pentachlorophenol	<250	ug/L		10/19/95
	Phenol	<250	ug/L		10/19/95

* U denotes results less than the instrument detection limit. < less than sample detection limit.

ADEM CENTRAL LABORATORY

- SAMPLE ANALYSIS REPORT -
10/04/95

To: CERCLA Program
1751 Cong. W.L.Dickinson Drive
Montgomery AL 36109

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MONTGOMERY

Attn:

Lab number : 5109203
Sample number : 521-6243
Sample matrix : WATER

Report Date: 10/04/95

COLLECTION INFORMATION
Date/Time/By: 09/26/95 1:20 STAMPE
Location : TANK BERM TB VS CRACKER A

ADEM CENTRAL LABORATORY
- RESULTS REPORT - October 4, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109203	1,1,1,2-Tetrachloroetha	5.0000	ug/L	U	10/02/95
	1,1,1-Trichloroethane	5.0000	ug/L	U	10/02/95
	1,1,2,2-Tetrachloroetha	5.0000	ug/L	U	10/02/95
	1,1,2Trichloroethane	5.0000	ug/L	U	10/02/95
	1,1-Dichloroethane	5.0000	ug/L	U	10/02/95
	1,1-Dichloroethylene	5.0000	ug/L	U	10/02/95
	1,1-Dichloropropene	5.0000	ug/L	U	10/02/95
	1,2,3-Trichlorobenzene	5.0000	ug/L	U	10/02/95
	1,2,3-Trichloropropane	5.0000	ug/L	U	10/02/95
	1,2,4-Trichlorobenzene	5.0000	ug/L	U	10/02/95
	1,2,4-Trimethylbenzene	5.0000	ug/L	U	10/02/95
	1,2-Dicholoethane	5.0000	ug/L	U	10/02/95
	1,2-Dichloropropane	5.0000	ug/L	U	10/02/95
	1,3,5-Trimethylbenzene	5.0000	ug/L	U	10/02/95
	1,3-Dichloropropane	5.0000	ug/L	U	10/02/95
	1,3-Dichloropropene	5.0000	ug/L	U	10/02/95
	2,2-Dichloropropane	5.0000	ug/L	U	10/02/95
	Tetrachloroethylene	5.0000	ug/L	U	10/02/95
	Bromobenzene	5.0000	ug/L	U	10/02/95
	Bromochloromethane	5.0000	ug/L	U	10/02/95
	Bromodichloromethane	5.0000	ug/L	U	10/02/95

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* U denotes results less than the instrument detection limit. < less than sample detection limit.

ADEM CENTRAL LABORATORY
- RESULTS REPORT -

October 4, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109208	Benzene	5.0000	ug/L	U	10/02/95
	Bromomethane	5.0000	ug/L	U	10/02/95
	cis-1,2-Dichloroethylen	5.0000	ug/L	U	10/02/95
	Chlorobenzene	5.0000	ug/L	U	10/02/95
	Chlorodibromomethane	5.0000	ug/L	U	10/02/95
	Chloroethane	5.0000	ug/L	U	10/02/95
	Bromoform	5.0000	ug/L	U	10/02/95
	Chloroform	5.0000	ug/L	U	10/02/95
	Chloromethane	5.0000	ug/L	U	10/02/95
	Carbon Tetrachloride	5.0000	ug/L	U	10/02/95
	Dibromomethane	5.0000	ug/L	U	10/02/95
	Dichlorodifluoromethane	5.0000	ug/L	U	10/02/95
	Dichloromethane	5.0000	ug/L	U	10/02/95
	Ethylbenzene	5.0000	ug/L	U	10/02/95
	Fluorotrichloromethane	5.0000	ug/L	U	10/02/95
	Hexachlorobutadiene	5.0000	ug/L	U	10/02/95
	Isopropylbenzene	5.0000	ug/L	U	10/02/95
	m-Dichlorobenzene	5.0000	ug/L	U	10/02/95
	m+p Xylene	5.0000	ug/L	U	10/02/95
	Naphthalene	5.0000	ug/L	U	10/02/95
	n-Butylbenzene	5.0000	ug/L	U	10/02/95
	n-Propylbenzene	5.0000	ug/L	U	10/02/95
	o-Chlorotoluene	5.0000	ug/L	U	10/02/95
	o-Dichlorobenzene	5.0000	ug/L	U	10/02/95
	o-Xylene	5.0000	ug/L	U	10/02/95
	p-Chlorotoluene	5.0000	ug/L	U	10/02/95
	p-Dichlorobenzene	5.0000	ug/L	U	10/02/95
	p-Isopropyltoluene	5.0000	ug/L	U	10/02/95
	Sec-butylbenzene	5.0000	ug/L	U	10/02/95
	Styrene	5.0000	ug/L	U	10/02/95
	t-1,2-Dichloroethylene	5.0000	ug/L	U	10/02/95
	Tertbutylbenzene	5.0000	ug/L	U	10/02/95
	Trichloroethylene	5.0000	ug/L	U	10/02/95
	Toluene	5.0000	ug/L	U	10/02/95
	Vinyl Chloride	5.0000	ug/L	U	10/02/95

* U denotes results less than the instrument detection limit. < less than sample detection limit.

ADEM CENTRAL LABORATORY

- SAMPLE ANALYSIS REPORT -
11/03/95

To: CERCLA Program
1751 Cong. W.L.Dickinson Drive
Montgomery AL 36109

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ADEM - FC
MONTGOMERY

Attn:

Lab number : 5109206
Sample number : 521-6243
Sample matrix : WATER

Report Date: 11/03/95

COLLECTION INFORMATION
Date/Time/By: 09/26/95 2:20 STAMPS
Location : TANK BERM TB WS

ADEM CENTRAL LABORATORY
- RESULTS REPORT - November 3. 1995

Lab#	Test	Result	Units	DL*	Analdate
5109206	1,2,4-Trichlorobenzene	<25	ug/L		10/17/95
	1,2-Dichlorobenzene	<25	ug/L		10/17/95
	1,2-Diphenylhydrazine	<25	ug/L		10/17/95
	1,3-Dichlorobenzene	<25	ug/L		10/17/95
	1,4-Dichlorobenzene	<25	ug/L		10/17/95
	2,3,7,8-Tetrachlorodibe	<25	ug/L		10/17/95
	2,4,6-Trichlorophenol	<25	ug/L		10/17/95
	2,4-Dichlorophenol	<25	ug/L		10/17/95
	2,4-Dimethylphenol	<25	ug/L		10/17/95
	2,4-Dinitrophenol	<250	ug/L		10/17/95
	2,4-Dinitrotoluene	<25	ug/L		10/17/95
	2,6-Dinitrotoluene	<25	ug/L		10/17/95
	2-Chloronaphthalene	<25	ug/L		10/17/95
	2-Chlorophenol	<25	ug/L		10/17/95
	2-Methyl-4,6-dinitrophe	<125	ug/L		10/17/95
	2-Nitrophenol	<25	ug/L		10/17/95
	3,3'-Dichlorobenzidine	<25	ug/L		10/17/95
	4-Bromophenyl phenyl et	<25	ug/L		10/17/95
	4-Chloro-3-methylphenol	<25	ug/L		10/17/95
	4-Chlorophenyl phenyl e	<25	ug/L		10/17/95
	4-Nitrophenol	<25	ug/L		10/17/95

NOV 1995
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SPECIAL PROJECTS

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* U denotes results less than the instrument detection limit. < less than sample detection limit.

ADEM CENTRAL LABORATORY
- RESULTS REPORT - November 3, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109206	Acenaphthylene	<25	ug/L		10/17/95
	Acenaphthene	<25	ug/L		10/17/95
	Anthracene	<25	ug/L		10/17/95
	Benzo(a)anthracene	<25	ug/L		10/17/95
	Benzo(a)pyrene	<25	ug/L		10/17/95
	Benzo(b)fluoranthene	<25	ug/L		10/17/95
	Butyl benzyl phthalate	<25	ug/L		10/17/95
	Bis(2-chlorethyl)ether	<25	ug/L		10/17/95
	Bis(2-chloroethoxy)meth	<25	ug/L		10/17/95
	Bis(2-chloroisopropyl)e	<25	ug/L		10/17/95
	Bis(2-ethylhexyl)phthal	<25	ug/L		10/17/95
	Benzo(g,h,i)perylene	<25	ug/L		10/17/95
	Benzidine	<25	ug/L		10/17/95
	Benzo(k)fluoranthene	<25	ug/L		10/17/95
	Chrysene	<25	ug/L		10/17/95
	Dibenzo(a,h)anthracene	<25	ug/L		10/17/95
	Dibutyl phthalate	<25	ug/L		10/17/95
	Diethyl phthalate	<25	ug/L		10/17/95
	Dimethylphthalate	<25	ug/L		10/17/95
	Di-n-octyl phthalate	<25	ug/L		10/17/95
	Fluoranthene	<25	ug/L		10/17/95
	Fluorene	<25	ug/L		10/17/95
	Hexachlorobutadiene	<25	ug/L		10/17/95
	Hexachlorobenzene	<25	ug/L		10/17/95
	Hexachlorocyclopentadie	<25	ug/L		10/17/95
	Hexachloroethane	<25	ug/L		10/17/95
	Isophorone	<25	ug/L		10/17/95
	Indeno(1,2,3-cd)pyrene	<25	ug/L		10/17/95
	Naphthalene	<25	ug/L		10/17/95
	Nitrobenzene	<25	ug/L		10/17/95
	N-nitroso-di-n-propylam	<25	ug/L		10/17/95
	N-nitrosodimethylamine	<25	ug/L		10/17/95
	N-nitrosodiphenylamine	<25	ug/L		10/17/95
	Pyrene	<25	ug/L		10/17/95
	Phenanthrene	<25	ug/L		10/17/95
	Pentachlorophenol	<25	ug/L		10/17/95
	Phenol	<25	ug/L		10/17/95

* U denotes results less than the instrument detection limit. < less than sample detection limit.

ADEM CENTRAL LABORATORY

- SAMPLE ANALYSIS REPORT -
10/31/95

To: CERCLA Program
1751 Cong. W.L.Dickinson Drive
Montgomery AL 36109

Attn:

Lab number : 5109207
Sample number : 521-6243
Sample matrix : WATER

Report Date: 10/31/95

COLLECTION INFORMATION
Date/Time/By: 09/27/95 3:45 STAMPS
Location : T PIPE DISCHARGE-LAWTER

ADEM CENTRAL LABORATORY
- RESULTS REPORT - October 31, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109207	1,2,4-Trichlorobenzene	<125	ug/L		10/29/95
	1,2-Dichlorobenzene	<125	ug/L		10/29/95
	1,2-Diphenylhydrazine	<125	ug/L		10/29/95
	1,3-Dichlorobenzene	<125	ug/L		10/29/95
	1,4-Dichlorobenzene	<125	ug/L		10/29/95
	2,3,7,8-Tetrachlorodibe	<125	ug/L		10/29/95
	2,4,6-Trichlorophenol	<125	ug/L		10/29/95
	2,4-Dichlorophenol	<125	ug/L		10/29/95
	2,4-Dimethylphenol	<125	ug/L		10/29/95
	2,4-Dinitrophenol	<1250	ug/L		10/29/95
	2,4-Dinitrotoluene	<125	ug/L		10/29/95
	2,6-Dinitrotoluene	<125	ug/L		10/29/95
	2-Chloronaphthalene	<125	ug/L		10/29/95
	2-Chlorophenol	<125	ug/L		10/29/95
	2-Methyl-4,6-dinitrophe	<625	ug/L		10/29/95
	2-Nitrophenol	<125	ug/L		10/29/95
	3,3'-Dichlorobenzidine	<125	ug/L		10/29/95
	4-Bromophenyl phenyl et	<125	ug/L		10/29/95
	4-Chloro-3-methylphenol	<125	ug/L		10/29/95
	4-Chlorophenyl phenyl e	<125	ug/L		10/29/95
	4-Nitrophenol	<125	ug/L		10/29/95

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* U denotes results less than the instrument detection limit. < less than sample detection limit.

ADEM CENTRAL LABORATORY
- RESULTS REPORT - October 31, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109207	Acenaphthylene	<125	ug/L		10/29/95
	Acenaphthene	<125	ug/L		10/29/95
	Anthracene	<125	ug/L		10/29/95
	Benzo(a)anthracene	<125	ug/L		10/29/95
	Benzo(a)pyrene	<125	ug/L		10/29/95
	Benzo(b)fluoranthene	<125	ug/L		10/29/95
	Butyl benzyl phthalate	<125	ug/L		10/29/95
	Bis(2-chlorethyl)ether	<125	ug/L		10/29/95
	Bis(2-chloroethoxy)meth	<125	ug/L		10/29/95
	Bis(2-chloroisopropyl)e	<125	ug/L		10/29/95
	Bis(2-ethylhexyl)phthal	<125	ug/L		10/29/95
	Benzo(g,h,i)perylene	<125	ug/L		10/29/95
	Benzidine	<125	ug/L		10/29/95
	Benzo(k)fluoranthene	<125	ug/L		10/29/95
	Chrysene	<125	ug/L		10/29/95
	Dibenzo(a,h)anthracene	<125	ug/L		10/29/95
	Dibutyl phthalate	<125	ug/L		10/29/95
	Diethyl phthalate	<125	ug/L		10/29/95
	Dimethylphthalate	<125	ug/L		10/29/95
	Di-n-octyl phthalate	<125	ug/L		10/29/95
	Fluoranthene	<125	ug/L		10/29/95
	Fluorene	<125	ug/L		10/29/95
	Hexachlorobutadiene	<125	ug/L		10/29/95
	Hexachlorobenzene	<125	ug/L		10/29/95
	Hexachlorocyclopentadie	<125	ug/L		10/29/95
	Hexachloroethane	<125	ug/L		10/29/95
	Isophorone	<125	ug/L		10/29/95
	Indeno(1,2,3-cd)pyrene	<125	ug/L		10/29/95
	Naphthalene	<125	ug/L		10/29/95
	Nitrobenzene	<125	ug/L		10/29/95
	N-nitroso-di-n-propylam	<125	ug/L		10/29/95
	N-nitrosodimethylamine	<125	ug/L		10/29/95
	N-nitrosodiphenylamine	<125	ug/L		10/29/95
	Pyrene	<125	ug/L		10/29/95
	Phenanthrene	<125	ug/L		10/29/95
	Pentachlorophenol	<125	ug/L		10/29/95
	Phenol	<125	ug/L		10/29/95

* U denotes results less than the instrument detection limit. < less than sample detection limit.

ADEM CENTRAL LABORATORY

- SAMPLE ANALYSIS REPORT -
10/11/95

To: CERCLA Program
1751 Cong. W.L.Dickinson Drive
Montgomery AL 36109

Attn:

Lab number : 5109201
Sample number : 521-6243
Sample matrix : WATER

Report Date: 10/11/95

COLLECTION INFORMATION
Date/Time/By: 09/27/95 3:45 STAMPS
Location : LAWTER T-PIPE DISCHARGE

ADEM CENTRAL LABORATORY
- RESULTS REPORT - October 11. 1995

Lab#	Test	Result	Units	DL*	Analdate
5109201	1,1,1,2-Tetrachloroetha	5.0000	ug/L	U	10/03/95
	1,1,1-Trichloroethane	5.0000	ug/L	U	10/03/95
	1,1,2,2-Tetrachloroetha	5.0000	ug/L	U	10/03/95
	1,1,2Trichloroethane	5.0000	ug/L	U	10/03/95
	1,1-Dichloroethane	5.0000	ug/L	U	10/03/95
	1,1-Dichloroethylene	5.0000	ug/L	U	10/03/95
	1,1-Dichloropropene	5.0000	ug/L	U	10/03/95
	1,2,3-Trichlorobenzene	5.0000	ug/L	U	10/03/95
	1,2,3-Trichloropropane	5.0000	ug/L	U	10/03/95
	1,2,4-Trichlorobenzene	5.0000	ug/L	U	10/03/95
	1,2,4-Trimethylbenzene	5.0000	ug/L	U	10/03/95
	1,2-Dicholoethane	5.0000	ug/L	U	10/03/95
	1,2-Dichloropropane	5.0000	ug/L	U	10/03/95
	1,3,5-Trimethylbenzene	5.0000	ug/L	U	10/03/95
	1,3-Dichloropropane	5.0000	ug/L	U	10/03/95
	1,3-Dichloropropene	5.0000	ug/L	U	10/03/95
	2,2-Dichloropropane	5.0000	ug/L	U	10/03/95
	Tetrachloroethylene	5.0000	ug/L	U	10/03/95
	Bromobenzene	5.0000	ug/L	U	10/03/95
	Bromochloromethane	5.0000	ug/L	U	10/03/95
	Bromodichloromethane	5.0000	ug/L	U	10/03/95

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* U denotes results less than the instrument detection limit, < less than sample detection limit.

ADEM CENTRAL LABORATORY
- RESULTS REPORT - October 11, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109201	Benzene	5.0000	ug/L	U	10/03/95
	Bromomethane	5.0000	ug/L	U	10/03/95
	cis-1,2-Dichloroethylen	5.0000	ug/L	U	10/03/95
	Chlorobenzene	5.0000	ug/L	U	10/03/95
	Chlorodibromomethane	5.0000	ug/L	U	10/03/95
	Chloroethane	5.0000	ug/L	U	10/03/95
	Bromoform	5.0000	ug/L	U	10/03/95
	Chloroform	5.0000	ug/L	U	10/03/95
	Chloromethane	5.0000	ug/L	U	10/03/95
	Carbon Tetrachloride	5.0000	ug/L	U	10/03/95
	Dibromomethane	5.0000	ug/L	U	10/03/95
	Dichlorodifluoromethane	5.0000	ug/L	U	10/03/95
	Dichloromethane	5.0000	ug/L	U	10/03/95
	Ethylbenzene	5.0000	ug/L	U	10/03/95
	Fluorotrichloromethane	5.0000	ug/L	U	10/03/95
	Hexachlorobutadiene	5.0000	ug/L	U	10/03/95
	Isopropylbenzene	5.0000	ug/L	U	10/03/95
	m-Dichlorobenzene	5.0000	ug/L	U	10/03/95
	m-p Xylene	5.0000	ug/L	U	10/03/95
	Naphthalene	5.0000	ug/L	U	10/03/95
	n-Butylbenzene	5.0000	ug/L	U	10/03/95
	n-Propylbenzene	5.0000	ug/L	U	10/03/95
	o-Chlorotoluene	5.0000	ug/L	U	10/03/95
	o-Dichlorobenzene	5.0000	ug/L	U	10/03/95
	o-Xylene	5.0000	ug/L	U	10/03/95
	p-Chlorotoluene	5.0000	ug/L	U	10/03/95
	p-Dichlorobenzene	5.0000	ug/L	U	10/03/95
	p-Isopropyltoluene	5.0000	ug/L	U	10/03/95
	Secbutylbenzene	5.0000	ug/L	U	10/03/95
	Styrene	5.0000	ug/L	U	10/03/95
	t-1,2-Dichloroethylene	5.0000	ug/L	U	10/03/95
	Tertbutylbenzene	5.0000	ug/L	U	10/03/95
	Trichloroethylene	5.0000	ug/L	U	10/03/95
	Toluene	5.0000	ug/L	U	10/03/95
	Vinyl Chloride	5.0000	ug/L	U	10/03/95

* U denotes results less than the instrument detection limit. < less than sample detection limit.

ADEM CENTRAL LABORATORY

- SAMPLE ANALYSIS REPORT -
10/04/95

To: CERCLA Program
1751 Cong. W.L.Dickinson Drive
Montgomery AL 36109

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MONTGOMERY

Attn:

Lab number : 5109200
Sample number : 521-6243
Sample matrix : WATER

Report Date: 10/04/95

COLLECTION INFORMATION
Date/Time/By: 09/26/95 2:35 STAMPS
Location : SKIMMER TRENCH-CRACKER AS

ADEM CENTRAL LABORATORY
- RESULTS REPORT - October 4, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109200	1,1,1,2-Tetrachloroetha	5.0000	ug/L	U	10/02/95
	1,1,1-Trichloroethane	5.0000	ug/L	U	10/02/95
	1,1,2,2-Tetrachloroetha	5.0000	ug/L	U	10/02/95
	1,1,2Trichloroethane	5.0000	ug/L	U	10/02/95
	1,1-Dichloroethane	5.0000	ug/L	U	10/02/95
	1,1-Dichloroethylene	5.0000	ug/L	U	10/02/95
	1,1-Dichloropropene	5.0000	ug/L	U	10/02/95
	1,2,3-Trichlorobenzene	5.0000	ug/L	U	10/02/95
	1,2,3-Trichloropropane	5.0000	ug/L	U	10/02/95
	1,2,4-Trichlorobenzene	5.0000	ug/L	U	10/02/95
	1,2,4-Trimethylbenzene	5.0000	ug/L	U	10/02/95
	1,2-Dicholoethane	5.0000	ug/L	U	10/02/95
	1,2-Dichloropropane	5.0000	ug/L	U	10/02/95
	1,3,5-Trimethylbenzene	5.0000	ug/L	U	10/02/95
	1,3-Dichloropropane	5.0000	ug/L	U	10/02/95
	1,3-Dichloropropene	5.0000	ug/L	U	10/02/95
	2,2-Dichloropropane	5.0000	ug/L	U	10/02/95
	Tetrachloroethylene	5.0000	ug/L	U	10/02/95
	Bromobenzene	5.0000	ug/L	U	10/02/95
	Bromochloromethane	5.0000	ug/L	U	10/02/95
	Bromodichloromethane	5.0000	ug/L	U	10/02/95

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* U denotes results less than the instrument detection limit. < less than sample detection limit.

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ADEM CENTRAL LABORATORY
- RESULTS REPORT -

October 4, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109200	Benzene	5.0000	ug/L	U	10/02/95
	Bromomethane	5.0000	ug/L	U	10/02/95
	cis-1,2-Dichloroethylen	5.0000	ug/L	U	10/02/95
	Chlorobenzene	5.0000	ug/L	U	10/02/95
	Chlorodibromomethane	5.0000	ug/L	U	10/02/95
	Chloroethane	5.0000	ug/L	U	10/02/95
	Bromoform	5.0000	ug/L	U	10/02/95
	Chloroform	5.0000	ug/L	U	10/02/95
	Chloromethane	5.0000	ug/L	U	10/02/95
	Carbon Tetrachloride	5.0000	ug/L	U	10/02/95
	Dibromomethane	5.0000	ug/L	U	10/02/95
	Dichlorodifluoromethane	5.0000	ug/L	U	10/02/95
	Dichloromethane	5.0000	ug/L	U	10/02/95
	Ethylbenzene	5.0000	ug/L	U	10/02/95
	Fluorotrichloromethane	5.0000	ug/L	U	10/02/95
	Hexachlorobutadiene	5.0000	ug/L	U	10/02/95
	Isopropylbenzene	5.0000	ug/L	U	10/02/95
	m-Dichlorobenzene	5.0000	ug/L	U	10/02/95
	m-p Xylene	5.0000	ug/L	U	10/02/95
	Naphthalene	5.0000	ug/L	U	10/02/95
	n-Butylbenzene	5.0000	ug/L	U	10/02/95
	n-Propylbenzene	5.0000	ug/L	U	10/02/95
	o-Chlorotoluene	5.0000	ug/L	U	10/02/95
	o-Dichlorobenzene	5.0000	ug/L	U	10/02/95
	o-Xylene	5.0000	ug/L	U	10/02/95
	p-Chlorotoluene	5.0000	ug/L	U	10/02/95
	p-Dichlorobenzene	5.0000	ug/L	U	10/02/95
	p-Isopropyltoluene	5.0000	ug/L	U	10/02/95
	Secbutylbenzene	5.0000	ug/L	U	10/02/95
	Styrene	5.0000	ug/L	U	10/02/95
	t-1,2-Dichloroethylene	5.0000	ug/L	U	10/02/95
	Tertbutylbenzene	5.0000	ug/L	U	10/02/95
	Trichloroethylene	5.0000	ug/L	U	10/02/95
	Toluene	5.0000	ug/L	U	10/02/95
	Vinyl Chloride	5.0000	ug/L	U	10/02/95

* U denotes results less than the instrument detection limit. < less than sample detection limit.

ADEM CENTRAL LABORATORY

- SAMPLE ANALYSIS REPORT -
11/03/95

To: CERCLA Program
1751 Cong. W.L.Dickinson Drive
Montgomery AL 36109

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MONTGOMERY

Attn:

Lab number : 5109205
Sample number : 521-6243
Sample matrix : WATER

Report Date: 11/03/95

COLLECTION INFORMATION
Date/Time/By: 09/26/95 2:35 STAMPS
Location : SKIMMER TRENCH TRWS-CRACK

ADEM CENTRAL LABORATORY
- RESULTS REPORT - November 3, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109205	1,2,4-Trichlorobenzene	<25	ug/L		10/17/95
	1,2-Dichlorobenzene	<25	ug/L		10/17/95
	1,2-Diphenylhydrazine	<25	ug/L		10/17/95
	1,3-Dichlorobenzene	<25	ug/L		10/17/95
	1,4-Dichlorobenzene	<25	ug/L		10/17/95
	2,3,7,8-Tetrachlorodibe	<25	ug/L		10/17/95
	2,4,6-Trichlorophenol	<25	ug/L		10/17/95
	2,4-Dichlorophenol	<25	ug/L		10/17/95
	2,4-Dimethylphenol	<25	ug/L		10/17/95
	2,4-Dinitrophenol	<250	ug/L		10/17/95
	2,4-Dinitrotoluene	<25	ug/L		10/17/95
	2,6-Dinitrotoluene	<25	ug/L		10/17/95
	2-Chloronaphthalene	<25	ug/L		10/17/95
	2-Chlorophenol	<25	ug/L		10/17/95
	2-Methyl-4,6-dinitrophe	<125	ug/L		10/17/95
	2-Nitrophenol	<25	ug/L		10/17/95
	3,3'-Dichlorobenzidine	<25	ug/L		10/17/95
	4-Bromophenyl phenyl et	<25	ug/L		10/17/95
	4-Chloro-3-methylphenol	<25	ug/L		10/17/95
	4-Chlorophenyl phenyl e	<25	ug/L		10/17/95
	4-Nitrophenol	<25	ug/L		10/17/95

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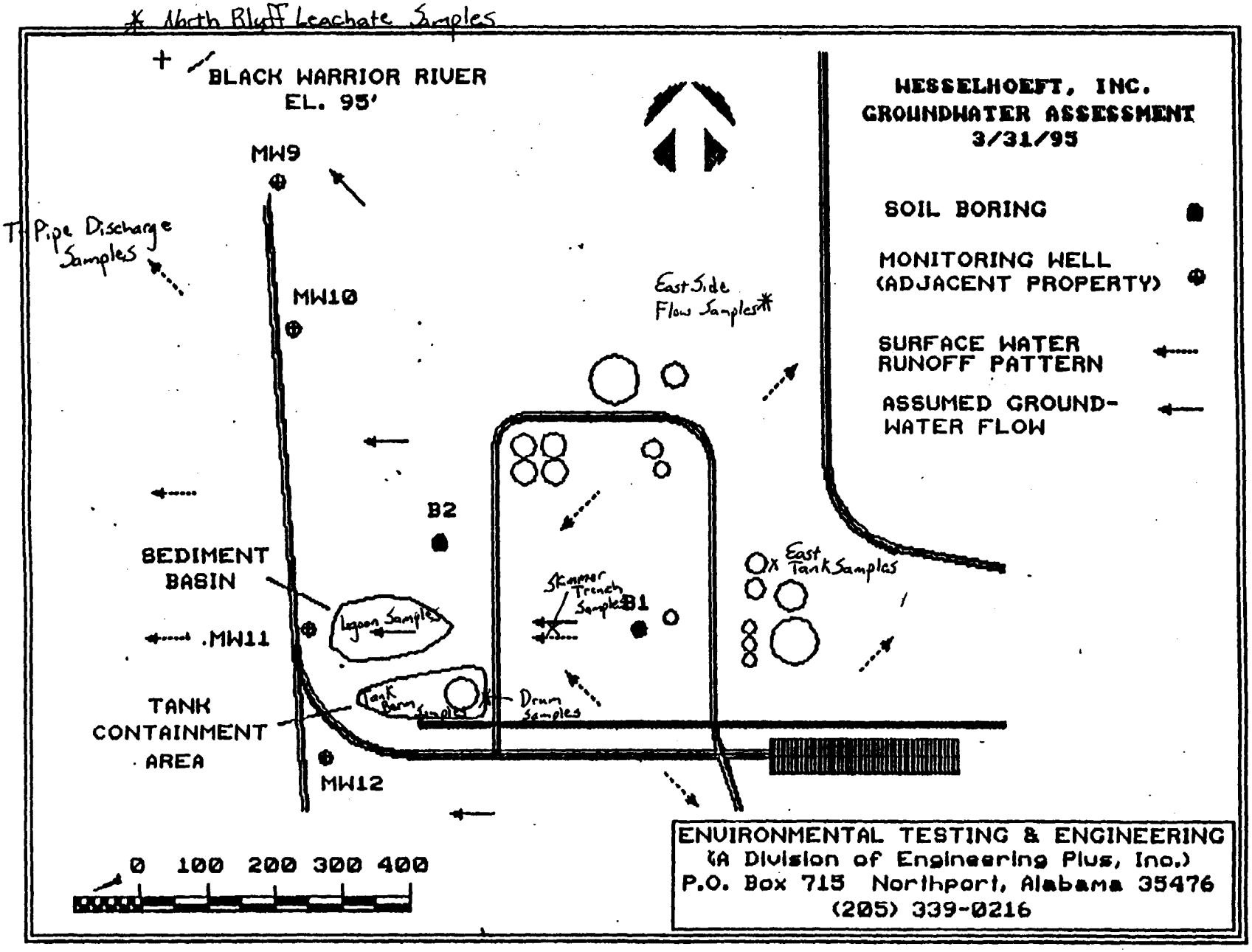
* ll denotes results less than the instrument detection limit. < less than sample detection limit.

ADEM CENTRAL LABORATORY
- RESULTS REPORT - November 3, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109205	Acenaphthylene	<25	ug/L		10/17/95
	Acenaphthene	<25	ug/L		10/17/95
	Anthracene	<25	ug/L		10/17/95
	Benzo(a)anthracene	<25	ug/L		10/17/95
	Benzo(a)pyrene	<25	ug/L		10/17/95
	Benzo(b)fluoranthene	<25	ug/L		10/17/95
	Butyl benzyl phthalate	<25	ug/L		10/17/95
	Bis(2-chlorethyl)ether	<25	ug/L		10/17/95
	Bis(2-chloroethoxy)meth	<25	ug/L		10/17/95
	Bis(2-chloroisopropyl)e	<25	ug/L		10/17/95
	Bis(2-ethylhexyl)phthal	<25	ug/L		10/17/95
	Benzo(g.h.i)perylene	<25	ug/L		10/17/95
	Benzidine	<25	ug/L		10/17/95
	Benzo(k)fluoranthene	<25	ug/L		10/17/95
	Chrysene	<25	ug/L		10/17/95
	Dibenzo(a.h)anthracene	<25	ug/L		10/17/95
	Dibutyl phthalate	<25	ug/L		10/17/95
	Diethyl phthalate	<25	ug/L		10/17/95
	Dimethylphthalate	<25	ug/L		10/17/95
	Di-n-octyl phthalate	<25	ug/L		10/17/95
	Fluoranthene	<25	ug/L		10/17/95
	Fluorene	<25	ug/L		10/17/95
	Hexachlorobutadiene	<25	ug/L		10/17/95
	Hexachlorobenzene	<25	ug/L		10/17/95
	Hexachlorocyclopentadie	<25	ug/L		10/17/95
	Hexachloroethane	<25	ug/L		10/17/95
	Isophorone	<25	ug/L		10/17/95
	Indeno(1.2.3-cd)pyrene	<25	ug/L		10/17/95
	Naphthalene	<25	ug/L		10/17/95
	Nitrobenzene	<25	ug/L		10/17/95
	N-nitroso-di-n-propylam	<25	ug/L		10/17/95
	N-nitrosodimethylamine	<25	ug/L		10/17/95
	N-nitrosodiphenylamine	<25	ug/L		10/17/95
	Pyrene	<25	ug/L		10/17/95
	Phenanthrene	<25	ug/L		10/17/95
	Pentachlorophenol	<25	ug/L		10/17/95
	Phenol	<25	ug/L		10/17/95

* U denotes results less than the instrument detection limit. < less than sample detection limit.

APPENDIX E


* North Bluff Leachate Samples
BLACK WARRIOR RIVER
EL. 95'
MW9
* T-Pipe Discharge Samples
MW10
East Side Flow Samples*
B2
SEDIMENT BASIN
Lagoon Samples
MW11
Skimmer Trench Sample
B1
East Tank Samples
TANK CONTAINMENT AREA
Tank Barn Samples
Drum Samples
MW12
0 100 200 300 400
HESSELHOEFT, INC.
GROUNDWATER ASSESSMENT
3/31/95
SOIL BORING
MONITORING WELL (ADJACENT PROPERTY)
SURFACE WATER RUNOFF PATTERN
ASSUMED GROUND-WATER FLOW
ENVIRONMENTAL TESTING & ENGINEERING
(A Division of Engineering Plus, Inc.)
P.O. Box 715 Northport, Alabama 35476
(205) 339-0216

ADEM CENTRAL LABORATORY

- SAMPLE ANALYSIS REPORT -
11/22/95

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To: CERCLA Program
1751 Cong. W.L.Dickinson Drive
Montgomery AL 36109

Attn:

Lab number : 5109212
Sample number : 521-6243
Sample matrix : SOIL

Report Date: 11/22/95

COLLECTION INFORMATION
Date/Time/By: 09/27/95 11:30 STAMPS
Location : EAST TANKS SAMPLE 1

ADEM CENTRAL LABORATORY
- RESULTS REPORT - November 22, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109212	1,1,1,2-Tetrachloroetha	<.14	ug/g		10/17/95
	1,1,1-Trichloroethane	<.14	ug/g		10/17/95
	1,1,2,2-Tetrachloroetha	<.14	ug/g		10/17/95
	1,1,2Trichloroethane	<.14	ug/g		10/17/95
	1,1-Dichloroethane	<.14	ug/g		10/17/95
	1,1-Dichloroethylene	<.14	ug/g		10/17/95
	1,1-Dichloropropene	<.14	ug/g		10/17/95
	1,2,3-Trichlorobenzene	<.14	ug/g		10/17/95
	1,2,3-Trichloropropane	<.14	ug/g		10/17/95
	1,2,4-Trichlorobenzene	<1000	ug/g		11/15/95
	1,2,4-Trichlorobenzene	<1000	ug/g		11/15/95
	1,2,4-Trimethylbenzene	<.14	ug/g		10/17/95
	1,2-Dichlorobenzene	<1000	ug/g		11/15/95
	1,2-Dicholoethane	<.14	ug/g		10/17/95
	1,2-Dichloropropane	<.14	ug/g		10/17/95
	1,2-Diphenylhydrazine	<1000	ug/g		11/15/95
	1,3,5-Trimethylbenzene	<.14	ug/g		10/17/95
	1,3-Dichloropropane	<.14	ug/g		10/17/95
	1,3-Dichlorobenzene	<1000	ug/g		11/15/95
	1,3-Dichloropropene	<.14	ug/g		10/17/95
	1,4-Dichlorobenzene	<1000	ug/g		11/15/95

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* U denotes results less than the instrument detection limit, < less than sample detection limit.

ADEM CENTRAL LABORATORY
- RESULTS REPORT November 22, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109212	2,2-Dichloropropane	<.14	ug/g		10/17/95
	2,3,7,8-Tetrachlorodibe	<1000	ug/g		11/15/95
	2,4,6-Trichlorophenol	<1000	ug/g		11/15/95
	2,4-Dichlorophenol	<1000	ug/g		11/15/95
	2,4-Dimethylphenol	<1000	ug/g		11/15/95
	2,4-Dinitrophenol	<10000	ug/g		11/15/95
	2,4-Dinitrotoluene	<1000	ug/g		11/15/95
	2,6-Dinitrotoluene	<1000	ug/g		11/15/95
	2-Chloronaphthalene	<1000	ug/g		11/15/95
	2-Chlorophenol	<1000	ug/g		11/15/95
	2-Methyl-4,6-dinitrophe	<5000	ug/g		11/15/95
	2-Nitrophenol	<1000	ug/g		11/15/95
	3,3'-Dichlorobenzidine	<1000	ug/g		11/15/95
	4-Bromophenyl phenyl et	<1000	ug/g		11/15/95
	4-Chloro-3-methylphenol	<1000	ug/g		11/15/95
	Tetrachloroethylene	<.14	ug/g		10/17/95
	4-Chlorophenyl phenyl e	<1000	ug/g		11/15/95
	4-Nitrophenol	<1000	ug/g		11/15/95
	Acenaphthylene	<1000	ug/g		11/15/95
	Acenaphthene	<1000	ug/g		11/15/95
	Anthracene	<1000	ug/g		11/15/95
	Benzo(a)anthracene	<1000	ug/g		11/15/95
	Benzo(a)pyrene	<1000	ug/g		11/15/95
	Bromobenzene	<.14	ug/g		10/17/95
	Benzo(b)fluoranthene	<1000	ug/g		11/15/95
	Butyl benzyl phthalate	<1000	ug/g		11/15/95
	Bis(2-chlorethyl)ether	<1000	ug/g		11/15/95
	Bis(2-chloroethoxy)meth	<1000	ug/g		11/15/95
	Bis(2-chloroisopropyl)e	<1000	ug/g		11/15/95
	Bromochloromethane	<.14	ug/g		10/17/95
	Bromodichloromethane	<.14	ug/g		10/17/95
	Bis(2-ethylhexyl)phthal	<1000	ug/g		11/15/95
	Benzene	0.1400	ug/g		10/17/95
	Benzo(g,h,i)perylene	<1000	ug/g		11/15/95
	Benzidine	<1000	ug/g		11/15/95
	Benzo(k)fluoranthene	<1000	ug/g		11/15/95
	Bromomethane	<.14	ug/g		10/17/95
	cis-1,2-Dichloroethylen	<.14	ug/g		10/17/95
	Chlorobenzene	<.14	ug/g		10/17/95
	Chlorodibromomethane	<.14	ug/g		10/17/95
	Chloroethane	<.14	ug/g		10/17/95
	Bromoform	<.14	ug/g		10/17/95
	Chloroform	<.14	ug/g		10/17/95
	Chloromethane	<.14	ug/g		10/17/95
	Chrysene	<1000	ug/g		11/15/95
	Carbon Tetrachloride	<.14	ug/g		10/17/95
	Dibenzo(a,h)anthracene	<1000	ug/g		11/15/95

* U denotes results less than the instrument detection limit. < less than sample detection limit.

ADEM CENTRAL LABORATORY
- RESULTS REPORT

November 22, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109212	Dibromomethane	<.14	ug/g		10/17/95
	Dibutyl phthalate	<1000	ug/g		11/15/95
	Dichlorodifluoromethane	<.14	ug/g		10/17/95
	Dichloromethane	<.14	ug/g		10/17/95
	Diethyl phthalate	<1000	ug/g		11/15/95
	Dimethylphthalate	<1000	ug/g		11/15/95
	Di-n-octyl phthalate	<1000	ug/g		11/15/95
	Ethylbenzene	<.14	ug/g		10/17/95
	Fluoranthene	<1000	ug/g		11/15/95
	Fluorene	<1000	ug/g		11/15/95
	Fluorotrichloromethane	<.14	ug/g		10/17/95
	Hexachlorobutadiene	<1000	ug/g		11/15/95
	Hexachlorobutadiene	<.14	ug/g		10/17/95
	Hexachlorobenzene	<1000	ug/g		11/15/95
	Hexachlorocyclopentadie	<1000	ug/g		11/15/95
	Hexachloroethane	<1000	ug/g		11/15/95
	Isophorone	<1000	ug/g		11/15/95
	Indeno(1,2,3-cd)pyrene	<1000	ug/g		11/15/95
	Isopropylbenzene	<.14	ug/g		10/17/95
	m-Dichlorobenzene	<.14	ug/g		10/17/95
	m+p-Xylene	<.14	ug/g		10/17/95
	Naphthalene	<1000	ug/g		11/15/95
	Naphthalene	<1000	ug/g		11/15/95
	Nitrobenzene	<1000	ug/g		11/15/95
	n-Butylbenzene	<.14	ug/g		10/17/95
	N-nitroso-di-n-propylam	<1000	ug/g		11/15/95
	N-nitrosodimethylamine	<1000	ug/g		11/15/95
	N-nitrosodiphenylamine	<1000	ug/g		11/15/95
	n-Propylbenzene	<.14	ug/g		10/17/95
	o-Chlorotoluene	<.14	ug/g		10/17/95
	o-Dichlorobenzene	<.14	ug/g		10/17/95
	o-Xylene	<.14	ug/g		10/17/95
	Pyrene	<1000	ug/g		11/15/95
	Phenanthrene	<1000	ug/g		11/15/95
	Pentachlorophenol	<1000	ug/g		11/15/95
	p-Chlorotoluene	<.14	ug/g		10/17/95
	p-Dichlorobenzene	<.14	ug/g		10/17/95
	Phenol	<1000	ug/g		11/15/95
	p-Isopropyltoluene	<.14	ug/g		10/17/95
	Secbutylbenzene	<.14	ug/g		10/17/95
	Styrene	<.14	ug/g		10/17/95
	t-1,2-Dichloroethylene	<.14	ug/g		10/17/95
	Tertbutylbenzene	<.14	ug/g		10/17/95
	Trichloroethylene	<.14	ug/g		10/17/95
	Toluene	0.2700	ug/g		10/17/95
	Vinyl Chloride	<.14	ug/g		10/17/95

* U denotes results less than the instrument detection limit, < less than sample detection limit.

ADEM CENTRAL LABORATORY

- SAMPLE ANALYSIS REPORT -
11/22/95

To: CERCLA Program
1751 Cong. W.L.Dickinson Drive
Montgomery AL 36109

NOV 1995
RECEIVED
ADEM - FO
MONTGOMERY

Attn:

Lab number : 5109214
Sample number : 521-6243
Sample matrix : SOIL

Report Date: 11/22/95

COLLECTION INFORMATION
Date/Time/By: 09/27/95 11:40 STAMPS
Location : EAST SIDE FLOW CRACKER AS

ADEM CENTRAL LABORATORY
- RESULTS REPORT - November 22, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109214	1,1,1,2-Tetrachloroetha	<.20	ug/g		10/17/95
	1,1,1-Trichloroethane	<.20	ug/g		10/17/95
	1,1,2,2-Tetrachloroetha	<.20	ug/g		10/17/95
	1,1,2Trichloroethane	<.20	ug/g		10/17/95
	1,1-Dichloroethane	<.20	ug/g		10/17/95
	1,1-Dichloroethylene	<.20	ug/g		10/17/95
	1,1-Dichloropropene	<.20	ug/g		10/17/95
	1,2,3-Trichlorobenzene	<.20	ug/g		10/17/95
	1,2,3-Trichloropropane	<.20	ug/g		10/17/95
	1,2,4-Trichlorobenzene	<1000	ug/g		11/15/95
	1,2,4-Trichlorobenzene	<1000	ug/g		11/15/95
	1,2,4-Trimethylbenzene	0.3300	ug/g		10/17/95
	1,2-Dichlorobenzene	<1000	ug/g		11/15/95
	1,2-Dicholoethane	<.20	ug/g		10/17/95
	1,2-Dichloropropane	<.20	ug/g		10/17/95
	1,2-Diphenylhydrazine	<1000	ug/g		11/15/95
	1,3,5-Trimethylbenzene	0.3600	ug/g		10/17/95
	1,3-Dichloropropane	<.20	ug/g		10/17/95
	1,3-Dichlorobenzene	<1000	ug/g		11/15/95
	1,3-Dichloropropene	<.20	ug/g		10/17/95
	1,4-Dichlorobenzene	<1000	ug/g		11/15/95

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ADEM
SPECIAL PROJECTS

* U denotes results less than the instrument detection limit, < less than sample detection limit.

ADEM CENTRAL LABORATORY
- RESULTS REPORT November 22, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109214	2,2-Dichloropropane	<.20	ug/g		10/17/95
	2,3,7,8-Tetrachlorodibe	<1000	ug/g		11/15/95
	2,4,6-Trichlorophenol	<1000	ug/g		11/15/95
	2,4-Dichlorophenol	<1000	ug/g		11/15/95
	2,4-Dimethylphenol	<1000	ug/g		11/15/95
	2,4-Dinitrophenol	<10000	ug/g		11/15/95
	2,4-Dinitrotoluene	<1000	ug/g		11/15/95
	2,6-Dinitrotoluene	<1000	ug/g		11/15/95
	2-Chloronaphthalene	<1000	ug/g		11/15/95
	2-Chlorophenol	<1000	ug/g		11/15/95
	2-Methyl-4,6-dinitrophe	<5000	ug/g		11/15/95
	2-Nitrophenol	<1000	ug/g		11/15/95
	3,3'-Dichlorobenzidine	<1000	ug/g		11/15/95
	4-Bromophenyl phenyl et	<1000	ug/g		11/15/95
	4-Chloro-3-methylphenol	<1000	ug/g		11/15/95
	Tetrachloroethylene	<.20	ug/g		10/17/95
	4-Chlorophenyl phenyl e	<1000	ug/g		11/15/95
	4-Nitrophenol	<1000	ug/g		11/15/95
	Acenaphthylene	<1000	ug/g		11/15/95
	Acenaphthene	<1000	ug/g		11/15/95
	Anthracene	<1000	ug/g		11/15/95
	Benzo(a)anthracene	<1000	ug/g		11/15/95
	Benzo(a)pyrene	<1000	ug/g		11/15/95
	Bromobenzene	<.20	ug/g		10/17/95
	Benzo(b)fluoranthene	<1000	ug/g		11/15/95
	Butyl benzyl phthalate	<1000	ug/g		11/15/95
	Bis(2-chlorethyl)ether	<1000	ug/g		11/15/95
	Bis(2-chloroethoxy)meth	<1000	ug/g		11/15/95
	Bis(2-chloroisopropyl)e	<1000	ug/g		11/15/95
	Bromochloromethane	<.20	ug/g		10/17/95
	Bromodichloromethane	<.20	ug/g		10/17/95
	Bis(2-ethylhexyl)phthal	<1000	ug/g		11/15/95
	Benzene	<.20	ug/g		10/17/95
	Benzo(g,h,i)perylene	<1000	ug/g		11/15/95
	Benzidine	<1000	ug/g		11/15/95
	Benzo(k)fluoranthene	<1000	ug/g		11/15/95
	Bromomethane	<.20	ug/g		10/17/95
	cis-1,2-Dichloroethylen	<.20	ug/g		10/17/95
	Chlorobenzene	<.20	ug/g		10/17/95
	Chlorodibromomethane	<.20	ug/g		10/17/95
	Chloroethane	<.20	ug/g		10/17/95
	Bromoform	<.20	ug/g		10/17/95
	Chloroform	<.20	ug/g		10/17/95
	Chloromethane	<.20	ug/g		10/17/95
	Chrysene	<1000	ug/g		11/15/95
	Carbon Tetrachloride	<.20	ug/g		10/17/95
	Dibenzo(a,h)anthracene	<1000	ug/g		11/15/95

* U denotes results less than the instrument detection limit, < less than sample detection limit.

ADEM CENTRAL LABORATORY
- RESULTS REPORT November 22, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109214	Dibromomethane	<.20	ug/g		10/17/95
	Dibutyl phthalate	<1000	ug/g		11/15/95
	Dichlorodifluoromethane	<.20	ug/g		10/17/95
	Dichloromethane	<.20	ug/g		10/17/95
	Diethyl phthalate	<1000	ug/g		11/15/95
	Dimethylphthalate	<1000	ug/g		11/15/95
	Di-n-octyl phthalate	<1000	ug/g		11/15/95
	Ethylbenzene	<.20	ug/g		10/17/95
	Fluoranthene	<1000	ug/g		11/15/95
	Fluorene	<1000	ug/g		11/15/95
	Fluorotrichloromethane	<.20	ug/g		10/17/95
	Hexachlorobutadiene	<1000	ug/g		11/15/95
	Hexachlorobutadiene	<.20	ug/g		10/17/95
	Hexachlorobenzene	<1000	ug/g		11/15/95
	Hexachlorocyclopentadie	<1000	ug/g		11/15/95
	Hexachloroethane	<1000	ug/g		11/15/95
	Isophorone	<1000	ug/g		11/15/95
	Indeno(1,2,3-cd)pyrene	<1000	ug/g		11/15/95
	Isopropylbenzene	<.20	ug/g		10/17/95
	m-Dichlorobenzene	<.20	ug/g		10/17/95
	m+p-Xylene	<.20	ug/g		10/17/95
	Naphthalene	<1000	ug/g		11/15/95
	Naphthalene	<1000	ug/g		11/15/95
	Nitrobenzene	<1000	ug/g		11/15/95
	n-Butylbenzene	<.20	ug/g		10/17/95
	N-nitroso-di-n-propylam	<1000	ug/g		11/15/95
	N-nitrosodimethylamine	<1000	ug/g		11/15/95
	N-nitrosodiphenylamine	<1000	ug/g		11/15/95
	n-Propylbenzene	<.20	ug/g		10/17/95
	o-Chlorotoluene	<.20	ug/g		10/17/95
	o-Dichlorobenzene	<.20	ug/g		10/17/95
	o-Xylene	<.20	ug/g		10/17/95
	Pyrene	<1000	ug/g		11/15/95
	Phenanthrene	<1000	ug/g		11/15/95
	Pentachlorophenol	<1000	ug/g		11/15/95
	p-Chlorotoluene	<.20	ug/g		10/17/95
	p-Dichlorobenzene	<.20	ug/g		10/17/95
	Phenol	<1000	ug/g		11/15/95
	p-Isopropyltoluene	<.20	ug/g		10/17/95
	Secbutylbenzene	<.20	ug/g		10/17/95
	Styrene	<.20	ug/g		10/17/95
	t-1,2-Dichloroethylene	<.20	ug/g		10/17/95
	Tertbutylbenzene	<.20	ug/g		10/17/95
	Trichloroethylene	<.20	ug/g		10/17/95
	Toluene	0.4600	ug/g		10/17/95
	Vinyl Chloride	<.20	ug/g		10/17/95

* U denotes results less than the instrument detection limit, < less than sample detection limit.

ADEM CENTRAL LABORATORY

- SAMPLE ANALYSIS REPORT -
11/14/95

To: CERCLA Program
1751 Cong. W.L.Dickinson Drive
Montgomery AL 36109

Attn:

Lab number : 5109211
Sample number : 521-6243
Sample matrix : SOIL

Report Date: 11/14/95

COLLECTION INFORMATION
Date/Time/By: 09/26/95 2:40 STAMPS
Location : SKIMMER TRENCH TR-1

ADEM CENTRAL LABORATORY
- RESULTS REPORT - November 14, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109211	1,1,1,2-Tetrachloroetha	<.2	ug/g		10/11/95
	1,1,1-Trichloroethane	<.2	ug/g		10/11/95
	1,1,2,2-Tetrachloroetha	<.2	ug/g		10/11/95
	1,1,2Trichloroethane	<.2	ug/g		10/11/95
	1,1-Dichloroethane	<.2	ug/g		10/11/95
	1,1-Dichloroethylene	<.2	ug/g		10/11/95
	1,1-Dichloropropene	<.2	ug/g		10/11/95
	1,2,3-Trichlorobenzene	<.2	ug/g		10/11/95
	1,2,3-Trichloropropane	<.2	ug/g		10/11/95
	1,2,4-Trichlorobenzene	<50	ug/g		11/03/95
	1,2,4-Trichlorobenzene	<50	ug/g		11/03/95
	1,2,4-Trimethylbenzene	<.2	ug/g		10/11/95
	1,2-Dichlorobenzene	<50	ug/g		11/03/95
	1,2-Dicholoethane	<.2	ug/g		10/11/95
	1,2-Dichloropropane	<.2	ug/g		10/11/95
	1,2-Diphenylhydrazine	<50	ug/g		11/03/95
	1,3,5-Trimethylbenzene	<.2	ug/g		10/11/95
	1,3-Dichloropropane	<.2	ug/g		10/11/95
	1,3-Dichlorobenzene	<50	ug/g		11/03/95
	1,3-Dichloropropene	<.2	ug/g		10/11/95
	1,4-Dichlorobenzene	<50	ug/g		11/03/95

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* U denotes results less than the instrument detection limit. < less than sample detection limit.

ADEM CENTRAL LABORATORY
- RESULTS REPORT - November 14, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109211	2,2-Dichloropropane	<.2	ug/g		10/11/95
	2,3,7,8-Tetrachlorodibe	<50	ug/g		11/03/95
	2,4,6-Trichlorophenol	<50	ug/g		11/03/95
	2,4-Dichlorophenol	<50	ug/g		11/03/95
	2,4-Dimethylphenol	<50	ug/g		11/03/95
	2,4-Dinitrophenol	<500	ug/g		11/03/95
	2,4-Dinitrotoluene	<50	ug/g		11/03/95
	2,6-Dinitrotoluene	<50	ug/g		11/03/95
	2-Chloronaphthalene	<50	ug/g		11/03/95
	2-Chlorophenol	<50	ug/g		11/03/95
	2-Methyl-4,6-dinitrophe	<250	ug/g		11/03/95
	2-Nitrophenol	<50	ug/g		11/03/95
	3,3'-Dichlorobenzidine	<50	ug/g		11/03/95
	4-Bromophenyl phenyl et	<50	ug/g		11/03/95
	4-Chloro-3-methylphenol	<50	ug/g		11/03/95
	Tetrachloroethylene	<.2	ug/g		10/11/95
	4-Chlorophenyl phenyl e	<50	ug/g		11/03/95
	4-Nitrophenol	<50	ug/g		11/03/95
	Acenaphthylene	<50	ug/g		11/03/95
	Acenaphthene	<50	ug/g		11/03/95
	Anthracene	<50	ug/g		11/03/95
	Benzo(a)anthracene	<50	ug/g		11/03/95
	Benzo(a)pyrene	<50	ug/g		11/03/95
	Bromobenzene	<.2	ug/g		10/11/95
	Benzo(b)fluoranthene	<50	ug/g		11/03/95
	Butyl benzyl phthalate	<50	ug/g		11/03/95
	Bis(2-chlorethyl)ether	<50	ug/g		11/03/95
	Bis(2-chloroethoxy)meth	<50	ug/g		11/03/95
	Bis(2-chloroisopropyl)e	<50	ug/g		11/03/95
	Bromochloromethane	<.2	ug/g		10/11/95
	Bromodichloromethane	<.2	ug/g		10/11/95
	Bis(2-ethylhexyl)phthal	<50	ug/g		11/03/95
	Benzene	<.2	ug/g		10/11/95
	Benzo(g,h,i)perylene	<50	ug/g		11/03/95
	Benzidine	<50	ug/g		11/03/95
	Benzo(k)fluoranthene	<50	ug/g		11/03/95
	Bromomethane	<.2	ug/g		10/11/95
	cis-1,2-Dichloroethylen	<.2	ug/g		10/11/95
	Chlorobenzene	<.2	ug/g		10/11/95
	Chlorodibromomethane	<.2	ug/g		10/11/95
	Chloroethane	<.2	ug/g		10/11/95
	Bromoform	<.2	ug/g		10/11/95
	Chloroform	<.2	ug/g		10/11/95
	Chloromethane	<.2	ug/g		10/11/95
	Chrysene	<50	ug/g		11/03/95
	Carbon Tetrachloride	<.2	ug/g		10/11/95
	Dibenzo(a,h)anthracene	<50	ug/g		11/03/95

* U denotes results less than the instrument detection limit. < less than sample detection limit.

ADEM CENTRAL LABORATORY
- RESULTS REPORT - November 14, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109211	Dibromomethane	<.2	ug/g		10/11/95
	Dibutyl phthalate	<50	ug/g		11/03/95
	Dichlorodifluoromethane	<.2	ug/g		10/11/95
	Dichloromethane	<.2	ug/g		10/11/95
	Diethyl phthalate	<50	ug/g		11/03/95
	Dimethylphthalate	<50	ug/g		11/03/95
	Di-n-octyl phthalate	<50	ug/g		11/03/95
	Ethylbenzene	<.2	ug/g		10/11/95
	Fluoranthene	<50	ug/g		11/03/95
	Fluorene	<50	ug/g		11/03/95
	Fluorotrichloromethane	<.2	ug/g		10/11/95
	Hexachlorobutadiene	<50	ug/g		11/03/95
	Hexachlorobutadiene	<.2	ug/g		10/11/95
	Hexachlorobenzene	<50	ug/g		11/03/95
	Hexachlorocyclopentadie	<50	ug/g		11/03/95
	Hexachloroethane	<50	ug/g		11/03/95
	Isophorone	<50	ug/g		11/03/95
	Indeno(1,2,3-cd)pyrene	<50	ug/g		11/03/95
	Isopropylbenzene	<.2	ug/g		10/11/95
	m-Dichlorobenzene	<.2	ug/g		10/11/95
	m+p-Xylene	<.2	ug/g		10/11/95
	Naphthalene	<50	ug/g		11/03/95
	Naphthalene	<50	ug/g		11/03/95
	Nitrobenzene	<50	ug/g		11/03/95
	n-Butylbenzene	<.2	ug/g		10/11/95
	N-nitroso-di-n-propylam	<50	ug/g		11/03/95
	N-nitrosodimethylamine	<50	ug/g		11/03/95
	N-nitrosodiphenylamine	<50	ug/g		11/03/95
	n-Propylbenzene	<.2	ug/g		10/11/95
	o-Chlorotoluene	<.2	ug/g		10/11/95
	o-Dichlorobenzene	<.2	ug/g		10/11/95
	o-Xylene	<.2	ug/g		10/11/95
	Pyrene	<50	ug/g		11/03/95
	Phenanthrene	<50	ug/g		11/03/95
	Pentachlorophenol	<50	ug/g		11/03/95
	p-Chlorotoluene	<.2	ug/g		10/11/95
	p-Dichlorobenzene	<.2	ug/g		10/11/95
	Phenol	<50	ug/g		11/03/95
	p-Isopropyltoluene	<.2	ug/g		10/11/95
	Secbutylbenzene	<.2	ug/g		10/11/95
	Styrene	<.2	ug/g		10/11/95
	t-1,2-Dichloroethylene	<.2	ug/g		10/11/95
	Tertbutylbenzene	<.2	ug/g		10/11/95
	Trichloroethylene	<.2	ug/g		10/11/95
	Toluene	2.0000	ug/g		10/11/95
	Vinyl Chloride	<.2	ug/g		10/11/95

* U denotes results less than the instrument detection limit. < less than sample detection limit.

ADEM CENTRAL LABORATORY

- SAMPLE ANALYSIS REPORT -
11/03/95

To: CERCLA Program
1751 Cong. W.L.Dickinson Drive
Montgomery AL 36109

RECEIVED
ADEM
MONTGOMERY

Attn:

Lab number : 5109210
Sample number : 521-6243
Sample matrix : SOIL

Report Date: 11/03/95

COLLECTION INFORMATION
Date/Time/By: 09/26/95 2:00 STAMPS
Location : TANK BERM TB-1 CRACKER AS

ADEM CENTRAL LABORATORY
- RESULTS REPORT - November 3, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109210	1,1,1,2-Tetrachloroetha	<.22	ug/g		10/11/95
	1,1,1-Trichloroethane	<.22	ug/g		10/11/95
	1,1,2,2-Tetrachloroetha	<.22	ug/g		10/11/95
	1,1,2Trichloroethane	<.22	ug/g		10/11/95
	1,1-Dichloroethane	<.22	ug/g		10/11/95
	1,1-Dichloroethylene	<.22	ug/g		10/11/95
	1,1-Dichloropropene	<.22	ug/g		10/11/95
	1,2,3-Trichlorobenzene	<.22	ug/g		10/11/95
	1,2,3-Trichloropropane	<.22	ug/g		10/11/95
	1,2,4-Trichlorobenzene	<1.65	ug/g		10/30/95
	1,2,4-Trichlorobenzene	<1.65	ug/g		10/30/95
	1,2,4-Trimethylbenzene	<.22	ug/g		10/11/95
	1,2-Dichlorobenzene	<1.65	ug/g		10/30/95
	1,2-Dicholoethane	<.22	ug/g		10/11/95
	1,2-Dichloropropane	<.22	ug/g		10/11/95
	1,2-Diphenylhydrazine	<1.65	ug/g		10/30/95
	1,3,5-Trimethylbenzene	<.22	ug/g		10/11/95
	1,3-Dichloropropane	<.22	ug/g		10/11/95
	1,3-Dichlorobenzene	<1.65	ug/g		10/30/95
	1,3-Dichloropropene	<.22	ug/g		10/11/95
	1,4-Dichlorobenzene	<1.65	ug/g		10/30/95

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* U denotes results less than the instrument detection limit. < less than sample detection limit.

ADEM CENTRAL LABORATORY
- RESULTS REPORT - November 3, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109210	2,2-Dichloropropane	<.22	ug/g		10/11/95
	2,3,7,8-Tetrachlorodibe	<1.65	ug/g		10/30/95
	2,4,6-Trichlorophenol	<1.65	ug/g		10/30/95
	2,4-Dichlorophenol	<1.65	ug/g		10/30/95
	2,4-Dimethylphenol	<1.65	ug/g		10/30/95
	2,4-Dinitrophenol	<16.5	ug/g		10/30/95
	2,4-Dinitrotoluene	<1.65	ug/g		10/30/95
	2,6-Dinitrotoluene	<1.65	ug/g		10/30/95
	2-Chloronaphthalene	<1.65	ug/g		10/30/95
	2-Chlorophenol	<1.65	ug/g		10/30/95
	2-Methyl-4,6-dinitrophe	<8.25	ug/g		10/30/95
	2-Nitrophenol	<1.65	ug/g		10/30/95
	3,3'-Dichlorobenzidine	<1.65	ug/g		10/30/95
	4-Bromophenyl phenyl et	<1.65	ug/g		10/30/95
	4-Chloro-3-methylphenol	<1.65	ug/g		10/30/95
	Tetrachloroethylene	<.22	ug/g		10/11/95
	4-Chlorophenyl phenyl e	<1.65	ug/g		10/30/95
	4-Nitrophenol	<1.65	ug/g		10/30/95
	Acenaphthylene	<1.65	ug/g		10/30/95
	Acenaphthene	<1.65	ug/g		10/30/95
	Anthracene	<1.65	ug/g		10/30/95
	Benzo(a)anthracene	<1.65	ug/g		10/30/95
	Benzo(a)pyrene	<1.65	ug/g		10/30/95
	Bromobenzene	<.22	ug/g		10/11/95
	Benzo(b)fluoranthene	<1.65	ug/g		10/30/95
	Butyl benzyl phthalate	<1.65	ug/g		10/30/95
	Bis(2-chlorethyl)ether	<1.65	ug/g		10/30/95
	Bis(2-chloroethoxy)meth	<1.65	ug/g		10/30/95
	Bis(2-chloroisopropyl)e	<1.65	ug/g		10/30/95
	Bromochloromethane	<.22	ug/g		10/11/95
	Bromodichloromethane	<.22	ug/g		10/11/95
	Bis(2-ethylhexyl)phthal	<1.65	ug/g		10/30/95
	Benzene	<.22	ug/g		10/11/95
	Benzo(g,h,i)perylene	<1.65	ug/g		10/30/95
	Benzidine	<1.65	ug/g		10/30/95
	Benzo(k)fluoranthene	<1.65	ug/g		10/30/95
	Bromomethane	<.22	ug/g		10/11/95
	cis-1,2-Dichloroethylen	<.22	ug/g		10/11/95
	Chlorobenzene	<.22	ug/g		10/11/95
	Chlorodibromomethane	<.22	ug/g		10/11/95
	Chloroethane	<.22	ug/g		10/11/95
	Bromoform	<.22	ug/g		10/11/95
	Chloroform	<.22	ug/g		10/11/95
	Chloromethane	<.22	ug/g		10/11/95
	Chrysene	<1.65	ug/g		10/30/95
	Carbon Tetrachloride	<.22	ug/g		10/11/95
	Dibenzo(a,h)anthracene	<1.65	ug/g		10/30/95

* U denotes results less than the instrument detection limit. < less than sample detection limit.

ADEM CENTRAL LABORATORY
- RESULTS REPORT - November 3. 1995

Lab#	Test	Result	Units	DL*	Analdate
5109210	Dibromomethane	<.22	ug/g		10/11/95
	Dibutyl phthalate	<1.65	ug/g		10/30/95
	Dichlorodifluoromethane	<.22	ug/g		10/11/95
	Dichloromethane	<.22	ug/g		10/11/95
	Diethyl phthalate	<1.65	ug/g		10/30/95
	Dimethylphthalate	<1.65	ug/g		10/30/95
	Di-n-octyl phthalate	<1.65	ug/g		10/30/95
	Ethylbenzene	<.22	ug/g		10/11/95
	Fluoranthene	<1.65	ug/g		10/30/95
	Fluorene	<1.65	ug/g		10/30/95
	Fluorotrichloromethane	<.22	ug/g		10/11/95
	Hexachlorobutadiene	<1.65	ug/g		10/30/95
	Hexachlorobutadiene	<.22	ug/g		10/11/95
	Hexachlorobenzene	<1.65	ug/g		10/30/95
	Hexachlorocyclopentadie	<1.65	ug/g		10/30/95
	Hexachloroethane	<1.65	ug/g		10/30/95
	Isophorone	<1.65	ug/g		10/30/95
	Indeno(1,2,3-cd)pyrene	<1.65	ug/g		10/30/95
	Isopropylbenzene	<.22	ug/g		10/11/95
	m-Dichlorobenzene	<.22	ug/g		10/11/95
	m+p-Xylene	<.22	ug/g		10/11/95
	Naphthalene	<1.65	ug/g		10/30/95
	Naphthalene	<1.65	ug/g		10/30/95
	Nitrobenzene	<1.65	ug/g		10/30/95
	n-Butylbenzene	<.22	ug/g		10/11/95
	N-nitroso-di-n-propylam	<1.65	ug/g		10/30/95
	N-nitrosodimethylamine	<1.65	ug/g		10/30/95
	N-nitrosodiphenylamine	<1.65	ug/g		10/30/95
	n-Propylbenzene	<.22	ug/g		10/11/95
	o-Chlorotoluene	<.22	ug/g		10/11/95
	o-Dichlorobenzene	<.22	ug/g		10/11/95
	o-Xylene	<.22	ug/g		10/11/95
	Pyrene	<1.65	ug/g		10/30/95
	Phenanthrene	<1.65	ug/g		10/30/95
	Pentachlorophenol	<1.65	ug/g		10/30/95
	p-Chlorotoluene	<.22	ug/g		10/11/95
	p-Dichlorobenzene	<.22	ug/g		10/11/95
	Phenol	<1.65	ug/g		10/30/95
	p-Isopropyltoluene	<.22	ug/g		10/11/95
	Secbutylbenzene	<.22	ug/g		10/11/95
	Styrene	<.22	ug/g		10/11/95
	t-1,2-Dichloroethylene	<.22	ug/g		10/11/95
	Tertbutylbenzene	<.22	ug/g		10/11/95
	Trichloroethylene	<.22	ug/g		10/11/95
	Toluene	<.22	ug/g		10/11/95
	Vinyl Chloride	<.22	ug/g		10/11/95

* U denotes results less than the instrument detection limit, < less than sample detection limit.

ADEM CENTRAL LABORATORY

- SAMPLE ANALYSIS REPORT -
10/31/95

To: CERCLA Program
1751 Cong. W.L.Dickinson Drive
Montgomery AL 36109

OCT 1995
RECEIVED
MONTGOMERY

Attn:

Lab number : 5109209
Sample number : 521-6243
Sample matrix : SOIL

Report Date: 10/31/95

COLLECTION INFORMATION
Date/Time/By: 09/26/95 1:55 STAMPS
Location : LAG1-CRACKER ASPHALT LAGO

ADEM CENTRAL LABORATORY
- RESULTS REPORT - October 31, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109209	1,1,1.2-Tetrachloroetha	<.17	ug/g		10/11/95
	1,1,1-Trichloroethane	<.17	ug/g		10/11/95
	1,1,2,2-Tetrachloroetha	<.17	ug/g		10/11/95
	1,1,2Trichloroethane	<.17	ug/g		10/11/95
	1,1-Dichloroethane	<.17	ug/g		10/11/95
	1,1-Dichloroethylene	<.17	ug/g		10/11/95
	1,1-Dichloropropene	<.17	ug/g		10/11/95
	1,2,3-Trichlorobenzene	<.17	ug/g		10/11/95
	1,2,3-Trichloropropane	<.17	ug/g		10/11/95
	1,2,4-Trichlorobenzene	<33	ug/g		10/03/95
	1,2,4-Trichlorobenzene	<33	ug/g		10/03/95
	1,2,4-Trimethylbenzene	1.7000	ug/g		10/11/95
	1,2-Dichlorobenzene	<33	ug/g		10/03/95
	1,2-Dicholoethane	<.17	ug/g		10/11/95
	1,2-Dichloropropane	<.17	ug/g		10/11/95
	1,2-Diphenylhydrazine	<33	ug/g		10/03/95
	1,3,5-Trimethylbenzene	0.1800	ug/g		10/11/95
	1,3-Dichloropropane	<.17	ug/g		10/11/95
	1,3-Dichlorobenzene	<33	ug/g		10/03/95
	1,3-Dichloropropene	<.17	ug/g		10/11/95
	1,4-Dichlorobenzene	<33	ug/g		10/03/95

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SPECIAL PROJECTS

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* U denotes results less than the instrument detection limit, < less than sample detection limit.

ADEM CENTRAL LABORATORY
- RESULTS REPORT -

October 31, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109209	2,2-Dichloropropane	<.17	ug/g		10/11/95
	2,3,7,8-Tetrachlorodibe	<33	ug/g		10/03/95
	2,4,6-Trichlorophenol	<33	ug/g		10/03/95
	2,4-Dichlorophenol	<33	ug/g		10/03/95
	2,4-Dimethylphenol	<33	ug/g		10/03/95
	2,4-Dinitrophenol	<330	ug/g		10/03/95
	2,4-Dinitrotoluene	<33	ug/g		10/03/95
	2,6-Dinitrotoluene	<33	ug/g		10/03/95
	2-Chloronaphthalene	<33	ug/g		10/03/95
	2-Chlorophenol	<33	ug/g		10/03/95
	2-Methyl-4,6-dinitrophe	<165	ug/g		10/03/95
	2-Nitrophenol	<33	ug/g		10/03/95
	3,3'-Dichlorobenzidine	<33	ug/g		10/03/95
	4-Bromophenyl phenyl et	<33	ug/g		10/03/95
	4-Chloro-3-methylphenol	<33	ug/g		10/03/95
	Tetrachloroethylene	<.17	ug/g		10/11/95
	4-Chlorophenyl phenyl e	<33	ug/g		10/03/95
	4-Nitrophenol	<33	ug/g		10/03/95
	Acenaphthylene	<33	ug/g		10/03/95
	Acenaphthene	<33	ug/g		10/03/95
	Anthracene	<33	ug/g		10/03/95
	Benzo(a)anthracene	<33	ug/g		10/03/95
	Benzo(a)pyrene	<33	ug/g		10/03/95
	Bromobenzene	<.17	ug/g		10/11/95
	Benzo(b)fluoranthene	<33	ug/g		10/03/95
	Butyl benzyl phthalate	<33	ug/g		10/03/95
	Bis(2-chloroethyl)ether	<33	ug/g		10/03/95
	Bis(2-chloroethoxy)meth	<33	ug/g		10/03/95
	Bis(2-chloroisopropyl)e	<33	ug/g		10/03/95
	Bromochloromethane	<.17	ug/g		10/11/95
	Bromodichloromethane	<.17	ug/g		10/11/95
	Bis(2-ethylhexyl)phthal	<33	ug/g		10/03/95
	Benzene	<.17	ug/g		10/11/95
	Benzo(g,h,i)perylene	<33	ug/g		10/03/95
	Benzidine	<33	ug/g		10/03/95
	Benzo(k)fluoranthene	<33	ug/g		10/03/95
	Bromomethane	<.17	ug/g		10/11/95
	cis-1,2-Dichloroethylen	<.17	ug/g		10/11/95
	Chlorobenzene	<.17	ug/g		10/11/95
	Chlorodibromomethane	<.17	ug/g		10/11/95
	Chloroethane	<.17	ug/g		10/11/95
	Bromoform	<.17	ug/g		10/11/95
	Chloroform	<.17	ug/g		10/11/95
	Chloromethane	<.17	ug/g		10/11/95
	Chrysene	<33	ug/g		10/03/95
	Carbon Tetrachloride	<.17	ug/g		10/11/95
	Dibenzo(a,h)anthracene	<33	ug/g		10/03/95

* U denotes results less than the instrument detection limit. < less than sample detection limit.

ADEM CENTRAL LABORATORY
- RESULTS REPORT - October 31, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109209	Dibromomethane	<.17	ug/g		10/11/95
	Dibutyl phthalate	<33	ug/g		10/03/95
	Dichlorodifluoromethane	<.17	ug/g		10/11/95
	Dichloromethane	<.17	ug/g		10/11/95
	Diethyl phthalate	<33	ug/g		[illegible]
	Dimethylphthalate	[illegible]	ug/g		[illegible]
	Di-n-octyl phthalate	<33	ug/g		10/03/95
	Ethylbenzene	0.0300	ug/g		10/11/95
	Fluoranthene	<33	ug/g		[illegible]
	Fluorene	<33	ug/g		[illegible]
	Fluorotrichloromethane	<.17	ug/g		[illegible]
	Hexachlorobutadiene	<33	ug/g		[illegible]
	Hexachlorobutadiene	<.17	ug/g		[illegible]
	Hexachlorobenzene	<33	ug/g		[illegible]
	Hexachlorocyclopentadie	<33	ug/g		[illegible]
	Hexachloroethane	<33	ug/g		[illegible]
	Isophorone	<33	ug/g		[illegible]
	Indeno(1,2,3-cd)pyrene	<33	ug/g		[illegible]
	Isopropylbenzene	0.1700	ug/g		[illegible]
	m-Dichlorobenzene	<.17	ug/g		[illegible]
	m+p-Xylene	<.17	ug/g		10/11/95
	Naphthalene	48.3000	ug/g		10/03/95
	Naphthalene	48.30	ug/g		10/03/95
	Nitrobenzene	<33	ug/g		10/03/95
	n-Butylbenzene	<.17	ug/g		10/11/95
	N-nitroso-di-n-propylam	<33	ug/g		10/03/95
	N-nitrosodimethylamine	<33	ug/g		10/03/95
	N-nitrosodiphenylamine	<33	ug/g		10/03/95
	n-Propylbenzene	0.8100	ug/g		10/11/95
	o-Chlorotoluene	<.17	ug/g		10/11/95
	o-Dichlorobenzene	<.17	ug/g		10/11/95
	o-Xylene	<.17	ug/g		10/11/95
	Pyrene	<33	ug/g		10/03/95
	Phenanthrene	<33	ug/g		10/03/95
	Pentachlorophenol	<33	ug/g		10/03/95
	p-Chlorotoluene	<.17	ug/g		10/11/95
	p-Dichlorobenzene	<.17	ug/g		10/11/95
	Phenol	<33	ug/g		10/03/95
	p-Isopropyltoluene	<.17	ug/g		10/11/95
	Secbutylbenzene	<.17	ug/g		10/11/95
	Styrene	<.17	ug/g		10/11/95
	t-1,2-Dichloroethylene	<.17	ug/g		10/11/95
	Tertbutylbenzene	<.17	ug/g		10/11/95
	Trichloroethylene	<.17	ug/g		10/11/95
	Toluene	<.17	ug/g		10/11/95
	Vinyl Chloride	<.17	ug/g		10/11/95

* U denotes results less than the instrument detection limit, < less than sample detection limit.

ADEM CENTRAL LABORATORY

- SAMPLE ANALYSIS REPORT -
11/03/95

To: CERCLA Program
1751 Cong. W.L.Dickinson Drive
Montgomery AL 36109

123456
NOV 1995
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ADEM - FO
MONTGOMER

Attn:

Lab number : 5109213
Sample number : 521-6243
Sample matrix : SOIL

Report Date: 11/03/95

COLLECTION INFORMATION
Date/Time/By: 09/27/95 2:10 STAMPS
Location : NB LEACHATE

ADEM CENTRAL LABORATORY
- RESULTS REPORT - November 3, 1995

Lab#	Test	Result	Units	DL*	Analdate
5109213	1,1,1,2-Tetrachloroetha	<.22	ug/g		10/11/95
	1,1,1-Trichloroethane	<.22	ug/g		10/11/95
	1,1,2,2-Tetrachloroetha	<.22	ug/g		10/11/95
	1,1,2Trichloroethane	<.22	ug/g		10/11/95
	1,1-Dichloroethane	<.22	ug/g		10/11/95
	1,1-Dichloroethylene	<.22	ug/g		10/11/95
	1,1-Dichloropropene	<.22	ug/g		10/11/95
	1,2,3-Trichlorobenzene	<.22	ug/g		10/11/95
	1,2,3-Trichloropropane	<.22	ug/g		10/11/95
	1,2,4-Trichlorobenzene	<1.65	ug/g		10/03/95
	1,2,4-Trichlorobenzene	<1.65	ug/g		10/03/95
	1,2,4-Trimethylbenzene	<.22	ug/g		10/11/95
	1,2-Dichlorobenzene	<1.65	ug/g		10/03/95
	1,2-Dicholoethane	<.22	ug/g		10/11/95
	1,2-Dichloropropane	<.22	ug/g		10/11/95
	1,2-Diphenylhydrazine	<1.65	ug/g		10/03/95
	1,3,5-Trimethylbenzene	<.22	ug/g		10/11/95
	1,3-Dichloropropane	<.22	ug/g		10/11/95
	1,3-Dichlorobenzene	<1.65	ug/g		10/03/95
	1,3-Dichloropropene	<.22	ug/g		10/11/95
	1,4-Dichlorobenzene	<1.65	ug/g		10/03/95

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* U denotes results less than the instrument detection limit. < less than sample detection limit.

Common Name	*Listing*	*Distribution in Alabama*
Flat Pigtoe Mussel	Endangered	Known in Green County
Heavy Pigtoe Mussel	Endangered	Known in Green County
Inflated Heelsplitter Mussel	Endangered	Known in Green and Hale counties
Orange-Nacre Musket Mussel	Endangered	Known in Green and Tuscaloosa counties
Ovate Clubshell Mussel	Endangered	Known in Green and Tuscaloosa counties
Southern Clubshell Mussel	Endangered	Known in Green and Tuscaloosa counties
Stirrup Shell Mussel	Endangered	Known in Green County
Wood Stork	Endangered	Possible occurrence in Green and Hale counties
Red-Coakaded Woodpecker	Endangered	Known in Hale and Tuscaloosa counties
Indiana Bat	Endangered	Possible occurrence in Tuscaloosa County
Dark Pigtoe Mussel	Endangered	Known in Tuscaloosa County
Fine-Lined Pocketbook Mussel	Endangered	Known in Tuscaloosa County
Flattened Musk Turtle	Endangered	Known in Tuscaloosa County
Red Wolf	Endangered	Statewide
Backman's Warbler	Endangered	Statewide
Eskimo Curlew	Endangered	Statewide
American Peregrine Falcon	Endangered	Statewide
American Burying Beetle	Endangered	Statewide

APPENDIX C

SITE INSPECTION WORKSHEETS

This appendix consists of worksheets that can be used to generate an SI site score. Completion of these worksheets is not required, but the SI investigator must evaluate an SI score, either by these worksheets, PREscore, or other regional scoring tools.

The worksheets consists of instructions and data tables to be filled in with scores from HRS reference tables. The data tables may also call for Data Type and References.

Data Type: The Data Type columns should be filled in with an H, Q, or + if the data are HRS quality
well documented. The Data Type column should be filled in with an E, X, or - if the data represents
estimated, approximations, or are not fully documented. This type identifies data gaps for expanded
SI to investigate

References: The Reference columns should be filled in with coded reference numbers. The numbered reference list should be attached or the numbering should be cross-referenced to the SI Narrative.

The SI investigator will need the current SCDM to complete these worksheets.

SITE INSPECTION WORKSHEETS

CERCLIS ID NUMBER
ALD004034138

SITE LOCATION

SITE NAME **Southern Resins Division of Lawter Chem. Moundville**			
ADDRESS Cracker Rd.			
CITY Moundville	**STATE** Alabama	**ZIP CODE** 35474	**TELEPHONE** 2053712235
COORDINATES: LATITUDE and LONGITUDE 33.00'40 N 87.37'30 W	**TOWNSHIP, RANGE, and SECTION**		

OV

OWNER Lawter International			**OPERATOR** Southern Resins		
ADDRESS 990 Skokie Blvd.			P.O. Box 128		
CITY Northbrook			Moundville		
STATE IL.	**ZIP CODE**	**TELEPHONE 312-498-4700**	**STATE** Ala.	**ZIP CODE** 35474	**TELEPHONE** (205) 371-2235

SITE EVALUATION

INVESTIGATOR **Phillip Skaggs**
CONTACT **Phillip Skaggs**
TELEPHONE **334-260-2712**

Site Description and Operational History: Provide a brief description of the site and its operational history. State the site name, owner, operator, type of facility and operations, size of property, active or inactive status, and years of waste generation. Summarize waste treatment, storage, or disposal activities that have or may have occurred at the site; note whether these activities are documented or alleged. Identify all source types and prior spills, floods, or fires. Summarize highlights of the PA and other investigations.

The Southern Resins Site, a Division of Lawter International is an active facility. Currently the facility produces resins. The facility began operations in 1966 and was purchased by Lawter International in 1976, at the time the facility manufactured both resin and varnish. Since 1976 the facility has produced only resins, including tall oil resins, ketone resins and polyamide resins, which are used in paints, inks and adhesives. There are currently two resin manufacturing plants at the facility. A wastewater treatment plant, constructed in 1980, is located directly north of the two resin plants. In 1990, an incinerator located east of the wastewater treatment plant was installed. (please see site layout map) Southern Resins is located off Alabama highway 69, on Cracker Road in Northern Moundville, Tuscaloosa County Ala. The facility encompasses approximately 64 acres, about half of which is developed.

The facility has been sited for violations of environmental regulations since 1981 by the Alabama Department of Environmental Management (ADEM). These violations include improper waste storage and violations of the NPDES permit. In 1981 ADEM notified the facility that an onsite open dump of 55-gallon drums containing waste resin and other unspecified substances was not acceptable under State solid waste regulations due to the toxic characteristics of the resins. (Ref.3) In May 1983, resin-like material, reportedly was spilled from the facility into an unnamed perennial tributary of the Black Warrior River.

On October 31, 1984, ADEM issued a Consent Order to the facility for the companies violations of its NPDES permit. The Consent Order stated that the facility had to implement changes in waste handling procedures due to the inadequate spill containment and exceeding parameter limits for phenol compounds in the plants discharge water. The procedures included additional treatment of wastewater and the development of a method to store, handle and dispose of filter cake waste.(NUS, Summary attached). A Notice of Violation (NOV) was issued by ADEM to the facility in 1985 for improper storage of filter cake waste (ADEM files). In response to the order the facility removed all filter cakes stored onsite to a licensed hazardous waste landfill in Emelle, Alabama, by June 1985. (Ref. 9) In June of 1993 another NOV was issued for a failed onsite inspection. The facility installed a vapor liquid incinerator to burn its waste, it is assumed to avoid a build up of the filter cake that has been a part of the facilities past regulatory problems.

The manufacture of resins at the facility generates wastewater and waste filter cake. Before 1980, wastewater generated at the facility was discharged to several onsite surface impoundments. (Ref. 3) After 1980, this wastewater was discharged to the onsite wastewater treatment plant. Treated water from the wastewater treatment plant is currently discharged into an onsite wastewater treatment pond prior to entering the Black Warrior River under the facilities NPDES permit. The north bluff pond was apparently emptied of water and sediment and closed by the facility. No records could be located to verify the clean closure of the area. The facility generates approximately 185,900 gallons of filter cake waste each year. (Ref.3,6,7,8) The filter cakes contain metals (barium, manganese and Zinc) and numerous organic compounds and solvents such as xylene, methyl ethyl benzene and naphthalene. (Ref. 8) In the past filter cake waste was stored at the rear of the property in three areas: a three-sided concrete waste filter cake bin, a filter cake waste pile and a filter cake debris pile. The concrete bin did not have a cover and was cracked in several locations (Ref. 7) During a July 18, 1984, site inspection ADEM personnel observed what appeared to be solvent pooled on the ground next to the concrete cake bin(Ref. 7) Currently the waste piles have been removed and disposed of in a certified landfill. A solvent recovery system has been installed and allows solvents to be removed from the filter cake and recycled back into the manufacturing process at the facility (Ref. 3) The solid filter cake waste along with off-specification resins produced by the plant are stored onsite in 55-gallon drums prior to incineration in the facility incinerator.

A listing of the investigations, and a summary of findings, on the southern resins site from 1983 to 1998 follows.

Summary of Previous Investigations

Two sampling investigations have been conducted at the facility. In April 1985, CH2M Hill collected waste samples from filter cakes generated at the facility (Ref. 8). The sampling event was conducted to characterize the composition of filter cakes produced at the facility to ensure proper disposal. NUS conducted an SI at the facility in December 1990. Table 1 summarizes investigations conducted at the facility from 1983 to 1990.

TABLE 1

SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

Summary of Previous Investigations

DATE	AGENCY	EVENT	SAMPLES COLLECTED	REFERENCE(S)
July 12, 1983	ADEM	Site Inspection	No samples collected	11
August 16, 1984	ADEM	Compliance Inspection	No samples collected	11
July 18, 1984	ADEM	Site Evaluation	No samples collected	7
January 11, 1984	ADEM	Unannounced Inspection	No samples collected	6

Note: Footnotes for Table 1 appear at the end of the table of page 7.

TABLE 1, concluded

SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

Summary of Previous Investigations

DATE	AGENCY	EVENT	SAMPLES COLLECTED	REFERENCE(S)
April 1985	CH2M Hill	Filter Cake Sampling Investigation	1 FFC 1 FCB 1 FCWP 1 DP	8
December 1990	NUS Corporation	Site Inspection	5 SS 5 GW 5 SW 5 SD	3; 4; 5

GW = Groundwater
SW = Surface water
SD = Sediment
SS = Surface soil
DP = Debris pile
FFC = Fresh filter cake
FCB = Filter cake bin
FCWP = Filter cake waste pile
ADEM = Alabama Department of Environmental Management

During April 1985, CH2M Hill collected waste filer cake samples at the facility during a filter cake sampling investigation. CH2M Hill collected a fresh filter cake sample and filter cake samples from onsite disposal areas including the filter cake bin, the filter cake waste pile and the filter cake debris pile. Analyses of the fresh filter cake sample indicated detectable levels of barium, chromium, manganese, copper, zinc, nickel, cyanide, xylene, methyl ethyl benzene, trinethylbenzene, 2-methyl styrene, dimethyl ethyl benzene, naphthalene, dicylopentadiene, toluene, ethyl benzene, 1,3-cyclopentadiene and styrene. Analyses of the filter cake samples collected from the onsite disposal areas indicated the presence of similar contaminants; however, the concentrations of contaminants were greatest in the analyses of the fresh filter cake sample (Ref. 8, pp. 1, 13, 14).

Table 2 describes elevated levels of hazardous constituents detected in surface soil, groundwater, surface water and sediment samples collected during the NUS SI. The concentration of an analyte is considered elevated if the concentration is greater than or equal to three times the concentration in the background or control sample or greater than or equal to the Minimum Quantitation Limit (MQL)

if the analyte was not detected in the background or control sample. Background samples were collected for all media.

TABLE 2

SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA
SITE INSPECTION
DECEMBER 1990

Summary of Analytical Data

SAMPLE NUMBER	SAMPLE LOCATION	ANALYTICAL RESULTS		REFERENCE(S)
SR-SS-01 (Background)	North of plant buildings.	Arsenic	2 (U) mg/kg	3, pp. 19-21
		Barium	45 mg/kg	
		Copper	6(U) mg/kg	
		Lead	8.1 mg/kg	
		Manganese	130 mg/kg	
		Vanadium	7.4 mg/kg	
		Zinc	20 (U) mg/kg	
		Benzene	11 (U) ug/kg	
		Benzo(a)anthracene	360 (U) ug/kg	
		Dihydromethylindene	800 (J) ug/kg	
		Ethylbenzene	11 (U) ug/kg	
		Ethyldimethylbenzene	6,000 (J) ug/kg	
		2-Methylnaphthalene	140 (J) ug/kg	
		Naphthalene	3,600 ug/kg	
		Octohydromethanoindene	400 (J) ug/kg	
		Styrene	11 (U) ug/kg	
		Tetramethylbenzene	2,00 (J) ug/kg	
		Toluene	11 (U) ug/kg	
		Xylene	11 (U) ug/kg	
SR-SS-02	Waste piles north of plant building.	Vanadium	22 mg/kg	3, pp. 19-21
SR-SS-03	West of wastewater treatment plant.	Ethyldimethylbenzene	1,000 ug/kg	3, pp. 19-21
SR-SS-04	Storage pond north of wastewater treatment plant.	Ethylbenzene	1,900 ug/kg	3, pp. 19-21
		Ethyldimethylbenzene	40,000 (J) ug/kg	
		Ethenylmethylbenzene	10,000 (J) ug/kg	
		Ethylmethylbenzene	60,000 (J) ug/kg	
		2-Methylnaphthalene	5,100 (J) ug/kg	
		Naphthalene	64,000 ug/kg	
		Propenylbenzene	50,000 (J) ug/kg	
		Styrene	1,600 ug/kg	
		Trimethylbenzene	100,000 (J) ug/kg	
		Tetramethylbenzene	40,000 (J) ug/kg	
		Tetrahydromethanoindene	90,000 (J) ug/kg	
		Xylene	16,000 ug/kg	

Note: Footnotes for Table 2 appear at the end of the table on page 11.

TABLE 2, continued

SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA
SITE INSPECTION
DECEMBER 1990

Summary of Analytical Data

SAMPLE NUMBER	SAMPLE LOCATION	ANALYTICAL RESULTS		REFERENCE(S)
SR-SS-05	West of plant building.	Zinc	210 mg/kg	3, pp. 19-21
		Dimethylethylethoxybenzene	4,000 (J) ug/kg	
		Dimethylethylphenol	30,000 (J) ug/kg	
		Hydroxyphenylmethylethylphenol	30,000 (J) ug/kg	
		Trimethylphenylethanone	5,000(J) ug/kg	
SR-MW-01 (Background)	North of waste piles.	Barium	180 ug/l	3, pp. 22-25
		Cadmium	3(U) ug/l	
		Chromium	82 ug/l	
		Copper	53 ug/l	
		Lead	14 ug/l	
		Manganese	120 ug/l	
		Nickel	20 (U) ug/l	
		Vanadium	1990 ug/l	
		Zinc	120 ug/l	
		Benzene	220 ug/l	
		Ethylbenzene	75 ug/l	
		Ethylmethylbenzene	200 (J) ug/l	
		Propylbenzene	60 (J) ug/l	
		Propenylbenzene	50 (J) ug/l	
		Styrene	62 ug/l	
		Xylene	370 ug/l	
SR-MW-03	East of storage pond.	Manganese	410 ug/l	3, pp. 22-25
		Ethyldimethylbenzene	100 (J) ug/l	
		Methylindene	40 (J) ug/l	
		Propadienylbenzene	80 (J) ug/l	
		Trimethylbenzene	80 (J) ug/l	
SR-MW-04	Southeast of incinerator.	Manganese	770 ug/l	3, pp. 22-25
		Ethylbenzene	410 ug/l	
		Ethyldimethylbenzene	500 (J) ug/l	
		Ethylmethylbenzene	2,000 (J) ug/l	
		Ethenylethylbenzene	200 (J) ug/l	
		Methylindene	100 (J) ug/l	
		Methylbenzoic Acid	100 (J) ug/l	
		Methylenepropenylbenzene	70 (J) ug/l	
		Naphthalene	750 ug/l	
		Propylbenzene	400 (J) ug/l	
		Propenylbenzene	400 (J) ug/l	
		Propadienylbenzene	700 (J) ug/l	
		Styrene	280 ug/l	
		Tetrahydrocyclopropindene	100 (J) ug/l	
		Xylene	2,300 ug/l	

Note: Footnotes for Table 2 appear at the end of the table on page 11.

TABLE 2, continued

SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA
SITE INSPECTION
DECEMBER 1990

Summary of Analytical Data

SAMPLE NUMBER	SAMPLE LOCATION	ANALYTICAL RESULTS		REFERENCE(S)
SR-MW-05	Northeast of plant building.	Barium	890 ug/l	3, pp. 22-25
		Cadmium	9 ug/l	
		Chromium	430 ug/l	
		Manganese	1,300 ug/l	
		Vanadium	570 ug/l	
		Ethyldimethylbenzene	90 (J) ug/l	
		Ethylmethylbenzene	700 (J) ug/l	
		Propadienylbenzene	90 (J) ug/l	
		Tetramethylbenzene	50 (J) ug/l	
		Trimethylbenzene	600 (J) ug/l	
SR-SD-01 (Background)	Carthage Branch, upstream from facility.	Barium	5 mg/kg	3, pp. 26-27
		Lead	1.1 mg/kg	
		Manganese	67 mg/kg	
		Vanadium	2.5 mg/kg	
		Zinc	5 (U) mg/kg	
		Ethylbenzene	12 (U) mg/kg	
		2-Methylnaphthalene	410 (U) mg/kg	
		Naphthalene	410 (U) mg/kg	
		Styrene	12 (U) mg/kg	
		Toluene	12 (U) mg/kg	
		Xylene	12 (U) mg/kg	
SR-SD-05	Sludge pond in central portion of facility.	Barium	20 mg/kg	3, pp. 26-27
		Lead	4 mg/kg	
		Vanadium	7.7 mg/kg	
		Diethylbenzene	100,000 (J) mg/kg	
		Ethylbenzene	3,000 mg/kg	
		Ethyldimethylbenzene	200,000 (J) mg/kg	
		Ethylmethylbenzene	70,000 (J) mg/kg	
		2-Methylnaphthalene	7,500 mg/kg	
		Methylpropylbenzene	50,000 (J) mg/kg	
		Naphthalene	190,000 mg/kg	
		Propylbenzene	10,000 (J) mg/kg	
		Propenylbenzene	9,000 (J) mg/kg	
		Styrene	1,900 mg/kg	
		Tetramethylbenzene	90,000 (J) mg/kg	
		Toluene	420 (J) mg/kg	
		Trimethylbenzene	30,000 (J) mg/kg	
		Xylene	22,000 mg/kg	
SR-SW-01 (Background)	Carthage Branch, upstream from facility.	Barium	56 ug/l	3, pp. 28-30

Note: Footnotes for Table 2 appear at the end of the table on page 11.

TABLE 2, continued

SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA
SITE INSPECTION
DECEMBER 1990

Summary of Analytical Data

SAMPLE NUMBER	SAMPLE LOCATION	ANALYTICAL RESULTS		REFERENCE(S)
SR-SW-02	Carthage Branch, onsite.	Butylbenzoic Acid	900 (J) ug/l	3, pp. 28-30
		Decane	30 (J) ug/l	
		Dimethyloxymethane	20 (J) ug/l	
		Dimethylbutanone	50 (J) ug/l	
		Ethylmethylbenzene	100 (J) ug/l	
		Methylpropenal	30 (J) ug/l	
		Methylcyclopentanone	80 (J) ug/l	
		Tetramethylpentanone	600 (J) ug/l	
SR-SW-05	Sludge pond in central portion of facility.	Ethylmethylbenzene	8,000 (J) ug/l	3, pp. 28-30
		Methylbenzofuran	100 (J) ug/l	
		Methylenepropenylbenzene	100 (J) ug/l	
		Propenylbenzene	70 (J) ug/l	
		Propylbenzene	40 (J) ug/l	
		Trimethylbenzene	300 (J) ug/l	

J = Estimated value
U = Material analyzed for but not detected. Value given is the Minimum Quantitation Limit.
ug/l = Micrograms per liter
mg/kg = Milligrams per kilogram
ug/kg = Micrograms per kilogram

GENERAL INFORMATION (continued)

Site Sketch: Provided a sketch of the site. Indicate all pertinent features of the site and nearby environments including sources of wastes, areas of visible and buried wastes building, residences, access roads, parking areas, fences, fields, drainage patterns, water bodies, vegetation, wells, sensitive environments, and other features.

Please see topographic map.

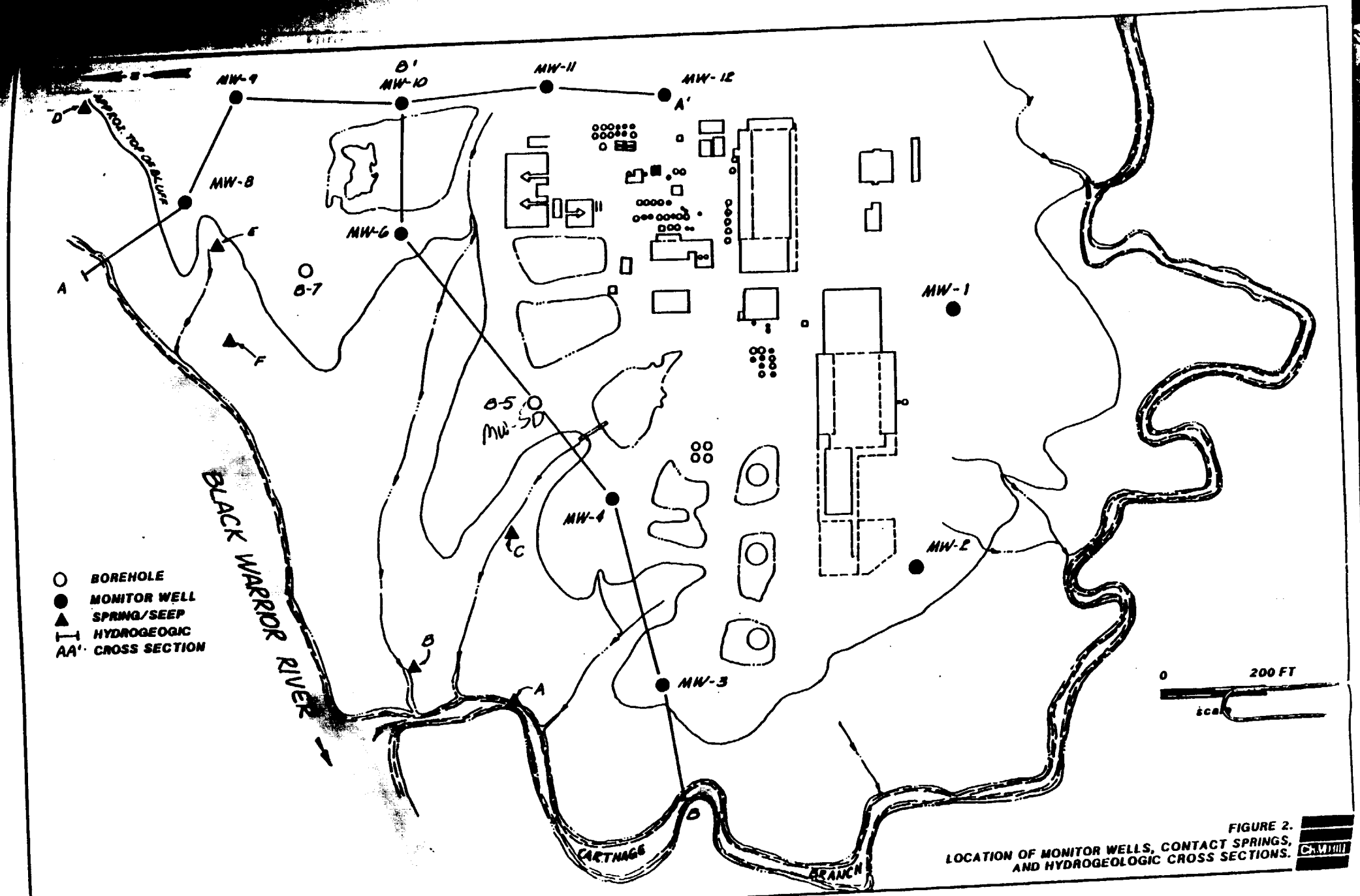
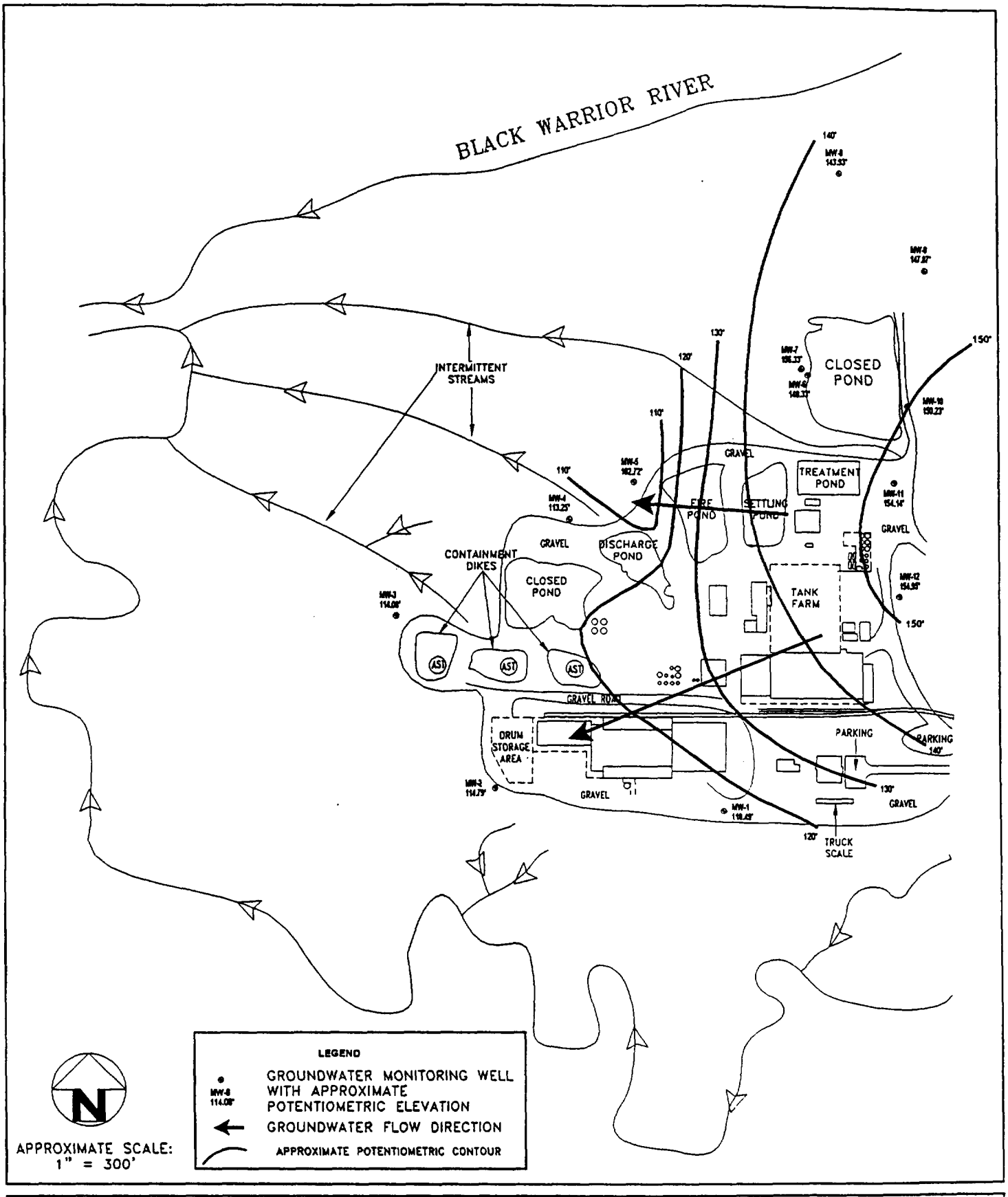


FIGURE 2.
LOCATION OF MONITOR WELLS, CONTACT SPRINGS, AND HYDROGEOLOGIC CROSS SECTIONS.



POTENTIOMETRIC SURFACE MAP
SOUTHERN RESINS FACILITY
MOUNDVILLE, ALABAMA
PROJECT NO.: J0522

NORTH AMERICAN ENVIRONMENTAL CORP.

C-5

GENERAL INFORMATION (continued)

Source Description: Describe all sources at the site. Identify source type and relate to waste disposal operations. Provide source dimensions and the best available waste quantity information. Describe the condition of sources and all containment structures. Cite references.

The main sources of concern are the contaminated soils in the former filter cake storage areas and the ground water plume, that exists under a large portion of the site. Most of the contaminated soils or Filter Cake stored on site, have been removed and are of less concern than the ground water. The HWQ (of 10) for the remaining contamination in the soils on site is minimal in comparison to the HWQ (10,000) and score for the potential ground water threat. The contaminated soils on site are a serious issue but in scoring the site have a small impact due to the surface water pathways high dilution factor of the Black Warrior River.

The ground water plume appears to be in the shallow aquifer and may, due to the geology of the site be localized, or forced to enter the Black Warrior or Carthage Branch (which enters the Black Warrior).For further discussion see the ground water pathway on page C-14. The main concern and focus of this site investigation is locating the source or sources of the ground water plume. The ground water plume discharges from a series of seeps along the Carthage Branch and the Black Warrior River. As shown previously, the seeps have been sampled and several have shown low levels of contamination. From three separate investigations the relative approximate size of the plume has been determined. The waste Quantity has been calculated from these investigations. A worst case estimate of waste quantity has been used, the plume has been estimated at ten acres, with ten feet of water at a 20% soil pore space. (Ref. USGS, NUS, and ADEM Cracker SI)

SOURCE TYPES

Landfill: A man-made (by excavation or construction) or natural hole in the ground into which wastes have come to be disposed by backfilling, or by contemporaneous soil deposition with waste disposal.

Surface Impoundment: A natural topographic depression, man-made excavation, or diked area, primarily formed from earthen materials (lined or unlined) and designed to hold an accumulation of liquid wastes, wastes containing free liquids, or sludges not backfilled or otherwise covered; depression may be wet with exposed liquid or dry if deposited liquid has evaporated, volatilized or leached; structures that may be described as lagoon, pond, aeration pit, settling pond, tailings pond, sludge pit; also a surface impoundment that has been covered with soil after final deposition of waste materials.

Drum: A portable container designed to hold a standard 55-gallon volume of wastes.

Tank and Non-drum Container: Any device, other than a drum, designed to contain an accumulation of waste that provides structural support and is constructed primarily of fabricated materials (such as wood, concrete, steel, or plastic); any portable or mobile device in which waste is stored or otherwise handled.

Contaminated Soil: An area or volume of soil onto which hazardous substances have been spilled spread, disposed, or deposited.

Pile: Any non-containerized accumulation above the ground surface of solid, non-flowing waste; includes open dumps. Some types of waste piles are:

Chemical Waste Pile: A pile consisting primarily of discarded chemical products, by

products, radioactive waste, or used or unused feedstocks

Scrap Metal or Junk Pile: A pile consisting primarily of scrap metal or discarded durable goods (such as appliances, automobiles, auto parts, batteries, etc.) composed of materials containing hazardous substances

Tailings Pile: A pile consisting primarily of any combination of overburden from a mining

operation and tailings from a mineral mining, benefication, or processing operation.

Trash Pile: A pile consisting primarily of paper, garbage, or discarded non-durable goods containing hazardous substances.

Land Treatment: Landfarming or other method of waste management in which liquid wastes or sludges are spread over land and tilled, or liquids are injected at shallow depths into soils.

Other: Sources not in categories listed above.

GENERAL INFORMATION (continued)

Source Description: Include description of containment per pathway for ground water (see HRS Table 3-2), surface water (see HRS table 4-2), and air (see HRS table 6-3 and 6-9).

The contaminated soils that exist on site are a result of storage practices in the past. The waste filter cake produced by the Southern Resins Facility and the previous facility owners was stored in such a manner as to allow it and the various solvents in it to migrate to the soils on site. These soils make up a part of the sources on site the ground water plume being the other source. Very little containment exists for either of these sources.

Hazardous Waste Quantity (HWQ) Calculation: SI Tables 1 and 2 (see HRS tables 2-5, 2-6, and 5-2)

The ground water plume covers an area of approximately 10 acres. One acre equals 4356 square feet, a water depth or aquifer depth of ten feet (assumed for worst case scenario) a pore space of 20%

10 X 4356 ft.square X10 ft. water depth X .20 (pore space) = 871200/67.25(from HRS "other category for source") =12,906.67 this is an HWQ of 10,000

HWQ=10,000

10,000

C-7

SI TABLE 1: ***HAZARDOUS WASTE QUANTITY (HWQ) SCORES FOR SINGLE SOURCE SITES***

AND FORMULAS FOR MULTIPLE SOURCE SITES

		Single Source Sites	
(Column 1) Tier	(Column 2) Source Type	(Column 3) HWQ = 10	(Column 4) HWQ = 100
A Hazardous Constituent Quantity	N/A	HWQ = 1 If Hazardous Constituent Quantity data are complete HWQ = 10 If Hazardous Constituent Quantity data are not complete	> 100 to 10,000 lbs
B Hazardous Wastestream Quantity	N/A	≤ 500,000 lbs	>500,000 to 50 million lbs
C Volume	Landfill	≤ 6.75 million cubic feet ≤ 250,000 cubic yards	> 6.75mil to 675mil cu.ft > 250,000 to 25mil cu.yd
	Surface Impoundment	≤ 6,750 cubic feet ≤ 250 cubic yards	> 6750 to 675000 cu.ft. > 250 to 25,000 cu.yd.
	Drums	≤ 1,000 drums	> 1000 to 100000 drums
	Tanks and non-drum Containers	≤ 50,000 gallons	> 50,000 to 5mil gallons
	Contaminated soil	≤ 6.75 mil cubic feet ≤ 250,000 cubic yards	> 6.75mil to 675mil cu.ft >250000 to 25mil cu.yd
	Pile	≤ 6,750 cubic feet ≤ 250 cubic yards	> 6750 to 675000 cu.ft > 250 to 25000 cu. yd
	Other	≤ 6,750 cubic feet ≤ 250 cubic yards	> 6750 to 675000 cu. ft >250 to 25000 cu. yd
D Area	Landfill	≤ 340,000 sq. ft ≤ 7.8 acres	>340000 to 34mil sq.ft. > 7.8 to 780 acres
	Surface Impoundment	≤ 1,300 sq. ft ≤ 0.029 acres	>1300 to 130000 sq.ft. >0.029 to 2.9 acres
	Contaminated soil	≤ 3.4mil sq. ft ≤ 78 acres	>3.4mil to 340mil sq.ft. >78 to 7800 acres
	Pile	≤ 1,300 sq. ft ≤ 0.029 acres	>1300 to 130000 sq.ft. >0.029 to 2.9 acres
	Land treatment	≤ 27,000 sq. ft ≤ 0.62 acres	>27000 to 2.7mil sq.ft. >0.62 to 62 acres

Table 1 (continued)

Single source sites		Multiple source Sites		
HWQ = 10000	HWQ=1000000	Divisor	Source type	Tier
>10000 - 1mil lbs	>1mil lbs	lbs/1	N/A	A Hazardous Constituent Quantity
>50mil - 5bil lbs	>5bil lbs	lbs/5000	N/A	B Hazardous Wastestream Quantity
>675mil - 67.5bil >25mil - 2.5bil	>67.5bil >2.5bil	cu.ft./675000 cu.yd/2500	Landfill	C Volume
>675000-67.5mil >25000 - 2.5mil	>67.5mil >2.5mil	cu.ft/67.5 cu.yd/2.5	Surface Impoundment	
>100000 - 10mil	>10mil	drums/10	Drums	
>5mil-500mil	>500mil	gallons/500	Tanks and non-drum containers	
>675mil-67.5bil >25mil-2.5bil	>67.5bil >2.5bil	cu.ft/67500 cu.yd/2500	Contaminated soil	
>675000-67.5mil >25000-2.5mil	>67.5mil >2.5mil	cu.ft/67.5 cu.yd/2.5	Pile	
>675000-67.5mil >25000-2.5mil	>67.5mil >2.5mil	cu.ft/67.5 cu.yd/2.5	Other	
>34mil-3.4bil >780-78000	>3.4bil >78000	sq.ft/3400 acres/0.078	Landfill	D Area
>130000-13mil >2.9-290	>13mil >290	sq.ft/13 acres/0.00029	Surface Impoundment	
>340mil-34bil >7800-780000	>34bil >780000	sq.ft/34000 acres/0.78	Contaminated soil	
>130000-13mil >2.9-290	>13mil >290	sq.ft/13 acres/0.00029	Pile	
>2.7mil-270mil >62-6200	>270mil >6200	sq.ft/270 acres/0.0062	Land treatment	

HAZARDOUS WASTE QUANTITY (HWQ) CALCULATION

For each migration pathway, evaluate HWQ associated with sources that are available to migrate to that pathway. (Note: If **Actual Contamination Targets** exist for groundwater, surface water, or air migration pathways, assign the calculated HWQ score or 100, whichever is greater, as the HWQ score for that pathway.) For each source, evaluate HWQ for one or more of the four tiers (SI Table 1; HRS Table 2-5) for which data exist: constituent quantity, wastestream quantity, source volume, and source area. Select the tier that gives the highest value as the source HWQ. Select the source volume HWQ rather than source area HWQ if data for both tiers are available.

Column 1 of SI Table 1 indicates the quantity tier. Column 2 lists source types for the four tiers. Columns 3,4,5, and 6 provide ranges of waste amount for sites with only one source, corresponding to HWQ scores at the tops of the columns. Column 7 provides formulas to obtain source waste quantity values at sites with multiple sources.

1. Identify each source type

2. Examine all waste quantity data available for each source. Record constituent quantity and waste stream mass or volume. Record dimensions of each source.
3. Convert source measurements to appropriate units for each tier to be evaluated.
4. For each source, use the formulas in the last column of SI Table 1 to determine the waste quantity value for each tier that can be evaluated. Use the waste quantity value obtained from the highest tier as the quantity value for the source
5. Sum the values assigned to each source to determine the total site waste quantity.
6. Assign HWQ score from SI Table 2 (HRS Table 2-6)

Note these exceptions to evaluate soil exposure pathway HWQ (see HRS Table 5-2)

The divisor for the area (sq.ft) of a landfill is 34,000.
The divisor for the area (sq.ft) of a pile is 34.
Wet surface impoundments and tanks and non-drum containers are only sources for which volume measurements are evaluated for the soil exposure pathway.

SI Table 2: HWQ Score for sites

Site WQ Total	HWQ Score
0	0
1* to 100	1**
> 100 to 10,000	100
>10,000 to 1 million	10,000
> 1 million	1,000,000

- If the WQ total is between 0 and 1 round it to 1

** If the hazardous constituent quantity data are not complete, assign the score of 0

SI TABLE 3: WASTE CHARACTERIZATION WORKSHEET

Site Name: Southern Resins **References: 3,8**

Sources: Please see next page

1.
2.
3.

Source	Haz. Sub	Toxicity	GW Path	SW Path							
			GW Mob	Tox Mob	Per	Tox/ Per	Bio Pot	Tox /Per/ Bio	Ecotox	Ecotox/ per	Ecotox/ Per/Bio
		10,000	1	10,000	1	10,000	500	50,00000	10	10	5000
3		10	1	10	.4	4	50	200	100	40	2,000
1,2		10,000	1	10,000	1	10,000	5	50,000	100	100	500
1,2		10,000	.002	20	1	10,000	500	5,000,000	10	10	5,000

Table 3

WASTE CHACTERIZATION WORK SHEET FOR CRACKER ASPHALT SITE

SOURCES:

REFERENCES: APPENDIX A & C IN NARRATIVE REPORT

1. MW-6
2. MW-11
3. MW-12
4. SEEP SAMPLES

SOURCE	SUBSTANCE	TOXICITY	GW MOBILITY	GW TOX/MOB	PER	TOX/PER	FOOD CH. BIOACC	ENV. BIOACC	FOOD CH. TOX/PER BIOACC	ENV. TOX/PER BIOACC	ECOTOX	ECOTOX/ PER	FOOD CH ECOTOX/ PER/ BIOACC	ENV. ECOTOX/ PER/ BIOACC	TOX/ MOB/ PER	FOOD CH TOX/ MOB/ PER/ BIOACC	ENV. TOX/ MOB/ PER/ BIOACC	ECOTOX/ MOB/ PER	FOOD CH. ECOTOX/ MOB/ PER/ BIOACC	ENV. ECOTOX/ MOB/ PER/ BIOACC
1 (GW)	Benzene	100	1.00	100.00	0.40	40.00	5000	500	2.00E+05	2.00E+04	100	40	2.00E+05	2.00E+04	40.00	2.00E+05	2.00E+04	40.00	2.00E+05	2.00E+04
2 (GW)	Ethylbenzene	10	0.01	0.10	0.40	4.00	50	50	200	200	100	40	2000	2000	0.04	2.00	2.00	0.40	20	20
1 (GW)	Napthalene	1	0.01	0.01	0.40	0.40	500	500	200	200	1000	400	2.00E+05	2.00E+05	4.00E-03	2.00	2.00	4.00	2000	2000
2 (GW)	Styrene	10	0.01	0.10	0.40	4.00	50	50	200	200	100	40	2000	2000	0.04	2.00	2.00	0.40	20	20
2 (GW)	Toluene	10	0.01	0.10	0.40	4.00	50	50	200	200	100	40	2000	2000	0.04	2.00	2.00	0.40	20	20
3 (GW)	Xylene	1	0.01	0.01	0.40	0.40	50	50	20	20	100	40	2000	2000	4.00E-03	0.20	0.20	0.40	20	20
2 (GW)	Cumene	1000	0.01	10.00	0.40	400.00	500	500	2.00E+05	2.00E+05	100	40	2.00E+04	2.00E+04	4.00	2.00E+03	2.00E+03	0.40	200	200
4 (GW/SW)	Xylene	1	0.01	0.01	0.40	0.40	50	50	20	20	100	40	2000	2000	4.00E-03	0.20	0.20	0.40	20	20
4 (GW/SW)	Meth. Chlor.	10	1.00	10.00	0.40	4.00	5	5	20	20	1	0.40	2	2	4.00	20.00	20.00	0.40	2	2
4 (GW/SW)	Chloroform	100	1.00	100.00	0.40	40.00	5	5	200	200	10	4	20	20	40.00	200.00	200.00	4.00	20	20
4 (GW/SW)	Benzene	100	1.00	100.00	0.40	40.00	5000	500	2.00E+05	2.00E+04	100	40	2.00E+05	2.00E+04	40.00	2.00E+05	2.00E+04	40.00	2.00E+05	2.00E+04
4 (GW/SW)	Ethylbenzene	10	0.01	0.10	0.40	4.00	50	50	200	200	100	40	2000	2000	0.04	2.00	2.00	0.40	20	20
4 (GW/SW)	Toluene	10	0.01	0.10	0.40	4.00	50	50	200	200	100	40	2000	2000	0.04	2.00	2.00	0.40	20	20
4 (GW/SW)	Styrene	10	0.01	0.10	0.40	4.00	50	50	200	200	100	40	2000	2000	0.04	2.00	2.00	0.40	20	20

Groundwater Observed Release Substances Summary Table

On SI Table 4, list the hazardous substances associated with the site detected in groundwater samples for that aquifer. Include only those substances directly observed or with concentrations significantly greater than background levels. Obtain toxicity values from the SCDM. Assign mobility a value of 1 for all observed release substances regardless of the aquifer being evaluated. For each substance, multiply the toxicity by the mobility to obtain the toxicity/mobility factor value; enter the highest toxicity/mobility value for the aquifer in the space provided.

Groundwater Actual Contamination Targets Summary Table

If there is an observed release at a drinking water well, enter each hazardous substance meeting the requirements for an observed release by well and sample ID on SI table 5 and record the detected concentration. Obtain benchmark, cancer risk, and reference dose concentrations from SCDM. For MCL and MCLG benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages for the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage or the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate the population using the well as a level 1 target. If these percentages are less than 100% or all are N/A, evaluate the population using the well as a level II target for that aquifer.

SI TABLE 4: GROUNDWATER OBSERVED RELEASE SUBSTANCES (BY AQUIFER)

Sample ID	Haz. Substance	Bckgrd. Conc.	Toxicity/Mobility	References
Mw-6	Benzene		100	
Mw11	Cumeme		10	
Mw-11	Styrene		0.1	
Mw-6	Napthalene		.01	
Mw-12	Xylene		.01	
		Highest Tox/Mob	100	

SI TABLE 5: GROUNDWATER ACTUAL CONTAMINATION TARGETS

Well ID: Well, # NA Level I: Level II: Pop. Ser.: Ref.: #

Sample ID	Haz.Sub.	Conc. PPB	Bench. Conc. MCL/MCLG	% of Bench	Cancer risk conc.	% of cancer risk conc.	RFD	% of RFD
NA								
			Highest %		Sum of %		Sum of %	

Well ID: Level I: Level II: Pop. Ser. Ref.

Sample ID	Haz.Sub.	Conc. PPB	Bench. Conc. MCL/MCLG	% of Bench.	Cancer risk conc.	% of cancer risk conc.	RFD	% of RFD
NA								
			Highest %		Sum of %		Sum of %	

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GROUNDWATER PATHWAY

GROUNDWATER USE DESCRIPTION

Describe groundwater use within 4 miles of the site: Describe generalized stratigraphy, aquifer, municipal and private wells.

The Lawter/Southern Resins site lies within the Alluvial- Deltic Plain district of the East Gulf Coastal Plain physiographic section. The prominent physiographic feature of this area is the broad, well developed, flat flood plains and terraces that have been formed by the meandering Black Warrior River. (U.S.G.S)

The geologic units that outcrop in Moundville and the surrounding area are of sedimentary origin and consist of gravel, sand, silt and clay (SI on Cracker Ref.6243) At the Southern Resins site alluvium and terrace deposits of Quaternary age overlie the Cretaceous age Gordo and Coker formations of the Tuscaloosa Group.

The Quaternary flood plain deposits can be as much as 100 feet thick, and consist mainly of gravel, sand, silt and clay. The Gordo Formation, which lies beneath the flood plain deposits, is as much as 400 feet thick, and consists of sand and gravel overlain by alternating lenticular beds of sand and mottled clay. The Coker formation, which lies beneath the Gordo Formation, ranges in thickness from less than 100 feet to up to 1,000 feet. The Coker Formation consists of a nonmarine zone of gravel overlain by marine sand and clay. The nonmarine basal zone is generally separated from the marine sand beds by 50 feet or more of clay.

Sand and gravel beds of the Tuscaloosa group are the major sources of ground water in the study area. Aluvium and terrace deposits may also contain sand and gravel aquifers that are capable of yielding enough water for a private domestic or stock supply. (U.S.G.S). According to the outcrops along the river bank and the bore logs from the monitoring wells on site, the terrace deposits consist of an upper fine grained unit and a basal coarse-grained unit that lies unconformably atop the eroded remnants of the Gordo Formation. The base of the terrace deposit is considered to be the lowest occurrence of gravel.

The Gordo Formation, as seen in the bore hole logs consist of an upper unit of sand having zones of high iron content intermingled with layers of sandy clay and clayey sand and a basal unit of fine to medium sand. The contact between the Gordo Formation and the Coker Formation, as seen in the outcrops along the river bank, is a ½ inch layer of iron cemented sanstone underlain by massive red, purple, gray and brown mottled clay.

The terrace and Gordo deposits thicken in a westward direction and are estimated to 35 to 120 feet in thickness underneath the Lawter/Southern Resins Site.

There are a total of 70 houses within the four mile target distance that are assumed to be on well water due to well houses and the lack of city water in the area they are located. The City of Moundville has two wells 3.75 miles north East from the site at 244 ft. deep. The city of Moundvile has 1,348 connections on its system. The Moundville Water Works supplies 40% of Hale Counties water. Hale county serves 2,500 people. This amounts to approximately 300,000 gallons a day.

While there is evidence that the Terrace/Gordo aquifer at the Lawter site and adjacent Cracker Asphalt Site, is contaminated, the likelihood of any known municipal wells becoming contaminated is thought to be minimal because: 1) The nearest public well is 1.4 miles to the southwest of the site. 2) The flow direction of ground water in the shallow terrace deposit aquifer beneath the site is, according to three independent studies (ADEM, NUS, and U.S Environmental Engineering Inc.) to the South west away from the municipal wells and toward the Black Warrior River and Carthage Branch. 3) The contaminate aquifer is horizontallly discontinuous in nature and the aquifer discharges its ground water to the surface in areas where erosional features have cut the land surface to a depth below the Terrace/Gordo aquifer. 4) The public water supply wells located within the 4-mile target radius are screened in the Coker aquifer and not the Terrace/Gordo aquifer. 5)The upper units of the Coker Formation are massive clays that help protect the aquifer from the contaminants above. 6) The Coker aquifer has a higher water pressure than the

Terrace/Gordo aquifer above. Therefore ground water from the Terrace/Gordo aquifer can not migrate downward into the Coker aquifer. After careful review of the evidence it is the writers opinion that the Black Warrior and Carthage Branch represent Discontinuities to the ground water flow at the Lawter/Southern resins site, under the HRS definition (Ref. Section7.1 of HRS guidance U.S EPA)

After a review of the three studies of the Lawter and adjacent site, Cracker Asphalt EPA Ref. #6243 the ground water plume appears to be originating from the Cracker sludge pond or one of the other tanks just up gradient from the old pond. The ground water flow, potentiometric maps generated by three consulting agents (One U.S Environmental, for Cracker another for Lawter, and one developed by ADEM in an SI investigation of Cracker Asphalt agree with the general flow toward the river. The data on the monitoring wells nearest the Cracker Asphalt sediment pond have the highest average contaminate levels, the farther away from this pond the lower the levels get. The ground water exits the bluffs in several locations at the Black Warrior and the Carthage Branch. Contaminates have been detected at low levels in some of these seeps. It is likely that a large portion of the contamination found in the ground water is from a source or sources on the Cracker Site, but the Lawter Site has been proven to have areas of contamination due to past storage practices and may be partially responsible for the groundwater contamination. (Ref. SI,SIP,Cracker SI) The sampling done in several studies and direct inspection by ADEM personnel shows that past contamination of the Lawter site has occurred. (Ref. NUS, SI)

Show calculations of groundwater drinking water populations for each aquifer: Provide apportionment calculations for blended supply systems. County average number of persons per household: 2.685

GROUNDWATER PATHWAY WORKSHEET

Data

Likelihood of release	**Score**	**Type**	**Refs**
1. OBSERVED RELEASE: If sampling data or direct observation support a release to the aquifer, assign a score of 550. Record observed release substances on SI Table 4.	550		
2. POTENTIAL TO RELEASE: Depth to aquifer: feet. If sampling data do not support a release to the aquifer, and the site is in karst terrain or the depth to aquifer is 70 feet or less, assign a score of 500; otherwise, assign a score of 340. Optionally, evaluate potential to release according to HRS Section 3.			
LR =	550		

Targets

Are any wells part of a blended system? **Y** N If yes, attach a page to show apportionment calculations. 3. ACTUAL CONTAMINATION TARGETS: If analytical evidence indicates that any target drinking water well for the aquifer has been exposed to a hazardous substance from the site, evaluate the factor score for the number of people served (SI Table 5). Level I: people x 10 = Level II: people x 1 =	0		
4. POTENTIAL CONTAMINATION TARGETS: Determine the number of people served by drinking water wells for the aquifer or overlying aquifers that are not exposed to a hazardous substance from the site; record the population for each distance category in SI Table 6a or 6b. Sum the population values and multiply by 0.1.	136		
5. NEAREST WELL: Assign a score of 50 for any Level I Actual Contamination Targets for the aquifer or overlying aquifer. Assign a score of 45 if there are Level II targets but no Level I targets. If no Actual Contamination Targets exist, assign the Nearest Well score from SI Table 6a or 6b. If no drinking water wells exist within 4 miles assign 0.	5		
6. WELLHEAD PROTECTION AREA (WHPA): If any source lies within or above a WHPA for the aquifer, or if a groundwater observed release has occurred within a WHPA, assign a score of 20; assign 5 if neither condition applies but a WHPA is within 4 miles; otherwise assign 0.	5		
7.RESOURCES: Assign a score of 5 if one or more groundwater resource applies; assign 0 if none applies. - Irrigation (5 acre min) of commercial food crops or commercial forage crops -Watering of commercial livestock -Ingredient in commercial food preparation -Supply for commercial aquaculture -Supply for a major or designated water recreation area, excluding drinking water use	5		
Sum of Targets	151		

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SI TABLE 6 (From HRS Table 3-12): Values for Pot. Contamination GW Target Pop.

SI Table 6a: Other Than Karst Aquifers

Population served by wells within distance category

Dis. From Site	Pop.	Near Well	1 to 10	11 to 30	31 to 100	101 to 300	301 to 1000	1001 to 3000	3001 to 1.0E+4	10001 to 3.0E+4	30001 to 1.0E+5	>1.0E+5 to 3.0E+5	Pop. val.
0 to .25		20	4	17	53	164	522	1633	5214	16325	52137	163246	
.25 to .5		18	2	11	33	102	324	1013	3233	10122	32325	101213	
.5 to 1		9	1	5	17	52	167	523	1669	5224	16684	52239	
1 to 2	3220	5	0.7	3	10	30	94	294	939	2939	9385	29384	939
2 to 3		3	0.5	2	7	21	68	212	678	2122	6778	21222	
3 to 4	3220	2	0.3	1	4	13	42	131	417	1306	4171	13060	417
Nearest	well	5										Sum =	1356

Ref. 1a,and 3a

SI TABLE 6 (From HRS Table 3-12) Values for Pot. Contamination GW Target Pop.

SI Table 6b: Karst Aquifers **Na**

Population served by wells within distance category

Dis. From Site	Pop.	Near Well	1 to 10	11 to 30	31 to 100	101 to 300	301 to 1000	1001 to 3000	3001 to 1.0E+4	10001 to 3.0E+4	30001 to 1.0E+5	>1.0E+5 to 3.0E+5	Pop. val.
0 to .25	6	20	4	17	53	164	522	1633	5214	16325	52137	163246	4
.25 to .5		20	2	11	33	102	324	1013	3233	10122	32325	101213	
.5 to 1		20	2	9	26	82	261	817	2607	8163	26068	81623	
1 to 2		20	2	9	26	82	261	817	2607	8163	26068	81623	
2 to 3		20	2	9	26	82	261	817	2607	8163	26068	81623	
3 to 4	2333	20	2	9	26	82	261	817	2607	8163	26068	81623	817
Nearest	Well	20										Sum =	821

GROUNDWATER PATHWAY WORKSHEET (concluded)

Data

Waste Characteristics	Score	Type
8. If any Actual Contamination Targets exist for the aquifer or overlying aquifers, assign the calculated hazardous waste quantity score or a score of 100, whichever is greater; if no Actual Contamination Targets exist, assign the hazardous waste quantity score calculated for sources available to migrate to groundwater.	10,000	
9. Assign the highest groundwater toxicity/mobility value from SI Table 3 or 4.	100	
10. Multiply the groundwater toxicity/mobility and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below: (from HRS Table 2-7)		
WC=	32	

Product	WC Score
0	0
>0 to <10	1
10 to <100	2
100 to <1000	3
1000 to <10000	6
10000 to <1E+05	10
1E+05 to <1E+06	18
1E+06 to <1E+07	32
1E+07 to <1E+08	56
1E+08 or greater	100

Multiply LR by T and by WC. Divide the product by 82,500 to obtain the groundwater pathway score for each aquifer. Select the highest aquifer score. If the pathway score is greater than 100, assign 100.

Groundwater Pathway Score: $\frac{\text{LR x T x WC}}{82{,}500}$ =20

$$\frac{2{,}657{,}600}{82500} = 32.21$$

SURFACE WATER PATHWAY

Sketch of the Surface Water Migration Route:

Label all surface water bodies. Include runoff and drainage direction, probable point of entry, and 15-mile target distance limit. Mark sample locations, intakes, fisheries, and sensitive environments. Indicate flow directions, tidal influence, and rate. **Please see following diagrams and topographic maps.**

The surface water run-off from the site flows to the west to northwest, approximately 500 feet to the Carthage branch Creek. The surface run off takes place in at least six distinct depressions, several of which go direct to the Black Warrior. The Cartage Branch flows approximately 500 feet and enters the Black Warrior River. The 15-mile downstream surface water pathway (swp) ends in the Black Warrior.). The Black Warrior River has a seven day consecutive low flow of 935 cubic feet per second . There are no known drinking water intakes located along the swp Approximately 26 of the 30 miles of river bank along the swp is considered to be wetlands. The adjacent wetlands to the east and the land along the surface water pathways may be critical to the support of many threatened and endangered species.

Contaminates have been detected in the Carthage Branch, that appear to come from this site or the site next to it, the former Cracker Asphalt plant, (now owned by a different company). The contaminates of concern are butylbenzenic acid, elimthyloxy methane and ethyl methylbenzene.

Surface Water Conclusions:

The site lacks the concentrations of contaminates that have a high enough bioaccumulation factor to rank the site. The high dilution factor of the Black Warrior and the lack of any drinking water intakes on the river within 15 miles, mitigate much of the risk measured under the HRS.

SURFACE WATER PATHWAY

Surface Water Observed Release Substance Summary Table

On SI Table 7, list hazardous substances detected in surface water samples for the watershed, which can be attributed to the site. Include only those substances in observed releases (direct observation) or with concentration levels significantly above background levels. Obtain toxicity, persistence, bioaccumulation potential, and ecotoxicity values from SCDM. Enter the highest toxicity/persistence, toxicity/persistence/bioaccumulation, and ecotoxicity/persistence/ecobioaccumulation values in the spaces provided.

- TP = Toxicity x persistence
- TPB = TP x bioaccumulation
- ETPB = EP x bioaccumulation (EP = ecotoxicity x persistence)

Drinking Water Actual Contamination Targets Summary Table

For an observed release at or beyond a drinking water intake, on SI Table 8 enter each hazardous substance by sample ID and the detected concentration. For surface water sediment detecting a hazardous substance at or beyond intake, evaluate the intake as level II contamination. Obtain benchmark, cancer risk, and reference dose concentrations for each substance from SCDM. For MCL and MCGL benchmark, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages of the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage or the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate the population served by the intake as a Level I target. If the percentages are less than 100% or all are N/A, evaluate the population served by the intake as a Level II target.

TABLE 7: SURFACE WATER OBSERVED RELEASE SUBSTANCES

SAMPLE ID	HAZARDOUS SUBSTANCE	CONC. ppb	Toxicity Persistence	Food Chain Toxicity/ Persis. Bioaccum	Env. Toxicity/ Persis. Bioaccum	Food Chain Ecotoxicity/ Persis./ Ecobioaccum	Env. Ecotoxicity/ Persis./ Ecobioaccum	REFERENCES
4 (GW/SW)	Xylene	320	0.4	20	20	2000	2000	see Narrative Report Appendices
4 (GW/SW)	Meth. Chlor.	7.5	4	20	20	2	2	see Narrative Report Appendices
4 (GW/SW)	Chloroform	4.7	40	200	200	20	20	see Narrative Report Appendices
4 (GW/SW)	Benzene	150	40	2.00E+05	2.00E+04	2.00E+05	2.00E+04	see Narrative Report Appendices
4 (GW/SW)	Ethylbenzene	54	4	200	200	2000	2000	see Narrative Report Appendices
4 (GW/SW)	Toluene	28	4	200	200	2000	2000	see Narrative Report Appendices
4 (GW/SW)	Styrene	37	4	200	200	2000	2000	see Narrative Report Appendices
Highest Values			40	2.00E+05	2.00E+04	2.00E+05	2.00E+04	

TABLE 8: SURFACE WATER DRINKING WATER ACTUAL CONTAMINATION TARGETS

NO INTAKES WITHIN 15 MILES OF SITE

Please See following Chart

SI TABLE 7: SURFACE WATER OBSERVED RELEASE SUBSTANCES

Sample ID	Haz. Substance	Bckgrd. Conc.	Toxicity/Per.	Tox/Per /Bio	Ecotox/Per /Ecobio	Ref.
		Highest Tox/Mob				

SI TABLE 8: SURFACE WATER DRINKING WATER ACTUAL CONTAMINATION TARGETS No Drinking Water Intakes in 15 Mile TDL

Intake ID:NA Sample type: Level I: Level II: Pop. served.: Ref.:

Sample ID	Haz.Sub.	Conc. PPB	Bench. Conc. MCL/MCLG	% of Bench	Cancer risk conc.	% of cancer risk conc.	RFD	% of RFD
NA								
			Highest %		Sum of %		Sum of %	

Intake ID: NA Sample type: Level I: Level II: Pop. ser.: Ref.:

Sample ID	Haz.Sub.	Conc. PPB	Bench. Conc. MCL/MCLG	% of Bench.	Cancer risk conc.	% of cancer risk conc.	RFD	% of RFD
NA								
			Highest %		Sum of %		Sum of %	

SURFACE WATER PATHWAY

LIKELIHOOD OF RELEASE- OVERLAND/FLOOD MIGRATION	Score	Data Type	Ref
1. OBSERVED RELEASE: If sampling data or direct observation support a release to surface water in the watershed, assign a score of 550. Record observed release substances on SI Table 7.	550		
2. POTENTIAL TO RELEASE: Distance to surface water: **feet**. If sampling data do not support a release to surface water in the watershed, use the table below to assign a score. **Score** Distance to surface water <2500 feet 500 Distance to surface water >2500 feet and Site in annual or 10 yr floodplain 500 Site in 100 yr floodplain 400 Site in 500 yr floodplain 300 Site outside 500 yr floodplain 100 Optionally, evaluate surface water potential to release according to HRS Section 4.1.2.1.2			
LR =	550		

LIKELIHOOD OF RELEASE GROUNDWATER TO SURFACE WATER MIGRATION	Score	Data Type	Ref
1. OBSERVED RELEASE: If sampling data or direct observation support a release to surface water in the watershed, assign a score of 550. Record observed release substances on SI Table 7. Note: Evaluate groundwater to surface water migration only for a surface water body that meets all of the following conditions: 1. A portion of the surface water is within 1 mile of site sources having a containment factor greater than 0. 2. No aquifer discontinuity is established between the source and the above portion of the surface water body. 3. The top of the uppermost aquifer is at or above the bottom of the surface water. Elevation of top of uppermost aquifer: Elevation of bottom of surface water body:	550		
2. POTENTIAL TO RELEASE: Use the groundwater potential to release. Optionally, evaluate surface water potential to release according to HRS Section 3.1.2			
LR =	550		

SURFACE WATER PATHWAY

LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT WORKSHEET (CONTINUED)

DRINKING WATER THREAT TARGETS

Record the water body type, flow, and number of people served by each drinking water intake within the target distance limit in the watershed. If there is no drinking water intake within the target distance limit, assign 0 to factors 3, 4, and 5. Intake Name Water Body Type Flow Pop. Served Are any intakes part of a blended system? Y N If yes, attach a page to show apportionment calculations. 3. ACTUAL CONTAMINATION TARGETS: If analytical evidence indicates a drinking water intake has been exposed to a hazardous substance from the site, list the intake name and evaluate the factor score for the drinking water population (SI Table 8) Level I: people x 10 = Level II: people x 1 = Total =	NA		
4. POTENTIAL CONTAMINATION TARGETS: Determine the number of people served by drinking water intakes for the watershed that have not been exposed to a hazardous substance from the site. Assign the population values from SI Table 9. Sum the values and multiply by 0.1.	0		
5. NEAREST INTAKE: Assign a score of 50 for any Level I Actual Contamination Drinking Water Targets for the watershed. Assign a score of 45 if there are Level II targets for the watershed, but no Level I targets. If no Actual Contamination Drinking Water Targets exist, assign a score for the intake nearest the PPE from SI Table 9. If no drinking water intakes exist, assign 0.	NA		
6. RESOURCES: Assign a score of 5 if one or more surface water resource applies; assign 0 if none applies. -Irrigation (5 acre minimum) of commercial food crops or commercial forage crops -Watering of commercial livestock -Ingredient in commercial food preparation -Major or designated water recreation area, excluding drinking water use	5		
SUM OF TARGETS =	5		

No Drinking Water intakes are within the 15 mile target distance limit.

SI TABLE 9 (From HRS 4-14): DILUTION-WEIGHTED POP. VALUES FOR POTENTIAL CONTAMINATION FOR SURFACE WATER MIGRATION PATHWAY

Number of people

CFS/Water Body	Pop.	Near intake	1 to 10	11 to 30	31 to 100	101 to 300	301 to 1000	1001 to 3000	3001 to 10000	10001 to 30000	Pop. Value
<10 cfs		20	4	17	53	164	522	1633	5214	16325	
10 to 100 cfs		2	.4	2	5	16	52	163	521	1633	
>100 to1000 cfs		0	.04	.2	.5	2	5	16	52	163	
>1000 to 10000 cfs		0	.004	.02	.05	.2	.5	2	5	16	
>10000 to 100000 cfs		0	0	.002	.005	.02	.05	.2	.5	16	
>100000 cfs		0	0	0	.001	.002	.005	.02	.05	.2	
Shallow ocean zone or Great Lake (depth <20 feet)		0	0	.002	.005	.02	.05	.2	.5	2	
Moderate ocean zone or Great Lake (depth 20 to 200 feet)		0	0	0	.001	.002	.005	.02	.05	.2	
Deep ocean zone or Great Lake (depth > 200 feet)		0	0	0	0	.001	.003	.008	.03	.08	
3 mile mixing zone in quiet flowing river (≥ 10 cfs)		10	2	9	26	82	261	817	2607	8163	
Nearest intake		na								Sum =	

No Drinking Water intakes within the 15 mile target distance limit.

SURFACE WATER PATHWAY

Human Food Chain Actual Contamination Targets Summary Table

On SI Table 10, list the hazardous substance detected in sediment, aqueous, sessile benthic organism tissue, or fish tissue samples (taken from fish caught with the boundaries of the observed release) by sample ID and concentration. Evaluate fisheries within the boundaries of observed release detected by sediment or aqueous samples as Level II, if at least one observed release substance has a bioaccumulation potential factor value of 500 or greater (see SI Table 7). Obtain benchmark, cancer risk, and reference dose concentrations from SCDM. For FDAAL benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages for the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate this portion of the fishery as subject to Level I concentrations. If the percentages are less than 100% or all are N/A, evaluate the fishery as a Level II target.

Sensitive Environment Actual Contamination Targets Summary Table

On SI Table 11, list each hazardous substances detected in aqueous or sediment samples at or beyond wetlands or a surface water sensitive environment by sample ID. Record the concentration. If contaminated sediments or tissues are detected at or beyond a sensitive environment, evaluate the sensitive environment as Level II. Obtain benchmark concentrations from SCDM. For AWQC/AALAC benchmarks, determine the highest percentage of benchmark of the substances detected in aqueous samples. If benchmark concentrations are not available for a particular substance, enter N/A for the percentage. If highest benchmark percentage equals or exceeds 100%, evaluate that part of the sensitive environment subject to Level I concentrations. If the percentage is less than 100%, or all are N/A, evaluate the sensitive environment as Level II.

SI TABLE 10: HUMAN FOOD CHAIN ACTUAL CONTAMINATION TARGETS FOR WATERSHED No Data Available

SI TABLE 11: SENSITIVE ENVIRONMENT ACTUAL CONTAMINATION TARGETS FOR WATERSHED No sample data, shows release of contaminates to watershed.

Envir. ID:na Sample Type: Level I: Level II: Envir. Val:

Sample ID	Hazardous Substance	Conc. PPB	Bench. Conc. AWQC or AALAC	% of Bench.	Ref.
			Highest %	0	

Envir. ID: Sample Type: Level I: Level II: Envir. Val:

Sample ID	Hazardous Substance	Conc. PPB	Bench. Conc. AWQC or AALAC	% of Bench.	Ref.
			Highest %		

SURFACE WATER PATHWAY (continued)

HUMAN FOOD CHAIN THREAT WORKSHEET

Human Food Chain Threat Targets

Record the water body type and flow for each fishery within the target distance limit. If there is no fishery within the target distance limit, assign a score of 0 at the bottom of this page.			
Fishery Name: Black Warrior Water Body: Large stream Flow: 100-1000 cfs Species: Production: unknown lbs/yr Species: Production: lbs/yr Fishery Name: Water Body: Flow: Species: Production: lbs/yr Species: Production: lbs/yr			
FOOD CHAIN INDIVIDUAL 7. ACTUAL CONTAMINATION FISHERIES If analytical evidence indicates that a fishery has been exposed to a hazardous substance with a bioaccumulation factor greater than or equal to 500 (SI Table 10), assign a score of 50 if there is a Level I fishery. Assign 45 if there is a Level II fishery, but no Level I fishery. 8. If there is a release of a substance with a bioaccumulation factor greater than or equal to 500 to a watershed containing fisheries within the target distance limit, but there are no Level I or Level II fisheries, assign a score of 20. If there is no observed release to the watershed, assign a value for potential contamination fisheries from the table below using the lowest flow at all fisheries within the target distance limit:			
Lowest Flow — FCI Value <10 cfs — 20 10 to 100 cfs — 2 >100 cfs, coastal tidal waters, oceans, or Great Lakes — 0 3- mile mixing zone in quiet flowing river — 10 FCI Value =	20	H	
SUM OF TARGETS =	20		

SURFACE WATER PATHWAY (continued)

ENVIRONMENTAL THREAT WORKSHEET

Environmental Threat Targets

Record the water body type and flow for each surface water sensitive environment within the target distance (see SI Table 12). If there is no sensitive environment within the target distance limit, assign a score of 0 at the bottom of the page.

Environment Name	Water Body Type	Flow (cfs)
Carthage	Minimal stream	Less than 10
East wetland	Overland drainage	Less than 10
Black Warrior	Large Stream	100 to 1000

9. ACTUAL CONTAMINATION SENSITIVE ENVIRONMENTS:
If sampling data or direct observation indicate any sensitive environment has been exposed to a hazardous substance from the site, record this information on SI Table, and assign a factor value for the environment (SI Table 13 and 14).

Environment Name	Type and value	Multiplier	Product	0
NA				

10. POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS 5.5

Flow	Dilution (SI table 12)	Type and Value	Pot Cont.	Product
<1000	.01 X 500		0.1	0.5
<10	0.1 X 25		0.1	2.5
<10	0.1 X 25		0.1	2.5
<10	X		0.1	
<10	X		0.1	
				Sum =

SUM OF TARGETS = 5.5

SI TABLE 12 (HRS Table 4-13)

SURFACE WATER DILUTION WEIGHTS

Type of Surface Water Body		Assigned Dilution Weight
Descriptor	Flow Characteristics	
Minimal stream	<10 cfs	1
Small to moderate stream	10 to 100 cfs	0.1
Moderate to large stream	>100 to 1000 cfs	0.01
Large stream to river	>1000 to 10000 cfs	0.001
Large River	>10000 to 100000 cfs	0.0001
Very large river	> 100000 cfs	0.00001
Coastal tidal waters	N/A	0.001
Shallow ocean zone or Great Lake	Flow N/A; depth less than 20 feet	0.001
Moderate depth ocean zone or Great Lake	Flow N/A; depth 20 to 200 feet	0.0001
Deep ocean zone or Great Lake	Flow N/A; depth greater than 200 feet	0.000005
3-mile mixing zone in quiet flowing river	10 cfs or greater	0.5

SI TABLE 13 (HRS TABLE 4-23)

SURFACE WATER AND AIR SENSITIVE ENVIRONMENTS VALUES

SENSITIVE ENVIRONMENT	ASSIGNED VALUE
Critical habitat for Federal designated endangered or threatened species Marine Sanctuary National Park Designated Federal Wilderness Area Ecologically import areas identified under the Coastal Zone Wilderness Act Sensitive Areas identified under the National Estuary Program or Near Coastal Water Program of the Clean Water Act Critical Areas identified under the Clean Lakes Program of the Clean Water Act (subareas inlakes or entire small lakes) National Monument (air pathway only) National Seashore Recreation Area National Lakeshore Recreation Area	100
Habitat known to be used by Federal designated or proposed endangered or threatened species National Preserve National or State Wildlife Refuge Unit of Coastal Barrier Resources System Coastal Barrier (undeveloped) Federal land designated for the maintenance of fish/shellfish species within a river system, bay, or estuary Migratory pathways and feeding areas critical for the maintenance of anadromous fish species within river reaches or areas in lakes or coastal tidal waters in which the fish spend extended periods of time Terrestrial areas utilized by large or dense aggregations of vertebrate animals (semi-aquatic foragers) for breeding National river reach designated as recreational	75
Habitat known to be used by State designated endangered or threatened species Habitat known to be used by a species under review as to its Federal endangered or threatened status Coastal Barrier (partially developed) Federally designated Scenic or Wild River	50
State land designated for wildlife or game management State designated Scenic or Wild River State designated Natural Area Particular areas, relatively small in size, important to maintenance of unique biotic communities	25
State designated areas for the protection of maintenance of aquatic life under the Clean Water Act	5
Wetlands see SI Table 14 (SW pathway) or SI Table 23 (Air pathway)	

SI TABLE 14 (HRS TABLE 4-24): SURFACE WATER WETLANDS FRONTAGE VALUES

Total Length of Wetlands	Assigned Values
Less than 0.1 mile	0
0.1 to 1 mile	25
>1 to 2 miles	50
>2 to 3 miles	75
>3 to 4 miles	100
>4 to 8 miles	150
>8 to 12 miles	250
>12 to 16 miles	350

SURFACE WATER PATHWAY (concluded)

WASTE CHARACTERISTICS, THREAT, AND PATHWAY SCORE SUMMARY

WASTE CHARACTERISTICS **Score**

14. If any Actual Contamination Targets (drinking water, human food chain, or environmental threat) exist for the watershed, assign the calculated hazardous waste quantity score or a score of 100, whichever is greater.	
15. Assign the highest value from SI Table 7 or SI Table 3 for the hazardous substance waste characterization factors below. Multiply each by the surface water hazardous waste quantity score and determine the waste characteristics score for each threat	

	Substance Value		HWQ		Product	
Drinking Water Tox/Per	10,000	40	X	10,000	=	4e5	18
Food Chain Tox/Per/Bio	200,000		X	10,000		=2e9	180
Environmental Ecotox/Per/Ecobio	20,000		X	10,000	=	2e8	100

Product	WC Score
0	0
>0 to <10	1
10 to <100	2
100 to <1000	3
1000 to <10000	6
10000 to <1E+05	10
1E+05 to <1E+06	18
1E+06 to <1E+07	32
1E+07 to <1E+08	56
1E+08 to <1E+09	100
1E+09 to <1E+10	180
1E+10 to <1E+11	320
1E+11 to <1E+12	560
1E+12 or greater	1000

Surface Water Pathway Threat Scores

Threat	LR	Targets	WC	Threat Score
Drinking Water	**550**	**5**	**18**	**0.6**
Human Food Chain	**550**	**20**	**180**	**24**
Environmental	**550**	**5.5**	**100**	**3.66**
			SW Pathway Score	**28.26**

C-33

SOIL EXPOSURE PATHWAY

If there is no observed contamination (e.g., ground water plume with no surface source), do not evaluate the soil exposure pathway. Discuss evidence for no soil exposure pathway.

Soil Exposure Resident Population Targets Summary

For each property (duplicate page 35 as necessary)

IF there is an area of observed contamination on the property and within 200 feet of a residence, school, or day care center, enter on Table 15 each hazardous substance by sample ID. Record the detected concentration. Obtain cancer risk, and reference dose concentrations from SCDM. Sum the cancer risk and reference dose percentages for the substance listed. If cancer risk or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate the residents and students as Level I. If both are less than 100% or all are N/A, evaluate the targets as Level II.

The site is currently an active facility. The area is not readily accessible to the public. There is no resident population.

SI TABLE 15: SOIL EXPOSURE RESIDENT POPULATION TARGETS

Residence ID: Level I: Level II: Pop:

Sample ID	Haz.Sub.	Conc. PPM	Cancer risk conc.	% of cancer risk conc.	RFD	% of RFD	Toxicity Value	
NA								
			Highest %		Sum of %		Sum of %	

Residence ID: Level I: Level II: Pop:

Sample ID	Haz.Sub.	Conc. PPM	Cancer risk conc.	% of cancer risk conc.	RFD	% of RFD	Toxicity Value	
			Highest %		Sum of %		Sum of %	

Residence ID: Level I: Level II: Pop:

Sample ID	Haz.Sub.	Conc. PPM	Cancer risk conc.	% of cancer risk conc.	RFD	% of RFD	Toxicity Value	
			Highest %		Sum of %		Sum of %	

SOIL EXPOSURE PATHWAY WORKSHEET

RESIDENT POPULATION THREAT

Data

Likelihood of Exposure	Score	Type	Refs
1. OBSERVED RELEASE: If evidence indicates presence of observed contamination (**depth of 2 feet or less**), assign a score of 550; otherwise, assign 0. Note that a likelihood of exposure score of 0 results in a soil exposure pathway score of 0.	550		
LE =	550		

Targets

2. RESIDENT POPULATION: Determine the number of people occupying residences or attending school or day care on or within 200 feet of areas of observed contamination (HRS section 5.1.3). Level I: people x 10 = 0 Level II: people x 6 = 0 Sum =	0		
3. RESIDENT INDIVIDUAL: Assign a score of 50 if any Level I resident population exists. Assign a score of 45 if there are Level II targets but no Level I targets. If no resident population exist assign 0 (HRS Section 5.1.3)	0		
4. WORKERS: Assign a score from the table below for the total number of workers at the site and nearby facilities with areas of observed contamination associated with the site. Number or Workers — Score 0 — 0 1 to 100 — 5 101 to 1000 — 10 > 1000 — 15	5		
5. TERRESTRIAL SENSITIVE ENVIRONMENTS: Assign a value for each terrestrial sensitive environment (SI Table 16) in an area of observed contamination. Terrestrial Sensitive Environment Type — Value	0		
6. RESOURCES: Assign a score of 5 if any one or more of the following resources is present on an area of observed contamination at the site; assign 0 if none applies. -Commercial agriculture -Commercial silviculture -Commercial livestock production or commercial livestock grazing	0		
Sum of Targets	5		

No known Terrestrial Sensitive Environments for this site

SI TABLE 16 (HRS TABLE 5-5): SOIL EXPOSURE PATHWAY

TERRESTRIAL SENSITIVE ENVIRONMENT VALUES

TERRESTRIAL SENSITIVE ENVIRONMENT	ASSIGNED VALUE
Terrestrial critical habitat for Federal designated endangered or threatened species National Park Designated Federal Wilderness Area National Monument (air pathway only)	100
Terrestrial habitat known to be used by Federal designated or proposed endangered or threatened species National Preserve (terrestrial) National or State terrestrial Wildlife Refuge Federal land designated for the protection of natural ecosystems Administratively proposed Federal Wilderness Area Terrestrial areas utilized by large or dense aggregations of vertebrate animals (semi-aquatic foragers) for breeding	75
Terrestrial habitat known to be used by State designated endangered or threatened species Terrestrial habitat known to be used by a species under review as to its Federal endangered or threatened status	50
State land designated for wildlife or game management State designated Natural Areas Particular areas, relatively small in size, important to maintenance of unique biotic communities	25

SOIL EXPOSURE PATHWAY WORKSHEET

NEARBY POPULATION THREAT

Data

Likelihood of Exposure		Score	Type	Refs
7. Attractiveness/Accessibility (from SI Table 17 or HRS Table 5-6)	Value 25			
Area of Contamination (from SI Table 18 or HRS Table 5-7)	Value 100			
	Likelihood of Exposure(SI Table 19)			
	LE =	250		

Data

Targets	Score	Type	Ref.
8. Assign a score of 0 if Level I or Level II resident individual has been evaluated or if no individuals live within ¼ mile travel distance of an area of observed contamination. Assign a score of 1 if nearby population is within ¼ mile travel distance and no Level I or Level II resident population has been evaluated.	1		
9. Determine the population within 1 mile travel distance that is not exposed to a hazardous substance from the site (i.e., properties that are not determined to be Level I or Level II); record the population for each distance category in SI Table 20 (HRS table 5-10). Sum the population values and multiply by 0.1	.0315		
Targets =	1.315		

3.15 X 0.1 =0.315

SI TABLE 17 (HRS TABLE 5-6):

ATTRACTIVENESS/ACCESSIBILITY VALUES

Area of Observed Contamination	Assigned Value
Designated recreational area	100
Regularly used for public recreation (for example, vacant lots in urban area)	75
Accessible and unique recreational area (for example, vacant lots in urban area)	75
Moderately accessible (may have some access improvements-for example gravel road) with some public recreation use	50
Slightly accessible (for example, extremely rural area with no road improvement) with some public recreation use	25
Accessible with no public recreation use	10
Surrounded by maintained fence or combination of maintained fence and natural barriers	5
Physically inaccessible to public, with no evidence of public recreation use	0

SI TABLE (HRS TABLE 5-7):

AREA OF CONTAMINATION FACTOR VALUES

Total area of the areas of observed contamination (square feet)	Assigned Value
≤ to 5000	5
> 5000 to 125000	20
> 125000 to 250000	40
> 250000 to 375000	60
> 375000 to 500000	80
> 500000	100

SI TABLE 19 (HRS TABLE 5-8):

NEARBY POPULATION LIKELIHOOD OF EXPOSURE VALUES

Area of Contamination

Factor Value — Attractiveness/Accessibility Factor Value

	100	75	50	25	10	5	0
100	500	500	375	**250**	125	50	0
80	500	375	250	125	50	25	0
60	375	250	125	50	25	5	0
40	250	125	50	25	5	5	0
20	125	50	25	5	5	5	0
5	50	25	5	5	5	5	0

SI TABLE 20 (HRS TABLE 5-10):
DISTANCE-WEIGHTED POPULATION VALUES FOR NEARBY POPULATION THREAT

Number of people within the travel distance category

Dis. from site	Pop.		1 to 10	11 to 30	31 to 100	101 to 300	301 to 1000	1001 to 3000	3001 to 1.0E+4	10001 to 3.0E+4	30001 to 1.0E+5	>1.0E+5 to 3.0E+5	Pop. Val.
0 to .25	3	0	.1	.4	1.0	4	13	41	130	408	1303	13034	.1
.25 to .5	6	0	.05	.2	.7	2	7	20	65	204	652	6517	.05
.5 to 1	453	0	.02	.1	.3	1	3	10	33	102	326	1020	3
												Sum =	3.15

SOIL EXPOSURE PATHWAY WORKSHEET (concluded)

Waste Characteristics

10. Assign the hazardous waste quantity score calculated for soil exposure	10,000
11. Assign the highest toxicity value from SI Table 16	1000
12. Multiply the toxicity and hazardous waste quantity scores. Assign the Waste Characteristic score from the table below:	

Product	WC Score = **56**
0	0
>0 to <10	1
10 to <100	2
100 to <1000	3
1000 to <10000	6
10000 to <1E+05	10
1E+05 to <1E+06	18
1E+06 to <1E+07	32
1E+07 to <1E+08	56
1E+08 or greater	100

Resident population threat score	LR	Targets	WC	Threat Score
(Likelihood of Exposure, question 1; Targets = Sum of questions 2,3,4,5,6)	**550**	**5**	**56**	**1.86**

Nearby population threat score	LR	Targets	WC	ThreatScore
(Likelihood of Exposure, question 7; Targets = Sum of question 8,9)	**550**	**1.2**	**56**	**.22**
Soil Exposure pathway score		**Pathway**	**Score**	**2.08**

Soil Exposure Calculation, equals, Threat scores /82500

SITE SCORE CALCULATION

S	S(2)	
Groundwater Pathway	**32.21**	**1037.69**
Surface Water Pathway	**28.26**	**799**
Soil Exposure Pathway	**2.08**	**4.33**
Air Pathway	**Na**	**Na**
Site Score	**21.45**	

Comments: TheLawter/Southern Resins site, does not possess the necessary targets and hazardous waste quantity to qualify it for the NPL, but the site, still represents a minor threat to the environment immediately down stream from the site, in the form of ground water, and surface water drainage leaving the site. The writer recommends the Lawter /Southern Resins site Ref. #6243 be considered for NFRAP. The Water Division of ADEM is in the process of investigation of the Lawter Site and has ordered a Risk Assessment be done on the site. A portion of the Cracker Asphalt site is included in this risk assessment study, because Lawter once leased a large storage tank from Cracker to store a solvent byproduct.

Recommendations: The old sediment impoundment on the Cracker facility should be excavated and the contaminate levels in the wells on both sites should be monitored. If the levels do not decrease further investigation of the site may be needed.

File

TES VIII WORK ASSIGNMENT NO. C04119
SITE INSPECTION PRIORITIZATION
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA
EPA ID NO. ALD004034138
WASTELAN NO. 0137

DATE REPORT ACCEPTED 12-6-93
DISPOSITION Further Action
SAM SIGNATURE Cynthia Gunley

EPA REGION:	IV
CONTRACT NO.:	68-W9-0005; TES VIII
EPA WAM:	DEBORAH VAUGHN WRIGHT
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DOCUMENT CONTROL NO. C04119-SIP-LC-405

Submitted to

U.S.ENVIRONMENTAL PROTECTION AGENCY

REGION IV

by

DYNAMAC CORPORATION

December 1, 1993

TES VIII WORK ASSIGNMENT NO. C04119
SITE INSPECTION PRIORITIZATION
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA
EPA ID NO. ALD004034138
WASTELAN NO. 0137

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TES VIII WORK ASSIGNMENT NO. C04119
SITE INSPECTION PRIORITIZATION
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA
EPA ID NO. ALD004034138
WASTELAN NO. 0137

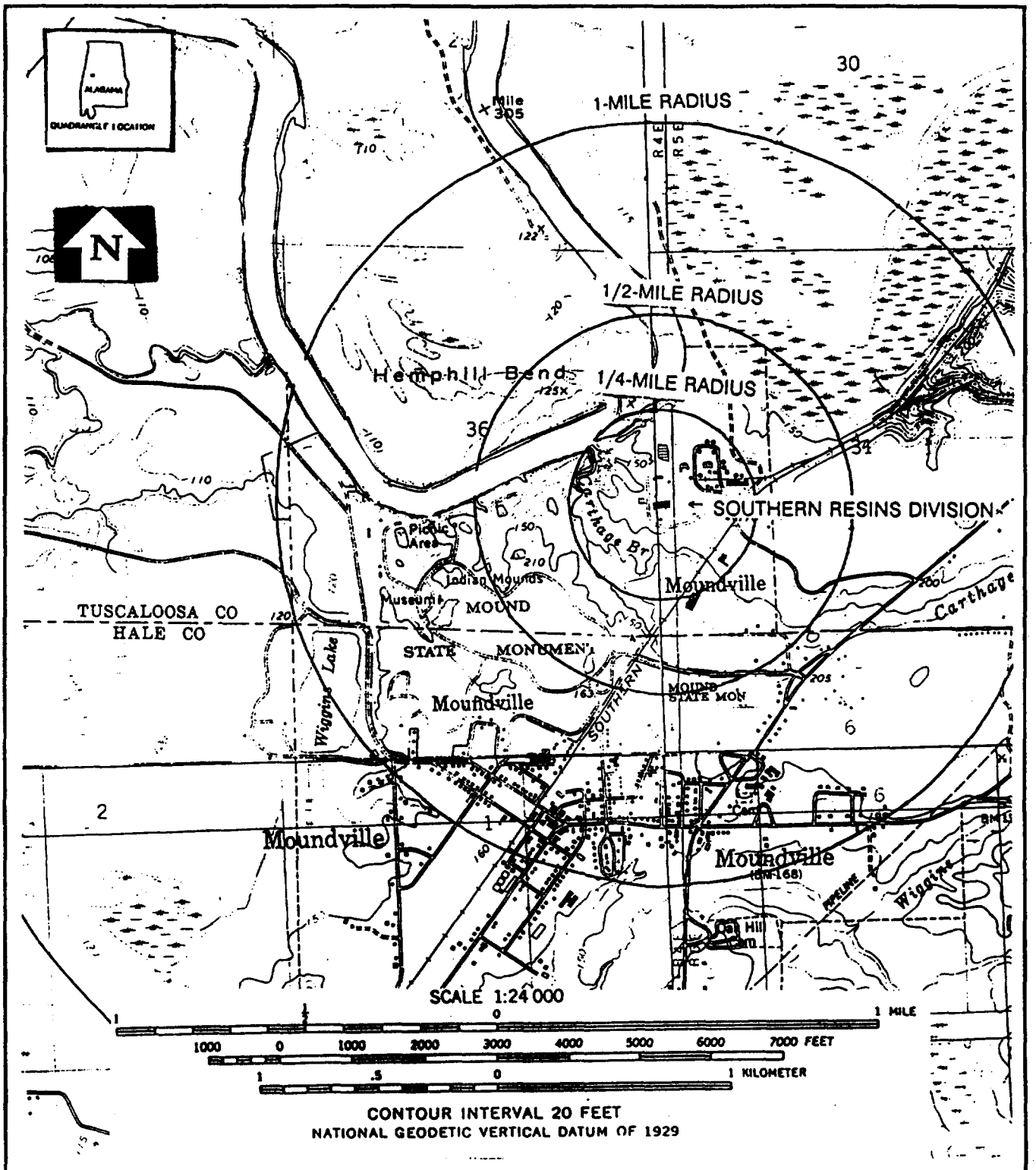
Introduction

Dynamac Corporation (Dynamac) has conducted this Site Inspection Prioritization (SIP) at the request of EPA Region IV under the Technical Enforcement Support (TES VIII) contract, Work Assignment No. C04119. The objective of this SIP was to evaluate the characteristics of the site and surrounding areas in order to provide a recommendation concerning further activities at the site. In order to achieve this objective, Dynamac has gathered and assimilated all readily available existing information concerning Southern Resins Division (Southern Resins) and has either assembled or confirmed the data concerning the population and environments in the vicinity of the site. Pertinent elements of the data gathered and evaluated are presented in the sections that follow. Any information gaps in the data evaluated are also identified.

Site History and Description

Southern Resins Division (the facility), a currently active manufacturer of resins, is located off Alabama Highway 69 on Cracker Road in northern Moundville, Tuscaloosa County, Alabama. Specifically, the facility is located at 33° 00′ 40″ north latitude and 87° 37′ 30″ west longitude (see Figure 1) (Refs. 1; 2; 4). The 64-acre facility is located primarily in a rural area. Land use in the vicinity of the facility is residential, commercial and recreational (Ref. 4, p. 4). Residential properties are adjacent to the eastern and southern borders of the facility, and there is no fence surrounding the facility (Ref. 3, p. 8). The west side of the facility adjoins Carthage Branch (Refs. 4, p. 2; 5, p. 12). The Black Warrior River is located to the north of the facility (Ref. 2).

The facility, which began operations in 1966, currently employs about 60 workers (Refs. 5, p. 4; 27). Prior to its purchase by Lawter International (Lawter) in 1976, the facility manufactured both resin and varnish. Available file material does not indicate the owners of the facility prior to 1976. Since 1976, the facility has produced only resins, including tall oil resins, ketone resins and polyamide resins, which are used in paints, inks and adhesives (Refs. 1; 5, pp. 3-5). There are currently two resin manufacturing plants at the facility. A wastewater treatment plant, constructed in 1980, is located directly north of the two resin plants. In 1990, an incinerator located east of the wastewater treatment plant was installed (see Figure 2) (Ref. 5, pp. 3-6).



Source: Map is a portion of USGS 7.5 Minute Series Quadrangle Maps of Alabama: Englewood 1970 (Photorevised [PR] 1983), Fosters 1969 (PR 1978), Moundville West 1980, Moundville East 1980 (PR 1983).

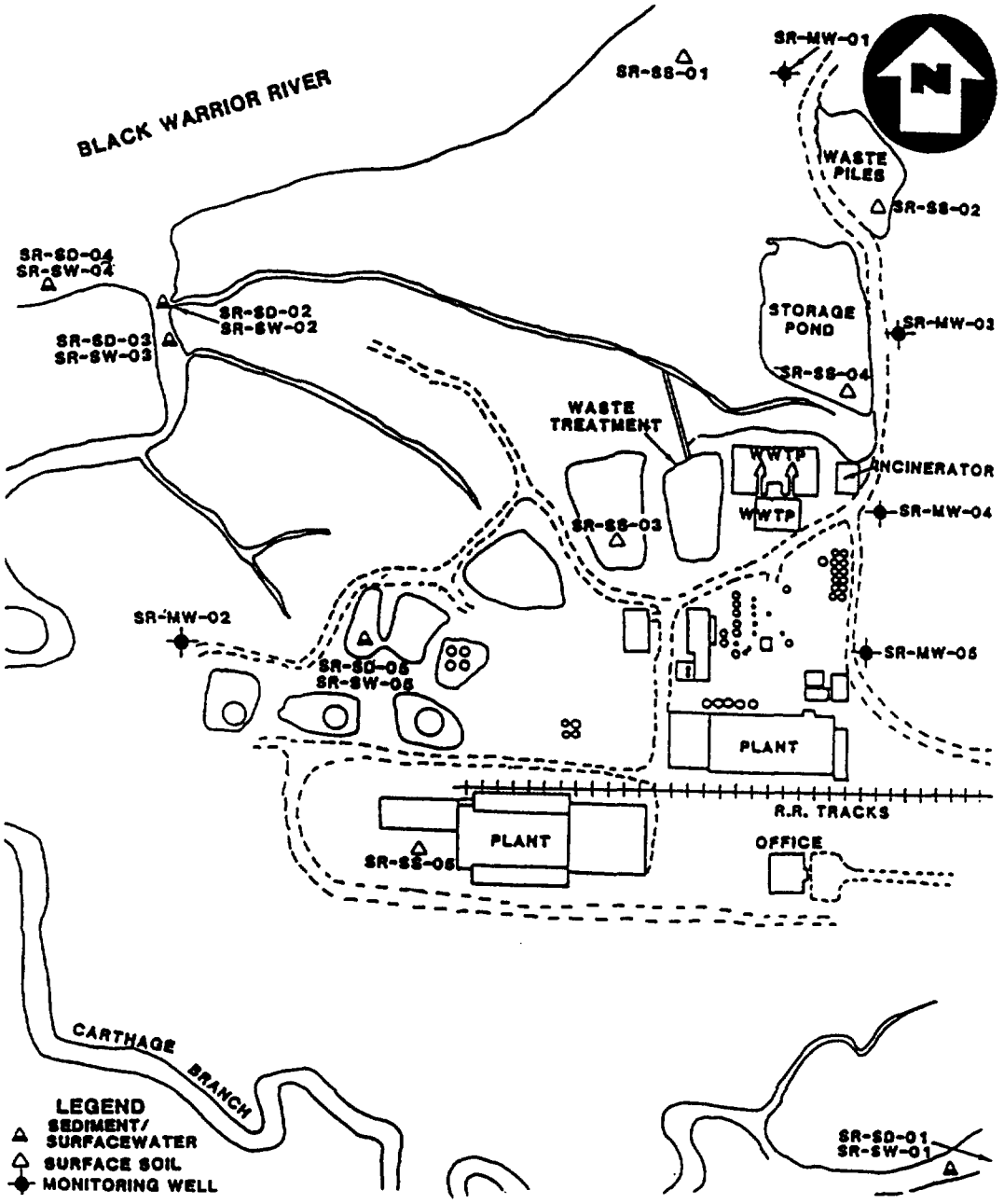
DYNAMAC CORPORATION
Environmental Services

Figure 1 : SITE LOCATION MAP
SOUTHERN RESINS DIVISION
Moundville, Tuscaloosa County, Alabama

During the manufacture of resins, the facility generates wastewater and waste filter cake. Before 1980, wastewater generated at the facility was discharged to several onsite surface impoundments (Refs. 3, pp. 5, 6; 6, p. 1). After 1980, this wastewater was discharged to the onsite wastewater treatment plant. Treated water from the wastewater treatment plant is currently discharged into an onsite wastewater treatment pond prior to entering the Black Warrior River under National Pollutant Discharge Elimination System (NPDES) permit number AL0026921 (Refs. 5, p. 6; 6, p. 2; 7, p. 1; 32).

The facility also generates approximately 185,900 gallons of filter cake waste each year (Refs. 3; 6; 7; 8). The filter cakes contain metals (including barium, manganese and zinc) and organic compounds and solvents (including xylene, methyl ethyl benzene and naphthalene) (Ref. 8, pp. 13, 14). In the past, filter cake waste was stored at the rear of the property in three areas: a three-sided concrete waste filter cake bin, a filter cake waste pile and a filter cake debris pile. The concrete bin did not have a cover and was cracked in several places (Ref. 7). During a July 18, 1984, site evaluation, Alabama Department of Environmental Management (ADEM) personnel observed an apparently solvent-like liquid pooled on the ground next to the concrete cake bin (Ref. 7, p. 1). The filter cake waste pile and the debris pile were covered by plastic; available file material does not indicate if the waste pile or debris pile are lined (Refs. 3; 7; 8; 9). In addition to waste filter cake, the filter cake debris pile reportedly received a variety of other unspecified facility wastes. Currently, a solvent recovery system allows solvents to be removed from the filter cake and recycled back into the manufacturing process at the facility (Refs. 3, p. 3; 6, p. 3; 7, p. 1; 8; 9). The solid filter cake waste along with off-specification resins produced by the facility stored onsite in 55-gallon drums prior to incineration in the facility incinerator. Incinerator emissions are reportedly regulated by ADEM (Ref. 5, p. 4). Available file material does not provide any additional information about the incinerator emissions.

An old surface impoundment located west of the wastewater treatment plant receives runoff and solvent spillage from the facility (Refs. 3, p. 3; 7, p. 2). The impoundment was reportedly constructed in the early 1960s. Available file material does not indicate the types of wastes deposited in the old impoundment prior to Lawter's purchase of the facility in 1976 (Ref. 7, p. 2). The size of this impoundment is also not indicated in available file material.



NOT TO SCALE

Source: Site layout map was taken from the 1991 Site Inspection Report prepared by NUS Corporation.

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Environmental Services

Figure 2: SITE LAYOUT MAP
Southern Resins Division
Moundville, Tuscaloosa County, Alabama

A sludge pond located northwest of the plants in the central portion of the facility reportedly received unspecified resin waste (Ref. 3, pp. 13, 14). Available file material does not indicate the size of this pond or the time frame during which it was used.

A previously used storage pond is located north of the wastewater treatment plant (Ref. 3, p. 14). The storage pond reportedly received an unspecified quantity and variety of wastes. Soil from the storage pond is reportedly being removed from the pond and incinerated onsite (Ref. 3, p. 13). Available file material does not provide any additional information about the incineration of soil from the storage pond.

On September 4, 1980, the facility filed a Resource Conservation and Recovery Act (RCRA) Part A Hazardous Waste permit application. The facility withdrew the application on February 23, 1981 (Ref. 13, pp. 1-2). The facility is not listed as a generator of hazardous waste and is not regulated under RCRA (Ref. 14; 15).

The facility currently operates under NPDES Permit No. AL0026921 for discharge to the Black Warrior River. The exact locations of the discharge points at the facility are not provided in the available file material. Topographic maps of the area do not depict a drainage ditch in the area between the facility and the Black Warrior River (Ref. 2). However, a site layout map from the Site Inspection (SI) Report which NUS Corporation (NUS), the EPA Region IV Field Investigation Team contractor prepared in October 1991 indicates that onsite intermittently flowing drainage ditches drain the wastewater treatment pond and other areas onsite into Carthage Branch, which is a perennial tributary of the Black Warrior River (Refs. 2; 3, p. 5). The facility apparently has operated under a NPDES permit since 1980 (Ref. 3, p. 3). The facility NPDES permit is effective from November 23, 1992 until November 30, 1997 (Ref. 32, p. 2). The current NPDES permit parameters includes pH, flow rate and numerous inorganic constituents including zinc, chromium, cyanide, lead and nickel and a variety of organic compounds including pyrene, phenanthrene, trichloroethylene, benzo(a)pyrene and methylene chloride (Ref. 32, pp. 1-6).

Violations of environmental regulations including improper waste storage have been reported at the facility since 1981. In 1981, ADEM notified the facility that an onsite open dump of 55-gallon drums containing waste resin and other unspecified substances was unacceptable under State solid waste regulations due to the toxic characteristics of the resins (Ref. 10). In May 1983, resin-like material reportedly was spilled from the facility into an unnamed perennial tributary of the Black Warrior River (Ref. 3, p. 6). On October 31, 1984, ADEM issued a Consent Order to the facility for numerous violations of its NPDES

permit including discharge to an unnamed perennial tributary of the Black Water River and for inadequate spill containment and wastewater treatment measures. Violations cited in the Consent Order also included exceeding parameter limits for phenol compounds. The Consent Order stated that the facility had to implement changes in waste handling procedures. These procedures included additional treatment of wastewater and the development of a method to store, handle and dispose of filter cake waste (Ref. 11, pp. 1-6). Available file material does not indicate if there have been any additional violations of the NPDES permit by the facility.

ADEM issued a Notice of Violation (NOV) to the facility in 1985 for improper storage of filter cake waste (Refs. 11; 12). In response to the Consent Order, the facility had removed all filter cakes stored onsite to a licensed hazardous waste landfill in Emelle, Alabama, by June 1985 (Ref. 9). ADEM issued another NOV to the facility in June 1993 after a failed onsite inspection. The facility is currently installing a vapor liquid incinerator (Ref. 28). Available file material does not indicate the reasons for the failed inspection or the proposed use for the vapor liquid incinerator.

Summary of Previous Investigations

Two sampling investigations have been conducted at the facility. In April 1985, CH2M Hill collected waste samples from filter cakes generated at the facility (Ref. 8). The sampling event was conducted to characterize the composition of filter cakes produced at the facility to ensure proper disposal. NUS conducted an SI at the facility in December 1990. Table 1 summarizes investigations conducted at the facility from 1983 to 1990.

TABLE 1

SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

Summary of Previous Investigations

DATE	AGENCY	EVENT	SAMPLES COLLECTED	REFERENCE(S)
July 12, 1983	ADEM	Site Inspection	No samples collected	11
August 16, 1984	ADEM	Compliance Inspection	No samples collected	11
July 18, 1984	ADEM	Site Evaluation	No samples collected	7
January 11, 1984	ADEM	Unannounced Inspection	No samples collected	6

Note: Footnotes for Table 1 appear at the end of the table of page 7.

TABLE 1, concluded

SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

Summary of Previous Investigations

DATE	AGENCY	EVENT	SAMPLES COLLECTED	REFERENCE(S)
April 1985	CH2M Hill	Filter Cake Sampling Investigation	1 FFC 1 FCB 1 FCWP 1 DP	8
December 1990	NUS Corporation	Site Inspection	5 SS 5 GW 5 SW 5 SD	3; 4; 5

GW = Groundwater
SW = Surface water
SD = Sediment
SS = Surface soil
DP = Debris pile
FFC = Fresh filter cake
FCB = Filter cake bin
FCWP = Filter cake waste pile
ADEM = Alabama Department of Environmental Management

During April 1985, CH2M Hill collected waste filer cake samples at the facility during a filter cake sampling investigation. CH2M Hill collected a fresh filter cake sample and filter cake samples from onsite disposal areas including the filter cake bin, the filter cake waste pile and the filter cake debris pile. Analyses of the fresh filter cake sample indicated detectable levels of barium, chromium, manganese, copper, zinc, nickel, cyanide, xylene, methyl ethyl benzene, trinethylbenzene, 2-methyl styrene, dimethyl ethyl benzene, naphthalene, dicylopentadiene, toluene, ethyl benzene, 1,3-cyclopentadiene and styrene. Analyses of the filter cake samples collected from the onsite disposal areas indicated the presence of similar contaminants; however, the concentrations of contaminants were greatest in the analyses of the fresh filter cake sample (Ref. 8, pp. 1, 13, 14).

Table 2 describes elevated levels of hazardous constituents detected in surface soil, groundwater, surface water and sediment samples collected during the NUS SI. The concentration of an analyte is considered elevated if the concentration is greater than or equal to three times the concentration in the background or control sample or greater than or equal to the Minimum Quantitation Limit (MQL)

if the analyte was not detected in the background or control sample. Background samples were collected for all media.

TABLE 2

SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA
SITE INSPECTION
DECEMBER 1990

Summary of Analytical Data

SAMPLE NUMBER	SAMPLE LOCATION	ANALYTICAL RESULTS		REFERENCE(S)
SR-SS-01 (Background)	North of plant buildings.	Arsenic	2 (U) mg/kg	3, pp. 19-21
		Barium	45 mg/kg	
		Copper	6(U) mg/kg	
		Lead	8.1 mg/kg	
		Manganese	130 mg/kg	
		Vanadium	7.4 mg/kg	
		Zinc	20 (U) mg/kg	
		Benzene	11 (U) ug/kg	
		Benzo(a)anthracene	360 (U) ug/kg	
		Dihydromethylindene	800 (J) ug/kg	
		Ethylbenzene	11 (U) ug/kg	
		Ethyldimethylbenzene	6,000 (J) ug/kg	
		2-Methylnaphthalene	140 (J) ug/kg	
		Naphthalene	3,600 ug/kg	
		Octohydromethanoindene	400 (J) ug/kg	
		Styrene	11 (U) ug/kg	
		Tetramethylbenzene	2,00 (J) ug/kg	
		Toluene	11 (U) ug/kg	
		Xylene	11 (U) ug/kg	
SR-SS-02	Waste piles north of plant building.	Vanadium	22 mg/kg	3, pp. 19-21
SR-SS-03	West of wastewater treatment plant.	Ethyldimethylbenzene	1,000 ug/kg	3, pp. 19-21
SR-SS-04	Storage pond north of wastewater treatment plant.	Ethylbenzene	1,900 ug/kg	3, pp. 19-21
		Ethyldimethylbenzene	40,000 (J) ug/kg	
		Ethenylmethylbenzene	10,000 (J) ug/kg	
		Ethylmethylbenzene	60,000 (J) ug/kg	
		2-Methylnaphthalene	5,100 (J) ug/kg	
		Naphthalene	64,000 ug/kg	
		Propenylbenzene	50,000 (J) ug/kg	
		Styrene	1,600 ug/kg	
		Trimethylbenzene	100,000 (J) ug/kg	
		Tetramethylbenzene	40,000 (J) ug/kg	
		Tetrahydromethanoindene	90,000 (J) ug/kg	
		Xylene	16,000 ug/kg	

Note: Footnotes for Table 2 appear at the end of the table on page 11.

TABLE 2, continued

SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA
SITE INSPECTION
DECEMBER 1990

Summary of Analytical Data

SAMPLE NUMBER	SAMPLE LOCATION	ANALYTICAL RESULTS		REFERENCE(S)
SR-SS-05	West of plant building.	Zinc	210 mg/kg	3, pp. 19-21
		Dimethylethylethoxybenzene	4,000 (J) ug/kg	
		Dimethylethylphenol	30,000 (J) ug/kg	
		Hydroxyphenylmethylethylphenol	30,000 (J) ug/kg	
		Trimethylphenylethanone	5,000(J) ug/kg	
SR-MW-01 (Background)	North of waste piles.	Barium	180 ug/l	3, pp. 22-25
		Cadmium	3(U) ug/l	
		Chromium	82 ug/l	
		Copper	53 ug/l	
		Lead	14 ug/l	
		Manganese	120 ug/l	
		Nickel	20 (U) ug/l	
		Vanadium	1990 ug/l	
		Zinc	120 ug/l	
		Benzene	220 ug/l	
		Ethylbenzene	75 ug/l	
		Ethylmethylbenzene	200 (J) ug/l	
		Propylbenzene	60 (J) ug/l	
		Propenylbenzene	50 (J) ug/l	
		Styrene	62 ug/l	
		Xylene	370 ug/l	
SR-MW-03	East of storage pond.	Manganese	410 ug/l	3, pp. 22-25
		Ethyldimethylbenzene	100 (J) ug/l	
		Methylindene	40 (J) ug/l	
		Propadienylbenzene	80 (J) ug/l	
		Trimethylbenzene	80 (J) ug/l	
SR-MW-04	Southeast of incinerator.	Manganese	770 ug/l	3, pp. 22-25
		Ethylbenzene	410 ug/l	
		Ethyldimethylbenzene	500 (J) ug/l	
		Ethylmethylbenzene	2,000 (J) ug/l	
		Ethenylethylbenzene	200 (J) ug/l	
		Methylindene	100 (J) ug/l	
		Methylbenzoic Acid	100 (J) ug/l	
		Methylenepropenylbenzene	70 (J) ug/l	
		Naphthalene	750 ug/l	
		Propylbenzene	400 (J) ug/l	
		Propenylbenzene	400 (J) ug/l	
		Propadienylbenzene	700 (J) ug/l	
		Styrene	280 ug/l	100
		Tetrahydrocyclopropindene	100 (J) ug/l	
		Xylene	2,300 ug/l	

Note: Footnotes for Table 2 appear at the end of the table on page 11.

TABLE 2, continued

SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA
SITE INSPECTION
DECEMBER 1990

Summary of Analytical Data

SAMPLE NUMBER	SAMPLE LOCATION	ANALYTICAL RESULTS		REFERENCE(S)
SR-MW-05	Northeast of plant building.	Barium	890 ug/l	3, pp. 22-25
		Cadmium	9 ug/l	
		Chromium	430 ug/l	
		Manganese	1,300 ug/l	
		Vanadium	570 ug/l	
		Ethyldimethylbenzene	90 (J) ug/l	
		Ethylmethylbenzene	700 (J) ug/l	
		Propadienylbenzene	90 (J) ug/l	
		Tetramethylbenzene	50 (J) ug/l	
		Trimethylbenzene	600 (J) ug/l	
SR-SD-01 (Background)	Carthage Branch, upstream from facility.	Barium	5 mg/kg	3, pp. 26-27
		Lead	1.1 mg/kg	
		Manganese	67 mg/kg	
		Vanadium	2.5 mg/kg	
		Zinc	5 (U) mg/kg	
		Ethylbenzene	12 (U) mg/kg	
		2-Methylnaphthalene	410 (U) mg/kg	
		Naphthalene	410 (U) mg/kg	
		Styrene	12 (U) mg/kg	
		Toluene	12 (U) mg/kg	
		Xylene	12 (U) mg/kg	
SR-SD-05	Sludge pond in central portion of facility.	Barium	20 mg/kg	3, pp. 26-27
		Lead	4 mg/kg	
		Vanadium	7.7 mg/kg	
		Diethylbenzene	100,000 (J) mg/kg	
		Ethylbenzene	3,000 mg/kg	
		Ethyldimethylbenzene	200,000 (J) mg/kg	
		Ethylmethylbenzene	70,000 (J) mg/kg	
		2-Methylnaphthalene	7,500 mg/kg	
		Methylpropylbenzene	50,000 (J) mg/kg	
		Naphthalene	190,000 mg/kg	
		Propylbenzene	10,000 (J) mg/kg	
		Propenylbenzene	9,000 (J) mg/kg	
		Styrene	1,900 mg/kg	
		Tetramethylbenzene	90,000 (J) mg/kg	
		Toluene	420 (J) mg/kg	
		Trimethylbenzene	30,000 (J) mg/kg	
		Xylene	22,000 mg/kg	
SR-SW-01 (Background)	Carthage Branch, upstream from facility.	Barium	56 ug/l	3, pp. 28-30

Note: Footnotes for Table 2 appear at the end of the table on page 11.

TABLE 2, continued

SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA
SITE INSPECTION
DECEMBER 1990

Summary of Analytical Data

SAMPLE NUMBER	SAMPLE LOCATION	ANALYTICAL RESULTS		REFERENCE(S)
SR-SW-02	Carthage Branch, onsite.	Butylbenzoic Acid	900 (J) ug/l	3, pp. 28-30
		Decane	30 (J) ug/l	
		Dimethyloxymethane	20 (J) ug/l	
		Dimethylbutanone	50 (J) ug/l	
		Ethylmethylbenzene	100 (J) ug/l	
		Methylpropenal	30 (J) ug/l	
		Methylcyclopentanone	80 (J) ug/l	
		Tetramethylpentanone	600 (J) ug/l	
SR-SW-05	Sludge pond in central portion of facility.	Ethylmethylbenzene	8,000 (J) ug/l	3, pp. 28-30
		Methylbenzofuran	100 (J) ug/l	
		Methylenepropenylbenzene	100 (J) ug/l	
		Propenylbenzene	70 (J) ug/l	
		Propylbenzene	40 (J) ug/l	
		Trimethylbenzene	300 (J) ug/l	

J = Estimated value
U = Material analyzed for but not detected. Value given is the Minimum Quantitation Limit.
ug/l = Micrograms per liter
mg/kg = Milligrams per kilogram
ug/kg = Micrograms per kilogram

Hydrogeology

The facility is located in the Fall Line Hills district of the Coastal Plain physiographic province. The topography in this district is fairly rugged and dissected, especially near streams (Refs. 16, pp. 3, 6; 17, p.3). Elevations within 4 miles of the facility range from 100 to 500 feet above mean sea level (msl). The elevation of the facility is approximately 160 feet above msl (Ref. 2).

Geologic units which underlie the facility, listed in descending stratigraphic order, include: alluvial deposits, terrace deposits, the Gordo Formation and the Coker Formation (Refs. 16, p. 6; 17, plate 2). Alluvial deposits underlie the floodplain of the Black Warrior River to the west and north of the facility (Refs. 17, plate 1; 18, p. 7). Alluvial deposits consist of lenticular beds of sand, gravel, clay and silt and are generally less than 50 feet thick (Ref. 17, pp. 4, 18). Terrace deposits directly underlie the facility (Refs. 16, pp. 6,

12; 2; 17, Plate 1; 18, p. 7). These deposits consist of lenticular beds of poorly sorted gravel, sand and clay and are generally less than 50 feet thick (Ref. 17, pp. 4, 18). The Gordo Formation subcrops beneath the alluvial and terrace deposits (Refs. 16, p. 6; 17, plate 1). The upper part of the Gordo Formation consists of laminated to massive clay and lenticular beds of sand. The lower part of the formation consists of poorly sorted, coarse-grained sand and chert gravel beds (Ref. 17, pp. 3, 4, 18). The thickness of the Gordo Formation is approximately 300 to 350 feet where it occurs as a complete section (Ref. 17, p. 18). However, due to erosion, the thickness of the Gordo Formation beneath the facility is expected to be much less. The Coker Formation unconformably underlies the Gordo Formation (Ref. 17, p. 3). The Coker Formation consists of sandy clay and fine- to coarse-grained sand and gravel and ranges in thickness from 500 to 600 feet (Ref. 17, pp. 3, 18).

Groundwater in the area of the facility occurs in the alluvial and terrace deposits and in sand and gravel beds in the underlying Gordo and Coker Formations (Refs. 16, p. 12; 17, pp. 6, 7). Alluvial and terrace deposits along the Black Warrior River are a potential source for large supplies of groundwater, as permeable beds in these deposits are hydraulically connected to the river (Refs. 17, p. 7; 19, p. 13). Individual aquifers in the alluvial and terrace deposits are difficult to define due to the heterogeneity of these deposits (Ref. 17, p. 7).

Groundwater in the Gordo Formation occurs under unconfined conditions (Ref. 18, p. 13). Recharge of the Gordo aquifer occurs by the infiltration of precipitation which falls at the outcrop area (located within a 4-mile radius of the facility) and by downward migration of groundwater from the overlying alluvial and terrace deposits (Refs. 17, p. 5, plate 1; 19, p. 16). The depth to groundwater in the interconnected terrace deposits and Gordo Formation can be approximated as equivalent to the water level of the Black Warrior River.

Groundwater in the underlying Coker Formation is confined by a clay zone at the top of the formation (Refs. 16, p. 8; 19, p. 8). However, in some areas, this clay zone is missing and the Coker aquifer is hydraulically connected to the Gordo aquifer (Ref. 16, p. 8). Groundwater in the Coker Formation is primarily recharged by the infiltration of precipitation which falls at the outcrop area located approximately 10 miles northeast of the facility (Ref. 16, p. 6).

Discussion of Potential Receptors

Moundville Water System, Hale County Water System and Inglewood-Hull Water System and private wells provide potable water to residents within 4 miles of the

facility. Moundville Water System maintains a total of two wells which are 244 feet deep and completed in the Gordo aquifer (Refs. 4, p. 11; 2; 17, p. 18, plate 1; 19, pp. 21, 22, Plate 1; 33; 34; 35). These wells are located 3.75 miles south of the facility and supply water to approximately 800 connections (Refs. 2; 20). The Hale County Water System purchases water from the Moundville Water System and serves approximately 2,223 connections (Ref. 21). Therefore, the Moundville Water System serves a total of 3,023 connections. Multiplying the number of connections by the 1990 U.S. Bureau of the Census population-per-household value of 2.82 for Hale County, the estimated population served by the Moundville Water System is 8,525 persons (Refs. 20; 21; 23). The Inglewood-Hulls Water System, which serves 846 connections, purchases water from the city of Tuscaloosa (Ref. 22). The water source for the city of Tuscaloosa is Lake Tuscaloosa, which is located approximately 20 miles north of the facility (Ref. 3, p. 10).

Residences not located adjacent to municipal waterlines are assumed to obtain water from private wells (Refs. 2; 3; 4; 5). The nearest private well is located approximately 1.4 miles northeast of the facility (Ref. 4, p. 12). Based on a house count from topographic maps of the area marked with municipal water distribution lines, it is estimated that approximately 71 residences within 4 miles of the facility use private wells for drinking water. The 1990 U.S. Bureau of the Census population-per-household values of 2.55 for Tuscaloosa County and 2.82 for Hale County were used to estimate the number of persons using groundwater for potable water (Refs. 2; 3; 4; 20; 21; 23). Thus, the total number of persons within 4 miles of the facility using groundwater for drinking water is estimated as presented in Table 3 (Refs. 2; 3; 4; 20; 21; 23, 33; 34; 35). No private wells are located between a 0- to 1-mile distance interval from the facility; therefore, these distance intervals were not included in Table 3.

TABLE 3

SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

Population Using Private Wells Within 4 Miles

RADIAL DISTANCE	HOUSEHOLDS		POPULATION*		
	TUSCALOOSA COUNTY	HALE COUNTY	TUSCALOOSA COUNTY	HALE COUNTY	TOTAL
1 - 2 miles	1	--	3	--	3
2 - 3 miles	15	15	38	42	80
3 - 4 miles	373	417	951	1,176	2,127
		TOTAL	992	1,218	2,210

* Population = households x persons-per-household values of 2.55 for Tuscaloosa County and 2.82 for Hale County

Combining the number of municipal well users with the number of private well users, the total population supplied drinking water by municipal and private wells within a 4-mile radius of the facility is estimated as follows: 0 - 0.25 mile (0 persons); 0.25 - 0.50 mile (0 persons); 0.50 - 1 mile (0 persons); 1 - 2 miles (3 persons); 2 - 3 miles (80 persons); 3 - 4 miles (10,652 persons).

Surface water runoff from the facility flows west-northwest in onsite intermittently flowing drainage ditches approximately 500 feet and enters Carthage Branch. Carthage Branch flows northwest approximately 400 feet before converging with Black Warrior River. The 15-mile surface water migration pathway is completed in the Black Warrior River which flows to the southwest (Ref. 2). The average flow rate of Black Warrior River is 7,988 cubic feet per second (cfs) (Ref. 29). The average flow rate for Carthage Branch is estimated to be between 10 and 100 cfs (Ref. 2).

There are no known surface water intakes located within 15 miles downstream of the facility. Both Carthage Branch and Black Warrior River are fished (Refs. 5, p. 5; 24; 25; 30). Fish commonly caught along Carthage Branch and Black Warrior River include bass, bream, crappie and catfish (Ref. 30). Two federally designated endangered species, the inflated heel splitter mussel (Potamilius inflatus) and the flattened musk turtle (Sternotherus depressus), are found along Black Warrior River (Ref. 26). Approximately 5 miles of wetlands occur along the 15-mile surface water migration pathway (Ref. 2).

There are no residents onsite. The nearest residence is approximately 600 feet northeast of the facility (Ref. 2). The facility currently employs 60 workers (Ref. 27). According to the available file material, no schools or day-care centers are located within 200 feet of the facility (Ref. 2).

Three fish hatcheries are located within a 3- to 4-mile radius of the facility (Refs. 2; 3, p. 8). While several federally listed threatened and endangered species are believed to inhabit the area within a 4-mile radius of the facility, their precise locations are not known. Federally listed threatened and endangered species believed to inhabit the area include the Florida panther (Felis concolor coryi), Arctic peregrine falcon (Falco peregrinus tundrius), bald eagle (Haliaeetus leucocephalus), Bachman's warbler (Vermivora bachmanii), wood stork (Mycteria americana), ivory-billed woodpecker (Campephilus principalis), red-cockaded woodpecker (Picoides borealis), flattened musk turtle (Sternotherus depressus) and the inflated heel spitter mussel (Potamilius inflatus) (Ref. 26). Approximately 360 acres of wetlands occur within a 4-mile radius of the facility (Ref. 2). Mound Monument State Park, which includes picnic areas and playgrounds, is located approximately a half mile south of the facility (Ref. 2).

Population distribution within 4 miles of the facility was determined by the Graphical Exposure Modeling System (GEMS) data base and by a house count from topographic maps of the area (Refs. 2; 31). The U.S. Bureau of the Census county conversion factors of 2.55 persons per household for Tuscaloosa County and 2.82 persons-per-household for Hale County were used to estimate the population per household (Ref. 23). The estimated number of persons residing within 4 miles of the facility is distributed as presented in Table 4.

TABLE 4

SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

Population Residing Within 4 Miles

RADIAL DISTANCE	HOUSEHOLDS		POPULATION		
	TUSCALOOSA COUNTY	HALE COUNTY	TUSCALOOSA COUNTY	HALE COUNTY	TOTAL
0 - 0.25 mile	8	—	20	--	20[a]
0.25 - 0.50	6	1	15	3	18[a]
0.50 - 1 mile	6	259	15	731	746[a]
1 - 2 miles	--	--	--	--	1,316[b]
2 - 3 miles	89	138	227	389	616[a]
3 - 4 miles	96	85	245	240	485[a]
				TOTAL	3,201

[a] Population = household x persons per household
[b] Population from Graphical Exposure Modeling System data base

Conclusion/Recommendations

The facility has a history of spills and improper waste handling. The facility violated its NPDES permit on numerous occasions in 1984. Elevated levels of various organic compounds were detected in onsite monitoring wells. The nearest private drinking water well is located approximately 1.4 miles from the facility. The total population obtaining drinking water from groundwater is 10,735 people within a 4-mile radius. Groundwater sampling of offsite private drinking water wells may be considered. Potential adverse effects due to direct exposure via soil or air contamination is expected to be minimal due to the lack of a resident population.

The surface water migration pathway is the main concern at the facility. Onsite drainage ditches discharge to Carthage Branch, a documented fishery. Analyses of surface water samples collected from Carthage Branch indicate elevated levels of butylbenzenic acid, elimethyloxy methane and ethyl methylbenzene. However, no background sample was collected upstream of all of the facility drainage ditch discharge points to Carthage Branch. Therefore, Dynamac recommends additional sediment and surface water sampling along the onsite drainage ditches along Carthage Branch downstream of the facility and from a location along Carthage Branch upstream of all discharge points from the facility into Carthage Branch.

References

1. Industrial Narrative Sheet (EPA Form 3012-111) of Potential Hazardous Waste Site Preliminary Assessment (EPA Form 2070-12) and attachments, Part I-Site Information and Assessment, Part III-Description of Hazardous Conditions and Incidents for Southern Resins Division, Moundville, Alabama. Filed by Jim Duncan, EPA, August 29, 1985.

2. U.S. Geological Survey, 7.5 Minute Series Topographic Quadrangle Maps of Alabama: Englewood 1970 (Photorevised [PR] 1983), Fosters 1969 (PR 1978), Moundville West 1980, Moundville East 1980 (PR 1983), scale 1:24000.

3. Halliburton NUS Corporation, Superfund Division, Final Report Site Inspection, Southern Resins Division, Moundville, Hale County, Revision 0, prepared under TDD No. F4-9011-22 for the Waste Management Division of the EPA (October 7, 1991).

4. Halliburton NUS Corporation Field Logbook No.F4-1768 for Southern Resins Division, TDD No. F4-8910-70. Documentation of facility reconnaissance, October 25 and November 16, 1989.

5. Halliburton NUS Corporation Field Logbooks No. F4-2683 and F4-2684 for Southern Resins Division, TDD No. F4-9011-22. Documentation of field investigation, December 10-12, 1990.

6. George Sullivan, interoffice memorandum to Ron Gore, Alabama Department of Environmental Management, January 17, 1984. Subject: Inspection of Southern Resins.

7. David Hagan, interoffice memorandum to Bernard E. Cox, Alabama Department of Environmental Management, August 16, 1984. Subject: Southern Resins, Moundville, Alabama.

8. CH2M Hill, Results of April 4, 1985, Filter Cake Sampling, Lawter International, Southern Resins Division, Moundville, Alabama, May 7, 1985; obtained from Alabama Department of Environmental Management file (Alabama Department of Environmental Management: Birmingham, Alabama).

9. F. Gordon Steward, General Manager, Southern Resins, letter to Bernard Cox, Alabama Department of Environmental Management, July 1, 1985. Subject: Filter Cake Removal, Southern Resins, Moundville, Al.

10. Javier A. Colon, Environmentalist III, Division of Solid and Hazardous Waste, Environmental Health Administration, letter to Hosny Elgamel, Southern Resins Division, April 8, 1981. Subject: Waste disposal practices at Southern Resins.

11. Alabama Department of Environmental Management, Findings of Fact, Lawter International, Inc., Southern Resins Division, Moundville, AL, Order No. 85-008-WP, issued by Joe B. Broadwater, Director, October 31, 1984.

12. Daniel E. Cooper, Chief, Land Division, letter to Hosny Elgamel, Southern Resins Division, May 22, 1985. Subject: Notice of violations.

13. David Hagan, Alabama Department of Environmental Management, interoffice memorandum to Buddy Cox, August 13, 1984. Subject: Chronological list of major regulatory events between Southern Resins and Alabama Department of Environmental Management.

14. Alicia Finch, Alabama Department of Conservation and Natural Resources, Land Protection, telephone conversation with Matthew McCoy, NUS Corporation, December 6, 1989. Subject: Current RCRA status.

15. Donna Wilkinson, Environmental Engineer, Environmental Protection Agency, Georgia, telephone conversation with Aparna Undrakonda, Staff Engineer, Dynamac Corporation, March 17, 1993. Subject: RCRA Status of the Southern Resins Division.

16. Sydney S. DeJarnette and Jo E. Crownover, Geohydrology and Susceptibility of Major Aquifers to Surface Contamination in Alabama; Area 6 , U.S. Geological Survey Water Resources Investigation Report 87-4113(Tuscaloosa, Alabama: Alabama Department of Environmental Management, 1987), excerpts, 9 pages.

17. Marvin Davis et al., Water Availability and Geology of Hale County, Alabama, Map 136, (University Alabama: Geological Survey of Alabama, 1975), excerpts, 8 pages with attachment.

18. J.D.Miller, Jr., and L.V.Causey, Geology and Ground-Water Resources of Tuscaloosa County, Alabama, Information Series 14, (University, Alabama: Geological Survey of Alabama, 1958), excerpts, 7 pages.

19. Will S. Mooty, Geohydrology and Susceptibility of Major Aquifers to Surface Contamination in Alabama; Area 7, Water-Resources Investigations Report 87-4109 (Tuscaloosa, Alabama: U.S. Geological Survey, 1987), excerpts, 8 pages with attachment

20. Armon Rogers, Moundville Water System, Moundville, Alabama, telephone conversation with Aparna Undrakonda, Staff Engineer, Dynamac Corporation, September 11, 1992. Subject: Water supply in the Moundville area.

21. Sercy Rhodes, Hale County Water System, telephone conversation with Aparna Undrakonda, Staff Engineer, Dynamac Corporation, September 11, 1992. Subject: Water supply in Moundville area.

22. Sercy Rhodes, Inglewood-Hull Water Supply, telephone conversation with Aparna Undrakonda, Staff Engineer, Dynamac Corporation, September 11, 1992. Subject: Water supply in Moundville area.

23. U.S. Department of Commerce, Proof Copy of table generated for CPH-1: Summary of Population and Housing Characteristics, issued by Bureau of the Census (April 1991), excerpt, 1 page.

24. Carol Lackey, Alabama Department of Conservation and Natural Resources, telephone conversation with Matthew McCoy, NUS Corporation, December 5, 1989. Subject: Fishing practices along the Black Warrior River.

25. Mr. Rodgers, Moundville Water Company, telephone conversation with Sheri Panabaker, NUS Corporation, January 15, 1991. Subject: Surface water intakes.

26. U.S. Fish and Wildlife Service, Endangered and Threatened Species of the Southern United States (Atlanta, Georgia, 1991), excerpts, 2 pages.

27. Ms. Lainie, Receptionist, Southern Resins Division, telephone conversation with Aparna Undrakonda, Staff Engineer, Dynamac Corporation, September 11, 1992. Subject: Current worker population of the Southern Resins Division.

28. Jimmy Coles, Engineer, Alabama Department of Environmental Management, Industrial Wastewater Division, telephone conversation with Mary Morgan, Dynamac Corporation, November 10, 1993. Subject: NPDES Permit No. AL0026921.

29. U.S. Geological Survey, Water Resources Data, Alabama Water Year 1990, excerpt, 1 page.

30. Sterling Thornton, owner, Thornton's Grocery and Bait Shop, telephone conversation with Mary Morgan, Dynamac Corporation, November 10, 1993. Subject: Fish Caught in Black Warrior River and Carthage Branch.

31. U.S. Environmental Protection Agency, Graphical Exposure Modeling System (GEMS) Data Base, compiled from the U.S. Bureau of the Census data (1990).

32. Alabama Department of Environmental Management, National Pollutant Discharge Elimination System Permit, issued to Lawter International, Inc., November 23, 1992.

33. Searcy Rhodes, Superintendent, Hale County Water Company, telephone conversation with Mary Morgan, Dynamac Corporation, November 18, 1993. Subject: Waterline Distribution of Hale County Water Department.

34. Steve Cawood, Engineer, Goodwyn, Mills and Cawood, Inc., telephone conversation with Mary Morgan, Dynamac Corporation, November 18, 1993. Subject: Waterline Distribution of Hale County Water Company.

35. Ricky Harrison, Engineer, Hankins and Harrison Engineering, Inc., telephone conversation with Mary Morgan, Dynamac Corporation, November 19, 1993. Subject: Waterline Distribution of Moundville Water Company.

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
EPS FORM 3012-III

INDUSTRIAL NARRATIVE SHEET

1. Site Identification:

Site number: ALD004034138

Site name: Southern Resins Division (Lawter Chemical)

Site county: Tuscaloosa

2. Industrial Narrative Summary:

Company Name: Southern Resins Division

Address: P. O. Box 128
Moundville, AL 35474

Telephone No.: 205/371-2235

Contact: Gorden Steward

Discussion: Southern Resins is a producer of synthetic resins. They have operated since 1966. In 1976, Lawter International bought Southern Resin. Southern Resin has had a history of environmental problems. These problems stem from waste streams improperly handled on site. They recently had a management and engineering change. They are now working with the state on a timely basis to correct their past problems. Lime filter cake saturated with aromatic solvents has been a problem. These solvents have potentially contaminated the groundwater and surface soil. Also, waste resin products, although not listed as hazardous waste, have caused problems with disposal at local sanitary landfills. At present all waste, hazardous and non-hazardous, is being shipped to a hazardous waste landfill because no one (i.e., local sanitary landfills) will take their waste due to their past reputation. ADEM is closely monitoring this site to insure proper compliance.

3. Disposition:

This is a RCRA facility and therefore, requires no further action.

4. Comments:

NA

OVERSIZED

DOCUMENT

REFERENCE NO. 3

Duplicate

R-586-10-1-25

4/5/92

FINAL REPORT

SITE INSPECTION
SOUTHERN RESINS DIVISION
MOUNDVILLE, ~~TUSCALOOSA~~ COUNTY, ALABAMA
EPA ID #: ALD004034138

HALE COUNTY

Prepared Under
TDD No. F4-9011-22
CONTRACT NO. 68-01-7346

Revision 0

FOR THE

WASTE MANAGEMENT DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY

OCTOBER 7, 1991

HALLIBURTON NUS ENVIRONMENTAL CORPORATION
SUPERFUND DIVISION

Prepared By	Reviewed By	Approved By
Simonia O. DeLaine Project Manager		Phil Blackwell Regional Project Manager

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EXECUTIVE SUMMARY

Southern Resins Division is located off of Highway 69 on the north side of Moundville, Tuscaloosa County, Alabama. The facility has been in operation since 1966 and was purchased in 1976 by Lawter International. Processes at the Southern Resins' plant involve the manufacturing of tall oil resins, ketone resins, polyamide resins, and hydrocarbon resins. Resins are primarily used in paints and inks, as well as some adhesives. Tall oil resins are produced by mixing cellulose (a clycerol), formaldehyde, and dodecylphenol, then heating the mixture indirectly with steam. Ketone resins are produced by mixing cyclohexanone and formaldehyde with a sodium-hydroxide catalyst. This reaction is controlled by the addition of water to cool the resins and remove excess caustic. The polyamide resins are made by reacting dimer acid with ethylene diamine under heat. The hydrocarbon resins are produced using boron trifluoride as a catalyst. Once the resins are dried, they are crushed and bagged. Air emissions from the crushers and baggers are controlled by baghouses. All water from the plant goes to a wastewater treatment plant.

The facility is located in the East Gulf Coastal Plain physiographic province. The area is underlain, in descending order, by Pleistocene-age terrace deposits and the Cretaceous-age Tuscaloosa Group, comprised of the Gordo and Coker formations. The terrace deposits comprise the surficial aquifer followed by a massive clay confining bed in the upper portion of the Gordo Formation. The remainder of the Gordo, along with the Coker Formation, comprise the Tuscaloosa aquifer.

The majority of the residents within 4 miles of the Southern Resins' facility obtain their potable water from three water companies, two of which are solely distribution systems. The Moundville Water System receives water from two wells and serves 705 connections. Moundville also sells some of its water to the Hale County Water System which supplies water to about 844 connections. The third water company is Ingerwood-Hulls Water System, which obtains its water from the city of Tuscaloosa and serves 846 connections. There are also approximately 70 houses within 4 miles of the facility that utilize private wells for potable water. The nearest private well is about 1.4 miles northeast of Southern Resins. The surface water pathway is of concern since there is recreational and commercial fishing in the Black Warrior River. Also, since there are municipal and private wells located within 4 miles of the facility, the groundwater pathway is of concern. There is resin waste on the ground around the plant, and there are fumes from plant operations so that the soil exposure and air pathways are also of concern. 2223

Twenty environmental samples were collected during the field investigation associated with this study.

During this study, the following organic compounds on the Target Compound List were detected in elevated quantities: ethyl benzene, styrene, xylenes, naphthalene, and 2-methylnaphthalene. Most of the tentatively identified compounds reported were aromatics, with phenols also included. These categories of organics are those typically associated with tall oil resins which were used at the facility. When filter cakes were analyzed by Southern Resins, these compounds were also present. Those samples with the most contamination were collected from source areas such as the storage pond, sludge pond, and previous waste pile area. Elevated quantities of organic contaminants were also detected in groundwater samples collected on the east side of the facility.

Additionally, zinc, barium, cadmium, lead, and manganese were found in elevated amounts. Again, the contaminated samples were from source areas, the sludge pond, and waste pile area. One monitoring well on the eastern portion of the property also contained inorganics of concern. All of the metals, except for lead, were previously detected in synthetic filter cakes.

Since most of the contamination was found in source areas, there is no indication that contaminants are migrating from the facility along the surface water pathway. However, organic compounds and metals of concern were detected in groundwater samples making contamination of the municipal and private wells a potential threat. Therefore, FIT 4 recommends that Southern Resins be evaluated using the HRS (effective March 14, 1991).

1.0 INTRODUCTION

The Halliburton NUS Environmental Corporation Region 4 Field Investigation Team (FIT) was tasked by the U.S. Environmental Protection Agency (EPA), Waste Management Division to conduct a Site Inspection (SI) at the Southern Resins Division facility in Moundville, Tuscaloosa County, Alabama. The investigation was performed under the authority of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA). The task was performed to satisfy the requirements stated in Technical Directive Document (TDD) number F4-9011-22. The field investigation was conducted during the week of December 10, 1990.

1.1 OBJECTIVES

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

1.2 SCOPE OF WORK

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

- Obtain and review background materials relevant to HRS scoring of site.
- Obtain information on local water systems.
- Evaluate target populations associated with the groundwater, surface water, air, and onsite exposure pathways.
- Determine location and distance to nearest potable well.

- Develop a site sketch to scale.
- Collect environmental samples.
- Complete a Site Inspection Report, provided as Appendix A in this report.

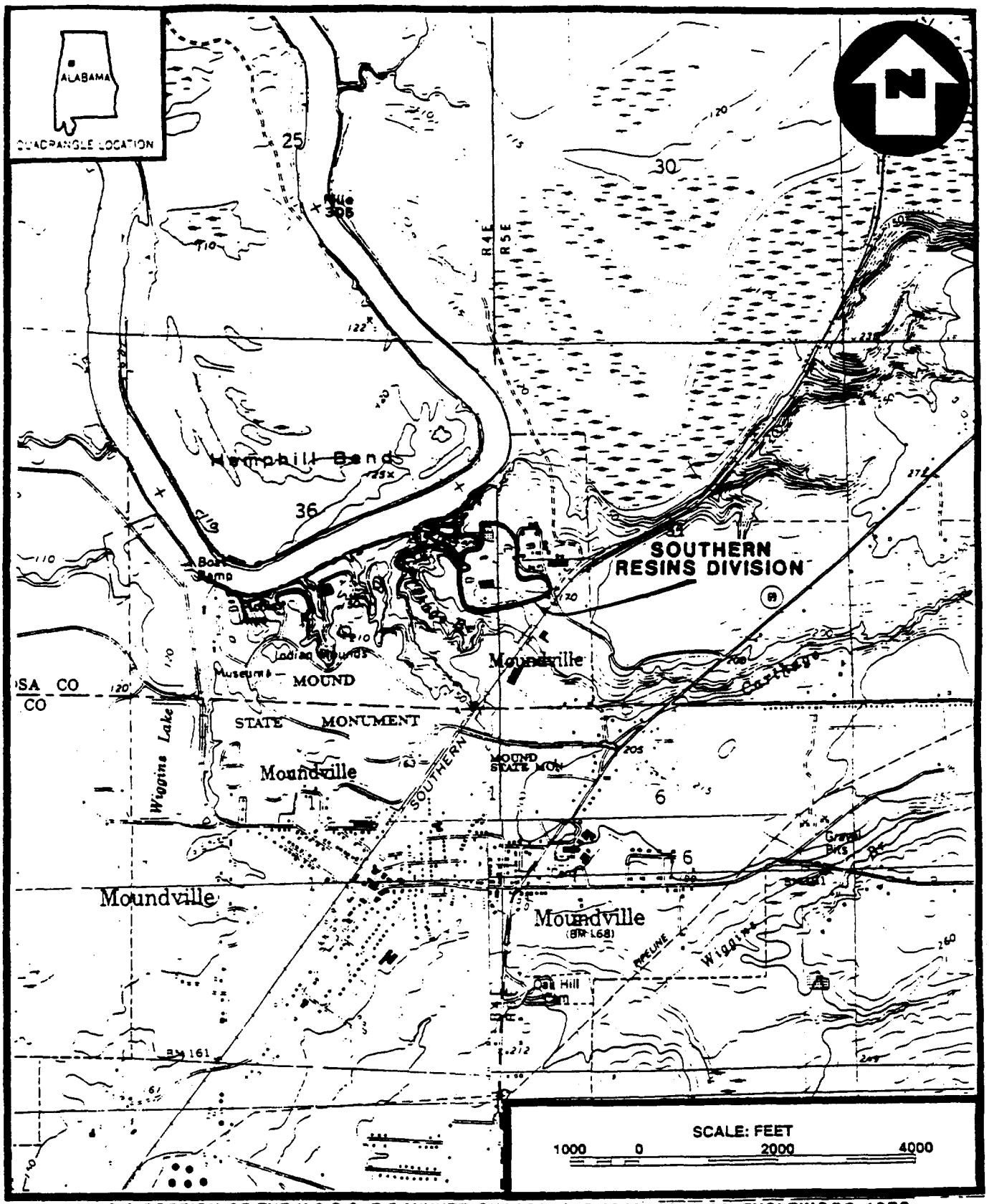
2.0 SITE CHARACTERIZATION

2.1 SITE BACKGROUND AND HISTORY

Southern Resins Division is located off of Highway 69, at the end of Cracker Road on the north side of Moundville, Tuscaloosa County, Alabama. The facility is presently active and has been in operation since 1966 (Refs. 1, 2). The facility was purchased by Lawter International in 1976 (Ref. 1). There was a varnish plant on the property, as well as a resin plant, prior to the facility's purchase by Lawter. Only resins have been produced since that time. Resins are primarily used in paints and inks and in some adhesives (Ref. 2).

Processes at the Southern Resins' plant involve the manufacturing of tall oil resins, ketone resins, and polyamide resins. Tall oil resins are produced by mixing cellulose (a glycerol), formaldehyde, and dodecylphenol, then heating the mixture indirectly with steam. Ketone resins are produced by mixing cyclohexanone and formaldehyde with a sodium-hydroxide catalyst. This reaction is controlled by the addition of water to cool the resins and remove excess caustic. The polyamide resins are made by reacting dimer acid with ethylene diamine under heat. Once the resins are dried, they are crushed and bagged. Air emissions from the crushers and baggers are controlled by baghouses. All water from the plant goes to a wastewater treatment plant (WWTP) (Ref. 3). The WWTP was built in 1980, and the facility has an National Pollutant Discharge Elimination System (NPDES) permit to discharge to the Black Warrior River. Prior to this, water was discharged to surface impoundments (Ref. 2). One surface impoundment was used to receive plant run-off and any significant solvent spills (Ref. 4).

Other processes at the manufacturing plant produce hydrocarbon resins using boron trifluoride as a catalyst. After the proper reaction time, the reaction is stopped by adding lime to the mixture, forming a calcium difluoride precipitate. The mixture is filtered to remove the solids and stripped with steam to remove a by-product solvent from the resin for recycling (Ref. 3). It is uncertain what solvents are removed from the resin; however, toluene and xylene are used in resin manufacturing (Ref. 5). The solids were, at one time, disposed of in the rear of the property (Ref. 3). The filter cakes generated by the filtration process are primarily composed of calcium fluoride ash containing volatile and other organics, but free of flowing liquids Production at the Southern Resins Division plant generates 60 to 70 drums of filter cake per week (Ref. 6). In the past, filter cake was stored in two waste piles, one that was in a three-sided bin, and a debris pile, all of which have been removed (Refs. 2, 6). Presently, the filter cake, as well as off-spec resins, are stored in drums on site, waiting to be incinerated. The incinerator came on-line in June 1990, and is regulated by the Alabama

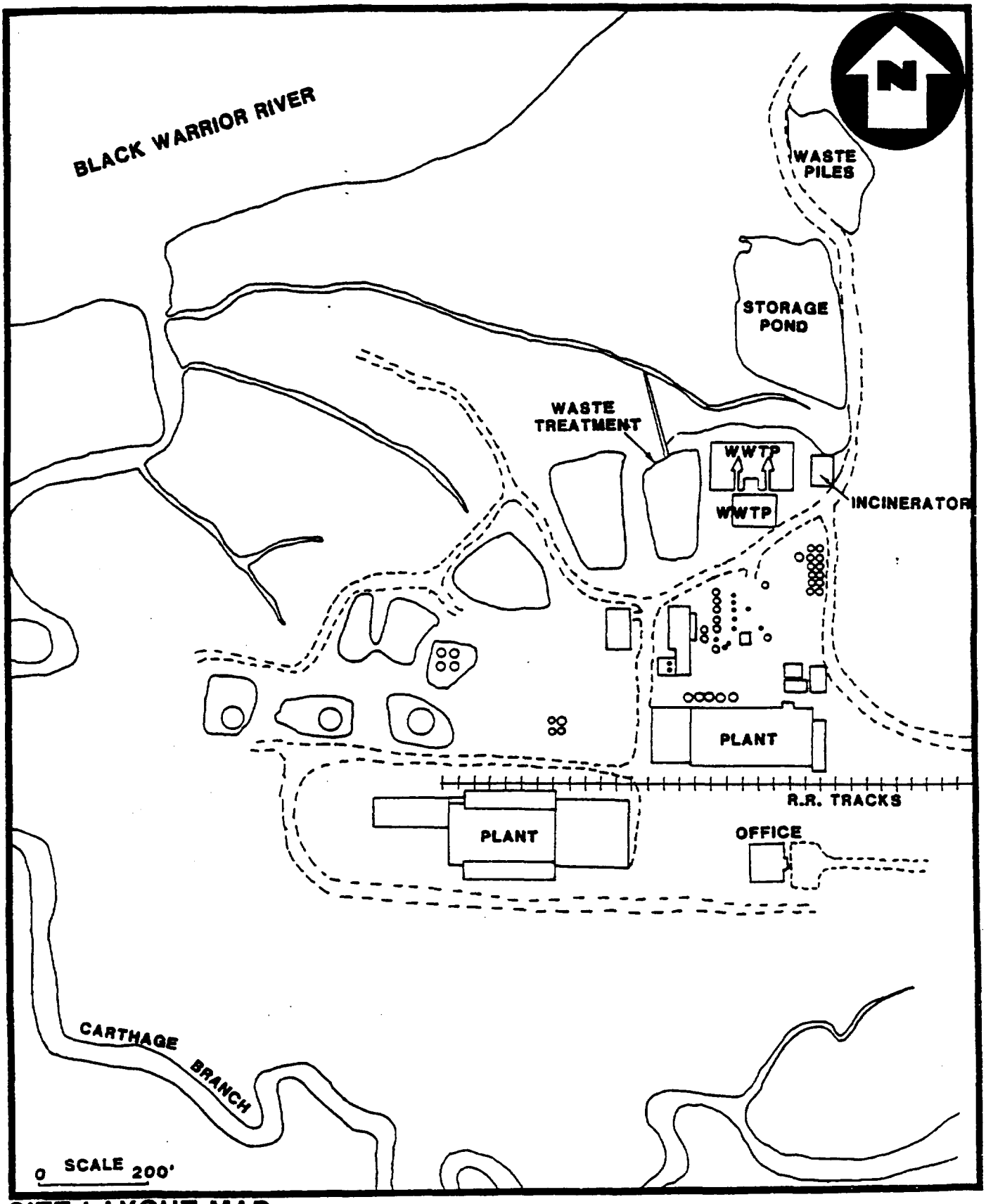


BASE MAP IS A PORTION OF THE U.S.G.S. 7.5 MINUTE QUADRANGLE FOSTERS 1969, ENGLEWOOD 1970, MOUNDVILLE WEST 1980, MOUNDVILLE EAST 1980, ALABAMA.

SITE LOCATION MAP
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

FIGURE 1

NUS



SITE LAYOUT MAP
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

FIGURE 2

NUS CORPORATION

Department of Environmental Management (ADEM). Air emissions from the incinerator are also monitored by ADEM (Ref. 2).

In 1981, Southern Resins Division was notified that an onsite open dump of waste resin and other substances stored in drums was unacceptable under state solid waste regulations due to the toxic characteristics of substances disposed of at the dump (Ref. 7). In May 1983, a spill of resinous material occurred from the Southern Resins' facility into a tributary of the Black Warrior River. Also, two inspections in July 1983, and August 1984, revealed unpermitted discharges of pollutants into the tributary. In May 1984, the company was requested to submit a spill contaminant plan for the wastewater recycling areas. In 1984, an inspection revealed that the facility also violated its NPDES Permit, No. AL0026921, by exceeding allowable biochemical and chemical oxygen demand and levels. The inspection reported leaks from pumps as well (Ref. 8). In 1985, a Notice of Violation was issued to Southern Resins Division for improper storage of waste (Ref. 9). By June 27, 1985, all filter cakes stored on site was removed to a hazardous waste landfill in Emelle, Alabama (Ref. 10).

Southern Resins Division, also known as Lawter Chemicals, filed a Resource Conservation and Recovery Act Part A application on September 4, 1980, but withdrew it on February 23, 1981 (Ref. 11). The facility never received interim status and is currently listed as a nonhandler of hazardous waste (Ref. 12).

2.2 SITE DESCRIPTION

2.2.1 Site Features

Southern Resins Division is located off of Highway 69 within the city limits of Moundville, Alabama (Figure 1) (Appendix B). The facility is located in a rural area on approximately 64 acres of land, about half of which is undeveloped (Ref. 2, Appendix B). There is no fence surrounding the plant; however, the west side of the property is adjacent to the Black Warrior River. An active railroad spur enters the property ending at the center of the plant. There are two resin plants on site along with a WWTP that is located directly north of the two plants. There are several surface impoundments located west of the WWTP and one located to the north. There is also a new incinerator at the facility located east of the WWTP (Ref. 2). The site layout is depicted on Figure 2.

2.2.2 Waste Characteristics

A variety of chemicals are used for the production of resins at the Southern Resins' facility. Eighty percent of the products manufactured are tall oil resins, which are made from the reaction of tall oil

resin with cellusolse (a glycerol), formaldehyde, and dodecylphenol (Ref. 3). Tall oil resin, which is commonly used in varnishes, is composed of oils and abietic acid (Ref. 13, p. 195). In addition to inert substances, the oil mixture may contain one or more aromatic hydrocarbons, such as benzene, ethylbenzene, B-methyl styrene, naphthalene, styrene, toluene, and xylene. Contact with these toxic chemicals can cause a variety of adverse physical reactions along with cancer (Refs. 14, pp. 360, 361, 1971; 15). Additionally, formaldehyde is toxic and a carcinogen (Refs. 14, pp. 1451, 1452; 15).

Dibasic organic acids and diamines are used for the production of polyamide resins, while cyclohexanone is a constituent of ketone resin (Refs. 3, 15). Since these reactants are soluble in organic solvents, there is a large selection of chlorinated and aromatic compounds that can be used for these reactions. The only one listed on the hazardous materials sheet is 1,1,1-trichloroethane, which is toxic (Ref. 14, p. 2620).

Synthetic filter cake was analyzed by CH2M Hill for suspected hazardous inorganic and organic substances. Among the inorganics, barium, chromium, manganese, copper, zinc, nickel, and cyanide were detected. Barium was found in larger quantities than the others. The following organic compounds were detected: xylene, methylbenzene, trimethylbenzene, 2-methyl styrene, dimethylbenzene, dimethylpyridine, trimethylpyridine, naphthalene, dicyclopentadiene, toluene, ethylbenzene, 1,3-cyclopentadiene, and styrene. These were all specific chemicals, described above, on Southern Resins' hazardous materials sheets or compounds in the categories of those used in the production of resins (Ref. 6). Additionally, exposure to pyridine or its derivatives poses health hazards (Ref. 14, p. 2325).

3.0 REGIONAL POPULATIONS AND ENVIRONMENTS

3.1 POPULATION AND LAND USE

3.1.1 Demography

The area immediately surrounding Southern Resins is very rural and sparsely populated, though the town of Moundville is located between 0.5 and 1 mile south of the facility. The majority of the residences are single-family homes, and almost all are located south of the property (Appendix B). The nearest residence is located approximately 700 feet southeast of plant operations (Ref. 16). The other areas around the property are primarily undeveloped. The total population within a 4-mile radius of the site, based on topographic maps, using a factor of 3.8 people/house, is 2,804. The population distribution is 802 between 0 and 1 mile, 646 between 1 and 2 miles, 737 between 2 and 3 miles, and 619 between 3 and 4 miles (Appendix B).

3.1.2 Land Use

The vast majority of the area within a 4-mile radius of Southern Resins is rural and somewhat sparsely populated. Located directly east of the facility is B & W Heads, which has large tanks on the property that are primarily empty. There is also a sawmill located immediately south of the site. Located 3 miles northeast, as well as 3.5 to 4.0 miles north of the facility, are several fish hatcheries. A picnic area and boat ramp are located about 0.6 mile west of the site. Also, Mound State Monument Park is located 0.5 mile southwest of the plant. The remainder of the land surrounding Southern Resins is primarily undeveloped, much of which is covered by wetland areas, especially toward the north (Ref. 16, Appendix B). Although there are no critical habitats designated in Tuscaloosa or Hall counties, there are several federally endangered species designated for the entire state or the west-central portion. These include the Florida panther (Felis concolor coryi), the bald eagle (Haliaeetus leucocephalus), Bachman's warbler (Vermivora buchmanii), the ivory-billed woodpecker (Campephilus principalis), the red-cockaded woodpecker (Piocoides (Dendrocopos) borealis), and the southeastern bat (Myotis austroriparius) (Refs. 17, 18).

3.2 SURFACE WATER

3.2.1 Climatology

The climate of the Moundville area is characterized by long, hot, humid summers and relatively mild, short winters. Rainfall is scattered fairly evenly throughout the year. The average summer and winter temperatures are 80°F and 46°F, respectively (Ref. 19, p. 1). The average annual precipitation and lake evaporation for this area are 52 inches and 42 inches, respectively, yielding a net annual precipitation of 10 inches (Ref. 20, pp. 43, 63). The 1-year, 24-hour rainfall is 3.5 inches (Ref. 21, p. 93).

3.2.2 Overland Drainage

Surface water run-off from the property would flow west to northwest, approximately 500 to 1,000 feet along various drainage pathways, as seen on Figure 2, and enter Carthage Branch Creek within 500 feet of the Black Warrior River. The Black Warrior River then continues southward for greater than 15 downstream miles from the facility. Surface water run-off may also enter the Black Warrior River directly from the western edge of the property (Appendix B).

3.2.3 Potentially Affected Water Bodies

There are no surface water intakes located for 15 miles downstream of the facility, but the Black Warrior River is used for commercial and recreational fishing (Refs. 22, 23). There are no critical habitats or sensitive environments designated for Carthage Branch Creek or the Black River (Ref. 18).

3.3 GROUNDWATER

3.3.1 Hydrogeology

Southern Resins Division is located in the Alluvial-Deltaic Plain district of the East Gulf Coastal Plain physiographic province and hydrologic setting. This area, in general, is characterized by broad, flat flood plains and terraces along major rivers (Ref. 24, p. 4). The facility is located on a terrace deposit that is approximately 60 feet above the Black Warrior River. The edge of the terrace has been sharply incised by the river on all but the eastern side. The highest land surface altitude of the property is about 210 feet above National Geodetic Vertical Datum, and total relief across the property is approximately 75 feet (Ref. 25, Appendix B). Soils in the site vicinity are generally classified as a fine, sandy loam. The soils are well drained, and run-off is fairly rapid causing moderate to severe erosion (Ref. 19, p. 30, sheet 100). The area is underlain, in descending order, by Pleistocene-age terrace

deposits and the Cretaceous-age Tuscaloosa Group comprised of the Gordo and Coker formations (Ref. 24, pp. 20, 21).

Groundwater in the area is obtained from two aquifers: the surficial and the Tuscaloosa (Ref. 24, pp. 8, 20, 21). The surficial aquifer is unconfined and located within the alluvial terrace deposits that consist of interbedded gravel, sand, silt, and clay (Ref. 24, p. 20). Based on the exposed slope located on the western edge of the property, the terrace deposits are approximately 30 feet thick. The upper 5 feet is comprised of light gray to yellowish brown, sandy and silty clay. The remaining sediments consist of beds of yellow-brown, sandy gravel and yellow to white, fine to coarse sand (Ref. 25). Depth to groundwater at the facility ranges from approximately 20 to 35 feet below land surface (Ref. 2). Hydraulic conductivity values for sands and gravels range from 1×10^{-1} to 1×10^{-3} cm/sec (Ref. 26, p. 29).

Unconformably underlying the terrace deposits is the Gordo Formation of the Tuscaloosa Group. The formation consists of alternating lenticular layers of sand and mottled clay that overlie a basal zone of gravelly sand. The upper part of the Gordo Formation is comprised of a massively bedded, light gray clay that probably confines the lower units from the surficial aquifer. The formation is approximately 300 feet thick in the area. The Coker Formation, which consists of marine sand and clay, and a basal nonmarine gravel zone, underlies the Gordo Formation. In some locations, the upper part of the Coker consists of a 50-foot clay layer, which separates the Coker from the Gordo aquifer. In other locations, the thick clay layer is absent, and the two aquifers are hydraulically connected; termed the Tuscaloosa aquifer (Refs. 24, pp. 6-12; 25). Hydraulic conductivity values for sediments of the Tuscaloosa Group range from 1×10^{-3} to 1×10^{-7} cm/sec (Ref. 26, p. 29).

3.3.2 Aquifer Use

The majority of water needs for the town of Moundville and the surrounding area are served by three water companies; two of which are solely distribution systems. The Moundville Water System obtains its water from two wells that are 244 feet deep and are completed in the Tuscaloosa aquifer (Refs. 16; 24, pp. 6-12; 25). The wells are located 3.75 miles south of Southern Resins and supply water to about 705 connections. The Hale County Water System obtains its water from the town of Moundville and serves approximately 844 connections located in the northern half of the county. The third water company, Ingerwood-Hulls Water System, which serves 846 connections, purchases water from the city of Tuscaloosa. The water source for the city is Lake Tuscaloosa, located north and upstream of the facility. A house count using topographic maps identified approximately 29 houses within 3 miles of the facility using private wells. An additional 41 houses between 3 and 4 miles from the plant are

using private wells. The nearest private well is located approximately 1.4 miles northeast of the facility (Ref. 16, Appendix B).

3.4 SUMMARY OF POTENTIALLY AFFECTED POPULATIONS AND ENVIRONMENTS

There are four pathways of concern at the Southern Resins facility: surface water, groundwater, onsite, and air. The surface water pathway is of concern since recreational and commercial fishing is allowed in the Black Warrior River. There are no surface water intakes, however, located along the surface water route. The groundwater pathway is also of concern, since there are two municipal wells and 70 private wells located within 4 miles of the facility. The soil exposure pathway is of concern since there is resin waste on the ground in the plant area, and the air pathway is potentially of concern since there are fumes from plant operations, though the types of constituents are unknown.

4.0 FIELD INVESTIGATION

4.1 SAMPLE COLLECTION

During the field investigation conducted the week of December 10, 1990, FIT 4 attempted to identify and characterize contaminants which may be present in the environment as a result of activities conducted at the Southern Resins Division facility. To accomplish this, FIT 4 collected environmental surface soil, subsurface soil, surface water, and groundwater samples from a number of strategic locations. These locations were selected based on historical information and hydrogeological data for the region and site area. A total of 20 environmental samples were collected according to standard EPA protocols.

4.1.1 Sample Collection Methodology

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

4.1.2 Duplicate Samples

Duplicate samples were offered to and accepted by James Adams of CH2M Hill, a designated representative of Southern Resins Division (Ref. 2). Receipt for sample forms are on file at FIT 4.

4.1.3 Description of Samples and Sample Locations

During the sampling investigation, a total of 20 environmental samples were collected for analysis. These samples included five surface soil, five sediment, five groundwater from permanent monitoring wells, and five surface water samples. Background surface soil and groundwater samples were collected north of the plant area from an upgradient location. Background sediment and surface water samples were collected from an upstream location, east of the facility, on Carthage Branch Creek.

Surface soil samples were taken from two locations previously used as waste piles for filter cake. At the time of the investigation, one location had drums, in various degrees of deterioration, full of resin waste covering the area. The other past waste pile area is presently a loading dock, but there are also drums of resin waste nearby. A surface soil sample was also collected from a previously used surface impoundment and from a storage pond. Soil from the storage pond, believed by Southern Resin personnel to be the most contaminated area on the facility, is presently being incinerated. Groundwater samples were collected from three monitoring wells located east of the property, since quarterly monitoring data showed higher levels of constituents in these wells (Ref. 2). Another groundwater sample was taken from a downgradient well, located west of plant and the surface impoundments.

Two surface water and sediment samples were collected from Carthage Branch near the confluence of the Black Warrior River. Both sample locations were downgradient of surface water run-off from plant property. One set of surface water and sediment samples, however, were collected from the point where discharge from the wastewater treatment plant intersects Carthage Branch. Also, a surface water and sediment sample were taken downstream of Carthage Branch from the Black Warrior River. Another set of surface water and sediment samples was collected from an onsite sludge pond that had been used to store resin waste. Sample locations are shown on Figure 3. Sample codes, descriptions, and rationale are contained in Table 1.

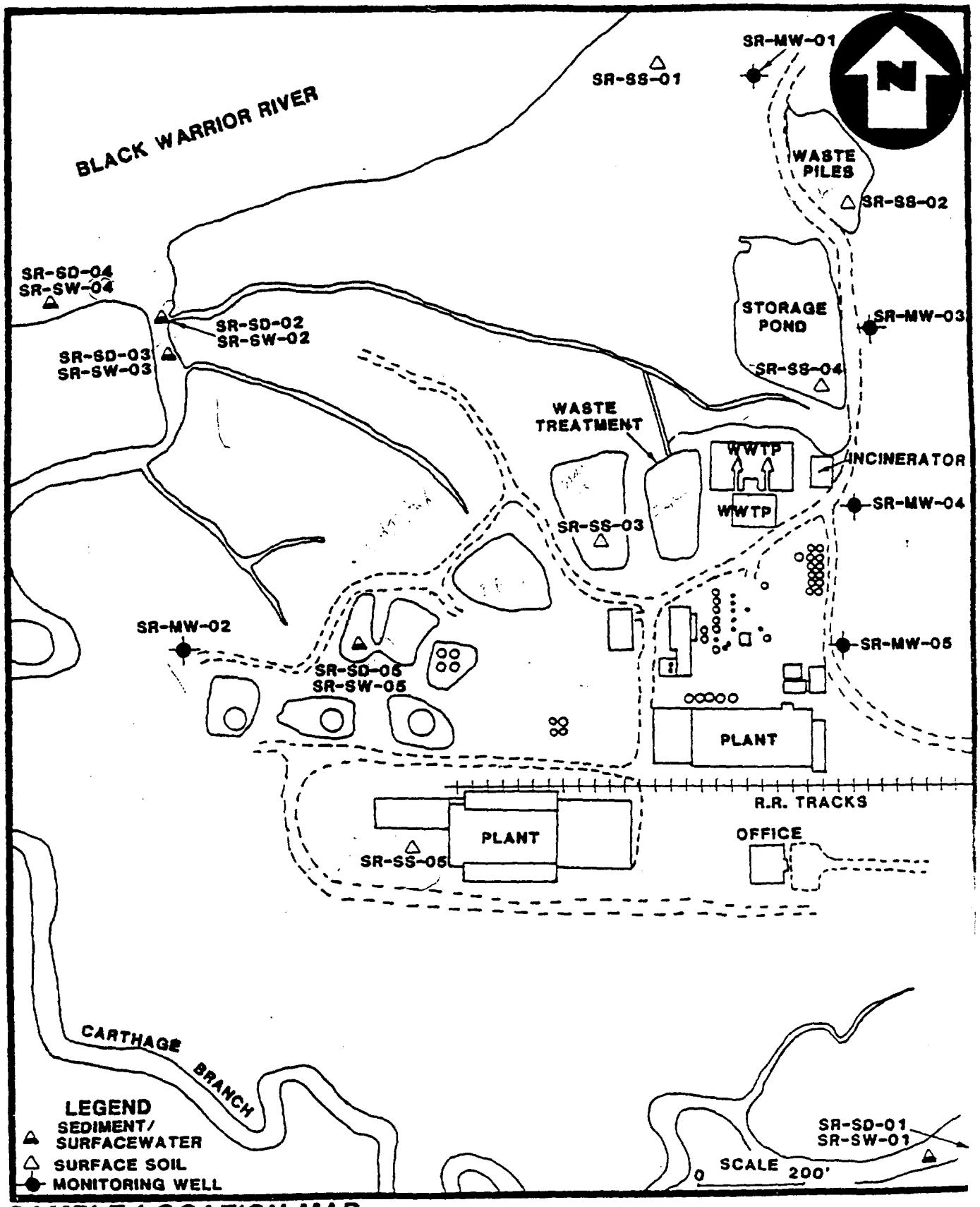
4.1.4 Field Measurements

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

4.2 SAMPLE ANALYSIS

4.2.1 Analytical Support and Methodology

All samples collected were analyzed under the Contract Laboratory Program (CLP) and analyzed for all parameters listed in the Target Compound List (TCL). Organic analysis of soil and water samples was performed by Compu Chem Labs in Research Triangle Park, North Carolina. Inorganic analysis of soil and water was performed by Skinner and Sherman of Waltham, Massachusetts.



SAMPLE LOCATION MAP
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

FIGURE 3

NUS

TABLE 1

SAMPLE CODES, DESCRIPTIONS, AND RATIONALE
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

Sample Code	Date Collected (1990)	Time Collected	Description	Rationale
SR-SS-01 SR-MW-01	12/11 12/12	1105 0930	Background samples collected from an upgradient location north of the plant area.	Collected to determine background soil and groundwater conditions.
SR-SS-02	12/11	1210	Onsite sample collected from northeast portion of property.	Collected from previous waste pile area.
SR-SS-03	12/11	1545	Onsite sample collected from center portion of property.	Collected from previously used surface impoundment.
SR-SS-04	12/11	1310	Onsite sample collected from north portion of property.	Collected from previously used storage pond.
SR-SS-05	12/11	1600	Onsite sample collected from southwest portion of plant.	Collected from previous waste pile area.
SR-MW-02	12/12	1305	Onsite sample collected from west portion of property.	Collected downgradient of surface impoundments.
SR-MW-03	12/12	1615	Onsite sample collected from northeast portion of property.	Collected from area east of storage pond.
SR-MW-04	12/12	1530	Onsite sample collected from east portion of property.	Collected from well showing elevated levels of constituents.
SR-MW-05	12/12	1650	Onsite sample collected from east portion of property.	Collected from well showing elevated levels of constituents.

SR - Southern Resins
SS - Surface Soil
MW - Groundwater, Monitoring Well
SD - Sediment
SW - Surface Water

TABLE 1

SAMPLE CODES, DESCRIPTIONS, AND RATIONALE
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

Sample Code	Date Collected (1990)	Time Collected	Description	Rationale
SR-SD-01 SR-SW-01	12/12 12/12	1215 1210	Offsite samples collected from an upstream location, east of the property, on Carthage Branch Creek.	Collected to determine background sediment and surface water conditions.
SR-SD-02 SR-SW-02	12/12 12/12	1100 1050	Onsite samples collected from Carthage Branch Creek.	Collected from downstream portion of creek, at the discharge point from the wastewater treatment plant.
SR-SD-03 SR-SW-03	12/12 12/12	1030 1015	Onsite samples collected from Carthage Branch Creek.	Collected from downstream portion of creek, near the confluence of the Black Warrior River.
SR-SD-04 SR-SW-04	12/12 12/12	0910 0900	Offsite sample collected from the Black Warrior River.	Collected from a downgradient location.
SR-SD-05 SR-SW-05	12/12 12/12	1330 1320	Onsite sample collected from central portion of property.	Collected from a sludge pond containing resin waste.

SR - Southern Resins
SS - Surface Soil
MW - Groundwater, Monitoring Well
SD - Sediment
SW - Surface Water

TABLE 2

FIELD MEASUREMENTS
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

Sample Code	Date (1990)	Time	pH	Temp. (°C)	Conductivity (umhos/cm)
SR-MW-01	12/12	0930	4.22	19	108.8
SR-MW-02	12/12	1305	4.98	20	191.1
SR-MW-03	12/12	1615	5.09	18	204.0
SR-MW-04	12/12	1530	5.02	17	517.0
SR-MW-05	12/12	1650	5.04	18	1047.0
SR-SW-01	12/12	1210	5.93	19	74.7
SR-SW-02	12/12	1050	7.2	21	453.0
SR-SW-03	12/12	1015	6.42	22	80.4
SR-SW-04	12/12	0900	6.71	15	327.0
SR-SW-05	12/12	1320	6.30	20	342.0

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

4.2.2 Analytical Data Quality and Data Qualifiers

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

4.2.3 Presentation of Analytical Results

This section presents a discussion and interpretation of the analytical results from the environmental samples collected during the investigation at the Southern Resins Division facility. Results of surface soil, sediment, groundwater, and surface water samples are presented in Tables 3 through 10. Background samples have been designated for all media. Values for background sample results are presented as either a measured value or as the MQL. Samples containing concentrations of contaminants greater than 3 times the background level or MQL of these contaminants are considered to be elevated. These samples are noted in the text.

TABLE 3

SUMMARY OF ORGANIC ANALYTICAL RESULTS
SURFACE SOIL SAMPLES
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

PARAMETERS (ug/kg)	Background	On Site				
	SR-SS-01	SR-SS-02	SR-SS-03	SR-SS-04	SR-SS-05	SR-TB-01S
PURGEABLE COMPOUNDS						
BENZENE	11U	-	-	9J	-	-
TOLUENE	11U	-	-	25	-	-
ETHYL BENZENE	11U	-	-	1900	-	-
STYRENE	11U	-	-	1600	-	-
TOTAL XYLENES	11U	-	-	16,000	-	-
ETHYLMETHYLBENZENE/ISOMERS(1)				60,000JN/2		
TRIMETHYLBENZENE/ISOMERS(1)				100,000JN/3		
ETHENYLMETHYLBENZENE(1)				10,000JN		
TETRAHYDROMETHANOINDENE(1)				90,000JN		
PROPENYLBENZENE/ISOMERS(1)				50,000JN/2	-	
METHYLPROPYLBENZENE(1)				40,000JN		
EXTRACTABLE COMPOUNDS						
NAPHTHALENE	3600	-	-	64,000	-	-
2-METHYLNAPHTHALENE	140J	-	-	5100J	-	-
BENZO(A)ANTHRACENE	360U	-	-	-	120J	-
UNIDENTIFIED COMPOUND/NO.(1)	7000J/7	60,000J/20	50,000J/18	600,000J/13	100,000J/12	
ETHYLDIMETHYLBENZENE/ISOMERS(1)	6000JN/4		1000JN/1	40,000JN/1		

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

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TABLE 3

SUMMARY OF ORGANIC ANALYTICAL RESULTS
SURFACE SOIL SAMPLES
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

PARAMETERS (ug/kg)	Background	On Site				
	SR-SS-01	SR-SS-02	SR-SS-03	SR-SS-04	SR-SS-05	SR-TB-01S
TETRAMETHYLBENZENE(1)	2000JN			40,000JN		
OCTAHYDROMETHANOINDENECARBOXALDEHYDE/ISOMERS(1)					10,000JN/2	
HYDROXYPHENYLMETHYLETHYLPHENOL(1)					30,000JN	
OCTAHYDROPHENANTHRENECARBOXYLIC ACID(1)					10,000JN	
DIHYDROMETHYLINDENE(1)	800JN					
DIMETHYLETHYLETHOXYBENZENE(1)					4000JN	
DIMETHYLETHYLPHENOL(1)					8000JN	
TRIMETHYLPHENYLETHANONE(1)					5000JN	
OCTAHYDROMETHANOINDENE	400JN					

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

TABLE 4

SUMMARY OF INORGANIC ANALYTICAL RESULTS
SOIL SAMPLES
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

	Background	On Site				
PARARMETERS (mg/kg)	SR-SS-01	SR-SS-02	SR-SS-03	SR-SS-04	SR-SS-05	SR-PB-01
ALUMINUM	4100	11,000	3800	8200	4000	-
ARSENIC	2U	-	-	3.6	2.8	-
BARIUM	45	18	9.5	19	17	-
CALCIUM	140	16,000	250	1600	120,000	-
COPPER	6U	-	3.2	-	-	-
IRON	4200	12,000	6900	12,000	5300	-
LEAD	8.1	7.3	3.2	6.8	8.4	-
MAGNESIUM	150	1200	90	240	23,000	-
MANGANESE	130	14	12	24	44	-
POTASSIUM	230	280	130	170	320	-
SODIUM	30U	-	-	260	-	-
VANADIUM	7.4	22	11	19	9	-
ZINC	20U	-	-	-	210	-

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

TABLE 5

SUMMARY OF ORGANIC ANALYTICAL RESULTS
GROUNDWATER SAMPLES
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

PARAMETERS (ug/l)	Background	On Site				
	SR-MW-01	SR-MW-02	SR-MW-03	SR-MW-04	SR-MW-05	SR-TB-01W
PURGEABLE COMPOUNDS						
CARBON DISULFIDE	24	21	14J	24J	42J	-
BENZENE	220	-	27	120	45J	-
TOLUENE	35	-	40	78J	61J	-
ETHYL BENZENE	75	-	84	410	140J	-
STYRENE	62	-	78	280	130J	-
TOTAL XYLENES	370	-	330	2300	740J	-
TRIMETHYLBENZENE/ISOMERS(1)			80JN/1		600JN/2	
PROPENYLBENZENE/ISOMERS(1)	50JN			400JN	100JN	
PROPYLBENZENE(1)	60JN		60JN	400JN	100JN	
ETHYLMETHYBENZENE/ISOMERS(1)	200JN/1		300JN/3	2000JN/2	700JN/3	
EXTRACTABLE COMPOUNDS						
NAPHTHALENE	270	-	140	750	170	-
PENTACHLOROPHENOL	50U	-	2J	-	-	-
DI-N-BUTYLPHTHALATE	10U	-	1J	-	-	-
UNIDENTIFIED COMPOUND/NO(1)	100J/3	50J/4	900J/9	3000J/4	1000J/10	
DIETHYLBENZENE(1)	10JN					
ETHYLDIMETHYLBENZENE/ISOMERS(1)			100JN/3	500JN/2	90JN/1	

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

TABLE 5

SUMMARY OF ORGANIC ANALYTICAL RESULTS
GROUNDWATER SAMPLES
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

PARAMETERS (ug/l)	Background	On Site				
	SR-MW-01	SR-MW-02	SR-MW-03	SR-MW-04	SR-MW-05	SR-TB-01W
TETRAMETHYLBENZENE(1)					50JN	
METHYLCYCLOPROPENYLBENZENE(1)	20JN					
AMINOHEXANOIC ACID(1)	200JN	400JN	300JN	400JN	300JN	
TETRAHYDROMETHYLNAPHTHALENE(1)	10JN					
PROPADIENYLBENZENE(1)			80JN	700JN	90JN	
METHYLINDENE(1)			40JN	100JN		
ETHENYLETHYLBENZENE(1)				200JN		
TETRAHYDROCYCLOPROPINDENE(1)				100JN		
METHYLBENZOIC ACID(1)				100JN		
METHYLENEPROPENYLBENZENE(1)				70JN		
PESTICIDE\PCB COMPOUNDS						
ALPHA-BHC	0.050U	-	-	-	0.097	-
DIELDRIN	0.10U	-	-	-	-	0.024J
DELTA-BHC	0.050U	-	0.021J	0.074	-	-
HEPTACHLOR	0.050U	-	-	0.04J	-	-
4,4'-DDE (P,P'-DDE)	0.10U	0.062J	-	0.029J	-	
4,4'-DDT (P,P'-DDT)	0.10U	0.054J	-	-	-	0.032J
ENDRIN KETONE	0.10U	0.060J	-	-	-	-

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

TABLE 5

SUMMARY OF ORGANIC ANALYTICAL RESULTS
GROUNDWATER SAMPLES
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

PARAMETERS (ug/l)	Background	On Site				
	SR-MW-01	SR-MW-02	SR-MW-03	SR-MW-04	SR-MW-05	SR-TB-01W
GAMMA-CHLORDANE	0.050U	0.030J	-	0.027J	-	-
ALPHA-CHLORDANE	0.050U	0.040J	-	0.089	-	-

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

TABLE 6

SUMMARY OF INORGANIC ANALYTICAL RESULTS
GROUNDWATER SAMPLES
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

	Background	On Site				
PARARMETERS (ug/l)	SR-MW-01	SR-MW-02	SR-MW-03	SR-MW-04	SR-MW-05	SR-PB-01
ALUMINUM	27,000	9200	48,000	2400	180,000	-
BARIUM	180	190	160	300	890	-
CADMIUM	3U	-	-	-	9	-
CALCIUM	2600	12,000	1900	11,000	20,000	-
CHROMIUM	82	19	98	-	430	-
COPPER	53	19	44	-	120	-
IRON	99,000	34,000	64,000	6500	240,000	-
LEAD	14	9	16	8	59	-
MAGNESIUM	1800	3100	1600	5400	19,000	-
MANGANESE	120	210	410	770	1300	-
NICKEL	20U	-	-	-	42	-
POTASSIUM	3400	7100	4000	6500	14,000	-
SODIUM	10,000	6400	21,000	77,000	100,000	-
VANADIUM	190	68	190	-	570	-
ZINC	120	110	-	240	200	-

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

TABLE 7

SUMMARY OF ORGANIC ANALYTICAL RESULTS
SEDIMENT SAMPLES
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

PARAMETERS (ug/kg)	Background	Carthage Branch		Black Warrior	On Site
	SR-SD-01	SR-SD-02	SR-SD-03	SR-SD-04	SR-SD-05
PURGEABLE COMPOUNDS					
TOLUENE	12U	-	-	-	420J
ETHYL BENZENE	12U	-	-	-	3000
STYRENE	12U	-	-	-	1900
TOTAL XYLENES	12U	-	-	-	22,000
ETHYLMETHYLBENZENE/ISOMERS(1)					70,000JN/3
TRIMETHYLBENZENE/ISOMERS(1)					30,000JN
PROPENYLBENZENE/ISOMERS(1)					9000JN
PROPYLBENZENE(1)					10,000JN
EXTRACTABLE COMPOUNDS					
NAPHTHALENE	410U	-	-	-	190,000
2-METHYLNAPHTHALENE	410U	-	-	-	7500
UNIDENTIFIED COMPOUND/NO.(1)				800J/1	400,000J/7
METHYLPROPYLBENZENE(1)					50,000JN
DIETHYLBENZENE(1)					100,000JN
ETHYLDIMETHYLBENZENE/ISOMERS(1)					200,000JN
TETRAMETHYLBENZENE(1)					90,000JN

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

TABLE 8

SUMMARY OF INORGANIC ANALYTICAL RESULTS
SEDIMENT SAMPLES
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

	Background	Carthage Branch		Black Warrior	On Site
PARARMETERS (mg/kg)	SR-SD-01	SR-SD-02	SR-SD-03	SR-SD-04	SR-SD-05
ALUMINUM	450	720	340	310	3800
BARIUM	5	8.7	4.1	4.9	20
CALCIUM	50U	200	-	82	240
IRON	2500	2500	2100	1100	3900
LEAD	1.1	2.3	1.3	1	4
MAGNESIUM	24	42	16	31	120
MANGANESE	67	19	28	42	42
POTASSIUM	40	69	35	54	160
SODIUM	30U	-	-	-	260
VANADIUM	2.5	3.1	2.2	1.7	7.7
ZINC	5U	-	-	-	9.6

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

TABLE 9

SUMMARY OF ORGANIC ANALYTICAL RESULTS
SURFACE WATER SAMPLES
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

PARAMETERS (ug/l)	Background	Carthage Branch		Black Warrior	On Site
	SR-SW-01	SR-SW-02	SR-SW-03	SR-SW-04	SR-SW-05
PURGEABLE COMPOUNDS					
CARBON DISULFIDE	10U	-	-	-	6J
1,1,1-TRICHLOROETHANE	10U	2J	-	-	-
BENZENE	10U	2J	-	-	19J
METHYL ISOBUTYL KETONE	10U	2J	-	-	-
TOLUENE	10U	3J		-	18J
ETHYL BENZENE	10U	2J	-	-	45J
TOTAL XYLENES	10U	22	-	-	480
TRIMETHYLBENZENE/ISOMERS(1)					300JN
PROPENYLBENZENE/ISOMERS(1)					70JN
PROPYLBENZENE(1)					40JN
ETHYLMETHYBENZENE/ISOMERS(1)		100JN/2			8000JN/2
DECANE(1)		30JN			-
DIMETHOXYMETHANE(1)		20JN			-
METHYLPROPENAL(1)		30JN			-
DIMETHYLBUTANONE(1)		50JN			-
METHYLCYCLOPENTANONE(1)		80JN			-

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

TABLE 9

SUMMARY OF ORGANIC ANALYTICAL RESULTS
SURFACE WATER SAMPLES
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

PARAMETERS (ug/l)	Background	Carthage Branch		Black Warrior	On Site
	SR-SW-01	SR-SW-02	SR-SW-03	SR-SW-04	SR-SW-05
TETRAMETHYLPENTANONE(1)		600JN			-
UNIDENTIFIED COMPOUND/NO.(1)		40J/1			-
EXTRACTABLE COMPOUNDS					
(3-AND/OR 4-)METHYLPHENOL	10U	-	-	-	17J
UNIDENTIFIED COMPOUND/NO(1)		9000J/18			4000J/13
BUTYLBENZOIC ACID(1)		900JN			-
HEXAHYDROBENZOCYCLOHEPTATHIAZINE(1)					200JN
METHYLBENZOFURAN(1)					100JN
METHYLENEPROPENYLBENZENE(1)					100JN

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

TABLE 10

SUMMARY OF INORGANIC ANALYTICAL RESULTS
SURFACE WATER SAMPLES
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

PARARMETERS (ug/l)	Background	Carthage Branch		Black Warrior	On Site
	SR-SW-01	SR-SW-02	SR-SW-03	SR-SW-04	SR-SW-05
ALUMINUM	220	670	-	630	13,000
BARIUM	56	48	55	94	25
CALCIUM	2600	12,000	3900	16,000	1700
IRON	570U	1100	360	1000	5200
LEAD	5	4	-	-	8
MAGNESIUM	1900	2100	1900	8200	700
MANGANESE	84	110	130	130	220
POTASSIUM	1200	2200	1500	2400	3500
SODIUM	2800	98,000	3300	22,000	61,000
VANADIUM	2U	-	-	-	15

- Material analyzed for but not detected above minimum quantitation limit (MQL).

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

The organic compounds detected in elevated quantities in this study from the TCL were the following aromatics: ethyl benzene, styrene, xylenes, naphthalene, and 2-methylnaphthalene. Most of the miscellaneous compounds found in large quantities were tentatively identified aromatics and several phenols. These compounds are characteristic of those in the tall oils which were used at Southern Resins. The most contaminated surface soil sample (SR-SS-05) was collected from the storage pond. It contained ethylbenzene (173 times MQL), styrene (145 times MQL), total xylenes (1,450 times MQL), 2-methlynaphthalene (36 times background, estimated quantity), and naphthalene (18 times background) in addition to eight tentatively identified miscellaneous compounds (ranging in concentration from 10,000J to 100,000JN/3 ug/kg). There were six of these substances (ranging in concentration from 4,000JN to 30,000JN ug/kg) detected in the surface soil sample (SR-SS-05) collected from a previous waste pile area.

The groundwater sample (SR-MW-04) collected from the monitoring well directly east of the wastewater treatment plant and incinerator also contained elevated amounts of aromatics, including ethylbenzene (5 times background), styrene 4.5 times background), and xylenes (6 times background), in addition to 11 tentatively identified compounds (ranging in concentration from 70 JN to 2,000 JN ug/l). Smaller quanties of these compounds were detected in two other monitoring wells (SR-MW-03, SR-MW-05) and the background samples (SR-MW-01).

The only contaminated sediment sample (SR-SD-05) was taken from an onsite sludge pond containing resin waste. The elevated organic compounds in this sample included toluene (35 times MQL, estimated quantity), styrene (158 times MQL), ethylbenzene (250 times MQL), xylenes (1,833 times MQL), naphthalene (463 times MQL), and 2-methylnaphthalene (18 times MQL). There were also eight tentatively identified miscellaneous compounds (ranging in concentration from 9,000JN to 200,000JN ug/kg). The corresponding surface water sample (SR-SW-05) contained small amounts of organic compounds with only the total xylenes (48 times MQL) in elevated quantities; and the sample (SR-SW-02), taken from Carthage Branch had trace amounts of organics.

During this study, there were a small number of inorganic contaminants of concern detected in elevated amounts. These inorganics were zinc, barium, cadmium, chromium, lead, and manganese. Only zinc (10 times MQL) was found in elevated quantities in a surface soil sample (SR-SS-05) which was collected southwest of the plant in a previous waste pile area. The only groundwater sample (SR-MW-05) with elevated amounts of metals of concern was collected from the monitoring well on

the southeastern border of the facility. It contained barium (5 times background), cadmium (3 times MQL), chromium (5 times background), lead (4 times background), and manganese (10 times background). Additionally, only the sediment sample (SR-SD-05) taken from the sludge pond had elevated amounts of inorganics of concern, barium (4 times background) and lead (4 times background), while there were no elevated quantities of metals of concern in any surface water sample.

5.0 SUMMARY

Southern Resins manufactures tall oil resins, ketone resins, and polyamide resins. Tall oil resins are produced by mixing cellulose (a glycerol), formaldehyde, and dodecylphenol, then heating the mixture indirectly with steam. Ketone resins are produced by mixing cyclohexanone and formaldehyde with a sodium-hydroxide catalyst. This reaction is controlled by the addition of water to cool the resins and remove excess caustic. The polyamide resins are made by reacting dimer acid with ethylene diamine under heat. Prior to the wastewater treatment plant, built in 1980, waste was discharged to surface impoundments.

The surface water pathway is of concern, since there is recreational and commercial fishing in the Black Warrior River. Also, since there are municipal and private wells located within 4 miles of the facility, the groundwater pathway is of concern. There is resin waste on the ground around the plant, and there are fumes from plant operations, so that the soil exposure and air pathways are also of concern.

During this study, the following organic compounds on the Target Compound List were detected in elevated quantities: ethylbenzene, styrene, xylenes, naphthalene, and 2-methylnaphthalene. Most of the tentatively identified compounds reported were aromatics, and several phenols. These categories of organics are those typically associated with tall oil resins used at the facility. When filter cake was analyzed by Southern Resins, these compounds were also present. Those samples with the most contamination were collected from source areas such as the storage pond, sludge pond, and previous waste pile area. Elevated quantities of organic contaminants were also detected in groundwater samples collected on the east side of the facility.

Additionally, zinc, barium, cadmium, lead, and manganese were found in elevated amounts. Again, the contaminated samples were from source areas, the sludge pond, and waste pile area. One monitoring well on the eastern portion of the property also contained inorganics of concern. All of the metals, except for lead, were previously detected in synthetic filter cake.

Since most of the contamination was found in source areas, there is no indication that contaminants are migrating from the facility along the surface water pathway. However, organic compounds and metals of concern were detected in groundwater samples making contamination of the municipal and private wells a potential threat. Therefore, FIT 4 recommends that Southern Resins be evaluated using the HRS (effective March 14, 1991).

REFERENCES

1. Potential Hazardous Waste Site Preliminary Assessment (EPS Form 3012-III) for Southern Resins Division, Moundville, Alabama, Industrial Narrative Sheet, August 29, 1985; obtained from Alabama Department of Environmental Management, Birmingham, Alabama.

2. NUS Corporation Field Logbooks No. F4-2683 and F4-2684 for Southern Resins Division, TDD No. F4-9011-22. Documentation of field investigation, December 10-12, 1990.

3. George Sullivan, interoffice memorandum to Ron Gore, Alabama Department of Environmental Management, January 17, 1984. Subject: Inspection of Southern Resins.

4. David Hagan, interoffice memorandum to Bernard E. Cox, Alabama Department of Environmental Management, August 16, 1984. Subject: Waste management at Southern Resins.

5. J.F. Holohan and J.Y. Penn, "Hydrocarbon Resins," Kirk-Othmer Encyclopedia and Chemical Technology, 3rd ed., Vol. 12 (New York: John Wiley & Sons, 1983).

6. Results of April 4, 1985, filter cake sampling, Lawter International, Southern Resins Division, Moundville, Alabama, May 7, 1985; obtained from Alabama Department of Environmental Management, Birmingham, Alabama, pp. 1, 2, 18, 19, 20.

7. Jauier A. Colon, Environmentalist III, Division of Solid and Hazardous Waste, Environmental Health Administration, letter to Hosny Elgamel, Southern Resins Division, April 8, 1981. Subject: Waste disposal practices at Southern Resins.

8. Findings of Fact, Order No. 85-008-WP, Lawter International, Inc., Southern Resins Division, November 1, 1984; obtained from Alabama Department of Environmental Management, Birmingham, Alabama.

9. Daniel E. Cooper, Chief, Land Division, letter to Hosny Elgamel, Southern Resins Division, May 22, 1985. Subject: Notice of violations.

10. F. Gordon Steward, General Manager Southern Resins, letter to Bernard Cox, Alabama Department of Environmental Management, July 1, 1985. Subject: Removal of lime filter cake and adjacent debris pile.

11. David Hagan, Alabama Department of Environmental Management, letter to Buddy Cox, August 13, 1984. Subject: Chronological list of major regulatory events between Southern Resins and Alabama Department of Environmental Management.

12. Alicia Finch, Alabama Department of Conservation and Natural Resources, Land Protection, telephone conversation with Matthew McCoy, NUS Corporation, December 6, 1989. Subject: Current RCRA status.

13. William Gardner, ed., Handbook of Chemical Synonyms and Trade Names (Boca Raton, Florida: CRC Press, Inc., 1978).

14. N. Irving Sax, Dangerous Properties of Industrial Materials, Sixth ed., (New York: Van Nostrand Reinhold Company, 1984).

15. List of Hazardous Materials Used per SARA, Title III for Lawter International, Inc., Moundville, Alabama, October 16, 1987.

16. NUS Corporation Field Logbook No. F4-1768 for Southern Resins Division, TDD No. F4-8910-70. Documentation of facility reconnaissance, November 16, 1989.

17. Robert H. Mount, Vertebrate Animals of Alabama in Need of Special Attention (Alabama Agricultural Experiment Station and Auburn Univeristy), pp. 78, 79, 111, 112.

18. U.S. Fish and Wildlife Service, Endangered and Threatened Species of the Southeastern United States (Atlanta, Georgia, 1988).

19. U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of Tuscaloosa County, Alabama (August 1981), pp. 1, 30, sheet 100.

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

21. U.S. Department of Commerce, Rainfall Frequency Atlas of the United States, Technical Paper No. 40 (Washington, D.C.: GPO, 1961), p. 93.

22. Carol Lackey, Alabama Department of Conservation and Natural Resources, telephone conversation with Matthew McCoy, NUS Corporation, December 5, 1989. Subject: Fishing practices on the Black Warrior River.

23. Mr. Rodgers, Moundville water company, telephone conversation with Sheri Panabaker, NUS Corporation, January 15, 1991. Subject: Surface water intakes.

24. Sydney S. DeJarnette and Jo E. Crownover, Geohydrology and Susceptibility of Major Aquifers to Surface Contamination in Alabama; Area 6, U.S. Geological Survey Water Resources Investigation Report 87-4113 (Tuscaloosa, Alabama: Alabama Department of Environmental Management, 1987).

25. CH2M Hill, Hydrogeologic Assessment, Lawter International, Southern Resins Plant, Moundville, Alabama (April 1985).

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

REFERENCE NO. 4

"Rite in the Rain" - A unique All-Weat. Writing Paper created to shed water and enhance the written image. It is widely used throughout the world for recording critical field data in all kinds of weather.

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ALL-WEATHER

LEVEL

Notebook No. 311

F4-1768

Southern Resins Division Lawter Chem.
F4-8910-70
Moundville, Tuscaloosa County, Al
SAMUEL McIVER

LOGBOOK REQUIREMENTS
REVISED - NOVEMBER 29, 1988

NOTE: ALL LANGUAGE SHOULD BE FACTUAL AND OBJECTIVE

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

1

I have read and understand the phase I of the Work Plan for this facility.

10/25/89 Samuel McIver
Samuel McIver

10/25/89 Kenneth D. Sanders
Kenneth D. Sanders

10/25/89 Martin Wilkerson
Martin Wilkerson

003301

10/25/89 2

1455 Arrival on Cracker Rd Sunny About 75°F and Hot with Blue skies

1500 The plant is in operation and the facility is excessible because their are no fences or any restraints.

1510 Cracker Rd. is the only way in a out of the facility. The Building has several sections

Samuel McGee

10/25/89 Section 3

1520 The facility has a railroad track that runs to the warehouse that looks as though it is made of tin and it has rust spots on the roof and sides.

1525 The plant has ditches that runs along the left side and across the front of the facility. The plant is surrounded with woods on the left rear and right sides.

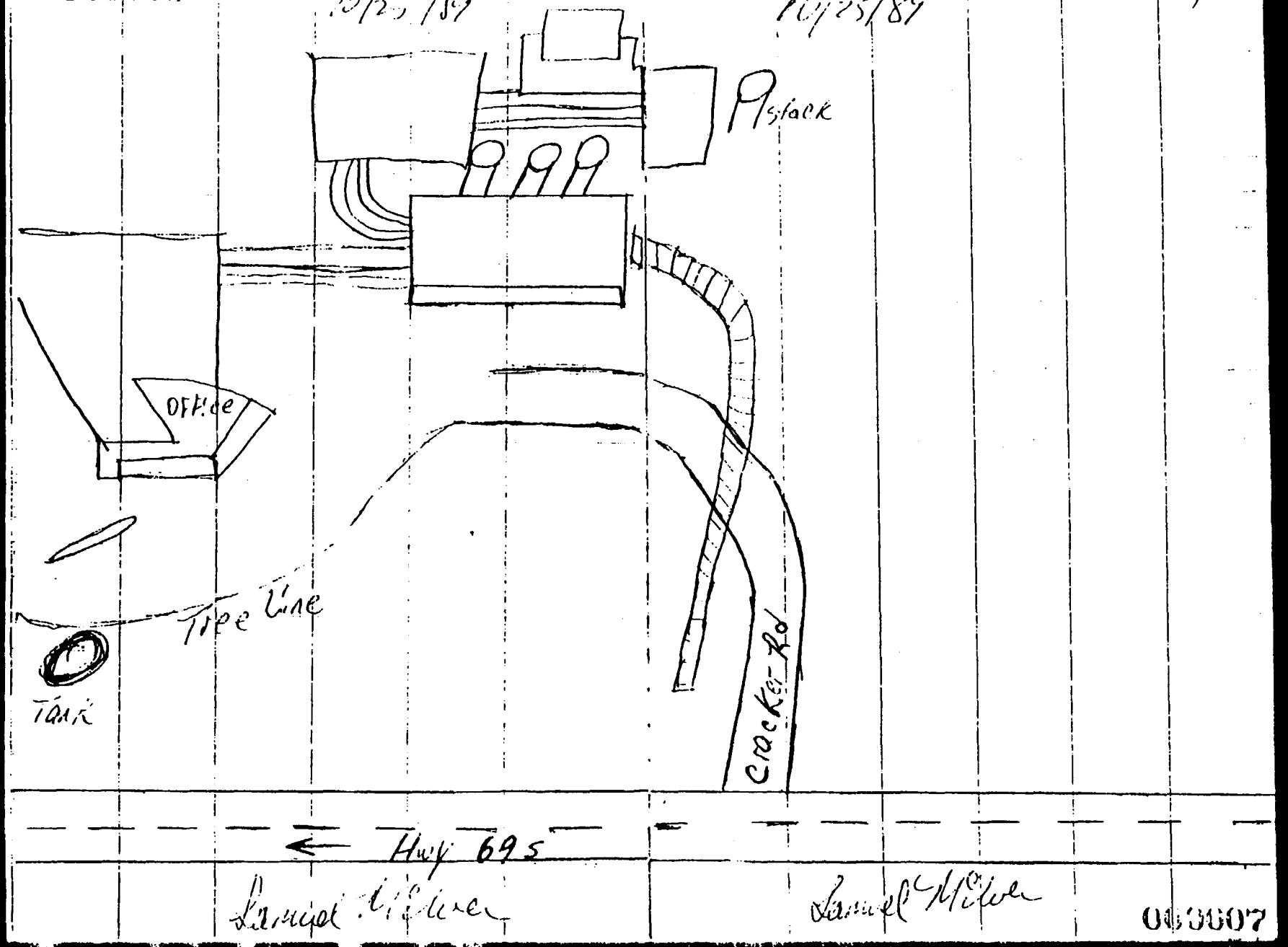
Samuel McGee

1530 The facility also has a guard booth but it doesn't look as though it's being used.

1530 There is a Company called B+W Heads, the Company produces Tanks Heads for metal Tanks and Dome Tops.

1530 The Land in the site vicinity is used for both industrial and residential purposes.

Samuel McLean



10/25/89
6
10/25/89
7
stack
Office
Tree Line
Tank
Cracker Rd
Hwy 69 S
Samuel McIver
Samuel McIver

8

This paper was reassigned to me on November 8, 1989

[illegible]
Matthew McCoy

9

I have read and understand the [illegible] plan for this [illegible]

[illegible]
11-16-89
Matthew J McCoy

10

11-16-81 [illegible]

1000 EST Arrive at Mountville Water Dept.

Met with Mr. Rodgers of Mountville and Mr. Rhodes of Hale County Water System

I was given a Map of Hale Co System
Hale Co buys water from Greensboro, for southern half of Co. and Mountville, for northern half of Co.

Greensboro Supply - 1351 Connections
Mountville Supply - 844 Connections

not required to [illegible] system

11

11-16-81 [illegible]

Mountville Water System

Source: 2 wells on Hwy 44
Cartwell 244 ft. deep
300 gpm yield
2 tanks 150,000 gals each

909 Connections
Most hook up if water available - no wells in city limits
Does not know of any private wells in Area
Area water lines on Map of Mountville

1100 EST [illegible] Mountville Water Dept.

000012

11-16-89 [illegible]

1115 CST Arrive at Southern Resign Division

Verify location on Topo Map.

Plant is not fenced
offset from Road 400 feet
Guard House at front unattended
Drainage looks like it
falls to Back of Property

1150 CST Left plant area

Drive Vicinity for nearest
private well

Nearest Resident is Next to
plant Entrance Road
See Topo - Houses on City water
noted Hose [illegible] in Yard
Site is in Tuscaloosa Co.

11-16-89 [illegible]

B&W Heels is Adjacent
Manufacturing Plant with
hundreds of Drums on Long
Dock
Large storage tanks in Back
of Drum Area

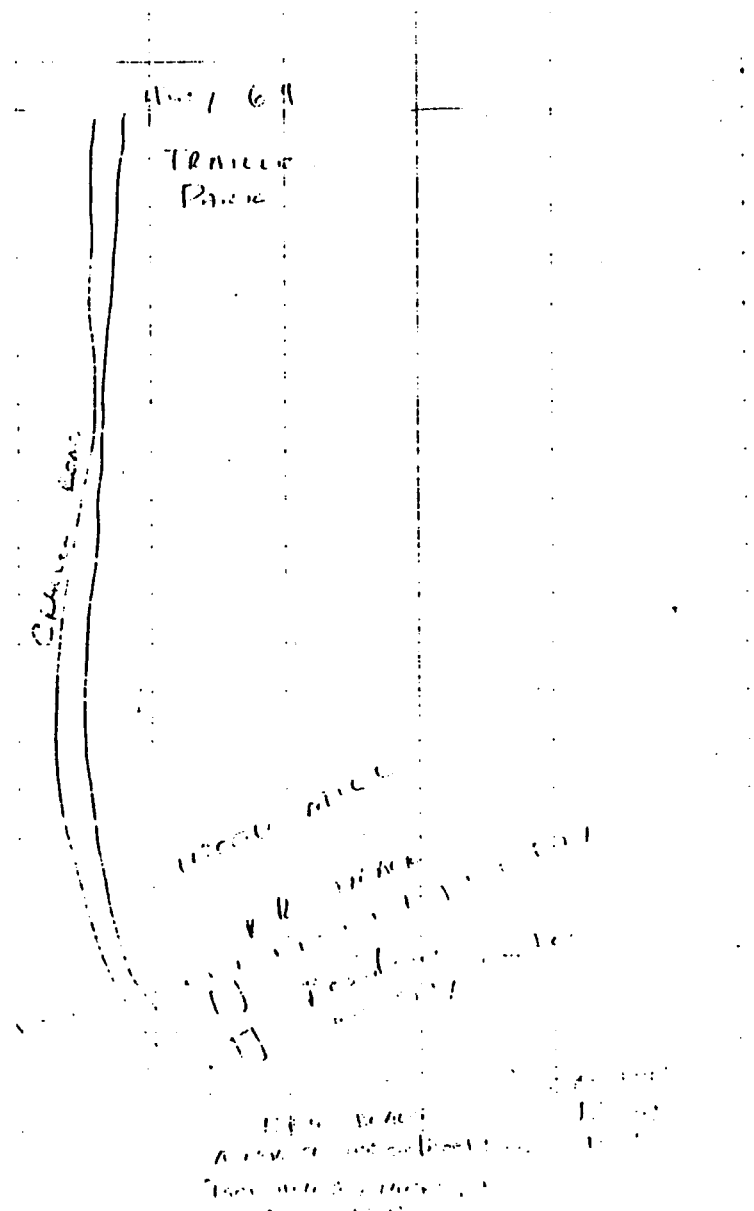
No wells sited within
4 miles of Site

1245 CST Arrive at Ingersoll
Houses water System
met with James
Crocker
given map of system

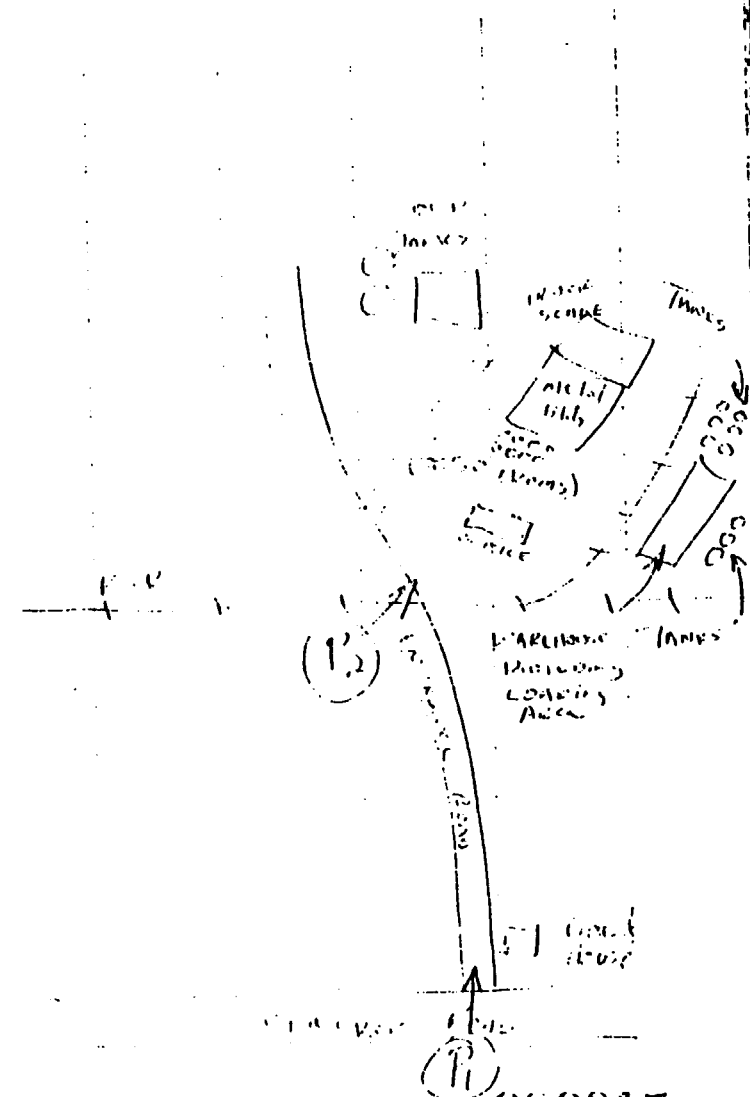
Maybe 2 or 3 Doesn't know of too many Private wells
Buy water from City of
Tuscaloosa who gets water from
Surface water Intake at Lake
Tuscaloosa
Serve # 169 to Hwy 95
646 Connections
Not required to hook up

000013

11-10-69



11-10-69



REFERENCE NO. 5

"Rite in the Rain"®

ALL-WEATHER

LEVEL

Notebook No. 311

F4-2683

Southern Resin Division
Moundville, Tuscaloosa Cty, AL
TDD No: F4-9011-22
Proj. Man.: Sheri Panabaker

Duplicate

LOGBOOK REQUIREMENTS
REVISED - NOVEMBER 30, 1988

NOTE: ALL LANGUAGE SHOULD BE FACTUAL AND OBJECTIVE

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

12/X/90

All entries into this logbook will be made by myself, Sheri Panabaker, Project Manager. Each page will be signed and dated. Any and all corrections will be properly intialed (SP).

Signature: Sheri Panabaker

All notes and observations made during this investigation will be included in this logbook.

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

Health & Safety Plan, Study Plan + Work Plan.

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

Sheri Panabaker

12/10/90 2

Sheri Panabaker She Pa
Carter Helm Carter Helm
Ken Sanders Ken Sanders
Mark Hitchcock Mark A Hitchcock

1900 leave for Moundville, AL

1200 Arrive in Tuscaloosa

1400 S. Panabaker & Carter Helm arrived at southern Resin Division and met w/ Terry Sheehan + Rick Hansen of Lawter Int & South Resin, respectively, and Ken Bittner of South Resin. Both Terry and Ken gave us a tour of the plant and I picked sampling locations & the area to be used as the clean zone

Sheri Pa

12/10/90

There are drums of waste to be burned all over the plant area.

1420 Two resin plants; use rosin to make rosin based resins used in paints, inks primarily & some adhesives

Other plant produces resins derived from hydrocarbons from petrochemical comp. Both presently active wastes: dust which is put in drums & recycled.

Other drums used to store offspec materials, filter bags (cloth bags used to filter product) and lime filter cakes. Product (liquid) goes through powder & moist lime put in incinerator

Sheri Pand

12/10/90 4

filter cake used to be put into waste pile & stored until incinerator put on line in June & July 1990. Approved by ADEM in June

(ADEM) George Sullivan - Incinerator (air)
Fred Mason - GW

Jack Honeycutt
Frank North
Ron Gore
Bernard Cox

Been in operation for a year prior to June to get bugs out. temp. permits

Above drums have resin waste in them and filter cake

hydrocarbon plant continuous process
other plant - batch process

operations began in 1966

Sheri Pa

12/10/90 5

The main used pond has a concrete pad beneath it where dirt to be burned is placed on top.

top of property by MW-8, overlooks Black Warrior River about 50-60 feet above the river. There are 3 guys fishing in the river.

Used to be a varnish plant until early 70's or so. when Lawter bought the plant made resins as well as varnish

In the future, equipment not used will be removed.

Sheri Pa

12/10/90 6

Directly east of plant used to be an asphalt plant

Around 1985 two of the ponds were tested by ADEM & then the water was let out.

Prior to 1977 used to use soda ash & ~~[illegible]~~ water then changed to lime

put discharge water into the old surface impound until WWTP built in 1/80. then water treated & changed to creek.

resin comes out acidic so send liquid resin

[illegible] Paul

12/10/90

through lime to a pH of ≈ 8. Lime sup ~~[illegible]~~ is then filter out using plates & then blown w/ nitrogen to dry out. Lime filter cake contains a little resin, and solvents and a little diatomous earth

buy streams and use what's capable of being polormerized, make product (solid hard resin) then what's not capable of being polormerized (called plant solvent) is sold to other places.

City supplies water for the plant. The ~~[illegible]~~ water well was used for process water for a short period of time

[illegible] Paul

12/10/90

Terrance Sheehan declined split samples and said purged water is dumped onto the ground from the monitoring wells by their consultants, Tuscaloosa Testing.

Not all the monitoring wells are grouted. They are all 2" PVC w/ 10-foot screens. All the well are inside protective steel casing & locked.

Mr. Sheehan has given me well data for all 11 monit. wells for the last two quarters & a report on a study of whats emmitted from the air stack of the incinerator and a list of haz. materials used per SARA Title III, 5311.

Shei Pan

12/11/90

Sunny, high mid-60s

0800 meeting in parking lot and pulling the trip blank

Station # SR-TB-01 and icing it down to 4°C.

The case number for this study is and the project number for this study is.

0900 arrived on site and met w/ Terrance Sheehan of Lawter International and Rick Hansen and Ken Bittner of Southern Resin Div. and J. P. Martin and James Adams of CH2M Hill. They have decided to split

Shei Pand

12/11/90

samples, though not all the ones we will be collecting. we discussed sampling locations.

0930 Finished meeting the others and are heading for the area to be used as the clean area and background samples. setting up hotline, decon area, and paperwork area

1000 calibrating HNU # 81632

Sherri Paul

12/11/90

After study the monit. well data & after looking over the site & based on additional info mentioned by Mr. Sleeman & recorded in the logbog yesterday, I have decided to add some additional samples. MW #7 of their plant numbering cannot be sampled, this corresponds to NUS/EPA sampling location SR-MW-02. Instead I will sample wells 10, 11, & 12 of their #'ing system. & renumber our locations accordingly. Also SR-SB-03 will not be collected since there is a concrete pad under the soil in the old lagoon.

Sheri Paul

12/11/90 12

the facility is not surrounded by a fence, though the Black Warrior River borders the west side of the property. Site access is easy. They are going to split all of the samples, soil and water both.

1100 James Adams has now provided us with jars to split sample and were beginning to start collecting the samples for background SR-SS-01 & SR-SB-01.

Sheri Pand

12/11/90 13

1105 collecting SR-SS-01 from ≈ 5-6 inches bls soil is dryish + med. dk brown w/reddish tinge sand w/ some clay. collected from the northernmost portion of developed property (unwooded) upgradient. samplers: C. Helm + K. Sanders splitting the sample w/ the Lawter Intrional personnel. see field sheets for specific info.

HNu-Clyp

Sheri Pand

12/11/90

1125 collecting subsurface soil sample SR-SB-01
HNU <1ppm = 4 ft bls, reddish dry sand w/ clay
Samplers: C. Helm + K. Sanders
HNU <1ppm

1150 J.P. Martin, Ken B, + T. Sheehan arrived at clean area we're preparing to go to a surface impoundment + waste pile area

1210 collecting surface soil sample SR-SV-02 from previous location of
HNU <1ppm waste pile used to store lime filter cake. The entire area is covered in drums on

Stei Paul

12/11/90

pallets filled w/ lime filter cake. Only accessible area is east of the drums.
collecting sample 2-3" bls reddish sand w/ some clay. Samplers: C. Helm + K. Sanders HNU <1ppm
One drum that's open is full of resin, soft + sticky
drums are in various stages of deterioration + are rusty + not all are sealed shut well

HNU <1ppm
1240 collecting subsurface soil sample SR-SB-02, 4' bls
HNU <1ppm clay primarily w/ some sand, gray and rebel color.

Stei Paul

12/11/90

Samplers: C. Helm, K. Sanders

1300 collecting surface soil sample (SR-SS-03) from the main storage pond (surface impoundment) in which the soil is presently being sent through the onsite incinerator. This sample is collected from soil that's been incinerated & which is being put back onto the ground in areas that don't have a concrete pad.

Samplers: C. Helm, K. Sanders

sample collected from 3"-4" down in pile

HNU < 1ppm

Sheri Paul

12/11/90

1310 collecting surface soil sample for SR-SS-04 from same surf. imp. & SR-SS-03, but soil has not been incinerated yet. sample taken from 3"-4" below surface down in pile. samplers K. Sanders, C. Helm

HNU < 1ppm

1330 ALL NUS personnel left site for lunch

1430 Arrived back on site from lunch preparing to take further samples

Sheri Paul

12/11/90

1500 Called about adding extra samples, found out there is no lab space at the CLP lab & the ESD lab is closed for the week so can't add any samples. I am changing the sample locations. No subsurface soil samples will be collected since the primary concern is the surface water runoff pathway, i.e. we will add some of the surface water and sediment samples requested by ESD & remove the subsurface soils. Also depth to groundwater ranges from about 28 to 40 ft bls & subsurface soils could not be obtained from the saturated zone anyway.

S. Pal

12/11/90

HNU < 1ppm

1515 Collecting surface soil sample SR-SS-03 (previous SR-SS-03) is being scrapped as well as the previously collected subsurface soil samples. This sample is being collected from an old surface impoundment no longer in use, downgradient from the first surface impoundment sampled. Med brown silty clay, 3" bls. Samples C. Delm & K. Sander. The pond is also adjacent (W)

S. Pal

12/11/90

+ downgradient from active WWTP
+ incinerator is directly east of WWTP.

1600 Collecting surface soil sample SR-SS-05 from previous location of waste pile of lime filter cake, sample it brown to gray soil, very dry, gravel area samples C Helm + K. Sanders. Drums are located all around sample area. sample from 3" bls HNU < 1ppm

Mr. Sheehan of Lawter Intern. has given us permission to dump the purge water from the mont. wells onto the ground as he will write in [illegible] 14 [illegible]

Sheri Pank

12/11/90

IN COLLECTING SAMPLES FROM THE MONITORING WELLS, I PERMIT H.U.S. TO THE DISPOSE OF PURGED WATER ON THE GROUND.

[illegible]

We will purge monitoring wells on 12/12/90, tommorrow.

1630 Begining to clean up site area to go home

Sheri Pank

12/11/90

1700 leaving site for the day

Steve Parker

12/12/90

0615 met ~~to~~ leave for the site and get ice, etc.

0700 Arrived at the site
James Adams of CH2M Hill is here
Sunny, high in the 60s F.

Setting up hotline + determining area

Steve Parker

12/12/90

0900 Collecting ~~sediment +~~ SCP 12/12/90
surface water sample
SR-SW-04 from
downgradient location
on the Black Warrior
River, below where
Cathridge Branch
flows into the river
Samplers: C. Helm, S. Panabaker
HNU <1ppm

0910 Collecting sediment sample
SR-SW-04 from
same location as
SR-SW-04, med. brown
sand. Samplers:
C. Helm & S. Panabaker

Shei Pan

12/12/90

After collecting the past
two samples, the CH2M
Hill representative had to
go get more jars for
the remaining two
surface water & sediment
samples.

1015 Collecting surface water
SR-SW-03 from
Cathridge Branch Creek
near where it flows
into the Black Warrior
River & ~~below~~ where
surface water runoff
from various areas of
the plant come into
the creek. Samplers C. Helm
& S. Panabaker. HNU <1ppm

Shei Pan

12/12/90

I've decided to not take the upgradient surface water sample from the Black Warrior River since I'll have one upgradient on Cathridge creek. Surface water runoff flow south to cathridge Branch creek. Water from the last pond of the WWTP that's discharge to the creek (they have an NPDES permit) is very cloudy so we are taking a sample here instead of upgradient of the Black Warrior

1030 collecting sediment sample SR-SD-03 from same place as SR-SW-03, med brown sand samples C. Helm & S. Pand

Shei Pand

12/12/90

1100 collecting surface water sample SR-SW-02 from intersection of drainage creek from WWTP & cathridge Branch, water is white cloudy. Samples: C. Helm & S. Pandu

HNU < 1ppm

1100 collecting sediment sample SR-SD-02 from same location as SR-SW-02. med brown sand w/ pepples

Shei Pand

12/12/90

1210 Collecting surface water sample SR-SW-01 from an up gradient location on Cathridge Branch Creek. Samplers: C. Helm + S. Park
HNU <1 ppm

1215 collecting sediment sample SR-SD-01 from same location as SR-SW-01. Samplers C. Helm + S. Panabaker

Shi Park

12/12/90

HNU <1 ppm

1320 collecting surface water sample SR-SW-05 from an old sludge pond located south of the waste water treatment plant, called the U-pond. Samplers S. Panabaker & C. Helm. split sample w/ CH2M Hill.

1330 collecting sediment sample SR-SD-05 from same location as SR-SW-05. There is rain on the bottom of the pond, in w/ the sediment sample

Shi Park

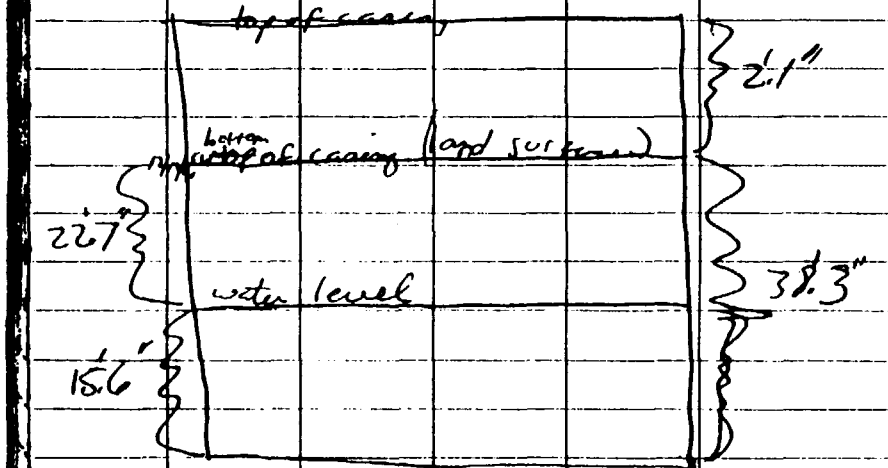
12/12/90

After studying quarterly monitoring well results, I've decided to take samples from 3 upgradient wells, #s 10, 11, 12 since they show the most contamination.

1415 Started setting up monitoring well SR-MW-03

Reading of HNu < 1 ppm
casing is 2" PVC

Measuring water depth & well depth



Sher Parker

12/12/90

1 volume = 0.163 for 2" diam. well
3 volumes = 3 x 0.163 = 0.49

∴ 15.6' x 0.49 = 7.6 gallons

∴ purge 7.6 gallons

∴ Since 4 bailers = 1 gallon
x 7.5
30 bailers

HNu < 1 ppm

1430 Started purging well
Purging by Ken Sanders & C. Helm

1445 rope broke & bailer fell down well

I am going to get treble hooks & fishing line
Ken S. & C. Helm are setting up at SR-MW-04

Sher Parker

12/12/90

1510 back on site w/ hooks & line
I am watching the samples.
M. Hitchcock decomed the
hook & line & is attempting
to get the bailer out.

1530 bailer is out of well
& Mark is back w/ samples

12/12/90 #5 Ken Sander has measured water
depth & well depth in
SR-MW-04. HNu <1ppm

Mark H. locked samples in truck
& has come back over to
help sample

HNu <1ppm

1550 Mark H. is purging
SR-MW-03, he is purging
30 bailers full of water

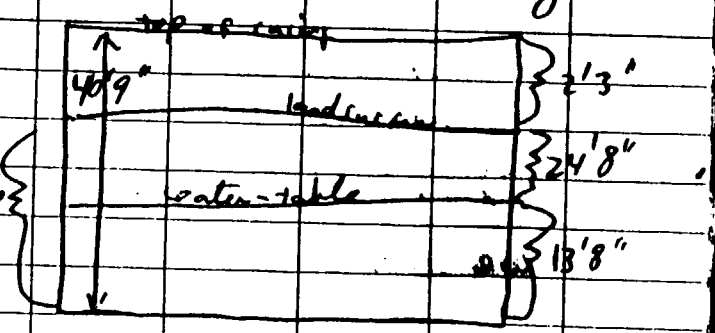
Shai Paul

12/12/90

#1 12/12/90

1615 Mark H is collecting
groundwater sample
SR-MW-03 (well # 10
according to Southern Resin thing).

1630 C. Helm is purging monitoring
well SR-MW-05 (# 12 accord.
to Southern Resin thing).



Shai Paul

12/12/90

Therefore: 1 vol = 0.163
3 vol = 0.49

∴ 13'8" x 0.49 = 6.7 gallon

4 bails = 1 gallon
x 6.7
27 bails

1650 Started collecting SR-MW-05

1720 finished collecting SR-MW-05
started to clean up
equipment & pack up

We split all samples
w/ Southern Resins and
turned the samples over
to James Adams of CH2M Hill

Sheri Panabe

12/12/90

1800 leaving site

Sheri Panabe

"Rite in the Rain"®

ALL-WEATHER

LEVEL

Notebook No. 311

F4-2684

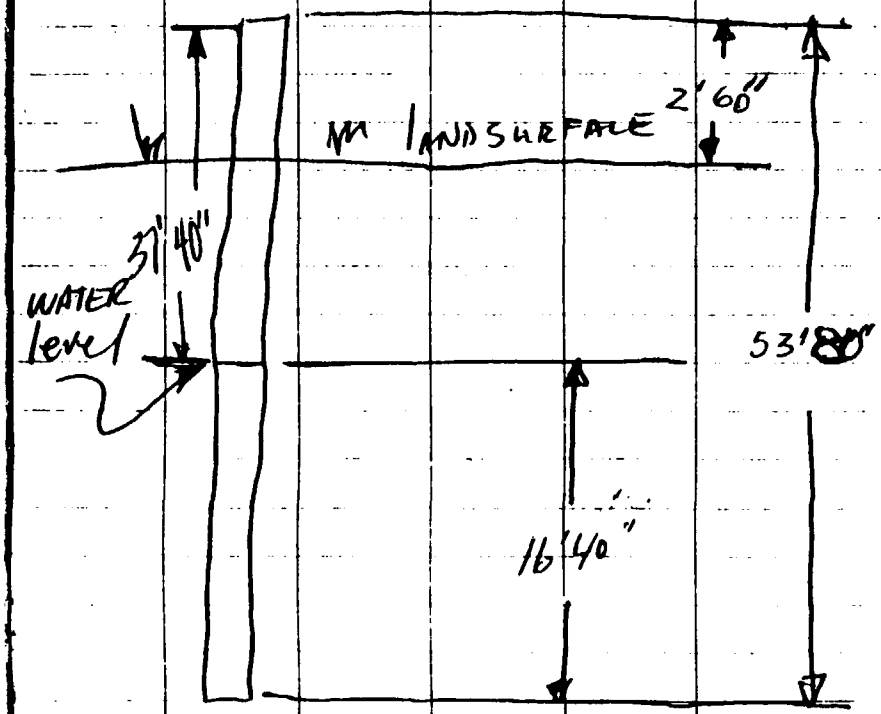
Southern Resin Division
Moundville, Tuscaloosa Cty, AL
TDD No.: F4-9011-22
Proj. Mgr.: Sheri Panabaker

This logbook is an extension of logbook FY- and is issued to Mark Hitchcock.
Sheri Panabaker

~~0800~~ Weather: Clear, foggy, 33°F

0745 STARTED SETTING UP BACKGROUND monitoring well SR-MW-01
EPA 192273

0800 took HNU Reading, From Breathing zone read 0 looking reading from casing read 0. casing is 2" PVC.



Mark A Hitchcock

0810 Started MEASURING water depth in casing.

1 volume = 0.163
3 volume = 0.49

16'4 x 0.49 = 8.036

purge 8 gallons

0835 started Purging

4 bailes = 1 gallon
x 8
32 bailes

0920 Finished purging well #8 (SR-MW#01) at 8 gallons.

0930 taking sample SR-MW-01, also taking extra volume for Matrix Duplicate
Samples M. Hitchcock & K. Sanders

Mark A Hitchcock

6

1000 FINISHED SAMPLING SP-MW-01

Mark Hitchcock

Shi Par

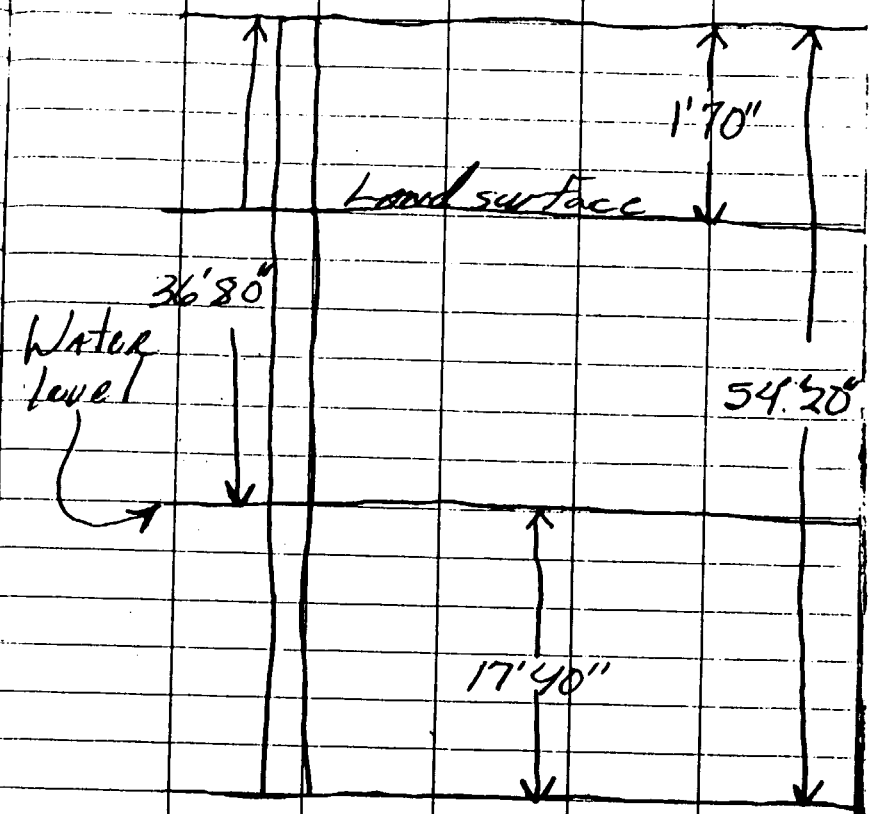
7

MONITORING WELLS & Surface Water

NO.	Purge Volume	total Depth	water Depth	total water	CASING SIZE	time TAKEN	DATE 1990	PH	COND	TEMP	COMMENTS
MW-01	8 gal 32 bale	53'8"	37'4"	16'4"	2" PVC	0930	12-12	4.22	X10 10.88	19°C 66°F	MATRIX DUPLICATE
MW-02	8 gal 32 bales	54'20"	36'8"	17'4"	2.0" PVC	1305	12-12	4.98	X10 19.11	20°C	
MW-03	7.6 gal 30 bales	40'4"	~~26'8"~~ 24'8"	15'6"	2.0" PVC	1615	12-12	5.09	X100 2.04	18°C	
MW-04	6 gal 24 bales	41'00"	28.5"	12'7"	2.0" PVC	1530	12-12	5.02	X100 5.17	17°C	
MW-05	6.7 gal 27 bales	~~40'4~~ 40'9"	~~25'8~~ 26'11"	~~15'6~~ 13'8"	2.0" PVC	1650	12-12	5.04	X100 10.47	18°C	
SW-01						~~0900~~ 1210	12-12	5.93	7.47 X10	19°C	
SW-02						1050	12-12	7.2	4.53 X100	21°C	
SW-03						1015	12-12	6.42	X10 8.04	22°C	
SW-04						0900	12-12	6.71	X100 3.37	15°C	
SW-05						1320	12-12	6.30	X100 3.42	20°C	

12/12/90

Logbook is now transfered to Ken Sanders.
Steve Panabaker



11:50 Started setting up Monitoring well SR-MW-02
EPA 192273-HNU

11:55 Took HNU reading from breathing zone, reading of 0. From casing to ground surface is ~~[illegible]~~ KDS 1" PVC. KDS

Kenneth Sanders

12:00 Started measuring water depth in casing.

1 volume = 0.163
3 volume = 0.49

17'4 x 0.49 = 8.526

Kenneth Sanders

Purge 8 gallons

12:15 Started purging

4 bails = 1 gallon
x8
32 bails

13:05 Started taking sample SR-MW-02 and also taking split samples CHM2Hill from WELL #3.

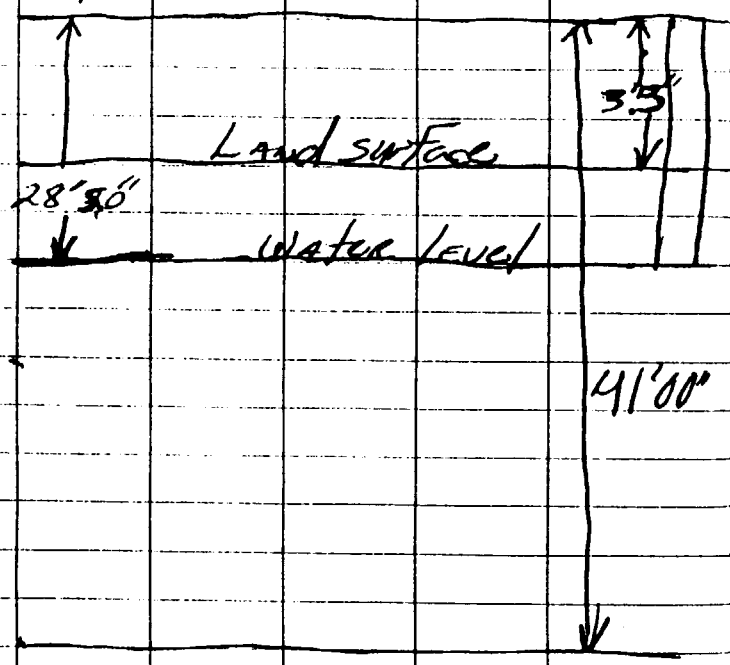
13:40 Finished sampling SR MW-02

Kenneth Sanders

Kenneth Sanders

1456 Started setting up for monitoring well SR-MW-04
EPA 192273

1458 Took HNU reading from breathing zone, reading 0.
Took reading from casing - reading 0. Casing is 3'3" in depth.



Kenneth Sanders

1505 Finished measuring depths concerning casing.

1 volume = 0.163
3 volumes = 0.49

12.7 x 0.49 = 6.223
Purge 6 gallons

15:10 Started purging
4 bails = 1 gallons
x 6
24 bails

15:30 Started taking sample SR MW-04 and also split sample for CH2M Hill from well # 11

Kenneth Sanders

36

12/11/70

12/11/70

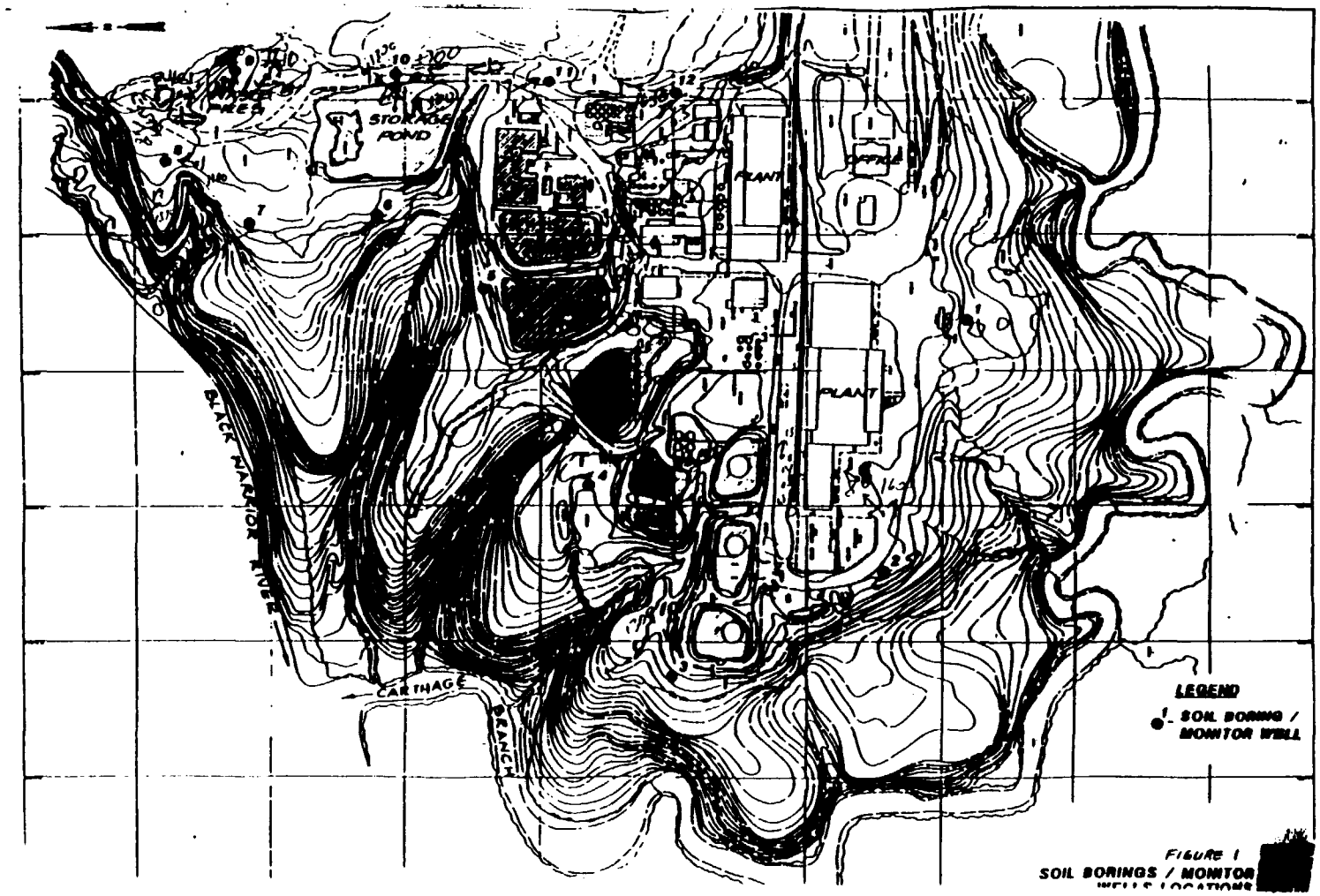


FIGURE 1
SOIL BORINGS / MONITOR WELLS LOCATIONS

37

REFERENCE NO. 6

ENVIRONMENTAL MANAGEMENT

January 17, 1980

MEMORANDUM

TO: Ron Gore

FROM: George Sullivan and Ronnie Watkins

SUBJECT: Inspection of Southern Resins (Lawter Chemical)

An unannounced inspection of the above facility, located in Mountville, was performed by Ronnie Watkins and George Sullivan on January 11, 1981. Walter Allen, plant manager, discussed the processes in detail with us and then conducted a tour of the facility.

The Synthetic Resins Plant manufactures three types of products: tall oil rosin ester resins, ketone resins, and polyamide resins. Eighty percent of the products manufactured are tall oil resins, with the other two resins 10% each. The tall oil resins are made by mixing tall oil rosin, Cellusolve (a glycerol), formaldehyde and dodecylphenol in a reactor which is heated indirectly by steam under a nitrogen blanket. There are two reactors, No. 3 and No. 4, which make the tall oil resin only and one, No. 1, which makes all three synthetic resins. There is also one, No. 2, reactor which makes the ketone and polyamide resins only. The ketone resin is made by mixing cyclohexanone and formaldehyde in the presence of a sodium hydroxide catalyst. This reaction is exothermic and is controlled by water in cooling coils. When the resin is formed, water is added to cool the resin and to remove the excess caustic. The caustic and water form an aqueous layer and is removed. Then the resin is heated to remove the excess water. It is then loaded into pans and allowed to set. Once set, it is crushed and bagged. The polyamide resin is made by reacting dimer acid with ethylene diamine under heat. The product is dropped on a conveyor belt, dried, flaked, and then bagged.

The emissions sources from the synthetic resins plant are the reactors and the crushers. Three reactors each have a knock-out tank and a scrubber. The other reactor has only a scrubber. All scrubbers are vented to a packed tower. The crushers and baggers are vented to baghouses.

All four reactors were operating during our inspection. Three of the reactors were producing tall oil resins and one was making the ketone resin. One of the reactors was being charged and it was evident that there was a negative pressure inside the reactor by the fact that no fumes were coming from the reactor through the charging door. The only other exit for the gases is an emergency release vent. This vent will only open if the pressure increases enough to break the metal diaphragm in the line.

Following the vent lines, the reactors vent downstairs to the control equipment. The area around the control equipment was very messy. Mr. Allen said they had just cleaned the packing in the packed bed scrubbe and the resin on the floor was from this. They clean the floor after cleaning the scrubber. All water from this plant goes to the wastewat treatment plant.

One problem with the packed bed scrubber was that there was no way telling if the water was on or off, except by looking at the steam comi out the stack. Mr. Allen said that there was once a sight glass by whi you could see if water was going to the scrubber, but it had been broke He said that another one could be installed. Other than the general messiness around the scrubbers, this was the only problem noted.

The baghouse which controls the emissions from the two crushers was not operating when first inspected. Mr. Allen had it turned on, but visible emissions of 30-40% were seen coming from it. Mr. Allen said the he thought the baghouse had a bad solenoid which was the reason it was turned off. The Torit dust collector for the baggers was operating and no emissions were seen; however, the baggers were not operating. There were fugitive emissions coming from a hopper inside the building due to the lid not being properly secured. There were also fugitive emissions at the crusher inside the building when the baghouse was turned off.

The storage tanks for the synthetic resins plant were also inspected. All tanks had conservation vents except the phenol tank. These vents only open under a pressure of 5" of water. A tall oil resin odor could be smelled but it was not unpleasant. Some of the lids were not down all the way, which, according to Mr. Allen, was due to an inventory done recently.

Next, Mr. Allen explained the "hydrocarbon" resins process as we walked through the process. "Heartcut" or "CRO" reacts with itself in the presence of a catalyst, boron trifluoride (BF3). After the exothermic reaction proceeds for approximately two hours, the material is pumped from the reactor to a neutralizing tank where quicklime is added to neutralize the BF3. The mixture is then filtered to remove the solids, which are disposed of at the rear of the plant property, and the filtrate is sent to storage. The filtrate then goes to the stripper where steam is sparged through the liquid to separate the by-product solvent from the product resin. The solvent is decanted from the condensed steam and sold. The water layer, which is slightly acidic, is sent to the wastewater treatment system. The product resin is stored in a heated tank before being sent to the flaker, where the hot resin is spread on a continuous water cooled metal belt to cool and solidify. The solid resin is crushed and stored for bagging.

There are two "hydrocarbon" resins process lines, one batch and one continuous. The process is the same in each process but some of the equipment is different. There are two batch reactors which vent to the atmosphere. White emissions were noted from one of the reactors. No strong odor was noted due to these emissions. The BF3 is introduced into the process from a mobile bank of pressurized tanks. Quicklime, which is

used to neutralize the BF3, is received in bulk by truck and blown into a storage silo. Emissions from the storage silo are controlled by a baghouse. The filter cake from the filtration step is being temporarily stored in a three sided structure at the rear of the process area. No odor was detected near the storage pile. This material used to be taken to a local landfill. Recently, Jack Honeycutt with the Land Division, informed Lawter that this material may have to be classified as hazardous because it contains some of the by-product solvent, which has a boiling point less than 140°F. Therefore, the material is being stored at the back of the plant property near the river until the problem can be resolved. No strong odor or emissions were noted from any of the storage tanks. However, there was evidence of leakage from pumps and piping in the storage tanks' dikes. The only other piece of air pollution control equipment is a baghouse in the product packaging area. No emissions were noted in the exhaust of this baghouse nor were fugitive particulate emissions a problem. Hydrocarbon emissions from the solidifying process are vented to the outside by a forced draft fan. No odor was noted at this point.

The continuous process is different from the batch process from a pollution standpoint in that the reactor and filter are enclosed. Another difference is that sometimes, approximately once per month, an acidic compound, e.g. maleic anhydride, is added to the product storage tanks in order to produce a product specifically for certain customers. This results in a disagreeable odor, according to Mr. Allen. The emissions are vented by natural draft through a tall stack next to the tanks. The baghouse for the flaker packaging area was observed, and no emissions were noted. No strong odors were noted in the processing area. However, there was evidence of leakage from pumps and piping in this area also.

Before leaving the plant, we discussed the problems noted during the inspection. The problems noted were:

(1) visible emissions from the baghouse for the synthetic resins plant crushers,

(2) replacement of the sight glass on the packed tower scrubber for the synthetic resins plant, and

(3) spillage under the tanks in the tank farms and under the hydrocarbon resins reactors which could cause an odor problem.

Mr. Allen stated that the first two problems would be taken care of as soon as possible. He did not comment on the third problem.

Recommendation

We recommended that Southern Resins be notified of the above problems and required to correct them.

/sd
cc: Freda Griffis, Land Division
J. P. Martin, Water Division

REFERENCE NO. 7

ADEM

ALABAMA
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Mailing Address:
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Field Offices

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nit 806, Building 8
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rmingham, AL
209
5 942-6168

58 Midmost Drive
bile, AL
609
5 343-7841

August 16, 1984

MEMORANDUM

TO: BUDDY COX BZC

THROUGH: JIM NEAL Jim

FROM: DAVID HAGAN

RE: Southern Resins, Moundville, Alabama

On July 18, 1984, the writer, accompanied by Mssrs. Fred Mason and Ashley Chadwick, visited the above referenced facility. The primary purpose of the visit was for Mr. Mason to evaluate a site on Southern Resins' property for suitability as a landfill for non-hazardous wastes generated by the facility. The writer accompanied Mr. Mason, at his suggestion, in order to determine whether a waste pile at the plant containing a solvent saturated lime cake (which has been designated a hazardous waste) is being managed properly. Mr. Mason also wanted someone from the Hazardous Waste Section to see the proposed landfill site.

We met with Mr. Mark Sharp, plant engineer, who gave us a tour of the waste management facilities at Southern Resins. These facilities consist of the hazardous waste pile, a wastewater treatment system that discharges under NPDES, a waste pile accumulating the solid waste generated by the plant, and an old surface impoundment not part of their present wastewater treatment system.

The hazardous waste pile consists of about 100 cubic yds (?) of material contained in a concrete structure with three (3) sides and an impermeable base. The open end is designed to allow a front end loader to have easy access to the interior of the containment structure. There is no roof or other covering over the waste pile. Solvent is leaching out of the lime cake and escaping containment through cracks in the walls and through the open end of the structure. A significant amount of solvent has collected in pools on the ground in the immediate vicinity of the containment structure. There is no barrier to migration of this waste into the subsurface except the natural permeability of the local soils. Mr. Sharp explained that Chemical Waste Management has delayed picking the waste lime cake up because of a disagreement over which EPA hazardous waste number applies to the material. Southern Resins has designated it as D001 but CWM will not accept that designation because the waste is a solid. This is to be a one-time disposal of hazardous waste as the company has developed some sort of solvent recovery system that removes most of the solvent from the lime cake, thereby raising the flash point of the material above 140 degrees Fahrenheit. The recovered solvent is reused in their manufactoring processes and the lime cake is disposed of as a solid waste.

The wastewater treatment system contains a surface inpoundment and it is not clear what wastes are intorduced into this unit. The NPDES discharge is to the Black Warrior River which borders the facility to the west. Parameters monitored for discharged waste water according to Mr. Sharp are TSS, ph, BOD, and COD.

The solid waste accumulation area is near the proposed site for the landfill. It consists of assorted plant trash, resin, and lime cake. However, at least one fifty-five (55) gallon drum of solvent was seen in this area. It was lying on its side and some solvent had spilled onto the ground. There were some additional drums of waste stored near the hazardous waste pile which Mr. Sharp said contained non-hazardous resinous material generated from their manufacturing processes.

The old surface impoundment is the area where Southern Resins would like to put the landfill. This unit currently receives plant runoff and any significant solvent spills. There is little information about what went into the impoundment prior to Southern Resins buying the property. Mr. Sharp said he thought the impoundment may have been there for 25 years. While we were inspecting the site, bubbles of some organic material were continually coming up from the bottom of the lagoon. A trench dug into the ground near the impoundment reached the water table at around 8 ft. and the water at the bottom had an organic film on the surface.

The facility achieved interim status but a complete Part A application was never sent to EPA. On January 16, 1981 the facility was notified by EPA that the Part A would have to be re-submitted and Southern Resins changed it's mind about the necessity of obtaining a RCRA storage permit and withdrew the application. The facility is listed under Lawter Chemicals in the latest EPA computer printout as withdrawn and as a non-handler.

Several issues must be resolved in order to bring Southern Resins into compliance with the Alabama Hazardous Waste Management Regulations.

1). The waste pile should be formally closed as a hazardous waste management unit as soon as possible. The closure plan should address the contamination of the surrounding area resulting from solvent leaching from the containment structure.

2). A comprehensive evaluation of all wastestreams at Southern Resins and their management should be undertaken. The efficiency of the solvent recovery system should be studied closely.

3). The decision on the landfill should await the outcome of an investigation of the old surface impoundment. Mr. Sharp is planning to draw off the water in the impoundment and sample the sludge in the bottom.

4). After point (2.) above has been completed, the appropriate notification should be made to both EPA and the State regarding the facility's current status under RCRA.

DH/sdm

cc: Mr. Jack Honeycutt
Solid Waste

Mr. Fred Mason
UIC

Mr. J.P. Martin
Water Division

File: Southern Resins
Tuscaloosa County
IW

REFERENCE NO. 8

LAWTER INTERNATIONAL
SOUTHERN RESINS DIVISION
MOUNDVILLE, ALABAMA

RESULTS OF 4 APRIL 1985 FILTER CAKE SAMPLING

7 May 1985

CONTENTS

1.0 Introduction
2.0 Sample Collection
3.0 Analytical Program
4.0 Results and Interpretation
5.0 Conclusions
Appendices

1.0 INTRODUCTION

1.1 OBJECTIVES

Limited information is currently available on the constituent make-up of the filter cake produced during manufacture of hydrocarbon resins at Lawter's Moundville, Alabama Southern Resins Division plant. The filter cake's constituent make-up (both qualitative and quantitative) is needed to characterize this material to assess proper handling, storage, transportation, and disposal procedures. Due to the limited information currently available for this material, the primary objective of this sampling event was to collect representative filter cake samples in order to characterize the composition of the filter cake and not to develop a data base for generating statistically defensible constituent concentrations.

1.2 BACKGROUND ON MATERIAL

Filter cake is generated during filtration of hydrocarbon resins produced in the Hydrocarbon Plant Resin Production line (HC Plant). Polymerizable raw materials and boron trifloride (a reaction catalyst) are added at the beginning of the resin production line, blended, and then reacted under heat to form resin. After the proper reaction time, the reaction is stopped (deactivated) by adding lime [$CA(OH)_2$] which reacts with the boron trifloride (BF_3) catalyst forming a calcium difluoride precipitate (CaF_2). The CaF_2 is then filtered out of the resin in two special resin filters. The filter cake generated from these two filters is an off-white granular solid which is free of free flowing liquids.

Currently the filter cake is drummed in DOT drums and shipped offsite weekly to Chemical Waste Management's Emelle, Alabama, facility. The approximate filter cake generation rate is:

- 3 - 3½ Drums Per Resin Filter Batch,
- 3 - 5 Resin Filter Batches Per Day,
- 8 - 10 Drums of Filter Cake Generated Per Day,
- 60 - 70 Drums of Filter Cake Generated Per Week.

1.3 BACKGROUND ON SAMPLE LOCATIONS

The current management practice for this waste stream is to collect the material in drums at the point of generation, which is a blowdown valve on the filters. The drummed waste is then labeled and stored as though a hazardous waste, in order to ensure compliance with all solid waste management requirements.

The past management practice for handling this material onsite was based on its characterization as a solid waste and onsite waste piles were used to store the material pending location of a suitable disposal site.
Currently filter cake is present in three onsite areas, two filter cake stockpiles and a debris pile. One of the stockpiles is a waste pile and one is a stockpile within a three sided, concrete floored bin. Both stockpiles are covered with plastic sheeting. These two stockpiles are known as the Filter Cake Waste Pile and Filter Cake Bin. There is also a Debris Pile onsite in the vicinity of the two filter cake stockpiles. The debris pile is reported to consist of waste resin and general plant trash (pallets, wood, paper resin bags, etc.) and undetermined quantity of filter cake.

2.0 SAMPLE COLLECTION

2.1 DESCRIPTION OF SAMPLES

The following filter cake samples were collected:

Sample A - Fresh Filter Cake: One composite sample of "fresh" filter cake was collected directly from the resin filters during a single resin filter batch. This sample was a composite sample of discrete samples collected at different times during the filter cake blowdown. Discrete samples were saved for possible future testing and analysis.

This sample was collected to represent "worst case" or "most fresh" sample. Changes in the makeup of the filter cake during a filter batch were noted in order to characterize the filter cake variability. By collecting this sample, we avoided the possibility of not characterizing compounds which may volatize during filter cake storage.

Discrete samples were collected by holding sample jars directly beneath the filter blowdown valve allowing the sample to drop directly into the sample jars. Aliquots were then taken from discrete samples and combined to form a single composite sample.

Sample C - Filter Cake Bin*: One composite sample was collected from the Filter Cake Bin stockpile. Samples were collected in a manner which yielded sample aliquots collected from the top, middle, bottom, each side, front, and back of the bin. Discrete samples were also collected and saved for possible future testing and analysis. Samples were collected using a 3½-inch diameter stainless steel auger and a post hole digger (see Sampling Methods Section).

Sample D - Filter Cake Pile*: One composite sample was collected from the Filter Cake Pile. Sampling locations and methods were the same as those described for the Filter Cake Bin composite sample.

Sample E - Debris Pile*: One composite sample was collected from the debris pile. This sample was collected from the areas of the debris pile which appeared to contain filter cake. The purpose of collecting this sample was to determine if filter cake has been added to the debris pile and, if so, to determine the characteristics of the filter cake added to the debris pile.

*Note: The filter cake bin, waste pile, and debris pile were sampled separately to determine if the material in each of these stockpiles were sufficiently different to require separate handling, transportation and disposal.

2.2 SAMPLING METHODS

Due to the unique nature of the filter cake, several different types of sampling methods were tried to find the method which best meets the desired sampling objectives. Sampling methods tried included a waste pile sampler, PVC pipe shelby tube type sampler, trowel or scope, small shovel, post hole digger, and a bucket auger. After attempting each of these methods, a combination of using a bucket auger and post hole digger worked the best to provide representative samples.

3.0 ANALYTICAL PROGRAM

The analytical tests performed on the samples are summarized in Table 1. Note that in addition to the samples described in Section 2, a laboratory composite of the Filter Cake Bin and Filter Cake Pile samples was prepared and a limited number of analyses performed. A description of the analytical tests is presented below.

Analytical Test Description

VOC. Analyze for organic priority pollutant volatile fraction compounds (listed on Table 2) using standardized soil analytical methods (USEPA Method 8240). Any non-priority pollutant volatile compounds that could be positively identified were also reported.

B/N/A. Analyze for semi-volatile organic priority pollutant base/neutral and acid fraction compounds (listed on Tables 3 and 4) using a solvent extraction technique (USEPA Method 2870). Any non-priority pollutant B/N/A fraction compounds that could be positively identified were also reported.

Total Metals. The total sample was subjected to an acid digestion followed by analysis for the following:

Arsenic	Silver
Barium	Manganese
Cadmium	Zinc
Chromium	Chloride
Copper	Iron
Nitrate	Sulfate
Lead	Cyanide
Mercury	Nickel
Selenium	Thallium
Fluoride (EP Tox Metals Only)	

TABLE 1
ANALYTICAL SCHEDULE

Parameter/Analysis*	Sample 5917A Fresh Filter Cake	Sample 5917B Filter Cake Bin	Sample 5917C Filter Cake Pile	Sample 5917D Bin/Pile Composite	Sample 5917E Debris Pile
VOC	X	X	X		X
B/N/A	X	X	X		X
Headspace VOC Screening	X	X	X	X	X
VOC Headspace @ 43°C (110°F)	X				
B/N/A Headspace @ 43°C (110°F)	X	X	X		X
EP TOX B/N/A	X			X	X
Total Metals	X			X	X
EP TOX Metals	X			X	X
Loose/Compact Density	X	X	X	X	X
Percent Weight Lose with Temperature (TGA)	XX	X	X		X
Free Liquid Compaction Test	X	X	X	X	X
Flammability Test	X	X	X	X	X

NOTES: * = See Analytical Schedule section of text for description of analytical tests.
X = Perform analysis on this sample for indicated parameters.
XX = Perform duplicate analysis on this sample for indicated parameters.

TABLE 2.

CH2M HILL

VOLATILE COMPOUNDS

GC/MS Report

Analyst _____

Date of Analysis _____

Client _____ Laboratory No. _____

Sample Description _____

Compounds	MDL[1]	Conc.[2]			
Chloromethane					
Bromomethane					
Vinyl Chloride					
Chloroethane					
Methylene Chloride					
Trichlorofluoromethane					
1,1-Dichloroethene					
1,1-Dichloroethane					
Trans-1,2-Dichloroethene					
Chloroform					
1,2-Dichloropropane					
1,1,1-Trichloroethane					
Carbon Tetrachloride					
Bromodichloromethane					
1,2-Dichloroethane					
Trans-1,3-Dichloropropene					
Trichloroethylene					
Benzene					
Dibromochloromethane					
1,1,2-Trichloroethane					
Cis-1,2-Dichloropropene					
2-Chloroethyl vinyl ether					
Bromoform					
1,1,2,2-Tetrachloroethane					
Tetrachloroethylene					
Toluene					
Chlorobenzene					
Ethyl Benzene					
Acrylonitrile					
Acrolein					
Dichlorodifluoromethane	ND[3]				

[1]MDL = Method Detection Limit

[2]BMDL = Below Method Detection Limit

[3]ND = Not Determined

Comments _____

TABLE 3.

CH2M HILL

BASE/NEUTRAL COMPOUNDS

GC/MS Report

Analyst _____

Date of Analysis _____

Client _____ Laboratory No. _____

Sample Description _____

Compounds	MDL[1]	Conc.[2]	Compounds	MDL[1]	Conc.[2]
Bis (2-chloroethyl) ether			4-Bromophenyl phenyl ether		
1,3-Dichlorobenzene			Hexachlorobenzene		
1,4-Dichlorobenzene			Phenanthrene		
1,2-Dichlorobenzene			Anthracene		
Bis (2-Chloroisopropyl) ether			Dibutyl phthalate		
Hexachloroethane			Fluoranthene		
N-nitroso-di-n-propylamine			Pyrene		
Nitrobenzene			Benzidine		
Isophorone			Butyl benzyl phthalate		
Bis (2-Chloroethoxy) methane			2,3,7,8-Tetrachlorodibenzo-p-dioxin		
1,2,4-Trichlorobenzene			Benzo (a) anthracene		
Naphthalene			Chrysene		
Hexachlorobutadiene			3,3'-Dichlorobenzidine		
Hexachlorocylopentadiene			Bis (2-ethylhexyl) phthalate		
2-Chloronaphthalene			Di-n-octyl phthalate		
Acenaphthylene			Benzo (b) fluoranthene		
Dimethylphthalate			Benzo (k) fluoranthene		
2,6-Dinitrotoluene			Benzo (a) pyrene		
Acenaphthene			Indeno (1,2,3-cd) pyrene		
2,4-Dinitrotoluene			Dibenzo (a,h) anthracene		
Fluorene			Benzo (g,h,i) perylene		
4-Chlorophenyl phenyl ether			N-nitrosodimethylamine	ND[5]	
Diethyl phthalate			Bis (chloromethyl) ether	ND[5]	
N-nitrosodiphenylamine[3]					
1,2-Diphenylhydrazine[4]					

[1]MDL = Method Detection Limit

[2]BMDL = Below Method Detection Limit

[3]Detected as Diphenylamine

[4]Detected as Azobenzene

[5]ND = Not Determined

Comments _____

TABLE F.

CH2M HILL

ACID COMPOUNDS

GC/MS Report

Analyst _____

Date of Analysis _____

Client _____ Laboratory No. _____

Sample Description _____

Compounds	MDL[1]	Conc.[2]			
Phenol					
2-Chlorophenol					
2-Nitrophenol					
2-4-Dimethylphenol					
2-4-Dichlorophenol					
4-Chloro-3-methylphenol					
2,4,6-Trichlorophenol					
2,4-Dinitrophenol					
4-Nitrophenol					
2-Methyl-4,6-dinitrophenol					
Pentachlorophenol					

[1]MDL = Method Detection Limit

[2]BMDL = Below Method Detection Limit

Comments _____

EP TOX Metals. Perform the EP toxicity extraction procedure and then analyze for the metal species listed under total metals.

Flammability Test. Since there is no standard method for determining the flashpoint of a solid, a modified version of a standard liquid flashpoint test was attempted. After several attempts, it became evident that this method would not work. Therefore, a simple check for ignitability was used to estimate flammability. One gram from each sample 5917A through E was exposed to a flame. The samples that ignited were reweighed to determine what portion of the weight remaining. Results and observations were recorded.

Loose/Compact Density. Density determinations were made on samples 5917A-E. A graduated cylinder was filled and gently tapped to aid settling of material. The material's volume was noted and weight determined. The same sample was then hand compacted in the graduated cylinder, and the volume was again recorded.

Free Liquid Compression Test. This test involved subjecting each of samples 5917A-E to incremental pressures between 10 psi and 60 psi. (25 psi is roughly equivalent to the force exerted by a 30 ft. column of high density clay of 120 lbs/ft^3 on the test chambers 4" diameter base.) Only the bin composite sample (5917B) yielded a leachate within this pressure range.

Head Space VOC Screening. Samples 5917A-E were analyzed with an organic vapor analyzer (Foxboro OVA-108, range 1-10,000 ppm as methane). The headspace in each sample container was checked after allowing the sample to reach room temperature.

Headspace @ 43°C (110°F). Analyze for VOA and B/N/A fraction organic compounds that are present in the sample headspace above the sample in a septum sealed container heated to 43°C (110°F).

Percent Weight Lost With Temperature (TGA). Perform a thermal gravimetric analysis (TGA) on the material by constantly monitoring the weight of a sample heated from 0°C to 480°C.

EP TOX B/N/A. Subject the sample to the EP toxicity extraction procedure and then analyze the extract for base/neutral and acid fraction organic compounds.

4.0 RESULTS AND INTERPRETATION

Analytical results are summarized in Tables 5 through 9. Analytical data sheets are included in the Appendix.

4.1 COMPARISON OF RESULTS

The analytical results of metal and inorganic analyses (Table 5) indicate that the Filter Cake does not exhibit the characteristic of EP Toxicity in any of the samples. This result is consistent with the nature of the plant processes where no metallic-based catalysts or materials are currently in use. Based on these facts the filter cake is unlikely to possess the characteristics of EP-Toxicity.

Organic compound analytical results are summarized in Table 6. Concentrations tended to be higher in the fresh filter cake and filter cake bin samples although concentrations tended to be compound specific rather than sample specific.

More significant results can be seen by comparing the EP extract samples with the filter cake material. EP extract sample results indicate that the organic compounds in the filter cake are not likely to partition into the water phase.

Sample headspace analytical results are summarized in Table 7. Initially only volatile fraction compound analysis (Table 1) was planned. However, after analyzing the fresh filter cake (sample 5917A) no volatile fraction compounds were found present in the headspace above the sample at 43°C (110°F). Due to this result, only base/neutral and acid fraction compounds (listed in Tables 3 and 4) were analyzed in the filter cake bin, filter cake pile, and debris pile

Table 5

FILTER CAKE SAMPLE METAL AND INORGANIC RESULTS

Parameter	Sample[1] Fresh Filter Cake (mg/kg)	Sample[1] Bin/Pile Composite (mg/kg)	Sample[1] Debris Pile (mg/kg)	EP Extract Sample[2] Fresh Filter Cake (mg/l)	EP Extract Sample[2] Bin/Pile Composite (mg/l)	EP Extract Sample[2] Debris Pile (mg/l)	EP-Toxicity Test Criteria[3] (mg/l)
Arsenic	<0.5	<0.5	<0.5	<0.01	<0.01	<0.01	5.0
Barium	464	30	40	5.1	0.29	0.36	100.0
Cadmium	<0.2	0.4	<0.2	0.03	0.04	<0.01	1.0
Chromium	1.8	7.0	7.8	<0.01	<0.01	0.05	5.0
Lead	<1.0	<1.0	<1.0	<0.05	<0.05	<0.05	5.0
Mercury	<0.5	<0.5	<0.5	<0.02	<0.02	<0.02	0.2
Selenium	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05	1.0
Silver	<0.5	<0.5	<0.5	<0.01	<.01	<0.01	5.0
Manganese	17	46	18	<0.01	<0.01	<0.01	No Criterion
Copper	1.5	2.6	2.2	<0.02	<0.02	<0.02	No Criterion
Zinc	3.1	11	14	0.16	0.12	0.15	No Criterion
Iron	954	334	426	0.17	<0.02	<0.02	No Criterion
Nickel	0.8	3.0	4.3	<0.05	<0.05	<0.05	No Criterion
Thallium	<5.0	<5.0	<5.0	<0.05	<0.05	<0.05	No Criterion
Nitrate	--	--	--	<0.5	<0.5	<0.5	No Criterion
Chlorine	--	--	--	9.1	99.8	36.3	No Criterion
Sulfate	--	--	--	<5	<5	<5	No Criterion
Cyanide	0.045	0.083	0.040				No Criterion
Fluoride	--	--	--	36	38	48	No Criterion

Notes: [1]Sample refers to material as collected. Results reported in mg/kg (ppm) found in original sample as collected.

[2]EP Extract sample refers to analysis of liquid fraction (water extract) developed using EP-Toxicity extraction procedure. Results reported in mg/l (ppm) found in EP extract.

[3]Concentration above which material is considered to fail the EP-Toxicity test.

--Not analyzed.

jd/MGMEF2/048

Table 6

FILTER CAKE SAMPLE ORGANIC COMPOUND RESULTS[1]

Parameter	Sample[2] Fresh Filter Cake (mg/l)	Filter Cake Bin (ppm)	Filter Cake Pile (ppm)	Debris Pile (ppm)	EP Extract Sample[3] Fresh Filter Cake (ppm)*	Bin/Pile Composite (ppm)*	Debris Pile (ppm)*
Xylene	6,100	6,900	2,000	3,600	1.7	4.1	2.6
Methyl ethyl benzene	23,000	15,000	6,300	12,000	1.6	2.4	1.8
Trimethylbenzene	48,000	19,000	8,200	16,000	4.5	3.5	3.1
2-Methyl styrene	3,700	2,000	890	2,000	0.66	0.77	ND
Dimethyl ethyl benzene	9,200	7,300	1,800	2,000	ND	ND	ND
Dimethyl pyridine	ND	ND	ND	ND	ND	0.67	0.55
Trimethyl pryidine	ND	ND	ND	ND	ND	ND	3.4
Naphthalene	11,000	6,400	4,900	6,200	2.4	2.7	2.4
Dicyclopentadiene	40,000	5,400	4,900	7,400	2.3	0.76	0.82
Toluene	430	580	150	140	NA	NA	NA
Ethyl benzene	130	330	ND	29	NA	NA	NA
1,3-Cyclopentadiene	170	390	80	17	NA	NA	NA
Styrene	990	180	ND	47	NA	NA	NA

Notes: [1]Results are presented only for compounds detected. See Appendix for full range of compounds analyzed for.

[2]Sample refers to material as collected. Results reported in ppm found in original sample as collected.

[3]EP Extract Samples refers to analysis of liquid fraction (water extract) developed using EP-Toxicity extraction protocol.

*Results reported in ppm found in EP extract.

NA - Not analyzed.

ND - Not detected.

jd/MGMEF2/048

Table 7
FILTER CAKE SAMPLE HEADSPACE RESULTS

Compound	Fresh Filter Cake (ug/ml)	Filter Cake Bin (ug/ml)	Filter Cake Pile (ug/ml)	Debris Pile (ug/ml)
Xylene	2.9	2.8	1.2	1.3
Methyl ethyl benzene	2.4	7.6	1.5	1.4
Trimethyl benzene	3.5	8.5	1.8	1.4
2-Methyl styrene	ND	0.8	0.2	ND
Dimethyl ethyl benzene	ND	0.6	0.1	ND
Naphthalene	ND	1.0	0.2	ND
Dicyclopentadiene	3.5	2.6	1.2	0.8
Styrene	3.0	ND	ND	ND

NOTES: Results reported in ug/ml in air in the headspace above the sample at 43°C (110°F).

ND = Not detected.

Table 8
FILTER CAKE SAMPLE PHYSICAL PROPERTIES

Property	Fresh Filter Cake	Filter Cake Bin	Filter Cake Pile	Bin/Pile Composite	Debris Pile
Flammability (1)					
- Lightable	Yes, immediately	Yes, difficult	No	No	No
- Duration	One minute	Ten seconds	--	--	--
- Residue	60%	80%	--	--	--
Desnity, lb/ft^3					
- Loose (2)	34.3	92.4	58.7	97.4	73.0
- Compacted (3)	65.6	--	86.2	109.3	106.1
Compression (4)					
- Leachage volume	None	10 ml (6)	None	None	None
- Pressure	60 psi	15 psi	60 psi	60 psi	60 psi
Headspace Analysis, ppm as methane (5)	800	1,000	400	500	500

NOTES:

[1] One gram of sample was exposed to flame and residue weight measured.

[2] Measured by filling graduated cylinder and gently tapping to aid settling.

[3] Measured by hand compaction in cylinder and recording volume change.

[4] Incremental pressure applied from 10 to 60 psi, to sample of 100-300g.

[5] Headspace in sample container was measured with organic vapor analyzer after sample had reached room temperature.

[6] 300 gram sample used.

jd/MGMEF2/048

Table 9
FILTER CAKE SAMPLE THERMOGRAVIMETRIC ANALYSIS RESULTS

Measurement	Fresh Filter Cake Sample 1	Fresh Filter Cake Sample 2	Filter Cake Bin	Filter Cake Pile	Debris Pile
% Volatiles (0-200°C)	24	24	40	23	34
% Organics (200-500°C)	19	14	9	20	12
% Total Ash	56	50	51	57	54
Total %	99 [a]	88 [a]	100	100	100

[a] Total does not add to 100%, apparently due to spattering of materials. Analyst expects the difference to be considered ash.

headspace samples. Compounds identified in the headspace were found in higher concentration in fresh filter cake and filter cake bin headspace samples than in the filter cake pile and debris pile samples. These results generally agree with what was found for organic compound analysis of the filter cake material.

The results of the physical properties tests are summarized in Table 8. The cake generally does not yield a free liquid under compression, and the cake generally does not support combustion. It was noted by the laboratory analyst that the very small sample (about one gram) resulted in a large surface to volume ratio, not expected under normal handling of the material. Therefore, these results would be expected to represent a worst case analysis. The samples did not exhibit a vigorous ignition.

The results of the thermographic analyses (Table 9) indicate there is no strong correlation between the gross levels of volatile/organic compounds in the sample and the cake age.

4.2 FRESH FILTER CAKE

The results in Tables 5 to 9 indicate that the fresh filter cake has the properties:

Inert (Ash)	50-56%
Volatile Organics	24%
Other Organics	14-19%

The filter cake loose density of about 34 lb/ft^3 is believed due to the sampling with the compacted density of 66 lb/ft^3 more reasonable (this also is close to the density of aged cake). It is significant that the fresh filter cake does not release a free liquid, even under compaction. The flammability test indicated that the fresh filter cake may

support ignition. The lack of volatiles in the headspace analysis indicates the organics that ignite are probably the base/neutral materials (Table 7).

4.3 FILTER CAKE BIN

The results in Tables 5 to 9 indicate the filter cake in the bin has the properties:

Inert (Ash)	51%	
Volatile Organics	40%	(0-200°C)
Other Organics	9%	(200-500°C)

The cake loose density is about 92 lb/ft^3. At 15 psi compression, about 10 ml liquid was leached from approximately 300 g. of sample. Note that this was the only sample where liquid leaching was observed, and that this was a small volume. The sample demonstrated a slight capability to ignite.

4.4 FILTER CAKE PILE

The results in Tables 5 to 9 indicate the filter cake in the bin has the properties:

Inert (Ash)	57%	
Volatile	23%	(0-200°C)
Other Organics	20%	(200-500°C)

The cake loose density is about 59 lb/ft^3, with compaction increasing this to about 86 lb/ft^3. The cake did not yield any liquid under compression and did not ignite.

4.5 DEBRIS PILE

The results in Tables 5 to 9 indicate the filter cake in the debris pile has the properties:

Inert (Ash)	54%	
Volatile	34%	(0-200°C)
Other Organics	12%	(200-500°C)

The cake loose density is about 73 lb/ft^3 with compaction increasing this about 1.06 lb/ft^3. The cake did not yield any liquid under compression and did not ignite.

5.0 CONCLUSIONS

1. The samples collected in this study are considered to be representative of the areas where filter cake may be located, except that the debris pile samples represent only the areas where the filter cake is suspected.

2. The analyses for all samples indicate that there are generally low levels of metals in the filter cake (exception barium and iron). There were no results that exceeded EP Toxicity limits.

3. The organics analyses identified the following compounds in at least one sample:

   Xylene
   Methylethylbenzene
   Trimethylbenzene
   2-Methyl styrene
   Dimethylethylbenzene
   Dimethylpyridine
   Trimethylpyridine
   Naphthalene
   Dicyclopentadiene
   Toluene
   Ethylbenzene
   1,3-Cyclopentadiene
   Styrene

4. None of the samples demonstrated a free liquid. A compression test on the samples indicated a small amount of leachate (about 20 ml for 300 g sample) for the filter bin sample. The other samples did not yield any liquid at a pressure of 60 psi.

5. The filter cake density appears to range from less than 60 lb/ft^3 to almost 110 lb/ft^3. The expected density is 70-90 lb/ft^3.

6. A one gram sample of the fresh filter cake was found to ignite immediately and sustain ignition for about 60 seconds. A one gram sample from the filter cake bin was found to ignite with some difficulty and sustain ignition for about 10 seconds. The other samples did not ignite.

REFERENCE NO. 9

Southern Resin
Lawter International, Inc.
P.O. Box 128
MOUNDVILLE, ALABAMA 35474
Phone 205-371-2235

JUL 1985
RECEIVED
ADEM
LAND DIVISION

July 1, 1985

Mr. Bernard E. Cox, Jr.
Alabama Department of
Environmental Management
1751 Federal Drive
Montgomery, Al. 36130

RE: Filter Cake Removal
Southern Resins, Moundville, Al.

Dear Mr. Cox:

Removal of all lime filter cake and the adjacent debris pile from the Southern Resins site to Chemical Waste's Emelle hazardous waste landfill was completed on June 27, 1985.

During the removal process, examination of the debris pile showed it to contain pockets of contaminated material that had not previously been detected - significantly reducing the amount of uncontaminated material that could be held for separate disposal. The debris was classified as described in Mr. Moccia's letter to you of June 19, 1985 but when we checked the uncontaminated debris collected we decided that the quantity remaining was too small to justify separate disposal and it was shipped to Emelle along with the lime filter cake.

On removing the waste we found that a bed of red and gray mottled clay underlay the whole area where waste had been deposited. The clay appears to be uniform across the site and it is very stiff in texture; thus there should be less concern that solvents may have migrated from the waste downward into the soil.

Con't

File: Gen/So. Resins/Tuscaloosa

The site is now generally bare down to the clay except for a pile of uncontaminated soil extending from its center to the west edge of the area where the waste had been piled. Scrap steel in the area that was outside of the waste pile will be consolidated into one pile before it is removed from the site.

If you have any questions or need additional information regarding the removal of this waste to Emelle please give me a call.

Very truly yours,

F. Gordon Steward

F. Gordon Steward
General Manager

FGS/mj

cc: James A. Campbell
Lawter International, Inc.

David Hagen
A. D. E. M.

Hermann Mueller
Lawter International, Inc.

Richard A. Nordman
Lawter International, Inc.

David M. Moccia
CH2M Hill

REFERENCE NO. 10

April 8, 1981

Certified Mail

Mr. Hosby Elgamal
Southern Resins Division
Lawter Chemicals, Inc.
P. O. Box 267
Moundville, Alabama 35474

Dear Mr. Elgamal:

This is to confirm the conversation you, Mr. Jack Davis (Tuscaloosa Testing Lab), Mr. L. G. Lima, Jr., and the writer had on March 31, 1981 at your plant. Also, this will confirm the sampling conducted during that day.

As mentioned, the open dump next to the new plant (Krumbhar plant) is unacceptable under the State Solid Waste Regulations. Also, it could possibly be in violation of State Water Pollution Laws.

Initially, you stated in the meeting that the waste disposed of at the Krumbhar plant dump site consisted of non-hazardous waste resin. However, upon inspection of the dump site, it was evident that other substances besides resin waste had been disposed of. Some of the substances mentioned in the drum labels were: Hexy-methylene diamine, ethylene Glycol, nonyl phenol, Sodium Hydroxide, [illegible] acid, and soda ash. Other labels could not be identified. It is obvious that unknown types and quantities of substances with different toxicity characteristics have been disposed of at this site. This is an uncontrolled site. Therefore, after consulting this matter with my supervisor, Mr. Bernard Gau, it was decided that this office gives you 30 days from the receipt of this letter to submit a clean up plan. Also, your company should take immediate action to prevent contamination of the nearby creek. It is suggested that the plan be prepared by an Engineer registered to practice in Alabama.

In regard to the other waste pile mine (hydrocarbon plant), we informed you that some of the waste contained [illegible] and [illegible] related compounds. A copy of the sample analysis results (Mr. John [illegible] [illegible] Feb. 2, 1981) was provided to Mr. Jack Davis, your consultant. As mentioned, this is a toxic material.

As mentioned before in some of our previous correspondence, it is the generators responsibility to determine if their waste is hazardous and to insure that it will be properly treated, stored, transported, disposed of, or otherwise managed, regardless of its final waste classification (hazardous or non-hazardous).

It is suggested that you address in your plan those two disposal areas.

We would appreciate it if you keep us informed on your company's decision regarding clean up of these sites.

Should you have any questions, please let us know.

Sincerely,

Javier A. Colon, Environmentalist III
Division of Solid & Hazardous Waste
Environmental Health Administration

JAC:rm

cc: [illegible]

ALABAMA DEPARTMENT OF

ENVIRONMENTAL MANAGEMENT

IN THE MATTER OF LAWTER INTERNATIONAL, INC. SOUTHERN RESINS DIVISION MOUNDVILLE, ALABAMA	ORDER NO. 85-008-WP

FINDINGS OF FACT

Pursuant to the provisions of the Alabama Environmental Management Act, Code of Alabama (1975) §§ 22-22A-1 et seq. (1983 Cum. Supp.) and the Alabama Water Pollution Control Act, Code of Alabama (1975) §§ 22-22-1 et seq. (1983 Cum. Supp.), the Alabama Department of Environmental Management (hereinafter, "the Department") makes the following FINDINGS OF FACT:

1. Lawter International, Inc., Southern Resins Division (hereinafter, "Southern Resins"), operates a facility for the manufacture of synthetic resins in Moundville, Alabama.

2. Southern Resins was issued NPDES Permit No. AL0026921 by the Department authorizing the discharge of pollutants and other industrial wastes from outfall serial numbers 001 and 001A to an unnamed tributary of the Black Warrior River, a water of the State, subject to certain limitations, terms and conditions.

3. Among the limitations contained in said permit, are daily maximum and daily average limitations for biochemical oxygen demand, five day (BOD_5), chemical oxygen demand (COD) and phenolics. Daily discharge limitations for said parameters are as follows:

	BOD_5 lbs/day	COD lbs/day	Phenolics lbs/day
Average	81	761	0.12 (Apr. - Sept.)
			0.18 (Oct. - Mar.)
Maximum	162	1522	0.36 (Apr. - Sept.)
			0.54 (Oct. - Mar.)

4. Southern Resins has violated its permit discharge limitations as follows:

Date	BOD_5 lbs/day	COD lbs/day	Phenolics lbs/day
11/09/83			.780
11/23/83			.747
11/30/83		1599	.863
Average	99	1055	.611
12/07/83		1823	1.77
12/14/83			.677
Average	103	1028	
1/04/84	253		
1/11/84	236		1.50
1/18/84	354	1771	2.75
1/25/84	387		2.53
Average		1297	1.76
2/01/84	378		2.70
2/08/84	250	1854	2.48
2/15/84	334	2275	
2/22/84	223		.582
2/29/84	332		.586
Average	303	1400	1.37
3/07/84	252		
3/14/84	178		
3/21/84	153		
3/28/84	405		
Average	246	996	.327
4/04/84	362	2806	.427
4/11/84	336	2108	.834
4/18/84	421	1807	1.04
4/25/84	197	1680	
Average	341	2097	.586

	BOD_5 lbs/day	COD lbs/day	Phenolics lbs/day
5/09/84	644		.619
5/16/84	247		.965
5/23/84			.607
Average	252		.507
6/06/84	343	1551	
6/21/84	302		
Average	211	1254	.279
7/05/84		2380	
7/11/84	165	2130	.399
7/18/84	170	2280	.435
7/25/84	324	3390	.662
Average	195	2543	.462

5. On May 17, 1983, Southern Resins spilled pollutants, i.e. resinous materials, into the unnamed tributary of the Black Warrior River, a water of the State.

6. On July 12, 1983, an inspection by Department staff revealed evidence of unpermitted discharges of pollutants to the unnamed tributary of the Black Warrior River and improper operation of a waste collection system.

7. On May 24, 1984, the Department requested that Southern Resins submit within 45 days a spill contaminant plan for the wastewater recycling area and an implementation schedule for said plan.

8. On August 16, 1984, a compliance inspection by Department staff revealed evidence of unpermitted discharges, improper waste collection, improper waste disposal, poor wastewater treatment and lack of progress on the recycle system.

ORDER

Based on the foregoing FINDINGS OF FACT and pursuant to Code of Alabama (1975) §§ 22-22A-5(10), 22-22-9(j) and 22-22-9(l) (1983 Cum. Supp.), it is hereby ORDERED:

A. That no later than December 1, 1984, Southern Resins shall cease the unpermitted discharge of pollutants to any waters of the State;

B. That Southern Resins shall perform the following actions necessary to provide additional collection, treatment and containment of Krumbhaar Plant wastewater, no later than the dates specified:

1. Complete all engineering, submit engineering plans and specifications to the Department and install concrete for dissolved air flotation equipment no later than November 15, 1984;

2. Install all major dissolved air flotation equipment no later than November 30, 1984;

3. Complete all piping installation no later than December 30, 1984;

4. Complete installation of instrumentation and pumps no later than February 1, 1985;

5. Complete operator training and complete operation and maintenance manual and submit to the Department no later than March 1, 1985; and

6. Operational completion of all facilities no later than April 1, 1985.

C. That no later than April 1, 1985, Southern Resins shall achieve, and continuously maintain thereafter, compliance with all the limitations, terms and conditions of NPDES Permit No. AL0026921;

D. That no later than July 1, 1985, a complete engineering report, detailing a biological treatability and design evaluation, waste treatment optimization study and final design change recommendations shall be submitted to the Department. The studies shall address optimization of overall biological, chemical and physical treatment in Southern Resins' wastewater treatment facility and shall be coordinated with Department staff during development.

E. That Southern Resins shall submit to the Department an implementation schedule for installation of the physical changes specified in the engineering report, with any modifications required by the Department, no later than August 1, 1985;

F. That Southern Resins shall comply with the implementation schedule required in Item E above, as approved by Department staff;

G. That no later than January 1, 1985 Southern Resins shall submit to the Department a complete inventory of liquid product and waste storage tanks, loading and handling areas, and a description of containment measures provided in accordance with spill prevention control and countermeasure plan regulations (40 C.F.R. Part 112);

H. That no later than February 1, 1985 Southern Resins shall implement the spill prevention control and countermeasure plan with any changes required by the Department;

I. That no later than February 1, 1985 Southern Resins shall develop and fully implement a method to store, handle and dispose of lime filter cake waste to prevent the discharge of stormwater runoff contaminated by such waste;

J. That the failure of Southern Resins to comply with any of the provisions of this Order shall constitute cause for the commencement of legal action for the recovery of civil penalties, criminal fines or other appropriate relief; and

K. That this Order is related to violations of the Alabama Water Pollution Control Act and its implementing regulations only. This Order does not constitute an endorsement by the Department that Southern Resins' operation is otherwise in compliance with all applicable environmental laws, rules and regulations, nor does compliance with the terms and conditions of this Order authorize violation of other applicable environmental laws, rules and regulations.

ORDERED and ISSUED this 31st day of October 1984.

Joe B. Broadwater

Joe B. Broadwater, Director
Alabama Department of
Environmental Management
1751 Federal Drive
Montgomery, Alabama 36130
(205) 271-7700

May 22, 1985

Mr. Hosny Elgamal
Southern Resins Division
Lawter International
Post Office Box 129
Moundville, Alabama 35434

Re: Notice of Violation
Facility I.D. No. ALD 004 034 138

Dear Mr. Elgamal:

On May 8, 1985, members of this Department met with representatives of CH2M Hill to discuss the above referenced, facility's progress toward compliance with the Alabama Hazardous Waste Management Regulations. By issuance of this Notice of Violation, we will summerize those aspects of the Notice of Violation dated August 8, 1984, and the Notice of Violation dated April 15, 1985 to reflect the current situation and activities. The following actions should be taken:

1) Submit a comprehensive closure plan for the solvent contaminated CaF_2 filtercake waste piles in accordance with Section 4-256.23 of the Alabama Hazardous Waste Regulations. This must include an assessment of the extent of soil and groundwater contamination resulting from Southern Resins' operation of the waste piles, as well as any corrective actions that may be necessary .

2) Submit a final list of all disposal areas (both on and off site) for the solvent contaminated calcium flouride filtercake waste stream generated since the unit began operations. This should supplement the letter of August 21, 1984, from Mr. Sharp and include all sanitary landfills.

3) Perform analysis of existing wells around K-Mart site (Harris Landfill) to determine areas of possible contamination.

Further evaluation indicates that currently generated wastes does not appear to be hazardous, but because of undesirable characteristics, it should be disposed of at a secure site. This being the case, Southern Resins would not be required to maintain generator's requirements in regard to the other aspects of our Regulations which were included in previous Notice of Violations. However, the Alabama Hazardous Waste Regulations are in the process of being updated and are subject to change. It is possible that the lime filtercake could be listed in the future so the facility would need to abide by the generator regulations in regard to the following:

Current Section 4-249.01(a)	Storage of less than ninety (90) days
Current Section 4-249.01(b(1)	Storage must be in drums or tanks.
Current Section 4-249.01(e)	Adequate Personnel Training and Preparedness and Prevention/Contingency Plan.

Several other problems should be addressed in the facility remedial action plan. Bins and wastes piles which originally held hazardous wastes for over ninety (90) days must have closure plans in accordance with the Regulations. This was previously mentioned in actions that should be taken (#1). The removal of the leached filtercake and waste pile can proceed as is as long as that material does not meet the criteria for being a hazardous waste. It is the owner's/generator's responsibility to ensure the material does not contain a higher concentration of solvent. If levels increase to the point where flashpoint causes the waste to be classified as hazardous, it must be treated, stored and shipped as such. Also, prior to December 1984, solvent M was managed in a manner inconsistant with legitimate recycling of hazardous wastes. The facility remedial action plan currently being developed should address the storage tank area where decanting occured and the MRO slovent storage tank on Cracker Asphalt property where considerable spillage has occurred.

For the present, we will await your submittal of the facility remedial action plan, waste pile closure plan, and final list of disposal sites for the filtercake and contact you as needed.

If you have any questions please contact Messrs. Dave Davis or David Hagan at (205) 271-7700.

Sincerely,

Daniel E. Cooper, Chief
Land Division

DEC/DD/sdm

cc: Mr. Jim Campbell, Vice President
Lawter International
South Kearney, N.J. 07032

Mr. Dave Meesin
CH2M Hill
Montgomery, AL 36104

Mr. Fred Mason
ADEM - Groundwater

REFERENCE NO. 13

DRAFT

August 13, 1984

MEMORANDUM

TO: Buddy Cox

FROM: [illegible]

[illegible] of events regarding Southern Resins/Lawter Chemicals, Inc. Facility I. D. Number ALD 004 034 138

The following is a chronological list of the major regulatory events between Southern Resins and ADEM's Hazardous Waste Branch:

11/20/78
In a letter to N. J. Weinstein of ReCon Systems in Somerville, N. J., Mr. Dan Cooper, of what was then the Environmental Health Administration, enclosed a draft procedure for sanitary landfill approval. Mr. Weinstein had inquired over the phone earlier about on-site disposal of wastewater treatment sludge from the Southern Resins plant in Moundville.

5/29/80
Material Safety Data sheets on Southern Resins finished products are sent to Javier Colon. Buddy Cox made a notation on the bottom of the cover letter indicating the material may be hazardous due to ignitability.

8/7/80
Mr. Colon writes Mr. Allen of Southern Resins advising him to analyze his resin waste for possible hazardous waste characteristics, particularly ignitability.

8/18/80
Mr. Allen writes Javier Colon and encloses test results on two wastestreams at Southern Resins lime waste and bag collector waste, that indicates they are non-hazardous by characteristic.

9/4/80
The Part A, signed by R.T. Voedisch on August 13, 1980, is received by EPA. D002, U122 and U147 are the hazardous waste identified as being generated by Southern Resins.

9/8/80
Mr. Colon, in a memo to John Gable, of the Environmental Health Lab summarizes an inspection to Southern Resins in which he obtains samples of several wastestreams which Southern Resins is reluctant to identify for reasons of confidentiality. He is particularly concerned about one wastestream which "emits a strong odor of unkown solvent...causes headaches, dizziness, etc.."

1/6/31
Rita Ford sends letter to Mr. Walter Allen requesting him to correct deficiencies in Southern Resins Part A.

2/2/81
Analysis of the waste with a strong solvent odor shows that it contains a variety of alkyl benzenes.

2/23/81
In a letter to Ms. Rita Ford of USEPA, Mr. Walter S. Allen of Southern Resins withdraws the Part A for the facility.

4/8/81
Mr. Colon sends a letter to Mr. Hoshy Elgamal of Southern Resins directing him to clean up an open dump next to the Kruumbhar plant that contains possible hazardous wastes and he also reminds Mr. Elgamal of the generators' responsiblity for determing whether his waste is hazardous.

9/11/81
A memo to Buddy Cox from L. G. Linn documents the results of analyses Tuscaloosa Testing performed on Southern Resins wastestreams. Sample #4 flashed at 33° C but there is no indication in the memo as to which wastestream corresponds to this sample number.

9/10/81
An 8700-12 is signed (illegible) by the plant manager of Southern Resins. It indicates the facility is a generator of D001 wastes. A letter requesting withdrawal of Southern Resin's Part A is also sent to the Department of Public Health by Walter Allen.

9/25/81
A letter to Mr. Allen from Belinda Wilson of The Environmental Health Agency advises him of the requirements for storage of hazardous wastes for generators (i. e., less than 90 day limit), and generator's responsibility for determining if wastes is hazardous. She then says in the letter that the Part A withdrawal for Southern Resin will be approved by the State if EPA does not disagree by December 1, 1981.

10/9/81
A memo to Bernard E. Cox from Belinda Wilson lists all wastestreams. Only the scrubber waste was mentioned as being hazardous (by ignitability). The lime filter cake was listed as a solid waste being stored in waste piles.

10/27/81
A memo to Bernard E. Cox from Belinda Wilson concerning potential disposal sites for Southern Resin's non-hazardous industrial waste is written.

11/5/81
A letter to Mr. Allen of Southern Resin from Butler Hine of Tuscaloosa County Health Department granting permission to dispose of non-hazardous industrial waste at the Harris Landfill in Jerusalem Heights near Tuscaloosa is sent. This included permission to dispose of bulk lime filter material which the writer suspects is the solvent saturated filter cake now designated as a hazardous waste. Wastes excluded from landfilling at this site include "any hazardous waste and any liquid waste."

11/13/81
In a memo to Bernard E. Cox, Belinda Wilson states that Al Hanke of EPA said Southern Resins would have to submit a copy of their Part A to EPA along with an inventory of all hazardous waste generated during operational start up of the facility before his office can determine whether Southern Resin should remain on the TSDF list.

12/1/81
In a letter to Mr. Jack Honeycutt, Walter Allen of Southern Resin gives notification of his intention to dispose of drummed scrubber wastes (previously identitied as hazardous by ignitability and covered under the small quantity exclusion) at the Tuscaloosa Landfill as he was directed by Mr. L. C. Harris.

7/21/83
Dr. Ed Passerini writes a letter to Jim Scarbrough complaining about the odor of wastes being dumped at the Harris Landfill and their possible toxic nature.

9/13/83
A letter is sent to Mr. Allen of Southern Resins from ADEM as a result of an August 31, 1983 inspection by Freda Griffis and Charles Fleming of the facility. The letter directs Southern Resin to analyze all wastestreams from the plant to determine if a hazardous waste is being generated.

10/10/83
Mr. Allen responds to ADEM's September 13, 1983, letter identifying five wastestreams generated by the plant. In this letter, Mr. Allen gives his reasons for determining all five wastestreams as non-hazardous.

12/8/83
Mr. Allen notifies ADEM that Southern Resin is constructing a concrete storage bin for the lime filter cake until final disposition can be determined.

Resin/Lawter Chemicals
Souther-
August 13, 1984

4/20/84
A letter is sent from Jack Honeycutt to Mr. William Sharp (Mike) granting approval for Southern Resin to dispose of non-hazardous solid waste at the Tuscaloosa Landfill but specifically prohibiting disposal of the lime filter cake anywhere but at a "secure chemical waste disposal site."

5/3/84
A memo to Bernard E. Cox from Jim Neal summarizes a visit to Southern Resin by he and Jack Honeycutt to discuss their waste disposal problem. They met with Mr. Hermann Mueller V.P. of Lawter International who wanted assistance in finding a disposal site for the plants non-hazardous industrial waste. Mr. Mueller assured Mr. Neal that the lime filter cake would be sent to a secure hazardous waste landfill.

7/25/84
Memo to Bernard E. Cox from the writer regarding a July 18, 1984, visit to Southern Resin with Fred Mason. At this time it was discovered that the lime filter cake waste pile was being mismanaged, with solvent leaching out of the containment structure and onto the ground.

7/25/84
Memo to Jack Honeycutt from Fred Mason summarizing the findings of the July 18, 1984 inspection of the proposed on-site landfill. Mr. Mason was concerned [illegible] ground water problems that may exist at the site due to past waste management practices.

8/8/84
An N. O. V. was sent to Southern Resin as a result of the information gained from the July 18, 1984 visit. It required Southern Resin to close the waste pile and begin managing the lime filter cake material in accordance with the generator standards of the Alabama Hazardous Waste Management Regulations.

It is evident from the correspondence in the files that Southern Resin failed in their responsibility to determine whether the wastes they generated were hazardous, even though the facility was repeatedly reminded to do so by ADEM. In addition, after the solvent filter cake was identified as a hazardous waste, it was not managed as such and continued to be disposed of at unauthorized sites. The most recent example of this was on August 8, 1984 when Mr. Butler Hine reported that some of the waste had been spilled on the road while it was being transported to a strip mine in Holt, Alabama for burial along with assorted non-hazardous industrial waste and trash from the facility.

DH/sjw

File: Southern Resin/Lawter Chemical

NUS CORPORATION AND S[redacted] REFERENCE NO. 14 [redacted] TELECON NOTE

CONTROL NO.	DATE: December 6, 1989	TIME: 1600

DISTRIBUTION:
File

BETWEEN: Alicia Finch	OF: AL Dept. of Conservation & Natural Resources - Land Protection	PHONE: (205) 271-7726

AND: Matt McCoy, NUS Corporation

DISCUSSION:

Lawter Chemicals, also known as Southern Resin Division, filed a RCRA Part A but withdrew it. They never received interim status and are currently listed as a non-handler.

REFERENCE NO. 15

TELEPHONE CONTACT SUMMARY

03/17/93

CALL MADE BY: Aparna Undrakonda
ORGANIZATION: Dynamac Corporation
DATE: 03/17/93
TIME: 11:40 am

REGION: IV
SITE: Southern Resins Division
EPA ID NO.: ALD004034138

PERSON CONTACTED:

NAME: Donna Wilkinson
TITLE: Environmental Engineer
PHONE NO.: 1-404-347-3433
ORGANIZATION: Environmental Protection Agency
CITY, STATE: Georgia

GENERAL SUBJECT:

RCRA Status of the Southern Resins Division

CONVERSATION SUMMARY:

Ms. Wilkinson said that the Southern Resins Division does not have any RCRA permits and it is not listed under RCRA.

REFERENCE NO. 16

GEOHYDROLOGY AND SUSCEPTIBILITY OF MAJOR AQUIFERS TO SURFACE CONTAMINATION IN ALABAMA; AREA 6

by Sydney S. DeJarnette and Jo E. Crownover

U.S. GEOLOGICAL SURVEY

Water-Resources Investigations Report 87-4113

Prepared in cooperation with the

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Tuscaloosa, Alabama

1987

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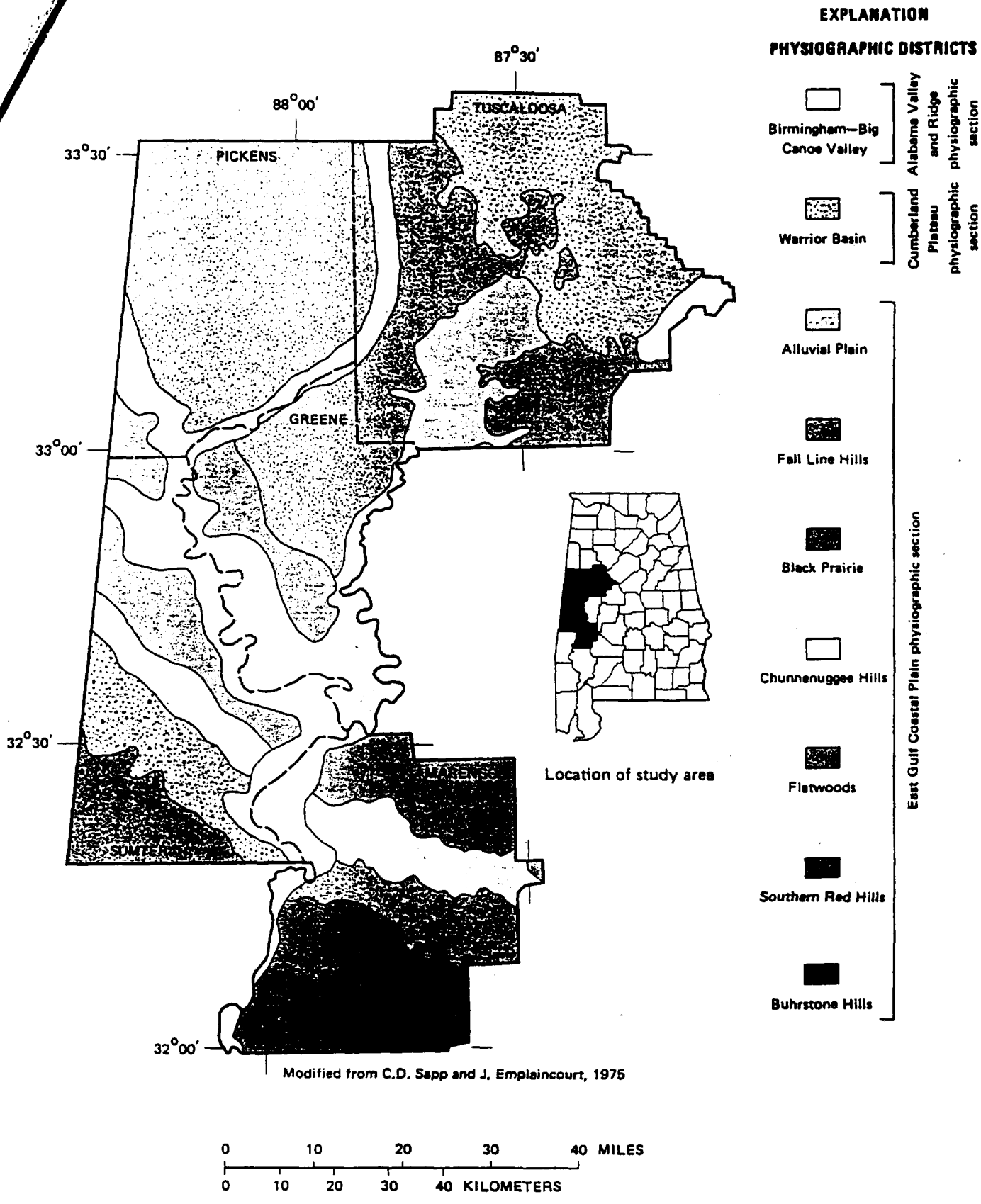


Figure 1.–Physiographic divisions of the study area.

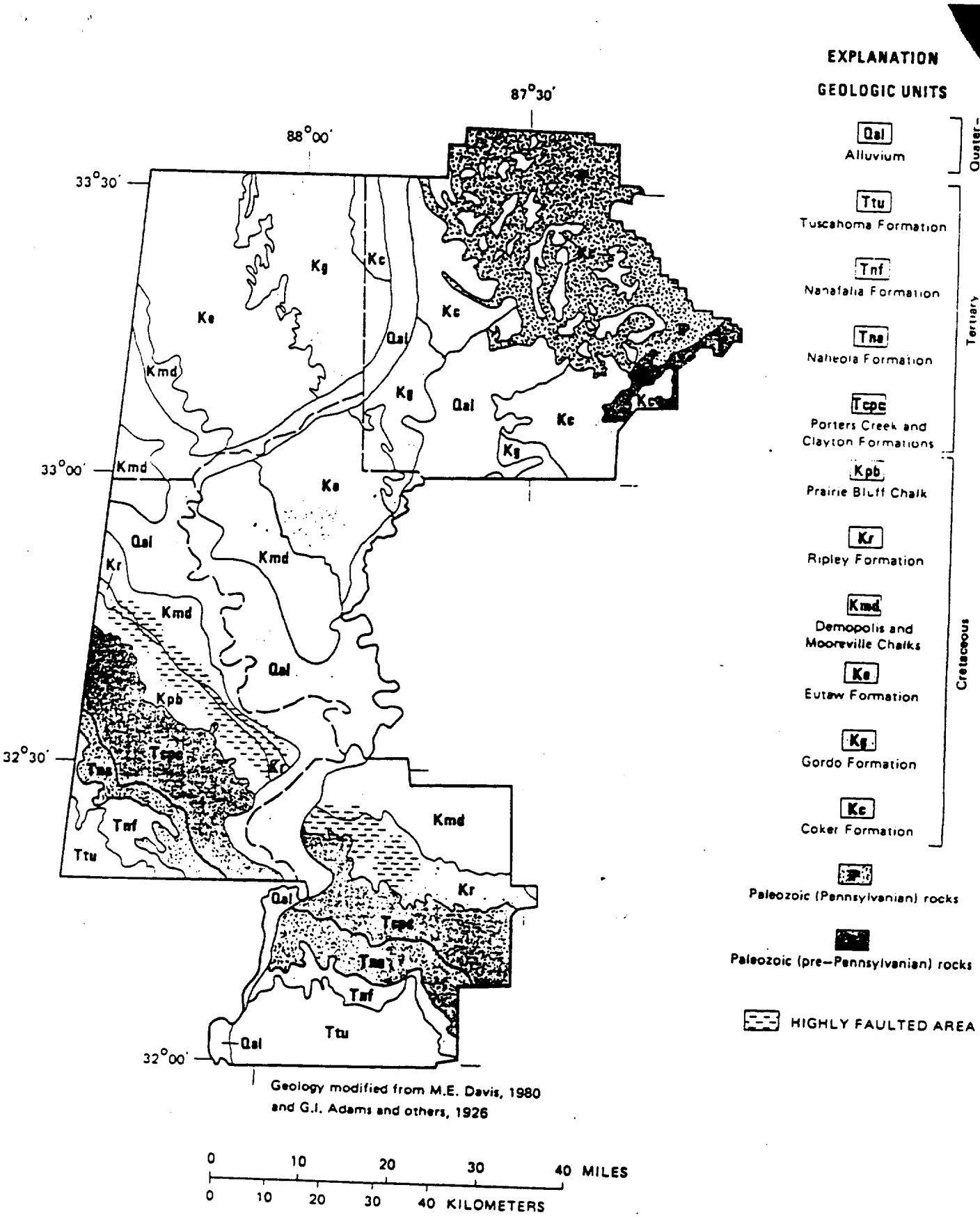
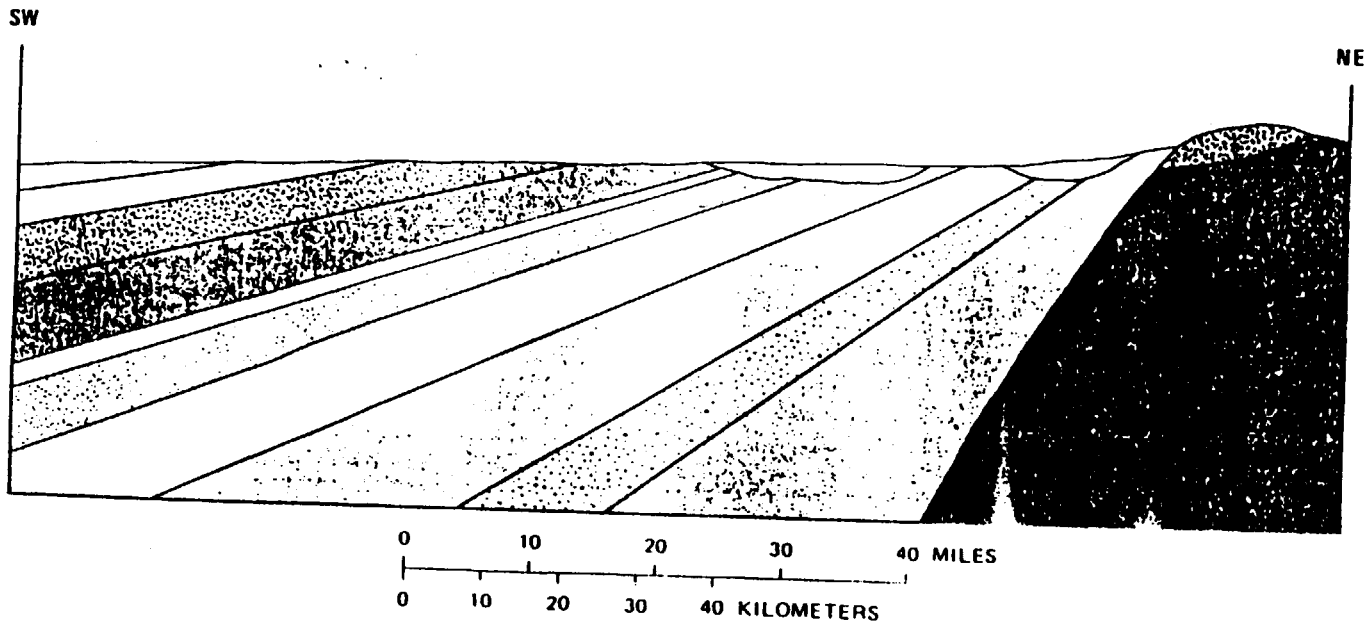


Figure 2.–Generalized geology of the study area.



EXPLANATION
GEOLOGIC UNITS

Cretaceous:
- Prairie Bluff Chalk
- Ripley Formation
- Demopolis and Mooreville Chalks
- Eutaw Formation
- Gordo Formation
- Coker Formation

Quaternary:
- Alluvium

Tertiary:
- Tuscahoma Formation
- Nanafalia Formation
- Naheola Formation
- Porters Creek and Clayton Formations

- Paleozoic (Pennsylvanian) rocks
- Paleozoic (pre–Pennsylvanian) rocks

Figure 3.--Generalized geologic section of the study area.

Cretaceous Formations

Coker Formation

The Coker Formation crops out in Tuscaloosa County and in streambeds in eastern Pickens County (see fig. 2). The Coker underlies all of the study area south and southwest of its area of outcrop.

The Coker Formation consists of a basal nonmarine zone of gravel, marine sand and clay. In most parts of the study area, the basal zone is generally separated from the marine sand beds by 50 feet or more of clay. A clay zone is usually present at the top of the Coker. Where this clay exists, it serves as a confining unit between the Coker aquifer and the overlying Gordo aquifer (see figs. 3 and 4). However, over much of the area, the two aquifers are hydraulically connected and are treated as one aquifer referred to as the Tuscaloosa aquifer for purposes of the potentiometric map of this report (fig. 4). The Coker Formation ranges in thickness from less than 100 feet where only the basal beds remain to more than 1,000 feet in southernmost parts of the study area.

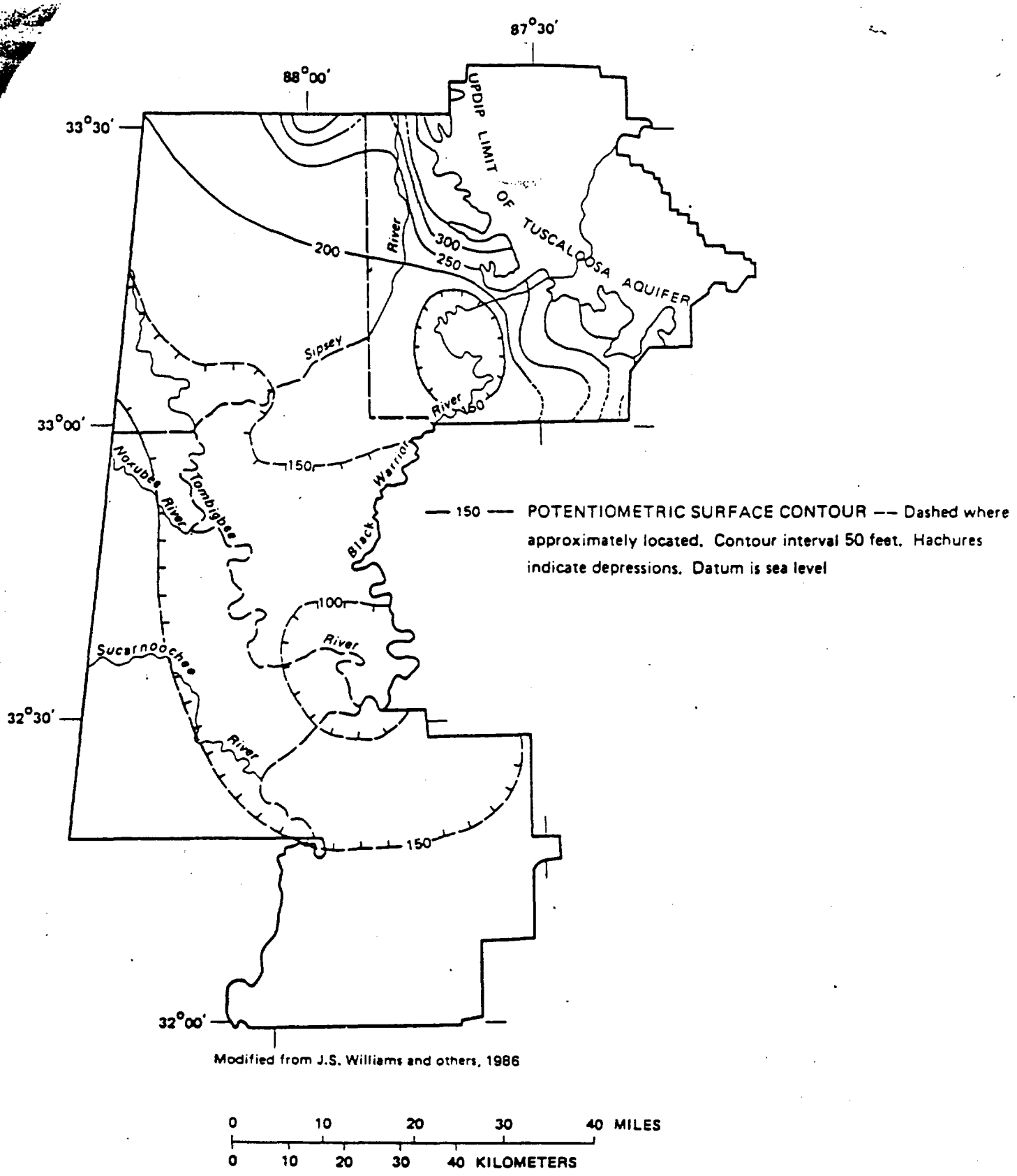
The towns of Coker and Gordo, and the Buhl-Elrod-Holman Water System pump from the Coker aquifer. However, the Coker is not used extensively farther downdip where shallower aquifers are available. An electric log of an oil test well in southwestern Pickens County indicates that the Coker contains relatively fresh water to a depth of 1,750 feet in that area (Wahl, 1965).

Gordo Formation

The Gordo Formation overlies the Coker Formation and crops out in southwestern Tuscaloosa County, northeastern Pickens County and in a small part of northeastern Greene County (see fig. 2). Like the Coker, it dips to the southwest and underlies the formations that crop out south of it. The Gordo consists of a basal zone of gravelly sand overlain by alternating lenticular beds of sand and varicolored mottled clay. It ranges in thickness from less than 100 feet at outcrops to nearly 400 feet in the subsurface in the southern part of the study area. The towns of Aliceville, Reform, Faunsdale, and Union pump from the Gordo aquifer.

Eutaw Formation

The Eutaw Formation overlies the Gordo Formation and crops out over the central part of Pickens County, northern Greene County, and a small part of southwestern Tuscaloosa County. The Eutaw consists of upper and lower zones of marine sand separated by a zone of clay. It ranges in thickness from less than 200 to 400 feet where the entire formation is present. The lower part of the formation consists of 30 to 50 feet of glauconitic sand interbedded with sandy clay. The middle part consists of 50 to 150 feet of calcareous clay and sandy clay. The upper part, the Tombigbee Sand Member, consists of 25 to 100 feet of massive glauconitic sand interbedded with calcareous sandstone and sandy limestone. In part of the area the McShan Formation underlies the Eutaw



Modified from J.S. Williams and others, 1986

Figure 4.--Potentiometric surface of the Tuscaloosa aquifer, fall 1982.

Formation (Conant and Monroe, 1945), but for the purposes of this report it is combined with the Eutaw Formation and forms the Eutaw aquifer (Newton and others, 1961).

The Eutaw is the most extensively used aquifer in the study area; it is pumped in downdip areas where it is overlain by the Mooreville and Demopolis Chalks (discussed below) in addition to its outcrop area. The towns of Eutaw, Boligee, Forkland, Demopolis, Linden, and Thomaston pump from the Eutaw.

Mooreville Chalk

The Mooreville Chalk overlies the Eutaw Formation, and crops out in southwestern Pickens County, northern Sumter County, and central Greene County (fig. 2). The Mooreville consists of about 400 to 420 feet of chalk, calcareous clay, sandy clay and limestone. The Arcola Limestone Member of the Mooreville, at the top of the unit, consists of two to four thin beds of limestone separated by clay and sandy clay. The Mooreville Chalk is relatively impermeable and is not a source of water in the study area. The chalk is an upper confining layer for the upper Eutaw aquifer. However, the Mooreville and the overlying Demopolis Chalk and Ripley Formation are extensively faulted in parts of Sumter and Marengo Counties (see fig. 2), which may allow water to move through the chalk.

Demopolis Chalk

The Demopolis Chalk overlies the Mooreville Chalk, and crops out in extreme southwest Pickens County, northern Sumter County, and northern Marengo County (fig. 2). The Demopolis consists of about 400 to 440 feet of chalk, calcareous clay, and sandy clay. It is relatively impermeable and is not an aquifer in the study area.

Ripley Formation

The Ripley Formation overlies the Demopolis Chalk and crops out in central Marengo and Sumter Counties (fig. 2). The Ripley Formation consists of fine grained fossiliferous calcareous clayey sand. The lower part locally contains thin beds of calcareous sandstone. The formation ranges in thickness from 150 to 220 feet in the study area. The Ripley is a minor aquifer in the study area.

Prairie Bluff Chalk

The Prairie Bluff Chalk overlies the Ripley and crops out in a narrow belt at the southern margin of the Ripley Formation in Sumter and Marengo Counties. It consists of fossiliferous sandy chalk and clay and generally ranges in thickness from 60 feet in Sumter County to 10 feet in Marengo County. The Prairie Bluff is relatively impermeable, and is not an aquifer in the study area.

Tertiary Formations

Tertiary deposits in the study area are limited to the Clayton, Porters Creek, and Naheola Formations of the Midway Group and the Nanafalia and Tuscahoma Formations of the Wilcox Group.

Clayton and Porters Creek Formations

The Clayton Formation overlies the Prairie Bluff Formation in Sumter and Marengo Counties. It consists of silty calcareous clay, clayey sandstone, and silty chalk in Sumter County; and sandy chalk and calcareous clayey sand in Marengo County. The Porters Creek Formation overlies the Clayton Formation and crops out in a belt southwest of the Clayton in central Sumter and Marengo Counties. The Porters Creek consists of massive gray marine clays. The clay produces a low-lying topography called the "Flatwoods." The combined thickness of the Clayton and Porters Creek Formations in Sumter and Marengo Counties is 270 to 370 feet. Neither unit is a major aquifer in Sumter or Marengo Counties.

Naheola Formation

The Naheola Formation overlies the Porters Creek Formation and crops out southwest of it in Marengo and Sumter Counties. It consists of fine- and coarse-grained sand, silty clay, and beds of lignite. It is about 120 feet thick and is not a major aquifer in the study area.

Nanafalia Formation

The Nanafalia Formation crops out southwest of the Naheola Formation in Marengo and Sumter Counties. It consists of sand, sandy marl, sandy clay, and lignite. The Nanafalia is about 150 to 200 feet thick in Sumter and Marengo Counties and is tapped by the city wells of Myrtlewood and Sweetwater in southern Marengo County.

Tuscahoma Formation

The Tuscahoma Formation crops out in southernmost Marengo County and southwestern Sumter County. The contact with the overlying Hatchetigbee Formation lies outside the study area to the south. The Tuscahoma consists of about 275 feet of clay, fine- to coarse-grained sand, and fossiliferous glauconitic marl. It is not a major aquifer in the study area.

Quaternary Deposits

Quaternary alluvial deposits overlie older formations throughout a large part of the study area (fig. 2). These deposits, which underlie flood plains of present and ancestral large streams, consist mainly of gravel, sand, silt,

and clay. Alluvial deposits along the flood plains of the Black Warrior, Sipsey, and Tombigbee Rivers are shown on the geologic map (fig. 2). Remnants of older alluvial deposits (usually mapped as high terrace deposits) are not shown on the geologic map, but form relatively flat uplands in several parts of the study area. The alluvial deposits generally range in thickness from 30 to 60 feet. They are not a major aquifer in the study area.

HYDROLOGY OF THE MAJOR AQUIFERS

The major aquifers in the study area are sand and gravel beds in the Coker, Gordo, Eutaw, and Nanafalia Formations. Water in these aquifers occurs under artesian conditions in most parts of the study area. Municipal wells that tap the major aquifers are shown in table 2 and their locations are shown on plate 1.

Recharge and Movement of Ground Water

Rainfall, which averages about 50 inches per year, is the source of recharge to the major aquifers. A large part of the rainfall runs off during and directly after rainstorms or is returned to the atmosphere by evaporation and transpiration of trees and other plants; a small part infiltrates to the water table to recharge aquifers. The recharge area for the Coker aquifer is mainly in Tuscaloosa County; the Gordo aquifer mainly in Pickens and Tuscaloosa Counties; and the Eutaw aquifer in Pickens and Greene Counties. The recharge area for the Nanafalia aquifer is in Sumter and Marengo Counties (see plate 1). These recharge areas consist largely of rolling sandhills, parts of which are wooded and parts cultivated. In Tuscaloosa and Pickens Counties remnants of high terrace deposits overlie significant parts of the recharge areas. These terrace remnants form relatively flat, permeable landscapes that impede runoff and probably increase recharge to the aquifers. Alluvial deposits overlie the major aquifers along the flood plains in the Black Warrior, Sipsey, and Tombigbee Rivers. These permeable deposits may provide increased recharge to the aquifers. Water moves downdip from areas of recharge to areas of natural discharge or areas of ground-water withdrawals, generally perpendicular to the potentiometric contour lines shown on figures 4, 5, and 6.

Natural Discharge and Ground-Water Withdrawals

The aquifers discharge through seeps and springs to provide the base (dry weather) flow of streams. Discharge to the rivers also occurs where streams are entrenched into the aquifers. Discharge to streams can occur by upward leakage through the confining unit between aquifers or by passing through fractures in the Mooreville and Demopolis Chalks (Gardner, 1981). Most of the remainder of the discharge is through wells. The largest pumping center in the study area is the city of Demopolis. In 1985, it was estimated to pump 1.3 Mgal/d (million gallons per day). The other pumping centers in the study area pump less than 1 Mgal/d each.

Wells are used for domestic, stock, industrial, and irrigation purposes. The amount of water used for these purposes was estimated to be 7.7 Mgal/d in 1982 (Baker, 1983). A significant amount of water is lost from the aquifers through flowing artesian wells. For example, about 3.2 Mgal/d was discharging through wells that flow in Tuscaloosa County in 1958 (Miller and Causey, 1958); about 2.7 Mgal/d in Greene County in 1965 (Wahl, 1966); about 2 Mgal/d in Pickens County in 1963 (Wahl, 1965); and more than 1 Mgal/d in Marengo County in 1961 (Newton and others, 1961). Many wells which formerly flowed have ceased to flow as a result of lowering of the potentiometric surface of the aquifers.

Effects of Withdrawals from the Aquifers

Long-term withdrawals of water from the major aquifers have resulted in lowering of the potentiometric surface and formation of depressions on the potentiometric surface of water in the aquifers. Depressions have formed in the Coker and Gordo aquifers (fig. 4) at Demopolis and in the vicinity of the Black Warrior River south of Tuscaloosa. A depression also exists at Demopolis in the Eutaw aquifer (fig. 5). The depressions at Demopolis are partly a result of pumping in both aquifers there. However, these and the depression on the Black Warrior River and the trough-like depression in the Nanafalia aquifer along the Tombigbee River (fig. 6) also reflect natural discharge to the rivers.

SUSCEPTIBILITY OF THE AQUIFERS TO SURFACE CONTAMINATION

All recharge areas for the major aquifers in the study area are susceptible to surface contamination (plate 1). However, throughout most of the study area the recharge areas are in rural settings that are used for timberlands, farms, or pastures. Usually, the depth of the water-producing zone being tapped and its horizontal distance from the aquifer outcrop provide some buffer from surface contamination (table 2). Shallow wells in outcrop areas are more susceptible, but none are considered highly susceptible. The areas most susceptible to future contamination are the flood plains of the Black Warrior, Sipsey, and Tombigbee Rivers, which are underlain by terrace and alluvial deposits that are in hydraulic connection with the major aquifers.

The recharge areas of the minor aquifers (the Paleozoic rocks, the Ripley, Naheola, and Tuscahoma Formations) are also susceptible to contamination from the surface. However, they are not included in the susceptible area on the map because they do not contain actively pumped public supply wells within the study area. Some of these aquifers, notably the Paleozoic limestone, contain public supply wells outside the area in neighboring counties, and are potential sources of public supply within the study area. For instance, the Paleozoic limestone is recharged in Tuscaloosa County and is the source of public supply for the city of West Blocton in adjacent Bibb County.

REFERENCE NO. 17

GEOLOGICAL SURVEY OF ALABAMA

Philip E. LaMoreaux
State Geologist

DIVISION OF WATER RESOURCES

R. M. Alverson
Chief Engineer

MAP 136

WATER AVAILABILITY AND GEOLOGY OF HALE COUNTY, ALABAMA

By Marvin E. Davis, Thomas H. Sanford, Jr.,
and Patrick O. Jefferson

UNIVERSITY, ALABAMA

1975

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on distinctive topographic features and generally represent erosional characteristics of outcropping geologic units. Two of these belts are represented in Hale County: the Fall Line Hills and the Black Prairie belt.

The Fall Line Hills belt is underlain by sand, clay, and gravel which, though poorly consolidated, are capable of supporting steep slopes. The topography is fairly rugged and dissected, especially near streams. The Black Prairie belt is represented by gently rolling hills of low relief, and receives its name from the black residual soil formed on underlying chalk beds. Low, flat flood plains border the Black Warrior River and flat to gently rolling terrace uplands extend eastward as far as Moundville and Havana.

The Black Warrior River flows southward along the western boundary of Hale County. Tributaries of the river drain all of the county except for a very small area near Gallion, where the drainage is to the Tombigbee River.

Most streams in Hale County head near the eastern boundary and flow westward to the Black Warrior River. Major streams which drain the Fall Line Hills in the northern part of the county are Elliotts, Gabriel, Fivemile, and Big Brush Creeks; the upper reaches of South Sandy Creek drain the northeast corner. The Black Prairie belt in the southern part of the county is drained by Big Prairie Creek and its tributaries.

GEOLOGY

GENERAL GEOLOGY

Geologic units that crop out in Hale County are shown on plate 1. The units are of sedimentary origin and consist mainly of sand, gravel, chalk, and clay. These deposits range in age from Late Cretaceous to Quaternary. The Cretaceous Series includes, in ascending stratigraphic order: the Coker and Gordo Formations of the Tuscaloosa Group, the Eutaw Formation, and the Mooreville and Demopolis Chalks of the Selma Group. The Cretaceous deposits strike northwestward across the county and dip southwestward about 35 feet per mile. The total thickness of the Cretaceous deposits in Hale County ranges from about 400 feet in the northeastern part of the county to about 1,900 feet in the southwestern part. The Cretaceous units are overlain in places by sediments of Quaternary age which, on the geologic map, are subdivided into terrace deposits and alluvium (pl. 1).

CRETACEOUS SYSTEM

TUSCALOOSA GROUP

The Tuscaloosa Group consists of the Coker and Gordo Formations. The Coker is the lower formation of the Tuscaloosa Group and is the basal unit of the Upper Cretaceous Series in Alabama. The upper part of the Coker Formation is exposed in the upper reaches of South Sandy Creek in the northeastern part of Hale County. The Coker unconformably overlies Paleozoic rocks in the northeastern part of the county and Lower Cretaceous deposits in the remaining part (Boswell and others, 1965, fig. 8). The formation ranges in thickness from about 500 to 600 feet and consists of olive-gray to yellowish-gray mottled sandy clay and yellowish-gray fine- to coarse-grained sand and gravel. The sands become progressively finer grained and less abundant toward the top of the formation where clay predominates. Massive beds of coarse-grained sand and gravel, as much as 200 feet in thickness, generally constitute the basal part of the formation.

The Gordo Formation, the upper unit of the Tuscaloosa Group, unconformably overlies the Coker Formation and crops out in a northwestward-trending belt across the northeastern part of the county. The formation ranges in thickness from about 300 to 350 feet in the subsurface and consists of light-gray to mottled red and gray thin-bedded to massive clay and light-tan to brown sand

and chert gravel. Poorly sorted coarse-grained sand and chert gravel beds are prevalent in the lower part of the formation. The base of these sand and gravel beds is generally defined as the contact between the Coker and Gordo Formations. The upper part of the formation consists of laminated to massive clay and lenticular beds of sand.

EUTAW FORMATION

The Eutaw Formation, as mapped in Hale County, includes all beds between the Tuscaloosa Group and the Selma Group. In some counties in western Alabama the deposits between the overlying Selma Group and the underlying Tuscaloosa Group have been designated as the McShan Formation in the lower part and the Eutaw Formation in the upper part. However, because of the difficulty in determining the contact between the McShan and Eutaw Formations in the subsurface and at outcrops east of the Black Warrior River, these deposits were not differentiated in Hale County (pl. 1).

The Eutaw Formation crops out in a northwestward-trending belt 10 to 12 miles wide through the north-central part of the county. The formation is about 400 feet thick in the subsurface and consists of gray to yellowish-brown glauconitic sand, laminated clay, and dark-gray shale. A massive bed of fine- to medium-grained glauconitic sand, which contains fossil shells and locally a few thin beds of light-gray calcareous hard sandstone, comprises the upper part of the formation. The lower part of the formation consists of thin to massive beds of fine- to coarse-grained glauconitic sand interbedded with layers of light-gray to gray laminated clay. Locally, sand beds are thin or absent in the middle part of the formation.

SELMA GROUP

The Mooreville Chalk rests disconformably on the Eutaw Formation and crops out in a northwestward-trending belt about 10 to 12 miles wide in the southern part of Hale County. The formation is about 300 feet thick and consists chiefly of dark bluish-gray fossiliferous silty chalk in the subsurface, which weathers to white or light yellowish gray at outcrops. Two or more beds of hard limestone, separated by soft silty clay, generally are present in the upper 15 to 50 feet of the formation. The basal 3 to 6 feet of the Mooreville Chalk in Hale County is generally composed of compact calcareous fossiliferous sandstone.

The Demopolis Chalk overlies the Mooreville Chalk and crops out in a belt as much as 4 miles wide just north of the southern boundary of Hale County. The unit in Hale County is less than 200 feet thick, which probably includes only the lower part; it is more than 400 feet thick southward in Marengo County. The Demopolis is composed mainly of a light-gray fossiliferous chalk in the subsurface and weathers to very light gray or white at outcrops. The basal part of the Demopolis Chalk consists of a thin bed of fossiliferous silty chalk that contains the index fossil *Diploschiza cretacea*. The basal beds are overlain by nearly pure chalk which, according to published analyses (Emmons and Hayes, 1904, p. 445-446), contains from 75 to 90 percent calcium carbonate ($CaCO_3$).

QUATERNARY SYSTEM

Terrace deposits overlie older rocks along the flanks of the valley of the Black Warrior River and its major tributaries. These alluvial sediments were deposited by ancestral streams and, since their deposition, have been eroded into isolated, benchlike remnants that range in areal extent from a few acres to several square miles at different elevations above the flood plain. The deposits generally are less than 50 feet thick and consist of lenticular beds of poorly sorted gravel, sand, and clay.

Alluvium underlies the flood plains of major streams in Hale County. These deposits consist of lenticular beds of sand, gravel, clay, and silt, and generally are less than 50 feet thick.

The terrace deposits and alluvium merge near the edges of the flood plains and in places the contact between them cannot be distinguished because of lithological similarity; therefore, some of the lower terrace deposits are mapped as alluvium (pl. 2).

SOURCE AND OCCURRENCE OF WATER

The source of all fresh water in Hale County is precipitation which occurs mainly in the form of rain. Annual rainfall averages about 52 inches and is fairly evenly distributed throughout the year. Part of the rainfall runs off directly into streams; part is returned to the atmosphere by evapotranspiration; and part percolates downward to replenish underground reservoirs. The average annual runoff from the county is about 17 inches or 0.82 mgd (million gallons per day) per square mile.

The occurrence of ground water and the flow of streams in Hale County are governed largely by the physical characteristics of geologic units. A summary of the geologic units in the county, their water-bearing characteristics, and chemical quality of water obtained from aquifers are given in table 1.

AVAILABILITY OF WATER

GROUND WATER

The major aquifers that yield water to wells in Hale County are beds of sand in the Coker, Gordo, and Eutaw Formations. Terrace deposits and alluvium contain sand and gravel aquifers that yield small quantities of water for domestic and stock supplies; however, they may yield larger supplies. The Mooreville and Demopolis Chalks consist of relatively impermeable chalk and clay beds and generally do not yield water to wells; however, they have a significant influence on ground-water conditions because they confine water in underlying aquifers and retard downward percolation of water from overlying aquifers.

The evaluation of the availability of ground water in Hale County is based on records for 308 wells and 2 springs. Their locations are shown on plate 2 and the data collected are tabulated in table 2.

Water table conditions occur throughout Hale County except in lowland areas near the Black Warrior River and near streams in the outcrop area of the Mooreville and Demopolis Chalks (pl. 1). Where the aquifers are overlain by relatively impermeable beds of chalk, the water becomes confined and is under hydrostatic pressure exerted by the weight of water in the same aquifer at higher elevations. Water in a well tapping a confined aquifer will rise above the top of the aquifer and in lowland areas will flow at the land surface. Such aquifers are termed artesian and the imaginary surface to which the water will rise under artesian conditions is called the potentiometric surface. An artesian well will flow if the potentiometric surface is above the land surface. The area of artesian flow in Hale County is shown on plate 2.

Ground water generally moves from areas of recharge toward areas of discharge. The rate of movement is dependent on the hydraulic gradient and permeability of the aquifer. The direction of flow of ground water in Hale County is generally southwestward and downdip from areas of outcrop. Recharge to the aquifers is derived from rainfall on these outcrop areas within and immediately north of the county.

The generalized bases of the three major aquifers are shown by contour lines on plate 2. A subsurface profile of the southwestward-dipping aquifers and their potentiometric surfaces are shown on plate 2. To estimate the depth below land surface necessary to drill to the base of a major aquifer, add the elevation above mean sea level of the proposed well site to the contour line nearest the site. For example, if the elevation of the well site is 200 feet above sea level and the nearest contour line for the

aquifer is 600 feet below sea level, the depth necessary to reach the base of the aquifer would be 800 feet. A compilation of driller's and sample logs are given in table 3.

Sand and gravel beds in the Coker Formation comprise a major aquifer throughout Hale County. The formation ranges in thickness from 500 to 600 feet and is composed of about 50 percent sand and gravel. The thicker and coarser grained sand beds generally occur in the lower part of the formation. Data from test wells in counties adjacent to Hale County indicate that the basal 200 feet of the formation is chiefly sand and gravel. Although sand beds throughout the formation yield water, the basal beds of sand and gravel comprise the major aquifer.

Depths to the base of the Coker Formation range from about 400 feet below land surface in the northeastern part of the county to about 1,900 feet in the southwestern part. The formation is not tapped by wells in the southern part of Hale County because of its excessive depth and because shallower aquifers yield large quantities of water. Data for 35 wells tapping the Coker Formation in the northern part of the county are included in table 2.

Well C-4, which taps the major aquifer, reportedly had a drawdown of 25 feet while producing about 200 gpm (gallons per minute), indicating a specific capacity of 8 gpm per foot of drawdown. The specific capacity of this well indicates a potential production of 1,000 gpm with a pumping level of about 150 feet below land surface. On the basis of these data, it is estimated that wells with capacities of 1.5 mgd could be constructed in the major aquifer of the Coker Formation in Hale County.

Sand and gravel beds in the Gordo Formation are a major aquifer in Hale County. The formation ranges in thickness from about 300 to 350 feet; however, the lower 150 to 200 feet of the formation, which consists predominantly of poorly sorted sand and gravel, is the major aquifer. Sand beds in the upper part of the formation are relatively thin and generally yield only small to moderate quantities of water to wells.

The depth to the base of the Gordo aquifer ranges from 300 feet below land surface in the northern part of the county (pl. 2) to about 1,300 feet in the southwestern part. The aquifer is not tapped by wells in the southern part of the county because of its excessive depth and because large amounts of water are available from the overlying Eutaw aquifer.

Data for 55 wells tapping the Gordo Formation in the northern part of Hale County are included in table 2. Wells P-13 and P-14, completed in the lower part of the Gordo, produce 618 and 545 gpm with drawdowns of 17 and 23 feet, respectively. The specific capacities of these wells indicate a potential production of 1,000 gpm with pumping levels about 150 feet below land surface. In areas of lower elevation where the water level or potentiometric surface is near or above the land surface, it is estimated that the lower part of the formation will yield about 1,000 gpm to individual wells with a pumping level about 50 feet below surface. On the basis of these data, it is estimated that the Gordo aquifer will yield 1.5 mgd to individual wells in central and southern parts of Hale County and will yield smaller quantities in the northern part where the aquifer is sufficiently saturated (pl. 2).

Sand beds in the Eutaw Formation are a major aquifer in Hale County. The formation is about 400 feet thick and consists generally of thin clay and sand beds with thicker and coarser grained sand beds in the lower part. A massive bed of sand occurs in the upper part of the formation; however, it is relatively fine grained and yields less water than the basal sand beds. Composition of the Eutaw Formation is estimated to be about 50 percent sand, although individual sand beds probably do not exceed 60 feet in thickness.

The depth to the base of the Eutaw aquifer ranges from about 300 feet below land surface in the vicinity of Greensboro to about 900 feet in the southwestern part of the county. The Eutaw Formation is not only a source of large water supplies, but is also the shallowest source of ground water for domestic and stock supplies in most of southern Hale County. Data for 225 wells tapping the Eutaw Formation are included in table 2.

Wells P-11 and P-16, completed in the middle part of the Eutaw Formation, yield 80 and 200 gpm, respectively. Well S-13, which taps the lower part of the formation, flows 100 gpm. Well V-13, which taps the lower part of the Eutaw, yields 295 gpm. The specific capacities of wells P-11, P-16, and S-13 range from 1.5 to 7 gpm per foot of drawdown. These and other available data indicate that the lower part of the Eutaw Formation will yield 1.5 mgd to individual wells in Hale County generally south of Greensboro, and will yield smaller supplies in the northern part of the county where the aquifer is sufficiently saturated (pl. 2).

Ground water occurs in the terrace deposits and alluvium in Hale County but, because of the heterogeneity of the deposits, individual aquifers are difficult to define. The deposits generally are less than 50 feet thick and consist of lenticular beds of poorly sorted gravel, sand, and clay. In general, aquifers in the deposits yield sufficient water for domestic or stock use. Wells of large capacity probably could be constructed in the low terrace deposits and alluvium along the Black Warrior River where the aquifers are hydraulically connected with the river. Data for nine wells tapping the terrace deposits or alluvium are included in table 1.

A well that will supply 10 gpm is considered adequate for normal domestic needs. All geologic units, except the Mooreville and Demopolis Chalks, that crop out in or underlie Hale County are potential sources of sufficient water for domestic use.

Domestic supplies may be obtained at depths of less than 50 feet from aquifers in terrace deposits and alluvium in the valleys of the Black Warrior River and its major tributaries. In areas of low to moderate relief, north of the Eutaw-Mooreville geologic contact (pl. 1) and east of the flood plain of the Black Warrior River, wells ranging in depth from 50 to 200 feet are required to tap aquifers in outcropping formations that will yield as much as 10 gpm. In areas of high relief, particularly in the northeastern part of the county, wells ranging in depth from 300 to 400 feet may be necessary to tap an aquifer.

In the area of outcrop of the Mooreville and Demopolis Chalks the shallowest source of ground water for domestic supplies generally is from sand beds in the upper part of the underlying Eutaw Formation. Chalk beds overlying the Eutaw Formation generally do not yield water to wells, and alluvium in this area is usually thin and may not yield sufficient quantities of water for domestic supply. Figure 2 shows by contour lines the elevation of the top of the Eutaw Formation. To estimate the depth from the land surface to the top of the formation at specific well sites, follow the method outlined in the preceding explanation, whereas depths are determined to the bases of the major aquifers. The depth below land surface to the top of the Eutaw Formation ranges from less than 5 feet near the Eutaw-Mooreville contact (pl. 1) to about 500 feet in the southwestern part of the county. Aquifers, capable of yielding domestic supplies, generally occur less than 100 feet below the top of the formation.

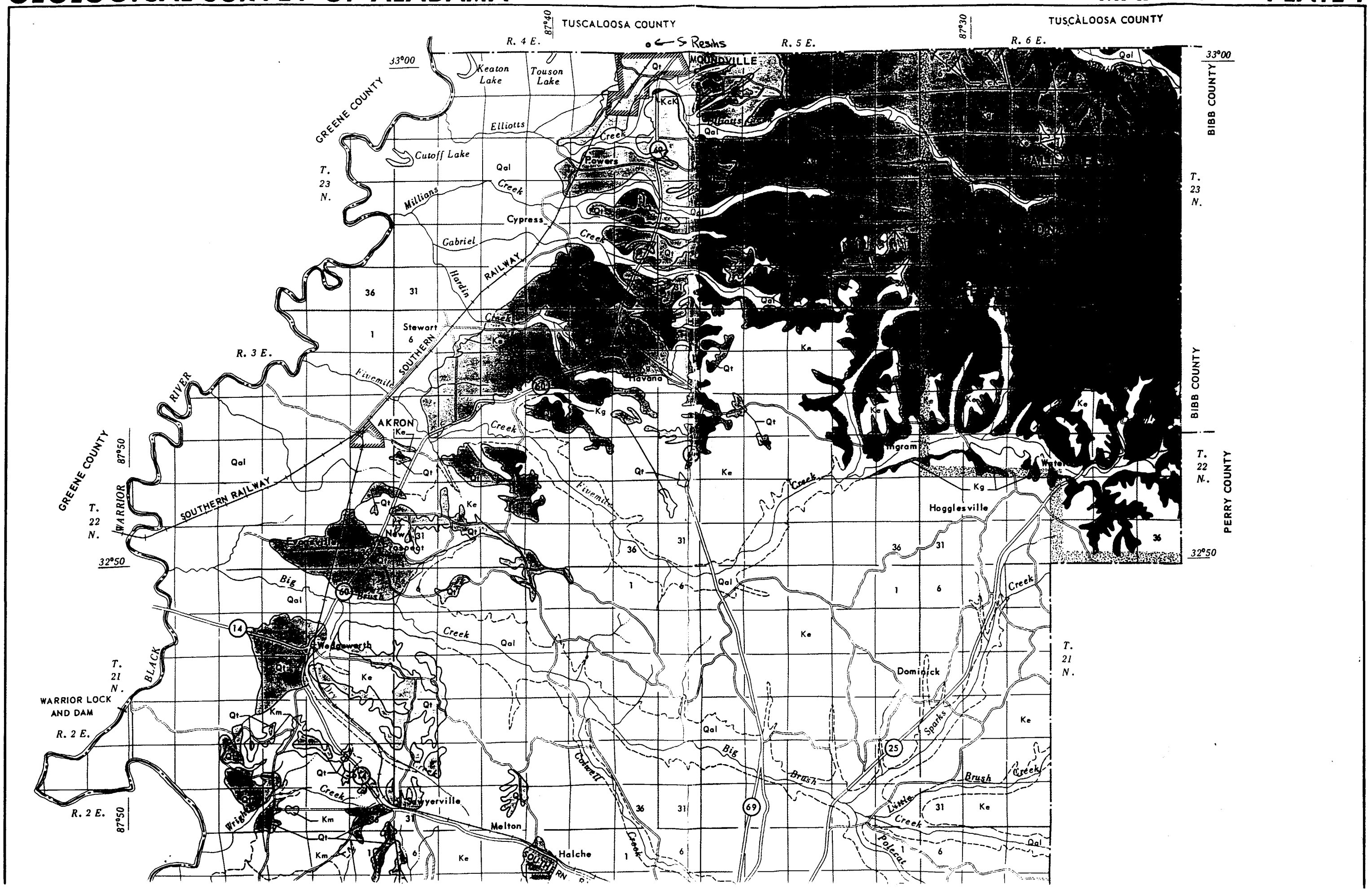
SURFACE WATER

AVERAGE FLOW

The long-term average flow of a stream, the arithmetic mean of all discharges for a long period of time, is a useful statistic for

Table 1.—*Summary of geologic units, lithology, and availability and quality of ground water in Hale County*

System	Series	Geologic unit		Thickness (feet)	Lithology	Availability of water	Quality of water
Quaternary	Holocene and Pleistocene	Alluvium		0-50±	Sand; gravel; clay; silt.	Yields adequate water supplies for domestic use; potential source of large supplies of water where aquifers are hydraulically connected with the Black Warrior River.	Water generally is of good quality; locally contains iron in excess of 0.3 mg/l.
	Pleistocene	Terrace deposits		0-50±	Gravel; sand; clay.	Yields adequate water supplies for domestic use; potential source of large supplies of water where aquifers are hydraulically connected with the Black Warrior River.	Water generally is of good quality; locally contains iron in excess of 0.3 mg/l.
Cretaceous	Upper Cretaceous	Selma Group	Demopolis Chalk	0-200±	Chalk, light-gray, fossiliferous.	Relatively impermeable; not a source of ground water.	
			Mooreville Chalk	300	Chalk, dark bluish-gray, silty, fossiliferous; compact calcareous fossiliferous sandstone in basal part of unit; hard limestone in upper part of unit.	Relatively impermeable; not a source of ground water.	
		Eutaw Formation		400±	Sand, gray to yellowish-brown, glauconitic; clay, light-gray to gray, laminated; shale, dark gray; thin to massive beds of fine- to coarse-grained glauconitic sand and light-gray to gray laminated clay in lower part; fine- to medium-grained fossiliferous glauconitic sand and, locally, thin beds of hard light-gray calcareous sandstone in upper part.	Principal aquifer in southern part of county; potential source of large supplies of water; will yield 1.5 mgd to individual wells from sand beds in lower part of formation in southern part of county; source of small supplies in northern part where unit is sufficiently saturated.	Water is soft to very hard; generally contains iron in excess of 0.3 mg/l from middle and lower parts of unit in central part of county. Water is soft and low in iron content from upper part of unit in southern part of county. Chloride content of water is more than 250 mg/l in extreme west-central part of county.
		Tuscaloosa Group	Gordo Formation	300-350	Sand and gravel, light-gray to brown; clay, light-gray to mottled red and gray; poorly sorted coarse-grained sand and chert gravel in lower part of formation; upper part consists of laminated to massive clay and lenticular sand beds.	Principal aquifer at Akron; potential source of large supplies of water; will yield 1.5 mgd to individual wells from sand beds in lower part of formation in central and southern parts of county; source of small to moderate supplies in northern part.	Water generally is soft; contains iron in excess of 0.3 mg/l except in local areas. Water is very hard and high in iron and chloride content in the extreme west-central part of the county.
			Coker Formation	500-600	Sand, yellowish-gray, fine- to coarse-grained; gravel; clay, olive-gray to yellowish-gray, sandy; clay predominates in upper part of formation; basal part of formation consists of coarse-grained sand and gravel.	Principal aquifer at Moundville; potential source of large supplies of water; will yield 1.5 mgd to individual wells from sand and gravel beds in lower part of formation in entire county.	Water is soft to very hard; contains iron in excess of 0.3 mg/l except in local areas. Chloride content of water is more than 250 mg/l in the extreme northwestern part of county.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TUSCALOOSA COUNTY
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BIBB COUNTY
PERRY COUNTY
GREENE COUNTY
WARRIOR LOCK AND DAM
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R. 6 E.
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Elliotts
Cutoff Lake
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Millians
Creek
Cypress
Gabriel
Hardin
RAILWAY
SOUTHERN
Stewart
Fivemile
AKRON
Havana
Ingram
Hogglesville
Evansville
New Prospect
Big
Brush
Wedgeworth
Dominick
Sparks
Little
Polecat
Sawyerville
Melton
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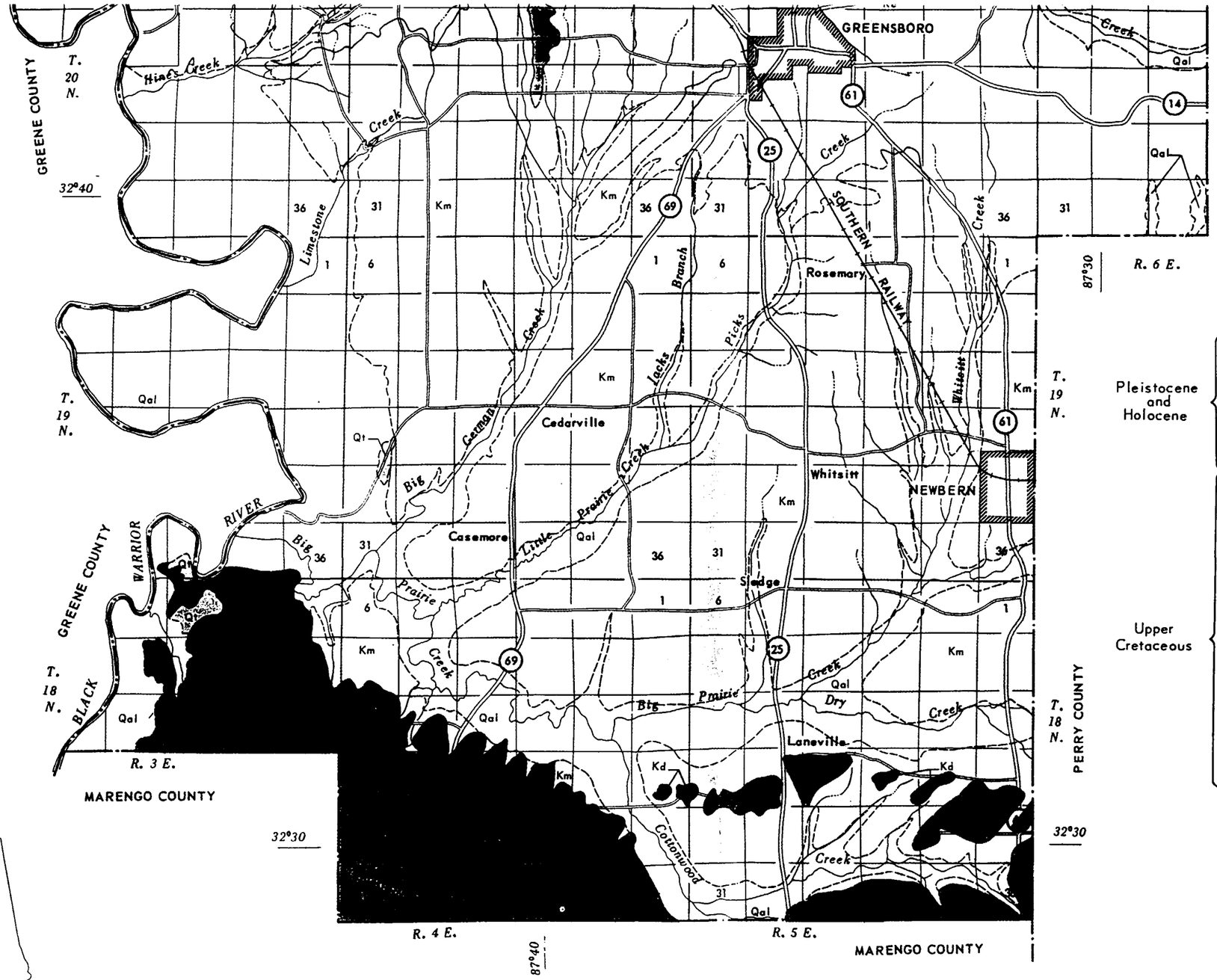
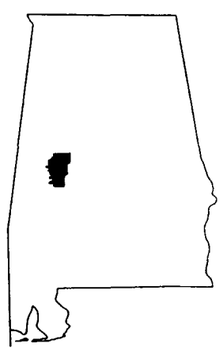


EXPLANATION

Pleistocene and Holocene	Qal — Alluvium	QUATERNARY
	Qt — Terrace deposits	
Upper Cretaceous	Selma Group: Km — Demopolis Chalk	CRETACEOUS
	Km — Mooreville Chalk	
	Ke — Eutaw Formation	
	Tuscaloosa Group: Kd — Gordo Formation	
	Kd — Coker Formation	

Contact: dashed where inferred



BASE MAP MODIFIED FROM ALABAMA HIGHWAY MAP AND FIELD NOTES

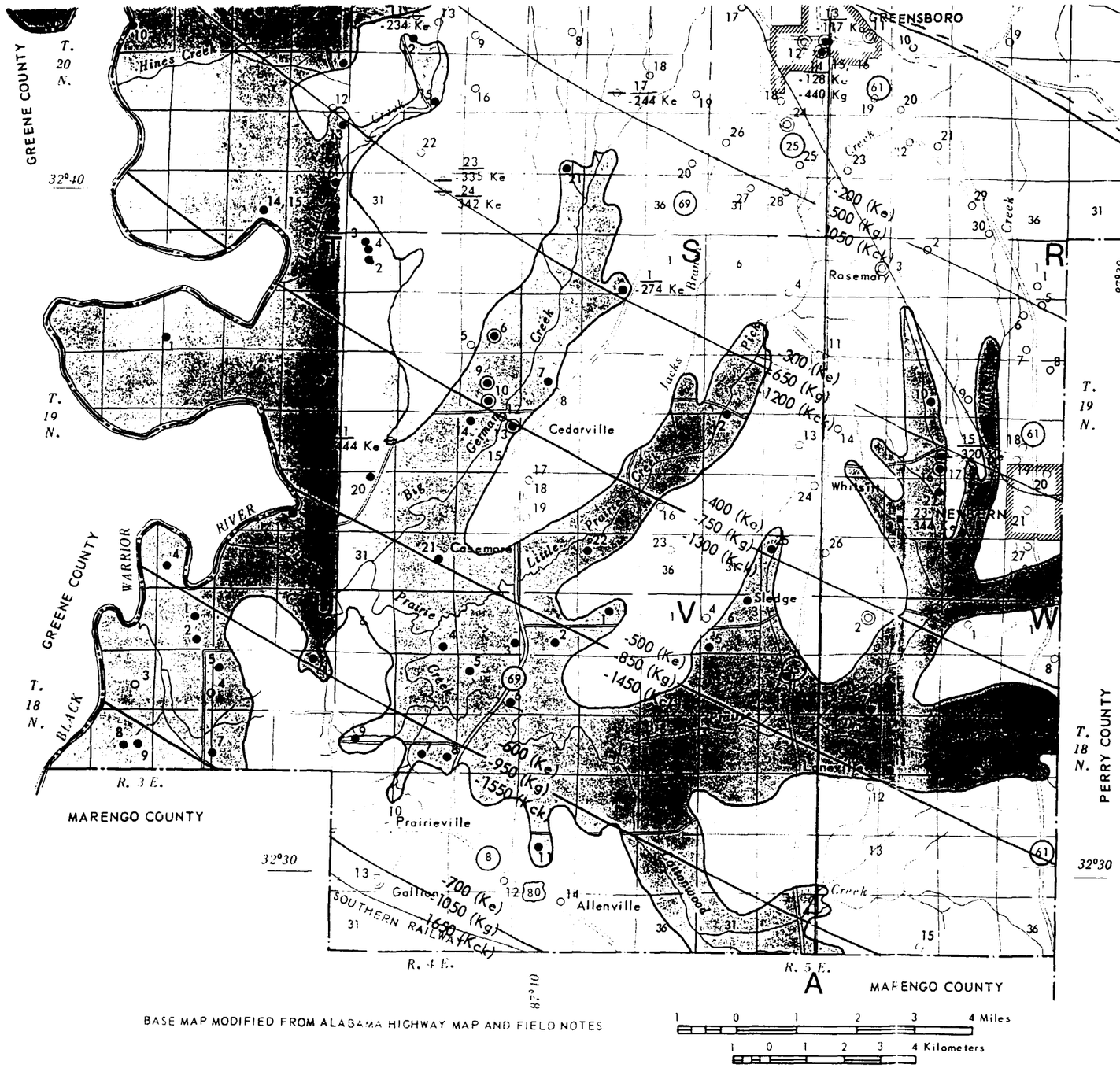
1 0 1 2 3 4 Miles

1 0 1 2 3 4 Kilometers

GEOLOGIC MAP OF HALE COUNTY, ALABAMA

BY
THOMAS H. SANFORD
1975

Prepared in cooperation with the
UNITED STATES GEOLOGICAL SURVEY



Area of artesian flow

Nonflowing well and number

Flowing well and number

Industrial or municipal nonflowing well and number

Industrial or municipal flowing well and number

Spring and number

Control well and number

Number above line is well number; number below line indicates elevation, in feet related to mean sea level of base of major aquifer (Eutaw Ke, Gordo Kg, Coker Kck).

-400 (Ke)
-750 (Kg)
-1300 (Kck)

Contour showing approximate elevation of base of indicated major aquifer capable of yielding 1.5 mgd to individual wells. Contour interval in feet is variable.

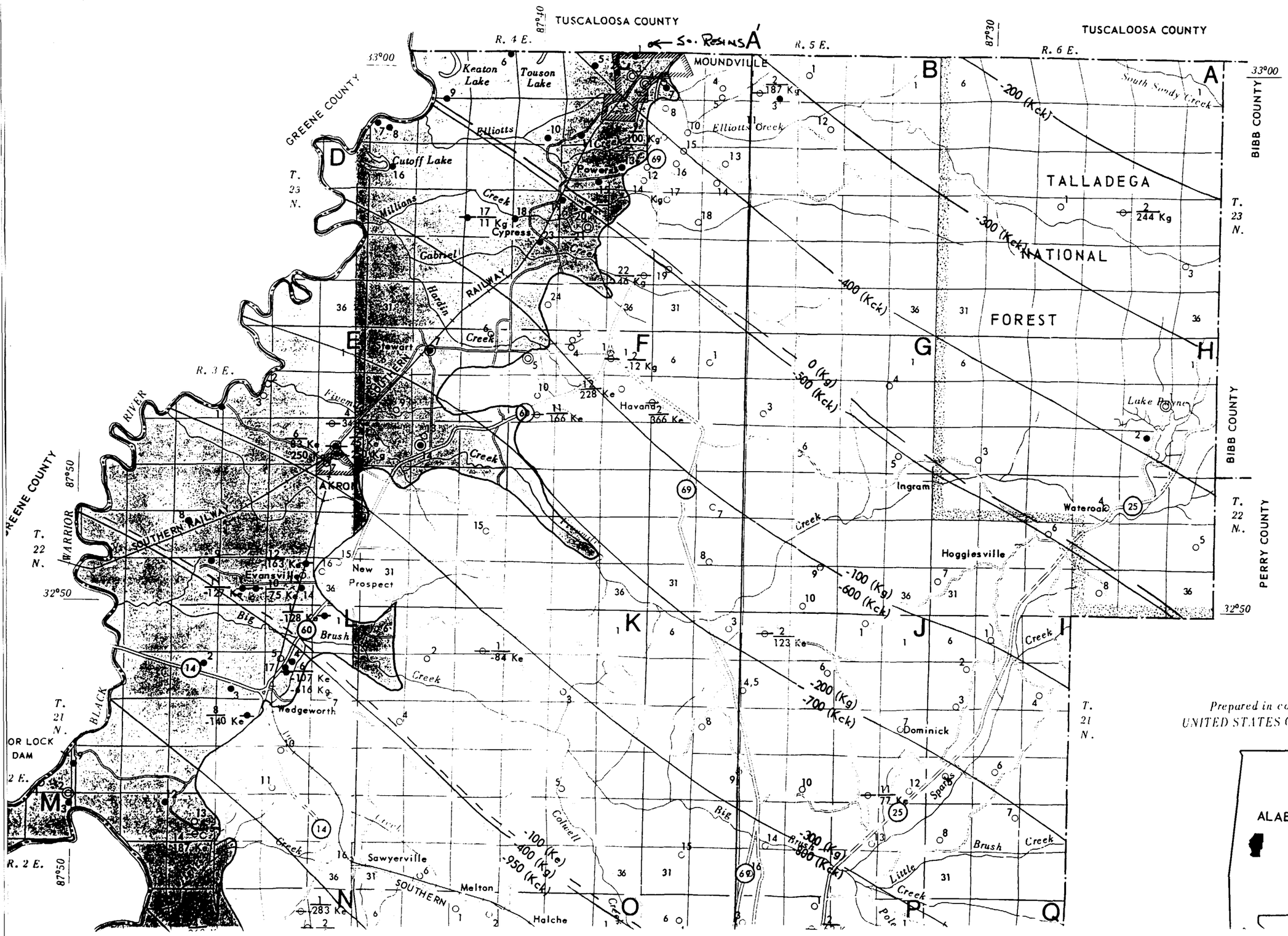
Northern extent of area in which major aquifer of the Eutaw Formation is capable of yielding 1.5 mgd to individual wells. Smaller supplies available north of this line.

Northern extent of area in which major aquifer of the Gordo Formation is capable of yielding 1.5 mgd to individual wells. Smaller supplies available north of this line.

Datum is mean sea level.

The numbering of wells and springs is based on the Federal Land classification system. Each township is divided into 36 sections, numbered from 1 in the northeastern corner to 36 in the southeastern corner. Similarly, each township is assigned a letter from A in the northeast township to W in the southwest township of the county. Wells are numbered consecutively 1, 2, 3, 4, in the same way that sections are numbered. For example; wells in township W would be designated W-1, W-2, W-3.

AVAILABILITY OF GROUND WATER IN HALE COUNTY, ALABAMA



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UNITED STATES GEOLOGICAL SURVEY

REFERENCE NO. 18

GEOLOGICAL SURVEY OF ALABAMA

WALTER B. JONES, STATE GEOLOGIST

Information Series 14

GEOLOGY AND GROUND-WATER RESOURCES OF TUSCALOOSA COUNTY ALABAMA

An Interim Report

By
J. D. Miller, Jr.
and
L. V. Causey

Prepared by the
United States Geological Survey
in cooperation with the
Tuscaloosa County Board of Revenue
and the
Geological Survey of Alabama

University, Alabama
1958

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ILLUSTRATIONS

(All plates are in pocket)

Plate 1. Map of Tuscaloosa County, Ala., showing locations of wells and springs.

2. Geologic cross section from Ralph to a point 4.5 miles northeast of Duncanville.

3. Geologic cross section from Ralph to a point 3 miles northeast of Samantha.

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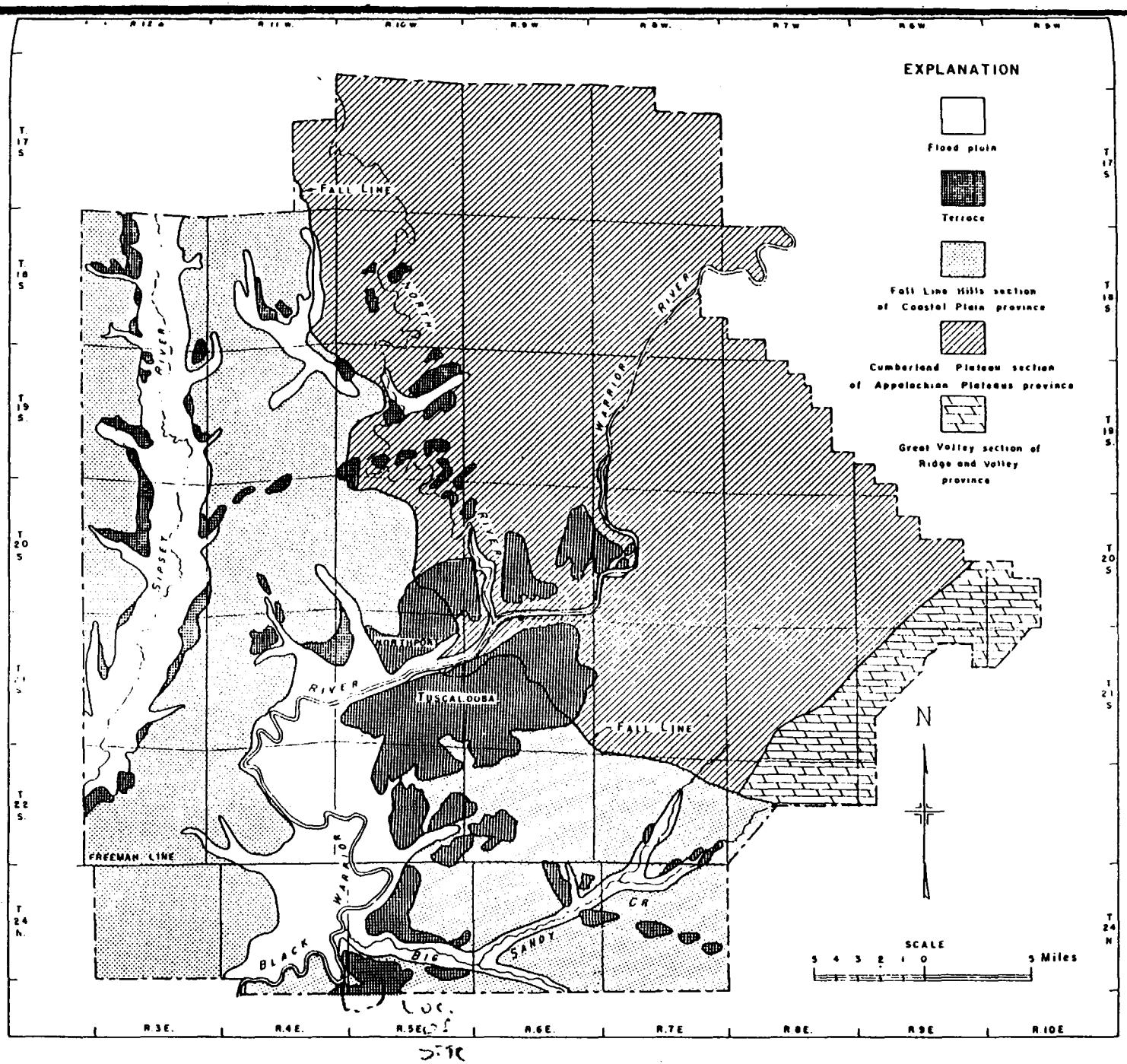


Figure 2.- Map of Tuscaloosa County, Ala., showing physiographic divisions

The Eutaw formation, of Late Cretaceous age, crops out in a small area in the southwest corner of the county, where it unconformably overlies the Gordo formation. It dips about 40 feet per mile to the southwest. The Eutaw consists predominantly of dark-red to rusty-brown sand containing lenses of gray to greenish-gray fissile clay and ranges in thickness from zero at the northern limit of its outcrop to about 50 feet in the southwest corner of the county. The basal part of the formation contains stringers of chert pebbles, which are an index to the contact with the underlying Gordo formation. The Eutaw formation is not an important source of water supply within the county; however, a few shallow wells used for domestic and stock supplies are dug in its basal sand and gravel.

Terrace deposits of Quaternary age, consisting of as much as 50 feet of sand, gravel, and clay, adjoin the flood plains of the Black Warrior and Sipsey Rivers and their tributary streams. Their distribution is shown in figure 2. They unconformably overlie older formations and occur at altitudes of 100 to 300 feet above the present Black Warrior River flood plain. The best preserved terrace in the county is that on which the city of Tuscaloosa and the University of Alabama are located. A few wells in these terrace deposits yield as much as 50 gpm each.

Quaternary alluvium, consisting of as much as 60 feet of sand, gravel, and clay, is present in most places along the Black Warrior and Sipsey Rivers and their tributaries. Many shallow wells in the southwestern part of the county obtain water for domestic and stock use from the alluvium. Some sand and gravel beds are very permeable, and in a few areas adjacent to the Black Warrior and Sipsey Rivers conditions are favorable for the construction of wells yielding as much as 1,000 gpm. Construction of large-capacity wells penetrating these beds should be preceded by test drilling and test pumping to determine the local extent of the permeable water-bearing deposits and their connection with the adjacent streams, which may serve as sources of abundant recharge.

GROUND WATER

Ground water is water that is below the land surface in the zone of saturation, where the rocks are saturated with water under hydrostatic pressure (pressure greater than atmosphere). The top of this zone is called the water table, and its position is shown by the level at which water stands in nonartesian wells. Only the water in the zone of saturation can be pumped from wells or will supply the flow to springs. Ground water is derived from precipitation, which in Alabama is chiefly rain. A part of the precipitation on the land surface runs off immediately and becomes streamflow, collects in ponds, or flows to the oceans; a part returns to the atmosphere by evaporation and by transpiration of plants, and a part seeps downward through the soil and rocks to become ground

water. The ground water moves from higher to lower levels, generally but not necessarily down the dip of the bedding, later to seep into bodies of surface water or to be discharged into the atmosphere by evaporation and transpiration.

Water infiltrating the soil first enters a zone of aeration (fig. 3), which lies between the land surface and the zone of saturation. A part of the water entering the zone of aeration is used to satisfy soil-moisture requirements, being held in this zone by molecular forces which counteract the force of gravity, and a part seeps downward into the zone of saturation.

Occurrence and Storage

Ground water occurs in the rocks of the earth's crust, in open spaces between the particles composing the rocks, and in fractures and openings along bedding planes. The number, size, shape, and distribution of these openings vary with location and rock type, and they control the storage and movement of ground water.

The porosity of a rock is its property of containing voids or open spaces. Porosity is the ratio, expressed as a percentage, of open space in a rock to the total volume of the rock. It is influenced by the size, shape, and arrangement and the degree of sorting, compaction, and cementation of the particles, and by the amount of fracturing, solution, and recrystallization of the rock after its initial formation.

The permeability of a rock is its ability to transmit water under a hydraulic gradient. It may be expressed as the rate, in gallons per day (gpd), at which water will flow through a cross section of the rock 1 foot square, under a unit hydraulic gradient (a loss in head of 1 foot for each foot of travel of the water, regardless of the direction of movement). Clay generally has a high porosity but a low permeability because its numerous pore spaces are very small. Sand or gravel may have a lower porosity than clay but a higher permeability because the interconnected open spaces are large. Permeable rock zones through which ground water moves freely enough to supply wells are called "aquifers."

Water-Table and Artesian Conditions

The water table is the upper surface of the zone of saturation except where that surface is formed by the bottom of a bed of clay or other relatively impermeable material which confines the water under artesian pressure (fig. 4). Unconfined water in the zone of saturation moves slowly through the rocks in a direction determined by the slope of the water

table. The water table is not a level or stationary surface; its variations from place to place and from time to time in shape and elevation are controlled by the permeability and structure of the rocks, variations in rainfall which affect the rate of recharge, and variations in the rate of discharge of water through wells and springs.

Artesian water is ground water that is confined under pressure by relatively impermeable overlying and underlying rocks (the confining beds, fig. 4). It occurs where rainfall and runoff have seeped into an aquifer and have passed between beds of clay or other relatively impermeable material.

The pressure exerted on ground water by the weight of water at higher levels is known as hydrostatic pressure.

Under artesian conditions the hydrostatic pressure is sufficient to cause the water in a well to rise above the bottom of the confining bed. The imaginary surface to which water will rise in tightly cased artesian wells is called the "piezometric surface." An artesian well will flow if the piezometric surface is higher than the land surface.

Water-Table and Artesian Systems in Tuscaloosa County

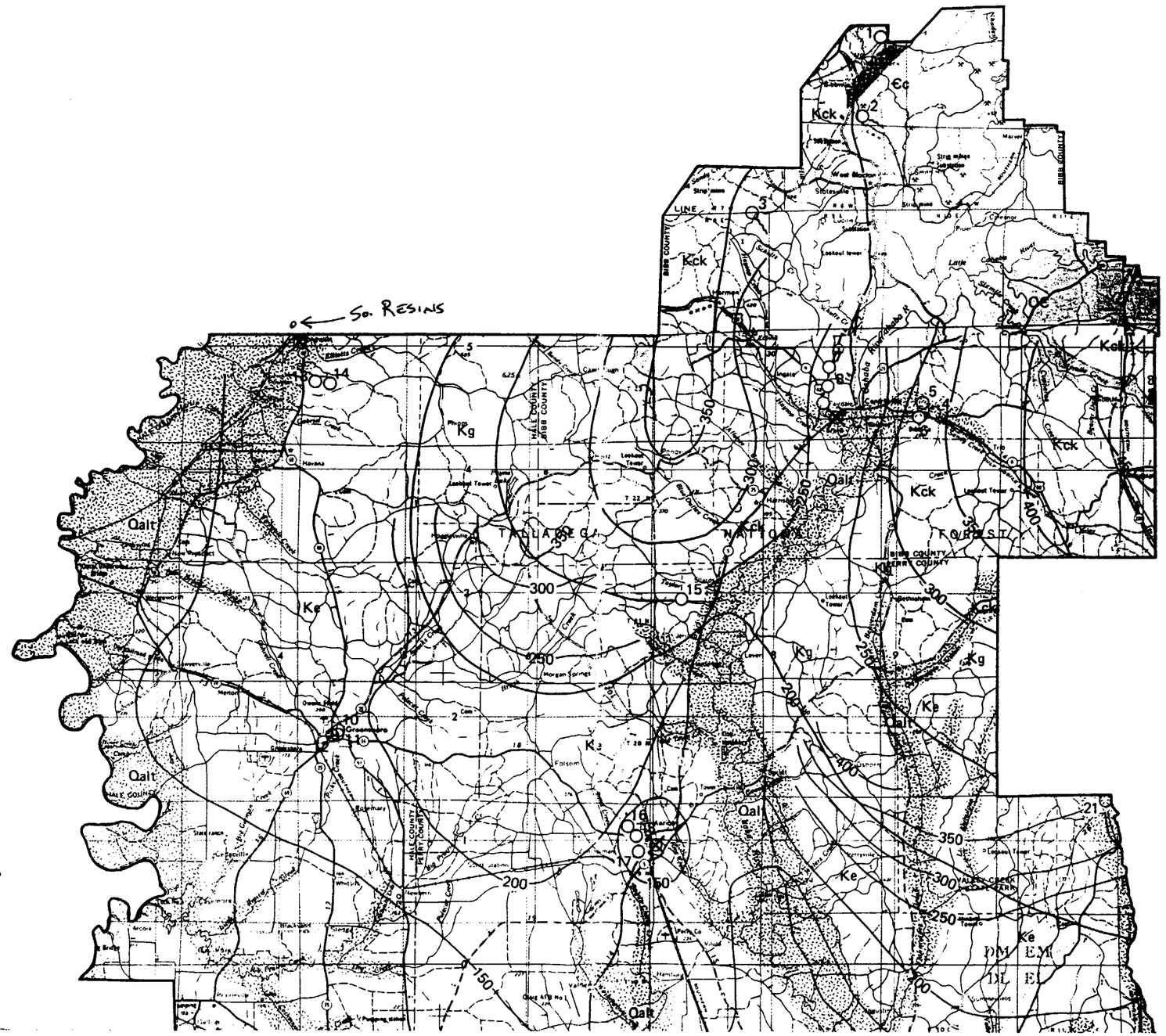
The water in the alluvial and terrace deposits and in the area of outcrop of sand beds in the Eutaw, Gordo, and Coker formations occurs under water-table conditions. Shallow dug, bored and drilled wells in these beds supply water to most of the rural population in the southwestern half of the county. The water levels in these shallow wells respond quickly to precipitation or to its lack; during periods of drought many of the shallow wells become dry because the water table declines below the bottom of the well.

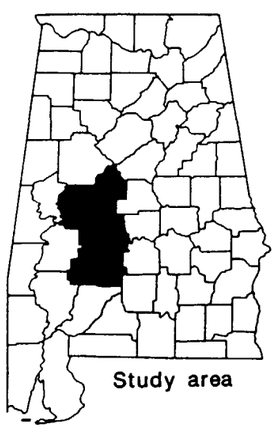
In Tuscaloosa County artesian wells can be obtained in the water-bearing sand and gravel beds in the Coker formation and the sandstone, shale, and coal beds in the Pottsville formation (pl. 1). Four flowing wells (A-8, F-3, H-16, I-6) yield water from the Pottsville formation in lowland areas in the northeastern and central parts of the county (table 1; pl. 1). Because few data are available, these artesian areas cannot be defined. Flows of about 1 gpm or less are obtained from wells in the Pottsville formation and the water is used for domestic purposes and for stock. About 90 wells in the Coker formation in lowland areas adjacent to the Black Warrior and Sipsey Rivers and their tributaries (pl. 1) flow, yielding less than 1 to about 150 gpm. Well QQ-41, at the plant of the Southern Pine Chemical Recovery Corp. at Hull, had a flow of 150 gpm and a pressure head of 10.2 feet above the land surface on October 15, 1956. Approximately 3.2 mgd of water, equivalent

DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
ALABAMA DEPARTMENT OF ENVIRONMENTAL
MANAGEMENT

WATER RESOURCE INVESTIGATIONS
REPORT 87-4109 PLATE 1





EXPLANATION

RECHARGE AREAS FOR PRIMARY AQUIFERS
(Areas susceptible to contamination--Modified from Adams and others, 1926).

Quaternary — Qalt — Alluvial and terrace deposit aquifers.

Tertiary
- Tallahatta not shown due to scale.
- Tha — Hatchetigbee } Lisbon aquifer
- Ttu — Tuscahoma Sand } Lisbon aquifer
- Nanafalia aquifer

Cretaceous
- Kr — Ripley aquifer
- Ke — Eutaw aquifer } Tuscaloosa aquifer
- Kg — Gordo aquifer } Tuscaloosa aquifer
- Kc — Coker aquifer

Paleozoic
- OЄ — Cambrian–Ordovician Limestone and Dolomite aquifers
- Conasauga aquifer

—200— POTENTIOMETRIC CONTOUR OF THE TUSCALOOSA AQUIFER--Shows altitude at which water level would have stood in tightly cased wells (1982). Hachures indicate depression. Contour interval 50 feet. Datum is sea level.

—150— POTENTIOMETRIC CONTOUR OF THE EUTAW AQUIFER--Shows altitude at which water level would have stood in tightly cased wells (1982). Hachures indicate depression. Contour interval 50 feet. Datum is sea level.

—50— POTENTIOMETRIC CONTOUR OF THE RIPLEY AQUIFER--Shows altitude at which water level would have stood in tightly cased wells (1982). Hachures indicate depression. Contour interval 50 feet. Datum is sea level.

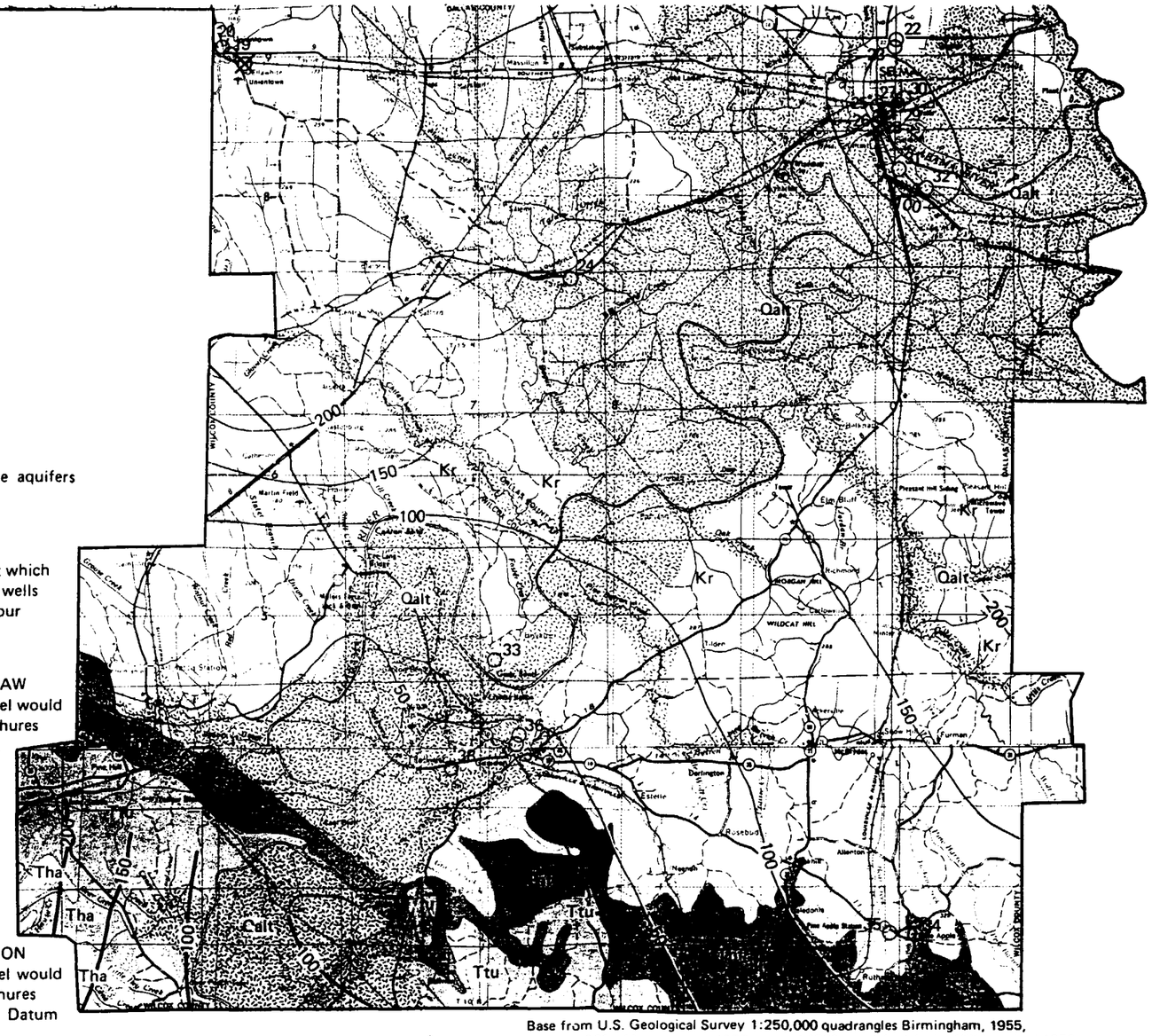
—100— POTENTIOMETRIC CONTOUR OF THE LISBON AQUIFER--Shows altitude at which water level would have stood in tightly cased wells (1982). Hachures indicate depression. Contour interval 50 feet. Datum is sea level.

AQUIFER BOUNDARY CONCEALED BY ALLUVIAL AND TERRACE DEPOSITS

1 PUBLIC WATER–SUPPLY WELL--Numbers correspond to those given in table 1.

2 PUBLIC WATER–SUPPLY SPRING--Numbers correspond to those given in table 1.

ABANDONED PUBLIC WATER–SUPPLY WELL.



Base from U.S. Geological Survey 1:250,000 quadrangles Birmingham, 1955, revised 1969: Montgomery, 1955, revised 1969: and Andalusia, 1954, revised 1970

0 5 10 15 20 Miles

0 5 10 15 20 Kilometers

RECHARGE AREAS AND POTENTIOMETRIC SURFACES OF THE MAJOR AQUIFERS, AREAS SUSCEPTIBLE TO CONTAMINATION, AND LOCATIONS OF PUBLIC WATER-SUPPLY WELLS

REFERENCE NO. 19

GEOHYDROLOGY AND SUSCEPTIBILITY OF MAJOR AQUIFERS TO SURFACE CONTAMINATION IN ALABAMA; AREA 7

by Will S. Mooty

U.S. GEOLOGICAL SURVEY

Water-Resources Investigations Report 87-4109

Prepared in cooperation with the

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Tuscaloosa, Alabama

1987

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Cretaceous Formations

Sedimentary deposits of Late Cretaceous age overlie the Paleozoic rocks throughout all of Hale and Perry Counties, most of Bibb and Dallas Counties, and a small part of Wilcox County. These deposits include, from the oldest to the youngest: the Coker and Gordo Formations of the Tuscaloosa Group; the Eutaw Formation; the Mooreville and Demopolis Chalks, the Ripley Formation, and the Prairie Bluff Chalk of the Selma Group. These formations strike southeastward and dip south to southwest at 30 to 50 feet per mile. They consist of sedimentary deposits of sand, gravel, clay, and chalk, most of which were deposited in relatively shallow marine waters, but some of which were deposited by streams on low plains that bordered the coast.

Coker Formation

The Coker Formation crops out in central Bibb County and a small part of northern Hale and Perry Counties (fig. 2). The Coker underlies all of the study area south of its outcrop area and is one of the major aquifers in the northern half of the study area. The Coker Formation ranges in thickness from 600 feet at its outcrop to 1,100 feet in the subsurface in the southern part of the study area (Kidd, 1976). The Coker consists of basal nonmarine zone of sand, gravel, and clay that was deposited in a deltaic environment. The coarser sand beds and the beds of gravel are near the bottom of the formation. The beds are about 25 feet thick and in places more than 100 feet thick. The gravel contains large amounts of quartz pebbles derived from the underlying Pottsville Formation. The upper part of the formation consists chiefly of clay and sandy clay containing some lenses of micaceous and glauconitic sand. A clay zone is usually present at the top of the Coker. This clay is a confining unit between the Coker aquifer and the overlying Gordo aquifer fig. 3).

The coarse sand and gravel beds of the Coker are developed for public water supplies by the city of Selma, by the towns of Plantersville and Moundville, and by the county system for Perry County. It has not been developed as a source of water supply south of Selma due to the excessive depth of the aquifer where the much shallower Gordo and Eutaw aquifers are available. Wells that tap the Coker have a potential production capacity of 1,000 gal/min in some areas, but most wells are pumped at 200 gal/min or less.

The chloride concentration of water in the Coker aquifer is less than 250 mg/L (milligrams per liter), except in parts of Hale County near the Black Warrior River and farther downdip in Wilcox County.

Gordo Formation

The Gordo Formation overlies the Coker and underlies all of the study area south of its outcrop in northeastern Hale County, southern Bibb County, northern Perry County, and northeastern Dallas County (figs. 2 and 3). The Gordo consists of a massive clay bed overlying alternating beds of sand and varicolored mottled clay with a basal zone of gravelly sand. The Gordo ranges in thickness from about 100 feet at its outcrop to more than 400 feet in the subsurface in the southern part of the study area.

The alluvial deposits are a potential source of water for large supplies in the flood plains of the major rivers in the area but have not been developed for public water supply systems.

HYDROLOGY OF THE MAJOR AQUIFERS

The major aquifers in the study area are the limestones and dolomites of the Conasauga Formation and the Copper Ridge and Chepultepec Dolomites of the Knox group, and the sand and gravel beds of the Coker, Gordo, Eutaw, and Ripley Formations.

Only a small part of southwestern Wilcox County recharges the Lisbon aquifer in the Lisbon Formation. Because the Lisbon is not a major aquifer in the study area, it will not be discussed in this report. The Lisbon is a major aquifer south of the study area.

Recharge and Movement of Ground Water

The source of recharge to the major aquifers is precipitation which averages about 50 to 60 inches per year in the study area (National Oceanic and Atmospheric Administration, 1985). The recharge area for each aquifer is approximately equivalent to its outcrop area except for those parts of the formations that consist of unfractured, noncarbonate rock.

Recharge to the Conasauga, Copper Ridge, and Chepultepec aquifers occurs in northern Bibb, western Tuscaloosa, southern Jefferson, and western Shelby Counties (plate 1). The recharge area, covering approximately 50 to 55 square miles within the study area, is a series of complexly folded and faulted rocks (plate 1). The area is primarily wooded with a few acres of pastureland. Very little cultivated land is found in the area due to its rocky nature. Ground water in these aquifers is stored and transmitted in secondary pores, consisting of joints, fractures, and bedding planes that have been enlarged by solution. The Conasauga, Copper Ridge, and the Chepultepec are solution-channel aquifers. The yields of a well in these aquifers depends on the number, size, and interconnection of the solution channels the well penetrates (Moffett, 1976).

A potentiometric surface for the aquifers is difficult to determine in these areas because of the complexities of the folds and faults in the formations. However, water movement in these aquifers generally follows the direction of the valleys on a regional basis. Locally, it follows the topography of the land. Springs commonly occur where the land surface is below the potentiometric surface of the aquifer. Fractures in the formations allow water to flow from the springs. Ground water discharges as surface runoff that may disappear into sinkholes or fractures somewhere downstream to become ground water once again.

The recharge area for the Coker aquifer in the study area is in Bibb County with small areas in Hale and Perry Counties (plate 1) and covers approximately 336 square miles. The recharge area for the Gordo aquifer is in

ground-water flow compared to the rate of flow in a sand aquifer. In the area underlain by limestone and dolomite, some sinkholes exist (U.S. Geological Survey, 1977). Figure 4 outlines the areas within the study area where sinkholes exist or could occur in the future. These sinkholes commonly are in direct connection to the water table from the land surface. A contaminant released in the area of a sinkhole could quickly affect the quality of water in the aquifers in the area.

The towns of Brent and Centreville have their public water-supply wells in the same dolomite formations as Green Pond and West Blocton. The wells are about 100 to 300 feet deep. The area in the vicinity of the wells is covered by alluvial and terrace deposits near the Cahaba River and the sandy deposits of the Coker Formation in other areas. These formations are highly permeable and cause the aquifers to be highly susceptible to contamination from the land surface. Sinkholes are present near Centreville and make the area highly susceptible to land-surface contamination. A significant fact here is that the large metropolitan areas of neighboring Jefferson and Shelby counties lie in the Valley and Ridge province. The direction of ground-water movement is from metropolitan areas, down the valleys, toward Bibb County and toward the recharge area for the major aquifers in the area. This increases the possibility of a contaminant entering the aquifer system in northern Bibb County.

Other areas of high susceptibility to contamination occur where alluvial deposits overlie recharge areas for the major aquifers (fig. 4). These areas are relatively flat, which causes surface runoff to be much slower; thus, water has a longer period of time to seep into the ground. Normally, the alluvial plains are areas of ground-water discharge to the rivers and streams. However, if a large pumping center is on the alluvial plain, the decline of water levels in the aquifer caused by ground-water withdrawals could be sufficient to reverse the direction of ground-water flow--that is, streams then would recharge aquifers under the alluvial plain deposits.

An area of alluvial deposits overlies the Eutaw Formation outcrop northeast of Selma's well field. Ground-water movement in this area is to the southwest. Withdrawals of water from the Selma well field has caused a significant cone of depression in the potentiometric surface of the Eutaw aquifer. An increase in the slope of the depression indicates an increase in the flow of water towards the center of the cone. A contaminant released in this area would almost certainly migrate towards the withdrawal point from the Eutaw aquifer in the Selma well field. The Tuscaloosa (Coker and Gordo Formations) aquifer, which Selma also uses for water supply is overlain by layers of clay that prevent or retard any vertical movement of water or contaminants into the aquifers in this area.

Water from remaining municipal water-supply wells in the study area are not in as much danger of contamination as the water in Bibb and Dallas Counties. All remaining wells are generally deeper than 300 to 400 feet. Within the overlying sediments are confining beds of clay and chalk that would prevent most land-surface contaminants from reaching the aquifer.

Table 1.--Records of public water-supply wells and springs in the study area

NOTE: Well numbers correspond to those shown on plate 1.

Geographic coordinate number: Lat (DDMMSS) Long (DDMMSS).

Depth of well and water level: Depth of well given in feet; reported water levels are in feet above (-) or below land surface; measured water levels are in feet and tenths.

Well diameter: Casing diameter in inches.

Water-bearing unit: Cc, Conasauga Formation; OCccu, Copper Ridge Dolomite and Chepultepec Dolomite undifferentiated; Kc, Coker Formation; Kg, Gordo Formation; Ke, Eutaw Formation; Kr, Ripley Formation.

Altitude of land surface: Altitudes given in feet above sea level, from topographic map or determined by aneroid barometer.

Method of lift: S, submergible; T, turbine; F, flowing.

Use of well: N, none; P, public water supply.

Well number	Geographic coordinate number	Well owner	Driller and year drilled	Well depth (feet)	Well diam. (inches)	Water bearing unit	Altitude of land surface	Water level above (+) or below Land Surface Datum	Date of measurement	Method of lift	Use of well	Remarks
1	3314000870740	Green Pond Water System	Southern Well Supply Co. 1965	240	6	Cc	580	106	6/01/66	T	P	Casing: 6 in. from surface to 239 ft; none below. Supplies community of Green Pond. Reported drawdown 11 ft after 40 days pumping 170 gal/min in 1966.
2	3309460870849	Green Pond Water System		spring		OCccu	460			F	P	
3	3305100871436	West Blocton Water Works		spring		OCccu	335			F	P	Known as Williams Spring. Estimated flow 750 gal/min on 10/25/67. Reportedly pumped about 3,000 gal/min during test in 1967.
4	3256210870444	Centreville Water & Sewer		358		OCccu	275				N	
5	3256360870536	Centreville Water and Sewer	H.W. Peerson Supply Co. 1962	110	6	OCccu	260	16	1962	T	P	Casing: 6 in. from surface to 78 ft; none below. Reported drawdown 70 ft after 24 hrs pumping 180 gal/min in 1962.
6	3256130870512	Centreville Water and Sewer	Acme Drilling Co. 1962	119	8	OCccu	252	23	1963	T	P	Casing: 8 in. from surface to 101 ft; none below. Reported drawdown 35 ft after 8 hrs pumping 343 gal/min in 1963.
7	3258200871008	Brent Utilities Board	Layne-Central Co. 1971	600	6	OCccu	280				N	Casing to 60 ft; none below.
8	3257250871027	Brent Utilities Board	Graves Well Drilling 1971	500	6	OCccu	295	90	7-87	T	P	Casing to 56 ft; none below. Reported pump capacity 133 gal/min.
9	3256310871032	Brent Utilities Board	Graves Well Drilling 1971	315	12	OCccu	255	38	7-87	T	P	Casing to 95 ft; none below. Reported pump capacity 500 gal/min.

Table 1.--Records of public water-supply wells and springs in the study area--Continued

Well number	Geographic coordinate number	Well owner	Driller and year drilled	Well depth (feet)	Well diam. (inches)	Water bearing unit	Altitude of land surface	Water level above (+) or below Land Surface Datum	Date of measurement	Method of lift	Use of well	Remarks
10	3242110873533	Greensboro Utilities Dept.	Layne-Central Co. 1957	706	18,10	Kg	287	117	1957	T	P	Casing: 18 in. from surface to 621 ft; 10 in. from 537 to 635.5 ft; 10 in. screen between 635.5 and 705.5 ft; 12 in. gravel wall from 606 to 706 ft. Drawdown 17 ft after 8 hrs pumping 618 gal/min in 1957.
11	3242100873540	Greensboro Utilities Dept.	Layne-Central Co. 1929	390	18, 8	Ke	258	84	1929	T	N	Casing: 18 in. from surface to 100 ft; 8 in. from surface to 370 ft; 8 in. screen between 370 and 390 ft.
12	3242160873523	Greensboro Utilities Dept.	Layne-Central Co. 1950	710	16,8	Kg	259	89.4	1952	T	P	Casing:16 in. from surface to 630 ft; 8 in. screen between 630 and 700 ft; 8 in. from 700 to 710 ft. Drawdown 23 ft after 8 hrs pumping 545 gal/min in 1950.
13	3257150873709	Moundville Water Works	Graves Well Drilling 1972	233	16	Kg	180	58	5-87	T	P	Reported pump capacity 500 gal/min.
14	3257110873627	Moundville Water Works	Graves Well Drilling 1981	240	16	Kg	200	26	5-87	T	P	Reported pump capacity 500 gal/min.
15	3248120871703	Perry Co. Water & Fire	Graves Well Drilling 1981	600	8	Kc	260	55	5-25-87	T	P	Casing: 8 in. from surface to 494 ft; 4 in. screen from 494 to 537 ft; 106 ft of lap pipe.
16	3238090872026	Marion Water Dept.	Layne-Central Co. 1970	674	16,10	Kg	360			T	P	Casing: 16 in. from surface to 405 ft; 10 in. from 325 to 405 ft; 10 in. screen between 410 and 450 ft. and between 560 and 600 ft.
17	3237160871933	Marion Water Dept.	Layne-Central 1963	391	16,10	Ke	315	163.42	10-21-86	T	P	Casing: 16 in. from surface to 292 ft; 297 ft; 10 in. screen from 297 to 347 ft.
18	3237560872003	Marion Water Dept.	Layne-Central Co.	516	18	Kg	350			T	P	Casing 513 ft. Reported pump capacity 800 gal/min.

TELEPHONE CONTACT SUMMARY

BA ll 03/17/93

CALL MADE BY: Aparna Undrakonda
ORGANIZATION: Dynamac Corporation
DATE: 8/6/92
TIME: 11:40 AM

REGION: IV
SITE: Southern Resins Division
EPA ID NO.: ALD004034138

PERSON CONTACTED:

NAME: Armon Rogers
TITLE: Manager
PHONE NO.: 1-205-371-2641
ORGANIZATION: Moundville Water System
CITY, STATE: Moundville,Alabama

GENERAL SUBJECT:

Water supply in Moundville area.

CONVERSATION SUMMARY:

Moundville Water System supplies water to about 800 connections in the Moundville area and gets its water from the two municipal wells located within the four-mile radius of the Southern Resins Division.

TELEPHONE CONTACT SUMMARY

03/17/93

CALL MADE BY: Aparna Undrakonda
ORGANIZATION: Dynamac Corporation
DATE: 8/6/92
TIME: 11:30 AM

REGION: IV
SITE: Southern Resins Division
EPA ID NO.: ALD004034138

PERSON CONTACTED:

NAME: Sercy Rhodes
TITLE: Manager
PHONE NO.: 1-205-624-8868
ORGANIZATION: Hale County Water System
CITY, STATE: Moundville,Alabama

GENERAL SUBJECT:

Water supply in Moundville area.

CONVERSATION SUMMARY:

Hale County Water System purchases water from Moundville Water System and distributes to about 2223 connections.

TELEPHONE CONTACT SUMMARY

03/17/93

CALL MADE BY: Aparna Undrakonda
ORGANIZATION: Dynamac Corporation
DATE: 8/6/92
TIME: 11:30 am

REGION: IV
SITE: Southern Resins Division
EPA ID NO.: ALD004034138

PERSON CONTACTED:

NAME: Sercy Rhodes
TITLE: Manager
PHONE NO.: 1-205-624-8868
ORGANIZATION: Inglewood-Hulls Water System
CITY, STATE: Moundville,Alabama

GENERAL SUBJECT:

Water supply in Moundville area.

CONVERSATION SUMMARY:

Inglewood-Hulls Water System purchases water from City of Tuscaloosa. It distributes water to about 846 connections. The source water is surface water.

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

REFERENCE NO. 23

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

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

State County Place and (In Selected States) County Subdivision	Persons in households	All households	Family households: Total	Family households: Married-couple family	Family households: Female householder, no husband present	Nonfamily households: Total	Nonfamily households: Householder living alone: Total	Nonfamily households: Householder living alone: 65 years and over: Total	Nonfamily households: Householder living alone: 65 years and over: Female	Persons per— Household	Persons per— Family	Persons in group quarters: Total	Persons in group quarters: Institutionalized persons	Persons in group quarters: Other persons in group quarters
The State	3 948 186	1 508 790	1 100 836	850 327	201 228	402 966	356 078	154 191	123 608	2.62	3.13	92 402	51 583	40 819
COUNTY														
Autauga County	34 028	11 826	9 501	7 706	1 437	2 325	2 003	933	746	2.88	3.27	194	173	21
Baldwin County	97 144	37 044	28 142	23 512	3 716	8 902	7 923	3 717	2 874	2.62	3.06	1 136	759	377
Barbour County	24 644	9 218	6 687	4 869	1 518	2 531	2 340	1 218	981	2.70	3.28	573	539	34
Bibb County	16 333	5 745	4 478	3 828	650	1 267	1 164	628	518	2.84	3.29	243	225	18
Blount County	39 047	14 644	11 654	10 130	1 160	2 990	2 788	1 500	1 242	2.67	3.05	201	182	19
Bullock County	10 369	3 787	2 712	1 590	979	1 075	1 021	592	458	2.74	3.35	673	673	-
Butler County	21 647	7 935	5 825	4 261	1 289	2 110	1 987	1 174	925	2.73	3.29	205	205	-
Calhoun County	111 127	42 983	31 718	25 111	5 346	11 265	9 965	4 215	3 477	2.59	3.08	4 907	954	3 953
Chambers County	36 502	13 786	10 219	7 564	2 189	3 567	3 289	1 794	1 429	2.65	3.15	374	363	11
Cherokee County	19 466	7 466	5 860	4 984	666	1 606	1 523	828	653	2.61	3.01	77	76	1
Chilton County	32 228	12 114	9 352	7 773	1 218	2 762	2 552	1 358	1 073	2.66	3.09	230	212	18
Choctaw County	15 941	5 747	4 313	3 291	831	1 434	1 370	705	528	2.77	3.32	77	77	-
Clarke County	26 935	9 506	7 192	5 498	1 404	2 314	2 184	1 138	868	2.83	3.37	305	303	2
Clay County	13 084	5 000	3 794	3 188	485	1 206	1 153	646	525	2.62	3.09	168	166	-
Cleburne County	12 662	4 776	3 748	3 212	384	1 028	955	499	408	2.65	3.05	68	67	1
Coffee County	38 788	15 280	11 570	9 546	1 630	3 800	3 315	1 525	1 238	2.61	3.05	452	364	88
Colbert County	51 379	20 096	15 174	12 410	2 278	4 922	4 592	2 291	1 873	2.56	3.01	287	239	48
Conecuh County	13 948	5 259	3 809	2 928	808	1 361	1 302	750	594	2.65	3.18	106	92	14
Coosa County	10 907	4 017	3 095	2 489	478	922	855	418	306	2.72	3.17	156	156	-
Covington County	36 141	14 444	10 474	8 440	1 629	3 970	3 707	2 078	1 684	2.50	3.01	337	284	53
Crenshaw County	13 495	5 282	3 786	2 870	747	1 476	1 407	831	640	2.56	3.12	140	140	-
Cullman County	66 715	25 805	19 815	17 165	2 093	5 990	5 284	2 729	2 237	2.61	3.02	898	717	181
Dale County	47 225	17 574	13 334	10 818	2 052	4 240	3 709	1 428	1 127	2.69	3.15	2 408	306	2 102
Dallas County	47 196	17 033	12 402	7 770	4 038	4 631	4 322	2 163	1 893	2.77	3.36	934	566	368
DeKalb County	54 175	20 968	16 094	13 593	1 921	4 874	4 571	2 420	1 995	2.58	3.02	476	476	-
Elmore County	45 836	16 532	13 000	10 828	1 850	3 532	3 212	1 515	1 194	2.77	3.19	3 374	3 363	11
Escambia County	34 154	12 890	9 507	7 258	1 841	3 382	3 128	1 586	1 283	2.65	3.16	1 364	1 364	-
Etowah County	98 568	38 675	28 585	22 956	4 573	10 090	9 411	4 763	3 953	2.55	3.04	1 272	980	292
Fayette County	17 785	6 659	5 165	4 306	685	1 494	1 583	932	754	2.50	3.06	177	126	51
Franklin County	27 504	10 850	8 164	6 930	975	2 686	2 528	1 396	1 119	2.53	3.00	310	306	4
Geneva County	23 523	9 231	8 870	5 696	911	2 361	2 234	1 213	1 008	2.55	3.03	124	124	-
Greene County	10 083	3 512	2 532	1 475	894	980	917	488	353	2.87	3.50	70	70	-
Hale County	15 232	5 397	3 983	2 679	1 094	1 414	1 319	744	538	2.82	3.40	266	264	2
Henry County	15 260	5 799	4 320	3 336	779	1 449	1 345	787	609	2.65	3.13	114	103	11
Houston County	80 450	30 844	22 828	17 992	4 097	8 216	7 429	3 222	2 616	2.61	3.12	881	738	143
Jackson County	47 460	18 020	14 041	11 849	1 678	3 979	3 726	1 833	1 496	2.63	3.05	336	170	166
Jefferson County	638 382	251 470	176 573	129 641	39 530	74 906	68 833	28 851	21 781	2.54	3.10	13 163	8 463	4 680
Lamar County	15 536	6 009	4 512	3 777	571	1 493	1 416	814	653	2.59	3.07	179	162	17
Lauderdale County	78 134	30 905	22 968	19 144	3 113	7 938	7 235	3 414	2 807	2.53	3.00	1 527	633	894
Lawrence County	31 346	11 410	9 032	7 514	1 189	2 378	2 225	1 146	871	2.75	3.16	167	167	-
Lee County	82 724	33 097	20 115	15 336	3 675	12 982	8 635	2 001	1 539	2.50	3.11	4 422	703	3 719
Limestone County	52 404	19 685	15 277	12 794	1 935	4 408	4 077	1 791	1 456	2.66	3.09	1 731	1 589	142
Lowndes County	12 630	4 056	3 143	1 892	1 065	913	850	460	344	3.11	3.65	28	28	-
Macon County	22 611	8 483	5 535	3 119	2 056	2 948	2 482	1 137	855	2.67	3.36	2 317	563	1 754
Madison County	233 149	91 208	65 475	53 195	9 590	25 733	21 923	5 866	4 758	2.56	3.06	5 763	1 408	4 355
Marengo County	22 889	8 156	6 098	4 328	1 455	2 058	1 973	1 067	834	2.81	3.37	195	189	6
Marion County	29 219	11 521	8 700	7 391	1 013	2 821	2 650	1 432	1 174	2.54	2.99	611	570	41
Marshall County	70 118	27 761	20 927	17 400	2 790	6 834	6 332	3 136	2 504	2.53	2.97	713	574	139
Mobile County	371 562	136 899	100 814	73 628	22 677	36 085	31 851	12 548	9 641	2.71	3.23	7 081	3 951	3 130
Monroe County	23 801	8 412	6 355	4 845	1 281	2 057	1 915	972	758	2.83	3.35	167	160	7
Montgomery County	201 578	77 173	53 973	37 973	13 254	23 600	20 578	7 609	6 186	2.61	3.21	7 507	4 276	3 231
Morgan County	98 295	37 790	28 851	23 679	3 893	8 146	8 370	3 364	2 708	2.60	3.05	1 748	1 600	148
Perry County	12 145	4 201	3 108	1 994	945	1 098	1 049	805	464	2.89	3.50	614	138	476
Pickens County	20 456	7 566	5 656	4 179	1 236	1 910	1 822	1 030	787	2.70	3.21	243	222	21
Pike County	25 824	10 314	8 048	5 052	1 606	3 365	2 892	1 432	1 163	2.50	3.11	1 771	214	1 557
Randolph County	19 671	7 953	5 840	4 532	874	1 913	1 814	1 008	800	2.60	3.09	210	204	6
Russell County	46 286	17 498	12 736	8 045	3 053	4 763	4 286	1 825	1 392	2.65	3.17	574	406	168
St. Clair County	48 453	17 686	14 084	12 032	1 597	3 572	3 285	1 488	1 194	2.74	3.13	1 556	1 530	26
Shelby County	97 539	35 985	27 787	24 095	2 862	8 218	7 034	1 886	1 483	2.71	3.14	1 819	582	1 237
Sumter County	15 434	5 545	3 914	2 417	1 286	1 631	1 475	778	590	2.78	3.42	740	142	598
Talladega County	71 728	28 448	20 195	15 588	3 752	8 253	5 782	2 810	2 252	2.71	3.18	2 379	1 854	525
Tallapoosa County	38 237	14 700	10 992	8 507	2 046	3 708	3 445	1 827	1 454	2.60	3.08	589	575	14
Tuscaloosa County	141 179	55 354	37 355	28 653	7 194	17 999	14 272	4 706	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Walker County	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

NUS CORPORATION AND SUBS. REFERENCE NO. 24 ELECON NOTE

CONTROL NO.	DATE: December 5, 1989	TIME: 1600

DISTRIBUTION:

File

BETWEEN: Carol Lackey	OF: Alabama Department of Conservation & Natural Resources	PHONE: (205) 339-5716

AND: Matthew McCoy, NUS Corporation

DISCUSSION:

Both recreational and commercial fishing are allowed along the Black Warrior River. This includes the Bankhead, Oliver, Warrior, and Demopolis Reservoirs. The Oliver Reservoir does not allow netting.

ACTION ITEMS:

NUS CORPORATION AND SUBSIDIARIES [redacted] [redacted] **NOTE**

REFERENCE NO. 25

CONTROL NO. F4-9011-22	**DATE:** 1/15/91	**TIME:** 1415

DISTRIBUTION: File Material
Southern Resins Division

BETWEEN: Mr. Rodgers	**OF:** Mound 341

AND: Sheri Panabaker, NUS Corporation SLP

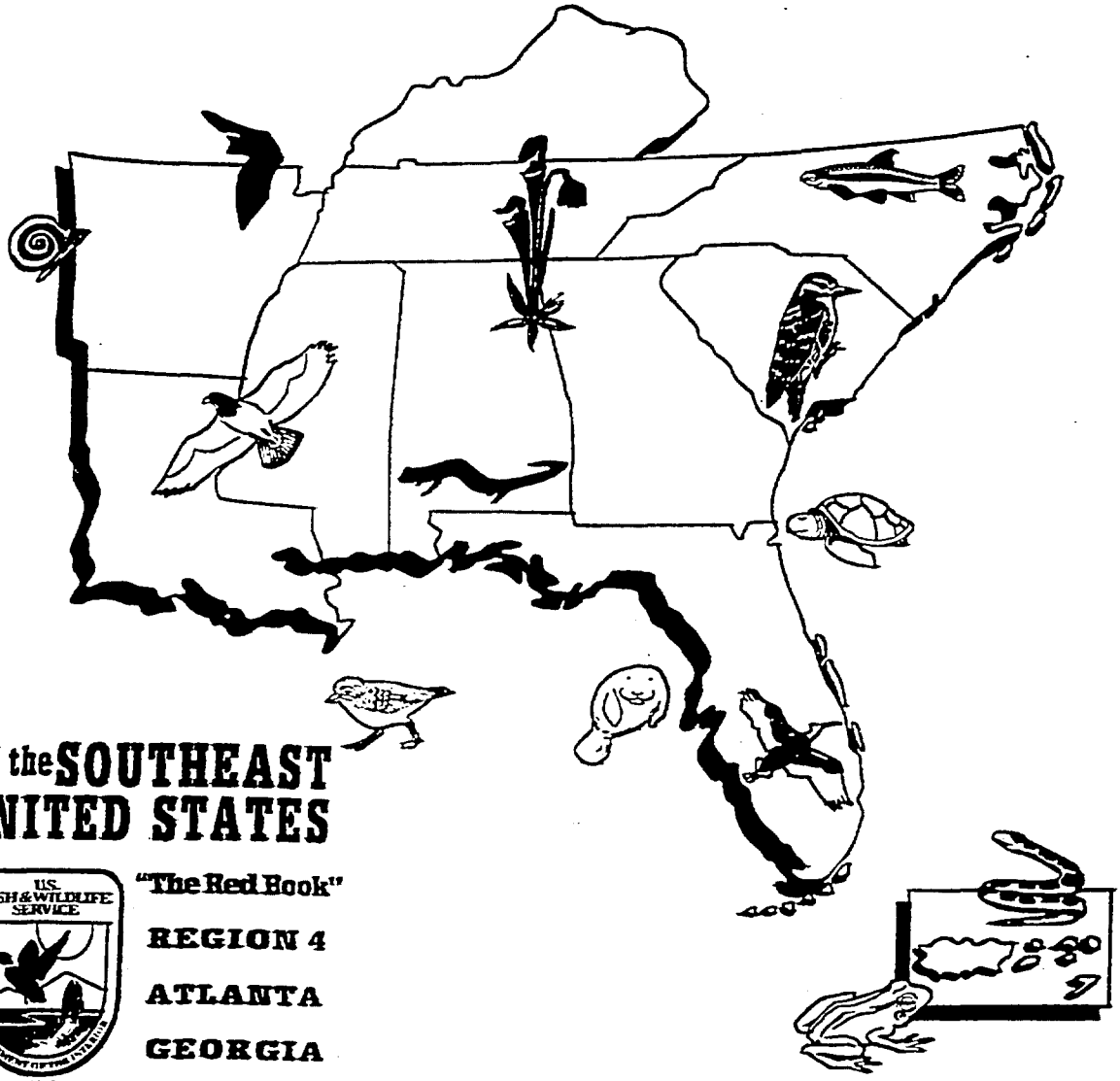
DISCUSSION:

I asked Mr. Rodgers if there were any surface water intak[illegible] of Moundville. He said that there were no companies for at least 20 miles downst[illegible] that all the towns down to at least Demopolis obtained their water from wells. Therefore he figured that since Demopolis is greater than 40 downstream miles, there are no surface water intakes within 15 downstream miles.

NUS 067 REVISED 0685

REFERENCE NO. 26

ENDANGERED & THREATENED SPECIES



of the SOUTHEAST UNITED STATES

U.S. FISH & WILDLIFE SERVICE

"The Red Book"

REGION 4

ATLANTA

GEORGIA

9300991

ENDANGERED AND THREATENED SPECIES

OF THE

SOUTHEASTERN UNITED STATES

(THE RED BOOK)

Prepared by:

U.S. Fish and Wildlife Service
Southeast Region
Atlanta, Georgia

January 1992

Availability Unlimited
For Sale by Superintendent of Documents
Post Office Box 371954
Pittsburgh, PA 15250-7954

Stock Order Number: 924-003-00000-6

09/30/91

Federally Listed Species By State

ALABAMA

(E=Endangered; T=Threatened; CH=Critical Habitat determined)

Mammals	General Distribution
Bat, gray (*Myotis grisescens*) - E	Extreme North, East
Bat, Indiana (*Myotis sodalis*) - E	Extreme North
Manatee, West Indian (*Trichechus manatus*) - E	Coastal waters
Mouse, Alabama beach (*Peromyscus polionotus ammobates*) - E,CH	Coastal; Baldwin
Mouse, Perdido Key beach (*Peromyscus polionotus trissyllepsis*) - E,CH	Perdido Key
Panther, Florida (*Felis concolor coryi*) - E	Entire state
Whale, finback (*Balaenoptera physalus*) - E	Coastal waters
Whale, humpback (*Megaptera novaeangliae*) - E	Coastal waters
Whale, right (*Eubalaena glacialis*) - E	Coastal waters
Whale, sei (*Balaenoptera borealis*) - E	Coastal waters
Whale, sperm (*Physeter catodon*) - E	Coastal waters

Birds	
Eagle, bald (*Haliaeetus leucocephalus*) - E	Entire State
Falcon, American peregrine (*Falco peregrinus anatum*) - E	North
Falcon, Arctic peregrine (*Falco peregrinus tundrius*) - T	Entire State
Plover, piping (*Charadrius melodus*) - T	Coast
Warbler, Bachman's (*Vermivora bachmanii*) - E	Entire State
Wood, stork (*Mycteria americana*) - E	Entire State
Woodpecker, ivory-billed (*Campephilus principalis*) - E	South, West Central
Woodpecker, red-cockaded (*Picoides* [=*Dendrocopos*] *borealis*) - E	Entire State

Reptiles	
Alligator, American (*Alligator mississippiensis*) - T (S/A)*	Coastal plain

*Alligators are biologically neither endangered nor threatened. For law enforcement purposes they are classified as "Threatened due to Similarity of Appearance." Alligator hunting is regulated in accordance with State law.

	General Distribution
Snake, eastern indigo (Drymarchon corais couperi) - T	South
Tortoise, gopher (Gopherus polyphemus) - T	Choctaw, Mobile, Washington Counties
Turtle, Alabama red-bellied (Pseudemys alabamensis) - E	Mobile River system; Baldwin and Mobile Counties
Turtle, flattened musk (Sternotherus depressus) - T	Upper Black Warrior River system
Turtle, Kemp's (Atlantic) ridley (Lepidochelys kempii) - E	Coastal waters
Turtle, green (Chelonia mydas) - T	Coastal waters
Turtle, hawksbill (Eretmochelys imbricata) - E	Coastal waters
Turtle, leatherback (Dermochelys coriacea) - E	Coastal waters
Turtle, loggerhead (Caretta caretta) - T	Coastal waters
Amphibians	
Salamander, Red Hills (Phaeognatus hubrichti) - T	Covington, Conecuh, Butler, Crenshaw, Monroe Counties
Arthropods	
Shrimp, Alabama cave (Palaemonias alabamae) - E	Madison County
Fishes	
Cavefish, Alabama (Speoplatyrhimus poulsoni) - E, CH	Lauderdale County
Darter, boulder (Etheostoma (Nothonotus) sp - E	Lower Elk River System, Limestone County
Darter, goldline (Percina aurolineata) - T	Cahaba River System
Darter, slackwater (Etheostoma boschungi) - T, CH	Madison, Lauderdale, Limestone Counties

	General Distribution
Darter, snail (Percina tanasi) - T	Madison and Jackson Counties (Paint Rock R.)
Darter, Watercress (Etheostoma nuchale) - E	Jefferson County
Shiner, blue (Cyprinella caerulea) -T	Upper Coosa River System: Weogufka and Choccolocco Creeks, lower reach of Little River
Sturgeon, Gulf (Acipenser axyrhynchus) - T	Alabama River System, Mobile River System
Mollusks	
Mussel, Alabama lamp pearly (Lampsilis virescens) - E	Paint Rock River, Estill Fork, Hurricane Creek, Larkin Fork
Mussel, fine-rayed pigtoe pearly (Fusconaia cuneolus) - E	Paint Rock River
Mussel, inflated heelsplitter - Potamilius inflatus - T	Tombigbee and Black Warrior Rivers
Mussel Judge Tait's (Pleurobema taitianum) - E	Tombigbee River (bendway in Sumter County), Sipsey River
Mussel, Marshall's (Pleurobema marshalli) - E	Tombigbee River (bendway in Sumter County)
Mussel, orange-footed pimpleback (Plethobasus cooperianus) - E	Tennessee River
Mussel, pale lilliput pearly (Toxolasma [Carunculina] cylindrella) - E	Paint Rock River, Estill Fork, Hurricane Creek
Mussel, penitent (Epioblasma [= Dysnomia] penita) - E	Tombigbee River (bendway in Sumter County), and Buttahatchie River
Mussel, pink mucket pearly (Lampsilis obiculata) - E	Tennessee and Paint Rock Rivers
Mussel, rough pigtoe pearly (Pleurobema plenum) - E	Tennessee River

	General Distribution
Mussel, shiny pigtoe pearly (*Fusconaia edgariana*) - E	Paint Rock River
Mussel, stirrup shell (*Quadrula stapes*) - E	Tombigbee River (bendway in Sumter County), and Sipsey River
Snail, Tulotoma (*Tulotoma magnifica*) - E	Coosa River tributaries (Kelly Creek, St. Clair and Shelby Counties; Weogufka and Hatchet Creeks, Coosa County; Ohatchee Creek, Calhoun County; and between Jordan Dam and Wetumpka, Elmore County)
Plants	
Amphianthus pusillus (little amphianthus) - T	Randolph, Chambers Counties
Clematis socialis (Alabama leather flower) - E	St. Clair, Cherokee Counties
Dalea foliosa (= *Petalostemum foliosum*) Leafy prairie-clover - E	Franklin, Morgan, Lawrence, and Jefferson Counties
Marshallia mohrii (Mohr's Barbara's buttons) - T	Bibb, Cherokee, Etowah Counties
Phyllitis scolopendrium var. *Americana* (American hart's tongue fern) - T	Jackson, Morgan Counties
Ptilimnium nodosum (harperella) - E	Dekalb County
Sagittaria secundifolia (Kral's water plaintain) - T	Dekalb, Cherokee Counties
Sarracenia oreophila (green pitcher plant) - E	Cherokee, Dekalb, Jackson, Marshall, Etowah Counties
Sarracenia rubra ssp. *alabamensis* Alabama canebrake pitcher-plant - E	Autauga, Chilton, Elmore Counties
Trillium reliquum (relict trillium) - E	Henry, Lee Counties
Xyris tennesseensis (Tennessee yellow-eyed grass) - E	Franklin County

TELEPHONE CONTACT SUMMARY

03/17/93

CALL MADE BY: Aparna Undrakonda
ORGANIZATION: Dynamac Corporation
DATE: 9/11/92
TIME: 9:30 am

REGION: IV
SITE: Southern Resins Division
EPA ID NO.: ALD004034138

PERSON CONTACTED:
NAME: Lainie
TITLE: Receptionist
PHONE NO.: 1-205-371-2235
ORGANIZATION: Sothern Resins Division.
CITY, STATE: Moundville, AL

GENERAL SUBJECT:

Current worker population of the Southern Resins Division.

CONVERSATION SUMMARY:

The present worker population of the Southern Resins Division is 60.

DYNAMAC CORPORATION
TELEPHONE CONTACT SUMMARY

CALL MADE BY:	Mary Morgan Mary Morgan	REGION:	IV
DATE:	11/10/93 11/10/93	SITE:	Southern Resins Division
TIME:	1530		
CERCLIS NO:	ALD 004 034 138		

PERSON CONTACTED:	Jimmy Coles
TITLE:	Engineer
ORGANIZATION:	Alabama Department of Environmental Management, Industrial Wastewater Division
CITY, STATE:	Montgomery, AL
PHONE NO.:	205-271-7841

SUBJECT: NPDES Permit No. AL0026921

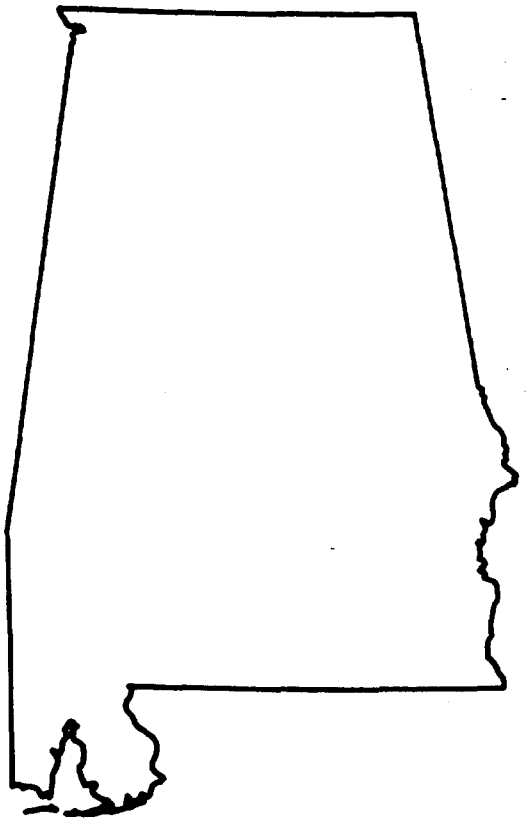
CONVERSATION SUMMARY:

Mr. Coles stated that Southern Resins (now known as Lawter Corporation) was issued a Notice of Violation in June 1993 after a failed inspection. He said that the facility is currently installing a vapor liquid incinerator. There have been no follow-up inspections since the NOV was issued. Mr. Coles said that the facility discharges directly to the Black Warrior River. He then stated that he would send a copy of the permit to me.

REFERENCE NO. 29

Water Resources Data Alabama Water Year 1990

by J.L. Pearman, F.C. Sedberry, V.E. Stricklin, and P.W. Cole



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT AL-90-1
Prepared in cooperation with the Alabama Department of Environmental Management, the Alabama Highway Department, and with other State, municipal, and Federal agencies

U.S. DEPARTMENT OF THE INTERIOR

MANUEL LUJAN, JR., Secretary

U.S. GEOLOGICAL SURVEY

Dallas Peck, Director

For information on the water program in Alabama write to
District Chief, Water Resources Division
U.S. Geological Survey
520 19th Avenue
Tuscaloosa, Alabama 35401

1991

02465000 BLACK WARRIOR RIVER AT NORTHPORT, AL

LOCATION.--Lat 33°12'51", long 87°34'50", in NW¼ sec. 21, T. 21 S., R. 10 W., Tuscaloosa County, Hydrologic Unit 03160112, attached to loading dock at Alabama State Dock Facility, at Northport, 0.2 mi downstream from Illinois Central Gulf Railroad bridge, 0.35 mi upstream from Oliver Lock and Dam, 0.9 mi downstream from Two Mile Creek, 5.2 mi downstream from North River, and at mile 126.6.

DRAINAGE AREA.--4,820 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1889 to September 1894 (gage heights only), October 1894 to December 1902, January 1903 to December 1905 (gage heights and discharge measurements only), August 1928 to current year. Monthly discharge only for period October to December 1894, published in WSP 1304.

REVISED RECORDS.--WSP 1002: 1940-43. WSP 1624: 1900. WDR AL-84-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 83.35 ft above National Geodetic Vertical Datum of 1929. See WSP 2106 for history of changes prior to Mar. 19, 1951. Mar. 20, 1951 to Feb. 13, 1974, water-stage recorder 0.35 mi upstream on pier of former bridge at present datum. Feb. 14, 1974, to Aug. 7, 1974, nonrecording gage at site 0.35 mi downstream at datum 1.08 ft lower. Subsequent to Apr. 19, 1944, auxiliary water-stage recorder, and Aug. 29, 1939, to Apr. 18, 1944, auxiliary nonrecording gage, 500 ft downstream from Oliver lock and dam at datum 1.08 ft lower.

REMARKS.--No estimated daily discharge. Water-discharge records good except those below 6,000 ft³/s, which are poor. Some regulation by Lewis Smith Reservoir on Sipsey Fork (station 02451950), by Bankhead Lock and Dam on Black Warrior River, usable capacity, 112,000 acre-ft, Holt Lock and Dam on Black Warrior River, usable capacity 115,000 acre-ft, and occasionally during periods of low flow by Oliver Lock and Dam downstream from gage. National Weather Service rain gage and gage height telemeters at station.

AVERAGE DISCHARGE.--70 years (water years 1895-1902, 1929-90) 7,988 ft³/s, 22.51 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 272,000 ft³/s, Apr. 13, 1979; maximum gage height, 67.7 ft, Apr. 18, 1900; minimum daily discharge, 20 ft³/s, Oct. 16, 1987.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 190,000 ft³/s, Feb. 16, gage height, 61.60 ft; minimum daily, 138 ft³/s, Sept. 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24500	8030	10100	23500	22900	19600	9010	5040	3430	505	2600	678
2	18400	7460	9410	15000	21600	20500	8950	6170	3810	2720	2040	529
3	15400	7740	8790	12500	19700	23600	6740	5880	4730	2600	2620	1780
4	11600	7500	8820	13200	43700	25600	7230	5360	4040	2220	409	1630
5	10800	7000	8920	24800	42500	22200	7460	3920	3680	3070	2920	2420
6	7350	794	8380	35600	29100	17900	9040	921	3100	2790	3440	2550
7	1980	6510	10100	30800	25300	15000	4920	4760	3440	586	2060	2140
8	3000	7650	9750	42800	21900	14500	3320	2150	4530	498	1920	763
9	697	7040	7900	35100	20600	19200	7420	5230	3530	2560	1700	138
10	661	4280	11200	22600	44300	17800	7330	6670	759	2770	1970	1400
11	845	6200	11000	15300	46000	13600	8140	3970	3620	3410	627	1940
12	863	2820	15200	14500	31200	15600	8140	3690	3060	3210	317	1670
13	452	3520	16600	12300	28300	13000	4590	4330	2630	4870	2650	2230
14	1050	3170	13000	11800	24400	11700	2040	4930	3730	3820	2560	1780
15	471	3390	11400	11700	38600	13200	4230	5800	2640	2700	2290	694
16	5500	8770	11400	11400	187000	74100	5370	5460	923	4290	2030	399
17	5760	10200	7910	11500	144000	93900	4960	5280	653	3720	1980	1350
18	1910	11000	8510	15600	118000	68500	3000	3960	3350	3830	1600	2200
19	3980	5890	9430	13200	73600	41000	4210	1050	3420	3850	599	1960
20	2360	7610	10000	18700	38300	29100	3960	3410	3530	3750	2780	1670
21	1630	8640	11000	46000	28100	22900	1140	12700	3390	808	2290	1540
22	477	12000	9430	33100	36500	24500	4440	18700	3650	678	2300	453
23	804	34000	9790	21100	36300	19700	4200	14200	6310	4000	2150	423
24	586	21700	8700	22800	31000	22100	3920	10400	1150	4120	1940	1040
25	765	14000	3170	42800	25000	16300	5260	9610	3760	2910	699	1600
26	156	11800	5260	36600	23400	16700	3620	7240	3130	2820	439	1590
27	1070	10200	5170	26000	19000	11000	5030	5350	3030	2760	3060	2780
28	7290	10000	5130	20600	21700	10400	6870	4350	2480	874	2500	2260
29	7590	9700	5960	30000	---	10000	5040	6140	2740	432	1920	3130
30	7680	10800	4500	35300	---	12100	4240	6700	659	1910	2370	2320
31	8350	---	8760	25300	---	12300	---	4100	---	3640	2250	---
TOTAL	153977	269414	284690	731500	1242000	747600	163820	187471	92904	82721	61030	47057
MEAN	4967	8980	9184	23600	44360	24120	5461	6047	3097	2668	1969	1569
MAX	24500	34000	16600	46000	187000	93900	9040	18700	6310	4870	3440	3130
MIN	156	794	3170	11400	19000	10000	1140	921	653	432	317	138
CFSM	1.03	1.86	1.91	4.90	9.20	5.00	1.13	1.25	.64	.55	.41	.33
IN.	1.19	2.08	2.20	5.65	9.59	5.77	1.26	1.45	.72	.64	.47	.36

CAL YR 1989 TOTAL 4239423 MEAN 11610 MAX 74900 MIN 156 CFSM 2.41 IN. 32.72
WTR YR 1990 TOTAL 4064184 MEAN 11130 MAX 187000 MIN 138 CFSM 2.31 IN. 31.37

DYNAMAC CORPORATION
TELEPHONE CONTACT SUMMARY

Mary Morgan

CALL MADE BY:	Mary Morgan	REGION:	IV
DATE:	11/10/93 11/10/93	SITE:	Southern Resins Division
TIME:	1645		
CERCLIS NO:	ALD 004 034 138		

PERSON CONTACTED:	Sterling Thornton
TITLE:	Owner
ORGANIZATION:	Thornton's Grocery and Bait Shop
CITY, STATE:	Moundville, AL
PHONE NO.:	205-371-9050

SUBJECT: Fish Caught in Black Warrior River and Carthage Branch

CONVERSATION SUMMARY:

Mr. Thornton stated that channel catfish, yellow catfish, bream, crappie and bass are commonly caught in Black Warrior River and in Carthage Branch.

Press RETURN key to continue ...

REFERENCE NO. 31

CENSUS DATA

SOUTHERN RESINS
LATITUDE 33: 0:40 LONGITUDE 87:37:30 1990 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	0	0	0
S 2	0	0	0	0	0	0	0
S 3	0	0	0	102	0	0	102
S 4	0	0	0	1214	0	0	1214
S 5	0	0	0	0	0	0	0
S 6	0	0	0	0	0	0	0
RING TOTALS	0	0	0	1316	0	0	1316

Press RETURN key to continue ...

Alt-Z FOR HELP | IBM PC | FDX | 2400 E71 | LOG CLOSED | PRINT OFF | ON-LINE

REFERENCE NO. 32

ADEM

ALABAMA
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Leigh Pegues, Director

1751 Cong. W. L.
Dickinson Drive
Montgomery, AL
36130
(205) 271-7700
FAX 271-7950
270-5612

Field Offices:

110 Vulcan Road
Birmingham, AL
35209
(205) 942-6168
FAX 941-1603

P.O. Box 953
Decatur, AL
35602
(205) 353-1713
FAX 340-9359

2204 Perimeter Road
Mobile, AL
36615
(205) 450-3400
FAX 479-2593

Guy Hunt
Governor

April 6, 1993

Mr. Andrew Kwiatkowski
Lawter International
P.O. Box 128
Moundville, AL 35474

Dear Kwiatkowski:

RE: Final Modification
NPDES Permit Number AL0026921

Attached is the issued modification of the referenced permit.

We will look forward to receiving monitoring data in accordance with the conditions of your Permit. **When submitting DMRs, do not submit lab worksheets, logs, reports or other paperwork, not specifically required by the permit unless requested to do so by ADEM staff.**

If there are questions or comments in reference to the permit or related monitoring requirements, please contact **Paul L. Webster** of this office.

Sincerely,

John A. Poole, Jr.
Chief
Industrial Branch
Water Division

/dmh

Enclosure: Final Permit

cc: EPA, w/enc.
Marilyn Elliott, Permits & Services

Printed on Recycled Paper

ADEM

ALABAMA
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT

PERMITTEE: LAWTER INTERNATIONAL, INC.

FACILITY LOCATION: CRACKER ROAD
MOUNDVILLE, ALABAMA

PERMIT NUMBER: AL0026921

RECEIVING WATERS: BLACK WARRIOR RIVER

In accordance with and subject to the provisions of the Federal Water Pollution Control Act, as amended, 33 U.S.C. §§1251-1378 (the "FWPCA"), the Alabama Water Pollution Control Act, as amended, Code of Alabama 1975, §§ 22-22-1 - 22-22-14 (the "AWPCA"), the Alabama Environmental Management Act, as amended, Code of Alabama 1975, §§22-22A-1 - 22-22A-15, and rules and regulations adopted thereunder, and subject further to the terms and conditions set forth in this permit, the Permittee is hereby authorized to discharge into the above-named receiving waters.

ISSUANCE DATE: NOVEMBER 23, 1992

EFFECTIVE DATE: DECEMBER 1, 1992

EXPIRATION DATE: NOVEMBER 30, 1997

MODIFICATION ISSUED: APRIL 6, 1993

MODIFICATION EFFECTIVE: MAY 1, 1993

Jann Wilson

Alabama Department of Environmental Management

PART I

A. DISCHARGE LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on the effective date of this permit and lasting through the expiration date of this permit, the permittee is authorized to discharge from the following point source(s) outfall(s)), described more fully in the permittee's application:

DSN001A: Process wastewater, steam condensate, storm water from diked area and storm water

Such discharge shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	UNITS	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS 1/	
		Daily Minimum	Daily Maximum	Monthly Average 2/	Measurement Frequency	Sample Type
Flow	MGD	-	Monitor	Monitor	Continuous	Totalized
pH	s.u.	6.0	8.5	-	1/day 3/	Grab
Total Zinc	lbs/day	-	1.1885	0.4781	1/3 months	24 hour Composite
Total Chromium	lbs/day	-	1.2614	0.5055	1/3 months	24 hour Composite
Acenaphthene	lbs/day	-	0.0268	0.01002	1/6 months	24 hour Composite
Acrylonitrile	lbs/day	-	0.1103	0.0437	1/6 months	Grab
Benzene	lbs/day	-	0.0620	0.0169	1/6 months	Grab
Carbon Tetrachloride	lbs/day	-	0.0173	0.0082	1/6 months	Grab
Chlorobenzene	lbs/day	-	0.0128	0.0068	1/6 months	Grab
1,2,4-Trichlorobenzene	lbs/day	-	0.0638	0.0310	1/6 months	24 hour Composite
Hexachlorobenzene	lbs/day	-	0.0128	0.0068	1/6 months	24 hour Composite
1,2-Dichloroethane	lbs/day	-	0.0961	0.0310	1/6 months	Grab
1,1,1-Trichloroethane	lbs/day	-	0.0246	0.0096	1/6 months	Grab
Hexachloroethane	lbs/day	-	0.0246	0.0096	1/6 months	24 hour Composite
1,1-Dichloroethane	lbs/day	-	0.0269	0.0100	1/6 months	Grab
1,1,2-Trichloroethane	lbs/day	-	0.0246	0.0096	1/6 months	Grab
Chloroethane	lbs/day	-	0.1221	0.0474	1/6 months	Grab
Chloroform	lbs/day	-	0.0210	0.0096	1/6 months	Grab
2-Chlorophenol	lbs/day	-	0.0447	0.0141	1/6 months	24 hour Composite

1/ Samples collected to comply with the monitoring requirements specified above shall be collected at the following location: At the nearest accessible location just prior to discharge and after final treatment. Unless otherwise specified, composite samples shall be time composite samples collected using automatic sampling equipment or a minimum of eight (8) equal volume grab samples collected over equal time intervals. All composite samples shall be collected for the total period of discharge not to exceed 24 hours.
2/ Monthly average limits apply only when a parameter is monitored more than once in a month.
3/ Daily high and low values shall be reported.
4/ See Part IV, Page 15.

PART I

A. DISCHARGE LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on the effective date of this permit and lasting through the expiration date of this permit, the permittee is authorized to discharge from the following point source(s) outfall(s)), described more fully in the permittee's application:

DSN001A: (Continued) Process wastewater, steam condensate, storm water from diked areas and storm water

Such discharge shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	UNITS	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS 1/	
		Daily Minimum	Daily Maximum	Monthly Average 2/	Measurement Frequency	Sample Type
1,2-Dichlorobenzene	lbs/day	-	0.0743	0.0351	1/6 months	Grab
1,3-Dichlorobenzene	lbs/day	-	0.0200	0.0141	1/6 months	Grab
1,4-Dichlorobenzene	lbs/day	-	0.0128	0.0068	1/6 months	24 hour Composite
1,1-Dichloroethylene	lbs/day	-	0.0114	0.0073	1/6 months	Grab
1,2-Trans-Dichloroethylene	lbs/day	-	0.0246	0.0096	1/6 months	Grab
2,4-Dichlorophenol	lbs/day	-	0.0510	0.0178	1/6 months	24 hour Composite
1,2-Dichloropropane	lbs/day	-	0.1048	0.0697	1/6 months	Grab
1,3-Dichloropropylene	lbs/day	-	0.0200	0.0132	1/6 months	Grab
2,4-Dimethylphenol	lbs/day	-	0.0164	0.0082	1/6 months	24 hour Composite
2,4-Dinitrotoluene	lbs/day	-	0.1299	0.0515	1/6 months	24 hour Composite
2,6-Dinitrotoluene	lbs/day	-	0.2920	0.1162	1/6 months	24 hour Composite
Ethylbenzene	lbs/day	-	0.0492	0.0146	1/6 months	Grab
Fluoranthene	lbs/day	-	0.0310	0.0114	1/6 months	24 hour Composite
Methylene Chloride	lbs/day	-	0.0405	0.0182	1/6 months	Grab
Methyl Chloride	lbs/day	-	0.0866	0.0392	1/6 months	Grab
Hexachlorobutadiene	lbs/day	-	0.0223	0.0091	1/6 months	24 hour Composite
Naphthalene	lbs/day	-	0.0269	0.0100	1/6 months	24 hour Composite
Nitrobenzene	lbs/day	-	0.0310	0.0123	1/6 months	24 hour Composite
2-Nitrophenol	lbs/day	-	0.0314	0.0187	1/6 months	24 hour Composite
4-Nitrophenol	lbs/day	-	0.0565	0.0328	1/6 months	24 hour Composite
2,4-Dinitrophenol	lbs/day	-	0.0560	0.0323	1/6 months	24 hour Composite
4,6-Dinitro-O-Cresol	lbs/day	-	0.1262	0.0355	1/6 months	24 hour Composite
Phenol	lbs/day	-	0.0118	0.0068	1/6 months	Grab
Bis (2-ethylhexyl)phthalate	lbs/day	-	0.1271	0.0469	1/6 months	24 hour Composite
Di-n-Butylphthalate	lbs/day	-	0.0260	0.0123	1/6 months	24 hour Composite

1/ Samples collected to comply with the monitoring requirements specified above shall be collected at the following location: At the nearest accessible location just prior to discharge and after final treatment. Unless otherwise specified, composite samples shall be time composite samples collected using automatic sampling equipment or a minimum of eight (8) equal volume grab samples collected over equal time intervals. All composite samples shall be collected for the total period of discharge not to exceed 24 hours.
2/ Monthly average limits apply only when a parameter is monitored more than once in a month.
3/ Daily high and low values shall be reported.
4/ See Part IV, Page 15.

PART I

A. DISCHARGE LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on the effective date of this permit and lasting through the expiration date of this permit, the permittee is authorized to discharge from the following point source(s) outfall(s)), described more fully in the permittee's application:

DSN001A: (Continued) Process wastewater, steam condensate, storm water from diked areas and storm water

Such discharge shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	UNITS	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS 1/	
		Daily Minimum	Daily Maximum	Monthly Average 2/	Measurement Frequency	Sample Type
Diethylphthalate	lbs/day	-	0.0925	0.0369	1/6 months	24 hour Composite
Dimethylphthalate	lbs/day	-	0.0214	0.0087	1/6 months	24 hour Composite
Benzo (a) anthracene	lbs/day	-	0.0269	0.0100	1/6 months	24 hour Composite
Benzo (a) pyrene	lbs/day	-	0.0278	0.0105	1/6 months	24 hour Composite
3,4-Benzofluoranthene	lbs/day	-	0.0278	0.0105	1/6 months	24 hour Composite
Benzo (k) fluoranthene	lbs/day	-	0.0269	0.0100	1/6 months	24 hour Composite
Chrysene	lbs/day	-	0.0269	0.0100	1/6 months	24 hour Composite
Acenaphthylene	lbs/day	-	0.0269	0.0100	1/6 months	24 hour Composite
Anthracene	lbs/day	-	0.0269	0.0100	1/6 months	24 hour Composite
Fluorene	lbs/day	-	0.0269	0.0100	1/6 months	24 hour Composite
Phenanthrene	lbs/day	-	0.0269	0.0100	1/6 months	24 hour Composite
Pyrene	lbs/day	-	0.0305	0.0114	1/6 months	24 hour Composite
Tetrachloroethylene	lbs/day	-	0.0255	0.0100	1/6 months	Grab
Toluene	lbs/day	-	0.0364	0.0118	1/6 months	Grab
Trichloroethylene	lbs/day	-	0.0246	0.0096	1/6 months	Grab
Vinyl Chloride	lbs/day	-	0.1221	0.0474	1/6 months	Grab
Total Copper	lbs/day	-	1.5391	0.6603	1/6 months	24 hour Composite
Total Cyanide 5/	lbs/day	-	Monitor	Monitor	1/6 months	Grab
Toal Lead	lbs/day	-	0.3142	0.1457	1/6 months	24 hour Composite
Total Nickel	lbs/day	-	1.8123	0.7696	1/6 months	24 hour Composite

1/ Samples collected to comply with the monitoring requirements specified above shall be collected at the following location: At the nearest accessible location just prior to discharge and after final treatment. Unless otherwise specified, composite samples shall be time composite samples collected using automatic sampling equipment or a minimum of eight (8) equal volume grab samples collected over equal time intervals. All composite samples shall be collected for the total period of discharge not to exceed 24 hours.
2/ Monthly average limits apply only when a parameter is monitored more than once in a month.
3/ Daily high and low values shall be reported.
4/ See Part IV, Page 15.
5/ The permittee is prohibited from using raw materials in the manufacture of synthetic resins or other products which have the potential to introduce cyanide into the waste streams.

PART I

A. DISCHARGE LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on the effective date of this permit and lasting through the expiration date of this permit, the permittee is authorized to discharge from the following point source(s) outfall(s)), described more fully in the permittee's application:

DSN001: Process wastewater, cooling water and storm water

Such discharge shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	UNITS	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS 1/	
		Daily Minimum	Daily Maximum	Monthly Average 2/	Measurement Frequency	Sample Type
Flow	MGD	-	Monitor	Monitor	Continuous	Totalized
pH	s.u.	6.0	8.5	-	1/day	Grab
Temperature	°F	-	90	90	1/week	Grab
Biochemical Oxygen Demand (5-day)	lbs/day	-	69.6	26.1	1/week	24 Hour Composite
Total Suspended Solids	lbs/day	-	94.4	29.3	1/week	24 Hour Composite
Oil and Grease	lbs/day	-	22	11	1/week	Grab
Total Dissolved Solids	lbs/day	-	Monitor	Monitor	1/month	24 Hour Composite
Sulfates	lbs/day	-	Monitor	Monitor	1/month	24 Hour Composite
Chlorides	lbs/day	-	Monitor	Monitor	1/month	24 Hour Composite
Acute Toxicity Testing	%	-	≤50	-	1/3 month	Grab

1/ Samples collected to comply with the monitoring requirements specified above shall be collected at the following location: At the nearest accessible location just prior to discharge and after final treatment. Unless otherwise specified, composite samples shall be time composite samples collected using automatic sampling equipment or a minimum of eight (8) equal volume grab samples collected over equal time intervals. All composite samples shall be collected for the total period of discharge not to exceed 24 hours.

2/ Monthly average limits apply only when a parameter is monitored more than once in a month.

ADEM PERMIT RATIONALE

DATE: March 31, 1993

PREPARED BY: Paul L. Webster

NAME: **LAWTER INTERNATIONAL**

LOCATION: Moundville, Alabama

PERMIT NUMBER: AL0026921

DISCHARGE SERIAL NUMBERS & DESCRIPTIONS:

DSN001A: Process wastewater, steam condensate, storm water from diked area, and storm water.

DSN001: Process wastewater, cooling water, and storm water.

DISCUSSION:

The permit is being re-opened by the Department to correct the sampling protocol for several of the constituents listed under outfall DSN001A. During a file review for an upcoming compliance sampling inspection, we determined that the EPA and ADEM sampling protocol for the following constituents should be modified as follows. The permit is being opened to correct only the sampling protocol on the constituents listed below and all previous permit rationale still applies.

Acenaphthene: This constituent is a base/neutral compound and the correct sampling protocol should be a composite sample. The sample type for acenaphthene is being modified to reflect a 24-hour composite sample.

Chlorobenzene: This constituent is a volatile compound and the correct sampling protocol should be a grab sample. The sample type for chlorobenzene is being modified to reflect a grab sample.

1,2 Dichlorobenzene: This constituent is a base/neutral compound; however, it is a semi-volatile, and the correct sampling protocol should be a grab sample. The sample type for 1,2 Dichlorobenzene is being modified to reflect a grab sample.

1,3 Dichlorobenzene: This constituent is a base/neutral compound; however, it is a semi-volatile, and the correct sampling protocol should be a grab sample. The sample type for 1,3 Dichlorobenzene is being modified to reflect a grab sample.

2,4 Dichlorophenol: This constituent is an acid compound and the correct sampling protocol should be a composite sample. The sample type for 2,4 Dichlorophenol is being modified to reflect a 24 hour composite sample.

Phenol: The sampling protocol for this constituent is required to be a grab sample as shown in 40 CFR Section 122.21. The sample type for phenol is being modified to reflect a grab sample.

ADEM

ALABAMA
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT

PERMITTEE: LAWTER INTERNATIONAL, INC.

FACILITY LOCATION: CRACKER ROAD
MOUNDVILLE, ALABAMA

PERMIT NUMBER: AL 0026921

RECEIVING WATERS: BLACK WARRIOR RIVER

In accordance with and subject to the provisions of the Federal Water Pollution Control Act, as amended, 33 U.S.C. §§1251-1378 (the "FWPCA"), the Alabama Water Pollution Control Act, as amended, Code of Alabama 1975, §§ 22-22-1 to 22-22-14 (the "AWPCA"), the Alabama Environmental Management Act, as amended, Code of Alabama 1975, §§22-22A-1 to 22-22A-15, and rules and regulations adopted thereunder, and subject further to the terms and conditions set forth in this permit, the Permittee is hereby authorized to discharge into the above-named receiving waters.

ISSUANCE DATE: NOVEMBER 23, 1992

EFFECTIVE DATE: DECEMBER 1, 1992

EXPIRATION DATE: NOVEMBER 30, 1997

Alabama Department of Environmental Management

NPDES PERMIT

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PART I

A. DISCHARGE LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on the effective date of this permit and lasting through the expiration date of this permit, the permittee is authorized to discharge from the following point source(s) outfall(s)), described more fully in the permittee's application:

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Such discharge shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	UNITS	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS 1/	
		Daily Minimum	Daily Maximum	Monthly Average 2/	Measurement Frequency	Sample Type
Flow	MGD	-	Monitor	Monitor	Continuous	Totalized
pH	s.u.	6.0	8.5	-	1/day 3/	Grab
Total Zinc	lbs/day	-	1.1885	0.4781	1/3 months	24 hour Composite
Total Chromium	lbs/day	-	1.2614	0.5055	1/3 months	24 hour Composite
Acenaphthene	lbs/day	-	0.0268	0.01002	1/6 months	Grab
Acrylonitrile	lbs/day	-	0.1103	0.0437	1/6 months	Grab
Benzene	lbs/day	-	0.0620	0.0169	1/6 months	Grab
Carbon Tetrachloride	lbs/day	-	0.0173	0.0082	1/6 months	Grab
Chlorobenzene	lbs/day	-	0.0128	0.0068	1/6 months	24 hour Composite
1,2,4-Trichlorobenzene	lbs/day	-	0.0638	0.0310	1/6 months	24 hour Composite
Hexachlorobenzene	lbs/day	-	0.0128	0.0068	1/6 months	24 hour Composite
1,2-Dichloroethane	lbs/day	-	0.0961	0.0310	1/6 months	Grab
1,1,1-Trichloroethane	lbs/day	-	0.0246	0.0096	1/6 months	Grab
Hexachloroethane	lbs/day	-	0.0246	0.0096	1/6 months	24 hour Composite
1,1-Dichloroethane	lbs/day	-	0.0269	0.0100	1/6 months	Grab
1,1,2-Trichloroethane	lbs/day	-	0.0246	0.0096	1/6 months	Grab
Chloroethane	lbs/day	-	0.1221	0.0474	1/6 months	Grab
Chloroform	lbs/day	-	0.0210	0.0096	1/6 months	Grab
2-Chlorophenol	lbs/day	-	0.0447	0.0141	1/6 months	24 hour Composite

1/ Samples collected to comply with the monitoring requirements specified above shall be collected at the following location: At the nearest accessible location just prior to discharge and after final treatment. Unless otherwise specified, composite samples shall be time composite samples collected using automatic sampling equipment or a minimum of eight (8) equal volume grab samples collected over equal time intervals. All composite samples shall be collected for the total period of discharge not to exceed 24 hours.
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PART I

A. DISCHARGE LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on the effective date of this permit and lasting through the expiration date of this permit, the permittee is authorized to discharge from the following point source(s) outfall(s)), described more fully in the permittee's application:

DSN001A: (Continued) Process wastewater, steam condensate, storm water from diked areas and storm water

Such discharge shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	UNITS	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS 1/	
		Daily Minimum	Daily Maximum	Monthly Average 2/	Measurement Frequency	Sample Type
1,2-Dichlorobenzene	lbs/day	-	0.0743	0.0351	1/6 months	24 hour Composite
1,3-Dichlorobenzene	lbs/day	-	0.0200	0.0141	1/6 months	24 hour Composite
1,4-Dichlorobenzene	lbs/day	-	0.0128	0.0068	1/6 months	24 hour Composite
1,1-Dichloroethylene	lbs/day	-	0.0114	0.0073	1/6 months	Grab
1,2-Trans-Dichloroethylene	lbs/day	-	0.0246	0.0096	1/6 months	Grab
2,4-Dichlorophenol	lbs/day	-	0.0510	0.0178	1/6 months	Grab
1,2-Dichloropropane	lbs/day	-	0.1048	0.0697	1/6 months	Grab
1,3-Dichloropropylene	lbs/day	-	0.0200	0.0132	1/6 months	Grab
2,4-Dimethylphenol	lbs/day	-	0.0164	0.0082	1/6 months	24 hour Composite
2,4-Dinitrotoluene	lbs/day	-	0.1299	0.0515	1/6 months	24 hour Composite
2,6-Dinitrotoluene	lbs/day	-	0.2920	0.1162	1/6 months	24 hour Composite
Ethylbenzene	lbs/day	-	0.0492	0.0146	1/6 months	Grab
Fluoranthene	lbs/day	-	0.0310	0.0114	1/6 months	24 hour Composite
Methylene Chloride	lbs/day	-	0.0405	0.0182	1/6 months	Grab
Methyl Chloride	lbs/day	-	0.0866	0.0392	1/6 months	Grab
Hexachlorobutadiene	lbs/day	-	0.0223	0.0091	1/6 months	24 hour Composite
Naphthalene	lbs/day	-	0.0269	0.0100	1/6 months	24 hour Composite
Nitrobenzene	lbs/day	-	0.0310	0.0123	1/6 months	24 hour Composite
2-Nitrophenol	lbs/day	-	0.0314	0.0187	1/6 months	24 hour Composite
4-Nitrophenol	lbs/day	-	0.0565	0.0328	1/6 months	24 hour Composite
2,4-Dinitrophenol	lbs/day	-	0.0560	0.0323	1/6 months	24 hour Composite
4,6-Dinitro-O-Cresol	lbs/day	-	0.1262	0.0355	1/6 months	24 hour Composite
Phenol	lbs/day	-	0.0118	0.0068	1/6 months	24 hour Composite
Bis (2-ethylhexyl)phthalate	lbs/day	-	0.1271	0.0469	1/6 months	24 hour Composite
Di-n-Butylphthalate	lbs/day	-	0.0260	0.0123	1/6 months	24 hour Composite

1/ Samples collected to comply with the monitoring requirements specified above shall be collected at the following location: At the nearest accessible location just prior to discharge and after final treatment. Unless otherwise specified, composite samples shall be time composite samples collected using automatic sampling equipment or a minimum of eight (8) equal volume grab samples collected over equal time intervals. All composite samples shall be collected for the total period of discharge not to exceed 24 hours.
2/ Monthly average limits apply only when a parameter is monitored more than once in a month.
3/ Daily high and low values shall be reported.
4/ See Part IV, Page 15.

PART I

A. DISCHARGE LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on the effective date of this permit and lasting through the expiration date of this permit, the permittee is authorized to discharge from the following point source(s) outfall(s)), described more fully in the permittee's application:

DSN001A: (Continued) Process wastewater, steam condensate, storm water from diked areas and storm water

Such discharge shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	UNITS	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS 1/	
		Daily Minimum	Daily Maximum	Monthly Average 2/	Measurement Frequency	Sample Type
Diethylphthalate	lbs/day	-	0.0925	0.0369	1/6 months	24 hour Composite
Dimethylphthalate	lbs/day	-	0.0214	0.0087	1/6 months	24 hour Composite
Benzo (a) anthracene	lbs/day	-	0.0269	0.0100	1/6 months	24 hour Composite
Benzo (a) pyrene	lbs/day	-	0.0278	0.0105	1/6 months	24 hour Composite
3,4-Benzofluoranthene	lbs/day	-	0.0278	0.0105	1/6 months	24 hour Composite
Benzo (k) fluoranthene	lbs/day	-	0.0269	0.0100	1/6 months	24 hour Composite
Chrysene	lbs/day	-	0.0269	0.0100	1/6 months	24 hour Composite
Acenaphthylene	lbs/day	-	0.0269	0.0100	1/6 months	24 hour Composite
Anthracene	lbs/day	-	0.0269	0.0100	1/6 months	24 hour Composite
Fluorene	lbs/day	-	0.0269	0.0100	1/6 months	24 hour Composite
Phenanthrene	lbs/day	-	0.0269	0.0100	1/6 months	24 hour Composite
Pyrene	lbs/day	-	0.0305	0.0114	1/6 months	24 hour Composite
Tetrachloroethylene	lbs/day	-	0.0255	0.0100	1/6 months	Grab
Toluene	lbs/day	-	0.0364	0.0118	1/6 months	Grab
Trichloroethylene	lbs/day	-	0.0246	0.0096	1/6 months	Grab
Vinyl Chloride	lbs/day	-	0.1221	0.0474	1/6 months	Grab
Total Copper	lbs/day	-	1.5391	0.6603	1/6 months	24 hour Composite
Total Cyanide 5/	lbs/day	-	Monitor	Monitor	1/6 months	Grab
Toal Lead	lbs/day	-	0.3142	0.1457	1/6 months	24 hour Composite
Total Nickel	lbs/day	-	1.8123	0.7696	1/6 months	24 hour Composite

1/ Samples collected to comply with the monitoring requirements specified above shall be collected at the following location: At the nearest accessible location just prior to discharge and after final treatment. Unless otherwise specified, composite samples shall be time composite samples collected using automatic sampling equipment or a minimum of eight (8) equal volume grab samples collected over equal time intervals. All composite samples shall be collected for the total period of discharge not to exceed 24 hours.
2/ Monthly average limits apply only when a parameter is monitored more than once in a month.
3/ Daily high and low values shall be reported.
4/ See Part IV, Page 15.
5/ The permittee is prohibited from using raw materials in the manufacture of synthetic resins or other products which have the potential to introduce cyanide into the waste streams.

PART I

A. DISCHARGE LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on the effective date of this permit and lasting through the expiration date of this permit, the permittee is authorized to discharge from the following point source(s) outfall(s)), described more fully in the permittee's application:

DSN001: Process wastewater, cooling water and storm water

Such discharge shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	UNITS	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS 1/	
		Daily Minimum	Daily Maximum	Monthly Average 2/	Measurement Frequency	Sample Type
Flow	MGD	-	Monitor	Monitor	Continuous	Totalized
pH	s.u.	6.0	8.5	-	1/day	Grab
Temperature	°F	-	90	90	1/week	Grab
Biochemical Oxygen Demand (5-day)	lbs/day	-	69.6	26.1	1/week	24 Hour Composite
Total Suspended Solids	lbs/day	-	94.4	29.3	1/week	24 Hour Composite
Oil and Grease	lbs/day	-	22	11	1/week	Grab
Total Dissolved Solids	lbs/day	-	Monitor	Monitor	1/month	24 Hour Composite
Sulfates	lbs/day	-	Monitor	Monitor	1/month	24 Hour Composite
Chlorides	lbs/day	-	Monitor	Monitor	1/month	24 Hour Composite
Acute Toxicity Testing	%	-	≤50	-	1/3 month	Grab

1/ Samples collected to comply with the monitoring requirements specified above shall be collected at the following location: At the nearest accessible location just prior to discharge and after final treatment. Unless otherwise specified, composite samples shall be time composite samples collected using automatic sampling equipment or a minimum of eight (8) equal volume grab samples collected over equal time intervals. All composite samples shall be collected for the total period of discharge not to exceed 24 hours.

2/ Monthly average limits apply only when a parameter is monitored more than once in a month.

B. DISCHARGE MONITORING AND RECORD KEEPING REQUIREMENTS

1. Representative Sampling

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge and shall be in accordance with the provisions of this permit.

2. Test Procedures

Test procedures for the analysis of pollutants shall conform to 40 CFR Part 136 and guidelines published pursuant to Section 304(h) of the FWPCA, 33 U.S.C. Section 1314(h). If more than one method for analysis of a substance is approved for use, a method having a detection limit lower than the permit limit shall be used. If the detection limit of all methods is higher than the permit limit the method having the lowest detection limit shall be used and a report of less than detection limit shall constitute compliance, however should EPA approve a method with a lower detection limit during the term of this permit the permittee shall use the newly approved method.

When an EPA approved test procedure for analysis of a pollutant does not exist, the Director shall approve the procedure to be used.

3. Recording of Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

a. The facility name and location, point source number, date, time and exact place of sampling;

b. The name(s) of person(s) who obtained the samples or measurements;

c. The dates and times the analyses were performed;

d. The name(s) of the person(s) who performed the analyses;

e. The analytical techniques or methods used, including source of method and method number; and

f. The results of all required analyses.

4. Records Retention and Production

a. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by the permit, and records of all data used to complete the above reports or the application for this permit, for a period of at least three years from the date of the sample measurement, report or application. This period may be extended by request of the Director at any time. If litigation or other enforcement action, under the AWPCA and/or the FWPCA, is ongoing which involves any of the above records, the records shall be kept until the litigation is resolved. Upon the written request of the Director or his designee, the permittee shall provide the Director with a copy of any record required to be retained by this paragraph. Copies of these records shall not be submitted unless requested.

b. All records required to be kept for a period of three years shall be kept at the permitted facility or an alternate location approved by the Department in writing and shall be available for inspection.

5. Monitoring Equipment and Instrumentation

All equipment and instrumentation used to determine compliance with the requirements of this permit shall be installed, maintained, and calibrated in accordance with the manufacturer's instructions or, in the absence of manufacturer's instructions, in accordance with accepted practices. At a minimum, flow measurement devices shall be calibrated at least once every 12 months.

C. DISCHARGE REPORTING REQUIREMENTS

1. Reporting of Monitoring Requirements

   a. Monitoring results obtained during the previous **[monthly]** reporting period shall be summarized on a Discharge Monitoring Report (DMR) Form approved by the Department, and received by the Director no later than the 28th day of the month following this monitoring period. The DMR must be legible and bear an original signature, photo and electronic copies of the signature are not acceptable and shall not satisfy the reporting requirements of this permit. The first report is due **January 28, 1993**. If the permittee, using approved analytical methods as specified in Provision I. B. 2. monitors any discharge from a point source for a limited substance identified in Provision I. A. of this permit more frequently than required by this permit, the results of such monitoring shall be included in the calculation and reporting of values on the DMR Form and the increased frequency shall be indicated on the DMR Form. In the event no discharge from a point source identified in Provision I. A of this permit and described more fully in the permittee's application occurs during a monitoring period, the permittee shall report "No Discharge" for such period on the appropriate DMR Form.

   b. The permittee may certify in writing that a discharge will not occur for an extended period of time and after such certification shall not be required to submit monitoring reports. Written notification of a planned resumption of discharge shall be submitted at least 30 days prior to resumption of the discharge. If an unplanned resumption of discharge occurs, written notification shall be submitted within 7 days of the resumption. In any case, all discharges shall comply with all provisions of this permit.

   c. All reports and forms required to be submitted by this permit, the AWPCA and the Department's Rules and regulations, shall be signed by a "responsible official" of the permittee as defined in ADEM Administrative Code Rule 335-6-6-.09 or a "duly authorized representative" of such official as defined in ADEM Administrative Code Rule 335-6-6-.09 and shall bear the following certification:

      "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

   d. All reports and forms required to be submitted by this permit, the AWPCA and the Department's Rules, shall be addressed to:

      Director
      Alabama Department of Environmental Management
      1751 Congressman Dickinson Drive
      Montgomery, Alabama 36130
      Attention: Industrial Branch, Water Division

2. Noncompliance Notification

a. If for any reason, the permittee's discharge (1) does not comply with any daily minimum or maximum discharge limitation for an effluent characteristic specified in Provision I. A. of this permit which is denoted by an "(X)", (2) threatens human health or welfare, fish or aquatic life, or water quality standards, (3) does not comply with an applicable toxic pollutant effluent standard or prohibition established under Section 307(a) of the FWPCA, 33 U.S.C. Section 1317(a), (4) contains a quantity of a hazardous substance which has been determined may be harmful to public health or welfare under Section 311(b)(4) of the FWPCA, 33 U.S.C. Section 1321(b)(4), (5) exceeds any discharge limitation for an effluent characteristic as a result of an unanticipated bypass or upset, or (6) is an unpermitted direct or indirect discharge of a pollutant to a water of the state (unpermitted discharges properly reported to the Department under any other requirement are not required to be reported under this provision), the permittee shall orally report the occurrence and circumstances of such discharge to the Director within 24-hours after the permittee becomes aware of the occurrence of such discharge. In addition to the oral report, the permittee shall submit to the Director a written report as provided in Provision I. C. 2. c. no later than five (5) days after becoming aware of the occurrence of such discharge.

b. If for any reason, the permittee's discharge does not comply with any limitation of this permit, the permittee shall submit to the Director a written report as provided in Provision I. C. 2. c. below, such report shall be submitted with the next Discharge Monitoring Report required to be submitted by Provision I. C. 1. of this permit after becoming aware of the occurrence of such noncompliance.

c. Any written report required to be submitted to the Director by Provision I. C. 2 a. or b. shall be submitted using a copy of the Noncompliance Notification Form provided with this permit and shall include the following information:

(1) A description of the discharge and cause of noncompliance;

(2) The period of noncompliance, including exact dates and times or, if not corrected, the anticipated time the noncompliance is expected to continue; and

(3) A description of the steps taken and/or being taken to reduce or eliminate the noncomplying discharge and to prevent its recurrence.

D. OTHER REPORTING AND NOTIFICATION REQUIREMENTS

1. Anticipated Noncompliance

The permittee shall give the Director written advance notice of any planned changes or other circumstances regarding a facility which may result in noncompliance with permit requirements.

2. Termination of Discharge

The permittee shall notify the Director, in writing, when all discharges from any point source(s) identified in Provision I. A. of this permit have permanently ceased. This notification shall serve as sufficient cause for instituting procedures for modification or termination of the permit.

3. Updating Information

a. The permittee shall inform the Director of any change in the permittee's mailing address or telephone number or in the permittee's designation of a facility contact or office having the authority and responsibility to prevent and abate violations of the AWPCA, the Department's Rules and the terms and conditions of this permit, in writing, no later than ten (10) days after such change. Upon request of the Director or his designee, the permittee shall furnish the Director with an update of any information provided in the permit application.

b. If the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, it shall promptly submit such facts or information with a written explanation for the mistake and/or omission.

4. Duty to Provide Information

The permittee shall furnish to the Director, within a reasonable time, any information which the Director or his designee may request to determine whether cause exists for modifying, suspending, or revoking this permit, in whole or in part, or to determine compliance with this permit.

5. Cooling Water and Boiler Water Additives

a. The permittee shall notify the Director in writing not later than sixty (60) days prior to instituting the use of any biocide corrosion inhibitor or chemical additive in a cooling or boiler system, not identified in the application for this permit, from which discharge is allowed by this permit. Such notification shall include:

(1) name and general composition of biocide or chemical,
(2) 96-hour median tolerance limit data for organisms representative of the biota of the waterway into which the discharge will ultimately reach,
(3) quantities to be used,
(4) frequencies of use,
(5) proposed discharge concentrations, and
(6) EPA registration number, if applicable.

b. The use of a biocide or additive containing tributyl tin, tributyl tin oxide, zinc, chromium or related compounds in a cooling or boiler system(s), from which a discharge regulated by this permit occurs, is prohibited. The use of any additive not identified in this permit or in the application for this permit prior to a determination by the Department that permit modification to control discharge of the additive is not required or prior to issuance of a permit modification controlling discharge of the additive is prohibited.

6. New or Increased Discharges

a. If this permit was issued based on estimates of the characteristics of a process discharge reported on an EPA NPDES Application Form 2D (EPA Form 3510-2D), the permittee shall complete and submit an EPA NPDES Application Form 2C (EPA Form 3510-2C) no later than two years after the date that discharge begins. Sampling required for completion of the Form 2C shall occur when a discharge(s) from the process(s) causing the new or increased discharge is occurring. If this permit was issued based on estimates concerning the composition of a storm water discharge(s), the permittee shall perform the sampling required by EPA NPDES Application Form 2F (EPA Form 3510-2F) no later than one year after the industrial activity generating the storm water discharge has been fully initiated.

b. This permit shall be reopened if required to address any new information resulting from the completion and submittal of the Form 2C and/or Form 2F.

E. SCHEDULE OF COMPLIANCE

1. The permittee shall achieve compliance with the discharge limitations specified in Provision I. A. in accordance with the following schedule:

COMPLIANCE SHALL BE ATTAINED ON THE EFFECTIVE DATE OF THIS PERMIT

2. No later than 14 calendar days following a date identified in the above schedule of compliance, the permittee shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirement.

PART II

A. OPERATIONAL AND MANAGEMENT REQUIREMENTS

1. Facilities Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of the permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities only when necessary to achieve compliance with the conditions of the permit.

2. Best Management Practices

a. Dilution water shall not be added to achieve compliance with discharge limitations except when the Director or his designee has granted prior written authorization for dilution to meet water quality requirements.

b. The permittee shall prepare, implement, and maintain a Spill Prevention, Control and Countermeasures (SPCC) Plan in accordance with 40 C.F.R. Section 112 if required thereby.

c. The permittee shall prepare, submit for approval and implement a Best Management Practices (BMP) Plan for containment of any or all process liquids or solids, in a manner such that these materials do not present a significant potential for discharge, if so required by the Director or his designee. When submitted and approved, the BMP Plan shall become a part of this permit and all requirements of the BMP Plan shall become requirements of this permit.

3. Spill Prevention, Control, and Management

The permittee shall provide spill prevention, control, and/or management sufficient to prevent any spills of pollutants from entering a water of the state or a publicly or privately owned treatment works. Any containment system used to implement this requirement shall be constructed of materials compatible with the substance(s) contained and which shall prevent the contamination of groundwater and such containment system shall be capable of retaining a volume equal to 110 percent of the capacity of the largest tank for which containment is provided.

B. OTHER RESPONSIBILITIES

1. Duty to Mitigate Adverse Impacts

The permittee shall promptly take all reasonable steps to mitigate and minimize or prevent any adverse impact on human health or the environment resulting from noncompliance with any discharge limitation specified in Provision I. A. of this permit, including such accelerated or additional monitoring of the discharge and/or the receiving waterbody as necessary to determine the nature and impact of the noncomplying discharge.

2. Right of Entry and Inspection

The permittee shall allow the Director, or an authorized representative, upon the presentation of proper identification to:

a. enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of the permit;

b. have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit;

c. inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under the permit; and

d. sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the AWPCA, any substances or parameters at any location.

C. BYPASS AND UPSET

1. Bypass

a. Any bypass is prohibited except as provided in b. and c. below:

b. A bypass is not prohibited if:

(1) It does not cause any discharge limitation specified in Provision I. A. of this permit to be exceeded; and

(2) It is necessary for essential maintenance of a treatment or control facility or system to assure efficient operation of such facility or system.

c. A bypass is not prohibited and need not meet the discharge limitations specified in Provision I. A. of this permit if:

(1) It is unavoidable to prevent loss of life, personal injury, or severe property damage;

(2) There are no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime (this condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgement to prevent a bypass which occured during normal periods of equipment downtime or preventive maintenance); and

(3) The permittee submits a written request for authorization to bypass to the Director at least ten (10) days prior to the anticipated bypass (if possible), the permittee is granted such authorization, and the permittee complies with any conditions imposed by the Director to minimize any adverse impact on human health or the environment resulting from the bypass.

d. The permittee has the burden of establishing that each of the conditions of Provision II. C. 1. b. or c. have been met to qualify for an exception to the general prohibition against bypassing contained in a. and an exemption, where applicable, from the discharge limitations specified in Provision I. A. of this permit.

2. Upset

a. A discharge which results from an upset need not meet the discharge limitations specified in Provision I. A. of this permit if:

(1) No later than 24-hours after becoming aware of the occurrence of the upset, the permittee orally reports the occurrence and circumstances of the upset to the Director or his designee; and

(2) No later than five (5) days after becoming aware of the occurrence of the upset, the permittee furnishes the Director with evidence, including properly signed, contemporaneous operating logs, or other relevant evidence, demonstrating that (i) an upset occurred; (ii) the permittee can identify the specific cause(s) of the upset; (iii) the permittee's facility was being properly operated at the time of the upset; and (iv) the permittee promptly took all reasonable steps to minimize any adverse impact on human health or the environment resulting from the upset.

b. The permittee has the burden of establishing that each of the conditions of Provision II C. 2. a. of this permit have been met to qualify for an exemption from the discharge limitations specified in Provision I. A. of this permit.

D. DUTY TO COMPLY WITH PERMIT, RULES, AND STATUTES

1. Duty to Comply

a. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the AWPCA and the FWPCA and is grounds for enforcement action, for permit termination, revocation and reissuance, suspension, modification; or denial of a permit renewal application.

b. The necessity to halt or reduce production or other activities in order to maintain compliance with the conditions of the permit shall not be a defense for a permittee in an enforcement action.

c. The discharge of a pollutant from a source not specifically identified in the permit application for this permit and not specifically included in the description of an outfall in this permit is not authorized and shall constitute noncompliance with this permit.

d. The permittee shall take all reasonable steps, including cessation of production or other activities, to minimize or prevent any violation of this permit or to minimize or prevent any adverse impact of any permit violation.

2. Removed Substances

Solids, sludges, filter backwash, or any other pollutant or other waste removed in the course of treatment or control of wastewaters shall be disposed of in a manner that complies with all applicable Department Rules.

3. Loss or Failure of Treatment Facilities

Upon the loss or failure of any treatment facility, including but not limited to the loss or failure of the primary source of power of the treatment facility, the permittee shall, where necessary to maintain compliance with the discharge limitations specified in Provision I. A. of this permit, or any other terms or conditions of this permit, cease, reduce, or otherwise control production and/or all discharges until treatment is restored.

4. Compliance With Statutes and Rules

a. This permit has been issued under ADEM Administrative Code, Chapter 335-6-6. All provisions of this chapter, that are applicable to this permit, are hereby made a part of this permit. A copy of this chapter may be obtained for a small charge from the Office of General Counsel, Alabama Department of Environmental Management, 1751 Congressman Dickinson Drive, Montgomery, AL 36130.

b. This permit does not authorize the noncompliance with or violation of any Laws of the State of Alabama or the United States of America or any regulations or rules implementing such laws. FWPCA, 33 U.S.C. Section 1319, and Code of Alabama 1975, Section 22-22-14.

E. PERMIT TRANSFER, MODIFICATION, SUSPENSION, REVOCATION, AND REISSUANCE

1. Duty to Reapply or Notify of Intent to Cease Discharge

a. If the permittee intends to continue to discharge beyond the expiration date of this permit, the permittee shall file a complete permit application for reissuance of this permit at least 180 days prior to its expiration. If the permittee does not intend to continue discharge beyond the expiration of this permit, the permittee shall submit written notification of this intent which shall be signed by an individual meeting the signatory requirements for a permit application as set forth in ADEM Administrative Code Rule 335-6-6-.09.

b. Failure of the permittee to apply for reissuance at least 180 days prior to permit expiration will void the automatic continuation of the expiring permit provided by ADEM Administrative Code Rule 335-6-6-.06 and should the permit not be reissued for any reason any discharge after expiration of this permit will be an unpermitted discharge.

2. Change in Discharge

a. The permittee shall apply for a permit modification at least 180 days in advance of any facility expansion, production increase, process change, or other action that could result in the discharge of additional pollutants or increase the quantity of a discharged pollutant such that existing permit limitations would be exceeded or that could result in an additional discharge point. This requirement applies to pollutants that are or that are not subject to discharge limitations in this permit. No new or increased discharge may begin until the Director has authorized it by issuance of a permit modification or a reissued permit.

b. The permittee shall notify the Director as soon as it is known or there is reason to believe:

(1) That any activity has occurred or will occur which would result in the discharge on a routine or frequent basis, of any toxic pollutant which is not limited in this permit, if that discharge will exceed the highest of the following notification levels:

(a) one hundred micrograms per liter;

(b) two hundred micrograms per liter for acrolein and acrylonitrile; five hundred micrograms per liter for 2,4-dinitrophenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter for antimony;

(c) five times the maximum concentration value reported for that pollutant in the permit application; or

(2) That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following notification levels:

(a) five hundred micrograms per liter;

(b) one milligram per liter for antimony;

(c) ten times the maximum concentration value reported for that pollutant in the permit application.

3. Transfer of Permit

This permit may not be transferred or the name of the permittee changed without notice to the Director and subsequent modification or revocation and reissuance of the permit to identify the new permittee and to incorporate any other changes as may be required under the FWPCA or AWPCA. In the case of a change in name, ownership or control of the permittee's premises only, a request for permit modification in a format acceptable to the Director is required at least 30 days prior to the change. In the case of a change in name, ownership or control of the permittee's premises accompanied by a change or proposed change in effluent characteristics, a complete permit application is required to be submitted to the Director at least 180 days prior to the change. Whenever the Director is notified of a change in name, ownership or control, he may decide not to modify the existing permit and require the submission of a new permit application.

4. Permit Modification and Revocation

a. This permit may be modified or revoked and reissued, in whole or in part, during its term for cause, including but not limited to, the following:

(1) If cause for termination under Provision II. E. 5. of this permit exists, the Director may choose to revoke and reissue this permit instead of terminating the permit;

(2) If a request to transfer this permit has been received, the Director may decide to revoke and reissue or to modify the permit; or

(3) If modification or revocation and reissuance is requested by the permittee and cause exists, the Director may grant the request.

b. This permit may be modified during its term for cause, including but not limited to, the following:

(1) If cause for termination under Provision II. E. 5. of this permit exists, the Director may choose to modify this permit instead of terminating this permit;

(2) There are material and substantial alterations or additions to the facility or activity generating wastewater which occurred after permit issuance which justify the application of permit conditions that are different or absent in the existing permit;

(3) The Director has received new information that was not available at the time of permit issuance and that would have justified the application of different permit conditions at the time of issuance;

(4) A new or revised requirement(s) of any applicable standard or limitation is promulgated under Sections 301(b)(2)(C), (D), (E), and (F), and 307(a)(2) of the FWPCA;

(5) Errors in calculation of discharge limitations or typographical or clerical errors were made;

(6) To the extent allowed by ADEM Administrative Code, Rule 335-6-6-.17, when the standards or regulations on which the permit was based have been changed by promulgation of amended standards or regulations or by judicial decision after the permit was issued;

(7) To the extent allowed by ADEM Administrative Code, Rule 335-6-6-.17, permits may be modified to change compliance schedules;

(8) To agree with a granted variance under 301(c), 301(g), 301(h), 301(k), or 316(a) of the FWPCA or for fundamentally different factors;

(9) To incorporate an applicable 307(a) FWPCA toxic effluent standard or prohibition;

(10) When required by the reopener conditions in this permit;

(11) When required under 40 CFR 403.8(e) (compliance schedule for development of pretreatment program);

(12) Upon failure of the state to notify, as required by Section 402(b)(3) of the FWPCA, another state whose waters may be affected by a discharge permitted by this permit;

(13) When required to correct technical mistakes, such as errors in calculation, or mistaken interpretations of law made in determining permit conditions; or

(14) When requested by the permittee and the Director determines that the modification has cause and will not result in a violation of federal or state law, regulations or rules; or

5. This permit may be terminated during its term for cause, including but not limited to, the following:

a. Violation of any term or condition of this permit;

b. The permittee's misrepresentation or failure to disclose fully all relevant facts in the permit application or during the permit issuance process or the permittee's misrepresentation of any relevant facts at any time;

c. Materially false or inaccurate statements or information in the permit application or the permit;

d. A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge;

e. The permittee's discharge threatens human life or welfare or the maintenance of water quality standards;

f. Permanent closure of the facility generating the wastewater permitted to be discharged by this permit or permanent cessation of wastewater discharge;

g. New or revised requirements of any applicable standard or limitation that is promulgated under Sections 301(b)(2)(C), (D), (E), and (F), and 307(a)(2) of the FWPCA that the Director determines cannot be complied with by the permittee.

h. Any other cause allowed by the ADEM Administrative Code, Chapter 335-6-6.

6. This permit may be suspended during its term for noncompliance until the permittee has taken action(s) necessary to achieve compliance.

7. The filing of a request by the permittee for modification, suspension or revocation of this permit, in whole or in part, does not stay any permit term or condition.

F. COMPLIANCE WITH TOXIC POLLUTANT STANDARD OR PROHIBITION

If any applicable effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the FWPCA, 33 U.S.C. Section 1317(a), for a toxic pollutant discharged by the permittee and such standard or prohibition is more stringent than any discharge limitation on the pollutant specified in Provision I. A. of this permit, or controls a pollutant not limited in Provision I. A. of this permit, this permit shall be modified to conform to the toxic pollutant effluent standard or prohibition and the permittee shall be notified of such modification. If this permit has not been modified to conform to the toxic pollutant effluent standard or prohibition before the effective date of such standard or prohibition, the permittee shall attain compliance with the requirements of the standard or prohibition within the time period required by the standard or prohibition and shall continue to comply with the standard or prohibition until this permit is modified or reissued.

G. DISCHARGE OF WASTEWATER GENERATED BY OTHERS

The discharge of wastewater, generated by any process, facility, or by any other means not under the operational control of the permittee or not identified in the application for this permit or not identified specifically in the description of an outfall in this permit is not authorized by this permit.

PART III

A. CIVIL AND CRIMINAL LIABILITY

1. Tampering

Any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained or performed under the permit shall, upon conviction, be subject to penalties as provided by the AWPCA.

2. False Statements

Any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be subject to penalties as provided by the AWPCA.

3. Permit Enforcement

a. Any NPDES permit issued or reissued by the Department is a permit for the purpose of the AWPCA and the FWPCA and as such any terms, conditions, or limitations of the permit are enforceable under state and federal law.

b. Any person required to have a NPDES permit pursuant to ADEM Administrative Code Chapter 335-6-6 and who discharges pollutants without said permit, who violates the conditions of said permit, who discharges pollutants in a manner not authorized by the permit, or who violates applicable orders of the Department or any applicable rule or standard of the Department, is subject to any one or combination of the following enforcement actions under applicable state statutes.

(1) An administrative order requiring abatement, compliance, mitigation, cessation, clean-up, and/or penalties;

(2) An action for damages;

(3) An action for injunctive relief; or

(4) An action for penalties.

4. Relief From Liability

Except as provided in Provision II. C. 1. (Bypass) and Provision II. C. 2. (Upset), nothing in this permit shall be construed to relieve the permittee of civil or criminal liability under the AWPCA or FWPCA for noncompliance with any term or condition of this permit.

B. OIL AND HAZARDOUS SUBSTANCE LIABILITY

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities or penalties to which the permittee is or may be subject under Section 311 of the FWPCA, 33 U.S.C. Section 1321.

C. PROPERTY AND OTHER RIGHTS

This permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to persons or property or invasion of other private rights, or any infringement of federal, state, or local laws or regulations, nor does it authorize or approve the construction of any physical structures or facilities or the undertaking of any work in any waters of the state or of the United States.

D. AVAILABILITY OF REPORTS

Except for data determined to be confidential under Code of Alabama 1975, Section 22-22-9(c), all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Department. Effluent data shall not be considered confidential.

E. EXPIRATION OF PERMITS FOR NEW OR INCREASED DISCHARGES

1. If this permit was issued for a new discharger or new source, this permit shall expire eighteen months after the issuance date if construction of the facility has not begun during the eighteen month period.

2. If this permit was issued or modified to allow the discharge of increased quantities of pollutants to accommodate the modification of an existing facility and if construction of this modification has not begun during the eighteen month period after issuance of this permit or permit modification, this permit shall be modified to reduce the quantities of pollutants allowed to be discharged to those levels that would have been allowed if the modification of the facility had not been planned.

3. Construction has begun when the owner or operator has:

   a. begun, or caused to begin as part of a continuous on-site construction program:

      (1) any placement, assembly, or installation of facilities or equipment; or

      (2) significant site preparation work including clearing, excavation, or removal of existing buildings, structures, or facilities which is necessary for the placement, assembly, or installation of new source facilities or equipment; or

   b. entered into a binding contractual obligation for the purpose of placement, assembly, or installation of facilities or equipment which are intended to be used in its operation within a reasonable time. Options to purchase or contracts which can be terminated or modified without substantial loss, and contracts for feasibility, engineering, and design studies do not constitute a contractual obligation under the paragraph. The entering into a lease with the State of Alabama for exploration and production of hydrocarbons shall also be considered beginning construction.

F. COMPLIANCE WITH WATER QUALITY STANDARDS

1. On the basis of the permittee's application, plans, or other available information, the Department has determined that compliance with the terms and conditions of this permit should assure compliance with the applicable water quality standards.

2. Compliance with permit terms and conditions notwithstanding, if the permittee's discharge(s) from point sources identified in Provision I. A. of this permit cause or contribute to a condition in contravention of state water quality standards, the Department may require abatement action to be taken by the permittee in emergency situations or modify the permit pursuant to the Department's Rules, or both.

3. If the Department determines, on the basis of a notice provided pursuant to this permit or any investigation, inspection or sampling, that a modification of this permit is necessary to assure maintenance of water quality standards or compliance with other provisions of the AWPCA or FWPCA, the Department may require such modification and, in cases of emergency, the Director may prohibit the discharge until the permit has been modified.

G. GROUNDWATER

Unless specifically authorized by this permit, the discharge of pollutants to groundwater is prohibited. Should a threat of groundwater contamination occur, the Director may require groundwater monitoring to properly assess the degree of the problem and the Director may require that the permittee undertake measures to abate any such discharge and/or contamination.

H. DEFINITIONS

1. Average monthly discharge limitation - means the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month (zero discharge days shall not be included in the number of "daily discharges" measured and a less than detectable test result shall be treated as a concentration of zero if the most sensitive EPA approved method was used).

2. Average weekly discharge limitation - means the highest allowable average of "daily discharges" over a calendar week, calculated as the sum of all "daily discharges" measured during a calendar week divided by the number of "daily discharges" measured during that week (zero discharge days shall not be included in the number of "daily discharges" measured and a less than detectable test result shall be treated as a concentration of zero if the most sensitive EPA approved method was used).

3. AWPCA - means the Alabama Water Pollution Control Act.

4. Bypass - means the intentional diversion of waste streams from any portion of a treatment facility.

5. Daily discharge - means the discharge of a pollutant measured during any consecutive 24 hour period in accordance with the sample type and analytical methodology specified by the discharge permit.

6. Daily maximum - means the highest value of any individual sample result obtained during a day.

7. Daily minimum - means the lowest value of any individual sample result obtained during a day.

8. Day - means any consecutive 24-hour period.

9. Department - means the Alabama Department of Environmental Management.

10. Director - means the Director of the Department.

11. Discharge - means "[t]he addition, introduction, leaking, spilling or emitting of any sewage, industrial waste, pollutant or other waste into waters of the state". Code of Alabama 1975, Section 22-22-1(b)(9).

12. Discharge monitoring report (DMR) - means the form approved by the Director to accomplish reporting requirements of an NPDES permit.

13. EPA - means the United States Environmental Protection Agency.

14. FWPCA - means the Federal Water Pollution Control Act.

15. Permit application - means forms and additional information that is required by ADEM Administrative Code Rule 335-6-6-.08 and applicable permit fees.

16. Point source - means "any discernible, confined and discrete conveyance, including but not limited to any pipe, channel, ditch, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, . . . from which pollutants are or may be discharged." Section 502(14) of the FWPCA, 33 U.S.C. Section 1362(14).

17. Pollutant - includes for purposes of this permit, but is not limited to, those pollutants specified in Code of Alabama 1975, Section 22-22-1(b)(3) and those effluent characteristics specified in Provision I. A. of this permit.

18. Severe property damage - means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

19. Upset - means an exceptional incident in which there is an unintentional and temporary noncompliance with technology-based permit discharge limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

20. Waters - means "[a]ll waters of any river, stream, watercourse, pond, lake, coastal, ground or surface water, wholly or partially within the state, natural or artificial. This does not include waters which are entirely confined and retained completely upon the property of a single individual, partnership or corporation unless such waters are used in interstate commerce." Code of Alabama 1975, Section 22-22-1(b)(2). Waters "include all navigable waters" as defined in Section 502(7) of the FWPCA, 22 U.S.C. Section 1362(7), which are within the State of Alabama.

21. Week - means the period beginning at twelve midnight Saturday and ending at twelve midnight the following Saturday.

L. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

EFFLUENT TOXICITY LIMITATIONS AND BIOMONITORING REQUIREMENTS

1. The permittee shall perform 48 hour acute toxicity screening tests on the wastewater discharges required to be tested for acute toxicity by Part I of this permit. The tests shall be performed in accordance with Section 8 of the latest edition of "EPA Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms". and shall be performed using the fathead minnow (Pimephales promelas) and the Ceriodaphnia.

2. Biomonitoring test results obtained during each monitoring period shall be summarized and reported using the appropriate report form approved by the Department and shall be submitted so that the report is received by the Department no later than 28 days following the last day of the monitoring period.

3. A grab sample shall be obtained for use in the above biomonitoring tests. The holding time for each grab sample shall not exceed 36 hours. The tests shall be performed using undiluted effluent.

4. Effluent toxicity tests in which survival in the control is less than 90% or in which the other requirements of the EPA Test Procedure are not met shall be unacceptable and the permittee shall not report the test results and shall rerun the test, except when survival in the test is 90% or greater, the test may be reported and not rerun.

5. Any tests that result in less than 50% survival indicate acute toxicity and constitute noncompliance with this permit. To determine the extent and duration of the toxic condition, the permittee shall perform four additional acute toxicity tests in accordance with these procedures. The toxicity tests shall be performed once per week and shall be performed during the first four calendar weeks following the date on which the permittee became aware of the permit noncompliance and the results of these tests shall be submitted no later than 28 days following the month in which the tests were performed.

6. After evaluation of the results of the follow-up tests, the Department will determine if additional action is appropriate and may require additional testing and/or toxicity reduction measures.

EFFLUENT TOXICITY TESTING REPORTS

7. The following information in the format shown shall be submitted with each discharge monitoring report. The Department may at any time suspend or reinstate this requirement or may decrease or increase the frequency of submittals.

Introduction

1. Facility name and location
2. Permit number
3. Toxicity testing requirements of permit
4. Name of receiving water body

Plant Operations

1. Raw materials and end product(s)
2. Operating schedule
3. Description of waste treatment
4. Retention time (if applicable)
5. Design flow of treatment facility at time of sampling

Source of Effluent and Dilution Water

1. Effluent samples

   a. Sampling point
   b. Collection dates and times
   c. Sample collection method
   d. Physical and chemical data
      (volume of waste flow, dissolved oxygen, water temperature, pH, alkalinity, hardness, specific conductance)

2. Dilution Water

   a. Source
   b. Collection/preparation date(s) and time(s)
   c. Pretreatment (if applicable)
   d. Physical and chemical characteristics
      (dissolved oxygen, water temperature, pH, alkalinity, hardness, specific conductance)

Test Methods

1. Toxicity test method utilized
2. End point(s) of test
3. Deviations from referenced method, if any, and reasons
4. Date and time test started
5. Date and time test terminated
6. Type and volume of test chambers
7. Volume of solution per chamber
8. Number of organisms per test chamber
9. Number of replicate test chambers per treatment
10. Test temperature (mean and range)

Test Organisms

1. Scientific name
2. Life stage and age
3. Source
4. Disease treatment (if applicable)

Quality Assurance

1. Standard toxicant utilized and source
2. Date and time of most recent test
3. Dilution water utilized in test
4. Results (LC50, NOEC, etc.)
5. Physical and chemical methods utilized

Results

1. Provide copies of laboratory bench sheets of all raw data

    a. Physical/chemical data for test concentrations
    b. Biological data - daily records on organisms

2. Indicate statistical methods utilized to calculate endpoints and provide copies of calculations.

3. Provide summary tables of calculations (LC50, NOEC, etc.) and physical/chemical data.

Adapted from "Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms", Second Edition, Weber, C.I., et al., March 1989 (EPA/600/4-89/001), Section 9, Report Preparation

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
WATER DIVISION - INDUSTRIAL BRANCH
NONCOMPLIANCE NOTIFICATION FORM

PERMITTEE NAME:_____

PERMIT NUMBER:_____

FACILITY LOCATION:_____

DMR REPORTING PERIOD:_____

1. DESCRIPTION OF DISCHARGE:

   NONCOMPLIANCE PARAMETER(S):

   CAUSE OF NONCOMPLIANCE: (Attach additional pages if necessary)

2. PERIOD OF NONCOMPLIANCE: (Include exact date(s) and time(s) or, if not corrected, the anticipated time the noncompliance is expected to continue):

3. DESCRIPTION OF STEPS TAKEN AND/OR BEING TAKEN TO REDUCE OR ELIMINATE THE NONCOMPLYING DISCHARGE AND TO PREVENT ITS RECURRENCE (attach additional pages if necessary):

_____
NAME AND TITLE OF RESPONSIBLE OFFICIAL (type or print)

_____ _____
SIGNATURE OF RESPONSIBLE OFFICIAL DATE SIGNED

ADEM DISCHARGE MONITORING REPORT MONTH_____,19___

COMPANY: Lawter International LOCATION: Cracker Road NPDES PERMIT # AL0026921

Moundville, Alabama

DSN001											DSN001A			
PARAM	Flow	pH	Temp	BOD5	TSS	O&G	TDS	SO4	Cl-		Flow	pH	Zn,T	Cr,T
MIN	-	6.0	-	-	-	-	-	-	-		-	6.0	-	-
MAX	Monitor	8.5	90	69.6	94.4	22	Monitor	Monitor	Monitor		Monitor	8.5	1.1885	1.2614
MO.AVG	Monitor	-	90	26.1	29.3	11	Monitor	Monitor	Monitor		Monitor	-	0.4781	0.5055
FREQ	Contin	1/day	1/wk	1/wk	1/wk	1/wk	1/mth	1/mth	1/mth		Contin	1/day	1/3 mths	1/3 mths
UNITS	MGD	s.u.	°F	ppd	ppd	ppd	ppd	ppd	ppd		MGD	s.u.	ppd	ppd
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I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature of Responsible Official_____ Date_____

ADEM 5/89

ADEM DISCHARGE MONITORING REPORT MONTH_____, 19___

COMPANY: Lawter International LOCATION: Cracker Road NPDES PERMIT # AL0026921

DSN001A Moundville, Alabama

PARAM	Acnaph	Acyn	Benz	Ccl4	CB	1,2,4 TCB	HCB	1,2 DCE	1,1,1 TCE	HCE	1,1 DCE	1,1,2 TCE	CE	CF
MIN	-	-	-	-	-		-	-		-	-		-	-
MAX	0.0268	0.1103	0.0620	0.0173	0.0128	0.0638	0.0128	0.0961	0.0246	0.0246	0.0269	0.0246	0.1221	0.0210
MO.AVG	0.01002	0.0437	0.0169	0.0082	0.0068	0.0310	0.0068	0.0310	0.0096	0.0096	0.0100	0.0096	0.0474	0.0096
FREQ	1/6 mo	1/6mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo
UNITS	ppd	ppd	ppd	ppd	ppd	ppd	ppd	ppd	ppd	ppd	ppd	ppd	ppd	ppd
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Signature of Responsible Official_____ Date_____

ADEM 5/89

ADEM DISCHARGE MONITORING REPORT MONTH_____,19___

COMPANY: Lawter International LOCATION: Cracker Road NPDES PERMIT # AL0026921

DSN001A Moundville, Alabama

PARAM	2-CP	1,2 DCB	1,3 DCB	1,4 DCB	1,1DCEY	1,2 TDCEY	2,4DCP	1,2DCPP	1,3 DCPPY	2,4 DMP	2,4DNT	2,6 DNT	EB	FLANTH
MIN	-	-	-	-	-		-	-		-	-	-	-	-
MAX	0.0447	0.0743	0.0200	0.0128	0.0114	0.0246	0.0510	0.1048	0.0200	0.0164	0.1299	0.2920	0.0492	0.0310
MO.AVG	0.0141	0.0351	0.0141	0.0068	0.0073	0.0096	0.0178	0.0697	0.0132	0.0082	0.0515	0.1162	0.0146	0.0114
FREQ	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6mo	1/6 mo	1/6 mo	1/6 mo
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Signature of Responsible Official_____ Date_____

ADEM 5/89

ADEM DISCHARGE MONITORING REPORT MONTH_____,19___

COMPANY: Lawter International LOCATION: Cracker Road NPDES PERMIT # AL0026921

DSN001A Moundville, Alabama

PARAM	MTHYCL	MC	HCBD	Naph	NB	2-NP	4-NP	2,4 DNP	4,6DNOC	Phenol	B2 EHPH	DNB-PH	DEPH	DMPH
MIN	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAX	0.0405	0.0866	0.0223	0.0269	0.0310	0.0314	0.0565	0.0560	0.1262	0.0118	0.1271	0.0260	0.0925	0.0214
MO.AVG	0.0182	0.0392	0.0091	0.0100	0.0123	0.0187	0.0328	0.0323	0.0355	0.0068	0.0469	0.0123	0.0369	0.0087
FREQ	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo	/6 mo	1/6 mo	1/6 mo
UNITS	ppd	ppd	ppd	ppd	ppd	ppd	ppd	ppd	ppd	ppd	ppd	ppd	ppd	ppd
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Signature of Responsible Official_____ Date_____

ADEM 5/89

ADEM DISCHARGE MONITORING REPORT MONTH_____,19___

COMPANY: Lawter International LOCATION: Cracker Road NPDES PERMIT # AL0026921

DSN001A Moundville, Alabama

PARAM	B<A>ANTH	B<A>P	3,4BFAN	B<K>	CHRY	ANPHY	ANTHRC	FL	PHANTH	PYRENE	TTRCE	Toluene	TCETHY	V Cl-
MIN	-	-	-	FANTH	-	-	-	-	-	-	THY	-	-	-
MAX	0.0269	0.0278	0.0278	0.0269	0.0269	0.0269	0.0269	0.0269	0.0269	0.0305	0.0255	0.0364	0.0246	0.1221
MO.AVG	0.0100	0.0105	0.0105	0.0100	0.0100	0.0100	0.0100	0.0100	0.0100	0.0114	0.0100	0.0118	0.0096	0.0474
FREQ	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo	1/6 mo
UNITS	ppd	ppd	ppd	ppd	ppd	ppd	ppd	ppd	ppd	ppd	ppd	ppd	ppd	ppd
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Signature of Responsible Official_____ Date_____

ADEM 5/89

ADEM DISCHARGE MONITORING REPORT MONTH_____,19___

COMPANY: Lawter International LOCATION: Cracker Road NPDES PERMIT # AL0026921
DSN001A Moundville, Alabama

PARAM	Cu.T	Cn.T	Pb.T	Ni.T										
MIN	-	-	-	-										
MAX	1.5391	Monitor	0.3142	1.8123										
MO.AVG	0.6603	Monitor	0.1457	0.7696										
FREQ	1/6 mo	1/6 mo	1/6 mo	1/6 mo										
UNITS	ppd	ppd	ppd	ppd										
1														
2														
3														
4														
5														
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26														
27														
28														
29														
30														
31														
MAX														
MO.AVG														

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature of Responsible Official_____ Date_____

ADEM 5/89

ADEM DISCHARGE MONITORING REPORT

QUARTER_____,19___

COMPANY: Lawter International

LOCATION: Moundville

NPDES # AL0026921

___ Weekly ___ Monthly _X_ Quarterly ___ Biannual ___ Yearly Accelerated Testing ___ yes ___ no

DSN001

SPECIES	FATHEAD MINNOW		DAPHNIA PULEX	
TEST DURATION	48 HR.		48 HR	
IWC or % EFFLUENT	na		na	
PERMITTED MORTALITY RATE (%)	na		na	
PERMITTED LC50 (%)				
REPORTED LC50 (%) or MORTALITY RATE (%)	LC50/MORTALITY		LC50/MORTALITY	

1														
2														
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I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature of Responsible Official_____ Date_____

ADEM 5/89

DYNAMAC CORPORATION
TELEPHONE CONTACT SUMMARY

CALL MADE BY:	Mary Morgan Mary Morgan	REGION:	IV
DATE:	11/18/93 11/18/93	SITE:	Southern Resins Division
TIME:	0930		
CERCLIS NO:	ALD 004 034 138		

PERSON CONTACTED:	Searcy Rhodes
TITLE:	Superintendent
ORGANIZATION:	Hale County Water Company
CITY, STATE:	Moundville, AL
PHONE NO.:	205-624-8868

SUBJECT: Waterline Distribution of Hale County Water Company

CONVERSATION SUMMARY:

Mr. Rhodes stated that Hale County Water Company buys all of its water from the Moundville Water Company, which obtains water from two groundwater wells. He then stated that I could obtain a map of Hale County Water Company waterlines from Steve Cawood of Goodwyn, Mills and Cawood, Inc., the engineering firm employed by Hale County Water Company. The phone number for Goodwyn, Mills and Cawood is (205) 271-3200.

REFERENCE NO. 34

DYNAMAC CORPORATION
TELEPHONE CONTACT SUMMARY

CALL MADE BY:	Mary Morgan Mary Morgan	REGION:	IV
DATE:	11/18/93 11/18/93	SITE:	Southern Resins Division
TIME:	1000		
CERCLIS NO:	ALD 004 034 138		

PERSON CONTACTED:	Steve Cawood
TITLE:	Engineer
ORGANIZATION:	Goodwyn, Mills and Cawood, Inc.
CITY, STATE:	Montgomery, AL
PHONE NO.:	205-271-3200

SUBJECT: Waterline Distribution of Hale County Water Company

CONVERSATION SUMMARY:

Mr. Cawood stated that he would be happy to send me a copy of the Hale County Water Department waterline distribution map. He said that he would put the map in the mail today. When asked about waterline distribution for Moundville Water System, Mr. Cawood stated that I should contact Ricky Harrison of Hankins and Harrison Engineering, Inc., in Tuscaloosa at (205) 752-4037.

OVERSIZED

DOCUMENT

DYNAMAC CORPORATION
TELEPHONE CONTACT SUMMARY

Mary Morgan

CALL MADE BY: Mary Morgan REGION: IV
DATE: 11/19/93 11/19/93 SITE: Southern Resins Division
TIME: 1530
CERCLIS NO: ALD 004 034 138

PERSON CONTACTED: Ricky Harrison
TITLE: Engineer
ORGANIZATION: Hankins and Harrison Engineering, Inc.
CITY, STATE: Tuscaloosa, AL
PHONE NO.: 205-752-4037

SUBJECT: Waterline Distribution of Moundville Water System

CONVERSATION SUMMARY:

Mr. Harrison stated that his firm is employed by the Moundville Water System. He said that he would mail a map of the Moundville Water System distribution lines to me.

EPA

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

I. IDENTIFICATION
01 STATE: AL
02 SITE NUMBER: D004034138

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site): Southern Resin Div. (Lawter Chem.)
02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER: P.O. Box 128
03 CITY: Moundville
04 STATE: AL
05 ZIP CODE: 35474
06 COUNTY: Tuscaloosa
07 COUNTY CODE:
08 CONG DIST: 07
09 COORDINATES LATITUDE: 33 00 40.0
LONGITUDE: 097 37 30.0
10 DIRECTIONS TO SITE (Starting from nearest public road): 13 miles South of Tuscaloosa, 3/4 mile west of Route 69 on Cracker Rd.

III. RESPONSIBLE PARTIES

01 OWNER (If known): Lawter International
02 STREET (Business, mailing, residential): 990 Skokie Blvd.
03 CITY: North Brook
04 STATE: IL
05 ZIP CODE:
06 TELEPHONE NUMBER: (312) 498-4700
07 OPERATOR (If known and different from owner):
08 STREET (Business, mailing, residential):
09 CITY:
10 STATE:
11 ZIP CODE:
12 TELEPHONE NUMBER: ( )

13 TYPE OF OWNERSHIP (Check one)
☒ A. PRIVATE ☐ B. FEDERAL: _____ (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
☒ A. RCRA 3001 DATE RECEIVED: 11/19/80 (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: / / (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
☒ YES DATE 03/01/85 (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☒ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: _____ (Specify)
CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)
☒ A. ACTIVE ☐ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION
1966 (BEGINNING YEAR) | (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED
Aromatic Solvents

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION
Groundwater contamination from solvents used at plant site

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)
☐ A. HIGH (Inspection required promptly) ☐ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☒ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT: Steve Maurer
02 OF (Agency/Organization): ADEM
03 TELEPHONE NUMBER: (205) 271-7728
04 PERSON RESPONSIBLE FOR ASSESSMENT: Jim Duncan
05 AGENCY:
06 ORGANIZATION: EPS
07 TELEPHONE NUMBER: (601) 922-8242
08 DATE: 08/29/85 (MONTH DAY YEAR)

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
AL	D004034138

II. HAZARDOUS CONDITIONS AND INCIDENTS

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

wells are being installed, extremely high potential for extensive ground-water contamination

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

Runoff from plant site.

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

Resins and by products are very oderous

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

waste on site is very flammable

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

Resins were landfilled at SLF where contact may occur

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

Solvents leaking from lime cake onto surface

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

UNK

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

ADEM staff indicates that workers tell of headaches from working at plant

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

UNK

R-586-10-1-25

FINAL REPORT

SITE INSPECTION
SOUTHERN RESINS DIVISION
MOUNDVILLE, ~~TUSCALOOSA~~ COUNTY, ALABAMA
EPA ID #: ALD004034138

HALE COUNTY

Prepared Under
TDD No. F4-9011-22
CONTRACT NO. 68-01-7346

Revision 0

FOR THE

WASTE MANAGEMENT DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY

OCTOBER 7, 1991

HALLIBURTON NUS ENVIRONMENTAL CORPORATION
SUPERFUND DIVISION

Prepared By	Reviewed By	Approved By
Simonia O. DeLaine Project Manager		Phil Blackwell Regional Project Manager

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EXECUTIVE SUMMARY

Southern Resins Division is located off of Highway 69 on the north side of Moundville, Tuscaloosa County, Alabama. The facility has been in operation since 1966 and was purchased in 1976 by Lawter International. Processes at the Southern Resins' plant involve the manufacturing of tall oil resins, ketone resins, polyamide resins, and hydrocarbon resins. Resins are primarily used in paints and inks, as well as some adhesives. Tall oil resins are produced by mixing cellulose (a clycerol), formaldehyde, and dodecylphenol, then heating the mixture indirectly with steam. Ketone resins are produced by mixing cyclohexanone and formaldehyde with a sodium-hydroxide catalyst. This reaction is controlled by the addition of water to cool the resins and remove excess caustic. The polyamide resins are made by reacting dimer acid with ethylene diamine under heat. The hydrocarbon resins are produced using boron trifluoride as a catalyst. Once the resins are dried, they are crushed and bagged. Air emissions from the crushers and baggers are controlled by baghouses. All water from the plant goes to a wastewater treatment plant.

The facility is located in the East Gulf Coastal Plain physiographic province. The area is underlain, in descending order, by Pleistocene-age terrace deposits and the Cretaceous-age Tuscaloosa Group, comprised of the Gordo and Coker formations. The terrace deposits comprise the surficial aquifer followed by a massive clay confining bed in the upper portion of the Gordo Formation. The remainder of the Gordo, along with the Coker Formation, comprise the Tuscaloosa aquifer.

The majority of the residents within 4 miles of the Southern Resins' facility obtain their potable water from three water companies, two of which are solely distribution systems. The Moundville Water System receives water from two wells and serves 705 connections. Moundville also sells some of its water to the Hale County Water System which supplies water to about 844 connections. The third water company is Ingerwood-Hulls Water System, which obtains its water from the city of Tuscaloosa and serves 846 connections. There are also approximately 70 houses within 4 miles of the facility that utilize private wells for potable water. The nearest private well is about 1.4 miles northeast of Southern Resins. The surface water pathway is of concern since there is recreational and commercial fishing in the Black Warrior River. Also, since there are municipal and private wells located within 4 miles of the facility, the groundwater pathway is of concern. There is resin waste on the ground around the plant, and there are fumes from plant operations so that the soil exposure and air pathways are also of concern.

Twenty environmental samples were collected during the field investigation associated with this study.

During this study, the following organic compounds on the Target Compound List were detected in elevated quantities: ethyl benzene, styrene, xylenes, naphthalene, and 2-methylnaphthalene. Most of the tentatively identified compounds reported were aromatics, with phenols also included. These categories of organics are those typically associated with tall oil resins which were used at the facility. When filter cakes were analyzed by Southern Resins, these compounds were also present. Those samples with the most contamination were collected from source areas such as the storage pond, sludge pond, and previous waste pile area. Elevated quantities of organic contaminants were also detected in groundwater samples collected on the east side of the facility.

Additionally, zinc, barium, cadmium, lead, and manganese were found in elevated amounts. Again, the contaminated samples were from source areas, the sludge pond, and waste pile area. One monitoring well on the eastern portion of the property also contained inorganics of concern. All of the metals, except for lead, were previously detected in synthetic filter cakes.

Since most of the contamination was found in source areas, there is no indication that contaminants are migrating from the facility along the surface water pathway. However, organic compounds and metals of concern were detected in groundwater samples making contamination of the municipal and private wells a potential threat. Therefore, FIT 4 recommends that Southern Resins be evaluated using the HRS (effective March 14, 1991).

1.0 INTRODUCTION

The Halliburton NUS Environmental Corporation Region 4 Field Investigation Team (FIT) was tasked by the U.S. Environmental Protection Agency (EPA), Waste Management Division to conduct a Site Inspection (SI) at the Southern Resins Division facility in Moundville, Tuscaloosa County, Alabama. The investigation was performed under the authority of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA). The task was performed to satisfy the requirements stated in Technical Directive Document (TDD) number F4-9011-22. The field investigation was conducted during the week of December 10, 1990.

1.1 OBJECTIVES

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

1.2 SCOPE OF WORK

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

- Obtain and review background materials relevant to HRS scoring of site.
- Obtain information on local water systems.
- Evaluate target populations associated with the groundwater, surface water, air, and onsite exposure pathways.
- Determine location and distance to nearest potable well.

- Develop a site sketch to scale.
- Collect environmental samples.
- Complete a Site Inspection Report, provided as Appendix A in this report.

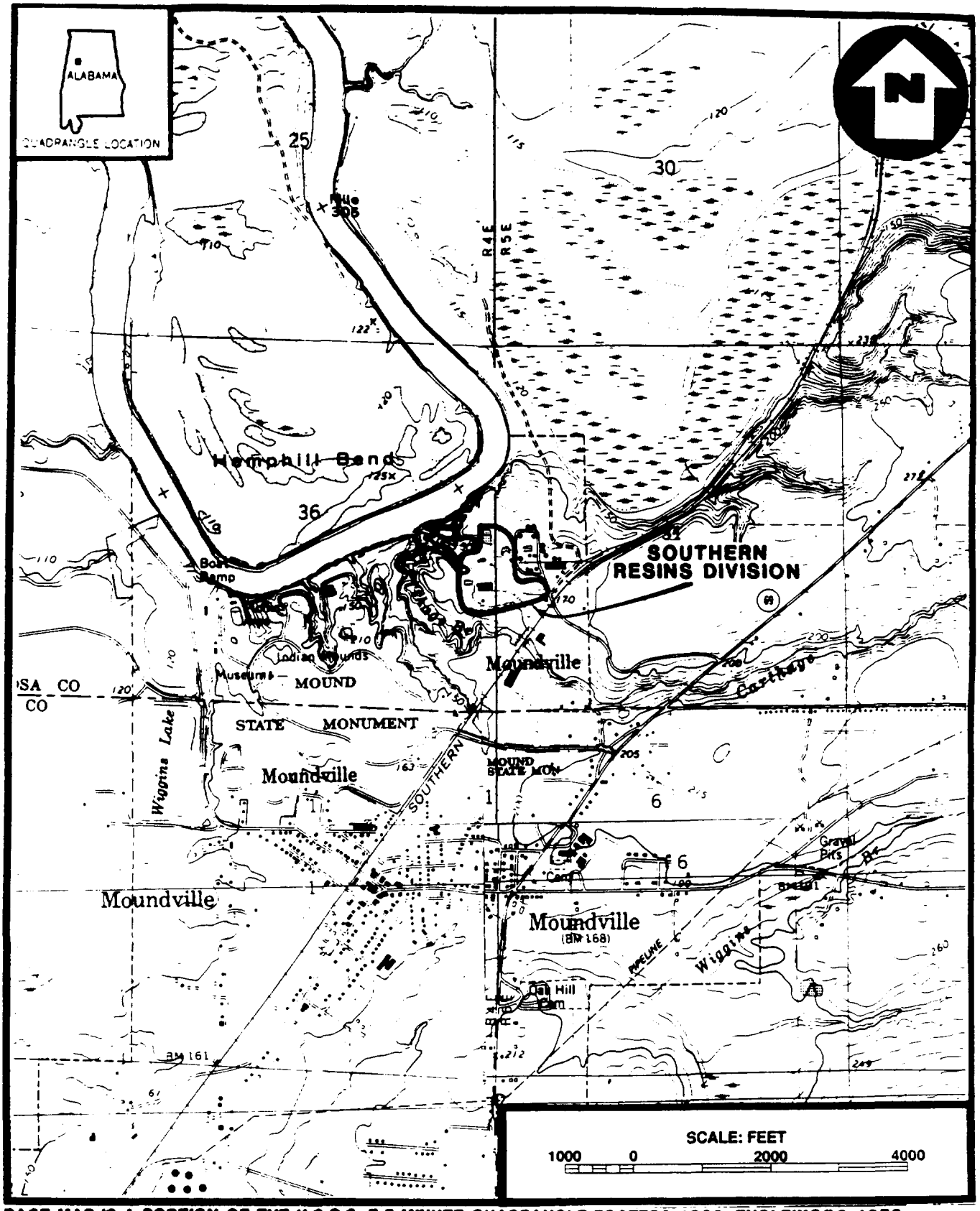
2.0 SITE CHARACTERIZATION

2.1 SITE BACKGROUND AND HISTORY

Southern Resins Division is located off of Highway 69, at the end of Cracker Road on the north side of Moundville, Tuscaloosa County, Alabama. The facility is presently active and has been in operation since 1966 (Refs. 1, 2). The facility was purchased by Lawter International in 1976 (Ref. 1). There was a varnish plant on the property, as well as a resin plant, prior to the facility's purchase by Lawter. Only resins have been produced since that time. Resins are primarily used in paints and inks and in some adhesives (Ref. 2).

Processes at the Southern Resins' plant involve the manufacturing of tall oil resins, ketone resins, and polyamide resins. Tall oil resins are produced by mixing cellulose (a glycerol), formaldehyde, and dodecylphenol, then heating the mixture indirectly with steam. Ketone resins are produced by mixing cyclohexanone and formaldehyde with a sodium-hydroxide catalyst. This reaction is controlled by the addition of water to cool the resins and remove excess caustic. The polyamide resins are made by reacting dimer acid with ethylene diamine under heat. Once the resins are dried, they are crushed and bagged. Air emissions from the crushers and baggers are controlled by baghouses. All water from the plant goes to a wastewater treatment plant (WWTP) (Ref. 3). The WWTP was built in 1980, and the facility has an National Pollutant Discharge Elimination System (NPDES) permit to discharge to the Black Warrior River. Prior to this, water was discharged to surface impoundments (Ref. 2). One surface impoundment was used to receive plant run-off and any significant solvent spills (Ref. 4).

Other processes at the manufacturing plant produce hydrocarbon resins using boron trifluoride as a catalyst. After the proper reaction time, the reaction is stopped by adding lime to the mixture, forming a calcium difluoride precipitate. The mixture is filtered to remove the solids and stripped with steam to remove a by-product solvent from the resin for recycling (Ref. 3). It is uncertain what solvents are removed from the resin; however, toluene and xylene are used in resin manufacturing (Ref. 5). The solids were, at one time, disposed of in the rear of the property (Ref. 3). The filter cakes generated by the filtration process are primarily composed of calcium fluoride ash containing volatile and other organics, but free of flowing liquids Production at the Southern Resins Division plant generates 60 to 70 drums of filter cake per week (Ref. 6). In the past, filter cake was stored in two waste piles, one that was in a three-sided bin, and a debris pile, all of which have been removed (Refs. 2, 6). Presently, the filter cake, as well as off-spec resins, are stored in drums on site, waiting to be incinerated. The incinerator came on-line in June 1990, and is regulated by the Alabama

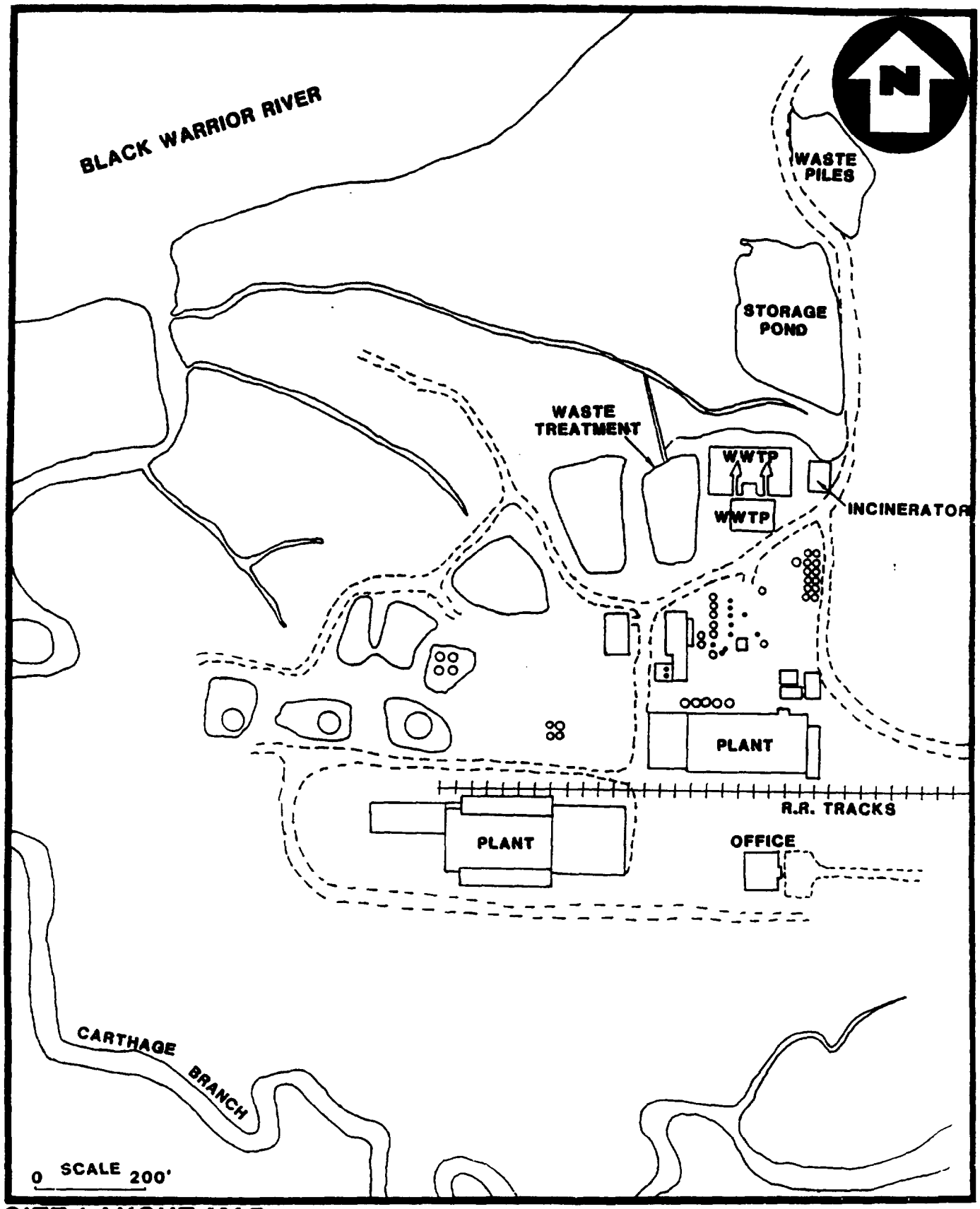


BASE MAP IS A PORTION OF THE U.S.G.S. 7.5 MINUTE QUADRANGLE FOSTERS 1969, ENGLEWOOD 1970, MOUNDVILLE WEST 1980, MOUNDVILLE EAST 1980, ALABAMA.

SITE LOCATION MAP
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

FIGURE 1

NUS CORPORATION



SITE LAYOUT MAP
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

FIGURE 2

NUS CORPORATION

Department of Environmental Management (ADEM). Air emissions from the incinerator are also monitored by ADEM (Ref. 2).

In 1981, Southern Resins Division was notified that an onsite open dump of waste resin and other substances stored in drums was unacceptable under state solid waste regulations due to the toxic characteristics of substances disposed of at the dump (Ref. 7). In May 1983, a spill of resinous material occurred from the Southern Resins' facility into a tributary of the Black Warrior River. Also, two inspections in July 1983, and August 1984, revealed unpermitted discharges of pollutants into the tributary. In May 1984, the company was requested to submit a spill contaminant plan for the wastewater recycling areas. In 1984, an inspection revealed that the facility also violated its NPDES Permit, No. AL0026921, by exceeding allowable biochemical and chemical oxygen demand and levels. The inspection reported leaks from pumps as well (Ref. 8). In 1985, a Notice of Violation was issued to Southern Resins Division for improper storage of waste (Ref. 9). By June 27, 1985, all filter cakes stored on site was removed to a hazardous waste landfill in Emelle, Alabama (Ref. 10).

Southern Resins Division, also known as Lawter Chemicals, filed a Resource Conservation and Recovery Act Part A application on September 4, 1980, but withdrew it on February 23, 1981 (Ref. 11). The facility never received interim status and is currently listed as a nonhandler of hazardous waste (Ref. 12).

2.2 SITE DESCRIPTION

2.2.1 Site Features

Southern Resins Division is located off of Highway 69 within the city limits of Moundville, Alabama (Figure 1) (Appendix B). The facility is located in a rural area on approximately 64 acres of land, about half of which is undeveloped (Ref. 2, Appendix B). There is no fence surrounding the plant; however, the west side of the property is adjacent to the Black Warrior River. An active railroad spur enters the property ending at the center of the plant. There are two resin plants on site along with a WWTP that is located directly north of the two plants. There are several surface impoundments located west of the WWTP and one located to the north. There is also a new incinerator at the facility located east of the WWTP (Ref. 2). The site layout is depicted on Figure 2.

2.2.2 Waste Characteristics

A variety of chemicals are used for the production of resins at the Southern Resins' facility. Eighty percent of the products manufactured are tall oil resins, which are made from the reaction of tall oil

resin with cellusolse (a glycerol), formaldehyde, and dodecylphenol (Ref. 3). Tall oil resin, which is commonly used in varnishes, is composed of oils and abietic acid (Ref. 13, p. 195). In addition to inert substances, the oil mixture may contain one or more aromatic hydrocarbons, such as benzene, ethylbenzene, B-methyl styrene, naphthalene, styrene, toluene, and xylene. Contact with these toxic chemicals can cause a variety of adverse physical reactions along with cancer (Refs. 14, pp. 360, 361, 1971; 15). Additionally, formaldehyde is toxic and a carcinogen (Refs. 14, pp. 1451, 1452; 15).

Dibasic organic acids and diamines are used for the production of polyamide resins, while cyclohexanone is a constituent of ketone resin (Refs. 3, 15). Since these reactants are soluble in organic solvents, there is a large selection of chlorinated and aromatic compounds that can be used for these reactions. The only one listed on the hazardous materials sheet is 1,1,1-trichloroethane, which is toxic (Ref. 14, p. 2620).

Synthetic filter cake was analyzed by CH2M Hill for suspected hazardous inorganic and organic substances. Among the inorganics, barium, chromium, manganese, copper, zinc, nickel, and cyanide were detected. Barium was found in larger quantities than the others. The following organic compounds were detected: xylene, methylbenzene, trimethylbenzene, 2-methyl styrene, dimethylbenzene, dimethylpyridine, trimethylpyridine, naphthalene, dicyclopentadiene, toluene, ethylbenzene, 1,3-cyclopentadiene, and styrene. These were all specific chemicals, described above, on Southern Resins' hazardous materials sheets or compounds in the categories of those used in the production of resins (Ref. 6). Additionally, exposure to pyridine or its derivatives poses health hazards (Ref. 14, p. 2325).

3.2 SURFACE WATER

3.2.1 Climatology

The climate of the Moundville area is characterized by long, hot, humid summers and relatively mild, short winters. Rainfall is scattered fairly evenly throughout the year. The average summer and winter temperatures are 80°F and 46°F, respectively (Ref. 19, p. 1). The average annual precipitation and lake evaporation for this area are 52 inches and 42 inches, respectively, yielding a net annual precipitation of 10 inches (Ref. 20, pp. 43, 63). The 1-year, 24-hour rainfall is 3.5 inches (Ref. 21, p. 93).

3.2.2 Overland Drainage

Surface water run-off from the property would flow west to northwest, approximately 500 to 1,000 feet along various drainage pathways, as seen on Figure 2, and enter Carthage Branch Creek within 500 feet of the Black Warrior River. The Black Warrior River then continues southward for greater than 15 downstream miles from the facility. Surface water run-off may also enter the Black Warrior River directly from the western edge of the property (Appendix B).

3.2.3 Potentially Affected Water Bodies

There are no surface water intakes located for 15 miles downstream of the facility, but the Black Warrior River is used for commercial and recreational fishing (Refs. 22, 23). There are no critical habitats or sensitive environments designated for Carthage Branch Creek or the Black River (Ref. 18).

3.3 GROUNDWATER

3.3.1 Hydrogeology

Southern Resins Division is located in the Alluvial-Deltaic Plain district of the East Gulf Coastal Plain physiographic province and hydrologic setting. This area, in general, is characterized by broad, flat flood plains and terraces along major rivers (Ref. 24, p 4). The facility is located on a terrace deposit that is approximately 60 feet above the Black Warrior River. The edge of the terrace has been sharply incised by the river on all but the eastern side. The highest land surface altitude of the property is about 210 feet above National Geodetic Vertical Datum, and total relief across the property is approximately 75 feet (Ref. 25, Appendix B). Soils in the site vicinity are generally classified as a fine, sandy loam. The soils are well drained, and run-off is fairly rapid causing moderate to severe erosion (Ref. 19, p. 30, sheet 100). The area is underlain, in descending order, by Pleistocene-age terrace

deposits and the Cretaceous-age Tuscaloosa Group comprised of the Gordo and Coker formations (Ref. 24, pp. 20, 21).

Groundwater in the area is obtained from two aquifers: the surficial and the Tuscaloosa (Ref. 24, pp. 8, 20, 21). The surficial aquifer is unconfined and located within the alluvial terrace deposits that consist of interbedded gravel, sand, silt, and clay (Ref. 24, p. 20). Based on the exposed slope located on the western edge of the property, the terrace deposits are approximately 30 feet thick. The upper 5 feet is comprised of light gray to yellowish brown, sandy and silty clay. The remaining sediments consist of beds of yellow-brown, sandy gravel and yellow to white, fine to coarse sand (Ref. 25). Depth to groundwater at the facility ranges from approximately 20 to 35 feet below land surface (Ref. 2). Hydraulic conductivity values for sands and gravels range from 1×10^{-1} to 1×10^{-3} cm/sec (Ref. 26, p. 29).

Unconformably underlying the terrace deposits is the Gordo Formation of the Tuscaloosa Group. The formation consists of alternating lenticular layers of sand and mottled clay that overlie a basal zone of gravelly sand. The upper part of the Gordo Formation is comprised of a massively bedded, light gray clay that probably confines the lower units from the surficial aquifer. The formation is approximately 300 feet thick in the area. The Coker Formation, which consists of marine sand and clay, and a basal nonmarine gravel zone, underlies the Gordo Formation. In some locations, the upper part of the Coker consists of a 50-foot clay layer, which separates the Coker from the Gordo aquifer. In other locations, the thick clay layer is absent, and the two aquifers are hydraulically connected; termed the Tuscaloosa aquifer (Refs. 24, pp. 6-12; 25). Hydraulic conductivity values for sediments of the Tuscaloosa Group range from 1×10^{-3} to 1×10^{-7} cm/sec (Ref. 26, p. 29).

3.3.2 Aquifer Use

The majority of water needs for the town of Moundville and the surrounding area are served by three water companies; two of which are solely distribution systems. The Moundville Water System obtains its water from two wells that are 244 feet deep and are completed in the Tuscaloosa aquifer (Refs. 16; 24, pp. 6-12; 25). The wells are located 3.75 miles south of Southern Resins and supply water to about 705 connections. The Hale County Water System obtains its water from the town of Moundville and serves approximately 844 connections located in the northern half of the county. The third water company, Ingerwood-Hulls Water System, which serves 846 connections, purchases water from the city of Tuscaloosa. The water source for the city is Lake Tuscaloosa, located north and upstream of the facility. A house count using topographic maps identified approximately 29 houses within 3 miles of the facility using private wells. An additional 41 houses between 3 and 4 miles from the plant are

3.0 REGIONAL POPULATIONS AND ENVIRONMENTS

3.1 POPULATION AND LAND USE

3.1.1 Demography

The area immediately surrounding Southern Resins is very rural and sparsely populated, though the town of Moundville is located between 0.5 and 1 mile south of the facility. The majority of the residences are single-family homes, and almost all are located south of the property (Appendix B). The nearest residence is located approximately 700 feet southeast of plant operations (Ref. 16). The other areas around the property are primarily undeveloped. The total population within a 4-mile radius of the site, based on topographic maps, using a factor of 3.8 people/house, is 2,804. The population distribution is 802 between 0 and 1 mile, 646 between 1 and 2 miles, 737 between 2 and 3 miles, and 619 between 3 and 4 miles (Appendix B).

3.1.2 Land Use

The vast majority of the area within a 4-mile radius of Southern Resins is rural and somewhat sparsely populated. Located directly east of the facility is B & W Heads, which has large tanks on the property that are primarily empty. There is also a sawmill located immediately south of the site. Located 3 miles northeast, as well as 3.5 to 4.0 miles north of the facility, are several fish hatcheries. A picnic area and boat ramp are located about 0.6 mile west of the site. Also, Mound State Monument Park is located 0.5 mile southwest of the plant. The remainder of the land surrounding Southern Resins is primarily undeveloped, much of which is covered by wetland areas, especially toward the north (Ref. 16, Appendix B). Although there are no critical habitats designated in Tuscaloosa or Hall counties, there are several federally endangered species designated for the entire state or the west-central portion. These include the Florida panther (Felis concolor coryi), the bald eagle (Haliaeetus leucocephalus), Bachman's warbler (Vermivora buchmanii), the ivory-billed woodpecker (Campephilus principalis), the red-cockaded woodpecker (Piocoides (Dendrocopos) borealis), and the southeastern bat (Myotis austroriparius) (Refs. 17, 18).

using private wells. The nearest private well is located approximately 1.4 miles northeast of the facility (Ref. 16, Appendix B).

3.4 SUMMARY OF POTENTIALLY AFFECTED POPULATIONS AND ENVIRONMENTS

There are four pathways of concern at the Southern Resins facility: surface water, groundwater, onsite, and air. The surface water pathway is of concern since recreational and commercial fishing is allowed in the Black Warrior River. There are no surface water intakes, however, located along the surface water route. The groundwater pathway is also of concern, since there are two municipal wells and 70 private wells located within 4 miles of the facility. The soil exposure pathway is of concern since there is resin waste on the ground in the plant area, and the air pathway is potentially of concern since there are fumes from plant operations, though the types of constituents are unknown.

4.0 FIELD INVESTIGATION

4.1 SAMPLE COLLECTION

During the field investigation conducted the week of December 10, 1990, FIT 4 attempted to identify and characterize contaminants which may be present in the environment as a result of activities conducted at the Southern Resins Division facility. To accomplish this, FIT 4 collected environmental surface soil, subsurface soil, surface water, and groundwater samples from a number of strategic locations. These locations were selected based on historical information and hydrogeological data for the region and site area. A total of 20 environmental samples were collected according to standard EPA protocols.

4.1.1 Sample Collection Methodology

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

4.1.2 Duplicate Samples

Duplicate samples were offered to and accepted by James Adams of CH2M Hill, a designated representative of Southern Resins Division (Ref. 2). Receipt for sample forms are on file at FIT 4.

4.1.3 Description of Samples and Sample Locations

During the sampling investigation, a total of 20 environmental samples were collected for analysis. These samples included five surface soil, five sediment, five groundwater from permanent monitoring wells, and five surface water samples. Background surface soil and groundwater samples were collected north of the plant area from an upgradient location. Background sediment and surface water samples were collected from an upstream location, east of the facility, on Carthage Branch Creek.

Surface soil samples were taken from two locations previously used as waste piles for filter cake. At the time of the investigation, one location had drums, in various degrees of deterioration, full of resin waste covering the area. The other past waste pile area is presently a loading dock, but there are also drums of resin waste nearby. A surface soil sample was also collected from a previously used surface impoundment and from a storage pond. Soil from the storage pond, believed by Southern Resin personnel to be the most contaminated area on the facility, is presently being incinerated. Groundwater samples were collected from three monitoring wells located east of the property, since quarterly monitoring data showed higher levels of constituents in these wells (Ref. 2). Another groundwater sample was taken from a downgradient well, located west of plant and the surface impoundments.

Two surface water and sediment samples were collected from Carthage Branch near the confluence of the Black Warrior River. Both sample locations were downgradient of surface water run-off from plant property. One set of surface water and sediment samples, however, were collected from the point where discharge from the wastewater treatment plant intersects Carthage Branch. Also, a surface water and sediment sample were taken downstream of Carthage Branch from the Black Warrior River. Another set of surface water and sediment samples was collected from an onsite sludge pond that had been used to store resin waste. Sample locations are shown on Figure 3. Sample codes, descriptions, and rationale are contained in Table 1.

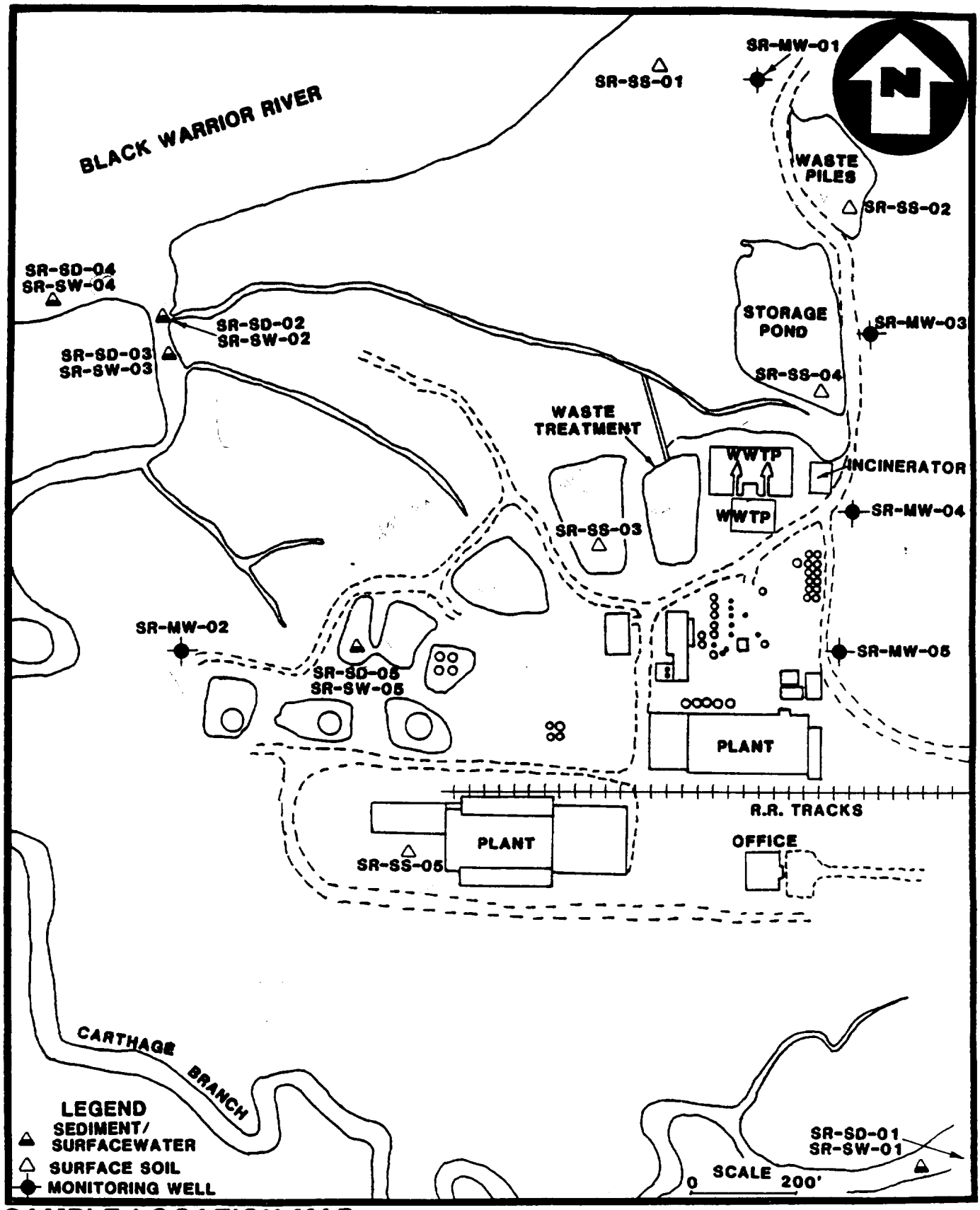
4.1.4 Field Measurements

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

4.2 SAMPLE ANALYSIS

4.2.1 Analytical Support and Methodology

All samples collected were analyzed under the Contract Laboratory Program (CLP) and analyzed for all parameters listed in the Target Compound List (TCL). Organic analysis of soil and water samples was performed by Compu Chem Labs in Research Triangle Park, North Carolina. Inorganic analysis of soil and water was performed by Skinner and Sherman of Waltham, Massachusetts.



SAMPLE LOCATION MAP
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

FIGURE 3

NUS CORPORATION

TABLE 1

SAMPLE CODES, DESCRIPTIONS, AND RATIONALE
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

Sample Code	Date Collected (1990)	Time Collected	Description	Rationale
SR-SS-01 SR-MW-01	12/11 12/12	1105 0930	Background samples collected from an upgradient location north of the plant area.	Collected to determine background soil and groundwater conditions.
SR-SS-02	12/11	1210	Onsite sample collected from northeast portion of property.	Collected from previous waste pile area.
SR-SS-03	12/11	1545	Onsite sample collected from center portion of property.	Collected from previously used surface impoundment.
SR-SS-04	12/11	1310	Onsite sample collected from north portion of property.	Collected from previously used storage pond.
SR-SS-05	12/11	1600	Onsite sample collected from southwest portion of plant.	Collected from previous waste pile area.
SR-MW-02	12/12	1305	Onsite sample collected from west portion of property.	Collected downgradient of surface impoundments.
SR-MW-03	12/12	1615	Onsite sample collected from northeast portion of property.	Collected from area east of storage pond.
SR-MW-04	12/12	1530	Onsite sample collected from east portion of property.	Collected from well showing elevated levels of constituents.
SR-MW-05	12/12	1650	Onsite sample collected from east portion of property.	Collected from well showing elevated levels of constituents.

SR - Southern Resins
SS - Surface Soil
MW - Groundwater, Monitoring Well
SD - Sediment
SW - Surface Water

TABLE 1

SAMPLE CODES, DESCRIPTIONS, AND RATIONALE
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

Sample Code	Date Collected (1990)	Time Collected	Description	Rationale
SR-SD-01 SR-SW-01	12/12 12/12	1215 1210	Offsite samples collected from an upstream location, east of the property, on Carthage Branch Creek.	Collected to determine background sediment and surface water conditions.
SR-SD-02 SR-SW-02	12/12 12/12	1100 1050	Onsite samples collected from Carthage Branch Creek.	Collected from downstream portion of creek, at the discharge point from the wastewater treatment plant.
SR-SD-03 SR-SW-03	12/12 12/12	1030 1015	Onsite samples collected from Carthage Branch Creek.	Collected from downstream portion of creek, near the confluence of the Black Warrior River.
SR-SD-04 SR-SW-04	12/12 12/12	0910 0900	Offsite sample collected from the Black Warrior River.	Collected from a downgradient location.
SR-SD-05 SR-SW-05	12/12 12/12	1330 1320	Onsite sample collected from central portion of property.	Collected from a sludge pond containing resin waste.

SR - Southern Resins
SS - Surface Soil
MW - Groundwater, Monitoring Well
SD - Sediment
SW - Surface Water

TABLE 2

FIELD MEASUREMENTS
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

Sample Code	Date (1990)	Time	pH	Temp. (°C)	Conductivity (umhos/cm)
SR-MW-01	12/12	0930	4.22	19	108.8
SR-MW-02	12/12	1305	4.98	20	191.1
SR-MW-03	12/12	1615	5.09	18	204.0
SR-MW-04	12/12	1530	5.02	17	517.0
SR-MW-05	12/12	1650	5.04	18	1047.0
SR-SW-01	12/12	1210	5.93	19	74.7
SR-SW-02	12/12	1050	7.2	21	453.0
SR-SW-03	12/12	1015	6.42	22	80.4
SR-SW-04	12/12	0900	6.71	15	327.0
SR-SW-05	12/12	1320	6.30	20	342.0

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

4.2.2 Analytical Data Quality and Data Qualifiers

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

4.2.3 Presentation of Analytical Results

This section presents a discussion and interpretation of the analytical results from the environmental samples collected during the investigation at the Southern Resins Division facility. Results of surface soil, sediment, groundwater, and surface water samples are presented in Tables 3 through 10. Background samples have been designated for all media. Values for background sample results are presented as either a measured value or as the MQL. Samples containing concentrations of contaminants greater than 3 times the background level or MQL of these contaminants are considered to be elevated. These samples are noted in the text.

TABLE 3

SUMMARY OF ORGANIC ANALYTICAL RESULTS
SURFACE SOIL SAMPLES
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

PARAMETERS (ug/kg)	Background	On Site				
	SR-SS-01	SR-SS-02	SR-SS-03	SR-SS-04	SR-SS-05	SR-TB-01S
PURGEABLE COMPOUNDS						
BENZENE	11U	-	-	9J	-	-
TOLUENE	11U	-	-	25	-	-
ETHYL BENZENE	11U	-	-	1900	-	-
STYRENE	11U	-	-	1600	-	-
TOTAL XYLENES	11U	-	-	16,000	-	-
ETHYLMETHYLBENZENE/ISOMERS(1)				60,000JN/2		
TRIMETHYLBENZENE/ISOMERS(1)				100,000JN/3		
ETHENYLMETHYLBENZENE(1)				10,000JN		
TETRAHYDROMETHANOINDENE(1)				90,000JN		
PROPENYLBENZENE/ISOMERS(1)				50,000JN/2	-	
METHYLPROPYLBENZENE(1)				40,000JN		
EXTRACTABLE COMPOUNDS						
NAPHTHALENE	3600	-	-	64,000	-	-
2-METHYLNAPHTHALENE	140J	-	-	5100J	-	-
BENZO(A)ANTHRACENE	360U	-	-	-	120J	-
UNIDENTIFIED COMPOUND/NO.(1)	7000J/7	60,000J/20	50,000J/18	600,000J/13	100,000J/12	
ETHYLDIMETHYLBENZENE/ISOMERS(1)	6000JN/4		1000JN/1	40,000JN/1		

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

TABLE 3

SUMMARY OF ORGANIC ANALYTICAL RESULTS
SURFACE SOIL SAMPLES
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

PARAMETERS (ug/kg)	Background	On Site				
	SR-SS-01	SR-SS-02	SR-SS-03	SR-SS-04	SR-SS-05	SR-TB-01S
TETRAMETHYLBENZENE(1)	2000JN			40,000JN		
OCTAHYDROMETHANOINDENECARBOXALDEHYDE/ISOMERS(1)					10,000JN/2	
HYDROXYPHENYLMETHYLETHYLPHENOL(1)					30,000JN	
OCTAHYDROPHENANTHRENECARBOXYLIC ACID(1)					10,000JN	
DIHYDROMETHYLINDENE(1)	800JN					
DIMETHYLETHYLETHOXYBENZENE(1)					4000JN	
DIMETHYLETHYLPHENOL(1)					8000JN	
TRIMETHYLPHENYLETHANONE(1)					5000JN	
OCTAHYDROMETHANOINDENE	400JN					

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

TABLE 4

SUMMARY OF INORGANIC ANALYTICAL RESULTS
SOIL SAMPLES
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

	Background	On Site				
PARARMETERS (mg/kg)	SR-SS-01	SR-SS-02	SR-SS-03	SR-SS-04	SR-SS-05	SR-PB-01
ALUMINUM	4100	11,000	3800	8200	4000	-
ARSENIC	2U	-	-	3.6	2.8	-
BARIUM	45	18	9.5	19	17	-
CALCIUM	140	16,000	250	1600	120,000	-
COPPER	6U	-	3.2	-	-	-
IRON	4200	12,000	6900	12,000	5300	-
LEAD	8.1	7.3	3.2	6.8	8.4	-
MAGNESIUM	150	1200	90	240	23,000	-
MANGANESE	130	14	12	24	44	-
POTASSIUM	230	280	130	170	320	-
SODIUM	30U	-	-	260	-	-
VANADIUM	7.4	22	11	19	9	-
ZINC	20U	-	-	-	210	-

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

TABLE 5

SUMMARY OF ORGANIC ANALYTICAL RESULTS
GROUNDWATER SAMPLES
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

PARAMETERS (ug/l)	Background	On Site				
	SR-MW-01	SR-MW-02	SR-MW-03	SR-MW-04	SR-MW-05	SR-TB-01W
PURGEABLE COMPOUNDS						
CARBON DISULFIDE	24	21	14J	24J	42J	-
BENZENE	220	-	27	120	45J	-
TOLUENE	35	-	40	78J	61J	-
ETHYL BENZENE	75	-	84	410	140J	-
STYRENE	62	-	78	280	130J	-
TOTAL XYLENES	370	-	330	2300	740J	-
TRIMETHYLBENZENE/ISOMERS(1)			80JN/1		600JN/2	
PROPENYLBENZENE/ISOMERS(1)	50JN			400JN	100JN	
PROPYLBENZENE(1)	60JN		60JN	400JN	100JN	
ETHYLMETHYBENZENE/ISOMERS(1)	200JN/1		300JN/3	2000JN/2	700JN/3	
EXTRACTABLE COMPOUNDS						
NAPHTHALENE	270	-	140	750	170	-
PENTACHLOROPHENOL	50U	-	2J	-	-	-
DI-N-BUTYLPHTHALATE	10U	-	1J	-	-	-
UNIDENTIFIED COMPOUND/NO(1)	100J/3	50J/4	900J/9	3000J/4	1000J/10	
DIETHYLBENZENE(1)	10JN					
ETHYLDIMETHYLBENZENE/ISOMERS(1)			100JN/3	500JN/2	90JN/1	

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

TABLE 5

SUMMARY OF ORGANIC ANALYTICAL RESULTS
GROUNDWATER SAMPLES
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

PARAMETERS (ug/l)	Background	On Site				
	SR-MW-01	SR-MW-02	SR-MW-03	SR-MW-04	SR-MW-05	SR-TB-01W
TETRAMETHYLBENZENE(1)					50JN	
METHYLCYCLOPROPENYLBENZENE(1)	20JN					
AMINOHEXANOIC ACID(1)	200JN	400JN	300JN	400JN	300JN	
TETRAHYDROMETHYLNAPHTHALENE(1)	10JN					
PROPADIENYLBENZENE(1)			80JN	700JN	90JN	
METHYLINDENE(1)			40JN	100JN		
ETHENYLETHYLBENZENE(1)				200JN		
TETRAHYDROCYCLOPROPINDENE(1)				100JN		
METHYLBENZOIC ACID(1)				100JN		
METHYLENEPROPENYLBENZENE(1)				70JN		
PESTICIDE\PCB COMPOUNDS						
ALPHA-BHC	0.050U	-	-	-	0.097	-
DIELDRIN	0.10U	-	-	-	-	0.024J
DELTA-BHC	0.050U	-	0.021J	0.074	-	-
HEPTACHLOR	0.050U	-	-	0.04J	-	-
4,4'-DDE (P,P'-DDE)	0 10U	0.062J	-	0.029J	-	
4,4'-DDT (P,P'-DDT)	0.10U	0.054J	-	-	-	0.032J
ENDRIN KETONE	0.10U	0.060J	-	-	-	-

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

TABLE 5

SUMMARY OF ORGANIC ANALYTICAL RESULTS
GROUNDWATER SAMPLES
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

PARAMETERS (ug/l)	Background	On Site				
	SR-MW-01	SR-MW-02	SR-MW-03	SR-MW-04	SR-MW-05	SR-TB-01W
GAMMA-CHLORDANE	0.050U	0.030J	-	0.027J	-	-
ALPHA-CHLORDANE	0.050U	0.040J	-	0.089	-	-

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

TABLE 6

SUMMARY OF INORGANIC ANALYTICAL RESULTS
GROUNDWATER SAMPLES
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

	Background	On Site				
PARARMETERS (ug/l)	SR-MW-01	SR-MW-02	SR-MW-03	SR-MW-04	SR-MW-05	SR-PB-01
ALUMINUM	27,000	9200	48,000	2400	180,000	-
BARIUM	180	190	160	300	890	-
CADMIUM	3U	-	-	-	9	-
CALCIUM	2600	12,000	1900	11,000	20,000	-
CHROMIUM	82	19	98	-	430	-
COPPER	53	19	44	-	120	-
IRON	99,000	34,000	64,000	6500	240,000	-
LEAD	14	9	16	8	59	-
MAGNESIUM	1800	3100	1600	5400	19,000	-
MANGANESE	120	210	410	770	1300	-
NICKEL	20U	-	-	-	42	-
POTASSIUM	3400	7100	4000	6500	14,000	-
SODIUM	10,000	6400	21,000	77,000	100,000	-
VANADIUM	190	68	190	-	570	-
ZINC	120	110	-	240	200	-

- Material analyzed for but not detected above minimum quantitation limit (MQL).

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

TABLE 7

SUMMARY OF ORGANIC ANALYTICAL RESULTS
SEDIMENT SAMPLES
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

PARAMETERS (ug/kg)	Background	Carthage Branch		Black Warrior	On Site
	SR-SD-01	SR-SD-02	SR-SD-03	SR-SD-04	SR-SD-05
PURGEABLE COMPOUNDS					
TOLUENE	12U	-	-	-	420J
ETHYL BENZENE	12U	-	-	-	3000
STYRENE	12U	-	-	-	1900
TOTAL XYLENES	12U	-	-	-	22,000
ETHYLMETHYLBENZENE/ISOMERS(1)					70,000JN/3
TRIMETHYLBENZENE/ISOMERS(1)					30,000JN
PROPENYLBENZENE/ISOMERS(1)					9000JN
PROPYLBENZENE(1)					10,000JN
EXTRACTABLE COMPOUNDS					
NAPHTHALENE	410U	-	-	-	190,000
2-METHYLNAPHTHALENE	410U	-	-	-	7500
UNIDENTIFIED COMPOUND/NO.(1)				800J/1	400,000J/7
METHYLPROPYLBENZENE(1)					50,000JN
DIETHYLBENZENE(1)					100,000JN
ETHYLDIMETHYLBENZENE/ISOMERS(1)					200,000JN
TETRAMETHYLBENZENE(1)					90,000JN

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

TABLE 8

SUMMARY OF INORGANIC ANALYTICAL RESULTS
SEDIMENT SAMPLES
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

	Background	Carthage Branch		Black Warrior	On Site
PARARMETERS (mg/kg)	SR-SD-01	SR-SD-02	SR-SD-03	SR-SD-04	SR-SD-05
ALUMINUM	450	720	340	310	3800
BARIUM	5	8.7	4.1	4.9	20
CALCIUM	50U	200	-	82	240
IRON	2500	2500	2100	1100	3900
LEAD	1.1	2.3	1.3	1	4
MAGNESIUM	24	42	16	31	120
MANGANESE	67	19	28	42	42
POTASSIUM	40	69	35	54	160
SODIUM	30U	-	-	-	260
VANADIUM	2.5	3.1	2.2	1.7	7.7
ZINC	5U	-	-	-	9.6

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

TABLE 9

SUMMARY OF ORGANIC ANALYTICAL RESULTS
SURFACE WATER SAMPLES
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

PARAMETERS (ug/l)	Background	Carthage Branch		Black Warrior	On Site
	SR-SW-01	SR-SW-02	SR-SW-03	SR-SW-04	SR-SW-05
PURGEABLE COMPOUNDS					
CARBON DISULFIDE	10U	-	-	-	6J
1,1,1-TRICHLOROETHANE	10U	2J	-	-	-
BENZENE	10U	2J	-	-	19J
METHYL ISOBUTYL KETONE	10U	2J	-	-	-
TOLUENE	10U	3J		-	18J
ETHYL BENZENE	10U	2J	-	-	45J
TOTAL XYLENES	10U	22	-	-	480
TRIMETHYLBENZENE/ISOMERS(1)					300JN
PROPENYLBENZENE/ISOMERS(1)					70JN
PROPYLBENZENE(1)					40JN
ETHYLMETHYBENZENE/ISOMERS(1)		100JN/2			8000JN/2
DECANE(1)		30JN			-
DIMETHOXYMETHANE(1)		20JN			-
METHYLPROPENAL(1)		30JN			-
DIMETHYLBUTANONE(1)		50JN			-
METHYLCYCLOPENTANONE(1)		80JN			-

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

TABLE 9

SUMMARY OF ORGANIC ANALYTICAL RESULTS
SURFACE WATER SAMPLES
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

PARAMETERS (ug/l)	Background	Carthage Branch		Black Warrior	On Site
	SR-SW-01	SR-SW-02	SR-SW-03	SR-SW-04	SR-SW-05
TETRAMETHYLPENTANONE(1)		600JN			-
UNIDENTIFIED COMPOUND/NO.(1)		40J/1			-
EXTRACTABLE COMPOUNDS					
(3-AND/OR 4-)METHYLPHENOL	10U	-	-	-	17J
UNIDENTIFIED COMPOUND/NO(1)		9000J/18			4000J/13
BUTYLBENZOIC ACID(1)		900JN			-
HEXAHYDROBENZOCYCLOHEPTATHIAZINE(1)					200JN
METHYLBENZOFURAN(1)					100JN
METHYLENEPROPENYLBENZENE(1)					100JN

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

TABLE 10

SUMMARY OF INORGANIC ANALYTICAL RESULTS
SURFACE WATER SAMPLES
SOUTHERN RESINS DIVISION
MOUNDVILLE, TUSCALOOSA COUNTY, ALABAMA

PARARMETERS (ug/l)	Background	Carthage Branch		Black Warrior	On Site
	SR-SW-01	SR-SW-02	SR-SW-03	SR-SW-04	SR-SW-05
ALUMINUM	220	670	-	630	13,000
BARIUM	56	48	55	94	25
CALCIUM	2600	12,000	3900	16,000	1700
IRON	570U	1100	360	1000	5200
LEAD	5	4	-	-	8
MAGNESIUM	1900	2100	1900	8200	700
MANGANESE	84	110	130	130	220
POTASSIUM	1200	2200	1500	2400	3500
SODIUM	2800	98,000	3300	22,000	61,000
VANADIUM	2U	-	-	-	15

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

The organic compounds detected in elevated quantities in this study from the TCL were the following aromatics: ethyl benzene, styrene, xylenes, naphthalene, and 2-methylnaphthalene. Most of the miscellaneous compounds found in large quantities were tentatively identified aromatics and several phenols. These compounds are characteristic of those in the tall oils which were used at Southern Resins. The most contaminated surface soil sample (SR-SS-05) was collected from the storage pond. It contained ethylbenzene (173 times MQL), styrene (145 times MQL), total xylenes (1,450 times MQL), 2-methlynaphthalene (36 times background, estimated quantity), and naphthalene (18 times background) in addition to eight tentatively identified miscellaneous compounds (ranging in concentration from 10,000J to 100,000JN/3 ug/kg). There were six of these substances (ranging in concentration from 4,000JN to 30,000JN ug/kg) detected in the surface soil sample (SR-SS-05) collected from a previous waste pile area.

The groundwater sample (SR-MW-04) collected from the monitoring well directly east of the wastewater treatment plant and incinerator also contained elevated amounts of aromatics, including ethylbenzene (5 times background), styrene 4.5 times background), and xylenes (6 times background), in addition to 11 tentatively identified compounds (ranging in concentration from 70 JN to 2,000 JN ug/l). Smaller quanties of these compounds were detected in two other monitoring wells (SR-MW-03, SR-MW-05) and the background samples (SR-MW-01).

The only contaminated sediment sample (SR-SD-05) was taken from an onsite sludge pond containing resin waste. The elevated organic compounds in this sample included toluene (35 times MQL, estimated quantity), styrene (158 times MQL), ethylbenzene (250 times MQL), xylenes (1,833 times MQL), naphthalene (463 times MQL), and 2-methylnaphthalene (18 times MQL). There were also eight tentatively identified miscellaneous compounds (ranging in concentration from 9,000JN to 200,000JN ug/kg). The corresponding surface water sample (SR-SW-05) contained small amounts of organic compounds with only the total xylenes (48 times MQL) in elevated quantities; and the sample (SR-SW-02), taken from Carthage Branch had trace amounts of organics.

During this study, there were a small number of inorganic contaminants of concern detected in elevated amounts. These inorganics were zinc, barium, cadmium, chromium, lead, and manganese. Only zinc (10 times MQL) was found in elevated quantities in a surface soil sample (SR-SS-05) which was collected southwest of the plant in a previous waste pile area. The only groundwater sample (SR-MW-05) with elevated amounts of metals of concern was collected from the monitoring well on

the southeastern border of the facility. It contained barium (5 times background), cadmium (3 times MQL), chromium (5 times background), lead (4 times background), and manganese (10 times background). Additionally, only the sediment sample (SR-SD-05) taken from the sludge pond had elevated amounts of inorganics of concern, barium (4 times background) and lead (4 times background), while there were no elevated quantities of metals of concern in any surface water sample.

5.0 SUMMARY

Southern Resins manufactures tall oil resins, ketone resins, and polyamide resins. Tall oil resins are produced by mixing cellulose (a glycerol), formaldehyde, and dodecylphenol, then heating the mixture indirectly with steam. Ketone resins are produced by mixing cyclohexanone and formaldehyde with a sodium-hydroxide catalyst. This reaction is controlled by the addition of water to cool the resins and remove excess caustic. The polyamide resins are made by reacting dimer acid with ethylene diamine under heat. Prior to the wastewater treatment plant, built in 1980, waste was discharged to surface impoundments.

The surface water pathway is of concern, since there is recreational and commercial fishing in the Black Warrior River. Also, since there are municipal and private wells located within 4 miles of the facility, the groundwater pathway is of concern. There is resin waste on the ground around the plant, and there are fumes from plant operations, so that the soil exposure and air pathways are also of concern.

During this study, the following organic compounds on the Target Compound List were detected in elevated quantities: ethylbenzene, styrene, xylenes, naphthalene, and 2-methylnaphthalene. Most of the tentatively identified compounds reported were aromatics, and several phenols. These categories of organics are those typically associated with tall oil resins used at the facility. When filter cake was analyzed by Southern Resins, these compounds were also present. Those samples with the most contamination were collected from source areas such as the storage pond, sludge pond, and previous waste pile area. Elevated quantities of organic contaminants were also detected in groundwater samples collected on the east side of the facility.

Additionally, zinc, barium, cadmium, lead, and manganese were found in elevated amounts. Again, the contaminated samples were from source areas, the sludge pond, and waste pile area. One monitoring well on the eastern portion of the property also contained inorganics of concern. All of the metals, except for lead, were previously detected in synthetic filter cake.

Since most of the contamination was found in source areas, there is no indication that contaminants are migrating from the facility along the surface water pathway. However, organic compounds and metals of concern were detected in groundwater samples making contamination of the municipal and private wells a potential threat. Therefore, FIT 4 recommends that Southern Resins be evaluated using the HRS (effective March 14, 1991).

REFERENCES

1. Potential Hazardous Waste Site Preliminary Assessment (EPS Form 3012-III) for Southern Resins Division, Moundville, Alabama, Industrial Narrative Sheet, August 29, 1985; obtained from Alabama Department of Environmental Management, Birmingham, Alabama.

2. NUS Corporation Field Logbooks No. F4-2683 and F4-2684 for Southern Resins Division, TDD No. F4-9011-22. Documentation of field investigation, December 10-12, 1990.

3. George Sullivan, interoffice memorandum to Ron Gore, Alabama Department of Environmental Management, January 17, 1984. Subject: Inspection of Southern Resins.

4. David Hagan, interoffice memorandum to Bernard E. Cox, Alabama Department of Environmental Management, August 16, 1984. Subject: Waste management at Southern Resins.

5. J.F. Holohan and J.Y. Penn, "Hydrocarbon Resins," Kirk-Othmer Encyclopedia and Chemical Technology, 3rd ed., Vol. 12 (New York: John Wiley & Sons, 1983).

6. Results of April 4, 1985, filter cake sampling, Lawter International, Southern Resins Division, Moundville, Alabama, May 7, 1985; obtained from Alabama Department of Environmental Management, Birmingham, Alabama, pp. 1, 2, 18, 19, 20.

7. Jauier A. Colon, Environmentalist III, Division of Solid and Hazardous Waste, Environmental Health Administration, letter to Hosny Elgamel, Southern Resins Division, April 8, 1981. Subject: Waste disposal practices at Southern Resins.

8. Findings of Fact, Order No. 85-008-WP, Lawter International, Inc., Southern Resins Division, November 1, 1984; obtained from Alabama Department of Environmental Management, Birmingham, Alabama.

9. Daniel E. Cooper, Chief, Land Division, letter to Hosny Elgamel, Southern Resins Division, May 22, 1985. Subject: Notice of violations.

10. F. Gordon Steward, General Manager Southern Resins, letter to Bernard Cox, Alabama Department of Environmental Management, July 1, 1985. Subject: Removal of lime filter cake and adjacent debris pile.

11. David Hagan, Alabama Department of Environmental Management, letter to Buddy Cox, August 13, 1984. Subject: Chronological list of major regulatory events between Southern Resins and Alabama Department of Environmental Management.

12. Alicia Finch, Alabama Department of Conservation and Natural Resources, Land Protection, telephone conversation with Matthew McCoy, NUS Corporation, December 6, 1989. Subject: Current RCRA status.

13. William Gardner, ed., Handbook of Chemical Synonyms and Trade Names (Boca Raton, Florida: CRC Press, Inc., 1978).

14. N. Irving Sax, Dangerous Properties of Industrial Materials, Sixth ed., (New York: Van Nostrand Reinhold Company, 1984).

15. List of Hazardous Materials Used per SARA, Title III for Lawter International, Inc., Moundville, Alabama, October 16, 1987.

16. NUS Corporation Field Logbook No. F4-1768 for Southern Resins Division, TDD No. F4-8910-70. Documentation of facility reconnaissance, November 16, 1989.

17. Robert H. Mount, Vertebrate Animals of Alabama in Need of Special Attention (Alabama Agricultural Experiment Station and Auburn Univeristy), pp. 78, 79, 111, 112.

18. U.S. Fish and Wildlife Service, Endangered and Threatened Species of the Southeastern United States (Atlanta, Georgia, 1988).

19. U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of Tuscaloosa County, Alabama (August 1981), pp. 1, 30, sheet 100.

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

21. U.S. Department of Commerce, Rainfall Frequency Atlas of the United States, Technical Paper No. 40 (Washington, D.C.: GPO, 1961), p. 93.

22. Carol Lackey, Alabama Department of Conservation and Natural Resources, telephone conversation with Matthew McCoy, NUS Corporation, December 5, 1989. Subject: Fishing practices on the Black Warrior River.

23. Mr. Rodgers, Moundville water company, telephone conversation with Sheri Panabaker, NUS Corporation, January 15, 1991. Subject: Surface water intakes.

24. Sydney S. DeJarnette and Jo E. Crownover, Geohydrology and Susceptibility of Major Aquifers to Surface Contamination in Alabama; Area 6, U.S. Geological Survey Water Resources Investigation Report 87-4113 (Tuscaloosa, Alabama: Alabama Department of Environmental Management, 1987).

25. CH2M Hill, Hydrogeologic Assessment, Lawter International, Southern Resins Plant, Moundville, Alabama (April 1985).

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

APPENDIX A

V

INFORMATION NEEDED TO ENTER SITE INTO THE ERRIS DATA BASE.

SITE NAME Southern Resins Co. (please avoid names such as "unnamed site", or "abandoned dump", but use either the name of the company itself with descriptive words added such as Topper Ghost Company Chemical Spill or clearest title possible, such as Bean County Brush Dump, Lost Horizon Derailment Site.)

STREET Cracker Road and Terra Drive (a street without a number such as Belmont St rather than 1243 Belmont St E. will make it difficult to track down a zip code when that is also left out. If it is not possible to give a street number, the nearest intersection is the next best thing.)

CITY Mountville County STATE Alabama ZIP 35914
(a zip is not important in the case of a very small town but where we have a large city like Memphis and also have a street where the street number has been omitted, it may prevent us from finding a zip in our zip code directory.)

LATITUDE/LONGITUDE (wherever possible)

33N/00'/00".
87W/37'/30'.

DESCRIPTION OF SITE Hazardous waste pile (about 100 cubic yards) contained in a concrete structure. Waste pile contains solvent saturated lime cake. Also, old surface impoundment at site

NUS CORPORATION
1927 LAKESIDE PARKWAY
SUITE 614
TUCKER, GEORGIA 30084
404-938-7710

C-586-1-0-122

January 30, 1990

Mr. A. R. Hanke
Site Investigation and Support Branch
Waste Management Division
Environmental Protection Agency
345 Courtland Street, N. E.
Atlanta, Georgia 30365

Date: 2/15/90
Site Disposition: Phase II
EPA Project Manager: GENA D. TOWNSEND
Disagree with Report's Recommendation

Subject: Screening Site Inspection, Phase I
Southern Resins Division
Moundville, Tuscaloosa County, Alabama
EPA ID No. ALD004034138
TDD No. F4-8910-70

Dear Mr. Hanke:

FIT 4 conducted a Screening Site Inspection, Phase I, of Southern Resins Division, in Moundville, Tuscaloosa County, Alabama. The inspection included a review of EPA and state file material, completion of a target survey, and an offsite reconnaissance of the facility and surrounding area.

Southern Resins, a division of Lawter International, manufactures synthetic and hydrocarbon resins. Manufacturing operations began in 1966 (Refs. 1, 2). The facility was purchased by Lawter International in 1976 (Ref. 1). Southern Resins, is located at the end of Cracker Road on the north side of the City of Moundville in a lightly populated, rural area. Land in the vicinity is used for residential, commercial, industrial, and recreational purposes (Ref. 3). Lands to the northeast and southwest are moderately scattered with swampland. The facility is not fenced and easily accessible (Ref. 2). The nearest residential dwelling is located approximately 700 feet southeast of plant operations (Refs. 2, 3).

Processes at the Southern Resins plant involve the manufacturing of tall oil resins, ketone resins, and polyamide resins. Tall oil resins are produced by mixing cellulose (a glycerol), formaldehyde and dodecylphenol, then heating the mixture indirectly with steam. Ketone resins are produced by mixing cyclohexanone and formaldehyde with a sodium-hydroxide catalyst. This reaction is controlled by the addition of water to cool the resins and remove excess caustic. The polyamide resins are made by reacting dimer acid with ethylene diamine under heat. Once the resins are dried, they are crushed and bagged. Air emissions from the crushers and baggers are controlled by baghouses. All water from the plant goes to a wastewater treatment plant (Ref. 4).

Other processes at the manufacturing plant produce hydrocarbon resins, using boron trifluoride as a catalyst. After the proper reaction time, the reaction is stopped by adding lime to the mixture, forming a calcium difluoride precipitate. The mixture is filtered to remove the solids and stripped with steam to remove a by-product solvent from the resin for recycling (Ref. 4). It is uncertain what solvents are removed from the resin; however, toluene and xylene are used in resin manufacturing

(Ref. 5). The solids were, at one time, disposed of in the rear of the property (Ref. 4). The filter cakes generated by the filtration process are primarily composed of calcium fluoride ash containing volatile and other organics, free of flowing liquids. Production at the Southern Resins Division plant generates 60 to 70 drums of filter cakes per week (Ref. 6).

Waste management facilities at Southern Resins Division consist of a hazardous waste pile and bin, a wastewater treatment system that discharges under an NPDES permit, a solid waste pile, and an old surface impoundment, which is not part of the present wastewater treatment system. The filter cakes are stored in the waste pile and bin. The hazardous waste bin is a three-sided concrete structure with no roof and an impermeable base. The wastewater treatment system contains a surface impoundment. It is uncertain what waste entered this unit. Discharge from the system flows into the Black Warrior River. The solid waste pile contains plant trash, resins, filter cake, and solvent. The old surface impoundment receives plant runoff and any significant solvent spills (Ref. 7). Filter cakes produced prior to 1977 were believed to be landfilled on site (Ref. 8). By June 27, 1985, all filter cakes stored on site were removed to a hazardous waste landfill in Emelle, Alabama (Ref. 9).

In 1981, Southern Resins Division was notified that an onsite open dump was unacceptable under state solid waste regulations due to the toxic characteristics of substances disposed of at the dump (Ref. 10). In 1985, a Notice of Violation was issued to Southern Resins Division for improper storage of waste (Ref. 11). In 1984, the facility violated their NPDES Permit, No. AL0026921, by exceeding allowable biochemical and chemical oxygen demand and phenolics levels (Ref. 12).

Southern Resins Division, also known as Lawter Chemicals, filed a RCRA Part A application but later withdrew it. The facility never received interim status and is currently listed as a non-handler of hazardous waste (Ref. 13).

The Southern Resins Division facility is located in the East Gulf Coastal Plain Physiographic Province (Ref. 14, p. 3). The net annual rainfall for the area averages 10 inches. The 1-year 24-hour rainfall is about 3.5 inches (Ref. 15, 16). Underlying the area are alluvial deposits that consist of interbedded gravel, sand, silt, and clay. The alluvium ranges in thickness from 30 to 60 feet. These deposits are hydraulically connected with the underlying aquifers. The Gordo Formation underlies the alluvial deposits and consists of alternating lenticular layers of sand and mottled clay that overlie a basal zone of gravelly sand. The formation ranges in thickness from less than 100 feet to about 400 feet. The Coker Formation, which consists of marine sand and clay, and a basal nonmarine gravel zone, underlies the Gordo Formation. The formation ranges in thickness from less than 100 feet (in the central part of the county) to greater than 1000 feet (estimated at facility area) (Ref. 14, pp. 6-12).

Groundwater in the area is drawn from the Gordo aquifer and the Coker aquifer. A clay unit at the top of the Coker serves as a confining layer between the two aquifers in some areas. Over much of the area, the clay unit is discontinuous, hydraulically connecting the two aquifers. The Gordo and Coker are, thus, considered one aquifer, referred to as the Tuscaloosa aquifer (Ref. 14, p. 8). Depth to groundwater in the facility area is approximately 8 feet bls (Ref. 7, p. 2). Hydraulic conductivity values for sediments underlying the site range from 1×10^{-3} to 1×10^{-5} cm/sec (Ref. 17).

Surface water runoff from the facility enters Carthage Branch, which flows along the west side of the facility, after a total overland flow of approximately 1,000 feet. Surface water flows north along Carthage Branch approximately 300 feet before entering Black Warrior River. Surface water runoff may also enter Black Warrior River directly. Surface water migrates mainly westward along the Black

Warrior River on past the end of the 15-mile pathway (Ref. 3). Both commercial and recreational fishing are allowed along the Black Warrior River (Ref. 18).

The drinking water needs of the community within a 4-mile radius of Southern Resins Division are met by three different municipal water systems. The Moundville Water System, with 705 connections, obtains water from two wells 3.75 miles south of the facility. The Hale County Water System, with 866 connections, is solely a distribution system and purchases water from the city of Moundville. The Ingerwood-Hulls Water System, with 846 connections, is a distribution system and purchases water from the city of Tuscaloosa. The city of Tuscaloosa's water source is Lake Tuscaloosa located north of the facility; it is unaffected by surface water drainage from the facility. The nearest-known public well is the city of Moundville public supply well (Ref. 2). An estimated 10 houses may use private wells 2 to 3 miles northwest of the facility (Ref. 3).

Although, there are no critical habitats designated in Tuscaloosa County, there are several federally and state-designated endangered animals whose habitats are found in central Alabama. These include the red-cockaded woodpecker, the southeastern bat, the gray bat, and the Indiana bat (Refs. 19, 20). The Mound State Monument, a state historic site, is located approximately 2500 feet southwest of the facility (Ref. 3).

Based on the lack of significant targets, the results of this evaluation and the above referenced material, FIT 4 recommends that no further remedial action be planned for this facility. If you have any questions, please contact me at this office.

Very truly yours,

Matthew McCoy
Project Manager

Approved:

MM/tb

Enclosures

cc: Gena Townsend

REFERENCES

1. Potential Hazardous Waste Site Preliminary Assessment (EPS Form 3012-III) for Southern Resins Division, Moundville, Alabama, Industrial Narrative Sheet; obtained from Alabama Department of Environmental Management, Birmingham, Alabama.

2. NUS Corporation Field Logbook No. F4-1768 for Southern Resins Division, TDD No. F4-8910-70. Documentation of facility reconnaissance, November 16, 1989.

3. U.S. Geological Survey, 7.5 minute series Topographic Quadrangle Maps of Alabama: Moundville East 1980 (Photorevised 1983), Moundville West 1980 (Photorevised 1983), Engelwood 1970 (Photorevised 1983), Fosters 1969 (Photorevised 1978), Knoxville 1980, Warrior Dam 1980.

4. George Sullivan, interoffice memorandum to Ron Gore, Alabama Department of Environmental Management, January 17, 1984. Subject: Inspection of Southern Resins.

5. J.F. Holohan and J.Y. Penn, "Hydrocarbon Resins," Kirk-Othmer Encyclopedia and Chemical Technology, 3rd ed., Vol. 12 (New York: John Wiley and Sons, 1983).

6. Results of April 4, 1985, filter cake sampling, Lawter International, Southern Resins Division, Moundville, Alabama, May 7, 1985; obtained from Alabama Department of Environmental Management, Birmingham, Alabama, pp. 1, 2, 18, 19, 20.

7. David Hagan, interoffice memorandum to Buddy Cox, Alabama Department of Environmental Management, August 16, 1984. Subject: Waste Management at Southern Resins.

8. David Hagan, interoffice memorandum to Bernard Cox, Alabama Department of Environmental Management, October 28, 1984. Subject: Site inspection at Southern Resins.

9. F. Gordon Steward, General Manager, Southern Resins Division, letter to Bernard E. Cox, Alabama Department of Environmental Management, July 1, 1985. Subject: Filter cake removal at Southern Resins.

10. Jauier A. Colon, Environmentalist III, Division of Solid and Hazardous Waste, Environmental Health Administration, letter to Hosny Elgamel, Southern Resins Division, April 8, 1981. Subject: Waste disposal practices at Southern Resins.

11. Daniel E. Cooper, Chief, Land Division, letter to Hosny Elgamel, Southern Resins Division, May 22, 1985. Subject: Notice of violations.

12. Findings of Fact, Order No. 85-008-WP, Lawter International, Inc., Southern Resins Division, November 1, 1984, obtained from Alabama Department of Environmental Management, Birmingham, Alabama.

13. Alicia Finch, Alabama Department of Conservation and Natural Resources, Land Protection, telephone conversation with Matthew McCoy, NUS Corporation, December 6, 1989. Subject: Current RCRA Status.

14. Sydney S. DeJarnette and Jo E. Crownover, Geohydrology and Susceptibility of Major Aquifers to Surface Contamination in Alabama; Area 6, U.S. Geological Survey Water Resources Investigation Report 87-4113 (Tuscaloosa, Alabama: Alabama Department of Enviromental Management, 1987).

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

16. U.S. Department of Commerce, Rainfall Frequency Atlas of the United States, Technical Paper No. 40 (Washington, D.C.: GPO, 1963), p. 93.

17. R. Allen Freeze and John A. Cherry, Groundwater (Engelwood Cliffs, New Jersey: Prentice-Hall, Inc. 1979).

18. Carol Lackey, Alabama Department of Conservation and Natural Resources, telephone conversation with Matthew McCoy, NUS Corporation, December 5, 1989. Subject: Fishing practices on the Black Warrior River.

19. Robert H. Mount, Vertebrate Animals of Alabama in Need of Special Attention (Alabama Agricultural Experiment Station and Aubora University), pp. 78, 79, 111, 112.

20. U.S. Fish and Wildlife Service, Endangered and Threatened Species of the Southeastern United States (Atlanta, Georgia: 1988).

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
AL	D004034138

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO. OR SPECIFIC LOCATION IDENTIFIER
Southern Resin Division	P.O. Box 128

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG. DIST.
Moundville	AL	35474	Tuscaloosa		

09 COORDINATES LATITUDE	LONGITUDE	10 TYPE OF OWNERSHIP (Check one)
33 00 40.0	087 37 30.0	X A. PRIVATE ☐ B. FEDERAL ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION (Month Day Year)	02 SITE STATUS	03 YEARS OF OPERATION
11 16 89	X ACTIVE ☐ INACTIVE	1966 (Beginning Year) / Present (Ending Year) ☐ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)

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

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
			( )

09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO.
Matthew McCoy	Project Manager	FIT 4	(404) 938-7710
			( )
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO.
			( )
			( )
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☐ PERMISSION ☐ WARRANT		

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO.
Joanna Townsend	EPA, Atlanta	(404) 347-5065

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE (Month Day Year)
Matthew McCoy	FIT 4	NUS Corp.	1-800-888-7710	12 8 89

EPA FORM 2070-13 (7-81)

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
AL	D004034138

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

✓ A SOLID
B POWDER, FINES
C SLUDGE
D OTHER
E SLURRY
F LIQUID
G GAS

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

TONS
CUBIC YARDS
NO. OF DRUMS 60-70/week

03 WASTE CHARACTERISTICS (Check all that apply)

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

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS	Unknown		Aromatic Solvents
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

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

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
	Formaldehyde	50-00-0	Stored in Concrete Bin	Unknown	
	Boron Tri Flouride				

V. FEEDSTOCKS See Appendix for most frequently cited CAS Numbers.

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

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

FIT, STATE, EPA FILES

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
AL	D004034138

II. HAZARDOUS CONDITIONS AND INCIDENTS

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

Contamination from Solvents used at Plant Site.

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

Runoff from Plant Site

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

Resins and By-Products are very oderous

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

Waste on site is ignitable

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

Waste were landfilled on-site.

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

Solvents leaking from lime cake onto surface

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

ND

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

ADEM indicates workers report headaches from working at plant.

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

ND

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
AL	D004034138

II. HAZARDOUS CONDITIONS AND INCIDENTS

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

ND

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

ND

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

ND

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

ND

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

ND

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

ND

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

ND

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

ND

III. TOTAL POPULATION POTENTIALLY AFFECTED: APPROXIMATELY ~~800~~ ~~2500~~ 6000

IV. COMMENTS

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

FIT, STATE, AND EPA FILES

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
AL	D 004034138

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Enter all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
A NPDES	AL 0026921	UNKNOWN	UNKNOWN	Violations Occurred in 1984
B UIC				
C AIR				
D RCRA				
E RCRA INTERIM STATUS				
F SPCC PLAN				
G STATE (Specify)				
H LOCAL (Specify)				
OTHER (Specify)				
J NONE				

III. SITE DESCRIPTION

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

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

05 OTHER

✓ A BUILDINGS ON SITE

06 AREA OF SITE

Approx 60 (Units)

07 COMMENTS

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

A ADEQUATE, SECURE ✓ B MODERATE C INADEQUATE, POOR D INSECURE, UNSOUND, DANGEROUS

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

a concrete bin was built to hold hazardous was until disposal Hazardous waste was also piled onsite uncontained. ~~Prior to 1977~~ WASTED are suspected to have been landfilled onsite prior to 1977.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE ✓ YES NO

02 COMMENTS Disposal Area is not Fenced

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

FIT, STATE, and EPA Files

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
AL	D 004034138

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check appropriate box)

	SURFACE	WELL
COMMUNITY	A ☐	B ☑
NON-COMMUNITY	C ☐	D ☐

02 STATUS

ENDANGERED	AFFECTED	MONITORED
A ☐	B ☐	C ☐
D ☐	E ☐	F ☐

03 DISTANCE TO SITE

A 3.9 (mi)
B _____ (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

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

02 POPULATION SERVED BY GROUND WATER 2400

03 DISTANCE TO NEAREST DRINKING WATER WELL 3.9 (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
100 (ft)	North	_____ (ft)	500 (gpd)	☒ YES ☐ NO

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

2 Municipal Drinking Water Supply wells are located 3.9 miles South of facility and are 244 feet deep

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

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

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

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME	AFFECTED	DISTANCE TO SITE
Carthage Branch	☑	0.2 (mi)
Black Warrior Creek	☑	15.0 (mi)
	☐	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A _____ (NO. OF PERSONS)	B _____ (NO. OF PERSONS)	C ~~2400~~ (NO. OF PERSONS)

02 DISTANCE TO NEAREST POPULATION 0.15 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE _____

04 DISTANCE TO NEAREST OFF SITE BUILDING _____ (mi)

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

FIT, STATE, AND EPA FILES

EPA FORM 2070-13 (7-81)

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
AL	D004034138

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

A [illegible] – [illegible] cm/sec B. 10^{-4} – 10^{-6} cm/sec ✓ C. 10^{-4} – 10^{-3} cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

A. IMPERMEABLE (Greater than [illegible] cm/sec) B. RELATIVELY IMPERMEABLE ([illegible] – [illegible] cm/sec) ✓ C. RELATIVELY PERMEABLE (10^{-2} – 10^{-4} cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH
_____ (ft)	_____ (ft)	_____

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
10 (in)	3.5 (in)	1.0 %	Southwest	17.0 %

09 FLOOD POTENTIAL

SITE IS IN _____ YEAR FLOODPLAIN

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

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE: A _____ (mi) OTHER: B _____ (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

_____ (mi)

ENDANGERED SPECIES _____

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL INDUSTRIAL	RESIDENTIAL AREAS, NATIONAL STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AGRICULTURAL LANDS: AG LAND
A _____ (mi)	B _____ (mi)	C _____ (mi)	D _____ (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

Surface Runoff flows into Carthage Branch which runs along the ~~S~~ western side of the facility and flows north to Black Warrior Creek. The facility is located within 500 feet of the Banks of Black Warrior Creek.

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

FIT, STATE, AND EPA FILES

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
AL	D004034138

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER			
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☐ GROUND ☐ AERIAL

02 IN CUSTODY OF _____
Name of organization or individual

03 MAPS ☐ YES ☐ NO

04 LOCATION OF MAPS _____

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

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

FIT, STATE, AND EPA FILES

EPA FORM 2070-13 (7-81)

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
AL	D004034138

II. CURRENT OWNER(S)

01 NAME	02 D+B NUMBER
LAWTER INTERNATIONAL, INC.	

03 STREET ADDRESS	04 SIC CODE
990 SKOKIE BLVD.	

05 CITY	06 STATE	07 ZIP CODE
Northbrook	IL.	

01 NAME	02 D+B NUMBER

03 STREET ADDRESS	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

PARENT COMPANY (If applicable)

08 NAME	09 D+B NUMBER

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

12 CITY	13 STATE	14 ZIP CODE

08 NAME	09 D+B NUMBER

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

12 CITY	13 STATE	14 ZIP CODE

08 NAME	09 D+B NUMBER

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

12 CITY	13 STATE	14 ZIP CODE

08 NAME	09 D+B NUMBER

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

12 CITY	13 STATE	14 ZIP CODE

III. PREVIOUS OWNER(S) (List most recent first)

01 NAME	02 D+B NUMBER
SOUTHERN RESIN	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
P.O. Box 128	

05 CITY	06 STATE	07 ZIP CODE
Moundville	AL	35474

01 NAME	02 D+B NUMBER

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

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

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

05 CITY	06 STATE	07 ZIP CODE

IV. REALTY OWNER(S) (If applicable; list most recent first)

01 NAME	02 D+B NUMBER

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

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

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

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

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

05 CITY	06 STATE	07 ZIP CODE

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

FIT, STATE, AND EPA FILES

EPA

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

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
AL	D004 034 138

II. CURRENT OPERATOR (if different from owner)

01 NAME: Southern Resin Division	02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.): P.O. Box 128	04 SIC CODE:
05 CITY: Moundville	06 STATE: Al.
07 ZIP CODE: 35474	
08 YEARS OF OPERATION:	09 NAME OF OWNER:

OPERATOR'S PARENT COMPANY (if applicable)

10 NAME:	11 D+B NUMBER:
12 STREET ADDRESS (P.O. Box, RFD #, etc.):	13 SIC CODE:
14 CITY:	15 STATE:
16 ZIP CODE:	

III. PREVIOUS OPERATOR(S) (list most recent first; provide only if different from owner)

01 NAME: Southern Resin	02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.): P.O. Box 128	04 SIC CODE:
05 CITY: Moundville	06 STATE: AL
07 ZIP CODE: 35474	
08 YEARS OF OPERATION:	09 NAME OF OWNER DURING THIS PERIOD:

PREVIOUS OPERATORS' PARENT COMPANIES (if applicable)

10 NAME:	11 D+B NUMBER:
12 STREET ADDRESS (P.O. Box, RFD #, etc.):	13 SIC CODE:
14 CITY:	15 STATE:
16 ZIP CODE:	

01 NAME:	02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):	04 SIC CODE:
05 CITY:	06 STATE:
07 ZIP CODE:	
08 YEARS OF OPERATION:	09 NAME OF OWNER DURING THIS PERIOD:

10 NAME:	11 D+B NUMBER:
12 STREET ADDRESS (P.O. Box, RFD #, etc.):	13 SIC CODE:
14 CITY:	15 STATE:
16 ZIP CODE:	

01 NAME:	02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):	04 SIC CODE:
05 CITY:	06 STATE:
07 ZIP CODE:	
08 YEARS OF OPERATION:	09 NAME OF OWNER DURING THIS PERIOD:

10 NAME:	11 D+B NUMBER:
12 STREET ADDRESS (P.O. Box, RFD #, etc.):	13 SIC CODE:
14 CITY:	15 STATE:
16 ZIP CODE:	

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

FIT, STATE, EPA Files

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
AL	D004034138

II. ON-SITE GENERATOR

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

III. OFF-SITE GENERATOR(S)

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

IV. TRANSPORTER(S)

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

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

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
AL	D 004034138

II. PAST RESPONSE ACTIVITIES

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

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

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

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

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

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

01 ☑ G. WASTE DISPOSED ELSEWHERE — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
All Hazardous Waste Wase Removed To Emille on June 27, 1985

01 ☑ H. ON SITE BURIAL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION
Suspected prior To 1977

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

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

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

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

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

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

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

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

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

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
AL	D004034138

II PAST RESPONSE ACTIVITIES (Continued)

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

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

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

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

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

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

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

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

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

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

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

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

III. SOURCES OF INFORMATION (Reference to referenced, e.g., state files, sample analysis, reports)

FIT, STATE, AND EPA FILES

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
AL	D004034138

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY ENFORCEMENT ACTION ✓ YES NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY ENFORCEMENT ACTION

Violation of NPDES Permit by exceeding BOD, COD, and phenolics limits

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

EPA, STATE, FIT Files

Reference No. 1

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
EPS FORM 3012-III

INDUSTRIAL NARRATIVE SHEET

1. Site Identification:

Site number: ALD004034138

Site name: Southern Resins Division (Lawter Chemical)

Site county: Tuscaloosa

2. Industrial Narrative Summary:

Company Name: Southern Resins Division

Address: P. O. Box 128
Moundville, AL 35474

Telephone No.: 205/371-2235

Contact: Gorden Steward

Discussion: Southern Resins is a producer of synthetic resins. They have operated since 1966. In 1976, Lawter International bought Southern Resin. Southern Resin has had a history of environmental problems. These problems stem from waste streams improperly handled on site. They recently had a management and engineering change. They are now working with the state on a timely basis to correct their past problems. Lime filter cake saturated with aromatic solvents has been a problem. These solvents have potentially contaminated the groundwater and surface soil. Also, waste resin products, although not listed as hazardous waste, have caused problems with disposal at local sanitary landfills. At present all waste, hazardous and non-hazardous, is being shipped to a hazardous waste landfill because no one (i.e., local sanitary landfills) will take their waste due to their past reputation. ADEM is closely monitoring this site to insure proper compliance.

3. Disposition:

This is a RCRA facility and therefore, requires no further action.

4. Comments:

NA

The approximately 2000 drums of pond scrubber waste have been found by Southern Resins to have recycle value. They are presently being stored on pallets and concrete pads at various locations around the plant awaiting recycling. Any waste generated from the recycling process goes to the WWTP according to Mr. Sharpe.

It was learned during this inspection that the diked area around one of the solvent storage tanks had been used as a decanting facility to separate spent solvent from the water that became mixed with it during steam stripping operations. The spent solvent was then sold to Fuels and Chemicals for use in their operation. Mr. Sharpe was informed that this required that the diked area be considered a regulated unit which must be formally closed as per Section 4-256.13 of the Alabama Hazardous Waste Management Regulations. Additionally, Mr. Sharpe stated that the facility has been manufacturing resins since 1956. Wastestreams generated in the past would have been the same as those generated currently. Mr. Sharpe suspects much of the solvent saturated filter cake generated prior to the plant's 1977 acquisition by Lawter Int. was landfilled on site.

DH/sdm

cc: Mr. Jack Honeycutt
Solid Waste Branch

Mr. Mark Peycke
Legal Division

File: Lawter; Southern Resins (Gen)

May 13, 1985

M E M O R A N D U M

TO: MARK PEYCKS
OFFICE OF GENERAL COUNSEL

THROUGH: DAN COOPER
DAVID LUDDER

FROM: MARGARET MARKEY
HAZARDOUS WASTE BRANCH

RE: Southern Resins/Lawter International, - Moundville

The subject facility has initiated a comprehensive environmental study and has [illegible] work with our Branch to enter into compliance by scheduling compliance activities with us.

Therefore, it is not necessary to proceed with a Final Order against the facility at this time. However, please keep the enforcement action on inactive status as an Order may be necessary in the future.

If you have any questions, please advise.

MEM/adm
cc: Mr. Dave Davis
Mr. David Hagan

~~File: Southern Resins (G)~~

ADEM

ALABAMA
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

January 31, 1985

MEMORANDUM

TO: Bernard E. Cox

FROM: David Hagan

RE: Southern Resins

Mr. Horton of INDEC called the writer this date regarding Southern Resins' plans to ship it's non-hazardous waste to Emelle. His primary reason for calling was to notify ADEM that INDEC probably would not be the transporter of any non-hazardous waste shipments to Emelle because of Chemical Waste Management's determination that the waste is not suitable for bulk shipment. Mr. Horton says Chemical Waste Management is concerned that Southern Resins may mix it's non-hazardous and hazardous streams if bulk shipment is allowed.

As you know, Southern Resins is forced to send it's non-hazardous waste to Emelle because no county or municipal landfill in the area will accept any waste from the company. This situation is the result of Southern Resins disposing of it's hazardous waste at various unauthorized sites in the area for the past few years.

DH/bsl

File: IW Southern Resins
(G)

February 5, 1985

IW

ADEM

ALABAMA
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

1751 Federal Drive
Montgomery, AL
36130
205 [illegible]

Field Offices

P.O. Box [illegible]
Decatur, AL
[illegible]

Unit [illegible] Building 8
[illegible] Oxmoor Circle
Birmingham, AL
[illegible]
205 [illegible]

4358 Midmost Drive
Mobile, AL
[illegible]
205 [illegible]

September 27, 1984

MEMORANDUM

TO: Mark Peycke

THROUGH: Buddy Cox

FROM: David Hagan

RE: Southern Resins/Lawter Chemical remedial action data, ALd 004 034 138

1. Off-site Disposal of Hazardous Wastes by Southern Resins

A. Since the solvent saturated calcium floride filter cake (CaF/solvent) was not recognized by Southern Resins as a hazardous waste until 1984, it is assumed that all such material generated since the beginning of operation of the plant has been disposed of improperly. This requires some form of remedial action on the part of Southern Resins to correct any resulting environmental damage. According to Mr. Mike Sharp, Engineering Manager of Southern Resins, all CaF/solvent disposed of off-site since 1981 went to the Harris Landfill in Tuscaloosa. There is some mention in the files of this waste stream also going to the Hale County Landfill, but there is no information on disposal sites prior to 1981. The first correspondence with the company from the Land Divison is November 20, 1978. Disposal sites for the CaF/solvent waste generated from 1978 to 1981 are unknown. Estimates of the amount of CaF/solvent generated since November 1978 to 1984 and the cost for disposal of this waste at a secure hazardous waste facility are as follows:

Amount Generated

1500lbs/day x 260 working days/yr x 5½ yrs = 1072 tons

Clean-up/Disposal Costs

$100/ton x 1072 tons = $107,200

B. An estimate of the cost of clean-up of ground water contamination at any of the disposal sites must await an assessment of the extent of contamination, if any. This will require, at a minimum, the installation of monitoring wells at each disposal site which will cost between $10,000 and $20,000 per site including consultant fees. If ground water contamination is found, clean-up costs will be significant.

II. On-Site Management of Hazardous Waste

A. The CaF/solvent waste stream has been stored on-site for varying periods throughout the operational history of the plant. Because the methods of on-site storage were haphazard at best, the potential for release of hazardous wastes into the environment is substantial. It is also possible that this waste stream was landfilled on-site. Visual evidence of ground water contamination was documented by the writer and Mr. Fred Mason in separate trip reports dated August 16, 1984 and July 25, 1984, respectively. This justification for requiring Southern Resins to develop and implement a ground water quality assessment plan. The cost of developing and implementing a ground water quality assessment plan would be approximately twenty to thirty thousand dollars. If a clean-up of the ground water is deemed necessary, the cost will be significant.

B. The amount of CaF/solvent currently being stored in waste piles on-site in violation of Alabama regulations is approximately 200 tons. The cost of removing this waste to a secure hazardous waste disposal facility is estimated to be $20,000 assuming 100 dollars/ton disposal costs.

BEC/DH/slw

Reference No 4

ENVIRONMENTAL MANAGEMENT

January 17, 1981

MEMORANDUM

TO: Ron Gore

FROM: George Sullivan and Ronnie Watkins

SUBJECT: Inspection of Southern Resins (Lawter Chemical)

An unannounced inspection of the above facility, located in Moundville, was performed by Ronnie Watkins and George Sullivan on January 11, 1981. Walter Allen, plant manager, discussed the processes in detail with us and then conducted a tour of the facility.

The Synthetic Resins Plant manufactures three types of products: tall oil rosin ester resins, ketone resins, and polyamide resins. Eighty percent of the products manufactured are tall oil resins, with the other two resins 10% each. The tall oil resins are made by mixing tall oil rosin, Cellusolve (a glycerol), formaldehyde and dodecylphenol in a reactor which is heated indirectly by steam under a nitrogen blanket. There are two reactors, No. 3 and No. 4, which make the tall oil resin only and one, No. 1, which makes all three synthetic resins. There is also one, No. 2, reactor which makes the ketone and polyamide resins only. The ketone resin is made by mixing cyclohexanone and formaldehyde in the presence of a sodium hydroxide catalyst. This reaction is exothermic and is controlled by water in cooling coils. When the resin is formed, water is added to cool the resin and to remove the excess caustic. The caustic and water form an aqueous layer and is removed. Then the resin is heated to remove the excess water. It is then loaned into pans and allowed to set. Once set, it is crushed and bagged. The polyamide resin is made by reacting dimer acid with ethylene diamine under heat. The product is dropped on a conveyor belt, dried, flaked, and then bagged.

The emissions sources from the synthetic resins plant are the reactors and the crushers. Three reactors each have a knock-out tank and a scrubber. The other reactor has only a scrubber. All scrubbers are vented to a packed tower. The crushers and baggers are vented to baghouses.

All four reactors were operating during our inspection. Three of the reactors were producing tall oil resins and one was making the ketone resin. One of the reactors was being charged and it was evident that there was a negative pressure inside the reactor by the fact that no fumes were coming from the reactor through the charging door. The only other exit for the gases is an emergency release vent. This vent will only open if the pressure increases enough to break the metal diaphragm in the line.

Following the vent lines, the reactors vent downstairs to the control equipment. The area around the control equipment was very messy. Mr. Allen said they had just cleaned the packing in the packed bed scrubber, and the resin on the floor was from this. They clean the floor after cleaning the scrubber. All water from this plant goes to the wastewater treatment plant.

One problem with the packed bed scrubber was that there was no way of telling if the water was on or off, except by looking at the steam coming out the stack. Mr. Allen said that there was once a sight glass by which you could see if water was going to the scrubber, but it had been broken. He said that another one could be installed. Other than the general messiness around the scrubbers, this was the only problem noted.

The baghouse which controls the emissions from the two crushers was not operating when first inspected. Mr. Allen had it turned on, but visible emissions of 30-40% were seen coming from it. Mr. Allen said that he thought the baghouse had a bad solenoid which was the reason it was turned off. The Torit dust collector for the baggers was operating and no emissions were seen; however, the baggers were not operating. There were fugitive emissions coming from a hopper inside the building due to the lid not being properly secured. There were also fugitive emissions at the crusher inside the building when the baghouse was turned off.

The storage tanks for the synthetic resins plant were also inspected. All tanks had conservation vents except the phenol tank. These vents only open under a pressure of 5" of water. A tall oil resin odor could be smelled but it was not unpleasant. Some of the lids were not down all the way, which, according to Mr. Allen, was due to an inventory done recently.

Next, Mr. Allen explained the "hydrocarbon" resins process as we walked through the process. "Heartcut" or "CRO" reacts with itself in the presence of a catalyst, boron trifluoride (BF_3). After the exothermic reaction proceeds for approximately two hours, the material is pumped from the reactor to a neutralizing tank where quicklime is added to neutralize the BF_3. The mixture is then filtered to remove the solids, which are disposed of at the rear of the plant property, and the filtrate is sent to storage. The filtrate then goes to the stripper where steam is sparged through the liquid to separate the by-product solvent from the product resin. The solvent is decanted from the condensed steam and sold. The water layer, which is slightly acidic, is sent to the wastewater treatment system. The product resin is stored in a heated tank before being sent to the flaker, where the hot resin is spread on a continuous water cooled metal belt to cool and solidify. The solid resin is crushed and stored for bagging.

There are two "hydrocarbon" resins process lines, one batch and one continuous. The process is the same in each process but some of the equipment is different. There are two batch reactors which vent to the atmosphere. White emissions were noted from one of the reactors. No strong odor was noted due to these emissions. The BF_3 is introduced into the process from a mobile bank of pressurized tanks. Quicklime, which is

used to neutralize the BF_3, is received in bulk by truck and blown into a storage silo. Emissions from the storage silo are controlled by a baghouse. The filter cake from the filtration step is being temporarily stored in a three sided structure at the rear of the process area. No odor was detected near the storage pile. This material used to be taken to a local landfill. Recently, Jack Honeycutt with the Land Division, informed Lawter that this material may have to be classified as hazardous because it contains some of the by-product solvent, which has a boiling point less than 140°F. Therefore, the material is being stored at the back of the plant property near the river until the problem can be resolved. No strong odor or emissions were noted from any of the storage tanks. However, there was evidence of leakage from pumps and piping in the storage tanks' dikes. The only other piece of air pollution control equipment is a baghouse in the product packaging area. No emissions were noted in the exhaust of this baghouse nor were fugitive particulate emissions a problem. Hydrocarbon emissions from the solidifying process are vented to the outside by a forced draft fan. No odor was noted at this point.

The continuous process is different from the batch process from a pollution standpoint in that the reactor and filter are enclosed. Another difference is that sometimes, approximately once per month, an acidic compound, e.g. maleic anhydride, is added to the product storage tanks in order to produce a product specifically for certain customers. This results in a disagreeable odor, according to Mr. Allen. The emissions are vented by natural draft through a tall stack next to the tanks. The baghouse for the flaker packaging area was observed, and no emissions were noted. No strong odors were noted in the processing area. However, there was evidence of leakage from pumps and piping in this area also.

Before leaving the plant, we discussed the problems noted during the inspection. The problems noted were:

(1) visible emissions from the baghouse for the synthetic resins plant crushers,

(2) replacement of the sight glass on the packed tower scrubber for the synthetic resins plant, and

(3) spillage under the tanks in the tank farms and under the hydrocarbon resins reactors which could cause an odor problem.

Mr. Allen stated that the first two problems would be taken care of as soon as possible. He did not comment on the third problem.

Recommendation

We recommended that Southern Resins be notified of the above problems and required to correct them.

/sd

cc: Freda Griffis, Land Division
J. P. Martin, Water Division

RECONNAISSANCE CHECKLIST FOR HRS2 CONCERNS

Instructions: Obtain as much "up front" information as possible prior to conducting fieldwork. Complete the form in as much detail as you can, providing attachments as necessary. Cite the source for all information obtained.

Site Name: Southern Resin Division
City, County, State: Moundville, Tuscaloosa County, Alabama
EPA ID No.: ALD004034129
Person responsible for form: Mathew McCoy
Date: 12-19-89

Air Pathway

Describe any potential air emission sources onsite: Baghouses used in crushing and bagging of Resin.
Identify any sensitive environments within 4 miles: Moundville State Monument located 2500 feet Southwest of facility; Scattered swamplands to the Northwest and Southeast
Identify the maximally exposed individual (nearest residence or regularly occupied building - workers do count): Workers onsite; Nearest residence located 700 feet Southeast of facility

Groundwater Pathway

Identify any areas of karst terrain: None

Identify additional population due to consideration of wells completed in overlying aquifers to the AOC: None

Do significant targets exist between 3 and 4 miles from the site? Municipal water supply well are located 3.75 miles South of facility.
Is the AOC a sole source aquifer according to Safe Drinking Water Act? (i.e. is the site located in Dade, Broward, Volusia, Putnam, or Flagler County, Florida): No

Surface Water Pathway

Are there intakes located on the extended 15-mile migration pathway? No

Are there recreational areas, sensitive environments, or human food chain targets (fisheries) along the extended pathway? Recreational and commercial fishing occur along Black Warrior ~~Creek~~ River.

Onsite Exposure Pathway

Is there waste or contaminated soil onsite at 2 feet below land surface or higher? Suspected.

Is the site accessible to non-employees (workers do not count)? Yes, Facility is unfenced.

Are there residences, schools, or day care centers onsite or in close proximity? Nearest Residential area located 0.5 miles Southeast of facility
Are there barriers to travel (e.g., a river) within one mile?
Facility is within 500 feet of Black Warrior River.

EPA

PO 'TIAL HAZARDOUS WASTE SITE
TENTATIVE DISPOSITION

RECION SITE NUMBER: IV ALD 004 034 138

File this form in the regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force *(EN-335)*; 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME	B. STREET	
Southern Resin Div / Lawter Chem.	Cracker Rd	
C. CITY	**D. STATE**	**E. ZIP CODE**
Moundville (Tuscaloosa Co)	AL	35474

II. TENTATIVE DISPOSITION

Indicate the recommended action(s) and agency(ies) that should be involved by marking 'X' in the appropriate boxes.

RECOMMENDATION	MARK 'X'	ACTION AGENCY: EPA	STATE	LOCAL	PRIVATE
A. NO ACTION NEEDED -- NO HAZARD					
B. INVESTIGATIVE ACTION(S) NEEDED *(If yes, complete Section III.)*	X				
C. REMEDIAL ACTION NEEDED *(If yes, complete Section IV.)*					
D. ENFORCEMENT ACTION NEEDED *(if yes, specify in Part E whether the case will be primarily managed by the EPA or the State and what type of enforcement action is anticipated.)*					

E. RATIONALE FOR DISPOSITION

Lawter Chemical Withdrew Interim Status.

F. INDICATE THE ESTIMATED DATE OF FINAL DISPOSITION *(mo., day, & yr.)*

G. IF A CASE DEVELOPMENT PLAN IS NECESSARY, INDICATE THE ESTIMATED DATE ON WHICH THE PLAN WILL BE DEVELOPED *(mo., day, & yr.)*

H. PREPARER INFORMATION

1. NAME	2. TELEPHONE NUMBER	3. DATE *(mo., day, & yr.)*
Elizabeth M Shaver	(404) 881-2234	10/7/85

III. INVESTIGATIVE ACTIVITY NEEDED

A. IDENTIFY ADDITIONAL INFORMATION NEEDED TO ACHIEVE A FINAL DISPOSITION.

Need to identify targets for HRS.

B. PROPOSED INVESTIGATIVE ACTIVITY *(Detailed Information)*

1. METHOD FOR OBTAINING NEEDED ADDITIONAL INFO.	2. SCHEDULED DATE OF ACTION *(mo, day, & yr)*	3. TO BE PERFORMED BY *(EPA, Contractor, State, etc.)*	4. ESTIMATED MANHOURS	5. REMARKS
a. TYPE OF SITE INSPECTION				
(1)				
(2)				
(3)				
b. TYPE OF MONITORING				
(1)				
(2)				
c. TYPE OF SAMPLING				
(1)				
(2)				

PROJE ANAGEMENT SUMM

Site Name: SOUTHERN RESIN DIV.

Site Number: ALD004034138

Owner: LAWTER INTERNATIONAL

Operator:

Site Status: [X] Active [ ] Inactive [ ] Unknown

Priority: [ ] High [ ] Medium [ ] Low [X] None

3. FINAL DISPOSITION

I. EPS Final Review - Date: 9/3/85

Comments:

Site Inspection Required [ ] Yes [X] No

II. ADEM Review - Date: 9/24/85 Scm

Comments:

Follow-up Action Required [ ] Yes [X] No

III. Final Disposition:

Review & revise Date:

Edited & correct Date:

Transmitted Date:

File close-out Date:

Initiate site inspection Date:

4. ADDITIONAL COMMENTS (ONGOING & FINAL)

TO THE BEST OF OUR KNOWLEDGE THIS IS A RCRA FACILITY ONLY

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
EPS FORM 3012-III

INDUSTRIAL NARRATIVE SHEET

1. Site Identification:

Site number: ALD004034138

Site name: Southern Resins Division (Lawter Chemical)

Site county: Tuscaloosa

2. Industrial Narrative Summary:

Company Name: Southern Resins Division

Address: P. O. Box 128
Moundville, AL 35474

Telephone No.: 205/371-2235

Contact: Gorden Steward

Discussion: Southern Resins is a producer of synthetic resins. They have operated since 1966. In 1976, Lawter International bought Southern Resin. Southern Resin has had a history of environmental problems. These problems stem from waste streams improperly handled on site. They recently had a management and engineering change. They are now working with the state on a timely basis to correct their past problems. Lime filter cake saturated with aromatic solvents has been a problem. These solvents have potentially contaminated the groundwater and surface soil. Also, waste resin products, although not listed as hazardous waste, have caused problems with disposal at local sanitary landfills. At present all waste, hazardous and non-hazardous, is being shipped to a hazardous waste landfill because no one (i.e., local sanitary landfills) will take their waste due to their past reputation. ADEM is closely monitoring this site to insure proper compliance.

3. Disposition:

This is a RCRA facility and therefore, requires no further action.

4. Comments:

NA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
EPS FORM 3012-II

TELEPHONE LOG SHEET

1. Site Identification:
   Site number: ALD004034138
   Site name: Southern Resins

2. Interview Data: (Party called)
   Name: Gorden Steward
   Position: Plant Manager
   Firm: Southern Resins
   Address: P.O. Box 128
   Moundville, AL. 35474
   Telephone No.: 205/371-2235

3. EPS Analyst Data:
   Name: Jim Duncan
   Purpose of call: Information for PA
   Form 2070-12 (7-81) P.N.
   Date of call: 8/30

4. Interview Narrative Summary: Southern Resins is a RCRA regulated facility and therefore their environmental problems are being address by ADEM at the present time. General Information was gathered from Gordan Steward, the acting Plant Manager. The plant began operating in 1966. In 1976 Lawter International bought Southern Resins. Their home offices are in North Brook, Illinois and their Alabama location is 13 south of Tuscaloosa, 3/4 mile off of Route 69 on Cracker Road. Environmental affairs are well documented in the ADEM Files.

5. Disposition/Comments:

6. Comments: Any additional sites used by this company?
   Location:
   Dates of use:
   Description of waste:
   Comments:

ENVIRONMENTAL PROTECTION SYSTEMS, INC.

Alabama RCRA 3012 Site Ranking Scheme
EPS Form 3012-V

Site Name Southern Resins
Site Number ALD004034138

Preliminary Assessment Ranking Scheme to Determine Which Sites Merit Further Action.

(Select one answer for each of the following seven questions)

1. Are Hazardous Substances Present?		
A. Confirmed on site!	10 points	
B. Suspected at site!	5 points	
C. It is unknown!	2 points	
D. No hazardous substances	0 points	
E. RCRA facility only!	0 points	x
2. Is There a Pollution Dispersal Pathway?		
A. Direct to surface and/or groundwater.	5 points	
B. Indirect to surface and/or groundwater.	4 points	
C. Suspected to surface and/or groundwater.	3 points	
D. Not known for sure.	2 points	
E. No pathway.	0 points	
3. Characteristics of Human Population?		
A. High density.	5 points	
B. Medium density.	4 points	
C. Low density.	3 points	
D. No population.	2 points	
4. Characteristics of Natural Environment?		
A. Critical habitat including endangered species, etc.	5 points	
B. Sensitive habitat.	3 points	
C. Common less sensitive habitat.	2 points	
5. How is Human Population Affected By Site?		
A. Public utility of drinking water from site.	5 points	
B. Direct public access to site.	4 points	
C. Public access to affected surface water.	3 points	
D. Only potential for human population contact.	2 points	
E. Low or no potential for contact.	1 point	
6. Facility Management Practices at Site?		
A. Site actively supervised and managed currently with monitoring reports and other permit and report requirements.	1 point	
B. Site inadequately managed records not up-to-date.	3 points	

C. Site not currently managed or regulated. — 4 points _____

D. Abandon site. — 5 points _____

7. Potential Responsible Parties for Site Operations?

A. Controlling party identified and accepts responsibility for site. — 1 point _____

B. Suspected controlling party identified but does not accept responsibility for site. — 4 points _____

C. No responsible party available. — 5 points _____

Ranking Score =

$$\frac{0}{\#1} \times \left[\frac{N/A}{\#2} + \frac{N/A}{\#4} + \left(\frac{N/A}{\#3} \times \frac{N/A}{\#5} \right) + \frac{N/A}{\#6} + \frac{N/A}{\#7} \right]$$

TABLE 1. Ranking Assessment

NUMERICAL RANGE	PRIORITY ASSESSMENT
0-50	NONE
50-150	LOW
150-300	MEDIUM
300-450	HIGH

Ranking Score: 0

Priority Assessment: None

.OTENTIAL HAZARDOUS WASTE S
PRELIMINARY ASSESSMENT
EPS FORM 3012-I
EPS ANALYST/REVIEWER CHECKLIST

Site No.
Site Name

Instructions: To be used in conjunction with EPA Form 2070-12 (7-81). Attach on inside front c site folder. Initial and date for all assessment entries under appropriate part/subpart as completed. initial/date in black for final assessment; in red i higher level (additional) assessment is in order. Follow same procedure for review process.

Review Codes: 1-Toxicology Review; 2-Chemical Review; 3-Ecology Review; 4-Chemical Engineer Review; 5-Geotechnical Review; 6-Project Manager Review; 7-Final Review

1. ANALYST/REVIEW STATUS

Form 2070 Part Number	Analyst/ Date	Review Code 1	Review Code 2	Review Code 3	Review Code 4	Review Code 5	Review Code 6	Review Code 7
1.I.-VI.								
	JD 8/29/85						HW 9/3	HW 9/3
2.I.								
2.II.								
2.III.								
2.IV.								
2.V.								
2.VI.								
3.I.								
3.II.A								
3.II.B								
3.II.C								
3.II.D								
3.II.E								
3.II.F								
3.II.G								
3.II.H								
3.II.I								
3.II.J								
3.II.K								
3.II.L								
3.II.M								
3.II.N								
3.II.O								
3.II.P								
3.III.								
3.IV.								
3.V.								

*No further assessment/review required, enter NA

EPA

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

I. IDENTIFICATION

01 STATE: AL | 02 SITE NUMBER: D004034138

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site): Southern Resin Div. (Lawter Chem.)

02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER: P.O. Box 128

03 CITY: Moundville | 04 STATE: AL | 05 ZIP CODE: 35474 | 06 COUNTY: Tuscaloosa | 07 COUNTY CODE: | 08 CONG DIST: 07

09 COORDINATES LATITUDE: 33 00 40.0 | LONGITUDE: 087 37 30.0

10 DIRECTIONS TO SITE (Starting from nearest public road): 13 miles South of Tuscaloosa, 3/4 mile west of Route 69 on Cracker Rd.

III. RESPONSIBLE PARTIES

01 OWNER (If known): Lawter International

02 STREET (Business, mailing, residential): 990 Skokie Blvd.

03 CITY: North Brook | 04 STATE: IL | 05 ZIP CODE: | 06 TELEPHONE NUMBER: (312) 498-4700

07 OPERATOR (If known and different from owner):

08 STREET (Business, mailing, residential):

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

13 TYPE OF OWNERSHIP (Check one)
- [X] A. PRIVATE
- [ ] B. FEDERAL: _____ (Agency name)
- [ ] C. STATE
- [ ] D. COUNTY
- [ ] E. MUNICIPAL
- [ ] F. OTHER: _____ (Specify)
- [ ] G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
- [X] A. RCRA 3001 DATE RECEIVED: 11 / 18 / 80 (MONTH DAY YEAR)
- [ ] B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: / / (MONTH DAY YEAR)
- [ ] C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
- [X] YES DATE 03 / 01 / 85 (MONTH DAY YEAR)
- [ ] NO

BY (Check all that apply)
- [ ] A. EPA
- [ ] B. EPA CONTRACTOR
- [X] C. STATE
- [ ] D. OTHER CONTRACTOR
- [ ] E. LOCAL HEALTH OFFICIAL
- [ ] F. OTHER: _____ (Specify)

CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)
- [X] A. ACTIVE
- [ ] B. INACTIVE
- [ ] C. UNKNOWN

03 YEARS OF OPERATION: 1966 (BEGINNING YEAR) | ____ (ENDING YEAR) [ ] UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED
Aromatic Solvents

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION
Groundwater contamination from solvents used at plant site

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)
- [ ] A. HIGH (Inspection required promptly)
- [ ] B. MEDIUM (Inspection required)
- [ ] C. LOW (Inspect on time available basis)
- [X] D. NONE (No further action needed; complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT: Steve Mavrer | 02 OF (Agency/Organization): ADEM | 03 TELEPHONE NUMBER: (205) 271-7728

04 PERSON RESPONSIBLE FOR ASSESSMENT: Jim Duncan | 05 AGENCY: | 06 ORGANIZATION: EPS | 07 TELEPHONE NUMBER: (601) 922-8242 | 08 DATE: 08 / 29 / 85 (MONTH DAY YEAR)

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
AL	D004034138

II. HAZARDOUS CONDITIONS AND INCIDENTS

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

wells are being installed, extremely high potential for extensive ground-water contamination

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

Runoff from plant site.

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

Resins and by products are very oderous

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

waste on site is very flammable

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

Resins were landfilled at SLF where contact may occur

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

Solvents leaking from lime cake onto surface

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

UNK

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

ADEM staff indicates that workers tell of headaches from working at plant

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

UNK

M.2 - SITE MAINTENANCE FORM

* ACTION: _

EPA ID : ALD004034138

SITE NAME: SOUTHERN RESINS DIV LAWTER CHEMICAL CO SOURCE: T

STREET : CRACKER RD & TERRA DR CONG DIST: 07

CITY : MOUNDVILLE ZIP: 35474

CNTY NAME: HALE CNTY CODE : 065

LATITUDE : 33/00/40.0 LONGITUDE : 087/37/30.0

LL-SOURCE: R LL-ACCURACY:

SMSA : HYDRO UNIT: 03160113

INVENTORY IND: Y REMEDIAL IND: Y REMOVAL IND: N FED FAC IND: N

NPL IND: N NPL LISTING DATE: NPL DELISTING DATE:

SITE/SPILL IDS:

RPM NAME: BETSY SHAVER RPM PHONE: 404-881-2234

SITE CLASSIFICATION: SITE APPROACH:

DIOXIN TIER: REG FLD1: REG FLD2: 6

RESP TERM: PENDING ( ) NO FURTHER ACTION ( ) * PENDING (_) NO FURTHER ACTION (_)

ENF DISP: NO VIABLE RESP PARTY ( ) VOLUNTARY RESPONSE ( )
ENFORCED RESPONSE ( ) COST RECOVERY ( )

SITE DESCRIPTION:

HAZARDOUS WASTE PILE (ABOUT 100 CUBIC YARDS) CONTAINED IN A
CONCRETE STRUCTURE. CONTAINS SOLVENT SATURATED LIME CAKE.
ALSO O/O SURFACE IMPOUNDMENT AT SITE.

M.2 - ALIAS/ALIAS LOCATION MAINTENANCE FORM

ACTION: _

SITE: SOUTHERN RESINS DIV LAWTER CHEMICAL CO

EPA ID: ALD004034138 ALIAS SEQ NO: 01

ALIAS NAME: LAWTER CHEMICAL CO/SOUTHERN RESINS DIV. SOURCE: R

ALIAS LOCATION ACTION: _

CONTIGUOUS PORTION OF SITE? FED FAC IND: _

STREET : CONG DIST :

CITY : ST: ZIP:

CNTY NAME: CNTY CODE:

LATITUDE : / / LONGITUDE : / /

LL-SOURCE: LL-ACCURACY: _

SMSA : HYDRO UNIT:

ALIAS DESCRIPTION:

M.2 - PROGRAM MAINTENANCE FORM

* ACTION: _

SITE: SOUTHERN RESINS DIV LAWTER CHEMICAL CO

EPA ID: ALD004034138 PROGRAM CODE: H01 PROGRAM TYPE: * _ *

PROGRAM QUALIFIER: ALIAS LINK : * ___ _

PROGRAM NAME: SITE EVALUATION * _____

DESCRIPTION:

* _____

* _____

* _____

* _____

M.2 - EVENT MAINTENANCE FORM

ACTION:

SITE: SOUTHERN RESINS DIV LAWTER CHEMICAL CO
PROGRAM: SITE EVALUATION

EPA ID: ALD004034138 PROGRAM CODE: H01 EVENT TYPE: DS1

FMS CODE: EVENT QUALIFIER : EVENT LEAD: E

EVENT NAME: DISCOVERY STATUS:

DESCRIPTION:

ORIGINAL	CURRENT	ACTUAL			
START:	START:	START:	__/__/__	__/__/__	__/__/__
COMP :	COMP :	COMP : 08/01/84	__/__/__	__/__/__	__/__/__

HQ COMMENT:

RG COMMENT:

COOP AGR #	AMENDMENT #	STATUS	STATE %
			0

M.2 - EVENT MAINTENANCE FORM

* ACTION: _

SITE: SOUTHERN RESINS DIV LAWTER CHEMICAL CO
PROGRAM: SITE EVALUATION

EPA ID: ALD004034138 PROGRAM CODE: H01 EVENT TYPE: PA1

FMS CODE: EVENT QUALIFIER : EVENT LEAD: S * _ ___ _ *

EVENT NAME: PRELIMINARY ASSESSMENT STATUS: * _____ _

DESCRIPTION:

* _____
* _____
*
* _____

ORIGINAL	CURRENT	ACTUAL			
START:	START:	START: 10/01/85	* __/__/__	__/__/__	__/__/__
COMP :	COMP :	COMP : 10/07/85	* __/__/__	__/__/__	__/__/__

HQ COMMENT:

* _____

RG COMMENT:

* _____

COOP AGR #	AMENDMENT #	STATUS	STATE %				
			0	* _____	_____	__	__

M.2 - REGIONAL UTILITY MAINTENANCE FORM

SITE: SOUTHERN RESINS DIV LAWTER CHEMICAL CO

EPA ID: ALD004034138

REG CODE: HSCS-01 * ACTION: _ *

DESCRIPTION: SOLVENTS * _____ *

* _____ *

DATE1: * __/__/__ *

DATE2: * __/__/__ *

DATE3: * __/__/__ *

FREE FIELD: * _____ *

REG CODE: OPD7-01 * ACTION: _ *

DESCRIPTION: SOIL CONTAMINATION * _____ *

* _____ *

DATE1: * __/__/__ *

DATE2: * __/__/__ *

DATE3: * __/__/__ *

FREE FIELD: * _____ *

REG CODE: 4C85-01 * ACTION: _ *

DESCRIPTION: CERCLA FY85 COOPERATIVE AGREEMENT (PA) * _____ *

* _____ *

DATE1: * __/__/__ *

DATE2: * __/__/__ *

DATE3: * __/__/__ *

FREE FIELD: * _____ *

M.2 - REGIONAL UTILITY MAINTENANCE FORM

SITE: SOUTHERN RESINS DIV LAWTER CHEMICAL CO

EPA ID: ALD004034138

REG CODE: 4ERR-01 * ACTION: _

DESCRIPTION: NEW ERRIS SITE *

*

DATE1: * __/__/__

DATE2: * __/__/__

DATE3: * __/__/__

FREE FIELD: * _____ *

REG CODE: 4HRN-01 * ACTION: _

DESCRIPTION: PRELIMINARY HAZARD RANKING NEEDED *

*

DATE1: * __/__/__

DATE2: * __/__/__

DATE3: * __/__/__

FREE FIELD: * _____ *

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
EPS FORM 3012-III

INDUSTRIAL NARRATIVE SHEET

1. Site Identification:

Site number: ALD004034138

Site name: Southern Resins Division (Lawter Chemical)

Site county: Tuscaloosa

2. Industrial Narrative Summary:

Company Name: Southern Resins Division

Address: P. O. Box 128
Moundville, AL 35474

Telephone No.: 205/371-2235

Contact: Gorden Steward

Discussion: Southern Resins is a producer of synthetic resins. They have operated since 1966. In 1976, Lawter International bought Southern Resin. Southern Resin has had a history of environmental problems. These problems stem from waste streams improperly handled on site. They recently had a management and engineering change. They are now working with the state on a timely basis to correct their past problems. Lime filter cake saturated with aromatic solvents has been a problem. These solvents have potentially contaminated the groundwater and surface soil. Also, waste resin products, although not listed as hazardous waste, have caused problems with disposal at local sanitary landfills. At present all waste, hazardous and non-hazardous, is being shipped to a hazardous waste landfill because no one (i.e., local sanitary landfills) will take their waste due to their past reputation. ADEM is closely monitoring this site to insure proper compliance.

3. Disposition:

This is a RCRA facility and therefore, requires no further action.

4. Comments:

NA

EPA

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

I. IDENTIFICATION
01 STATE: AL | 02 SITE NUMBER: D004034138

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site): Southern Resin Div. (Lawter Chem.)
02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER: P.O. Box 128
03 CITY: Moundville
04 STATE: AL | 05 ZIP CODE: 35474 | 06 COUNTY: Tuscaloosa | 07 COUNTY CODE: | 08 CONG DIST: 07
09 COORDINATES LATITUDE: 33 00 40.0 | LONGITUDE: 097 37 30.0
10 DIRECTIONS TO SITE (Starting from nearest public road): 13 miles South of Tuscaloosa, 3/4 mile west of Route 69 on Cracker Rd.

III. RESPONSIBLE PARTIES

01 OWNER (If known): Lawter International
02 STREET (Business, mailing, residential): 990 Skokie Blvd.
03 CITY: North Brook
04 STATE: IL | 05 ZIP CODE: | 06 TELEPHONE NUMBER: (312) 498-4700
07 OPERATOR (If known and different from owner):
08 STREET (Business, mailing, residential):
09 CITY:
10 STATE: | 11 ZIP CODE: | 12 TELEPHONE NUMBER: ( )

13 TYPE OF OWNERSHIP (Check one)
☒ A. PRIVATE ☐ B. FEDERAL: _____ (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
☒ A. RCRA 3001 DATE RECEIVED: 11 / 19 / 80 (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: / / (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
☒ YES DATE 03 / 01 / 85 (MONTH DAY YEAR)
☐ NO
BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☒ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: _____ (Specify)
CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)
☒ A. ACTIVE ☐ B. INACTIVE ☐ C. UNKNOWN
03 YEARS OF OPERATION
1966 (BEGINNING YEAR) | _____ (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED
Aromatic Solvents

* 05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION
Groundwater contamination from solvents used at plant site

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)
☐ A. HIGH (Inspection required promptly) ☐ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☒ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT: Steve Maurer
02 OF (Agency/Organization): ADEM
03 TELEPHONE NUMBER: (205) 271-7728
04 PERSON RESPONSIBLE FOR ASSESSMENT: Jim Duncan
05 AGENCY:
06 ORGANIZATION: EPS
07 TELEPHONE NUMBER: (601) 922-8242
08 DATE: 08 / 29 / 85 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

EPA

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

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
AL	D004034138

II. HAZARDOUS CONDITIONS AND INCIDENTS

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

wells are being installed, extremely high potential for extensive ground-water contamination

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

Runoff from plant site.

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

Resins and by products are very oderous

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

waste on site is very flammable

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

Resins were landfilled at SLF where contact may occur

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

Solvents leaking from lime cake onto surface

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

UNK

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

ADEM staff indicates that workers tell of headaches from working at plant

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

UNK

Reference No. 11

DRAFT

August 13, 1984

MEMORANDUM

To: Buddy Cox

[illegible]

[illegible] of events regarding Southern Resins/Lawter Chemicals, Inc. Facility I.D. Number ALD 004 034 138

The following is a chronological list of the major regulatory events between Southern Resins and ADEM's Hazardous Waste Branch:

11/20/79
In a letter to N. J. Weinstein of ReCon Systems in Somerville, N. J., Mr. Dan Cooper, of what was then the Environmental Health Administration, enclosed a draft procedure for sanitary landfill approval. Mr. Weinstein had inquired over the phone earlier about on-site disposal of wastewater treatment sludge from the Southern Resins plant in Moundville.

5/29/80
Material Safety Data sheets on Southern Resins finished products are sent to Javier Colon. Buddy Cox made a notation on the bottom of the cover letter indicating the material may be hazardous due to ignitability.

8/7/80
Mr. Colon writes Mr. Allen of Southern Resins advising him to analyze his resin waste for possible hazardous waste characteristics, particularly ignitability.

8/18/80
Mr. Allen writes Javier Colon and encloses test results on two wastestreams at Southern Resins lime waste and bag collector waste, that indicates they are non-hazardous by characteristic.

9/4/80
The Part A, signed by R.T. Voedisch on August 13, 1980, is received by EPA. D002, U122 and U147 are the hazardous waste identified as being generated by Southern Resins.

9/8/80
Mr. Colon, in a memo to John Gable, of the Environmental Health Lab summarizes an inspection to Southern Resins in which he obtains samples of several wastestreams which Southern Resins is reluctant to identify for reasons of confidentiality. He is particularly concerned about one wastestream which "emits a strong odor of unkown solvent...causes headaches, dizziness, etc.."

1/6/81
Rita Ford sends letter to Mr. Walter Allen requesting him to correct deficiencies in Southern Resins Part A.

2/2/81
Analysis of the waste with a strong solvent odor shows that it contains a variety of alkyl benzenes.

2/23/81
In a letter to Ms. Rita Ford of USEPA, Mr. Walter S. Allen of Southern Resins withdraws the Part A for the facility.

4/8/81
Mr. Colon sends a letter to Mr. Hoshy Elgamal of Southern Resins directing him to clean up an open dump next to the Kruumbhar plant that contains possible hazardous wastes and he also reminds Mr. Elgamal of the generators' responsiblity for determing whether his waste is hazardous.

9/11/81
A memo to Buddy Cox from L. G. Linn documents the results of analyses Tuscaloosa Testing performed on Southern Resins wastestreams. Sample #4 flashed at 33° C but there is no indication in the memo as to which wastestream corresponds to this sample number.

9/10/81
An 8700-12 is signed (illegible) by the plant manager of Southern Resins. It indicates the facility is a generator of D001 wastes. A letter requesting withdrawal of Southern Resin's Part A is also sent to the Department of Public Health by Walter Allen.

9/25/81
A letter to Mr. Allen from Belinda Wilson of The Environmental Health Agency advises him of the requirements for storage of hazardous wastes for generators (i. e., less than 90 day limit), and generator's responsibility for determining if wastes is hazardous. She then says in the letter that the Part A withdrawal for Southern Resin will be approved by the State if EPA does not disagree by December 1, 1981.

10/9/81
A memo to Bernard E. Cox from Belinda Wilson lists all wastestreams. Only the scrubber waste was mentioned as being hazardous (by ignitability). The lime filter cake was listed as a solid waste being stored in waste piles.

10/27/81
A memo to Bernard E. Cox from Belinda Wilson concerning potential disposal sites for Southern Resin's non-hazardous industrial waste is written.

11/5/81
A letter to Mr. Allen of Southern Resin from Butler Hine of Tuscaloosa County Health Department granting permission to dispose of non-hazardous industrial waste at the Harris Landfill in Jerusalem Heights near Tuscaloosa is sent. This included permission to dispose of bulk lime filter material which the writer suspects is the solvent saturated filter cake now designated as a hazardous waste. Wastes excluded from landfilling at this site include "any hazardous waste and any liquid waste."

11/13/81
In a memo to Bernard E. Cox, Belinda Wilson states that Al Hanke of EPA said Southern Resins would have to submit a copy of their Part A to EPA along with an inventory of all hazardous waste generated during operational start up of the facility before his office can determine whether Southern Resin should remain on the TSDF list.

12/1/81
In a letter to Mr. Jack Honeycutt, Walter Allen of Southern Resin gives notification of his intention to dispose of drummed scrubber wastes (previously identified as hazardous by ignitability and covered under the small quantity exclusion) at the Tuscaloosa Landfill as he was directed by Mr. L. C. Harris.

7/21/83
Dr. Ed Passerini writes a letter to Jim Scarbrough complaining about the odor of wastes being dumped at the Harris Landfill and their possible toxic nature.

9/13/83
A letter is sent to Mr. Allen of Southern Resins from ADEM as a result of an August 31, 1983 inspection by Freda Griffis and Charles Fleming of the facility. The letter directs Southern Resin to analyze all wastestreams from the plant to determine if a hazardous waste is being generated.

10/10/83
Mr. Allen responds to ADEM's September 13, 1983, letter identifying five wastestreams generated by the plant. In this letter, Mr. Allen gives his reasons for determining all five wastestreams as non-hazardous.

12/8/83
Mr. Allen notifies ADEM that Southern Resin is constructing a concrete storage bin for the lime filter cake until final disposition can be determined.

Southern Resin/Lawter Chemicals
August 13, 1984

4/20/84
A letter is sent from Jack Honeycutt to Mr. William Sharp (Mike) granting approval for Southern Resin to dispose of non-hazardous solid waste at the Tuscaloosa Landfill but specifically prohibiting disposal of the lime filter cake anywhere but at a "secure chemical waste disposal site."

5/3/84
A memo to Bernard E. Cox from Jim Neal summarizes a visit to Southern Resin by he and Jack Honeycutt to discuss their waste disposal problem. They met with Mr. Hermann Mueller V.P. of Lawter International who wanted assistance in finding a disposal site for the plants non-hazardous industrial waste. Mr. Mueller assured Mr. Neal that the lime filter cake would be sent to a secure hazardous waste landfill.

7/25/84
Memo to Bernard E. Cox from the writer regarding a July 18, 1984, visit to Southern Resin with Fred Mason. At this time it was discovered that the lime filter cake waste pile was being mismanaged, with solvent leaching out of the containment structure and onto the ground.

7/25/84
Memo to Jack Honeycutt from Fred Mason summarizing the findings of the July 18, 1984 inspection of the proposed on-site landfill. Mr. Mason was concerned [illegible] water problems that may exist at the site due to past waste [illegible] practices.

8/8/84
An N. O. V. was sent to Southern Resin as a result of the information gained from the July 18, 1984 visit. It required Southern Resin to close the waste pile and begin managing the lime filter cake material in accordance with the generator standards of the Alabama Hazardous Waste Management Regulations.

It is evident from the correspondence in the files that Southern Resin failed in their responsibility to determine whether the wastes they generated were hazardous, even though the facility was repeatedly reminded to do so by ADEM. In addition, after the solvent filter cake was identified as a hazardous waste, it was not managed as such and continued to be disposed of at unauthorized sites. The most recent example of this was on August 8, 1984 when Mr. Butler Hine reported that some of the waste had been spilled on the road while it was being transported to a strip mine in Holt, Alabama for burial along with assorted non-hazardous industrial waste and trash from the facility.

DH/sjw

File: Southern Resin/Lawter Chemical

ENVIRONMENTAL MANAGEMENT

January 17, 1984

MEMORANDUM

TO: Ron Gore

FROM: George Sullivan and Ronnie Watkins

SUBJECT: Inspection of Southern Resins (Lawter Chemical)

An unannounced inspection of the above facility, located in Moundville, was performed by Ronnie Watkins and George Sullivan on January 11, 1984. Walter Allen, plant manager, discussed the processes in detail with us and then conducted a tour of the facility.

The Synthetic Resins Plant manufactures three types of products: tall oil rosin ester resins, ketone resins, and polyamide resins. Eighty percent of the products manufactured are tall oil resins, with the other two resins 10% each. The tall oil resins are made by mixing tall oil rosin, Cellusolve (a glycerol), formaldehyde and dodecylphenol in a reactor which is heated indirectly by steam under a nitrogen blanket. There are two reactors, No. 3 and No. 4, which make the tall oil resin only and one, No. 1, which makes all three synthetic resins. There is also one, No. 2, reactor which makes the ketone and polyamide resins only. The ketone resin is made by mixing cyclohexanone and formaldehyde in the presence of a sodium hydroxide catalyst. This reaction is exothermic and is controlled by water in cooling coils. When the resin is formed, water is added to cool the resin and to remove the excess caustic. The caustic and water form an aqueous layer and is removed. Then the resin is heated to remove the excess water. It is then loaded into pans and allowed to set. Once set, it is crushed and bagged. The polyamide resin is made by reacting dimer acid with ethylene diamine under heat. The product is dropped on a conveyor belt, dried, flaked, and then bagged.

The emissions sources from the synthetic resins plant are the reactors and the crushers. Three reactors each have a knock-out tank and a scrubber. The other reactor has only a scrubber. All scrubbers are vented to a packed tower. The crushers and baggers are vented to baghouses.

All four reactors were operating during our inspection. Three of the reactors were producing tall oil resins and one was making the ketone resin. One of the reactors was being charged and it was evident that there was a negative pressure inside the reactor by the fact that no fumes were coming from the reactor through the charging door. The only other exit for the gases is an emergency release vent. This vent will only open if the pressure increases enough to break the metal diaphragm in the line.

Following the vent lines, the reactors vent downstairs to the control equipment. The area around the control equipment was very messy. Mr. Allen said they had just cleaned the packing in the packed bed scrubber, and the resin on the floor was from this. They clean the floor after cleaning the scrubber. All water from this plant goes to the wastewater treatment plant.

One problem with the packed bed scrubber was that there was no way of telling if the water was on or off, except by looking at the steam coming out the stack. Mr. Allen said that there was once a sight glass by which you could see if water was going to the scrubber, but it had been broken. He said that another one could be installed. Other than the general messiness around the scrubbers, this was the only problem noted.

The baghouse which controls the emissions from the two crushers was not operating when first inspected. Mr. Allen had it turned on, but visible emissions of 30-40% were seen coming from it. Mr. Allen said that he thought the baghouse had a bad solenoid which was the reason it was turned off. The Torit dust collector for the baggers was operating and no emissions were seen; however, the baggers were not operating. There were fugitive emissions coming from a hopper inside the building due to the lid not being properly secured. There were also fugitive emissions at the crusher inside the building when the baghouse was turned off.

The storage tanks for the synthetic resins plant were also inspected. All tanks had conservation vents except the phenol tank. These vents only open under a pressure of 5" of water. A tall oil resin odor could be smelled but it was not unpleasant. Some of the lids were not down all the way, which, according to Mr. Allen, was due to an inventory done recently.

Next, Mr. Allen explained the "hydrocarbon" resins process as we walked through the process. "Heartcut" or "CRO" reacts with itself in the presence of a catalyst, boron trifluoride (BF3). After the exothermic reaction proceeds for approximately two hours, the material is pumped from the reactor to a neutralizing tank where quicklime is added to neutralize the BF3. The mixture is then filtered to remove the solids, which are disposed of at the rear of the plant property, and the filtrate is sent to storage. The filtrate then goes to the stripper where steam is sparged through the liquid to separate the by-product solvent from the product resin. The solvent is decanted from the condensed steam and sold. The water layer, which is slightly acidic, is sent to the wastewater treatment system. The product resin is stored in a heated tank before being sent to the flaker, where the hot resin is spread on a continuous water cooled metal belt to cool and solidify. The solid resin is crushed and stored for bagging.

There are two "hydrocarbon" resins process lines, one batch and one continuous. The process is the same in each process but some of the equipment is different. There are two batch reactors which vent to the atmosphere. White emissions were noted from one of the reactors. No strong odor was noted due to these emissions. The BF3 is introduced into the process from a mobile bank of pressurized tanks. Quicklime, which is

used to neutralize the BF3, is received in bulk by truck and blown into a storage silo. Emissions from the storage silo are controlled by a baghouse. The filter cake from the filtration step is being temporarily stored in a three sided structure at the rear of the process area. No odor was detected near the storage pile. This material used to be taken to a local landfill. Recently, Jack Honeycutt with the Land Division, informed Lawter that this material may have to be classified as hazardous because it contains some of the by-product solvent, which has a boiling point less than 140°F. Therefore, the material is being stored at the back of the plant property near the river until the problem can be resolved. No strong odor or emissions were noted from any of the storage tanks. However, there was evidence of leakage from pumps and piping in the storage tanks' dikes. The only other piece of air pollution control equipment is a baghouse in the product packaging area. No emissions were noted in the exhaust of this baghouse nor were fugitive particulate emissions a problem. Hydrocarbon emissions from the solidifying process are vented to the outside by a forced draft fan. No odor was noted at this point.

The continuous process is different from the batch process from a pollution standpoint in that the reactor and filter are enclosed. Another difference is that sometimes, approximately once per month, an acidic compound, e.g. maleic anhydride, is added to the product storage tanks in order to produce a product specifically for certain customers. This results in a disagreeable odor, according to Mr. Allen. The emissions are vented by natural draft through a tall stack next to the tanks. The baghouse for the flaker packaging area was observed, and no emissions were noted. No strong odors were noted in the processing area. However, there was evidence of leakage from pumps and piping in this area also.

Before leaving the plant, we discussed the problems noted during the inspection. The problems noted were:

(1) visible emissions from the baghouse for the synthetic resins plant crushers,

(2) replacement of the sight glass on the packed tower scrubber for the synthetic resins plant, and

(3) spillage under the tanks in the tank farms and under the hydrocarbon resins reactors which could cause an odor problem.

Mr. Allen stated that the first two problems would be taken care of as soon as possible. He did not comment on the third problem.

Recommendation

We recommended that Southern Resins be notified of the above problems and required to correct them.

/sd
cc: Freda Griffis, Land Division
J. P. Martin, Water Division

ADEM

ALABAMA
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

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August 16, 1984

MEMORANDUM

TO: BUDDY COX

THROUGH: JIM NEAL

FROM: DAVID HAGAN

RE: Southern Resins, Moundville, Alabama

On July 18, 1984, the writer, accompanied by Mssrs. Fred Mason and Ashley Chadwick, visited the above referenced facility. The primary purpose of the visit was for Mr. Mason to evaluate a site on Southern Resins' property for suitability as a landfill for non-hazardous wastes generated by the facility. The writer accompanied Mr. Mason, at his suggestion, in order to determine whether a waste pile at the plant containing a solvent saturated lime cake (which has been designated a hazardous waste) is being managed properly. Mr. Mason also wanted someone from the Hazardous Waste Section to see the proposed landfill site.

We met with Mr. Mark Sharp, plant engineer, who gave us a tour of the waste management facilities at Southern Resins. These facilities consist of the hazardous waste pile, a wastewater treatment system that discharges under NPDES, a waste pile accumulating the solid waste generated by the plant, and an old surface impoundment not part of their present wastewater treatment system.

The hazardous waste pile consists of about 100 cubic yds (?) of material contained in a concrete structure with three (3) sides and an impermeable base. The open end is designed to allow a front end loader to have easy access to the interior of the containment structure. There is no roof or other covering over the waste pile. Solvent is leaching out of the lime cake and escaping containment through cracks in the walls and through the open end of the structure. A significant amount of solvent has collected in pools on the ground in the immediate vicinity of the containment structure. There is no barrier to migration of this waste into the subsurface except the natural permeability of the local soils. Mr. Sharp explained that Chemical Waste Management has delayed picking the waste lime cake up because of a disagreement over which EPA hazardous waste number applies to the material. Southern Resins has designated it as D001 but CWM will not accept that designation because the waste is a solid. This is to be a one-time disposal of hazardous waste as the company has developed some sort of solvent recovery system that removes most of the solvent from the lime cake, thereby raising the flash point of the material above 140 degrees Fahrenheit. The recovered solvent is reused in their manufactoring processes and the lime cake is disposed of as a solid waste.

The wastewater treatment system contains a surface inpoundment and it is not clear what wastes are intorduced into this unit. The NPDES discharge is to the Black Warrior River which borders the facility to the west. Parameters monitored for discharged waste water according to Mr. Sharp are TSS, ph, BOD, and COD.

The solid waste accumulation area is near the proposed site for the landfill. It consists of assorted plant trash, resin, and lime cake. However, at least one fifty-five (55) gallon drum of solvent was seen in this area. It was lying on its side and some solvent had spilled onto the ground. There were some additional drums of waste stored near the hazardous waste pile which Mr. Sharp said contained non-hazardous resinous material generated from their manufacturing processes.

The old surface impoundment is the area where Southern Resins would like to put the landfill. This unit currently receives plant runoff and any significant solvent spills. There is little information about what went into the impoundment prior to Southern Resins buying the property. Mr. Sharp said he thought the impoundment may have been there for 25 years. While we were inspecting the site, bubbles of some organic material were continually coming up from the bottom of the lagoon. A trench dug into the ground near the impoundment reached the water table at around 8 ft. and the water at the bottom had an organic film on the surface.

The facility achieved interim status but a complete Part A application was never sent to EPA. On January 16, 1981 the facility was notified by EPA that the Part A would have to be re-submitted and Southern Resins changed it's mind about the necessity of obtaining a RCRA storage permit and withdrew the application. The facility is listed under Lawter Chemicals in the latest EPA computer printout as withdrawn and as a non-handler.

Several issues must be resolved in order to bring Southern Resins into compliance with the Alabama Hazardous Waste Management Regulations.

1). The waste pile should be formally closed as a hazardous waste management unit as soon as possible. The closure plan should address the contamination of the surrounding area resulting from solvent leaching from the containment structure.

2). A comprehensive evaluation of all wastestreams at Southern Resins and their management should be undertaken. The efficiency of the solvent recovery system should be studied closely.

3). The decision on the landfill should await the outcome of an investigation of the old surface impoundment. Mr. Sharp is planning to draw off the water in the impoundment and sample the sludge in the bottom.

4). After point (2.) above has been completed, the appropriate notification should be made to both EPA and the State regarding the facility's current status under RCRA.

DH/sdm

cc: Mr. Jack Honeycutt
Solid Waste

Mr. Fred Mason
UIC

Mr. J.P. Martin
Water Division

File: Southern Resins
Tuscaloosa County
IW

"Rite in the Rain"®

ALL-WEATHER

LEVEL

Notebook No. 311

F4-2683

Southern Resin Division
Moundville, Tuscaloosa Cty, AL
TDD No: F4-9011-22
Proj. Man.: Sheri Panabaker

LOGBOOK REQUIREMENTS
REVISED - NOVEMBER 20, 1990

NOTE: ALL LANGUAGE SHOULD BE FACTUAL AND OBJECTIVE

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

12/13/90

All entries into this logbook will be made by myself, Sheri Panabaker, Project Manager. Each page will be signed and dated. Any and all corrections will be properly initialed (SP).

Signature: Sheri Panabaker

All notes and observations made during this investigation will be included in this logbook.

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

Health & Safety Plan, Study Plan + Work Plan.

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

Sheri Panabaker

12/10/90

Sheri Panabaker — Sheri Pan
Carter Helm — Carter Helm
Ken Sanders — Ken Sanders
Mark Hitchcock — Mark H Hitchcock

900 leave for Moundville, AL

1200 Arrive in Tuscaloosa

1400 S. Panabaker & Carter Helm arrived at southern resin Division and met w/ Terry Sheehan + Rick Hansen of Lawter Int & South Resin, respectively, and Ken Bittner of South Resin. Both Terry and Ken gave us a tour of the plant and I picked sampling locations & the area to be used as the clean zone

Sheri Pan

12/10/90

there are drums of waste to be burned all over the plant area.

1420 Two resin plants; use rosin to make rosin based resins used in paints, inks primarily & some adhesives

Other plant produces resins derived from hydrocarbons from petrochemical comp.

Both presently active

waste: dust which is put in drums & recycled.

Other drums used to store offspec materials, filter bags (both bags used to filter products) and lime filter cakes, Product (liquid) goes through powder & mixt line

Put in incinerator

Sheri Pand

12/10/90

filter cake used to be put into waste pile & stored until incinerator put on line in June ~ July 1990. Approved by ADEM in June

(ADEM) George Sullivan - Incinerator (air)
Fred Mason - GW

Jack Honeycutt
Frank North
Ron Gore
Bernard Cox

Been in operation for a year prior to June to get bugs out. temp. permits.

Above drums have resin waste in them and filter cake

hydrocarbon plant continuous process
other plant - batch process

operations began in 1966

Sher Pa

12/10/90

The main used pond has a concrete pad beneath it where dirt to be burned is placed on top.

top of property by MW-8, overlooks Black Warrior River about 50-60 feet above the river
There are 3 guys fishing in the river.

Used to be a varnish plant until early 70's or so when Lawter bought the plant
made resins as well as varnish

In the future, equipment not used will be removed.

Sher Pa

12/10/90

Directly east of plant used to be an asphalt plant

Around 1985 two of the ponds were tested by ADEM & then the water was let out.

Prior to 1977 used to use soda ash & lime water then changed to lime

Put discharge water into the old surface impound until WWTP built in 1/80. then water treated & changed to creek.

Resin comes out acidic so send liquid resin

St Paul

12/10/90

through line to a pit of ≈ 8. Lime sludge is then filter out using plates & then blown w/ nitrogen to dry out. Lime filter cake contains a little resin, and solvents and a little diatomaceous earth

buy streams and use what's capable of being polymerized, make product (solid hard resin) then what's not capable of being polymerized (called plant solvent) is sold to other places

City supplies water for the plant. The ~~aquifer~~ water well was used for process water for a short period of time

St Paul

12/90/90

Terrance Sheehan declined split samples. and said purged water is dumped onto the ground from the monitoring well by their consultants, Tuscaloosa Testing.

Not all the monitoring wells are grouted. they are all 2" PVC w/ 10-foot screene All the well are inside protective steel casing & locked.

Mr. Sheehan has given me well data for all 11 monit wells for the last two quarters & a report on a study of whats emmitted from the air stack of the incinerator and a list of haz. materials used per SARA Title III, 5311.

Shei Pan

12/11/90

Sunny, high mid-60s

0800 meeting in parking lot and pulling the trip blank

Station # SR-TB-01 and icing it down to 4°C.

The case number for this study is and the project number for this study is.

0900 arrived on site and met w/ Terrance Sheehan of Lawter International and Rick Hansen and Ken Bittner of Southern Resin Div. and J. P. Martin and James Adams of CH2M Hill. They have decided to split

Shei Pand

12/11/90

samples, though not all the ones we will be collecting. we discussed sampling locations.

0930 Finished meeting the others and are heading for the area to be used as the clean area and background samples setting up hotline, decon area, and paperwork area

1000 calibrating HNU # 81632

Shei Park

12/11/90

After study the monit well data & after looking over the site & based on additional info mentioned by Mr. Sleeman & recorded in the logbog yesterday, I have decided to add some additional samples.
mw #7 of their plant numbering cannot be sampled, this corresponds to NUS/EPA sampling location SB-MW-02. Instead I will sample wells, 10, 11, & 12 of their #ing system. & renumber our locations accordingly. Also SB-SB-03 will not be collected since there is a concrete pad under the soil in the old lagoon.

Shei Park

12/11/90

the facility is not surrounded by a fence, though the Black Warrior River borders the west side of the property. Site access is easy. They are going to split all of the samples, soil and water both.

1100 James Adams has now provided us with jars to split samples and were beginning to start collecting the samples for background SR-SS-01 & SR-SB-01.

Sheri Pand

12/11/90

1105 collecting SR-SS-01 from ≈ 5-6 inches bls. soil is drysh + med. dk brown w/ reddish tinge sand w/ some clay. collected from the northernmost portion of developed property (unwooded) upgradient. Samplers: C. Helm + K. Sanders splitting the sample w/ the Lawter Intrond personnel. see field sheets for specific info.

HNu - 21 ppm

Sheri Pand

12/11/90

1125 collecting subsurface soil
sample SR-SB-01
HNU <1ppm = 4 ft bls, reddish
dry sand w/ clay
Samplers: C. Helm + K. Sanders
HNU <1ppm

1150 J.P. Martin, Ken O. + T. Sheehan
arrived at clean area
we're preparing to go
to a surface impoundment
+ waste pile area

1210 collecting surface soil
sample SR-SS-02 from
previous location of
HNU <1ppm waste pile used to
store lime filter cake
The entire area is
covered in drums on
Steel Pan

12/11/90

pallets filled w/ lime filter
cake. Only accessible area is
east of the drums.
collecting sample 2-3" bls
reddish sand w/ some
clay. Samplers: C. Helm +
K. Sanders HNU <1ppm
one drum that's open is
full of resin, soft + sticky
drums are in various
stages of deterioration +
are rusty + not all
are sealed shut well

HNU <1ppm
1240 collecting subsurface soil
sample SR-SB-02, 8" bls
HNU <1ppm clay primarily w/ some
sand, gray and reddish
color.
Steel Pan

12/11/90

Samplers: C. Helm, K. Sanders

1300 collecting surface soil sample (SA-SS-03) A from the main storage pond (surface impoundment) in which the soil is presently being sent through the offsite incinerator. This sample is collected from soil that's been incinerated & which is being put back onto the ground in areas that don't have a concrete pad.
Samplers: C. Helm, K. Sanders
sample collected from 3"-4" down in pile
HNU < 1ppm

Sherri Paul

12/11/90

1310 collecting surface soil sample (SA-SS-04) from same surf. imp. & SA-SS-03, but soil has not been incinerated yet. sample taken from 3"-4" down in pile. Samplers K. Sanders, C. Helm
HNU < 1ppm

1330 All NUS personnel left site for lunch

1430 Arrived back on site from lunch preparing to take further samples

Sherri Paul

12/11/90

1500 Called about adding extra samples, found out there is no lab space at the CLP lab & the ESD lab is closed for the week so can't add any samples. I am changing the sample locations. No subsurface soil samples will be collected since the primary concern is the surface water runoff pathway, i.e. we will add some of the surface water and sediment samples requested by ESD & remove the subsurface soils. Also depth to groundwater ranges from about 28 to 40 ft bls & subsurface soils could not be obtained from the saturated zone.

S. Pal

12/11/90

HNU <1ppm

1515 Collecting surface soil sample SR-SS-03 (previous SR-SS-03) is being scrapped as well as the previously collected subsurface soil sample. This sample is being collected from an old surface impoundment no longer in use, downgradient from the first surface impoundment sampled. Med brown [redacted] silty clay, 3" bls. Samples C. Helm & K. Sanders. The pond is also adjacent (W)

S. Pal

12/11/90

+ downgradient from active WWTP
+ incinerator is directly east of WWTP.

1600 Collecting surface soil sample SR-SS-05 from previous location of waste pile of lime filter cake, sample 9+ brown to gray soil, very dry, gravel area samples C Helm + K. Sanden. Drums are located all around sample area. sample from 3" bls HNU < 1ppm

Mr. Sheehan of Lawter Intern. has given us permission to dump the purge water from the mont. wells onto the ground as he will write in [illegible] 14 [illegible] 148 book

Sheri Pank

12/11/90

IN COLLECTING SAMPLES FROM THE MONITORING WELLS, I PERMIT N.U.S. TO THE DISPOSE OF PURGED WATER ON THE GROUND.

[illegible]

We will purge monitoring wells on 12/12/90, tommorrow.

1630 Begining to clean up site area to go home

Sheri Pank

12/11/90

1700 leaving site for the day

Shei Pann

12/12/90

0615 met to leave for the site and get ice, etc.

0700 Arrived at the site
James Adams of CH2M Hill is here
Sunny, high in the 60s F.

Setting up hotline + decorning area

Shei Pann

12/12/90

0900 collecting ~~sediment &~~ surface water sample SR-SW-04 from downgradient location of the Black Warrior River below where Cathridge Branch flows into the river
Samplers: C. Helm, S. Panabaker
HNU < 1ppm

0910 collecting sediment sample SR-SD-04 from same location as SR-SW-04, med. brown sand. Samplers: C. Helm & S. Panabaker

Shei Park

12/12/90

After collecting the past two samples, the CH2M Hill representative had to go get more jars for the remaining two surface water & sediment samples.

1015 collecting surface water SR-SW-03 from Cathridge Branch Creek near where it flows into the Black Warrior River & where surface water runoff from various areas of the plant come into the creek. Samplers C. Helm & S. Panabaker. HNU < 1ppm

Shei Park

12/12/90

I've decided to not take the upgradient surface water sample from the Black Warrior River since I'll have one upgradient on Cathridge creek. Surface water runoff flows south to cathridge Branch creek. Water from the last pond of the WWTP that's discharge to the creek (they have an NPDES permit) is very cloudy so we are taking a sample here instead of upgradient of the Black Warrior

1030 collecting sediment sample SR-SD-03 from same place as SR-SW-03, med brown sand samples C Helm & S Pand

Shei Pand

12/12/90

1050 ~~1100~~ collecting surface water sample SR-SW-02 from intersection of drainage creek from WWTP & cathridge Branch, water is white cloudy samples: C. Helm & S. Pandal

HNU < 1ppm

1100 collecting sediment sample SR-SD-02 from same location as SR-SW-02. med brown sand w/ pepples

Shei Pand

12/12/90

1210 Collecting surface water sample SR-SW-01 from an up gradient location on Cathridge Branch Creek. Samplers: C. Helm + S. Park
HNU <1ppm

1215 collecting sediment sample SR-SD-01 from same location as SR-SW-01. Samplers C. Helm + S. Panabaker

Shi Park

12/12/90

HNU <1ppm
1320 collecting surface water sample SR-SW-05 from an old sludge pond located south of the waste water treatment plant, called the U-Pond. Samplers S. Panabaker & C. Helm. split samples w/ CH2M Hill.

1330 collecting sediment sample SR-SD-05 from same location as SR-SW-05. There is rain on the bottom of the pond, in w/ the sediment sample

Shi Park

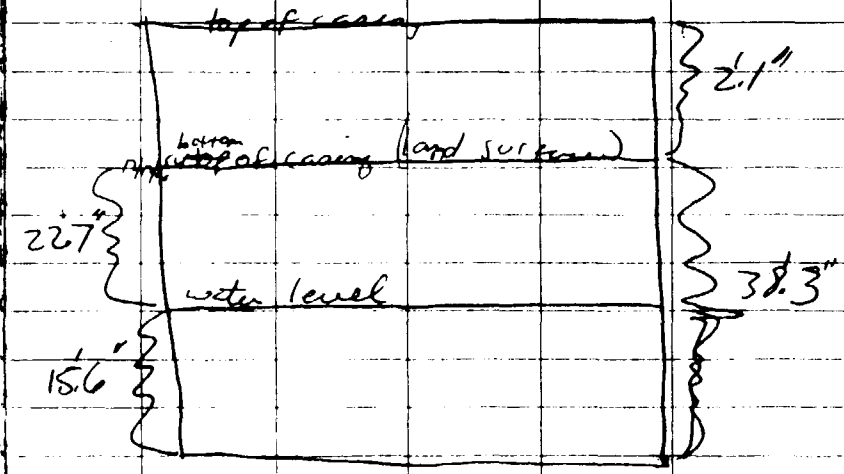
12/12/90

After studying quarterly monitoring well results, I've decided to take samples from 3 upgradient wells, #s 10, 4, 12 since they show the most contamination.

1415 Started setting up monitoring well SR-MW-03

Reading of HNU < 1 ppm
casing is 2" PVC

Measuring water depth & well depth



Steve Parker

12/12/90

1 volume = 0.163 for 2" diam. well
3 volumes = 3 x 0.163 = 0.49

∴ 15.6' x 0.49 = 7.6 gallons

∴ purge 7.6 gallons

∴ Since 4 bailers = 1 gallon
x 7.5
30 bailers

HNU < 1 ppm
1430 Started purging well
Purging by Ken Sanders & C. Helm

1445 rope broke & bailer fell down well

I am going to get treble hooks & fishing line
Ken S. & C. Helm are setting up at SR-MW-04

Steve Parker

12/12/90

1510 back on site w/ hooks & line, I am watching the samples. M. Hitchcock deconned the hooks & line & is attempting to get the bailer out.

1530 bailer is out of well & Mark is back w/ samples

~~12/11/90~~ ~~#~~ Ken Sanders has measured water depth & well depth in SR-MW-04. HNu <1ppm

Mark H. locked samples in truck & has come back over to help sample

HNu <1ppm

1550 Mark H. is purging SR-MW-03, he is purging 30 bailers full of water

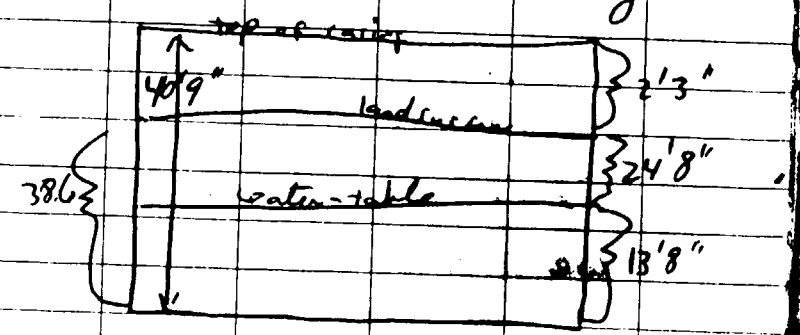
Sihai Pan

12/12/90

~~A~~ 12/11/90

1615 Mark H is collecting groundwater sample SR-MW-03 (well # 10 according to Southern Resin's #ing).

1630 C. Helm is purging monitoring well "SR-MW-05" (# 12 accord. to Southern Resin's #ing).



Sihai Pan

12/12/90

Therefore: 1 vol. = 0.163
3 vol. = 0.49

∴ 13'8" x 0.49 = 6.7 gallon

4 bails = 1 gallon
x6.7
27 bails

1650 Started collecting SR-MW-05

1720 finished collecting SR-MW-05
started to clean up
equipment & pack up

we split all samples
w/ Southern Resins and
turned the samples over
to James Adams of CH2M Hill

Shei Panabe

12/12/90

1800 leaving site

Shei Panabe

"Rite in the Rain"®

ALL-WEATHER

LEVEL

Notebook No. 311

F4-2684

Southern Resin Division

Moundville, Tuscaloosa Cty, AL

TDD No.: F4-9011-22

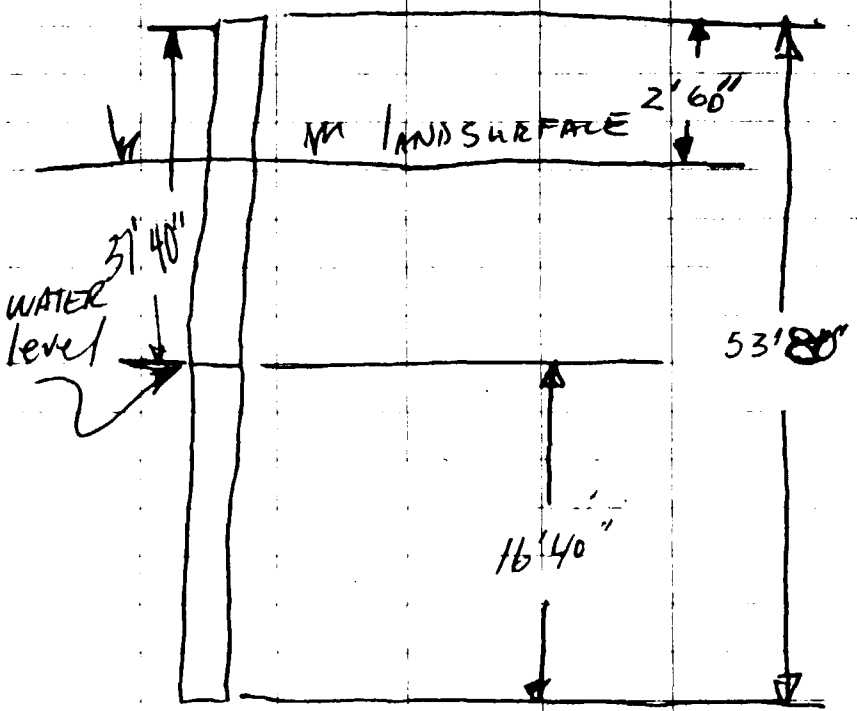
Proj. Man.: Sheri Panabaker

This logbook is an extension of logbook F4- and is issued to Mark Hitchcock.
Sherri Panabaker

Weather: Clear, 33°F

0745 STARTED SETTING UP BACKGROUND monitoring well SR-MW-01
EPA 192273

0800 took HNU Reading, From Breathing zone read 0 looking reading from casing read 0. casing is 2" PVC.



Mark A. Hitchcock

0810 Started measuring water depth in casing.

1 volume = 0.163
3 volume = 0.49

16'4 x 0.49 = 8.036

purge 8 gallons

0835 started Purging

4 bailer = 1 gallon
x 8
32 bailer

0920 Finished purging well #8 (SR MW#01) at 8 gallons.

0430 taking sample SR-MW-01, also taking extra volume for Matrix Duplicate Samples M. Hitchcock & K. Sandler

Mark A. Hitchcock

6

1000 FINISHED SAMPLING SP-MW-01

Mark Hitchcock

Shi Par

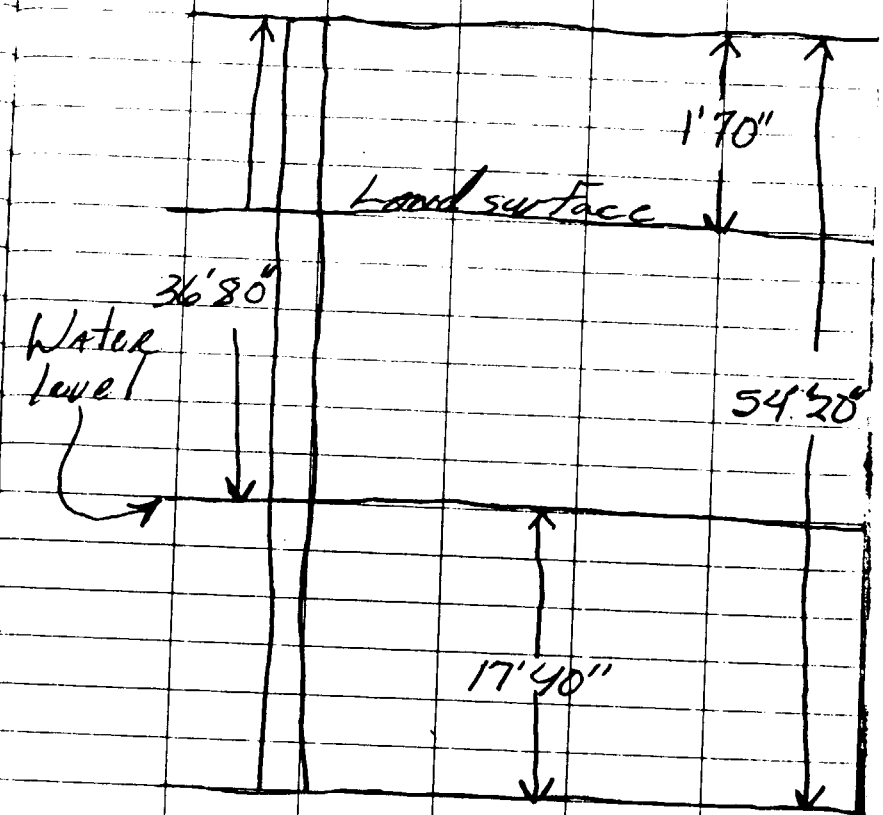
7

MONORITING WELLS & Surface Water

NO.	Purge volume	total Depth	water Depth	total water	CASING SIZE	time TAKEN	DATE 1990	PH	COND	TEMP	COMMENTS
MW-01	8 gal 32 bale	53'8"	37'4"	16'4"	2" PVC	0930	12-12	4.22	X10 10.88	19°C 66°F	MATRIX DUPLICATE
MW-02	8 gal 32 bales	54'20"	36'8'	17'4"	2.0" PVC	1305	12-12	4.98	X10 19.11	20°C	
MW-03	7.6 gal 30 bales	40'4"	~~28'8"~~ 24'8"	15'6"	2.0" PVC	1615	12-12	5.09	X100 2.04	18°C	
MW-04	6 gal 24 bales	41'00"	28.5"	12'7"	2.0" PVC	1530	12-12	5.02	X100 5.17	17°C	
MW-05	6.7 gal 27 bales	~~40'4~~ 40'9"	~~25'8~~ 26'11"	~~15'6~~ 13.8"	2.0" PVC	1650	12-12	5.04	X100 10.47	18°C	
SW-01						12/12/90 SCP ~~0900~~ 1210	12-12	5.93	7.47 X10	19°C	
SW-02						1050	12-12	7.2	4.53 X100	21°C	
SW-03						1015	12-12	6.42	X10 8.04	22°C	
SW-04						0900	12-12	6.71	X100 3.27	15°C	
SW-05						1320	12-12	6.30	X100 3.42	20°C	

12/12/90

Logbook is now transfered
to Ken Sanders.
Steve Panabaker



11:50 Started setting up Monitoring well SR-MW-02
EPA 192273-HNU

11:55 Took HNU reading from breathing zone, reading of 0. From casing to ground surface 1" PVC. KDS

Kenneth Sanders

12:00 Started measuring water depth in casing.

1 volume = 0.163
3 volume = 0.49

17'4 x 0.49 = 8.526

Kenneth Sanders

Purge 8 gallons

12:15 Started purging

4 bails = 1 gallon
x8
32 bails

13:05 Started taking sample SR-MW-02 and also taking split samples CHM2HILL from WEN #3.

13:40 Finished sampling SR MW-02

Kenneth Sanders

Kenneth Sanders

36

12/11/70

12/11/70

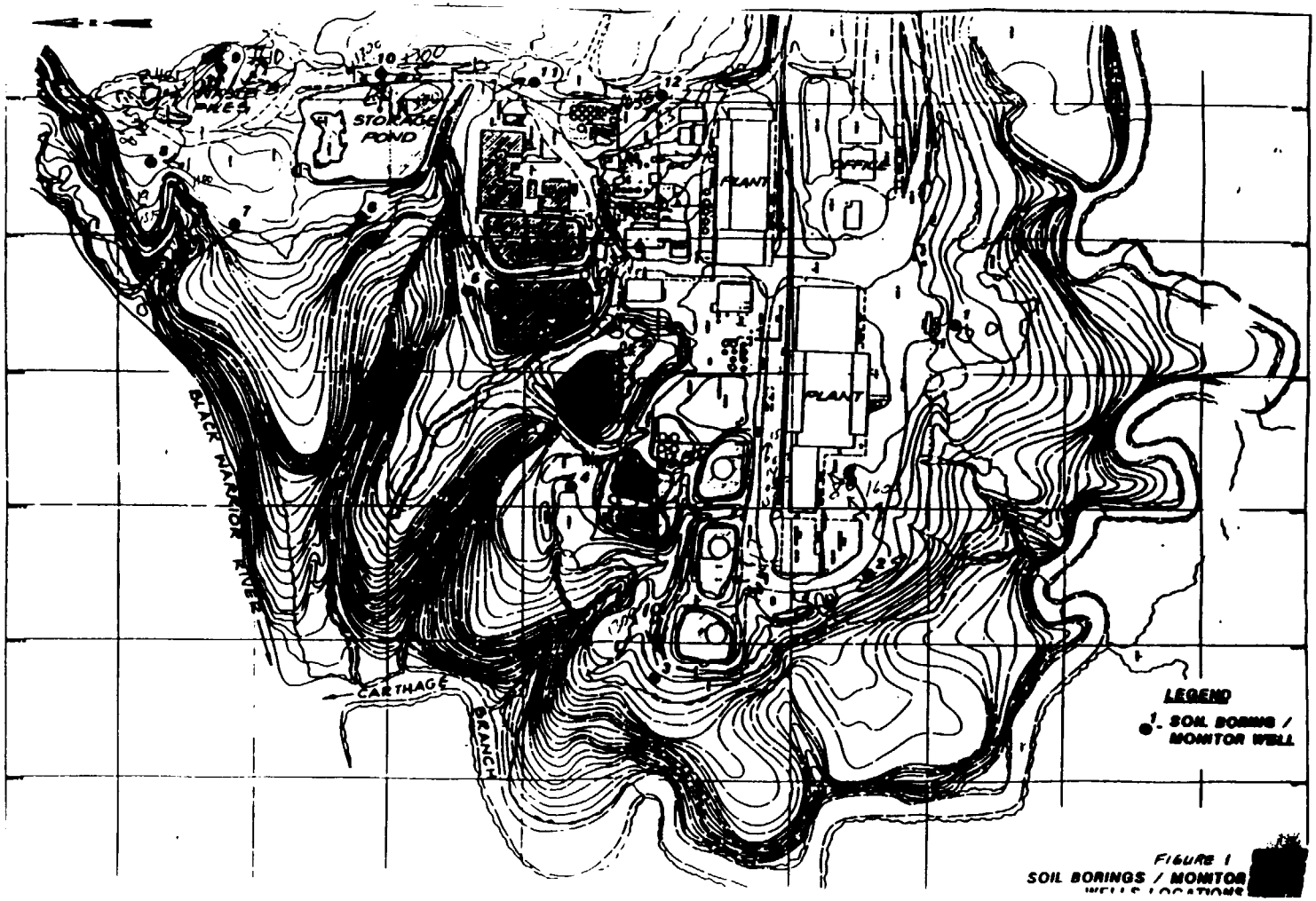


FIGURE 1
SOIL BORINGS / MONITOR [redacted]

37

Reference No. 2

"Rite In the Rain" - A unique All-Weather Writing Paper created to shed water and enhance the written image. It is widely used throughout the world for recording critical field data in all kinds of weather.

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Notebook No. 311

F4-1768

Southern Resins Division Lawter Chem.
F4-8910-70
Moundville, Tuscaloosa County, Al
SAMUEL McIVER

LOGBOOK REQUIREMENTS
REVISED - NOVEMBER 29, 1988

NOTE: ALL LANGUAGE SHOULD BE FACTUAL AND OBJECTIVE

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

I have read and understood the phase I of the work plan for this facility.

10/25/89 Samuel McIver
Samuel McIver

10/25/89 Kenneth D. Sanders
Kenneth D. Sanders

10/25/89 Martin Jackson
Martin Jackson

000002

10/25/89 2

1455 Arrived on Cracker Rd Sunny About 75°F and Hot with Blue skies

1500 The plant is in operation and the facility is excessible because their are no fences or any restrainsts.

1510 Cracker Rd is the only way in a out of the facility. The Building has several sections

Samuel Mclear

10/25/89 3

1520 The facility has a railroad track that runs to the warehouse that looks as though it is made of tin and it has rust spots on the roof and sides.

1525 The plant has ditches that runs along the left side and across the front of the facility. The plant is surrounded with woods on the left rear and right sides.

Samuel Mclear

000003

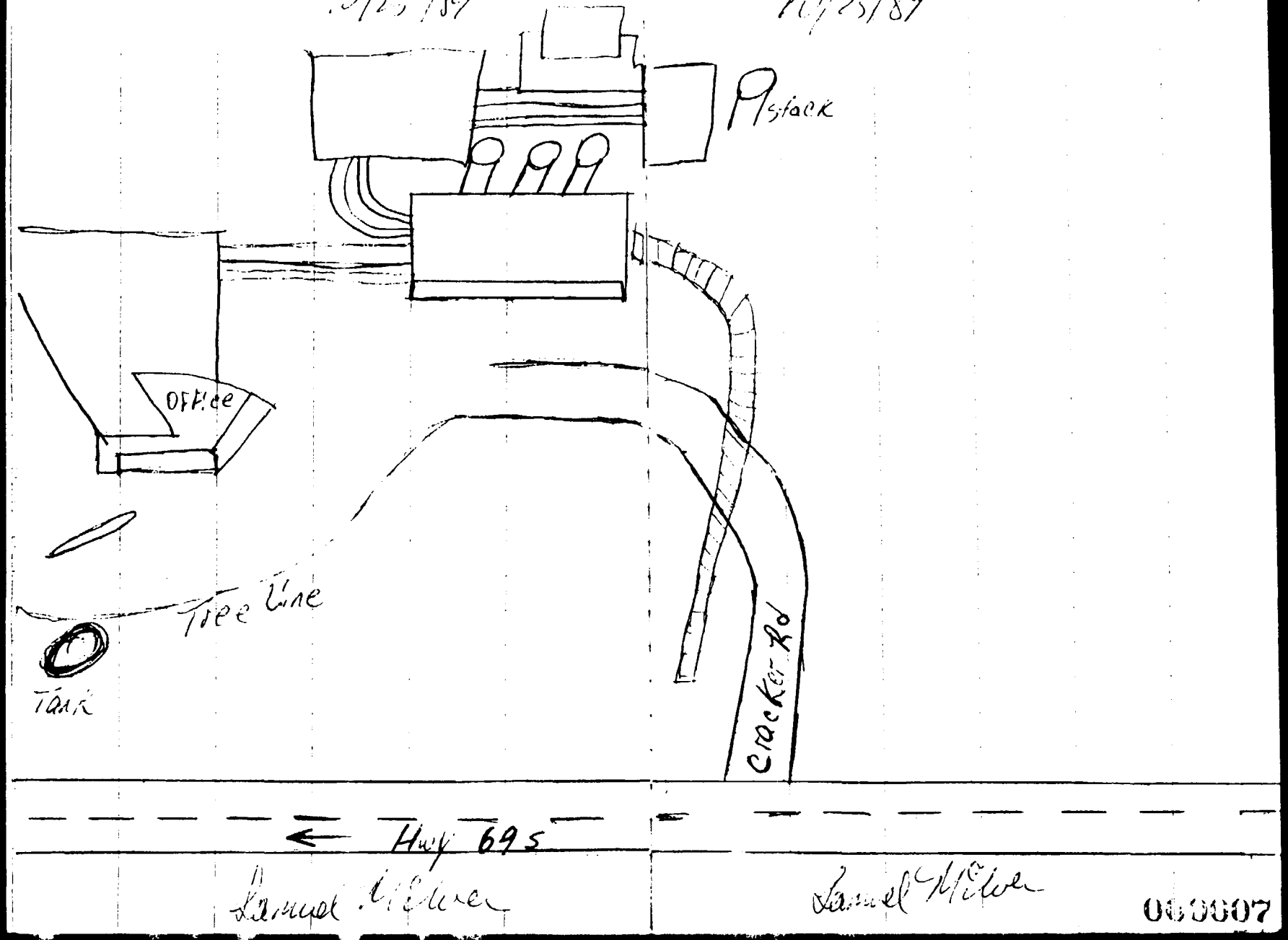
1530 The facility also has a guard booth but it doesn't look as though it's being used.

1530 There is a Company called B+W Heads, the Company produces Tanks Heads for metal Tanks and Dome Tops

1530 The Land in the site vicinity is used for both industrial and residential purposes.

Samuel McLean

10/25/89 6 10/25/89 7



POOR LEGIBILITY

PORTIONS OF THIS DOCUMENT MAY BE UNREADABLE, DUE TO THE QUALITY OF THE ORIGINAL

8

This [illegible] was [illegible] to me on November 8, 1989

[illegible]
Mathew McCoy

9

I have read and understand the [illegible] plan for the [illegible]

[illegible]
11-16-89
Mathew J McCoy

11-16-84 [illegible]

1000 EST Arrive at Moundville Water Dept.

Met with Mr. Rodgers of Moundville and Mr. Rhodes of Hale County Water System

I was given a Map of Hale Co System
Hale Co buys water from Greensboro, for southern half of Co. and Moundville for northern half of Co.

Greensboro Supply - 1[illegible] Connections
Moundville Supply - 844 Connections

not required to [illegible] system

11-16-84 [illegible]

Moundville Water System

Source: 2 wells on Hwy 44
Cabinet 244 ft. deep
300 gpm yield
2 tanks 150,000 gals each

405 Connections
Must hook up if water available - no wells in City limits
Does not know of any private wells in Area.
Draw water lines on Map of Moundville

1100 EST [illegible] Moundville Water Dept.

12

11-16-89 [illegible]

[illegible] Arrive at Southern Resin Division

Verify location on Topo Map.

Plant is not fenced
offset from Road 400 feet
Guard House at front unattended
Drainage looks like it
falls to Base of Property

[illegible] LeCt plant area

Drive Vicinity for nearest
private well

Nearest Resident is Next to
plant entrance Road
See Topo [illegible] City [illegible]
[illegible] in Yard
Site is in Tuscaloosa Co.

13

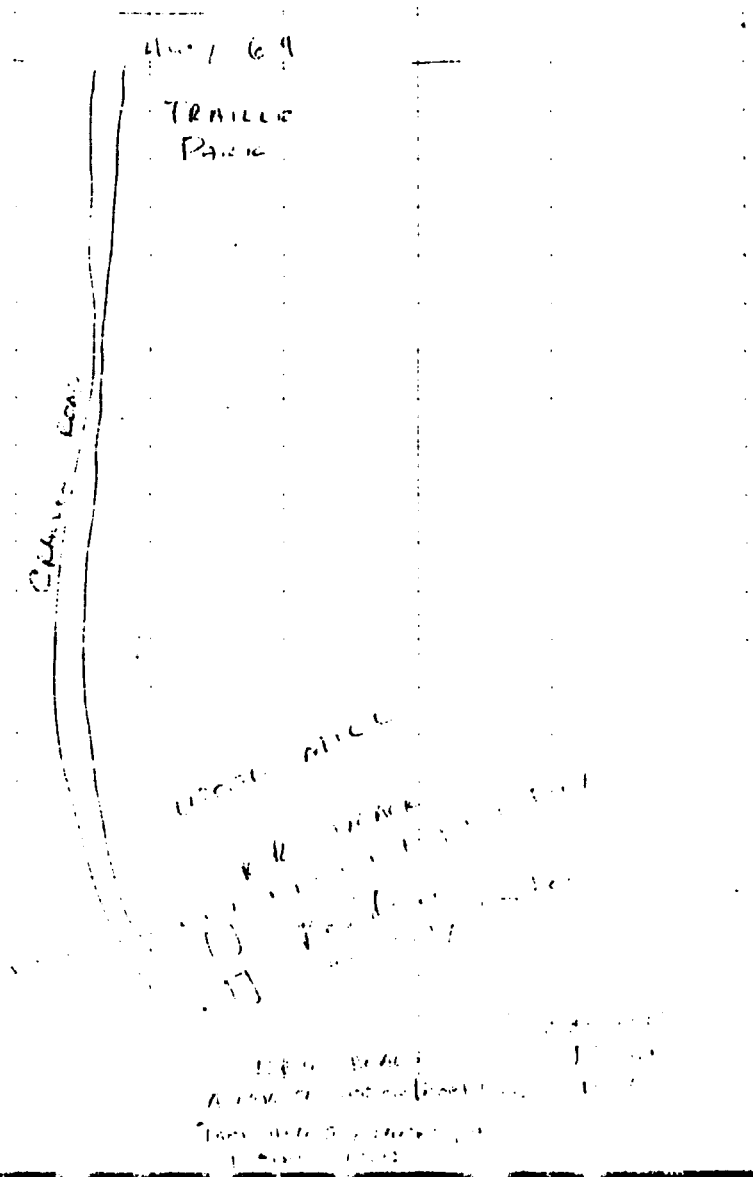
11-16-89 [illegible]
Base Hole is Original
Manufacturing Plant with
hundreds of Drums on Long
Deck
Large [illegible] tanks in Back
of Drum Area

No well sided within
4 miles of site

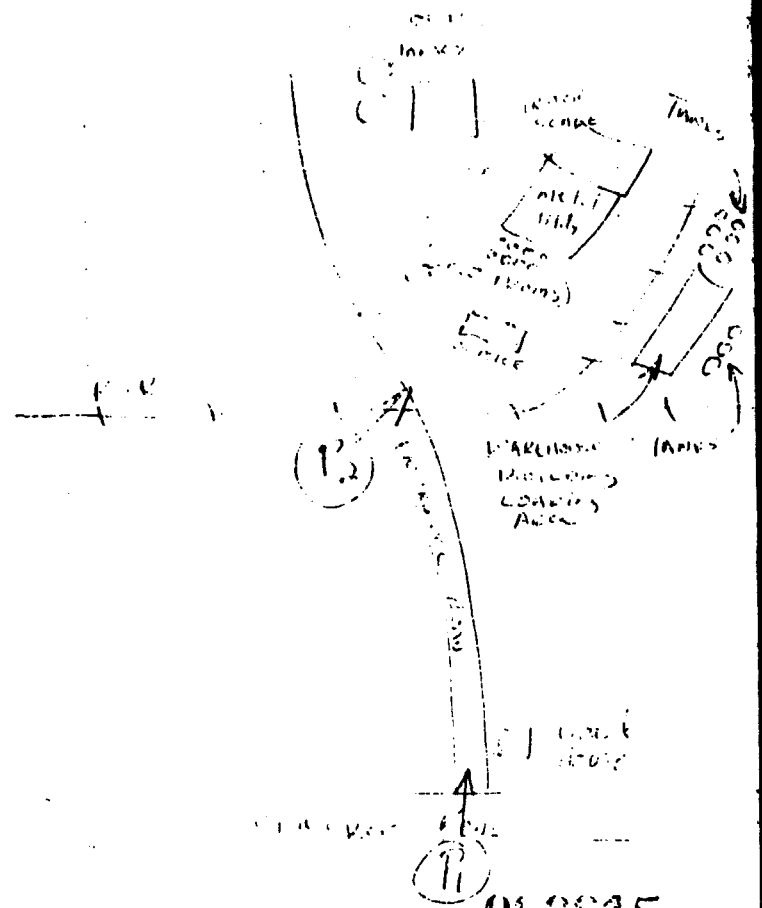
1245 [illegible] Arrive at Jugoman
[illegible] Water System
[illegible] with James
Crocker
[illegible] map of system

Maybe 2 of 3 Does not know of [illegible]
Buy Water from City of
Tuscaloosa who gets water from
surface water intake at Lake
Tuscaloosa
Since [illegible] 69 to May 95
[illegible] Connections
Not required to hook up

11-10-69



11-10-69



Reference No. 13

A. 14.

Handbook of Chemical Synonyms and Trade Names

A Dictionary and Commercial Handbook
Containing over 35,000 Definitions

Editor

WILLIAM GARDNER

Eighth Edition Revised and Enlarged by

EDWARD I. COOKE
M.A.(Cantab.), B.Sc.(Lond.), C.Chem., M.R.I.C.

and

RICHARD W. I. COOKE
M.B.B.S.(Long.), M.R.C.P.(U.K.), D.C.H.

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Colomycin. A proprietary preparation containing colistin sulphate. An antibiotic. (330).

Colona Steel. A proprietary trade name for a nickel-chromium steel containing some manganese.

Colonial Spirit. A purified methyl alcohol, CH_3OH.

Colonia Powder. An explosive, consisting of a mixture of from 30–35 per cent. nitro-glycerin, with from 65–70 per cent. ordinary gunpowder.

Colophonite. A mineral. It is a calcium-iron-silicate, a garnet.

Colophony (Rosin, Resin). The residue which remains after the volatile oils have been removed by the distillation of crude turpentine. It is essentially abietic anhydride, $C_{44}H_{62}O_4$. French rosin is obtained from *Pinus maritima*, by tapping the trees to yield the gemme containing 19–21 per cent. essential oil and 66–69 per cent. dry products. This is purified by sedimentation and then distilled for turpentine and rosin. The latter is purified by filtration through phosphor-bronze sieves. The best grades of French rosin are highly valued. The lightest is called "crystal," and the remaining ones range from AA to AAAAA, the more A's the lighter the colour. American rosin is obtained from several species of *Pinus*, mainly from *Pinus palustris* and *P. Australis*. The first year's or pale varieties are marked WW and K. The lightest in colour (almost colourless) is known as "Excelsior." WW is slightly yellow and WG yellow. Others range from X N (A being the darkest), H is light brown, G dark brown, and F–A very dark. Spanish rosin is obtained mainly from *Pinus maritima*, but *Pinus larix* and the Aleppo pine are also used. Indian rosin is obtained from several varieties including *Pinus longifolia*. The essential oil amounts to 20 per cent. and the rosin to 70–72 per cent. The rosin has an acid value of 174, a saponification value of 184, and softens at 74° C. Colophony is soluble in alcohol, amyl alcohol, amyl acetate, acetone, benzene, chloroform, carbon tetrachloride, ether, carbon disulphide, and acetic acid. The specific gravity varies from 1·045–1·09, the melting-point 120–150° C. (it softens at about 74° C.), the saponification value 150–[illegible], the acid value 145–185, the iodine value 112–120, and the ash from 0·02–[illegible] per cent. It is used in the manufacture of soap, in varnishes, and for a variety of other purposes.

Coloradoite. A mineral, HgTe.

Colorado Silver. An alloy of 57 per cent. copper, 25 per cent. nickel, and 18 per cent. zinc. It is a nickel silver (German silver). Also see NICKEL SILVERS.

Colorol 20. A proprietary trade name for a standardised modified lecithin used as a wetting and suspending agent for use in Nitrocellulose pigmental lacquers containing 10 per cent. polar solvent. (189).

Col-o-tex. A proprietary trade name for lacquer coated fabrics.

Coloured Inks. Inks which are usually prepared from water-soluble aniline dyes.

Colouring, Sugar. See BURNT SUGAR.

Colourless Coal Tar. See ANTHRASOL.

Colours, Mordant. See ADJECTIVE DYESTUFFS.

Colour Wash. A mixture of lime and water with pigments.

Col-o-vin. A proprietary trade name for polyvinyl synthetic resin coated fabrics.

Colsil. A German product. It consists of cholesterin with a small amount of lecithin.

Colsonite. A proprietary smokeless fuel. It is a semi-coke and has an ash of not more than 7·5 per cent.

Coltapaste. Zinc paste and coal tar bandage. (529).

Coltrock. A proprietary trade name for a phenolic plastic.

Coltwood. A proprietary trade name for a phenolic plastic.

Colugel. A proprietary aluminium hydroxide gel used as an antacid. (889).

Coluitrin. See PITUITRIN.

Columbia Black B. A dyestuff. It is the sodium salt of dimethoxy-diphenyl-disazo-naphthol-disulphonic acid-azo-bi-*m*-tolylene-diamine, $C_{38}H_{34}N_{10}O_9S_2Na_2$. Dyes cotton black.

Columbia Blacks 2BX, 2BW. Dyestuffs belonging to the same group as Columbia black B.

Columbia Black FB, FF Extra (Paramine Brilliant Black FB, FR, Carbide Black, Chlorazol Black FH). A dyestuff. It is the sodium salt of benzene-disazo-α-naphthylamine-sulphonic acid-naphthol-sulphonic acid-azo-*m*-phenylene-diamine, $C_{32}H_{23}N_9O_7S_2Na_2$. Dyes cotton black.

Columbia Black R. A dyestuff. It is the sodium salt of ditolyl-disazo-naphthol-disulphonic acid-azo-bi-*m*-tolylene-diamine, $C_{38}H_{34}N_{10}O_7S_2Na_2$. Dyes cotton black.

Columbia Blue G (Chicago Blue 2R, Benzo Blue 2R, Diamone Blue C4R). Mixed disazo dyestuffs from tolidine, amino-naphthol-sulphonic acids, and a third component. Dyes cotton blue.

Columbia Blue R. See CHICAGO BLUE 4R.

Reference No. 4

ADEM

ALABAMA
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

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Birmingham, AL
5 942 6168

Midwest Drive
Mobile, AL
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343 7641

August 16, 1984

MEMORANDUM

TO: BUDDY COX

THROUGH: JIM NEAL

FROM: DAVID HAGAN

RE: Southern Resins, Moundville, Alabama

On July 18, 1984, the writer, accompanied by Mssrs. Fred Mason and Ashley Chadwick, visited the above referenced facility. The primary purpose of the visit was for Mr. Mason to evaluate a site on Southern Resins' property for suitability as a landfill for non-hazardous wastes generated by the facility. The writer accompanied Mr. Mason, at his suggestion, in order to determine whether a waste pile at the plant containing a solvent saturated lime cake (which has been designated a hazardous waste) is being managed properly. Mr. Mason also wanted someone from the Hazardous Waste Section to see the proposed landfill site.

We met with Mr. Mark Sharp, plant engineer, who gave us a tour of the waste management facilities at Southern Resins. These facilities consist of the hazardous waste pile, a wastewater treatment system that discharges under NPDES, a waste pile accumulating the solid waste generated by the plant, and an old surface impoundment not part of their present wastewater treatment system.

The hazardous waste pile consists of about 100 cubic yds (?) of material contained in a concrete structure with three (3) sides and an impermeable base. The open end is designed to allow a front end loader to have easy access to the interior of the containment structure. There is no roof or other covering over the waste pile. Solvent is leaching out of the lime cake and escaping containment through cracks in the walls and through the open end of the structure. A significant amount of solvent has collected in pools on the ground in the immediate vicinity of the containment structure. There is no barrier to migration of this waste into the subsurface except the natural permeability of the local soils. Mr. Sharp explained that Chemical Waste Management has delayed picking the waste lime cake up because of a disagreement over which EPA hazardous waste number applies to the material. Southern Resins has designated it as D001 but CWM will not accept that designation because the waste is a solid. This is to be a one-time disposal of hazardous waste as the company has developed some sort of solvent recovery system that removes most of the solvent from the lime cake, thereby raising the flash point of the material above 140 degrees Fahrenheit. The recovered solvent is reused in their manufactoring processes and the lime cake is disposed of as a solid waste.

The wastewater treatment system contains a surface inpoundment and it is not clear what wastes are intorduced into this unit. The NPDES discharge is to the Black Warrior River which borders the facility to the west. Parameters monitored for discharged waste water according to Mr. Sharp are TSS, ph, BOD, and COD.

The solid waste accumulation area is near the proposed site for the landfill. It consists of assorted plant trash, resin, and lime cake. However, at least one fifty-five (55) gallon drum of solvent was seen in this area. It was lying on its side and some solvent had spilled onto the ground. There were some additional drums of waste stored near the hazardous waste pile which Mr. Sharp said contained non-hazardous resinous material generated from their manufacturing processes.

The old surface impoundment is the area where Southern Resins would like to put the landfill. This unit currently receives plant runoff and any significant solvent spills. There is little information about what went into the impoundment prior to Southern Resins buying the property. Mr. Sharp said he thought the impoundment may have been there for 25 years. While we were inspecting the site, bubbles of some organic material were continually coming up from the bottom of the lagoon. A trench dug into the ground near the impoundment reached the water table at around 8 ft. and the water at the bottom had an organic film on the surface.

The facility achieved interim status but a complete Part A application was never sent to EPA. On January 16, 1981 the facility was notified by EPA that the Part A would have to be re-submitted and Southern Resins changed it's mind about the necessity of obtaining a RCRA storage permit and withdrew the application. The facility is listed under Lawter Chemicals in the latest EPA computer printout as withdrawn and as a non-handler.

[illegible] must be resolved in order to bring Southern Resins into compliance [illegible] Alabama Hazardous Waste Management Regulations.

1). The waste pile should be formally closed as a hazardous waste management unit as soon as possible. The closure plan should address the contamination of the surrounding area resulting from solvent leaching from the containment structure.

2). A comprehensive evaluation of all wastestreams at Southern Resins and their management should be undertaken. The efficiency of the solvent recovery system should be studied closely.

3). The decision on the landfill should await the outcome of an investigation of the old surface impoundment. Mr. Sharp is planning to draw off the water in the impoundment and sample the sludge in the bottom.

4). After point (2.) above has been completed, the appropriate notification should be made to both EPA and the State regarding the facility's current status under RCRA.

DH/sdm

cc: Mr. Jack Honeycutt
Solid Waste

Mr. Fred Mason
UIC

Mr. J.P. Martin
Water Division

File: Southern Resins
Tuscaloosa County
IW

Reference No. 5

KIRK-OTHMER

ENCYCLOPEDIA OF CHEMICAL TECHNOLOGY

THIRD EDITION

VOLUME 12

GRAVITY CONCENTRATION
TO
HYDROGEN ENERGY

A WILEY-INTERSCIENCE PUBLICATION
John Wiley & Sons
NEW YORK • CHICHESTER • BRISBANE • TORONTO

Table 1. Resin Color Scales

Coal tar or Barrett	Gardner[a]
0.5	G-5
1	G-7 to G-8
2	G-11 to G-12
3	G-14
4	G-16
5	slightly darker than G-18

[a] Approximate.

Density. Although density may be determined by flotation methods, a displacement method such as the air-comparison pycnometer is faster and more accurate. Density ranges are given below.

	Density
petroleum resins	
aromatic	1.05–1.08
aliphatic	0.96–0.98
terpene resins	1.00
coumarone–indene resins	1.10–1.15

Melt Viscosity. Resins are frequently shipped in molten form, and melt viscosity data or curves are available from various producers. The highest viscosity at which a resin can be conveniently pumped is ca 1–1.1 Pa·s (10–11 P). The temperature required to attain that viscosity depends on the particular resin (see Rheological measurements).

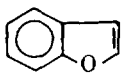
Solubility. All hydrocarbon resins are soluble in aromatic solvents such as toluene and xylene. Aliphatic petroleum resins and terpene resins are also soluble in aliphatic solvents such as hexane; partial insolubility of aged samples is usually due to oxidized resin. Terpene resins are insoluble in acetone. Coumarone–indene resins, on the other hand, are mostly soluble in acetone but insoluble in hexane.

Specialized solubility tests for various solvents and oils used in the printing ink industry are available.

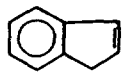
Molecular Weight. The molecular weight distribution of a resin determines its characteristics. A number of solvent/nonsolvent separations of hydrocarbon resins into fractions have been described (3–5). The nonsolvent is usually an alcohol. A more recent method is size exclusion (gel permeation) chromatography (2).

Coumarone–Indene or Coal-Tar Resins

The name coumarone–indene or coal-tar resins is derived from coumarone (1) and indene (2). It is, however, not particularly accurate because coumarone is only a small component.



(1)



(2)

Dicyclopentadiene Resins. 1,3-Cyclopentadiene is formed with many other hydrocarbons in the cracking of petroleum. It is separated from C_4/C_5 fractions by thermal dimerization followed by fractional distillation (30–32).

The rate constants for the thermal conversion of cyclopentadiene to dicyclopentadiene has been determined (33) (see Cyclopentadiene and dicyclopentadiene). Dicyclopentadiene (DCPD) feedstocks may vary in purity from high (90–95%), to medium (70–80%), to low purity mixtures of varying DCPD content. Codimers of cyclopentadiene with other dienes such as butadiene, isoprene, and methylcyclopentadiene may also be present. The feedstocks are analyzed by gas chromatography.

Dicyclopentadiene responds well to thermal polymerization; no Lewis acids or other catalysts are needed. Pure crystalline dicyclopentadiene (endo isomer) melts at 33.6°C (33). Crystalline tricyclopentadiene melts from 60 to 68°C (33).

At 200°C, only 5% DCPD remained unchanged after 90 h (33). Time cycles are improved by employing higher temperatures (240–280°C and higher).

Colors of commercial DCPD resins may run from about Gardner 10 to Gardner 18 and darker. Properties of a typical cyclic diolefin resin are given in Table 8.

Manufacture of DCPD waxes by thermal polymerization at 190–200°C for several hours has been patented (34). Partial hydrogenation of the products was also carried out. In contrast to the usual transparent, friable resins, these materials are opaque and white, and are waxy to the touch, and have sharply defined melting points.

In the manufacture of resins for printing inks, a commercial cracked hydrocarbon fraction containing 46.6% DCPD and about 23% codimers was polymerized at 245–250°C for 16 h (35). Removal of solvent gave a resin with a softening point of 175°C and an iodine number of 158 in 83% yield. The yield is higher than 69% (sum of DCPD and codimers) because other monomers such as styrene and indene are present which must copolymerize thermally. Addition of 10–20% α-pinene to the same hydrocarbon feed gave resins of similar softening point but with improved solubility in Stoddard solvent (35). However, only a small portion of the α-pinene was incorporated in the resin.

Dicyclopentadiene has been copolymerized thermally with styrene (36). A 70/30 blend by weight of DCPD/styrene was polymerized for 3 h at 260–265°C in a series of experiments using varying amounts of xylene as diluent. The final softening point varied from 58°C at 10/90 monomers/xylene to 155°C softening point at a ratio of 90/10 monomers/xylene (36). Therefore, it may be concluded that the ratio of monomer to diluent has a significant effect on softening point in this type of polymerization.

Table 8. Properties of A Typical Cyclic Diolefin Resin[a]

Property	Value
color, Gardner scale (50% in toluene)	11
softening point, ring and ball, °C	100
specific gravity at 15.5°C	1.11
acid number	<1
bromine number	55
iodine number	180
refractive index at 25°C, n_D^{20}	1.58

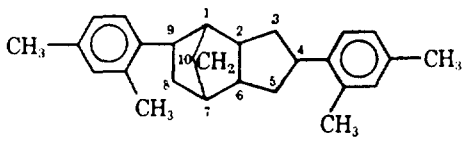
[a] Ref. 9.

Reactive, heat-reactive, or unsaturated resins react with drying oils in the range of 232–260°C to give products with improved performance in paints and varnishes (see Driers).

Dicyclopentadiene resins are sometimes modified for specific uses by hydrogenation (37) or by reaction with unsaturated organic acids and anhydrides such as maleic anhydride (38–39). For example, a thermal DCPD resin with a 148°C softening point and a bromine number of 87 was treated with 10% maleic anhydride for three h at 210°C (38). The resin obtained had a softening point of 179° and an acid number of 52, capable of undergoing esterification with oleyl alcohol. These resins are used in offset and gravure printing inks (qv). An acidic DCPD resin may be prepared by including maleic anhydride in the polymerization (40).

Thermal copolymerizations of DCPD with rosin (41) and tall oil (qv) (42) have been disclosed. Dicyclopentadiene may also be polymerized in solution with $AlCl_3$ as catalyst. For example, dicyclopentadiene was polymerized at 30°C by adding it slowly to half its weight of toluene in which 1% $AlCl_3$ (based on DCPD) was suspended (43). After neutralization with aqueous caustic and removal of solvent, a resin with softening point 152°C, bromine number 47, and Gardner color 13 was obtained.

Resins with lower softening points are obtained by an alkylation–polymerization of dicyclopentadiene in mixed xylenes catalyzed with $AlCl_3$ (44). This affords alkylation products of the type shown by (3).



(3)

Softening points are in the 30–130°C range. Such products are used as plasticizers (qv). Addition of cyclopentadiene increases the softening point when added to an $AlCl_3$ polymerization of C_5 monomers (23,45).

Terpene Resins

Terpene resins are obtained by polymerizing various unsaturated terpene hydrocarbons, most of which occur naturally (46) (see Resins, natural; Terpenoids).

Polymerization. The most important terpene resins are those made from limonene or dipentene (4), β-pinene (5), and α-pinene via cationic polymerization (6). Less important terpenes include β-phellandrene (7), myrcene (8), 3-carene (9), camphene (10), terpinolene, and various terpinene isomers. Optically active *d*-limonene is a by-product of the citrus fruit industry. Dipentene (*dl*-limonene is sometimes used to designate a crude distillate fraction from pulp mill liquor. *dl*-Limonene in addition to other terpenes is formed in the processing of sulfate liquor from kraft paper manufacture (see Pulp). With the exception of optical activity, it has the same physical properties as *d*-limonene. Polymerization is initiated by high-energy radiation, Ziegler-type catalysts (47), and Friedel-Crafts type of cationic catalyst, such as aluminum chloride. The mechanism for β-pinene polymerization (48) is shown below.

A number of Friedel-Crafts catalysts were evaluated (48); they are arranged below in a decreasing order of effectiveness: $AlBr_3 = AlCl_3$, $ZrCl_4$, $AlCl_3.(C_2H_5)_2O$, $BF_3.(C_2H_5)_2O$, $SnCl_4$, $BiCl_3$, $SbCl_3$, and $ZnCl_2$.

49. U.S. Pat. 3,478,007 (Nov. 11, 1969), L. B. Barkley and A. P. Patellis (to Pennsylvania Industrial Chemical Corp.).
50. U.S. Pat. 3,354,132 (Nov. 21, 1967), A. D. Sproat (to Pennsylvania Industrial Chemical Corp.).
51. U.S. Pat. 4,011,385 (Mar. 8, 1977), L. S. Wang and E. R. Ruckel (to Arizona Chemical Co.).
52. U.S. Pat. 4,016,346 (Apr. 5, 1977), R. T. Wojcik and E. R. Ruckel (to Arizona Chemical Co.).
53. U.S. Pat. 3,297,673 (Jan. 10, 1967), H. G. Sellers and H. F. McLaughlin (to Tenneco Chemicals, Inc.).
54. U.S. Pat. 3,466,267 (Sept. 6, 1969), J. M. Derfer (to SCM Corp.).
55. U.S. Pat. 3,737,418 (June 5, 1973), E. R. Ruckel, R. F. Phillips, and H. G. Arlt (to Arizona Chemical Co.).
56. U.S. Pat. 3,761,457 (Sept. 25, 1973), H. G. Arlt and E. R. Ruckel (to Arizona Chemical Co.).
57. Neth. Pat. Appl. 6,611,789 (Feb. 27, 1967), (to Tenneco Chemicals, Inc.).
58. U.S. Pat. 3,413,246 (Nov. 26, 1968), H. P. Weymann and Y. Jen (to Tenneco Chemicals, Inc.).
59. U.S. Pat. 3,622,550 (Nov. 23, 1971), A. P. Patellis and J. F. Holohan (to Pennsylvania Industrial Chemical Corp.).
60. U.S. Pat. 4,052,549 (Oct. 4, 1977), J. W. Booth (to Arizona Chemical Co.).
61. H. Pietila, A. Sivola and H. Sheffer, *J. Polym. Sci.* (*A 1*) **8**, 727 (1970).
62. U.S. Pat. 4,022,723 (May 10, 1977), T. Hokama and F. Scardiglia (to Velsicol Chemical Corp.).
63. U.S. Pat. 3,669,947 (June 13, 1972), H. Kahn and T. Hokama (to Velsicol Corp.).
64. U.S. Pat. 3,000,868 (Sept. 19, 1961), P. O. Powers (to Pennsylvania Industrial Chemical Corp.).
65. U.S. Pat. 3,630,981 (Dec. 28, 1971), D. A. Finfinger and C. C. Campbell (to Pennsylvania Industrial Chemical Corp.).
66. U.S. Pat. 3,956,250 (May 11, 1976), C. C. Campbell and D. A. Finfinger (to Hercules Incorporated).
67 U.S. Pat. 3,499,877 (Mar. 10, 1970), V. W. Arnold and R. J. Lee (to Standard Oil Co. of Indiana).
68. U.S. Pat. 3,429,843 (Feb. 25, 1969), V. W. Arnold and R. J. Lee (to Standard Oil Co. of Indiana).
69. Fr. Pat. 1,598,226 (Aug. 14, 1970), A. P. Patellis and J. F. Holohan (to Pennsylvania Industrial Chemical Corp.).
70. U.S. Pat. 3,654,250 (Apr. 4, 1972), B. J. Davis (to Reichhold Chemicals, Inc.).
71. U.S. Pat. 3,622,551 (Nov. 23, 1971), B. J. Davis (to Reichhold Chemicals, Inc.).
72. U.S. Pat. 4,075,404 (Feb. 21, 1978), P. S. Douglas, A. P. Patellis, and W. A. Vredenburgh (to Hercules Incorporated).
73. U.S. Pat. 4,113,801 (Sept. 12, 1978), P. S. Douglas, A. P. Patellis, and W. A. Vredenburgh (to Hercules Incorporated).
74. U.S. Pat. 3,932,332 (Jan. 13, 1976), P. S. Douglas, A. P. Patellis, and W. A. Vredenburgh (to Hercules Incorporated).
75. U.S. Pat. 3,879,334 (Apr. 22, 1975), W. A. Vredenburgh and P. S. Douglas (to Hercules Incorporated).
76. U.S. Pat. 3,753,961 (Aug. 21, 1973), D. R. St. Cyr (to Goodyear Tire and Rubber Co.).
77. U.S. Pat. 3,926,882 (Dec. 16, 1975), M. G. Henk and G. P. Sartler (to Standard Oil Co., Chicago).
78. U.S. Pat. 3,661,870 (May 9, 1972), H. L. Bullard (to Goodyear Tire and Rubber Co.).
79. U.S. Pat. 3,644,252 (Feb. 22, 1972), R. S. Shenfeld, F. M. Musser, and G. U. Kothari (to Velsicol Chemical Corp.).
80. U.S. Pat. 3,640,981 (Feb. 8, 1972), B. J. Davis (to Reichhold Chemicals, Inc.).
81. U.S. Re. 29,654 (May 30, 1978); a reissue of U.S. Pat. 3,919,181 (Nov. 11, 1975), K. C. Peterson and R. A. Meader (to Schenectady Chemicals, Inc.).
82. U.S. Pat. 3,657,369 (Apr. 18, 1972), G. L. Driscoll and D. L. Kerr (to Sun Oil Co.).

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1.0 INTRODUCTION

1.1 OBJECTIVES

Limited information is currently available on the constituent make-up of the filter cake produced during manufacture of hydrocarbon resins at Lawter's Moundville, Alabama Southern Resins Division plant. The filter cake's constituent make-up (both qualitative and quantitative) is needed to characterize this material to assess proper handling, storage, transportation, and disposal procedures. Due to the limited information currently available for this material, the primary objective of this sampling event was to collect representative filter cake samples in order to characterize the composition of the filter cake and not to develop a data base for generating statistically defensible constituent concentrations.

1.2 BACKGROUND ON MATERIAL

Filter cake is generated during filtration of hydrocarbon resins produced in the Hydrocarbon Plant Resin Production line (HC Plant). Polymerizable raw materials and boron trifloride (a reaction catalyst) are added at the beginning of the resin production line, blended, and then reacted under heat to form resin. After the proper reaction time, the reaction is stopped (deactivated) by adding lime [$CA(OH)_2$] which reacts with the boron trifloride (BF_3) catalyst forming a calcium difluoride precipitate (CaF_2). The CaF_2 is then filtered out of the resin in two special resin filters. The filter cake generated from these two filters is an off-white granular solid which is free of free flowing liquids.

Currently the filter cake is drummed in DOT drums and shipped offsite weekly to Chemical Waste Management's Emelle, Alabama, facility. The approximate filter cake generation rate is:

- 3 - 3½ Drums Per Resin Filter Batch,
- 3 - 5 Resin Filter Batches Per Day,
- 8 - 10 Drums of Filter Cake Generated Per Day,
- 60 - 70 Drums of Filter Cake Generated Per Week.

1.3 BACKGROUND ON SAMPLE LOCATIONS

The current management practice for this waste stream is to collect the material in drums at the point of generation, which is a blowdown valve on the filters. The drummed waste is then labeled and stored as though a hazardous waste, in order to ensure compliance with all solid waste management requirements.

The past management practice for handling this material onsite was based on its characterization as a solid waste and onsite waste piles were used to store the material pending location of a suitable disposal site.
Currently filter cake is present in three onsite areas, two filter cake stockpiles and a debris pile. One of the stockpiles is a waste pile and one is a stockpile within a three sided, concrete floored bin. Both stockpiles are covered with plastic sheeting. These two stockpiles are known as the Filter Cake Waste Pile and Filter Cake Bin. There is also a Debris Pile onsite in the vicinity of the two filter cake stockpiles. The debris pile is reported to consist of waste resin and general plant trash (pallets, wood, paper resin bags, etc.) and undetermined quantity of filter cake.

headspace samples. Compounds identified in the headspace were found in higher concentration in fresh filter cake and filter cake bin headspace samples than in the filter cake pile and debris pile samples. These results generally agree with what was found for organic compound analysis of the filter cake material.

The results of the physical properties tests are summarized in Table 8. The cake generally does not yield a free liquid under compression, and the cake generally does not support combustion. It was noted by the laboratory analyst that the very small sample (about one gram) resulted in a large surface to volume ratio, not expected under normal handling of the material. Therefore, these results would be expected to represent a worst case analysis. The samples did not exhibit a vigorous ignition.

The results of the thermographic analyses (Table 9) indicate there is no strong correlation between the gross levels of volatile/organic compounds in the sample and the cake age.

4.2 FRESH FILTER CAKE

The results in Tables 5 to 9 indicate that the fresh filter cake has the properties:

Inert (Ash)	50-56%
Volatile Organics	24%
Other Organics	14-19%

The filter cake loose density of about 34 lb/ft^3 is believed due to the sampling with the compacted density of 66 lb/ft^3 more reasonable (this also is close to the density of aged cake). It is significant that the fresh filter cake does not release a free liquid, even under compaction. The flammability test indicated that the fresh filter cake may

support ignition. The lack of volatiles in the headspace analysis indicates the organics that ignite are probably the base/neutral materials (Table 7).

4.3 FILTER CAKE BIN

The results in Tables 5 to 9 indicate the filter cake in the bin has the properties:

Inert (Ash)	51%	
Volatile Organics	40%	(0-200°C)
Other Organics	9%	(200-500°C)

The cake loose density is about 92 lb/ft^3. At 15 psi compression, about 10 ml liquid was leached from approximately 300 g. of sample. Note that this was the only sample where liquid leaching was observed, and that this was a small volume. The sample demonstrated a slight capability to ignite.

4.4 FILTER CAKE PILE

The results in Tables 5 to 9 indicate the filter cake in the bin has the properties:

Inert (Ash)	57%	
Volatile	23%	(0-200°C)
Other Organics	20%	(200-500°C)

The cake loose density is about 59 lb/ft^3, with compaction increasing this to about 86 lb/ft^3. The cake did not yield any liquid under compression and did not ignite.

4.5 DEBRIS PILE

The results in Tables 5 to 9 indicate the filter cake in the debris pile has the properties:

Inert (Ash)	54%	
Volatile	34%	(0-200°C)
Other Organics	12%	(200-500°C)

The cake loose density is about 73 lb/ft^3 with compaction increasing this about 1.06 lb/ft^3. The cake did not yield any liquid under compression and did not ignite.

Reference No. 6

LAWTER INTERNATIONAL
SOUTHERN RESINS DIVISION
MOUNDVILLE, ALABAMA

RESULTS OF 4 APRIL 1985 FILTER CAKE SAMPLING

7 May 1985

CONTENTS

1.0 Introduction
2.0 Sample Collection
3.0 Analytical Program
4.0 Results and Interpretation
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1.0 INTRODUCTION

1.1 OBJECTIVES

Limited information is currently available on the constituent make-up of the filter cake produced during manufacture of hydrocarbon resins at Lawter's Moundville, Alabama Southern Resins Division plant. The filter cake's constituent make-up (both qualitative and quantitative) is needed to characterize this material to assess proper handling, storage, transportation, and disposal procedures. Due to the limited information currently available for this material, the primary objective of this sampling event was to collect representative filter cake samples in order to characterize the composition of the filter cake and not to develop a data base for generating statistically defensible constituent concentrations.

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2.0 SAMPLE COLLECTION

2.1 DESCRIPTION OF SAMPLES

The following filter cake samples were collected:

Sample A - Fresh Filter Cake: One composite sample of "fresh" filter cake was collected directly from the resin filters during a single resin filter batch. This sample was a composite sample of discrete samples collected at different times during the filter cake blowdown. Discrete samples were saved for possible future testing and analysis.

This sample was collected to represent "worst case" or "most fresh" sample. Changes in the makeup of the filter cake during a filter batch were noted in order to characterize the filter cake variability. By collecting this sample, we avoided the possibility of not characterizing compounds which may volatize during filter cake storage.

Discrete samples were collected by holding sample jars directly beneath the filter blowdown valve allowing the sample to drop directly into the sample jars. Aliquots were then taken from discrete samples and combined to form a single composite sample.

Sample C - Filter Cake Bin*: One composite sample was collected from the Filter Cake Bin stockpile. Samples were collected in a manner which yielded sample aliquots collected from the top, middle, bottom, each side, front, and back of the bin. Discrete samples were also collected and saved for possible future testing and analysis. Samples were collected using a 3½-inch diameter stainless steel auger and a post hole digger (see Sampling Methods Section).

Sample D - Filter Cake Pile*: One composite sample was collected from the Filter Cake Pile. Sampling locations and methods were the same as those described for the Filter Cake Bin composite sample.

Sample E - Debris Pile*: One composite sample was collected from the debris pile. This sample was collected from the areas of the debris pile which appeared to contain filter cake. The purpose of collecting this sample was to determine if filter cake has been added to the debris pile and, if so, to determine the characteristics of the filter cake added to the debris pile.

*Note: The filter cake bin, waste pile, and debris pile were sampled separately to determine if the material in each of these stockpiles were sufficiently different to require separate handling, transportation and disposal.

2.2 SAMPLING METHODS

Due to the unique nature of the filter cake, several different types of sampling methods were tried to find the method which best meets the desired sampling objectives. Sampling methods tried included a waste pile sampler, PVC pipe shelby tube type sampler, trowel or scope, small shovel, post hole digger, and a bucket auger. After attempting each of these methods, a combination of using a bucket auger and post hole digger worked the best to provide representative samples.

3.0 ANALYTICAL PROGRAM

The analytical tests performed on the samples are summarized in Table 1. Note that in addition to the samples described in Section 2, a laboratory composite of the Filter Cake Bin and Filter Cake Pile samples was prepared and a limited number of analyses performed. A description of the analytical tests is presented below.

Analytical Test Description

VOC. Analyze for organic priority pollutant volatile fraction compounds (listed on Table 2) using standardized soil analytical methods (USEPA Method 8240). Any non-priority pollutant volatile compounds that could be positively identified were also reported.

B/N/A. Analyze for semi-volatile organic priority pollutant base/neutral and acid fraction compounds (listed on Tables 3 and 4) using a solvent extraction technique (USEPA Method 2870). Any non-priority pollutant B/N/A fraction compounds that could be positively identified were also reported.

Total Metals. The total sample was subjected to an acid digestion followed by analysis for the following:

Arsenic	Silver
Barium	Manganese
Cadmium	Zinc
Chromium	Chloride
Copper	Iron
Nitrate	Sulfate
Lead	Cyanide
Mercury	Nickel
Selenium	Thallium
Fluoride (EP Tox Metals Only)	

TABLE 1
ANALYTICAL SCHEDULE

Parameter/Analysis*	Sample 5917A Fresh Filter Cake	Sample 5917B Filter Cake Bin	Sample 5917C Filter Cake Pile	Sample 5917D Bin/Pile Composite	Sample 5917E Debris Pile
VOC	X	X	X		X
B/N/A	X	X	X		X
Headspace VOC Screening	X	X	X	X	X
VOC Headspace @ 43°C (110°F)	X				
B/N/A Headspace @ 43°C (110°F)	X	X	X		X
EP TOX B/N/A	X			X	X
Total Metals	X			X	X
EP TOX Metals	X			X	X
Loose/Compact Density	X	X	X	X	X
Percent Weight Lose with Temperature (TGA)	XX	X	X		X
Free Liquid Compaction Test	X	X	X	X	X
Flammability Test	X	X	X	X	X

NOTES: * = See Analytical Schedule section of text for description of analytical tests.
X = Perform analysis on this sample for indicated parameters.
XX = Perform duplicate analysis on this sample for indicated parameters.

TABLE 2.

CH2M HILL

VOLATILE COMPOUNDS

GC/MS Report

Analyst _____

Date of Analysis _____

Client _____ Laboratory No. _____

Sample Description _____

Compounds	MDL[1]	Conc.[2]			
Chloromethane					
Bromomethane					
Vinyl Chloride					
Chloroethane					
Methylene Chloride					
Trichlorofluoromethane					
1,1-Dichloroethene					
1,1-Dichloroethane					
Trans-1,2-Dichloroethene					
Chloroform					
1,2-Dichloropropane					
1,1,1-Trichloroethane					
Carbon Tetrachloride					
Bromodichloromethane					
1,2-Dichloroethane					
Trans-1,3-Dichloropropene					
Trichloroethylene					
Benzene					
Dibromochloromethane					
1,1,2-Trichloroethane					
Cis-1,2-Dichloropropene					
2-Chloroethyl vinyl ether					
Bromoform					
1,1,2,2-Tetrachloroethane					
Tetrachloroethylene					
Toluene					
Chlorobenzene					
Ethyl Benzene					
Acrylonitrile					
Acrolein					
Dichlorodifluoromethane	ND[3]				

[1]MDL = Method Detection Limit

[2]BMDL = Below Method Detection Limit

[3]ND = Not Determined

Comments _____

TABLE 3.

CH2M HILL

BASE/NEUTRAL COMPOUNDS

GC/MS Report

Analyst _____

Date of Analysis _____

Client _____ Laboratory No. _____

Sample Description _____

Compounds	MDL[1]	Conc.[2]	Compounds	MDL[1]	Conc.[2]
Bis (2-chloroethyl) ether			4-Bromophenyl phenyl ether		
1,3-Dichlorobenzene			Hexachlorobenzene		
1,4-Dichlorobenzene			Phenanthrene		
1,2-Dichlorobenzene			Anthracene		
Bis (2-Chloroisopropyl) ether			Dibutyl phthalate		
Hexachloroethane			Fluoranthene		
N-nitroso-di-n-propylamine			Pyrene		
Nitrobenzene			Benzidine		
Isophorone			Butyl benzyl phthalate		
Bis (2-Chloroethoxy) methane			2,3,7,8-Tetrachlorodibenzo-p-dioxin		
1,2,4-Trichlorobenzene			Benzo (a) anthracene		
Naphthalene			Chrysene		
Hexachlorobutadiene			3,3'-Dichlorobenzidine		
Hexachlorocylopentadiene			Bis (2-ethylhexyl) phthalate		
2-Chloronaphthalene			Di-n-octyl phthalate		
Acenaphthylene			Benzo (b) fluoranthene		
Dimethylphthalate			Benzo (k) fluoranthene		
2,6-Dinitrotoluene			Benzo (a) pyrene		
Acenaphthene			Indeno (1,2,3-cd) pyrene		
2,4-Dinitrotoluene			Dibenzo (a,h) anthracene		
Fluorene			Benzo (g,h,i) perylene		
4-Chlorophenyl phenyl ether			N-nitrosodimethylamine	ND[5]	
Diethyl phthalate			Bis (chloromethyl) ether	ND[5]	
N-nitrosodiphenylamine[3]					
1,2-Diphenylhydrazine[4]					

[1]MDL = Method Detection Limit

[2]BMDL = Below Method Detection Limit

[3]Detected as Diphenylamine

[4]Detected as Azobenzene

[5]ND = Not Determined

Comments _____

TABLE 1.

CH2M HILL

ACID COMPOUNDS

GC/MS Report

Analyst _____

Date of Analysis _____

Client _____ Laboratory No. _____

Sample Description _____

Compounds	MDL[1]	Conc.[2]			
Phenol					
2-Chlorophenol					
2-Nitrophenol					
2-4-Dimethylphenol					
2-4-Dichlorophenol					
4-Chloro-3-methylphenol					
2,4,6-Trichlorophenol					
2,4-Dinitrophenol					
4-Nitrophenol					
2-Methyl-4,6-dinitrophenol					
Pentachlorophenol					

[1]MDL = Method Detection Limit

[2]BMDL = Below Method Detection Limit

Comments _____

EP TOX Metals. Perform the EP toxicity extraction procedure and then analyze for the metal species listed under total metals.

Flammability Test. Since there is no standard method for determining the flashpoint of a solid, a modified version of a standard liquid flashpoint test was attempted. After several attempts, it became evident that this method would not work. Therefore, a simple check for ignitability was used to estimate flammability. One gram from each sample 5917A through E was exposed to a flame. The samples that ignited were reweighed to determine what portion of the weight remaining. Results and observations were recorded.

Loose/Compact Density. Density determinations were made on samples 5917A-E. A graduated cylinder was filled and gently tapped to aid settling of material. The material's volume was noted and weight determined. The same sample was then hand compacted in the graduated cylinder, and the volume was again recorded.

Free Liquid Compression Test. This test involved subjecting each of samples 5917A-E to incremental pressures between 10 psi and 60 psi. (25 psi is roughly equivalent to the force exerted by a 30 ft. column of high density clay of 120 lbs/ft^3 on the test chambers 4" diameter base.) Only the bin composite sample (5917B) yielded a leachate within this pressure range.

Head Space VOC Screening. Samples 5917A-E were analyzed with an organic vapor analyzer (Foxboro OVA-108, range 1-10,000 ppm as methane). The headspace in each sample container was checked after allowing the sample to reach room temperature.

Headspace @ 43°C (110°F). Analyze for VOA and B/N/A fraction organic compounds that are present in the sample headspace above the sample in a septum sealed container heated to 43°C (110°F).

Percent Weight Lost With Temperature (TGA). Perform a thermal gravimetric analysis (TGA) on the material by constantly monitoring the weight of a sample heated from 0°C to 480°C.

EP TOX B/N/A. Subject the sample to the EP toxicity extraction procedure and then analyze the extract for base/neutral and acid fraction organic compounds.

4.0 RESULTS AND INTERPRETATION

Analytical results are summarized in Tables 5 through 9. Analytical data sheets are included in the Appendix.

4.1 COMPARISON OF RESULTS

The analytical results of metal and inorganic analyses (Table 5) indicate that the Filter Cake does not exhibit the characteristic of EP Toxicity in any of the samples. This result is consistent with the nature of the plant processes where no metallic-based catalysts or materials are currently in use. Based on these facts the filter cake is unlikely to possess the characteristics of EP-Toxicity.

Organic compound analytical results are summarized in Table 6. Concentrations tended to be higher in the fresh filter cake and filter cake bin samples although concentrations tended to be compound specific rather than sample specific.

More significant results can be seen by comparing the EP extract samples with the filter cake material. EP extract sample results indicate that the organic compounds in the filter cake are not likely to partition into the water phase.

Sample headspace analytical results are summarized in Table 7. Initially only volatile fraction compound analysis (Table 1) was planned. However, after analyzing the fresh filter cake (sample 5917A) no volatile fraction compounds were found present in the headspace above the sample at 43°C (110°F). Due to this result, only base/neutral and acid fraction compounds (listed in Tables 3 and 4) were analyzed in the filter cake bin, filter cake pile, and debris pile

Table 5

FILTER CAKE SAMPLE METAL AND INORGANIC RESULTS

Parameter	Sample[1] Fresh Filter Cake (mg/kg)	Sample[1] Bin/Pile Composite (mg/kg)	Sample[1] Debris Pile (mg/kg)	EP Extract Sample[2] Fresh Filter Cake (mg/l)	EP Extract Sample[2] Bin/Pile Composite (mg/l)	EP Extract Sample[2] Debris Pile (mg/l)	EP-Toxicity[3] Test Criteria (mg/l)
Arsenic	<0.5	<0.5	<0.5	<0.01	<0.01	<0.01	5.0
Barium	464	30	40	5.1	0.29	0.36	100.0
Cadmium	<0.2	0.4	<0.2	0.03	0.04	<0.01	1.0
Chromium	1.8	7.0	7.8	<0.01	<0.01	0.05	5.0
Lead	<1.0	<1.0	<1.0	<0.05	<0.05	<0.05	5.0
Mercury	<0.5	<0.5	<0.5	<0.02	<0.02	<0.02	0.2
Selenium	<0.5	<0.5	<0.5	<0.05	<0.05	<0.05	1.0
Silver	<0.5	<0.5	<0.5	<0.01	<.01	<0.01	5.0
Manganese	17	46	18	<0.01	<0.01	<0.01	No Criterion
Copper	1.5	2.6	2.2	<0.02	<0.02	<0.02	No Criterion
Zinc	3.1	11	14	0.16	0.12	0.15	No Criterion
Iron	954	334	426	0.17	<0.02	<0.02	No Criterion
Nickel	0.8	3.0	4.3	<0.05	<0.05	<0.05	No Criterion
Thallium	<5.0	<5.0	<5.0	<0.05	<0.05	<0.05	No Criterion
Nitrate	--	--	--	<0.5	<0.5	<0.5	No Criterion
Chlorine	--	--	--	9.1	99.8	36.3	No Criterion
Sulfate	--	--	--	<5	<5	<5	No Criterion
Cyanide	0.045	0.083	0.040				No Criterion
Fluoride	--	--	--	36	38	48	No Criterion

Notes: [1]Sample refers to material as collected. Results reported in mg/kg (ppm) found in original sample as collected.

[2]EP Extract sample refers to analysis of liquid fraction (water extract) developed using EP-Toxicity extraction procedure. Results reported in mg/l (ppm) found in EP extract.

[3]Concentration above which material is considered to fail the EP-Toxicity test.

--Not analyzed.

jd/MGMEF2/048

Table 6

FILTER CAKE SAMPLE ORGANIC COMPOUND RESULTS[1]

Parameter	Sample[2] Fresh Filter Cake (mg/l)	Sample[2] Filter Cake Bin (ppm)	Sample[2] Filter Cake Pile (ppm)	Sample[2] Debris Pile (ppm)	EP Extract Sample[3] Fresh Filter Cake (ppm)*	EP Extract Sample[3] Bin/Pile Composite (ppm)*	EP Extract Sample[3] Debris Pile (ppm)*
Xylene	6,100	6,900	2,000	3,600	1.7	4.1	2.6
Methyl ethyl benzene	23,000	15,000	6,300	12,000	1.6	2.4	1.8
Trimethylbenzene	48,000	19,000	8,200	16,000	4.5	3.5	3.1
2-Methyl styrene	3,700	2,000	890	2,000	0.66	0.77	ND
Dimethyl ethyl benzene	9,200	7,300	1,800	2,000	ND	ND	ND
Dimethyl pyridine	ND	ND	ND	ND	ND	0.67	0.55
Trimethyl pryidine	ND	ND	ND	ND	ND	ND	3.4
Naphthalene	11,000	6,400	4,900	6,200	2.4	2.7	2.4
Dicyclopentadiene	40,000	5,400	4,900	7,400	2.3	0.76	0.82
Toluene	430	580	150	140	NA	NA	NA
Ethyl benzene	130	330	ND	29	NA	NA	NA
1,3-Cyclopentadiene	170	390	80	17	NA	NA	NA
Styrene	990	180	ND	47	NA	NA	NA

Notes: [1]Results are presented only for compounds detected. See Appendix for full range of compounds analyzed for.

[2]Sample refers to material as collected. Results reported in ppm found in original sample as collected.

[3]EP Extract Samples refers to analysis of liquid fraction (water extract) developed using EP-Toxicity extraction protocol.

*Results reported in ppm found in EP extract.

NA - Not analyzed.

ND - Not detected.

jd/MGMEF2/048

Table 7
FILTER CAKE SAMPLE HEADSPACE RESULTS

Compound	Fresh Filter Cake (ug/ml)	Filter Cake Bin (ug/ml)	Filter Cake Pile (ug/ml)	Debris Pile (ug/ml)
Xylene	2.9	2.8	1.2	1.3
Methyl ethyl benzene	2.4	7.6	1.5	1.4
Trimethyl benzene	3.5	8.5	1.8	1.4
2-Methyl styrene	ND	0.8	0.2	ND
Dimethyl ethyl benzene	ND	0.6	0.1	ND
Naphthalene	ND	1.0	0.2	ND
Dicyclopentadiene	3.5	2.6	1.2	0.8
Styrene	3.0	ND	ND	ND

NOTES: Results reported in ug/ml in air in the headspace above the sample at 43°C (110°F).

ND = Not detected.

Table 8
FILTER CAKE SAMPLE PHYSICAL PROPERTIES

Property	Fresh Filter Cake	Filter Cake Bin	Filter Cake Pile	Bin/Pile Composite	Debris Pile
Flammability (1)					
- Lightable	Yes, immediately	Yes, difficult	No	No	No
- Duration	One minute	Ten seconds	--	--	--
- Residue	60%	80%	--	--	--
Desnity, lb/ft^3					
- Loose (2)	34.3	92.4	58.7	97.4	73.0
- Compacted (3)	65.6	--	86.2	109.3	106.1
Compression (4)					
- Leachage volume	None	10 ml (6)	None	None	None
- Pressure	60 psi	15 psi	60 psi	60 psi	60 psi
Headspace Analysis, ppm as methane (5)	800	1,000	400	500	500

NOTES:

[1] One gram of sample was exposed to flame and residue weight measured.

[2] Measured by filling graduated cylinder and gently tapping to aid settling.

[3] Measured by hand compaction in cylinder and recording volume change.

[4] Incremental pressure applied from 10 to 60 psi, to sample of 100-300g.

[5] Headspace in sample container was measured with organic vapor analyzer after sample had reached room temperature.

[6] 300 gram sample used.

jd/MGMEF2/048

Table 9
FILTER CAKE SAMPLE THERMOGRAVIMETRIC ANALYSIS RESULTS

Measurement	Fresh Filter Cake Sample 1	Fresh Filter Cake Sample 2	Filter Cake Bin	Filter Cake Pile	Debris Pile
% Volatiles (0-200°C)	24	24	40	23	34
% Organics (200-500°C)	19	14	9	20	12
% Total Ash	56	50	51	57	54
Total %	99 [a]	88 [a]	100	100	100

[a] Total does not add to 100%, apparently due to spattering of materials. Analyst expects the difference to be considered ash.

headspace samples. Compounds identified in the headspace were found in higher concentration in fresh filter cake and filter cake bin headspace samples than in the filter cake pile and debris pile samples. These results generally agree with what was found for organic compound analysis of the filter cake material.

The results of the physical properties tests are summarized in Table 8. The cake generally does not yield a free liquid under compression, and the cake generally does not support combustion. It was noted by the laboratory analyst that the very small sample (about one gram) resulted in a large surface to volume ratio, not expected under normal handling of the material. Therefore, these results would be expected to represent a worst case analysis. The samples did not exhibit a vigorous ignition.

The results of the thermographic analyses (Table 9) indicate there is no strong correlation between the gross levels of volatile/organic compounds in the sample and the cake age.

4.2 FRESH FILTER CAKE

The results in Tables 5 to 9 indicate that the fresh filter cake has the properties:

Inert (Ash)	50-56%
Volatile Organics	24%
Other Organics	14-19%

The filter cake loose density of about 34 lb/ft^3 is believed due to the sampling with the compacted density of 66 lb/ft^3 more reasonable (this also is close to the density of aged cake). It is significant that the fresh filter cake does not release a free liquid, even under compaction. The flammability test indicated that the fresh filter cake may

support ignition. The lack of volatiles in the headspace analysis indicates the organics that ignite are probably the base/neutral materials (Table 7).

4.3 FILTER CAKE BIN

The results in Tables 5 to 9 indicate the filter cake in the bin has the properties:

Inert (Ash)	51%	
Volatile Organics	40%	(0-200°C)
Other Organics	9%	(200-500°C)

The cake loose density is about 92 lb/ft^3. At 15 psi compression, about 10 ml liquid was leached from approximately 300 g. of sample. Note that this was the only sample where liquid leaching was observed, and that this was a small volume. The sample demonstrated a slight capability to ignite.

4.4 FILTER CAKE PILE

The results in Tables 5 to 9 indicate the filter cake in the bin has the properties:

Inert (Ash)	57%	
Volatile	23%	(0-200°C)
Other Organics	20%	(200-500°C)

The cake loose density is about 59 lb/ft^3, with compaction increasing this to about 86 lb/ft^3. The cake did not yield any liquid under compression and did not ignite.

4.5 DEBRIS PILE

The results in Tables 5 to 9 indicate the filter cake in the debris pile has the properties:

Inert (Ash)	54%	
Volatile	34%	(0-200°C)
Other Organics	12%	(200-500°C)

The cake loose density is about 73 lb/ft^3 with compaction increasing this about 1.06 lb/ft^3. The cake did not yield any liquid under compression and did not ignite.

5.0 CONCLUSIONS

1. The samples collected in this study are considered to be representative of the areas where filter cake may be located, except that the debris pile samples represent only the areas where the filter cake is suspected.

2. The analyses for all samples indicate that there are generally low levels of metals in the filter cake (exception barium and iron). There were no results that exceeded EP Toxicity limits.

3. The organics analyses identified the following compounds in at least one sample:

   Xylene
   Methylethylbenzene
   Trimethylbenzene
   2-Methyl styrene
   Dimethylethylbenzene
   Dimethylpyridine
   Trimethylpyridine
   Naphthalene
   Dicyclopentadiene
   Toluene
   Ethylbenzene
   1,3-Cyclopentadiene
   Styrene

4. None of the samples demonstrated a free liquid. A compression test on the samples indicated a small amount of leachate (about 20 ml for 300 g sample) for the filter bin sample. The other samples did not yield any liquid at a pressure of 60 psi.

5. The filter cake density appears to range from less than 60 lb/ft^3 to almost 110 lb/ft^3. The expected density is 70-90 lb/ft^3.

6. A one gram sample of the fresh filter cake was found to ignite immediately and sustain ignition for about 60 seconds. A one gram sample from the filter cake bin was found to ignite with some difficulty and sustain ignition for about 10 seconds. The other samples did not ignite.

April 8, 1981

Certified Mail

Mr. Rocky Kigamal
Southern Resins Division
Lawter Chemicals, Inc.
P. O. Box 267
Moundville, Alabama 35474

Dear Mr. Kigamal:

This is to confirm the conversation you, Mr. [illegible] (Chemical Spec. Lab), Mr. L. G. [illegible], Jr., and the writer had on [illegible]. Also, this will confirm the sampling conducted [illegible].

As mentioned, the open dump next to the new plant (Krumbhar plant) is unacceptable under the State Solid Waste Regulations. Also, it could possibly be in violation of State Water Pollution Laws.

Initially, you stated in the meeting that the waste disposed of at the Krumbhar plant dump site consisted of non-hazardous waste resin. However, upon inspection of the dump site, it was evident that other substances besides resin waste had been disposed of. Some of the substances mentioned in the drum labels are: [illegible]-methylene diamine, ethylene Glycol, nonyl phenol, Sodium Hydroxide, [illegible] acid, and soda ash. Other labels could not be identified. It is obvious that unknown types and quantities of substances with different toxicity characteristics have been disposed of at this site. This is an uncontrolled site. Therefore, after consulting this matter with my supervisor, Mr. Bernard [illegible], it was decided that this office [illegible] a clean up plan. [illegible] termination of the [illegible] Engineer [illegible].

In regard to the other [illegible] that some of the waste [illegible] the sample analysis results [illegible] to Mr. Jack [illegible], your [illegible].

As mentioned before in one of our previous correspondence, it is the generators responsibility to determine if their waste is hazardous and to insure that it will be properly treated, recycled, transported, disposed or otherwise managed, regardless of the final waste classification (hazardous or non-hazardous).

Mr. Rocky Kignal

April 9, 1981

It is suggested that you address in your plan these two disposal areas.

We would appreciate it if you keep us informed on your company's decision regarding clean up of these sites.

Should you have any questions, please let us know.

Sincerely,

Javier A. Calan, Environmentalist III
Division of Solid & Hazardous Waste
Environmental Health Administration

JAC:rm

Reference No. 8 — File: Southern Resins

10-31-84

ALABAMA DEPARTMENT OF

ENVIRONMENTAL MANAGEMENT

IN THE MATTER OF LAWTER INTERNATIONAL, INC. SOUTHERN RESINS DIVISION MOUNDVILLE, ALABAMA	ORDER NO. 85-008-WP

FINDINGS OF FACT

Pursuant to the provisions of the Alabama Environmental Management Act, Code of Alabama (1975) §§ 22-22A-1 et seq. (1983 Cum. Supp.) and the Alabama Water Pollution Control Act, Code of Alabama (1975) §§ 22-22-1 et seq. (1983 Cum. Supp.), the Alabama Department of Environmental Management (hereinafter, "the Department") makes the following FINDINGS OF FACT:

1. Lawter International, Inc., Southern Resins Division (hereinafter, "Southern Resins"), operates a facility for the manufacture of synthetic resins in Moundville, Alabama.

2. Southern Resins was issued NPDES Permit No. AL0026921 by the Department authorizing the discharge of pollutants and other industrial wastes from outfall serial numbers 001 and 001A to an unnamed tributary of the Black Warrior River, a water of the State, subject to certain limitations, terms and conditions.

3. Among the limitations contained in said permit, are daily maximum and daily average limitations for biochemical oxygen demand, five day (BOD_5), chemical oxygen demand (COD) and phenolics. Daily discharge limitations for said parameters are as follows:

	BOD_5 lbs/day	COD lbs/day	Phenolics lbs/day
Average	81	761	0.12 (Apr. - Sept.)
			0.18 (Oct. - Mar.)
Maximum	162	1522	0.36 (Apr. - Sept.)
			0.54 (Oct. - Mar.)

4. Southern Resins has violated its permit discharge limitations as follows:

Date	BOD_5 lbs/day	COD lbs/day	Phenolics lbs/day
11/09/83			.780
11/23/83			.747
11/30/83		1599	.863
Average	99	1055	.611
12/07/83		1823	1.77
12/14/83			.677
Average	103	1028	
1/04/84	253		
1/11/84	236		1.50
1/18/84	354	1771	2.75
1/25/84	387		2.53
Average		1297	1.76
2/01/84	378		2.70
2/08/84	250	1854	2.48
2/15/84	334	2275	
2/22/84	223		.582
2/29/84	332		.586
Average	303	1400	1.37
3/07/84	252		
3/14/84	178		
3/21/84	153		
3/28/84	405		
Average	246	996	.327
4/04/84	362	2806	.427
4/11/84	336	2108	.834
4/18/84	421	1807	1.04
4/25/84	197	1680	
Average	341	2097	.586

	BOD_5 lbs/day	COD lbs/day	Phenolics lbs/day
5/09/84	644		.619
5/16/84	247		.965
5/23/84			.607
Average	252		.507
6/06/84	343	1551	
6/21/84	302		
Average	211	1254	.279
7/05/84		2380	
7/11/84	165	2130	.399
7/18/84	170	2280	.435
7/25/84	324	3390	.662
Average	195	2543	.462

5. On May 17, 1983, Southern Resins spilled pollutants, i.e. resinous materials, into the unnamed tributary of the Black Warrior River, a water of the State.

6. On July 12, 1983, an inspection by Department staff revealed evidence of unpermitted discharges of pollutants to the unnamed tributary of the Black Warrior River and improper operation of a waste collection system.

7. On May 24, 1984, the Department requested that Southern Resins submit within 45 days a spill contaminant plan for the wastewater recycling area and an implementation schedule for said plan.

8. On August 16, 1984, a compliance inspection by Department staff revealed evidence of unpermitted discharges, improper waste collection, improper waste disposal, poor wastewater treatment and lack of progress on the recycle system.

ORDER

Based on the foregoing FINDINGS OF FACT and pursuant to Code of Alabama (1975) §§ 22-22A-5(10), 22-22-9(j) and 22-22-9(l) (1983 Cum. Supp.), it is hereby ORDERED:

A. That no later than December 1, 1984, Southern Resins shall cease the unpermitted discharge of pollutants to any waters of the State;

B. That Southern Resins shall perform the following actions necessary to provide additional collection, treatment and containment of Krumbhaar Plant wastewater, no later than the dates specified:

1. Complete all engineering, submit engineering plans and specifications to the Department and install concrete for dissolved air flotation equipment no later than November 15, 1984;

2. Install all major dissolved air flotation equipment no later than November 30, 1984;

3. Complete all piping installation no later than December 30, 1984;

4. Complete installation of instrumentation and pumps no later than February 1, 1985;

5. Complete operator training and complete operation and maintenance manual and submit to the Department no later than March 1, 1985; and

6. Operational completion of all facilities no later than April 1, 1985.

C. That no later than April 1, 1985, Southern Resins shall achieve, and continuously maintain thereafter, compliance with all the limitations, terms and conditions of NPDES Permit No. AL0026921;

D. That no later than July 1, 1985, a complete engineering report, detailing a biological treatability and design evaluation, waste treatment optimization study and final design change recommendations shall be submitted to the Department. The studies shall address optimization of overall biological, chemical and physical treatment in Southern Resins' wastewater treatment facility and shall be coordinated with Department staff during development.

E. That Southern Resins shall submit to the Department an implementation schedule for installation of the physical changes specified in the engineering report, with any modifications required by the Department, no later than August 1, 1985;

F. That Southern Resins shall comply with the implementation schedule required in Item E above, as approved by Department staff;

G. That no later than January 1, 1985 Southern Resins shall submit to the Department a complete inventory of liquid product and waste storage tanks, loading and handling areas, and a description of containment measures provided in accordance with spill prevention control and countermeasure plan regulations (40 C.F.R. Part 112);

H. That no later than February 1, 1985 Southern Resins shall implement the spill prevention control and countermeasure plan with any changes required by the Department;

I. That no later than February 1, 1985 Southern Resins shall develop and fully implement a method to store, handle and dispose of lime filter cake waste to prevent the discharge of stormwater runoff contaminated by such waste;

J. That the failure of Southern Resins to comply with any of the provisions of this Order shall constitute cause for the commencement of legal action for the recovery of civil penalties, criminal fines or other appropriate relief; and

K. That this Order is related to violations of the Alabama Water Pollution Control Act and its implementing regulations only. This Order does not constitute an endorsement by the Department that Southern Resins' operation is otherwise in compliance with all applicable environmental laws, rules and regulations, nor does compliance with the terms and conditions of this Order authorize violation of other applicable environmental laws, rules and regulations.

ORDERED and ISSUED this 31st day of October 1984.

Joe B. Broadwater, Director
Alabama Department of
Environmental Management
1751 Federal Drive
Montgomery, Alabama 36130
(205) 271-7700

CERTIFICATE OF SERVICE

I hereby certify that I have served Order No. 85-008-DW upon Lawter International, Inc. by sending the same, postage paid, through the United States Mail as Certified Mail, with instructions to forward and return receipt requested to:

Mr. Robert Voedisch
Lawter International, Inc.
990 Skokie Blvd.
Northbrook, Illinois 60062

Done this 1st day of November 1984.

Olivia Hardy Hudgins

Reference No. 9

Southern Resins Div.
Lawter International, Inc.
P.O. Box 128
MOUNDVILLE, ALABAMA 35474
Phone 205-371-2235

JUL 1985
RECEIVED
ADEM
LAND DIVISION

July 1, 1985

Mr. Bernard E. Cox, Jr.
Alabama Department of
Environmental Management
1751 Federal Drive
Montgomery, Al. 36130

RE: Filter Cake Removal
Southern Resins, Moundville, Al.

Dear Mr. Cox:

Removal of all lime filter cake and the adjacent debris pile from the Southern Resins site to Chemical Waste's Emelle hazardous waste landfill was completed on June 27, 1985.

During the removal process, examination of the debris pile showed it to contain pockets of contaminated material that had not previously been detected - significantly reducing the amount of uncontaminated material that could be held for separate disposal. The debris was classified as described in Mr. Moccia's letter to you of June 19, 1985 but when we checked the uncontaminated debris collected we decided that the quantity remaining was too small to justify separate disposal and it was shipped to Emelle along with the lime filter cake.

On removing the waste we found that a bed of red and gray mottled clay underlay the whole area where waste had been deposited. The clay appears to be uniform across the site and it is very stiff in texture; thus there should be less concern that solvents may have migrated from the waste downward into the soil.

Con't

File: Ben/So. Resins/Tuscaloosa

The site is now generally bare down to the clay except for a pile of uncontaminated soil extending from its center to the west edge of the area where the waste had been piled. Scrap steel in the area that was outside of the waste pile will be consolidated into one pile before it is removed from the site.

If you have any questions or need additional information regarding the removal of this waste to Emelle please give me a call.

Very truly yours,

F. Gordon Steward

F. Gordon Steward
General Manager

FGS/mj

cc: James A. Campbell
Lawter International, Inc.

David Hagen
A. D. E. M.

Hermann Mueller
Lawter International, Inc.

Richard A. Nordman
Lawter International, Inc.

David M. Moccia
CH2M Hill

Hale Co.

Refer... No. 10

April 8, 1981

Certified Mail

Mr. Mosby Elgamal
Southern Resins Division
Lawter Chemicals, Inc.
P. O. Box 267
Moundville, Alabama 35474

Dear Mr. Elgamal:

This is to confirm the conversation you, Mr. Jack Davis (Pussalsons Testing Lab), Mr. L. G. Idma, Jr., and the writer had on March 31, 1981 [illegible] plant. Also, this will confirm the sampling conducted during that day.

As mentioned, the open dump next to the new plant (Krumbhar plant) is unacceptable under the State Solid Waste Regulations. Also, it could possibly be in violation of State Water Pollution Laws.

Initially, you stated in the meeting that the waste disposed of at the Krumbhar plant dump site consisted of non-hazardous waste resin. However, upon inspection of the dump site, it was evident that other substances besides resin waste had been disposed of. Some of the substances mentioned in the drum labels were: Hexy-methylene diamine, ethylene Glycol, nonyl phenol, Sodium Hydroxide, [illegible] acid, and soda ash. Other labels could not be identified. It is obvious that unknown types and quantities of substances with different toxicity characteristics have been disposed of at this site. This is an uncontrolled site. Therefore, after consulting this matter with my supervisor, Mr. Bernard [illegible], it was decided that this office gives you 30 days from the receipt of this letter to submit a clean up plan. Also, your [illegible] contamination of the nearby [illegible]. It is suggested that the plan be prepared by an Engineer registered to practice in Alabama.

In regard to the other [illegible] (hydrocarbon plant), we informed you that some of the waste [illegible]. A copy of the sample analysis results (Mr. John [illegible] of Feb. 2, 1981) was provided to Mr. Jack Davis, your consultant. As mentioned, this is a toxic material.

As mentioned before in some of our previous correspondence, it is the generators responsibility to determine if their waste is hazardous and to insure that it will be properly treated, stored, transported, disposed of, or otherwise managed, regardless of its final waste classification (hazardous or non-hazardous).

Mr. Rocky Kignal April 8, 1981

It is suggested that you address in your plan these two disposal areas.

We would appreciate it if you keep us informed on your company's decision regarding clean up of these sites.

Should you have any questions, please let us know.

Sincerely,

Javier A. Colon, Environmentalist III
Division of Solid & Hazardous Waste
Environmental Health Administration

JAC:rm

cc:

Reference No. 11 File Dan

May 22, 1985

Mr. Hosny Elgamal
Southern Resins Division
Lawter International
Post Office Box 128
Moundville, Alabama 35434

Re: Notice of Violation
Facility I.D. No. ALD 004 034 138

Dear Mr. Elgamal:

On May 8, 1985, members of this Department met with representatives of CH_2M Hill to discuss the above referenced, facility's progress toward compliance with the Alabama Hazardous Waste Management Regulations. By issuance of this Notice of Violation, we will summerize those aspects of the Notice of Violation dated August 8, 1984, and the Notice of Violation dated April 15, 1985 to reflect the current situation and activities. The following actions should be taken:

1) Submit a comprehensive closure plan for the solvent contaminated CaF_2 filtercake waste piles in accordance with Section 4-256.23 of the Alabama Hazardous Waste Regulations. This must include an assessment of the extent of soil and groundwater contamination resulting from Southern Resins operation of the waste piles, as well as any corrective actions that may be necessary .

2) Submit a final list of all disposal areas (both on and off site) for the solvent contaminated calcium flouride filtercake waste stream generated since the unit began operations. This should supplement the letter of August 21, 1984, from Mr. Sharp and include all sanitary landfills.

3) Perform analysis of existing wells around K-Mart site (Harris Landfill) to determine areas of possible contamination.

Further evaluation indicates that currently generated wastes does not appear to be hazardous, but because of undesirable characteristics, it should be disposed of at a secure site. This being the case, Southern Resins would not be required to maintain generator's requirements in regard to the other aspects of our Regulations which were included in previous Notice of Violations. However, the Alabama Hazardous Waste Regulations are in the process of being updated and are subject to change. It is possible that the lime filtercake could be listed in the future so the facility would need to abide by the generator regulations in regard to the following:

Mr. Hosny Elgamal
Southern Resins Division
May 22, 1985

Current Section 4-249.01(a)	Storage of less than ninety (90) days
Current Section 4-249.01(b(1)	Storage must be in drums or tanks.
Current Section 4-249.01(e)	Adequate Personnel Training and Preparedness and Prevention/Contingency Plan.

Several other problems should be addressed in the facility remedial action plan. Bins and wastes piles which originally held hazardous wastes for over ninety (90) days must have closure plans in accordance with the Regulations. This was previously mentioned in actions that should be taken (#1). The removal of the leached filtercake and waste pile can proceed as is as long as that material does not meet the criteria for being a hazardous waste. It is the owner's/generator's responsibility to ensure the material does not contain a higher concentration of solvent. If levels increase to the point where flashpoint causes the waste to be classified as hazardous, it must be treated, stored and shipped as such. Also, prior to December 1984, solvent W was managed in a manner inconsistant with legitimate recycling of hazardous wastes. The facility remedial action plan currently being developed should address the storage tank area where decanting occured and the MPO slovent storage tank on Cracker Asphalt property where considerable spillage has occurred.

For the present, we will await your submittal of the facility remedial action plan, waste pile closure plan, and final list of disposal sites for the filtercake and contact you as needed.

If you have any questions please contact Messrs. Dave Davis or David Hagan at (205) 271-7700.

Sincerely,

Daniel E. Cooper, Chief
Land Division

DEC/DD/sdm
cc: Mr. Jim Campbell, Vice President
Lawter International
South Kearney, N.J. 07032

Mr. Dave Meesia
CH2M Hill
Montgomery, AL 36104

Mr. Fred Mason
ADEM - Groundwater

File: Southern Resins
10-31-84

Reference No. 12

ALABAMA DEPARTMENT OF

ENVIRONMENTAL MANAGEMENT

IN THE MATTER OF LAWTER INTERNATIONAL, INC. SOUTHERN RESINS DIVISION MOUNDVILLE, ALABAMA	ORDER NO. 85-008-WP

FINDINGS OF FACT

Pursuant to the provisions of the Alabama Environmental Management Act, Code of Alabama (1975) §§ 22-22A-1 et seq. (1983 Cum. Supp.) and the Alabama Water Pollution Control Act, Code of Alabama (1975) §§ 22-22-1 et seq. (1983 Cum. Supp.), the Alabama Department of Environmental Management (hereinafter, "the Department") makes the following FINDINGS OF FACT:

1. Lawter International, Inc., Southern Resins Division (hereinafter, "Southern Resins"), operates a facility for the manufacture of synthetic resins in Moundville, Alabama.

2. Southern Resins was issued NPDES Permit No. AL0026921 by the Department authorizing the discharge of pollutants and other industrial wastes from outfall serial numbers 001 and 001A to an unnamed tributary of the Black Warrior River, a water of the State, subject to certain limitations, terms and conditions.

3. Among the limitations contained in said permit, are daily maximum and daily average limitations for biochemical oxygen demand, five day (BOD_5), chemical oxygen demand (COD) and phenolics. Daily discharge limitations for said parameters are as follows:

	BOD_5 lbs/day	COD lbs/day	Phenolics lbs/day
Average	81	761	0.12 (Apr. - Sept.)
			0.18 (Oct. - Mar.)
Maximum	162	1522	0.36 (Apr. - Sept.)
			0.54 (Oct. - Mar.)

4. Southern Resins has violated its permit discharge limitations as follows:

Date	BOD_5 lbs/day	COD lbs/day	Phenolics lbs/day
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11/30/83		1599	.863
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Average	246	996	.327
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Average	211	1254	.279
7/05/84		2380	
7/11/84	165	2130	.399
7/18/84	170	2280	.435
7/25/84	324	3390	.662
Average	195	2543	.462

5. On May 17, 1983, Southern Resins spilled pollutants, i.e. resinous materials, into the unnamed tributary of the Black Warrior River, a water of the State.

6. On July 12, 1983, an inspection by Department staff revealed evidence of unpermitted discharges of pollutants to the unnamed tributary of the Black Warrior River and improper operation of a waste collection system.

7. On May 24, 1984, the Department requested that Southern Resins submit within 45 days a spill contaminant plan for the wastewater recycling area and an implementation schedule for said plan.

8. On August 16, 1984, a compliance inspection by Department staff revealed evidence of unpermitted discharges, improper waste collection, improper waste disposal, poor wastewater treatment and lack of progress on the recycle system.

ORDER

Based on the foregoing FINDINGS OF FACT and pursuant to Code of Alabama (1975) §§ 22-22A-5(10), 22-22-9(j) and 22-22-9(1) (1983 Cum. Supp.), it is hereby ORDERED:

A. That no later than December 1, 1984, Southern Resins shall cease the unpermitted discharge of pollutants to any waters of the State;

B. That Southern Resins shall perform the following actions necessary to provide additional collection, treatment and containment of Krumbhaar Plant wastewater, no later than the dates specified:

1. Complete all engineering, submit engineering plans and specifications to the Department and install concrete for dissolved air flotation equipment no later than November 15, 1984;

2. Install all major dissolved air flotation equipment no later than November 30, 1984;

3. Complete all piping installation no later than December 30, 1984;

4. Complete installation of instrumentation and pumps no later than February 1, 1985;

5. Complete operator training and complete operation and maintenance manual and submit to the Department no later than March 1, 1985; and

6. Operational completion of all facilities no later than April 1, 1985.

C. That no later than April 1, 1985, Southern Resins shall achieve, and continuously maintain thereafter, compliance with all the limitations, terms and conditions of NPDES Permit No. AL0026921;

D. That no later than July 1, 1985, a complete engineering report, detailing a biological treatability and design evaluation, waste treatment optimization study and final design change recommendations shall be submitted to the Department. The studies shall address optimization of overall biological, chemical and physical treatment in Southern Resins' wastewater treatment facility and shall be coordinated with Department staff during development.

E. That Southern Resins shall submit to the Department an implementation schedule for installation of the physical changes specified in the engineering report, with any modifications required by the Department, no later than August 1, 1985;

F. That Southern Resins shall comply with the implementation schedule required in Item E above, as approved by Department staff;

G. That no later than January 1, 1985 Southern Resins shall submit to the Department a complete inventory of liquid product and waste storage tanks, loading and handling areas, and a description of containment measures provided in accordance with spill prevention control and countermeasure plan regulations (40 C.F.R. Part 112);

H. That no later than February 1, 1985 Southern Resins shall implement the spill prevention control and countermeasure plan with any changes required by the Department;

I. That no later than February 1, 1985 Southern Resins shall develop and fully implement a method to store, handle and dispose of lime filter cake waste to prevent the discharge of stormwater runoff contaminated by such waste;

J. That the failure of Southern Resins to comply with any of the provisions of this Order shall constitute cause for the commencement of legal action for the recovery of civil penalties, criminal fines or other appropriate relief; and

K. That this Order is related to violations of the Alabama Water Pollution Control Act and its implementing regulations only. This Order does not constitute an endorsement by the Department that Southern Resins' operation is otherwise in compliance with all applicable environmental laws, rules and regulations, nor does compliance with the terms and conditions of this Order authorize violation of other applicable environmental laws, rules and regulations.

ORDERED and ISSUED this 31st day of October 1984.

Joe B. Broadwater

Joe B. Broadwater, Director
Alabama Department of
Environmental Management
1751 Federal Drive
Montgomery, Alabama 36130
(205) 271-7700

Reference No. 13

NUS CORPORATION AND SUBSIDIARIES		TELECON NOTE
CONTROL NO.	DATE: December 6, 1989	TIME: 1600
DISTRIBUTION: File		
BETWEEN: Alicia Finch	OF: AL Dept. of Conservation & Natural Resources - Land Protection	PHONE: (205) 271-7726
AND: Matt McCoy, NUS Corporation		

DISCUSSION:

Lawter Chemicals, also known as Southern Resin Division, filed a RCRA Part A but withdrew it. They never received interim status and are currently listed as a non-handler.

DRAFT

August 13, 1984

MEMORANDUM

TO: Buddy Cox

[illegible]

[illegible] Southern Resins/Lawter Chemicals, Inc.
Facility I. D. Number AL[illegible]

The following is a chronological list of the major regulatory events between Southern Resins and ADEM's Hazardous Waste Branch:

11/20/78
In a letter to N. J. Weinstein of ReCon Systems in Somerville, N. J., Mr. Dan Cooper, of what was then the Environmental Health Administration, enclosed a draft procedure for sanitary landfill approval. Mr. Weinstein had inquired over the phone earlier about on-site disposal of wastewater treatment sludge from the Southern Resins plant in Moundville.

5/29/80
Material Safety Data sheets on Southern Resins finished products are sent to Javier Colon. Buddy Cox made a notation on the bottom of the cover letter indicating the material may be hazardous due to ignitability.

8/7/80
Mr. Colon writes Mr. Allen of Southern Resins advising him to analyze his resin waste for possible hazardous waste characteristics, particularly ignitability.

8/18/80
Mr. Allen writes Javier Colon and encloses test results on two wastestreams at Southern Resins lime waste and bag collector waste, that indicates they are non-hazardous by characteristic.

9/4/80
The Part A, signed by R.T. Voedisch on August 13, 1980, is received by EPA. D002, U122 and U147 are the hazardous waste identified as being generated by Southern Resins.

9/8/80
Mr. Colon, in a memo to John Gable, of the Environmental Health Lab summarizes an inspection to Southern Resins in which he obtains samples of several wastestreams which Southern Resins is reluctant to identify for reasons of confidentiality. He is particularly concerned about one wastestream which "emits a strong odor of unkown solvent...causes headaches, dizziness, etc.."

1/6/81
Rita Ford sends letter to Mr. Walter Allen requesting him to correct deficiencies in Southern Resins Part A.

2/2/81
Analysis of the waste with a strong solvent odor shows that it contains a variety of alkyl benzenes.

2/23/81
In a letter to Ms. Rita Ford of USEPA, Mr. Walter S. Allen of Southern Resins withdraws the Part A for the facility.

4/8/81
Mr. Colon sends a letter to Mr. Hoshy Elgamal of Southern Resins directing him to clean up an open dump next to the Kruumbhar plant that contains possible hazardous wastes and he also reminds Mr. Elgamal of the generators' responsiblity for determing whether his waste is hazardous.

9/11/81
A memo to Buddy Cox from L. G. Linn documents the results of analyses Tuscaloosa Testing performed on Southern Resins wastestreams. Sample #4 flashed at 33° C but there is no indication in the memo as to which wastestream corresponds to this sample number.

9/10/81
An 8700-12 is signed (illegible) by the plant manager of Southern Resins. It indicates the facility is a generator of D001 wastes. A letter requesting withdrawal of Southern Resin's Part A is also sent to the Department of Public Health by Walter Allen.

9/25/81
A letter to Mr. Allen from Belinda Wilson of The Environmental Health Agency advises him of the requirements for storage of hazardous wastes for generators (i. e., less than 90 day limit), and generator's responsibility for determining if wastes is hazardous. She then says in the letter that the Part A withdrawal for Southern Resin will be approved by the State if EPA does not disagree by December 1, 1981.

10/9/81
A memo to Bernard E. Cox from Belinda Wilson lists all wastestreams. Only the scrubber waste was mentioned as being hazardous (by ignitability). The lime filter cake was listed as a solid waste being stored in waste piles.

10/27/81
A memo to Bernard E. Cox from Belinda Wilson concerning potential disposal sites for Southern Resin's non-hazardous industrial waste is written.

11/5/81
A letter to Mr. Allen of Southern Resin from Butler Hine of Tuscaloosa County Health Department granting permission to dispose of non-hazardous industrial waste at the Harris Landfill in Jerusalem Heights near Tuscaloosa is sent. This included permission to dispose of bulk lime filter material which the writer suspects is the solvent saturated filter cake now designated as a hazardous waste. Wastes excluded from landfilling at this site include "any hazardous waste and any liquid waste."

11/13/81
In a memo to Bernard E. Cox, Belinda Wilson states that Al Hanke of EPA said Southern Resins would have to submit a copy of their Part A to EPA along with an inventory of all hazardous waste generated during operational start up of the facility before his office can determine whether Southern Resin should remain on the TSDF list.

12/1/81
In a letter to Mr. Jack Honeycutt, Walter Allen of Southern Resin gives notification of his intention to dispose of drummed scrubber wastes (previously identified as hazardous by ignitability and covered under the small quantity exclusion) at the Tuscaloosa Landfill as he was directed by Mr. L. C. Harris.

7/21/83
Dr. Ed Passerini writes a letter to Jim Scarbrough complaining about the odor of wastes being dumped at the Harris Landfill and their possible toxic nature.

9/13/83
A letter is sent to Mr. Allen of Southern Resins from ADEM as a result of an August 31, 1983 inspection by Freda Griffis and Charles Fleming of the facility. The letter directs Southern Resin to analyze all wastestreams from the plant to determine if a hazardous waste is being generated.

10/10/83
Mr. Allen responds to ADEM's September 13, 1983, letter identifying five wastestreams generated by the plant. In this letter, Mr. Allen gives his reasons for determining all five wastestreams as non-hazardous.

12/8/83
Mr. Allen notifies ADEM that Southern Resin is constructing a concrete storage bin for the lime filter cake until final disposition can be determined.

Southern Resin/Lawter Chemicals
August 13, 1984

4/20/84
A letter is sent from Jack Honeycutt to Mr. William Sharp (Mike) granting approval for Southern Resin to dispose of non-hazardous solid waste at the Tuscaloosa Landfill but specifically prohibiting disposal of the lime filter cake anywhere but at a "secure chemical waste disposal site."

5/3/84
A memo to Bernard E. Cox from Jim Neal summarizes a visit to Southern Resin by he and Jack Honeycutt to discuss their waste disposal problem. They met with Mr. Hermann Mueller V.P. of Lawter International who wanted assistance in finding a disposal site for the plants non-hazardous industrial waste. Mr. Mueller assured Mr. Neal that the lime filter cake would be sent to a secure hazardous waste landfill.

7/25/84
Memo to Bernard E. Cox from the writer regarding a July 18, 1984, visit to Southern Resin with Fred Mason. At this time it was discovered that the lime filter cake waste pile was being mismanaged, with solvent leaching out of the containment structure and onto the ground.

7/25/84
Memo to Jack Honeycutt from Fred Mason summarizing the findings of the July 18, 1984 inspection of the proposed on-site landfill. Mr. Mason was concerned [illegible] ground water problems that may exist at the site due to past waste [illegible] ent practices.

8/8/84
An N. O. V. was sent to Southern Resin as a result of the information gained from the July 18, 1984 visit. It required Southern Resin to close the waste pile and begin managing the lime filter cake material in accordance with the generator standards of the Alabama Hazardous Waste Management Regulations.

It is evident from the correspondence in the files that Southern Resin failed in their responsibility to determine whether the wastes they generated were hazardous, even though the facility was repeatedly reminded to do so by ADEM. In addition, after the solvent filter cake was identified as a hazardous waste, it was not managed as such and continued to be disposed of at unauthorized sites. The most recent example of this was on August 8, 1984 when Mr. Butler Hine reported that some of the waste had been spilled on the road while it was being transported to a strip mine in Holt, Alabama for burial along with assorted non-hazardous industrial waste and trash from the facility.

DH/sjw

File: Southern Resin/Lawter Chemical

Reference No. 14

Dangerous Properties of Industrial Materials

Sixth Edition

N. IRVING SAX

Assisted by:

Benjamin Feiner/Joseph J. Fitzgerald/Thomas J. Haley/Elizabeth K. Weisburger

VNR VAN NOSTRAND REINHOLD COMPANY

New York

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BENZEDRINE SULFATE

CAS RN: 156310 NIOSH #: SI 1225000
mf: $C_{18}H_{26}N_2 \cdot H_2O_4S$; mw: 368.54

SYNS:
PHENETHYLAMINE, ALPHA-METHYL-, SULFATE (2:1)
DIAMPHETAMINE SULFATE
DL-ALPHA-METHYLPHENETHYLAMINE SULFATE
1-PHENYL-2-AMINOPROPANE SULFATE

TOXICITY DATA:	3	CODEN:
ipr-rat LDLo:25 mg/kg		JPETAB 100,267,50
scu-rat LDLo:10 mg/kg		JPETAB 71,62,41
scu-mus LD50:14 mg/kg		JPETAB 87,214,46
ipr-gpg LDLo:50 mg/kg		JPETAB 100,267,50

THR: HIGH ipr, scu. See also sulfates.
Disaster Hazard: When heated to decomp it emits very tox fumes of SO_x and NO_x.

D-BENZEDRINE SULFATE

CAS RN: 51638 NIOSH #: SI 1400000
mf: $C_{18}H_{26}N_2 \cdot H_2O_4S$; mw: 368.54

SYNS:
AMPHEDRINE
AMPHEREX
(+)-AMPHETAMINE SULFATE
D-AMPHETAMINE SULFATE
DEXAMPHETAMINE SULFATE
DEXAMYL
DEXEDRINA
DEXEDRINE SULFATE
DEXIES
D-ALPHA-METHYLPHENETHYLAMINE SULFATE
OBESEDRIN
FASTBALLS
HEARTS
DEXTROAMPHETAMINE SULFATE
DEXTRO-ALPHA-METHYLPHENETHYLAMINE SULFATE
ORANGES
PHENEDRINE
PHENOPROMIN
D-1-PHENYL-2-AMINOPROPANE SULFATE
DEXTRO-1-PHENYL-2-AMINOPROPANE SULFATE
D-BETA-PHENYLISOPROPYLAMINE SULFATE
DEXTRO-BETA-PHENYLISOPROPYLAMINE SULFATE

TOXICITY DATA:	3	CODEN:
ipr-mus TDLo:50 mg/kg/(8D preg):TER		TJADAB 1,413,68
unk-mus TDLo:50 mg/kg/(8D preg):TER		TJADAB 1,413,68
orl-rat LD50:38 mg/kg		JOPDAB 69,663,66
ipr-rat LD50:70 mg/kg		TXAPA9 45(1),49,78
scu-rat LD50:200 mg/kg		12VXA5 8,335,68
ivn-rat LD50:30 mg/kg		JPETAB 110,180,54
orl-mus LD50:33 mg/kg		TXAPA9 21,302,72
ipr-mus LD50:72 mg/kg		JPETAB 128,176,60
scu-mus LD50:16 mg/kg		AIPTAK 184,34,70
ivn-mus LD50:30 mg/kg		JPETAB 137,365,62
orl-dog LD50:10 mg/kg		PSEBAA 118,557,65
ivn-dog LD50:3 mg/kg		PSEBAA 118,557,65
ivn-rbt LD50:10 mg/kg		JPETAB 110,180,54

Toxicology Review: ISYAM* -,343,70; 27ZTAP 3,46,69.
THR: An exper TER. HIGH orl, ipr, scu, ivn. A habit-forming stimulant. See also sulfates.
Disaster Hazard: When heated to decomp it emits very tox fumes of SO_x and NO_x.

L-BENZEDRINE SULFATE

CAS RN: 51627 NIOSH #: SI 1575000
mf: $C_{18}H_{26}N_2 \cdot H_2O_4S$; mw: 368.54

SYNS:
(-)-AMPHETAMINE SULFATE
L-AMPHETAMINE SULFATE
LEVEDRINE
L-1-PHENYL-2-AMINOPROPANE SULFATE

TOXICITY DATA:	3	CODEN:
scu-rat LDLo:160 mg/kg		JPETAB 71,62,41
ipr-mus LD50:232 mg/kg		JPETAB 158,135,67

THR: HIGH scu, ipr. See also sulfates.
Disaster Hazard: When heated to decomp it emits very tox fumes of SO_x and NO_x.

BENZENAMINE HYDROCHLORIDE

CAS RN: 142041 NIOSH #: CY 0875000
mf: $C_6H_7N \cdot ClH$; mw: 129.60

Crystals. vap. d: 4.46, d: 1.22, mp: 198°, bp: 245°, flash p: 380°F (OC).

SYNS:
ANILINE HYDROCHLORIDE
"ANILINE SALT"
CHLORHYDRATE D'ANILINE (FRENCH)
CHLORID ANILINU (CZECH)
NCI-C03736
USAF EK-442

TOXICITY DATA:	3	CODEN:
skn-rbt 500 mg/24H MOD		28ZPAK -,65,72
eye-rbt 20 mg/24H SEV		28ZPAK -,65,72
orl-rat TDLo:130 gm/kg/2Y-C:CARC		NCITR* NCI-CG-TR-130,78
orl-rat TD:238 gm/kg/2Y-C:CARC		NCITR* NCI-CG-TR-130,78
orl-rat LD50:1072 mg/kg		NTIS** PB214-270
ipr-rat LDLo:500 mg/kg		NCNSA6 5,11,53
orl-mus LD50:841 mg/kg		NTIS** PB214-270
ipr-mus LD50:300 mg/kg		NTIS** AD277-689
orl-rat TD:137 gm/kg/60W-C:ETA		IARC** 27,39,82
orl-rat TD:2163 gm/kg/2Y-C:CAR		IARC** 27,39,82
orl-rat TD:4326 gm/kg/2Y-C:CAR		IARC** 27,39,82

Aquatic Toxicity Rating: TLm96:100-10 ppm WQCHM* 2,-,74. NCI Carcinogenesis Bioassay Completed; Results Positive: Rat (NCITR* NCI-CG-TR-130,78). NCI Carcinogenesis Bioassay Completed; Results Negative: Mouse (NCITR* NCI-CG-TR-130,78). Reported in EPA TSCA Inventory, 1980. EPA TSCA 8(a) Preliminary Assessment Information Proposed Rule FERREAC 45,13646,80.
THR: An exper CARC. HIGH ipr; MOD orl, ipr. MOD skn irr, SEV eye irr in rbt. See also aniline.
Fire Hazard: Slight, when exposed to heat or flame.
Spontaneous Heating: No.
Disaster Hazard: Dangerous; when heated to decomp, or on contact with acid or acid fumes, emits highly toxic fumes of aniline and chlorine compounds; can react vigorously with oxidizing materials.
To Fight Fire: Water, CO_2, water mist or spray, dry chemical.

BENZENE

CAS RN: 71432 NIOSH #: CY 1400000
mf: C_6H_6; mw: 78.12

Clear colorless liquid. mp: 5.51°, bp: 80.093°-80.094°, flash p: 12°F (CC), d: 0.8794 @ 20°, autoign. temp.: 1044°F, lel: 1.4%, uel: 8.0%, vap. press: 100 mm @ 26.1°, vap. d: 2.77, ulc: 95-100.

SYNS:

(6)ANNULENE	COAL NAPHTHA
BENZEEN (DUTCH)	CYCLOHEXATRIENE
BENZEN (POLISH)	FENZEN (CZECH)
BENZOL	MINERAL NAPHTHA
BENZOLENE	MOTOR BENZOL
BENZOLO (ITALIAN)	NCI-C55276
BICARBURET OF HYDROGEN	PHENYL HYDRIDE
CARBON OIL	PYROBENZOLE

TOXICITY DATA: 3	CODEN:
skn-rbt 15 mg/24H open MLD	AIHAAP 23,95,62
eye-rbt 88 mg MOD	AMIHAB 14,387,56
eye-rbt 2 mg/24H SEV	28ZPAK -,23,72
cyt-rat-scu 12 gm/kg/12D-I	GTPZAB 17(3),24,73
mnt-mus-ipr 500 uL/kg	ENMUDM 2,43,80
cyt-mus-orl 100 uL/kg	ENMUDM 2,43,80
cyt-mus-ipr 100 uL/kg	ENMUDM 2,43,80
dlt-mus-ipr 5 mg/kg	TPKVAL 15,30,79
cyt-rbt-scu 8400 mg/kg	PSDTAP 15,275,74
scu-mus TDLo:2700 mg/kg/(13D preg):TER	AMBNAS 17,285,70
ihl-hmn TCLo:100 ppm/10Y-I:CAR	TRBMAV 37,153,78
orl-rat TDLo:52 gm/kg/52W-I:CAR	MELAAD 70,352,79
skn-mus TDLo:1200 gm/kg/ 49W-I:NEO	BJCAAI 16,275,62
scu-mus TDLo:600 mg/kg/ 17W-I:ETA	KRANAW 9,403,32
par-mus TDLo:670 mg/kg/ 19W-I:ETA	KLWOAZ 12,109,33
ihl-hmn TC:400 ppm/8Y-I:ETA	BLOOAW 52,285,78
ihl-man TC:2100 mg/m3/4Y-I:CAR	NEJMAG 271,872,64
orl-rat TD:10 gm/kg/52W-I:CAR	MELAAD 70,352,79
orl-hmn TDLo:130 mg/kg:CNS	AHYGAJ 31,336,1897
ihl-hmn LCLo:20000 ppm/5M	29ZUA8 -,-,53
ihl-hmn TCLo:210 ppm:BLD	27ZXA3 -,341,63
ihl-rat TCLo:670 mg/m3/24H (15D pre/1-22D preg)	HYSAAV 33,327,68
ihl-rat TCLo:56600 ug/m3/24H (1-22D preg)	HYSAAV 33,112,68
ihl-rat TCLO:50 ppm/24H (7-14D preg)	JHEMA2 24,363,80
ihl-rat TCLO:150 ppm/24H (7-14D preg)	JHEMA2 24,363,80
scu-mus TDLo:1100 mg/kg (12D preg)	TOXID9 1,125,81
scu-mus TDLo:2700 mg/kg/(13D preg) TFX:TER	AMBNAS 17,285,70
orl-mus TDLo:9 gm/kg (6-15D preg)	TJADAB 19,41A,79
orl-mus TDLo:12 gm/kg (6-15D preg)	TJADAB 19,41A,79
orl-rat TD:10 gm/kg/52W-I TFX:CAR	MELAAD 70,352,79
ihl-hmn TCLo:100 ppm:CNS	INMEAF 17,199,48
unk-man LDLo:194 mg/kg	85DCAI 2,73,70
orl-rat LD50:3800 mg/kg	TXAPA9 19,699,71
ihl-rat LC50:10000 ppm/7H	28ZRAQ -,113,60
ipr-rat LDLo:1150 mg/kg	TXAPA9 1,156,59
orl-mus LD50:4700 mg/kg	HYSAAV 32,349,67
ihl-mus LC50:9980 ppm	JIHTAB 25,366,43
ipr-mus LD50:990 ug/kg	AGGHAR 18,109,60
orl-dog LDLo:2000 mg/kg	HBAMAK 4,1313,35
ihl-dog LCLo:146000 mg/m3	HBTXAC 1,324,56
ihl-cat LCLo:170000 mg/m3	HBTXAC 1,324,56
ivn-rbt LDLo:88 mg/kg	JTEHD6 -(Suppl.2),45,77
ipr-gpg LDLo:527 mg/kg	HBTXAC 1,42,56
scu-frg LDLo:1400 mg/kg	HBAMAK 4,1313,35
ihl-mam LCLo:20000 ppm/5M	AEPPAE 138,65,28

Aquatic Toxicity Rating: TLm96:100-10 ppm WQCH 2,-,74. Carcinogenic Determination: Human Suspec IARC** 7,203,74.

TLV: Air: 10 ppm DTLVS* 4,37,80. *Toxicology Revie* ARPAAQ 11,434,31; EVHPAZ 11,163,75; AEHLA\ 22,373,71; PAREAQ 4,1,52; FNSCA6 2,67,73; MUREAV 47(2),75,78; AMSVAZ 118,354,44; ZHPMAT 166,113,78; JTEHD6 -(suppl.2),69,77; PHRPA6 41,1357,26; CTOXAO 11,531,77; BNYMAM 54, 413,78; KRANAW 9,403,32; 27ZTAP 3,22,69. OSHA Standard: Air: TWA 10 ppm; CL 25 ppm; Pk 50 ppm/ 10M/8H (SCP-U) FEREAC 39,23540,74. DOT: Flammable Liquid, Label: Flammable Liquid FEREAC 41,57018,76. Occupational Exposure to Benzene recm std: Air: CL 10 ppm/60M NTIS**. Currently Tested by NTP for Carcinogenesis by Standard Bioassay Protocol as of December 1980. "NIOSH Manual of Analytical Methods" VOL 1 127, VOL 3 S311. Reported in EPA TSCA Inventory, 1980. EPA TSCA 8E NO:12770027-Followup Sent as of April, 1979.

THR: Poisoning occurs most commonly through inhal of the vapor, though benzene can penetrate the skin, and poison in that way. Locally, benzene has a comparatively strong irr effect, producing erythema and burning, and, in more severe cases, edema and even blistering. Exposure to high conc of the vapor (3000 ppm or higher) may result from failure of equipment or spillage. Such exposure, while rare in industry, may result in acute poisoning, characterized by the narcotic action of benzene on the CNS. The anesthetic action of benzene is similar to that of other anesthetic gases, consisting of a preliminary stage of excitation followed by depression and, if exposure is continued, death through respiratory failure. The chronic, rather than the acute form, of benzene poisoning is important in industry. It is a recog leukemogen. There is no specific blood picture occurring in cases of chronic benzol poisoning. The bone marrow may be hypoplastic, normal, or hyperplastic, the changes reflected in the peripheral blood. Anemia, leucopenia, macrocytosis, reticulocytosis, thromocytopenia, high color index, and prolonged bleeding time may be present. Cases of myeloid leukemia have been reported. For the supervision of the worker, repeated blood examinations are necessary, including hemoglobin determinations, white and red cell counts and differential smears. Where a worker shows a progressive drop in either red or white cells, or where the white count remains below 5,000 per cu mm or the red count below 4.0 million per cu mm, on two successive monthly examinations, he should be immediately removed from exposure. Following absorption of benzene, elimination is chiefly through the lungs, when fresh air is breathed. The portion that is absorbed is oxidized, and the oxidation products are combined with sulfuric and glycuronic acids and eliminated in the urine. This may be used as a diagnostic sign. Benzene has a definite cumulative action, and exposure to relatively high conc is not serious from the point of view of causing damage to the blood-forming system, provided the exposure is not repeated. On the other hand,

daily exposure to conc of 100 ppm or less will usually cause damage if continued over a protracted period of time. In acute poisoning, the worker becomes confused and dizzy, complains of tightening of the leg muscles and of pressure over the forehead, then passes into a stage of excitement. If allowed to remain in exposure, he quickly becomes stupefied and lapses into coma. In non-fatal cases, recovery is usually complete and no permanent disability occurs. In chronic poisoning the onset is slow, with the symptoms vague; fatigue, headache, dizziness, nausea and loss of appetite, loss of weight and weakness are common complaints in early cases. Later, pallor, nosebleeds, bleeding gums, menorrhagia, petechiae and purpura may develop. There is great individual variation in the signs and symptoms of chronic benzene poisoning. Benzene is a common air contaminant. Exper MUT, CARC, TER, ETA, NEO.

Fire Hazard: Dangerous, when exposed to heat or flame; can react vigorously with oxidizing materials, such as BrF_5, Cl_2, CrO_3, O_2NClO_4, O_2, O_3, perchlorates, ($AlCl_3$ + $FClO_4$), (H_2SO_4 + permanganates), K_2O_2, ($AgClO_4$ + acetic acid), Na_2O_2.

Spontaneous Heating: No.

Explosion Hazard: Mod, when its vapors are exposed to flame. Use with adequate ventilation.

Disaster Hazard: Dangerous, highly flammable.

To Fight Fire: Foam, CO_2, dry chemical.

Incomp: diborane.

For further information see Vol. 2, No. 4 and Vol. 3, No. 3 of *DPIM Report.*

BENZENEACETALDEHYDE

CAS RN: 122781 NIOSH #: CY 1450000
mf: C_8H_8O; mw: 120.16

SYNS:

HYACINTHIN	ALPHA-TOLUALDEHYDE
PHENYLACETALDEHYDE	ALPHA-TOLUIC ALDEHYDE
PHENYLETHANAL	

TOXICITY DATA:	2	CODEN:
skn-hmn 2%/48H		FCTXAV 17,357,79
orl-rat LD50:1550 mg/kg		FCTXAV 17,357,79
orl-mus LD50:3890 mg/kg		FCTXAV 17,357,79
orl-gpg LD50:3890 mg/kg		FCTXAV 17,357,79

Reported in EPA TSCA Inventory, 1980.

THR: MOD orl. Hmn skn irr. See also aldehydes.

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

BENZENEARSONIC ACID

CAS RN: 98055 NIOSH #: CY 3150000
mf: $C_6H_7AsO_3$; mw: 202.05

Colorless crystals, water-sol. d: 1.760, mp: 160° decomp.

SYNS:

PHENYL ARSENIC ACID	PHENYLARSONIC ACID

TOXICITY DATA:	3	CODEN:
orl-rat LDLo:50 mg/kg		JPETAB 93,287,48
orl-mus LD50:270 ug/kg		CLDND*
ivn-rbt LD50:16 mg/kg		JPETAB 80,93,44

Reported in EPA TSCA Inventory, 1980.

THR: HIGH via oral and ivn routes. A deadly poison. See also arsenic compounds.

Disaster Hazard: When heated to decomp it emits tox fumes of As.

BENZENEBORONIC ACID

CAS RN: 98806 NIOSH #: CY 8575000
mf: $C_6H_7BO_2$; mw: 121.94

SYNS:

ACIDE PHENYLBORIQUE (FRENCH)	PHENYLBORIC ACID
BOROPHENYLIC ACID	USAF BO-2

TOXICITY DATA:	3-2	CODEN:
orl-rat LD50:740 mg/kg		14KTAK -,708,64
ipr-mus LD50:500 mg/kg		NTIS** AD277-689
ivn-mus LD50:320 mg/kg		CSLNX* NX#02033
ivn-dog LDLo:450 mg/kg		BANMAC 135,314,51
orl-rbt LDLo:600 mg/kg		14KTAK -,708,64
skn-rbt LDLo:4500 mg/kg		14KTAK -,708,64
ipr-gpg LD50:284 mg/kg		BANMAC 135,314,51

Reported in EPA TSCA Inventory, 1980.

THR: HIGH ivn, ipr. MOD orl, ipr, ivn, skn. See also boron compds.

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

BENZENECARBOTHIOAMIDE

CAS RN: 63906898 NIOSH #: CV 5860000
mf: C_7H_7NS; mw: 137.21

SYNS:

BENZOTHIAMIDE	THIOBENZAMIDE
BENZOTHIOAMIDE	TIOBENZAMIDE (ITALIAN)

TOXICITY DATA:	3	CODEN:
orl-rat TDLo:6300 mg/kg/15W-C:ETA		BSIBAC 54,1027,78
ipr-mus LD50:500 mg/kg		PCJOAU 11,1383,77

THR: An exper ETA.

Disaster Hazard: When heated to decomp it emits very tox fumes of NO_x and SO_x.

BENZENECARBOXALDEHYDE

CAS RN: 63021329 NIOSH #: CU 3750000
mf: $C_{19}H_{15}N$; mw: 257.35

SYNS:

7-ETHYLBENZ(C)ACRIDINE	PHENYLMETHANAL
9-ETHYL-3,4-BENZACRIDINE	

TOXICITY DATA:	3	CODEN:
scu-mus TDLo:200 mg/kg:ETA		VOONAW 1,52,55

THR: An exper ETA. See also aldehydes.

Disaster Hazard: When heated to decomp it emits tox fumes of NO_x.

Found in several common fodder grasses, contains COUMARIN (FCTXAV 14,659,76)

SYNS:

FOIN COUPE
HAY ABSOLUTE

TOXICITY DATA: 2	CODEN:
skn-rbt 500 mg/24H MLD	FCTXAV 14,659,76

Reported in EPA TSCA Inventory, 1980.

THR: MLD irr in rabbits' skin. See also coumarin.

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

FOLIC ACID

CAS RN: 59303 NIOSH #: LP 5425000

mf: $C_{19}H_{19}N_7O_6$; mw: 441.45

A member of the vitamin B complex. Orange yellow needles or platelets, odorless, slightly sol in water, insol in lipid solvents, sol in dilute alkali hydroxide and carbonate solutions.

SYNS:

FOLACIN
FOLCYSTEINE
NSC 3073
PTEGLU
PTEROYL-L-GLUTAMIC ACID
USAF CB-13
VITAMIN BC
VITAMIN M

TOXICITY DATA: 3	CODEN:
ipr-mus LD50:100 mg/kg	NTIS** AD277-689
ivn-mus LD50:239 mg/kg	TXAPA9 23,537,72

Reported in EPA TSCA Inventory, 1980.

THR: HIGH ipr and ivn. A food additive permitted in food for hmn consumption.

Disaster Hazard: When heated to decomp it emits tox fumes, including NO_x.

FOMINOBEN HYDROCHLORIDE

CAS RN: 24600360 NIOSH #: DM 0450000

mf: $C_{21}H_{24}ClN_3O_3 \cdot ClH$; mw: 438.39

SYNS:

3'-CHLORO-ALPHA-(METHYL ((MORPHOLINOCARBONYL) METHYL)AMINO)-O-BENZOTOLUIDIDE HYDROCHLORIDE
NOLEPTAN
OLEPTAN

TOXICITY DATA: 2	CODEN:
orl-rat LD50:1250 mg/kg	12VXA5 9,544,76
ipr-rat LD50:1201 mg/kg	12VXA5 9,544,76
orl-mus LD50:2200 mg/kg	12VXA5 9,544,76
ipr-mus LD50:630 mg/kg	12VXA5 9,544,76

THR: MOD oral and ipr.

Disaster Hazard: When heated to decomp it emits very tox fumes such as HCl and NO_x.

FORMALDEHYDE

CAS RN: 50000 NIOSH #: LP 8925000

mf: CH_2O; mw: 30.03

Clear, water-white, very slightly acid, gas or liquid, pungent odor. Pure formaldehyde is not available commercially because of its tendency to polymerize. It is sold as aqueous solutions containing from 37% to 50% formaldehyde by weight and varying amounts of methanol. Some alcoholic solutions are used industrially and the physical properties and hazards may be greatly influenced by the solvent. lel = 7.0%, uel = 73.0%, autoign. temp.: 806°F, d: 1.0, bp: −3°F, flash p: (37% methanol-free): 185°F, flash p: (15% methanol-free): 122°F.

SYNS:

ALDEHYDE FORMIQUE (FRENCH)
ALDEIDE FORMICA (ITALIAN)
FANNOFORM
FORMALDEHYD (CZECH, POLISH)
FORMALDEHYDE, AS FORMALIN SOLUTION (DOT)
FORMALIN
FORMALINA (ITALIAN)
FORMALINE (GERMAN)
FORMALIN-LOESUNGEN (GERMAN)
FORMALITH
FORMIC ALDEHYDE
FORMOL
FYDE
HOCH
KARSAN
METHANAL
METHYL ALDEHYDE
METHYLENE OXIDE
NCI-c02799
OPLOSSINGEN (DUTCH)
OXOMETHANE
OXYMETHYLENE

TOXICITY DATA: 3	CODEN:
skn-hmn 150 ug/3D-I MLD	85DKA8 -,127,77
eye-hmn 4 ppm/5M	IAPWAR 4,79,61
skn-rbt 540 mg open MLD	UCDS** 4/21/67
skn-rbt 50 mg/24H MOD	TXAPA9 21,369,72
eye-rbt 750 ug SEV	AJOPAA 29,1363,46
mmo-sat 10 uL/plate	ANYAA9 76,475,58
mmo-esc 100 ppm/3H	AMNTA4 85,119,51
mmo-srm 5 gm/L	ATXKA8 28,93,71
sln-dmg-ihl 7 pph/24H	THAGA6 39,330,69
sln-dmg-orl 250 ppm	THAGA6 39,330,69
sln-dmg-par 3000 ppm	AMNTA4 86,330,52
dlt-dmg-orl 1300 ppm	MGGEAE 106,286,70
mmo-nsc 10 mmol/plate	CSHSAZ 16,245,52
mrc-smc 24 mmol/L	MUREAV 33,179,75
dns-hmn:hla 10 nmol/L	CNREA8 38,2621,78
dnd-rat-ihl 35 ug/m3/8W-I	PRKHDK 4,101,79
ihl-rat TCLo:6 ppm/69W-I TFX:ETA	CENEAR 57,7,79
scu-rat TDLo:1170 mg/kg/65W-I TFX:ETA	GANNA2 45,451,54
ihl-rat TC:15 ppm/69W-I TFX:ETA	CENEAR 57,7,79
scu-rat TD:350 mg/kg/78W-I TFX:ETA	FAONAU 50A,77,72
ihl-rat TC:15 ppm/6H/77W-I TFX:ETA	PESTC* 8,13,80
orl-wmn LDLo:36 mg/kg	29ZWAE -,328,68
ihl-hmn TCLo:17 mg/m3/30M TFX:IRR	JAMAAP 165,1908,57
unk-man LDLo:477 mg/kg	85DCAI 2,73,70
orl-rat LD50:800 mg/kg	JIHTAB 23,259,41
ihl-rat LCLo:250 ppm/4H	JIHTAB 31,343,49
scu-rat LD50:420 mg/kg	APTOA6 6,299,50
ivn-rat LD50:87 mg/kg	AEPPAE 221,166,54
ihl-mus LCLo:900 mg/m3/2H	JNCIAM 30,31,63
ipr-mus LDLo:16 mg/kg	TXAPA9 23,288,72
scu-mus LD50:300 mg/kg	APTOA6 6,299,50
scu-dog LDLo:550 mg/kg	AIPTAK 17,147,1907
ihl-cat LCLo:820 mg/m3/8H	APTOA6 6,299,50
skn-rbt LD50:270 mg/kg	UCDS** 4/21/67
scu-rbt LDLo:240 mg/kg	JAMAAP 62,984,14
orl-gpg LD50:260 mg/kg	JIHTAB 23,259,41

Aquatic Toxicity Rating: TLm 96:100-10 ppm WQCHM* 3,-,74.

TLV: Air: 2 ppm DTLVS* 4,197,80. *Toxicology Review:* EVHPAZ 11,163,75; CMTVAS 10(3),49,73; 32XPAD -,49,75; 27ZTAP 3,71,69. OSHA Standard: Air: TWA 3 ppm; CL 5; Pk 10/30M/8H (SCP-V) FEREAC

39,23540,74. DOT: Combustible Liquid, Label: None FEREAC 41,57018,76. Occupational Exposure to Formaldehyde recm std: Air: CL 1.2 mg/m3/30M NTIS**. Currently Tested by NTP For Carcinogenesis by Standard Bioassay Protocol as of December 1980. "NIOSH Manual of Analytical Methods" VOL 1 125,235, VOL 4 S327*. Reported in EPA TSCA Inventory, 1980.

THR: HIGH irr to skn, eyes, mu mem. If swallowed it causes violent vomiting and diarrhea which can lead to collapse. A fungicide. A common air contaminant. MUT data and ETA of the lung. Frequently or prolonged exposure can cause hypersensitivity leading to contact dermatitis, possibly of an eczematoid nature. At air conc of 20 ppm is irr to eyes.

Fire Hazard: Very dangerous for gas, mod for vapors. Will burn above flash point if exposed to flame, sparks, etc. Should formaldehyde be involved in a fire, irr gaseous formaldehyde may be evolved.

Spontaneous Heating: No.

Explosion Hazard: When aqueous formaldehyde solutions are heated above their flash points, a potential for explosion hazard exists. High formaldehyde conc or methanol content lowers flash point. Reacts with NO_x @ about 180°; the reaction becomes explosive. Also reacts violently with ($HClO_4$-aniline) and performic acid, nitromethane; magnesium carbonate, H_2O_2.

Disaster Hazard: MOD dangerous; because of irr vapor which may be in tox conc locally if storage tank is ruptured.

To Fight Fire: Stop flow of gas (for pure form); alcohol foam for 37% methanol-free form.

For further information see Vol. 1, No. 4 and Vol. 3, No. 3 of *DPIM Report.*

FORMALDEHYDE HYDROSULFITE

CAS RN: 149440 NIOSH #: PB 0380000
mf: $CH_4O_3S \cdot Na$; mw: 119.10

SYNS:
FORMALDEHYDE SODIUM BISULFITE ADDUCT
FORMALDEHYDE SODIUM SULFOXYLATE
SODIUM FORMALDEHYDE SULFOXYLATE
SODIUM HYDROXYMETHANESULFINATE
SODIUM SULFOXYLATE FORMALDEHYDE

TOXICITY DATA: 2	CODEN:
scu-mus LDLo:3000 mg/kg	PHRPA6 49,908,34

Reported in EPA TSCA Inventory, 1980. EPA TSCA 8(a) Preliminary Assessment Information Proposed Rule FERREAC 45,13646,80.

THR: MOD scu. See also formaldehyde and sulfites.

Disaster Hazard: When heated to decomp it emits tox fumes of SO_x.

FORMAL-gamma-TRIMETHYLAMMONIUM PROPANEDIOL

CAS RN: 541662 NIOSH #: BQ 2700000
mf: $C_7H_{16}NO_2 \cdot I$; mw: 273.14

SYNS:
((1,3-DIOXOLAN-4-YL)METHYL) TRIMETHYLAMMONIUM IODIDE
OXAPROPANIUM IODIDE

TOXICITY DATA: 3	CODEN:
scu-rat LDLo:25 mg/kg	BSCIA3 26,516,44
orl-mus LDLo:300 mg/kg	BSCIA3 26,516,44
scu-mus LDLo:35 mg/kg	BSCIA3 26,516,44
ivn-mus LDLo:2500 ug/kg	BSCIA3 26,516,44
scu-gpg LDLo:5 mg/kg	BSCIA3 26,516,44

THR: HIGH scu, orl, ivn.

Disaster Hazard: When heated to decomp it emits very tox fumes of NO_x and I^-.

FORMAMIDE

CAS RN: 75127 NIOSH #: LQ 0525000
mf: CH_3NO; mw: 45.05

Colorless, hygroscopic and oily liquid misc in water and alc; very sl sol in ether mp: 2.5, fp: 2.6°, vap. press: 29.7 mm @ 129.4°, flash p: 310°F (COC), bp: 210° decomp, d: 1.134 @ 20°/40°; 1.1292 @ 25°/4°.

SYNS:
CARBAMALDEHYDE
METHANAMIDE

TOXICITY DATA: 3	CODEN:
eye-rbt 23 mg	AJOPAA 29,1363,46
skn-rat TDLo:1200 mg/kg/(10-11D preg):TER	TXAPA9 41,35,77
orl-rat TDLo:2 gm/kg (7D preg) TER	85DJA5 -,95,71
orl-rat TDLo:7980 mg/kg (7-12D preg) TER	85DJA5 -,95,71
orl-rat LD50:7500 mg/kg	34ZIAG -,279,69
ipr-mus LD50:4600 mg/kg	TXAPA9 26,596,73
ivn-dog LDLo:1500 mg/kg	HBAMAK 4,1289,35
scu-frg LDLo:30 mg/kg	HBAMAK 4,1289,35
orl-rbt TDLo:607 mg/kg (6-18D preg)	ARZNAD 30,1557,80
skn-rbt LDLo:6 mg/kg	PJPPAA 32,223,80

TLV: Air: 20 ppm DTLVS* 4,199,80. Reported in EPA TSCA Inventory, 1980. EPA TSCA 8(a) Preliminary Assessment Information Proposed Rule FERREAC 45,13646,80.

THR: MOD to LOW via ims and oral routes. An irr skn, eyes and mu mem. An exper TER.

Fire Hazard: Mod. Vapors will burn in air at temp. above 310°F.

Incomp: I_2, pyridine, SO_3.

Disaster Hazard: When heated to decomp, emits tox fumes of NO_x. Has exploded while in storage.

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

FORMHYDROXAMIC ACID

CAS RN: 4312872 NIOSH #: LQ 4740000
mf: CH_3NO_2; mw: 61.05

SYN: FORMHYDROXAMSAEURE (GERMAN)

TOXICITY DATA: 2	CODEN:
scu-rat TDLo:500 mg/kg (10D preg)	APEPA2 257,296,67
scu-rat TDLo:500 mg/kg/(10D preg) TFX:TER	APEPA2 257,296,67
scu-rat LD50:570 mg/kg	APEPA2 257,296,67

THR: An exper TER. MOD scu.

Disaster Hazard: Dangerous; shock will explode it; when heated, burns and emits acrid fumes; can react on contact with oxidizing materials.

NAPHTHA, COAL TAR

CAS RN: 8030306 NIOSH #: QI 9450000

Dark straw-colored to colorless liquid. Sol in benzene, toluene, xylene, etc. bp: 149°-216°, flash p: 107°F (CC), d: 0.862-0.892, autoign. temp.: 531°F.

SYNS:

BENZIN
160 DEGREE BENZOL
COAL TAR NAPHTHA DISTILLATE
LIGHT LIGROIN
NAFTA (POLISH)
NAPHTHA
NAPHTHA, PETROLEUM
PETROLEUM BENZIN
PETROLEUM NAPHTHA

TOXICITY DATA:	2	CODEN:
inhl-rat LCLo:1600 ppm/6H		CHINAG 17,1078,39

TLV: Air: 300 ppm DTLVS* 4,433,80. OSHA Standard: Air: TWA 100 ppm (SCP-G) FEREAC 39,23540,74. "NIOSH Manual of Analytical Methods" VOL 2 S86. Reported in EPA TSCA Inventory, 1980.

THR: MOD via inhal route. Can cause unconsciousness which may go to coma, stentorious breathing and bluish tint to the skin. Recovery follows removal from exposure. In mild form, intoxication resembles drunkenness. On a chronic basis no true poisoning; sometimes headache, lack of appetite, dizziness, sleeplessness, indigestion and nausea. A common air contaminant. See oils, mineral.

Fire Hazard: Mod, when exposed to heat or flame; can react with oxidizing materials. Keep containers tightly closed.

Explosion Hazard: Slight.

To Fight Fire: Foam, CO_2, dry chemical.

alpha-NAPHTHAL

CAS RN: 66773 NIOSH #: QJ 0175000

TOXICITY DATA:	3	CODEN:
scu-dog LDLo:330 mg/kg		ZMWIAJ 19,545,1881

Reported in EPA TSCA Inventory, 1980.

THR: HIGH scu.

NAPHTHALENE

CAS RN: 91203 NIOSH #: QJ 0525000

mf: $C_{10}H_8$; mw: 128.18

Aromatic odor, white, crystalline, volatile flakes. mp: 80.1°, bp: 217.9°, flash p: 174°F (OC), d: 1.162, lel = 0.9%, uel = 5.9%, vap. press: 1 mm @ 52.6°, vap. d: 4.42. Autoign temp: 1053°F (567°C); sol in alc, benzene. Insol in water; very sol in ether, CCl_4, CS_2 hydronaphthalenes, in fixed and volatile oils.

SYNS:

CAMPHOR TAR
MOTH BALLS
MOTH FLAKES
NAFTALEN (POLISH)
NAPHTHALINE
NAPHTHENE
NCI-C52904
TAR CAMPHOR
WHITE TAR

TOXICITY DATA:	3	CODEN:
ipr-rat TDLo:5925 mg/kg (1-15D preg)		TXAPA9 48,A35,79
skn-rbt 495 mg open MLD		UCDS** 1/11/68
eye-rbt 100 mg MLD		BIOFX* 16-4/70
scu-rat TDLo:3500 mg/kg/12W-I:ETA		APAVAY 329,141,56
orl-chd LDLo:100 mg/kg		28ZRAQ -,228,60
unk-man LDLo:74 mg/kg		85DCAI 2,73,70
orl-rat LD50:1780 mg/kg		BIOFX* 16-4/70
ipr-mus LD50:150 mg/kg		NTIS** AD691-490
scu-mus LD50:969 mg/kg		TOIZAG 20(5/6),772,73
ivn-mus LD50:100 mg/kg		CSLNX* NX#00203
orl-dog LDLo:400 mg/kg		HBAMAK 4,1289,35
orl-cat LDLo:1000 mg/kg		HBAMAK 4,1289,35
orl-rbt LDLo:3 gm/kg		HBAMAK 4,1289,35
orl-mam LD50:1000 mg/kg		FMCHA2 -,D213,80

Aquatic Toxicity Rating: TLm96:10-1 ppm WQCHM* 3,-,74. *TLV:* Air: 10 ppm DTLVS* 4,293,80. *Toxicology Review:* 38ZNAA 1(1),93,71; JOPDAB 59,1,61; 27ZTAP 3,30,69. OSHA Standard: Air: TWA 10 ppm (SCP-T) FEREAC 39,23540,74. DOT-ORM-A, Label: None FEREAC 41,57018,76. Currently Tested by NTR for Carcinogenesis by Standard Bioassay Protocol as of Sept 1980. "NIOSH Manual of Analytical Methods" VOL 3 S292. Reported in EPA TSCA Inventory, 1980.

THR: MOD orl and HIGH ipr, ivn. An exper ETA. May be used as an insecticide. Systemic reactions include nausea, headache, diaphoresis, hematuria, fever, anemia, liver damage, vomiting, convulsions and coma. Poisoning may occur by ing of large doses, inhal or skn absorption.

Fire Hazard: Mod, when exposed to heat or flame; reacts with oxidizing materials. Reacts violently with CrO_3.

Spontaneous Heating: No.

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

To Fight Fire: Water, CO_2, dry chemical.

Incomp: Dinitrogen pentaoxide.

1-NAPHTHALENEACETAMIDE

CAS RN: 86862 NIOSH #: QJ 0590000

mf: $C_{12}H_{11}NO$; mw: 185.24

SYNS:

NAPHTHALENE ACETAMIDE
ALPHA-NAPHTHALENEACETAMIDE
ALPHA-NAPHTHYLACETAMIDE
1-NAPHTHYLACETAMIDE

TOXICITY DATA:	2	CODEN:
orl-mam LD50:1000 mg/kg		FMCHA2 -,D143,75

Reported in EPA TSCA Inventory, 1980.

THR: MOD orl.

Disaster Hazard: When heated to decomp it emits tox fumes of NO_x.

1-NAPTHTALENEACETIC ACID

CAS RN: 86873 NIOSH #: QJ 0875000

mf: $C_{12}H_{10}O_2$; mw: 186.22

skn-rbt 500 mg/24H MOD	28ZPAK -,28,72
eye-rbt 100 mg MLD	AIHAAP 19,353,58
eye-rbt 2 mg/24H SEV	28ZPAK -,28,72
ihl-man LCLo:27 gm/m3/10M	JOCMA7 8,358,66
ihl-man TCLo:350 ppm:PSY	WEHSAL 10,82,73
orl-hmn TDLo:670 mg/kg:GIT	NTIS** PB257-185
ihl-hmn TCLo:920 ppm/70M:CNS	AIHAAP 19,353,58
orl-rat LD50:10300 mg/kg	NTIS** PB257-185
ihl-rat LCLo:1000 ppm	FMCHA2 -,D317,80
ipr-rat LD50:5100 mg/kg	NTIS** PB257-185
orl-mus LD50:11240 mg/kg	NTIS** PB257-185
ihl-mus LCLo:11000 ppm/2H	HBTXAC 5,72,59
ipr-mus LD50:4700 mg/kg	TXAPA9 13,287,68
orl-dog LD50:750 mg/kg	FMCHA2 -,D317,80
ipr-dog LD50:3100 mg/kg	TXAPA9 10,119,67
ivn-dog LDLo:95 mg/kg	HBTXAC 5,72,59
orl-rbt LD50:5660 mg/kg	AIHAAP 19,353,58
scu-rbt LDLo:500 mg/kg	HBTXAC 5,72,59
orl-gpg LD50:9470 mg/kg	AIHAAP 19,353,58

Aquatic Toxicity Rating: TLm96:100-10 ppm WQCHM* 3,-,74. Carcinogenic Determination: Indefinite IARC** 20,515,79.

TLV: Air: 350 ppm DTLVS* 4,269,80. *Toxicology Review:* FAZMAE 18,365,74; EATR** EB-TR-75047; AIHAAP 40,A46,79. OSHA Standard: Air: TWA 350 ppm (SCP-J) FEREAC 39,23540,74. DOT: ORM-A, Label: None FEREAC 41,57018,76. Occupational Exposure to 1,1,1-Trichloroethane recm std: Air: CL 350 ppm/15M NTIS**. NCI Carcinogenesis Bioassay Completed; Results Negative (NCITR* NCI-CG-TR-3,77). Currently Tested by NTP for Carcinogenesis by Standard Bioassay Protocol as of December 1980. "NIOSH Manual of Analytical Methods" VOL 1 127, VOL 3 S328. NIOSH Current Intelligence Bulletin 27, 1978. Reported in EPA TSCA Inventory, 1980. EPA TSCA 8(a) Preliminary Assessment Information Proposed Rule FERREAC 45,13646,80.

THR: In hmn it causes PSY, GIT, CNS effects. A MOD irr, a SEV eye irr in rbts. LOW orl, ipr, ihl in us. MOD orl, ipr dog; Narcotic in high conc. proarrhythmic activity which sensitizes the Na epinephrine-induced arrhythmias. This some- a cardiac arrest particularly when this ly inhaled as in drug abuse for eu- tly with N_2O_4, O_2, O_2 liquid, Na,

Disaster see chlorides.

For further 2, No. 1 of *DPIM Report.*

1,1,2-TRICHLOROETHAN

CAS RN: 79005 N

mf: $C_2H_3Cl_3$; mw: 133.40

Liquid, pleasant odor. bp: 114°, fp: −35°, 20°/4°, vap. press: 40 mm @ 35.2°.

SYNS:

ETHANE TRICHLORIDE	TROICHLOROETAN(1,1,2) (POLISH)
NCI-C04579	VINYL TRICHLORIDE
BETA-TRICHLOROETHANE	
1,2,2-TRICHLOROETHANE	

TOXICITY DATA: 3	CODEN:
skn-rbt 500 mg open MLD	UCDS** 6/28/72
skn-rbt 810 mg/24H SEV	JETOAS 9,171,76
eye-rbt 162 mg MLD	JETOAS 9,171,76
skn-gpg 1440 mg/15M	APTOA6 41,298,77
cyt-gpg-skn 2880 ug/kg	APTOA6 41,298,77
orl-mus TDLo:76 gm/kg/78W-I:CAR	NCITR* NCI-CG-TR-74,78
orl-mus TD:152 gm/kg/78W-I:CAR	NCITR* NCI-CG-TR-74,78
orl-rat LD50:1140 mg/kg	UCDS** 6/28/72
ihl-rat LCLo:500 ppm/8H	AIHAAP 30,470,69
ipr-mus LD50:994 mg/kg	TXAPA9 9,139,66
scu-mus LD50:227 mg/kg	JPETAB 123,224,58
orl-dog LDLo:500 mg/kg	AJHYA2 16,325,32
ipr-dog LD50:450 mg/kg	TXAPA9 10,119,67
ivn-dog LDLo:95 mg/kg	QJPPAL 7,205,34
ihl-cat LCLo:13100 mg/m3/4.5H	AHBAAM 116,131,36
scu-rbt LDLo:500 mg/kg	QJPPAL 7,205,34

Aquatic Toxicity Rating: TLm96:100-10 ppm WQCHM* 3,-,74. Carcinogenic Determination: Animal Positive IARC** 20,533,79.

TLV: Air: 10 ppm (skin) DTLVS* 4,406,80. *Toxicology Review:* FAZMAE 18,365,74; AIHAAP 40,A46,79; 27ZTAP 3,146,69. OSHA Standard: Air: TWA 10 ppm (skin) (SCP-J) FEREAC 39,23540,74. NCI Carcinogenesis Bioassay Completed; Results Positive: Mouse (NCITR* NCI-CG-TR-74,78). NCI Carcinogenesis Bioassay Completed; Results Negative: Rat (NCITR* NCI-CG-TR-74,78). "NIOSH Manual of Analytical Methods" VOL 1 127, VOL 2 S134. NIOSH Current Intelligence Bulletin 27, 1978. Reported in EPA TSCA Inventory, 1980. EPA TSCA 8(a) Preliminary Assessment Information Proposed Rule FERREAC 45, 13646,80.

THR: HIGH ivn, scu and MOD orl, ihl, ipr and dermal. MOD skn irr and SEV eye irr in rbts. Trichloroethane has narcotic properties and acts as a local irr to the eyes, nose and lungs. It may also be injurious to the liver and kidneys. A fumigant. An exper CARC. MUT data.

Disaster Hazard: Dangerous; see chlorides.

Incomp: K.

For further information see Vol. 2, No. 6 and Vol. 3, No. 2 of *DPIM Report.*

1,1,1-TRICHLOROETHANE mixed with TETRACHLOROETHYLENE (3:1)

NIOSH #: KJ 3950000

SYNS:

DOWCLENE	EC CLEANER

TOXICITY DATA: 2-1	CODEN:
orl-rat LD50:15 gm/kg	AIHAAP 24,541,63
ihl-rat LC50:3700 ppm/7H	AIHAAP 24,541,63
orl-mus LD50:10 gm/kg	AIHAAP 24,541,63
orl-rbt LD50:13 gm/kg	AIHAAP 24,541,63
l-gpg LD50:6 gm/kg	AIHAAP 24,541,63

LOW orl, ihl in rat; LOW orl in mus; orl in rbt l in gpg.

zard: When heated to decomp it emits very Cl^-.

TRICHLOROETHANOL

CAS RN: 115208 NIOSH #: KM 3850000
mf: $C_2H_3Cl_3O$; mw: 149.40

Liquid. mp: 17.8°, bp: 150° @ 765 mm, d: 1.54 @ 25°/4°, vap. press: 1 mm @ 20°, vap. d: 5.16.

SYNS:
2,2,2-TRICHLOROETHANOL
TRICHLOROETHYL ALCOHOL
2,2,2-TRICHLOROETHYL ALCOHOL

TOXICITY DATA: 3-2	CODEN:
mmo-asn 5 uL/plate/2H	CBINA8 30,9,80
orl-rat LD50:600 mg/kg	12VXA5 8,1069,68
ipr-rat LDLo:300 mg/kg	JPETAB 63,453,38
ivn-mus LD50:201 mg/kg	28ZPAK -,78,72
ivn-rbt LDLo:50 mg/kg	JPETAB 63,453,38

Reported in EPA TSCA Inventory, 1980.
THR: HIGH via ivn and ipr routes. MOD via oral route. An anesthetic. MUT data.
Disaster Hazard: Dangerous; see chlorides.

TRICHLOROETHENYLSILANE

CAS RN: 75945 NIOSH #: VV 6125000
mf: $C_2H_3Cl_3Si$; mw: 161.49

Fuming liquid. bp: 90.6°; d: 1.265 @ 25°/25°; flash p: 1[illegible]°.

SYNS:
TRICHLORO(VINYL)SILANE
TRICHLOROVINYL SILICANE
VINYLSILICON TRICHLORIDE
VINYL TRICHLOROSILANE

TOXICITY DATA: 2	CODEN:
skn-rbt 1 mg/24H	AMIHBC 10,61,54
skn-rbt 625 mg open SEV	UCDS** 1/19/72
eye-rbt 50 ug SEV	AMIHBC 10,61,54
orl-rat LD50:1280 mg/kg	AMIHBC 10,61,54
ihl-rat LCLo:500 ppm/4H	UCDS** 1/19/72
orl-mus LD50:3160 mg/kg	HYSAAV 34,334,69
ihl-mus LC50:3020 mg/m3/4H	HYSAAV 34,334,69
skn-rbt LD50:680 mg/kg	AMIHBC 10,61,54

Aquatic Toxicity Rating: TLm96:100-10 ppm WQCHM* 4,-,74. DOT: Flammable Liquid, Label: Flammable Liquid FEREAC 41,57018,76. Reported in EPA TSCA Inventory, 1980.
THR: MOD orl, ihl, skn. A skn, eye irr. See also chlorosilanes.
Fire Hazard: Dangerous; reacts violently with water, moist air.
Disaster Hazard: When heated to decomp it emits tox fumes of Cl^-. Will react with water or steam to produce tox and corrosive fumes.

2,2,2-TRICHLORO-1-ETHOXYETHANOL

CAS RN: 515833 NIOSH #: KM 4725000
mf: $C_4H_7Cl_3O_2$; mw: 193.46

Crystals, less sol in water than chloral hydrate, sol in organic solvents. d: 1.143, mp: 47.5°, bp: 116°.

SYNS:
CHLORAL ALCOHOLATE
CHLORAL ETHYLALCOHOLATE
CHLORAL, ETHYL HEMIACETAL
TRICHLOROACETALDEHYDE MONOETHYLACETAL

TOXICITY DATA: 2	CODEN:
orl-rat LD50:880 mg/kg	JPETAB 78,340,43
orl-dog LDLo:1200 mg/kg	JPETAB 78,340,43
orl-cat LDLo:500 mg/kg	JPETAB 78,340,43
orl-rbt LDLo:1100 mg/kg	JPETAB 78,340,43

Reported in EPA TSCA Inventory, 1980.
THR: MOD via oral route.
Disaster Hazard: When heated to decomp it emits tox fumes of Cl^-.

TRICHLOROETHYLAMINE

NIOSH #: KR 9850000
mf: $C_2H_4Cl_3N$; mw: 148.41

SYN: TCEA

TOXICITY DATA:	CODEN:
mmo-asn 1700 umol/L	SOGEBZ 6,220,70

THR: MUT data.
Disaster Hazard: When heated to decomp it emits very tox fumes of Cl^- and NO_x.

TRICHLOROETHYL CARBAMATE

CAS RN: 107697 NIOSH #: FD 1750000
mf: $C_3H_4Cl_3NO_2$; mw: 192.43

SYN: CARBAMIC ACID 2,2,2-TRICHLOROETHYL ESTER

TOXICITY DATA: 3	CODEN:
ipr-mus TDLo:3250 mg/kg/13W-I TFX:NEO	JNCIAM 8,99,47
ipr-mus LD50:500 mg/kg	JNCIAM 8,99,47

THR: An exper NEO. MOD ipr. See also esters, carbamates.
Disaster Hazard: When heated to decomp it emits very tox fumes of Cl^- and NO_x.

TRICHLORO ETHYLENE

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

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

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

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

MUTATION DATA:	CODEN:
mmo-sat 100 uL/plate	NIOSH* 5AUG77
mma-sat 5 pph/2H	ARTODN 41,249,79
mma-smc 10 mL/L	MUREAV 48,173,77

slt-mus-ipr 1 mmol/L	MUREAV 46,202,77
dns-mus-orl 2500 mg/L	NTIS** AD-A080-636
dns-mus:bmr 1 mmol/L	NTIS** AD-A080-636
hma-mus/smc 400 mg/kg	JEPTDQ 1,411,78

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

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

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

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

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

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

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

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

Spontaneous Heating: No.

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

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

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

alpha-TRICHLOROETHYLIDENE GLYCEROL

CAS RN: 4692493 NIOSH #: JI 3380000
mf: $C_5H_7Cl_3O_3$; mw: 221.47

SYN: ALPHA-2-(TRICHLOROMETHYL)-1,3-DIOXOLANE-4-METHANOL

TOXICITY DATA: 2	CODEN:
ipr-mus LD50:920 mg/kg	JPETAB 81,72,44
ivn-mus LD50:520 mg/kg	JPETAB 81,72,44

THR: MOD ipr, ivn.

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

beta-TRICHLOROETHYLIDENE GLYCEROL

CAS RN: 4692493 NIOSH #: JI 3440000
mf: $C_5H_7Cl_3O_3$; mw: 221.47

SYN: BETA-2-(TRICHLOROMETHYL)-1,3-DIOXOLANE-4-METHANOL

TOXICITY DATA: 2	CODEN:
ipr-mus LD50:959 mg/kg	JPETAB 81,72,44
ivn-mus LD50:518 mg/kg	JPETAB 81,72,44

THR: MOD ipr, ivn.

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

PYRIBENZAMINE HYDROCHLORIDE

CAS RN: 154698 NIOSH #: US 3150000
mf: $C_{16}H_{21}N_3 \cdot ClH$; mw: 291.86

Insol in benzene, ether, ethylacetate.

SYNS:
N-BENZYL-N-DIMETHYLAMINOETHYL ALPHA-AMINOPYRIDINEHYDROCHLORIDE
2-(BENZYL(2-(DIMETHYLAMINO)ETHYL)AMINO)PYRIDINE HYDROCHLORIDE
N-BENZYL-N',N'-DIMETHYL-N-2-PYRIDYL-ETHYLENEDIAMINE HYDROCHLORIDE
N-BENZYL-N-ALPHA-PYRIDYL-N',N'-DIMETHYL-AETHYLENDIAMIN-HYDROCHLORID (GERMAN)
N,N-DIMETHYL-N'-(2-PYRIDYL)-N'-BENZYLETHYLENEDIAMINE HYDROCHLORIDE
PYRABENZAMINE
N(SUP 1)-ALPHA-PYRIDYL-N(SUP 1)-BENZYL-N,N-DIMETHYL ETHYLENEDIAMINE MONOHYDROCHLORIDE
TRIPELENNAMINE HYDROCHLORIDE

TOXICITY DATA: 3	CODEN:
dns-rat:lvr 100 umol/L	ENMUDM 3,11,81
ipr-mus LD50:47 mg/kg	CTOXAO 16,17,80
unk-man LDLo:15 mg/kg	85DCAI 2,73,70
orl-rat LDLo:200 mg/kg	TXAPA9 1,42,59
ivn-rat LD50:16 mg/kg	JPETAB 94,197,48
orl-mus LD50:121 mg/kg	JPETAB 113,72,55
ipr-mus LD50:50 mg/kg	JPETAB 113,72,55
scu-mus LD50:41 mg/kg	JPETAB 113,72,55
ivn-mus LD50:12 mg/kg	ARZNAD 14,940,64
ivn-dog LDLo:49 mg/kg	JPETAB 113,72,55
ivn-rbt LD50:12 mg/kg	JPETAB 94,197,48
orl-gpg LD50:155 mg/kg	JPETAB 113,72,55
scu-gpg LD50:30 mg/kg	JPETAB 113,72,55

Toxicology Review: 27ZTAP 3,148,69.
THR: HIGH unk, orl, ivn, ipr, scu.
Disaster Hazard: When heated to decomp it emits very tox fumes of NO_x and HCl.

PYRIDAPHENTHION

CAS RN: 119120 NIOSH #: TF 2275000
mf: $C_{14}H_{17}N_2O_4PS$; mw: 340.36

SYNS:
O,O-DIETHYL O-(2,3-DIHYDRO-3-OXO-2-PHENYL-6-PYRIDAZINYL)PHOSPHOROTHIOATE
O,O-DIETHYLPHOSPHOROTHIOATE, O-ESTER WITH 6-HYDROXY-2-PHENYL-3(2H)-PYRIDAZINONE
O-(1,6)-DIHYDRO-6-OXO-1-PHENYLPYRIDAZIN-3-LY), O,O-DIETHYL PHOSPHOROTHIOATE
ENT 23,968

TOXICITY DATA: 3-2	CODEN:
orl-rat LD50:850 mg/kg	FMCHA2 -,D223,80
skn-rat LD50:2100 mg/kg	FMCHA2 -,D223,80
orl-mus LD50:459 mg/kg	NEZAAQ 27,111,72
ipr-mus LD50:64 mg/kg	28ZEAL 4,170,69

THR: HIGH ipr. MOD orl, skn.
Disaster Hazard: When heated to decomp it emits very tox fumes of SO_x, PO_x and NO_x.

PYRIDINE

CAS RN: 110861 NIOSH #: UR 8400000
mf: C_5H_5N; mw: 79.11

Colorless liquid, sharp, penetrating, empyreumatic odor, burning taste. Flammable. bp: 115.3°, lel = 1.8%, uel = 12.4%, fp: −42°, flash p: 68°F (CC), d: 0.982, autoign. temp.: 900°F, vap. press: 10 mm @ 13.2°, vap. d: 2.73. Volatile with steam. Misc with water, alc, ether.

SYNS:
AZABENZENE
NCI-C55301
PYRIDIN (GERMAN)
PIRIDINA (ITALIAN)
PYRIDINE (DOT)
PIRYDYNA (POLISH)

TOXICITY DATA: 2	CODEN:
skn-rbt 10 mg/24H MLD	AMIHBC 4,119,51
eye-rbt 2 mg SEV	AMIHBC 4,119,51
mma-sat 6 mmol/L/2H	CNREA8 39,4152,79
orl-rat LD50:891 mg/kg	BIOFX* 14-4/70
ihl-rat LC50:4000 ppm/4H	AMIHBC 4,119,51
ipr-rat LD50:866 mg/kg	NTIS** PB195-158
scu-rat LD50:1000 mg/kg	PSEBAA 62,19,46
ipr-mus LDLo:1200 mg/kg	JCINAO 25,908,46
ivn-dog LD50:880 mg/kg	TXCYAC 4,165,75
skn-rbt LD50:1121 mg/kg	BIOFX* 14-4/70
orl-gpg LDLo:4000 mg/kg	JPHYA7 17,272,1894
ipr-gpg LDLo:870 mg/kg	JPHYA7 17,272,1894

Aquatic Toxicity Rating: TLm96:1000-100 ppm WQCHM* 4,-,74.
TLV: Air: 5 ppm (skin) DTLVS* 4,353,80. *Toxicology Review:* PAREAQ 4,1,52; 27ZTAP 3,122,69. OSHA Standard: Air: TWA 5 ppm (SCP-L) FEREAC 39,-23540,74. DOT: Flammable Liquid, Label: Flammable Liquid FEREAC 41,57018,76. Currently Tested by NTP for Carcinogenesis by Standard Bioassay Protocol as of December 1980. "NIOSH Manual of Analytical Methods" VOL 3 S161. Reported in EPA TSCA Inventory, 1980. EPA TSCA 8(a) Preliminary Assessment Information Proposed Rule FERREAC 45,13646,80.
THR: MUT data. A skn, eye irr. MOD orl, dermal scu ivn and ihal. Is mildly irr to skn and can cause CNS depression. Kidney, liver damage and GI upset also.
Fire Hazard: Dangerous; when exposed to heat, flame or oxidizers.
Spontaneous Heating: No.
Explosion Hazard: Severe, in the form of vapor, when exposed to flame or spark. Reacts violently with chlorosulfonic acid, CrO_3, maleic anhydride, HNO_3, oleum, perchromates, β-propiolactone, $AgClO_4$, H_2SO_4, formamide; SO_3; I.
Disaster Hazard: Dangerous; when heated to decomp it emits highly tox fumes of cyanides; can react vigorously with oxidizing materials.
To Fight Fire: Alcohol foam.

PYRIDINE-2-ALDOXIME

CAS RN: 873698 NIOSH #: TJ 5100000
mf: $C_6H_6N_2O$; mw: 122.14

SYN: P2A

TOXICITY DATA: 3	CODEN:
ipr-rat LD50:299 mg/kg	BJPCAL 13,202,58
ipr-mus LD50:200 mg/kg	NTIS** AD691-490

THR: HIGH ipr.

LAWTER INTERNATIONAL, INC.

MOUNDVILLE, ALA.

LIST OF HAZARDOUS MATERIALS USED PER SARA TITLE III, §311

Materials are categorized under their primary hazard with secondary hazards listed as notes under that main heading.

Mixtures exhibiting the same properties are listed as a group as are the hazardous components requiring that they be listed.

PHYSICAL HAZARDS

1. Combustibles

Common Name	Chemical Name	C.A.S. No.	Secondary Hazards
Cyclohexanone	Cyclohexanone	108-94-1	Irritant: Eyes, Skin, Respiration
D.I.B.K.	Diisobutyl Ketone	108-83-8	Irritant: Eyes, Skin, Respiration
DY-11	α-Methyl Styrene	98-83-9	Irritant: Eyes, Skin, Respiration
Rule 66 MS	Mineral Spirits	8052-41-3	Irritant: Eyes, Skin, Respiration
Resin Oil Mixture	N/A	N/A	
D.C.P.D.	See Below (1)	N/A	Irritant: Eyes, Skin, Respiration, Possible carcinogen
Heartcut	" " "	N/A	Irritant: Eyes, Skin, Respiration, Possible carcinogen
LRO-90	" " "	68477-54-3	Irritant: Eyes, Skin, Respiration, Possible carcinogen
Monomer 363	" " "	N/A	Irritant: Eyes, Skin, Respiration,

2. Flammables

Common Name	Chemical Name	C.A.S. No.	Secondary Hazards
Resin Oil Mixtures	N/A	N/A	
A-118	See Below (1)	N/A	Irritant: Eyes, Skin, Respiration, Possible carcinogen
BO-17	" " "	N/A	Irritant: Eyes, Skin, Respiration, Possible carcinogen
ECR-602	" " "	N/A	Irritant: Eyes, Skin, Respiration,
RI-300	" " "	N/A	Irritant: Eyes, Skin
RO-60	" " "	N/A	Irritant: Eyes, Skin, Respiration, Possible carcinogen
Solvent	N/A Mixture	N/A	Irritant: Eyes, Skin, Respiration

NOTE: (1) The resin oil mixtures contain 2 or more of the following materials:

Chemical Name	C.A.S. No.
Benzene	71-43-2
Ethylbenzene	100-41-4
Dicyclopentadiene	77-73-6
Indene	95-13-6
β-Methyl Styrene	98-82-8
Naphthalene	91-20-3
Styrene	100-42-5
Toluene	108-88-3
Trimethylbenzene	25551-13-7
Vinyl Toluene	25013-15-4
Xylene	1330-20-7

LAWTER INTERNATIONAL, INC.

MOUNDVILLE, ALA.

LIST OF HAZARDOUS MATERIALS USED PER SARA TITLE III, §311 CON'T

HEALTH HAZARDS

1. Corrosives

Common Name	Chemical Name	C.A.S. No.	Secondary Hazards
Acetic Acid	Acetic Acid	64-19-7	Combustible
Acrylic Acid	Acrylic Acid	150-76-5	Combustible
BF_3	Boron Trifluoride	7637-07-2	Compressed Gas
Caustic Soda	Sodium Hydroxide	1310-73-2	
1,3 Diamino-propane	1,3 Propanediamine	109-76-2	Combustible
E.D.A.	1,2 Ethanediamine	107-15-3	Combustible
H.M.D.A.	Hexamethylenediamine	124-09-4	
Isophorone diamine	3-Amino-3,5,5-Trimethyl cyolohexylamine	2855-13-2	
Maleic Anhydride	2,5-Furandione	108-31-6	
M.E.A.	Monoethanolamine	141-43-5	Combustible
Propionic Acid	Propionic Acid	79-09-4	Combustible
1,2 Propylene diamine	1,2 Propanediamine	78-90-0	Flammable

2. Irritants

Common Name	Chemical Name	C.A.S. No.	Secondary Hazards
Bisphenol A	4,4 Isopropylidene Diphenol	80-05-7	
Butylphenol	p-tert-Butylphenol	98-54-4	
Corexit 153	N/A - Mixture	N/A	
Claiborne MSO	N/A - Mixture	64741-86-2	
Dicalite	Amorphous Silica		
Dinonylphenol	Dinonylphenol	1323-65-5	
D.M.C.D.	Dimethyl 1,4-cyclo hexanedicarboxylate	94-60-1	
Dodecylphenol	Dodecylphenol	27192-86-8	
Ethylene Glycol	Ethylene Glycol	107-21-1	
Flexon 641	N/A - Mixture	N/A	
Formalin 37/7	Formaldehyde	50-00-0	Combustible, Possible carcinogen
Fumaric Acid	2-Butenedionic Acid(E)	110-17-8	
Lime Hydrated	Calcium Hydroxide	1305-62-0	
Magnesium Oxide	Magnesium Oxide	1309-48-4	
Octyl Phenol	Octyl Phenol	140-66-9	
Nonylphenol	p-Nonylphenol	25154-52-3	
Oxalic Acid	Ethanedionic Acid	144-62-7	
PARA	Paraformaldehyde	30525-89-4	Combustible, Possible carcinogen
Pelargonic Acid	Pelargonic Acid		
Therminol 75	Terphenyls &	26140-60-3	
	Triphenylene	217-59-4	
1,1,1 Trichloro ethane	Methyl Chloroform	71-55-6	CNS Depressant
T.P.P.	Triphenyl Phosphite	101-02-0	

Reference No. 1

CLIMATIC ATLAS OF THE UNITED STATES

RCE . Environmental Science Services Administration . Environmental Data Service

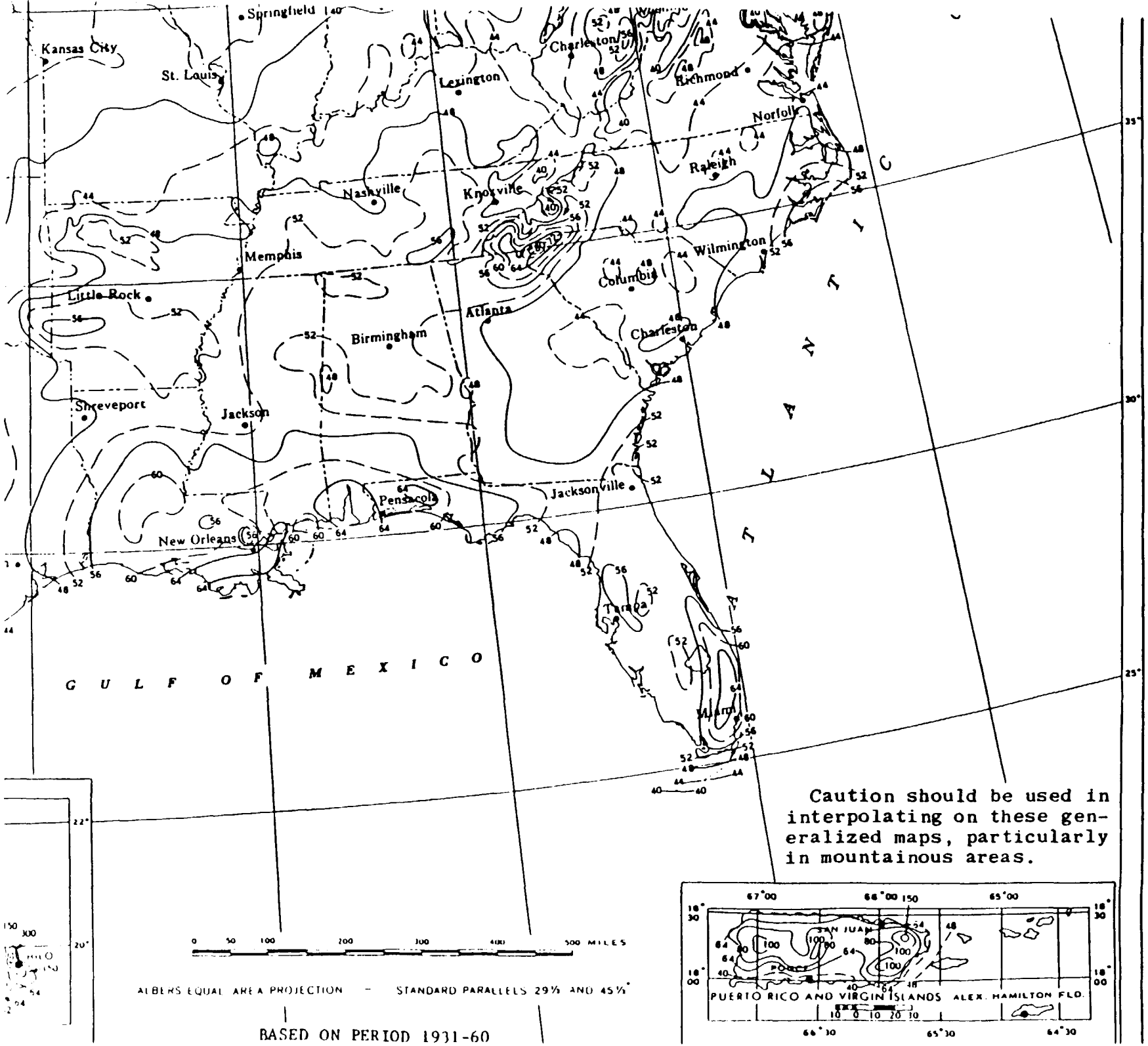
U.S. DEPARTMENT OF COMMERCE
C. R. Smith, Secretary

ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
Robert M. White, Administrator

ENVIRONMENTAL DATA SERVICE
Woodrow C. Jacobs, Director

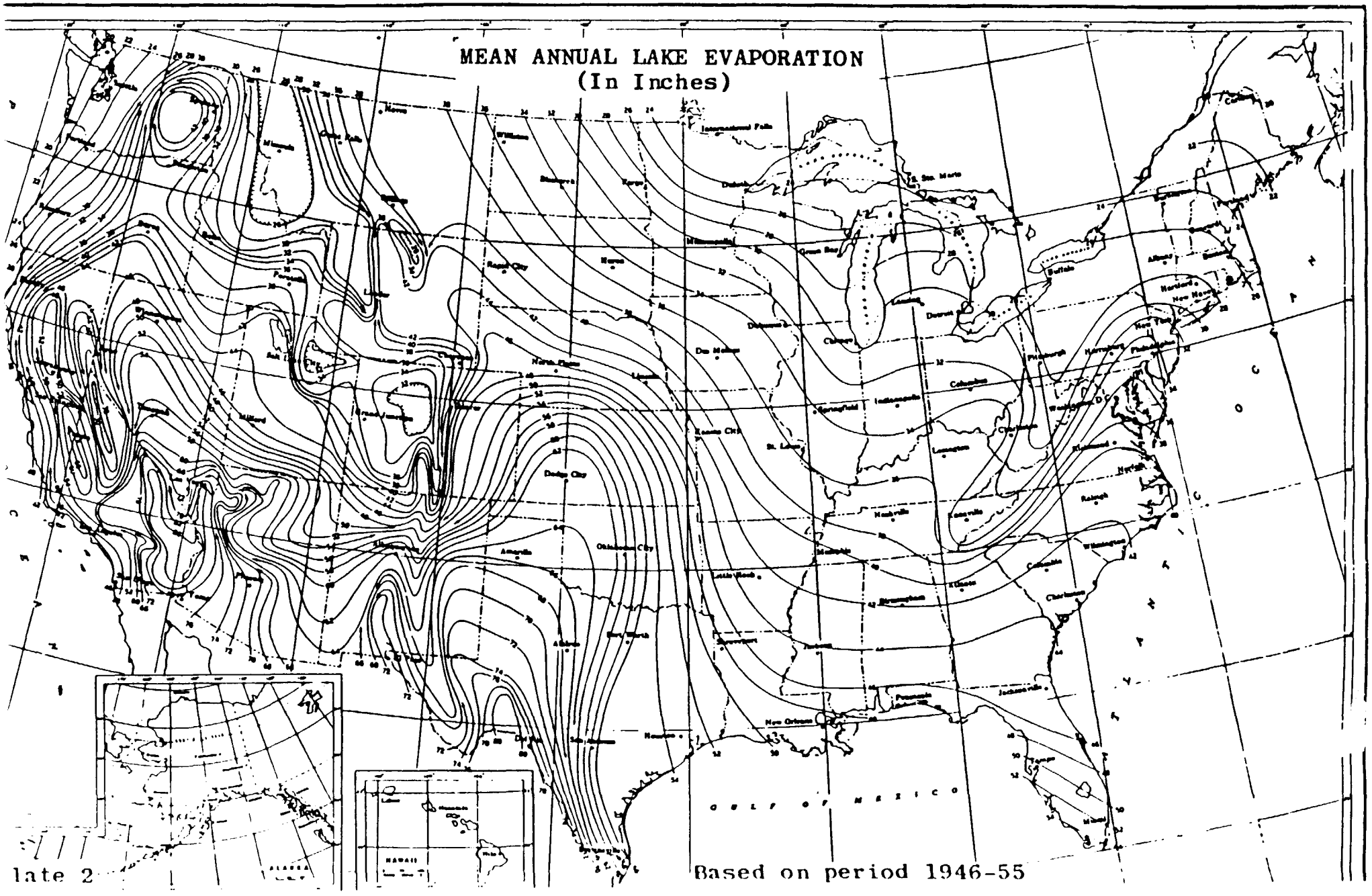
JUNE 1968

REPRINTED BY THE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
1983



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

KE EVAPORATION



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Reference No. 17 Bob Donaghue

VERTEBRATE ANIMALS OF ALABAMA IN NEED OF SPECIAL ATTENTION

Edited by

ROBERT H. MOUNT
Professor of Zoology-Entomology

Published by

Alabama Agricultural Experiment Station
Auburn University
David H. Teem, Acting Director

As A Contribution To

Alabama's Nongame Wildlife Program

In Cooperation With

Game and Fish Division
Alabama Department of Conservation
and Natural Resources
Charles D. Kelley, Director

The Snowy Plover requires undisturbed, sandy beaches and, more so than most other creatures, its numbers are greater on islands. The Piping and Snowy plovers appear to be complementary sister species. The more cosmopolitan Snowy Plover is replaced in the northeast by the Piping Plover, which winters with it on the Gulf Coast where there appears to be no competition.

BASIS FOR STATUS CLASSIFICATION. In recent decades, the Snowy Plover's critical beaches have been subjected to excessive human activity. Some human recreation is not detrimental, but when a great many people take part or when the activity includes vehicles, the beach as a habitat for wild creatures, plant and animal, suffers.

Development of beaches is an even more serious threat because it is permanent. The building of houses, apartments, and other structures on the beach has become excessive.

RECOMMENDATIONS. Although legislation exists to limit the use of off-road vehicles, it is often violated and should be more vigorously enforced. The few remaining relatively pristine beaches in Alabama should be kept as natural as possible. Recreational use of beaches should be regulated to the extent practicable to avoid unnecessary disturbance of the fragile habitat. The public should constantly be reminded that the plant and animal life associated with the coast are important in making it attractive.

Ideally, no human intrusion at all is best for the Snowy Plover, especially during breeding. If possible, Sand and Pelican islands, the western portion of Dauphin Island, Fort Morgan, and some part of the Alabama Point area should be set aside as sanctuaries.

Range of the Snowy Plover.

SELECTED REFERENCES

AMERICAN BIRDS, 1971-1983 (Audubon Field Note 1970, Vols. 1-24) Vols. 25-37 Bi-Monthly, Nationa bon Society, New York; four issues contain season one the Christmas Count, all of which contain (tional data on the Snowy Plover.

CHAPMAN, F. M. 1966. Handbook of Birds of Easter America. Dover, N.Y. 581 pp.

HARRISON, C. 1978. A Field Guide to the Nests, E Nestlings of North American Birds. Collins, Glas pp.

IMHOF, T. A. 1976. Alabama Birds, Second Ed. Un Press, Tuscaloosa. 445 pp.

PREPARED BY: Thomas A. Imhof, 1036 Pike Ro mingham, Alabama 35218.

Endangered

RED-COCKADED WOODPECKER

Picoides borealis (Vieillot)
Family Picidae
Order Piciformes

OTHER NAMES. None.

DESCRIPTION. The Red-cockaded Woodpecker i the size of the Hairy Woodpecker, which it resembles it has a zebra-like back, a black crown and a large white patch. Male birds have a small red spot near the ear wise the sexes are similar. Length 20 cm (8½ inches).

FIG. 66. Red-cockaded Woodpecker (Ed Tyberghein).

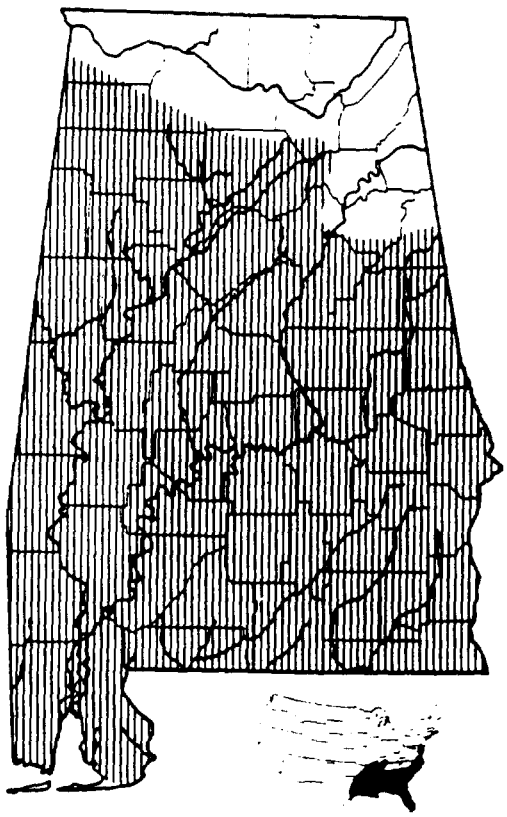
RANGE. This woodpecker is resident from eastern (homa, Kentucky, and southern Maryland south to eas Texas and southern Florida. In Alabama, it is found local most of the State south of the Tennessee River.

HABITAT. Red-cockaded Woodpeckers reside in c pine woods. Requirements include living mature pines

ing dead hearts, within which the birds excavate their nest cavities. Optimal habitat has, in addition, interspersed stands of young pines, which provide good sites for foraging.

LIFE HISTORY AND ECOLOGY. Red-cockaded woodpeckers travel through open pine woods in small bands searching limbs, twigs, and cones for the insects that comprise the main portion of their food. Some seeds are also eaten. This species invariably nests in the aforementioned mature pines. The nest hole is dug into the center of the tree and angles upward until the dead heartwood is reached. The bird then digs straight down for about 30 cm (1 foot). Small holes are pecked above and below the nest entrance, allowing sap to flow and cover the surface around the hole and downward for about 1 m or so. The sticky surface apparently tends to repel such predators as snakes and flying squirrels. Two to 6 glossy white eggs are laid in the cavity. Old cavities are used for roosting.

BASIS FOR STATUS CLASSIFICATION. The culling of "substandard" trees and the increasingly extensive areas devoted to short-rotation forestry have greatly reduced Red-cockaded Woodpecker populations. Large pine trees with dead hearts are undesirable in the view of commercial foresters, and many have been removed. Many forest managers, knowing the endangered status of this species, now leave the nesting trees as well as a few large trees that surround them. At the present time, the extent of the area that should be left alone to enable a nesting colony to survive indefinitely is unknown. It has been estimated, however, that the home range size may approach 80 ha (200 acres). THE SPECIES IS CONSIDERED ENDANGERED BY THE UNITED STATES DEPARTMENT OF THE INTERIOR.



Range of the Red-cockaded Woodpecker.

RECOMMENDATIONS. Life history and habitat studies on the Red-cockaded Woodpecker are underway throughout the range. These studies are being coordinated through the Endangered Species Office of the U. S. Fish and Wildlife Service. Until concrete information is available on the species' requirements, little can be done to assure that the population can be brought out of danger. All corporate and individual owners of large tracts of forestland should be kept informed of current research and encouraged to set aside a few acres of trees surrounding Red-cockaded Woodpecker nesting sites.

SELECTED REFERENCES

IMHOF, T. A. 1976. Alabama Birds. Second Ed., Univ. of Ala. Press, Tuscaloosa. 445 pp.

ROBBINS, C. S., B. BRUUN, AND H. S. ZIM. 1966. Birds of North America. Golden Press, N.Y.

U. S. FISH AND WILDLIFE SERVICE. 1976. Red-cockaded Woodpecker Recovery Plan. U.S. Fish and Wildl. Serv., Washington, D.C.

PREPARED BY: James E. Keeler, 3576 N. Georgetown Dr., Montgomery, Alabama 36109

Endangered

BACHMAN'S WARBLER

Vermivora bachmani (Audubon)
Family Emberizidae
Order Passeriformes

OTHER NAMES. None.

DESCRIPTION. Length: 11.5 cm (4.5 inches). Adult males with yellow forehead and chin and black cap and throat, or bib. Amount of black in the cap and throat patch varies. Upper parts olive-green and under parts yellow except for white undertail coverts. Adult females with yellow forehead, gray crown and cheeks, and prominent yellow eye ring. Breast buff-colored or only slightly yellowish. Both adult males and females have noticeable yellow shoulder patch, not always stressed in field guides, which may be a useful field mark. Immatures buff below, brown above, and have whitish eye ring.

RANGE. Breeding has been recorded only in Alabama, Arkansas, Kentucky, Missouri, and South Carolina. The species has also been recorded in Florida, Georgia, Indiana, Louisiana, Mississippi, North Carolina, Oklahoma, and Virginia. The winter range is Cuba, including the Isle of Pines. The present distribution is unknown, and no populations are known.

HABITAT. Bachman's Warbler frequents, or formerly frequented, mature hardwood bottoms and headwater swamps where openings permit the development of second growth vegetation. Apparently it does not inhabit swamps that are subject to flooding for extended periods of time. From descriptions of 32 nesting habitats in the southern Coastal Plain reported between 1897 and 1919, the plant communities used for nesting were sweet bay-swamp tupelo-red maple associ-

RANGE. Although the mountain lion once ranged over much of the Eastern United States, including Alabama, its present range is greatly reduced. No Alabama specimens are present in museums. Undocumented sight reports are fairly numerous, but most are difficult to believe. Hamilton and Whitaker note, "one shot in Tuscaloosa County, Alabama in 1956" (but no specimen). A cast of a track was made on the Fred T. Stimpson Wildlife Reserve in Clarke County in 1961. The only positive sight record is given by Ralph Allen (retired, Alabama Department of Conservation and Natural Resources), who had personal knowledge of a pair of mountain lions that denned and reared cubs at a remote site in northern Baldwin County.

HABITAT. In the Southeast, the mountain lion prefers thick, remote swamps, and extensively wooded river floodplains.

LIFE HISTORY AND ECOLOGY. One to three young are born early in the year, and the young are cared for by the parents. Otherwise, solitary life is customary. Food is mainly white-tailed deer, which have become abundant in many areas of Alabama. Smaller animals, such as rabbits and rodents, and also birds are occasionally taken.

The home range is large and these cats usually travel at night or early morning. They seldom leave distinguishable footprints that are useful records because they tend to walk on surfaces that do not permit the formation of good prints.

BASIS FOR STATUS CLASSIFICATION. The mountain lion of the Southeast, *F. c. coryi*, IS CLASSIFIED BY THE UNITED STATES DEPARTMENT OF THE INTERIOR AS ENDANGERED. Its small numbers and decreasing availability of its habitat support this classification.

RECOMMENDATIONS. Protection of the few remaining areas of extensively forested, remote wildlands, such as the Tensaw-Mobile River swamp, would be helpful. Educational programs designed to promote public understanding and conservation of this animal would likewise be beneficial.

SELECTED REFERENCES

CURRIER, M. J. P. 1983. *Felis concolor*. Mammalian Species 200:1-7. Am. Soc. Mamm.

DOWNING, R. L. 1979. Eastern Cougar Newsletter. U.S. Fish and Wildl. Serv. Clemson Univ., Clemson, S.C.

_____. 1981. Eastern Cougar Newsletter. U.S. Fish and Wildl. Serv., Clemson Univ., Clemson, S.C.

_____. 1982. Eastern Cougar Newsletter. U. S. Fish and Wildl. Serv., Clemson Univ., Clemson, S.C.

HALL, E. R. 1981. The Mammals of North America, 2nd ed. John Wiley and Sons, New York, 2 vols., 1,181 pp.

HAMILTON, W. J., JR. AND J. O. WHITAKER. 1979. Mammals of the Eastern United States, 2nd ed. Comstock Pub. Assoc., Ithaca, N.Y. 346 pp.

PREPARED BY: Julian L. Dusi, Department of Zoology-Entomology, Auburn University, Alabama 36849.

Special Concern

SOUTHEASTERN MYOTIS

Myotis austroriparius (Rhoads)
Family Vespertilionidae
Order Chiroptera

OTHER NAMES. Southeastern bat, Mississippi myotis.

DESCRIPTION. A medium-sized bat having a wingspan of 238 to 270 mm (9.4-10.6 inches) and forearm length of 36 to 41 mm (1.2-1.6 inches). Pelage dull brown to gray above and buff to whitish below. Fur appears wooly and unicolored from base to tip. Long hairs on toes extend well beyond the tips of the claws. Calcar not keeled.

FIG. 93. Southeastern myotis in a cluster (Merlin D. Tuttle).

RANGE. Principally a southeastern species that ranges from coastal North Carolina west to eastern Texas and southeastern Oklahoma. Occurs northward along the Mississippi River to western Kentucky. Isolated populations also occur in southern Illinois and Indiana. The distribution of *M. austroriparius* in Alabama is poorly known. During the summer, this species occurs below the Fall Line in the southern one-half of the State; however, during the fall and winter, several specimens have been collected from caves in northern Alabama.

HABITAT. Although predominantly a cave-roosting species, *M. austroriparius* may utilize buildings, mines, cul-

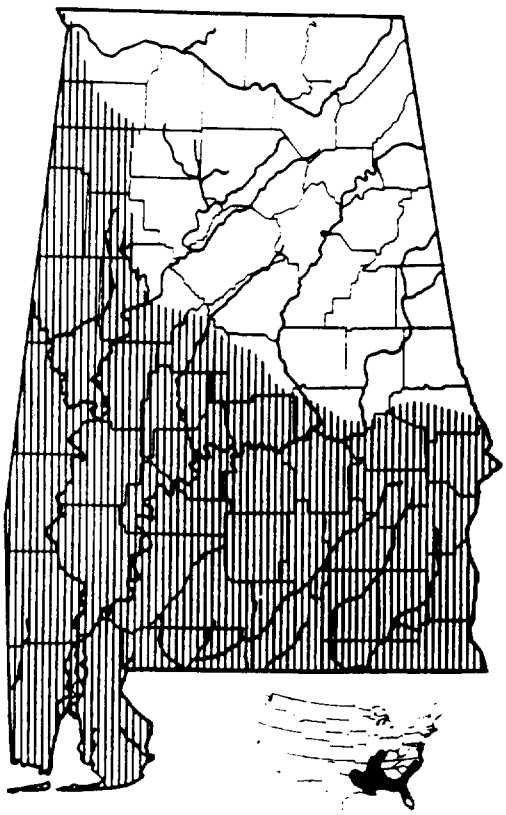
verts, or other manmade structures in those portions of its range devoid of caves. (Also see following information.)

LIFE HISTORY AND ECOLOGY. Little pertinent data are available concerning the reproductive biology of *M. austroriparius* in Alabama. In other portions of the range, females emerge from hibernation and congregate at maternity roosts during early spring. Males disperse to selected bachelor roosts; they rejoin females and young following parturition. Young are born during late spring or early summer, with a high percentage of gravid females producing twins.

These bats often roost and typically forage over water. As they feed, individuals fly extremely close to the water, often dipping to skim insects from the surface.

BASIS FOR STATUS CLASSIFICATION. The status of *M. austroriparius* in Alabama is poorly known. Based on unpublished reports, populations appear to be declining, not only in Alabama but throughout the range. Human disturbance and vandalism of major roosting sites are apparently responsible for most of the decline. The largest summer colony in Alabama, formerly inhabiting a limestone cave in Conecuh County, has reportedly been extirpated by vandals and careless cave explorers.

RECOMMENDATIONS. Field studies should be initiated to determine the status and distribution of *M. austroriparius* in Alabama. Caves or manmade structures known to support colonies should be protected, especially during the periods when bats are in residence. Guano from such sites should be sampled for evidence of pesticide contamination; however, such sampling should not disturb roosting bats.



Usual range of the southeastern myotis.

SELECTED REFERENCES

BARBOUR, R. W. AND W. H. DAVIS. 1969. Bats of America. Univ. Press of Ky. Lexington. 286 pp.

HOLLIMAN, D. C. 1963. The Mammals of Alabama. Unpub. Ph.D. diss., Univ. of Ala., Tuscaloosa. 316 pp.

LAVAL, R. K. 1967. Records of Bats from the Southeastern United States. J. Mamm. 48(4):645-648.

LOWERY, G. H., JR. 1974. The Mammals of Louisiana and its Adjacent Waters. La. St. Univ. Press, Baton Rouge. 565 pp.

RICE, D. W. 1957. Life History and Ecology of *Myotis austroriparius* in Florida. J. Mamm. 38:15-32.

PREPARED BY: J. Ralph Jordan, Regional Natural Heritage Project, Division of Land and Forest Resources, Tennessee Valley Authority, Norris, Tennessee 37828.

Special Concern

RAFINESQUE'S BIG-EARED BAT

Plecotus rafinesquii Lesson
Family Vespertilionidae
Order Chiroptera

OTHER NAMES. Eastern big-eared bat, southeastern big-eared bat, eastern lump-nosed bat, LeConte's lump-nosed bat, LeConte's big-eared bat, mule-eared bat.

DESCRIPTION. A medium-sized bat having a wingspan of 265 to 301 mm (10.4-11.9 inches) and forearm length of 40 to 46 mm (1.6-1.8 inches). Ears noticeably large, often in excess of 25 mm (1 inch) in length. Coloration uniformly dark gray to brown above and white or whitish below. Ventral hairs strongly bicolored, with dark brown or black bases and white tips. Snout with two conspicuous lumps situated dorsolaterally.

FIG. 94. Rafinesque's big-eared bat (Merlin D. Tuttle).

Reference No. 18

OB DONAGHUE

ENDANGERED AND THREATENED SPECIES

U.S. FISH AND WILDLIFE SERVICE

REGION 4 - ATLANTA

GRAY BAT

Myotis grisescens

Order: Chiroptera

Family: Vespertilionidae

Status: Endangered throughout its range (Federal Register 4/28/75).

Range: Populations are found mainly in Alabama, Arkansas, Kentucky, Missouri, and Tennessee, but a few occur in Florida, Georgia, Kansas, Indiana, Illinois, Oklahoma, Virginia, and possibly North Carolina. Distribution within range was always patchy, but fragmentation and isolation of populations are increasing.

Description: Medium-sized bat of gray to rusty-red color. Its unicolored dorsal fur distinguishes it from other bats within its range.

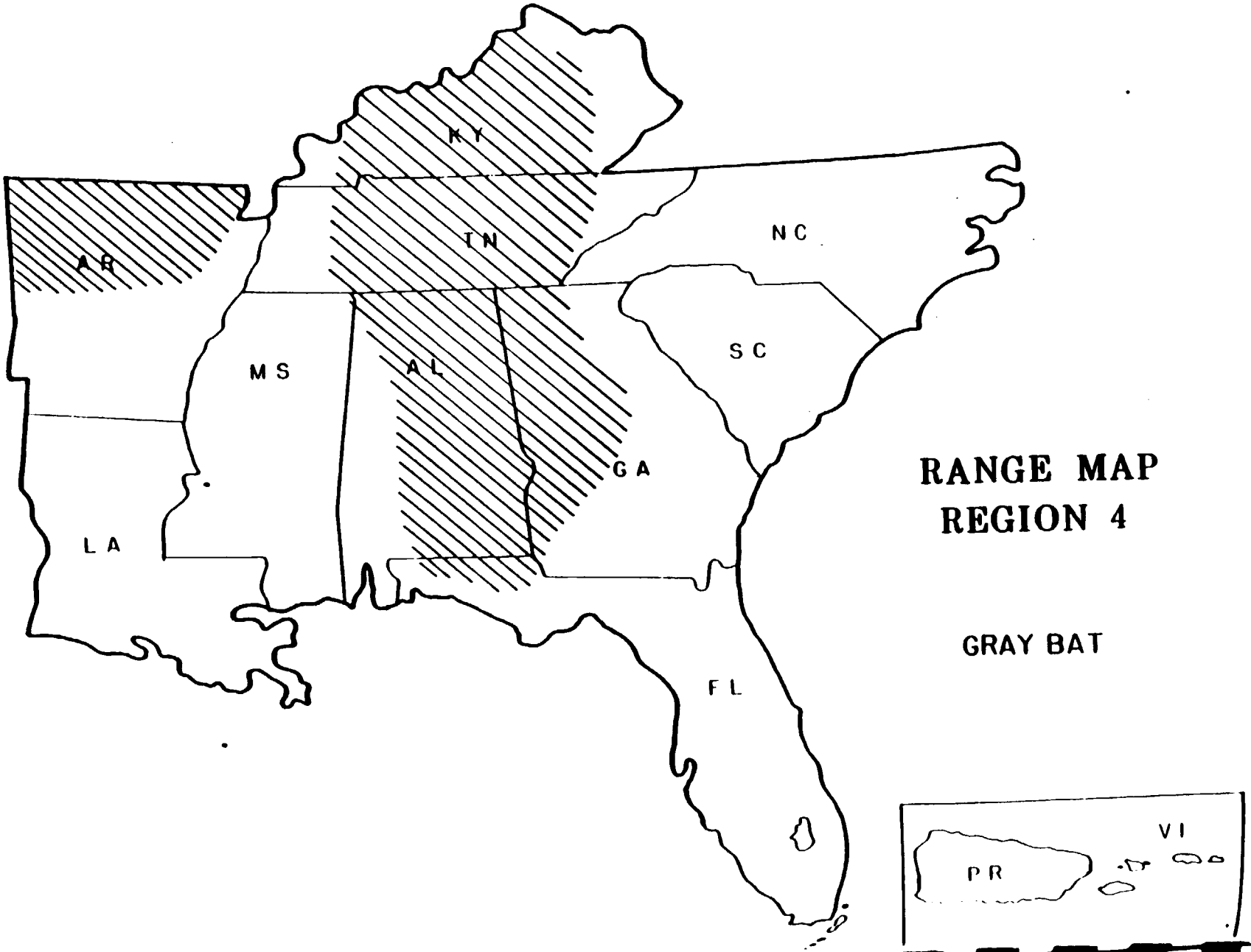
Reasons for Current Status: Gray bat colonies roost only in caves and cave-like habitats. Human disturbance and vandalism are thought to be primarily responsible for the decline. Disturbance of a maternity colony may cause thousands of young to be dropped to the cave floor where they perish, excessive disturbance may cause a colony to completely abandon a cave. A 1968-1970 survey of 22 colonies showed an estimated 48 percent decline from pervious years, and a survey made 6 years later showed the same colonies had declined another 47 percent. Other factors contributing to the decline include pesticide poisoning, natural calamities such as flooding and cave-ins, loss of caves due to inmundation by man-made impoundments, and possibly a reduction in insect prey over streams that have been degraded through excessive pollution and siltation.

Habitat: Gray bat colonies are restricted entirely to caves or cave-like habitats. During summer the bats are highly selective for caves providing specific temperature and roost conditions, and in winter they utilize only deep, vertical caves having a temperature of 6-11 C. Consequently, only a small proportion of the caves in any area are or can be used regularly. There are nine known caves that are believed to house roughly 95 percent of the hibernating population.

One-way migrating distance between winter and summer caves may vary from as little as 10 miles to well over 200. Banding studies indicate the bats occupy a rather definite summer range with relation to the roosting site and nearby foraging areas over large streams and reservoirs. Summer colonies show a preference for caves not over 1.2 miles from the feeding area.

Critical Habitat: None designated.

Feeding Habits: Little is known about actual feeding habits of gray bats. However, limited observations indicate that within the wide variety of insects which are eaten, the majority seem to be aquatic species, especially mayflies.



RANGE MAP
REGION 4

GRAY BAT

INDIANA BAT

Myotis sodalis (Miller and Allen)

Order: Chiroptera

Family: Vespertilionidae

Status: Endangered throughout its range (*Federal Register* 3/11/67).

Range: Occurs in the Midwest and eastern United States from the western edge of the Ozark region in Oklahoma, to southern Wisconsin, east to Vermont, and as far south as northern Florida. In summer it is apparently absent south of Tennessee; in winter it is apparently absent from Michigan, Ohio, and northern Indiana where suitable caves and mines are unknown.

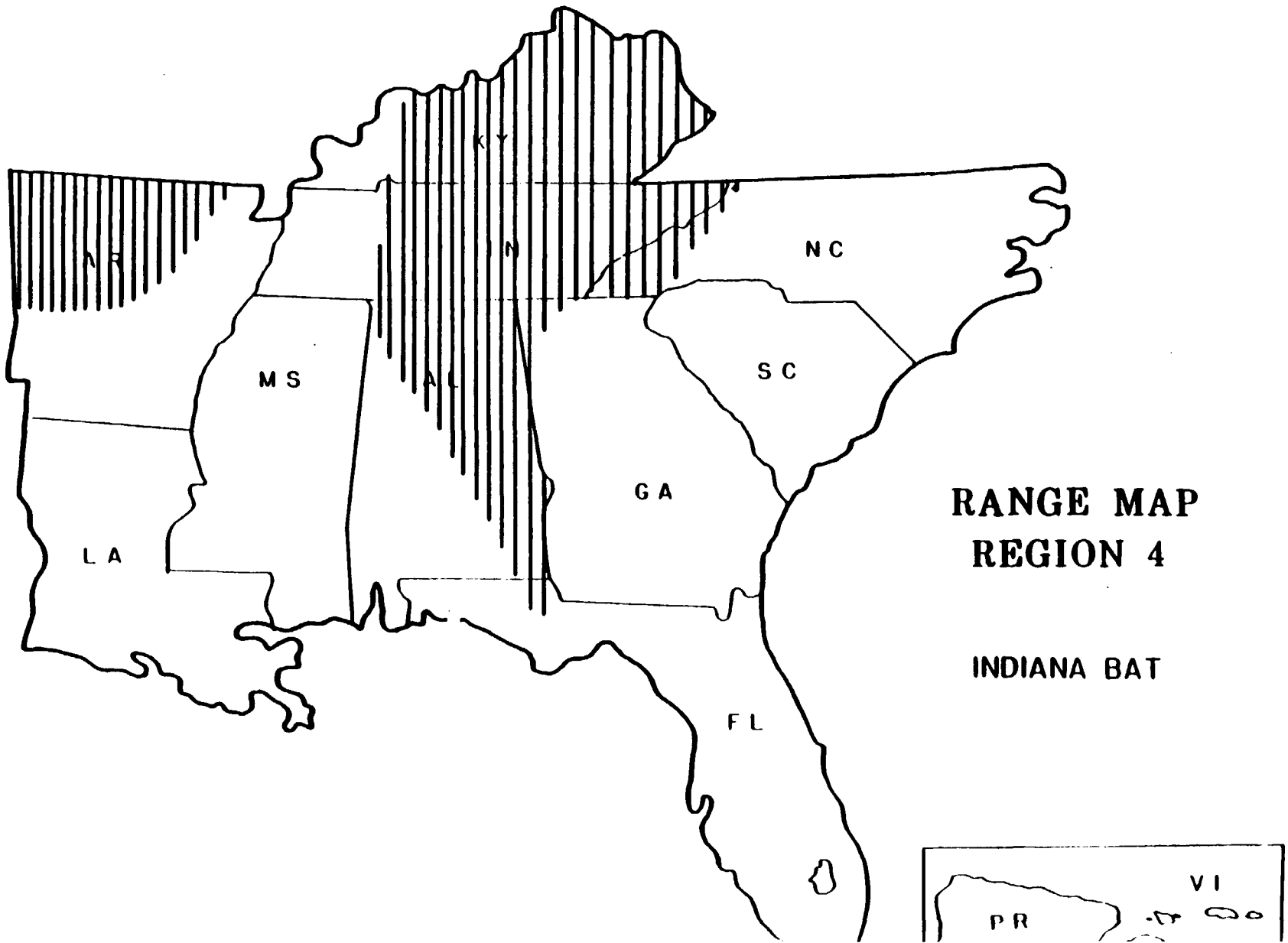
Description: A medium-sized myotis, closely resembling the little brown bat (*Myotis lucifugus*) but differing in coloration, the fur being a dull gravish chestnut rather than bronze, with the basal portion of the hairs of the back dull lead colored; coloration of underparts pinkish to cinnamon, hind feet smaller and more delicate than in *M. lucifugus*; calcar strongly keeled.

Reasons for Current Status: The decline is attributed to commercialization of roosting caves, wanton destruction by vandals, disturbances caused by increased numbers of spelunkers and bat banding programs, use of bats as laboratory experimental animals, and possibly insecticide poisoning. Some winter hibernacula have been rendered unsuitable as a result of blocking or impeding air flow into the caves and thereby changing the cave's climate. *Myotis sodalis* is nearly extinct over most of its former range in the northeastern states, and since 1950, the major winter colonies in caves of West Virginia, Indiana, and Illinois have disappeared. A high degree of aggregation during winter makes the species very vulnerable. During this period approximately 87 percent of the entire population hibernates in only seven caves.

Habitat: Mainly utilizes limestone caves for winter hibernation. The preferred caves have a temperature averaging 37° to 43°F in midwinter, and a relative humidity averaging 87 percent. Summer records are rather scarce. A few individuals have been found under bridges and in old buildings, and several maternity colonies have been found under loose bark and in the hollows of trees. Summer foraging by females and juveniles is limited to riparian and floodplain areas. Creeks are apparently not used if riparian trees have been removed. Males forage over floodplain ridges and hillside forests and usually roost in caves. Foraging areas average 11.2 acres per animal in midsummer.

Critical Habitat: The following caves have been designated as Critical Habitat within Region 4.

Tennessee: White Oak Blowhole Cave, Blount County
Kentucky: Bat Cave, Carter County
Coach Cave, Edmonson County



RANGE MAP
REGION 4

INDIANA BAT

RED-COCKADED WOODPECKER

Picoides (=Dendrocopos) borealis (Vieillot)

Order: Piciformes

Family: Picidae

Status: Endangered (Federal Register 10/13/70).

Range: Presently found in scattered locations throughout the southeast; previous range slightly larger with more uniform distribution.

Description: Small woodpecker, 18 to 20 cm long, wing span 35 to 38 cm, black and white horizontal stripes on back, white cheeks and under parts, flanks black streaked. The cap and stripe on the side of the neck and the throat are black. The male has a small red spot on each side of the black cap.

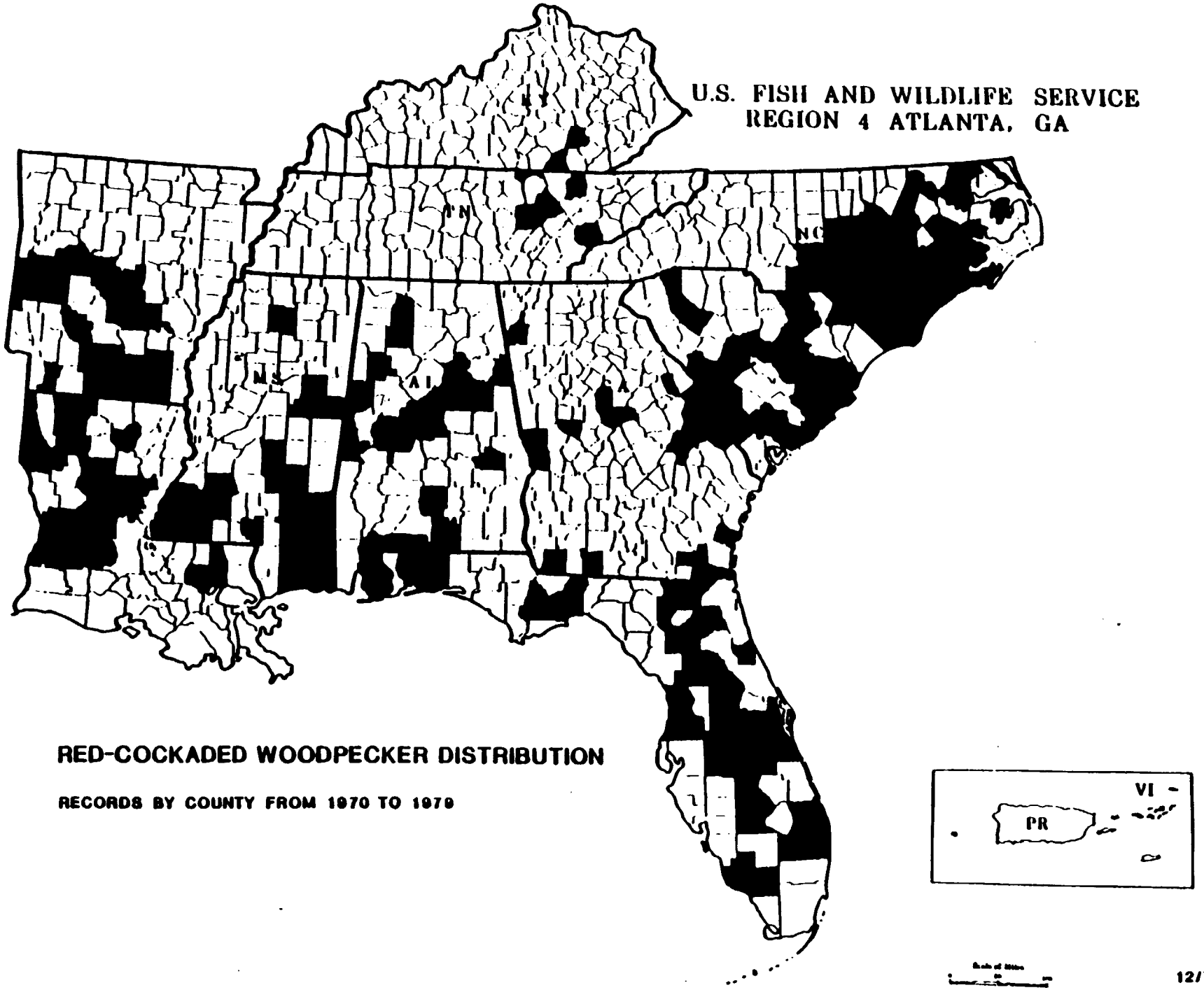
Reasons for Current Status: The red-cockaded woodpecker was described by Audubon as being abundant in 1839, but it received little study until around 1970 when investigations began to indicate that the species could be headed for extinction. The decline is attributed primarily to the reduction of pine forest with trees sixty years old and older. Living pines in this age group infected with red-heart disease generally provide the specialized nesting sites which these woodpeckers require.

Habitat: The basic habitat requirement is for open stands of pines with a minimum age of 60 years. Longleaf pine (Pinus palustris) is most commonly used, but other species of southern pine are also acceptable. Dense stands, stands that are primarily hardwoods, or that have a dense understory are avoided.

Cavity excavation for roosting almost always occurs in living pines, and usually in those which are infected with a fungus producing what is known as red-heart disease. The average cavity tree age is nearly 100 years for longleaf and about 80 years for loblolly and other pines (Jackson et al. 1979b). A cavity tree area is referred to as a colony. There may be a number of cavities in the colony and up to seven or eight woodpeckers in the immediate area, but there will be only one breeding pair in the group. Completed cavities in active use usually have numerous small surrounding excavations which exude sap. The birds keep the sap flowing apparently as a cavity defense mechanism against rat snakes and possibly other predators. The home range for a clan (a family unit) averages about 200 acres, but observers have reported home ranges running from a low of around 100 acres in good habitat, to an upper extreme of more than a thousand in very poor habitat.

Critical Habitat: None designated.

U.S. FISH AND WILDLIFE SERVICE
REGION 4 ATLANTA, GA



RED-COCKADED WOODPECKER DISTRIBUTION

RECORDS BY COUNTY FROM 1970 TO 1979

12/79

Reference No. 19

SOIL SURVEY OF
Tuscaloosa County, Alabama

United States Department of Agriculture
Soil Conservation Service and Forest Service
In cooperation with
Alabama Agricultural Experiment Station and
Alabama Department of Agriculture and Industries

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Issued August 1981

soil survey of
Tuscaloosa County, Alabama

By Kenneth W. Johnson, Soil Conservation Service

Fieldwork by Kenneth W. Johnson, Johnny C. Trayvick, James C. Cotton, and James E. Boman, Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service and Forest Service
in cooperation with
Alabama Agricultural Experiment Station and
Alabama Department of Agriculture and Industries

general nature of the county

Tuscaloosa County is in the west-central part of Alabama. Tuscaloosa, the county seat and major urban area, has a population of about 73,228. The city of Northport is across the Black Warrior River from Tuscaloosa and has a population of approximately 12,000. Just east of the city of Tuscaloosa are two smaller, unincorporated communities: Cottondale and Holt. The county has two other incorporated areas: Brookwood and Vance. In the southern part of the county, the town of Moundville projects into Tuscaloosa County.

Tuscaloosa County is in the second tier of counties from the Alabama-Mississippi state line. It is the second largest county in the state, and has an area of 863,360 acres or 1,349 square miles. Tuscaloosa is bounded on the west by Pickens and Greene Counties; on the north by Fayette and Walker Counties; on the east by Walker, Jefferson, and Bibb Counties; and on the south by Bibb, Hale, and Green Counties.

An earlier survey of Tuscaloosa County was published in 1911 (*9*). The present survey updates this earlier survey and provides additional information and more detailed maps.

climate

Prepared by the National Climatic Center, Asheville, North Carolina.

Tuscaloosa County has long, hot summers because moist tropical air from the Gulf of Mexico persistently covers the area. Winters are cool and fairly short, with only a rare cold wave that moderates in 1 or 2 days. Precipitation is fairly heavy throughout the year, and prolonged droughts are rare. Summer precipitation, mainly afternoon thunderstorms, is adequate for all crops.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Tuscaloosa, Alabama in the period 1951 to 1973. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 46° F, and the average daily minimum temperature is 35°. The lowest temperature on record, which occurred at Tuscalooosa on January 30, 1966, is 1°. In summer the average temperature is 80°, and the average daily maximum temperature is 91°. The highest recorded temperature, which occurred on July 24, 1952, is 107°.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50° F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 49 inches. Of this, 23 inches, or 45 percent, usually falls in April through September, which includes the growing season for most crops. In 2 years out of 10, the rainfall in April through September is less than 19 inches. The heaviest 1-day rainfall during the period of record was 5.44 inches at

throughout, unless the surface layer has been limed. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. Available water capacity is moderate. The root zone is restricted by the compact and brittle subsoil.

Urban land makes up about 45 percent of each mapped area. It consists of areas that are covered by sidewalks, patios, driveways, and parking lots and buildings, such as schools, churches, homes, offices, and industrial sites.

Included with this complex in mapping are a few small areas of Bama and Cahaba soils. Included soils make up about 5 percent of this unit.

The Shatta soil is well suited to most recreation uses. Slope is a moderate limitation for playgrounds.

This soil is fairly suited to most engineering uses. The risk of corrosion of uncoated steel and concrete ranges from moderate to high.

The Shatta soil is fairly suited to most urban uses. Wetness and a perched water table during wet periods are severe limitations for septic tank absorption fields and moderate limitations for dwellings and small commercial buildings. Low strength is a moderate limitation for local roads and streets if the soil is used as roadfill. Most of these limitations can be partly overcome by proper engineering design and installation.

This soil is well suited to vegetable gardens and to most plants used in landscaping.

This complex is not in a capability subclass or woodland group.

33—Smithdale fine sandy loam, 6 to 15 percent slopes. This deep, well drained soil is on ridgetops and side slopes of the Coastal Plain uplands. Slopes range from 6 to 15 percent. Individual areas range from 10 to 1,300 acres.

Typically, the surface layer is dark brown fine sandy loam about 5 inches thick. The upper part of the subsoil is red loam to a depth of 42 inches. The lower part is yellowish red sandy loam to a depth of 52 inches and sandy clay loam to a depth of 72 inches or more.

This soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout, unless the surface layer has been limed. Permeability and available water capacity are moderate. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are soils that have a dark red surface layer. Also included are a few intermingled areas of Bama, Flomaton, Luverne, Pikeville, and Ruston soils. The included soils make up about 15 percent of this map unit.

Most of the acreage of this soil is used as woodland. Some areas have been cleared and used for cultivated crops and pasture. Cultivated areas are generally planted to corn and small grains.

This soil is fairly suited to cultivated crops and is well suited to pasture. Steep, complex slopes are limitations for the use of equipment and increase the hazard of erosion. The hazard of erosion is moderate if cultivated crops are grown. Terraces, minimum tillage, and the use of cover crops in the cropping system, including grasses and legumes, help to slow runoff and control erosion.

This Smithdale soil is well suited to loblolly pine and longleaf pine. There are no significant limitations for woodland use or management. The soil is well suited to use as woodland wildlife habitat.

This soil is well suited to most urban uses. Moderate limitations for urban uses are present on slopes of more than 8 percent.

The Smithdale soil is in capability subclass IIIe and woodland group 3o.

34—Smithdale fine sandy loam, 15 to 35 percent slopes. This deep, well drained soil is on side slopes of the Coastal Plain uplands. Slopes range from 15 to 35 percent. Individual areas range from 6 to 2,100 acres.

Typically, the surface layer is dark brown fine sandy loam about 5 inches thick. The upper part of the subsoil is red loam to a depth of 42 inches. The lower part is yellowish red sandy loam to a depth of 52 inches and sandy clay loam to a depth of 72 inches or more.

This soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid throughout. Permeability and available water capacity are moderate. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few areas of a soil that is similar to the Smithdale soil except that it has a sandier subsoil. Also included are a few small areas of Bibb, Flomaton, Luverne, and Pikeville soils. Included soils make up about 20 percent of this map unit.

Most of this Smithdale soil is used as woodland. A few areas are used for pasture.

This soil is poorly suited to cultivated crops because of steep slopes and a severe hazard of erosion. It is fairly suited to pasture and hay. Steep slopes are a moderate limitation.

The Smithdale soil is well suited to loblolly pine and longleaf pine. Plant competition is a moderate limitation. This soil is well suited to use as woodland wildlife habitat.

This soil is fairly suited to most urban uses because of steep slopes. This limitation can be overcome by proper engineering design.

The Smithdale soil is in capability subclass VIIe and woodland group 3o.

35—Smithdale-Flomaton complex, 15 to 35 percent slopes. This map unit consists of small areas of Smithdale and Flomaton soils that are so intermingled that it was not practical to map them separately. These deep, well drained and excessively drained soils are on upper side slopes and ridgetops. Slopes range from 15 to 35 percent. Individual areas range from 10 to 2,800 acres.

R. 4 E. | R. 5 E.
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105 000 FEET
T. 24 N.
(Joins sheet 101)
24
17
14
30
33
28
6
27
5
69
29
32
RIVER
18
16
Mound
MOUND STATE
MONUMENT
COUNTY

Reference No. 20

CLIMATIC ATLAS OF THE UNITED STATES

RCE . Environmental Science Services Administration . Environmental Data Service

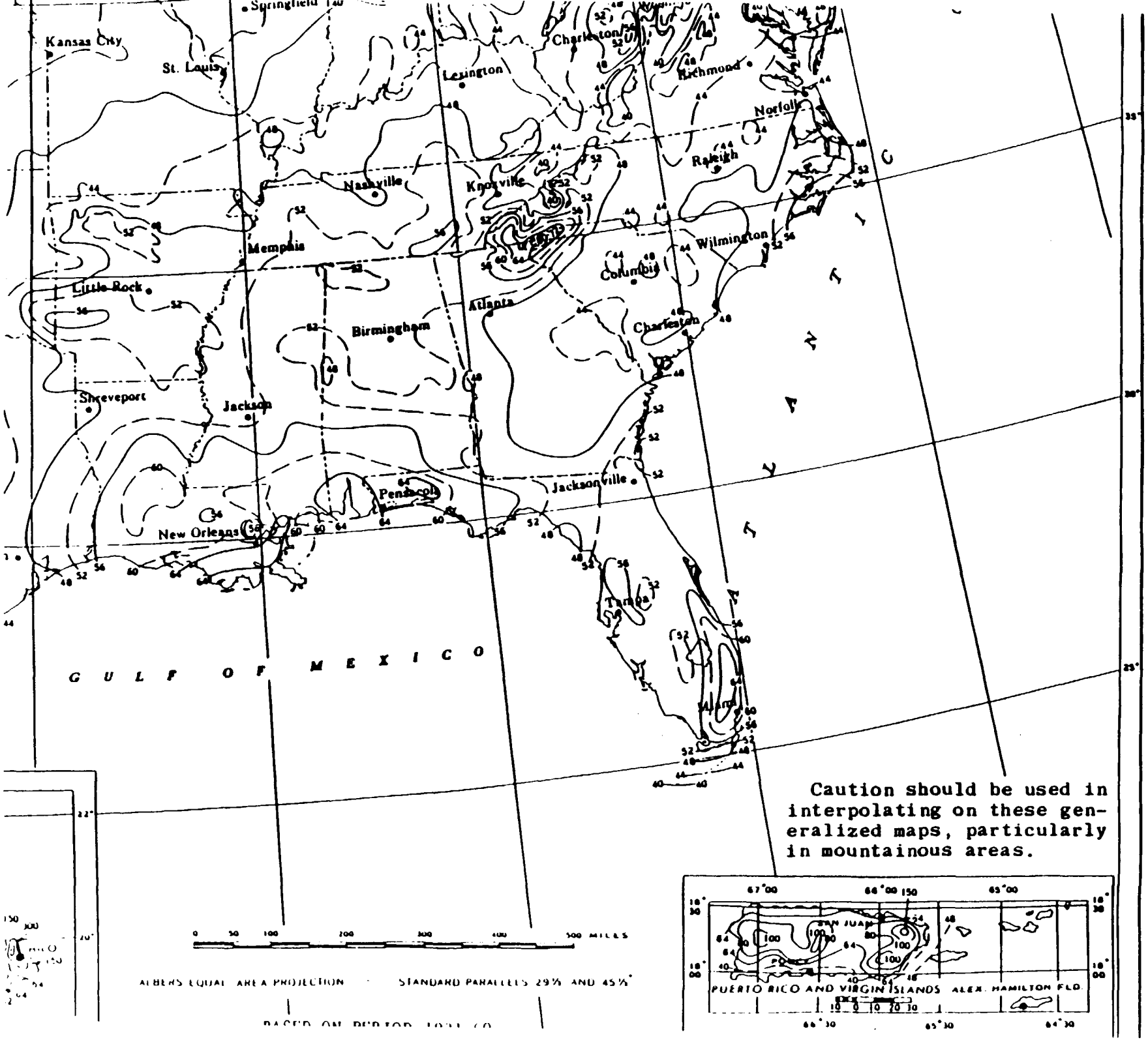
U.S. DEPARTMENT OF COMMERCE
C. R. Smith, Secretary

ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
Robert M. White, Administrator

ENVIRONMENTAL DATA SERVICE
Woodrow C. Jacobs, Director

JUNE 1968

REPRINTED BY THE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
1983



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

AKE EVAPORATION

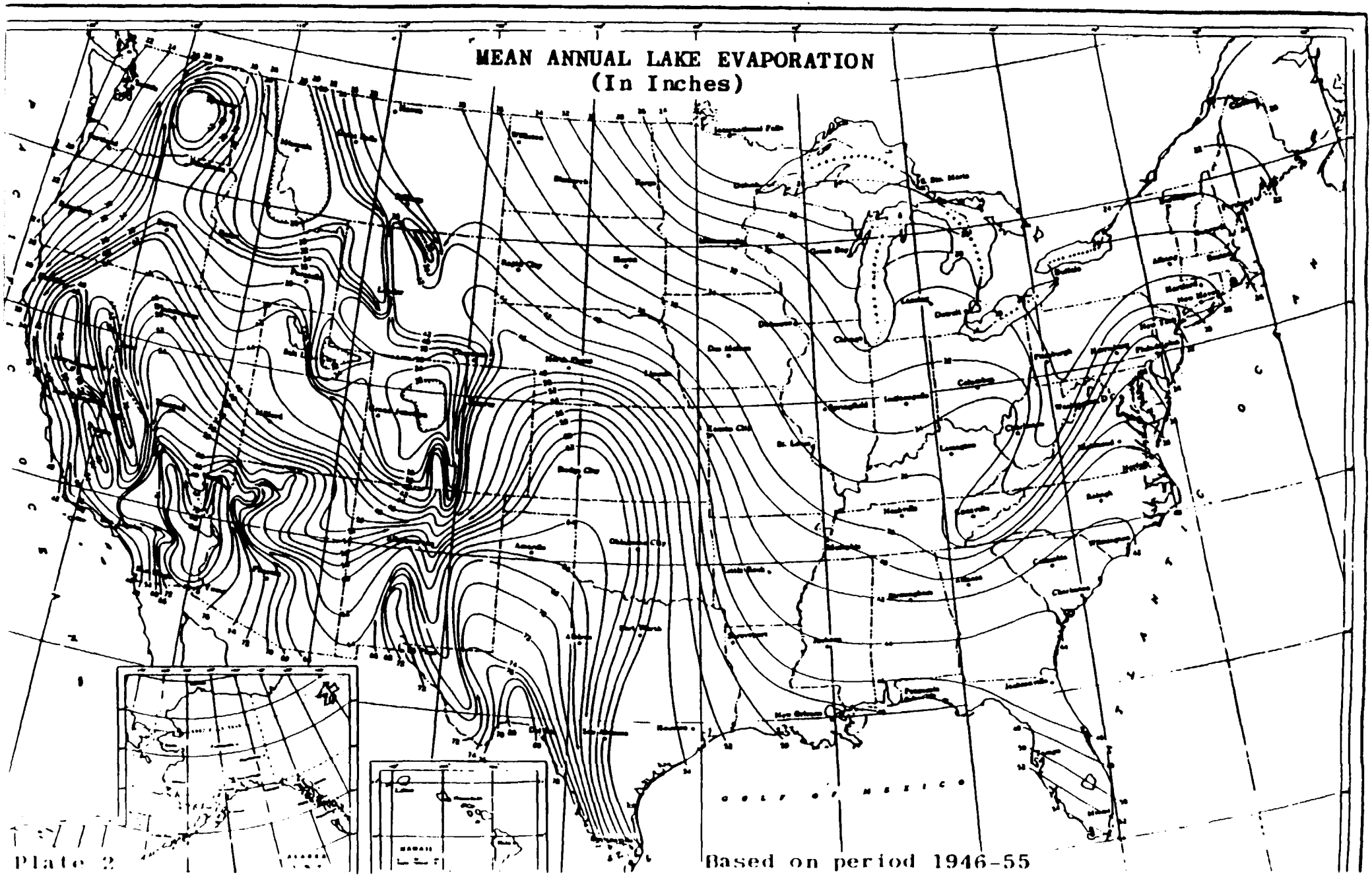


Plate 2

OF COMMERCE
ary

WEATHER
F. W. REICH

TECHNICAL PAPER NO. 40

RAINFALL FREQUENCY ATLAS OF THE UNITED STATES

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

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

Reference No. 21

PROPERTY
FILE

GULF OF MEXICO
ATLANTIC OCEAN

Reference No. 18

NUS CORPORATION AND SUBS. **ELECON NOTE**

CONTROL NO.	DATE:

DISTRIBUTION:

File

22

BETWEEN: Carol Lackey	OF: Ala Conser	39-5716

AND: Matthew McCoy, NUS Corporation

DISCUSSION:

Both recreational and commercial fishing are allo[illegible] River. This includes the Bankhead, Oliver, Warrior, and Demopolis Reservoirs. The Oliver Reservoir does not allow netting.

ACTION ITEMS:

NUS CORPORATION AND SUBSIDIARIES **TELECON NOTE**

CONTROL NO. F4-9011-22	**DATE:** 1/15/91	**TIME:** 1415

DISTRIBUTION: File Material
Southern Resins Division

23

BETWEEN: Mr. Rodgers	**OF:** Mound 41

AND: Sheri Panabaker, NUS Corporation SLP

DISCUSSION:

I asked Mr. Rodgers if there were any surface water intak[illegible] of Moundville. He said that there were no companies for at least 20 miles downst[illegible] that all the towns down to at least Demopolis obtained their water from wells. Therefore he figured that since Demopolis is greater than 40 downstream miles, there are no surface water intakes within 15 downstream miles.

- REF 24 -

GEOHYDROLOGY AND SUSCEPTIBILITY OF MAJOR AQUIFERS TO SURFACE CONTAMINATION IN ALABAMA; AREA 6

by Sydney S. DeJarnette and Jo E. Crownover

U.S. GEOLOGICAL SURVEY

Water-Resources Investigations Report 87-4113

Prepared in cooperation with the

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Tuscaloosa, Alabama

1987

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CONVERSION FACTORS

For use of readers who prefer to use metric (International System) units, conversion factors for inch-pound units used in this report are listed below:

Multiply inch-pound unit	By	To obtain metric unit
inch (in.)	25.4	millimeter (mm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
gallon per minute (gal/min)	0.06308	liter per second (L/s)
million gallons per day (Mgal/d)	0.04381	cubic meter per second (m^3/s)

Sea level: In this report "sea level" refers to the National Geodetic Vertical DAtum of 1929 (NGVD of 1929)--a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called "Mean Sea Level of 1929."

GEOHYDROLOGY AND SUSCEPTIBILITY OF MAJOR AQUIFERS TO SURFACE CONTAMINATION IN ALABAMA; AREA 6

by Sydney S. DeJarnette and Jo E. Crownover

ABSTRACT

The major aquifers in the study area (defined as those with actively pumped public supply wells) are the Coker, Gordo, Eutaw, and Nanafalia aquifers. The recharge areas for these aquifers are in Tuscaloosa, Pickens, Greene, Sumter, and Marengo Counties. The aquifers underlie most of the study area and consist of sand and gravel beds. Water in the aquifers usually occurs under artesian conditions.

The Coker aquifer is the source of public water supplies for the towns of Coker and Gordo, and for the Buhl-Elrod-Holman Water System in Tuscaloosa County. The Gordo and Eutaw aquifers are sources of public water supplies in Pickens, Greene, and Marengo Counties. The Nanafalia aquifer is the source of public water supplies for the towns of Sweetwater and Myrtlewood in Marengo County.

Depressions in the potentiometric surface have developed around Demopolis in the Gordo and Eutaw aquifers partly as a result of ground-water withdrawals. Other depressions and troughs have formed along the major rivers because of ground-water discharge to the rivers.

All the recharge areas for the major aquifers are susceptible to surface contamination throughout most of the study area; however, the recharge areas are in rural settings that are used for timberlands, farms, and pastures. Usually, the depth to the water-bearing zone tapped by a well and the horizontal distance from the outcrop to the well provide a buffer from surface contamination.

Other potential areas susceptible to surface contamination are the permeable terrace and alluvial deposits along major river flood plains, if the potentiometric surface in the underlying aquifer has been depressed. The alluvial deposits are usually in areas of discharge, but if pumpage has caused a depression in the potentiometric surface of the underlying aquifer, the alluvial aquifer will become a source of recharge, allowing water to infiltrate through the alluvium into the underlying aquifer.

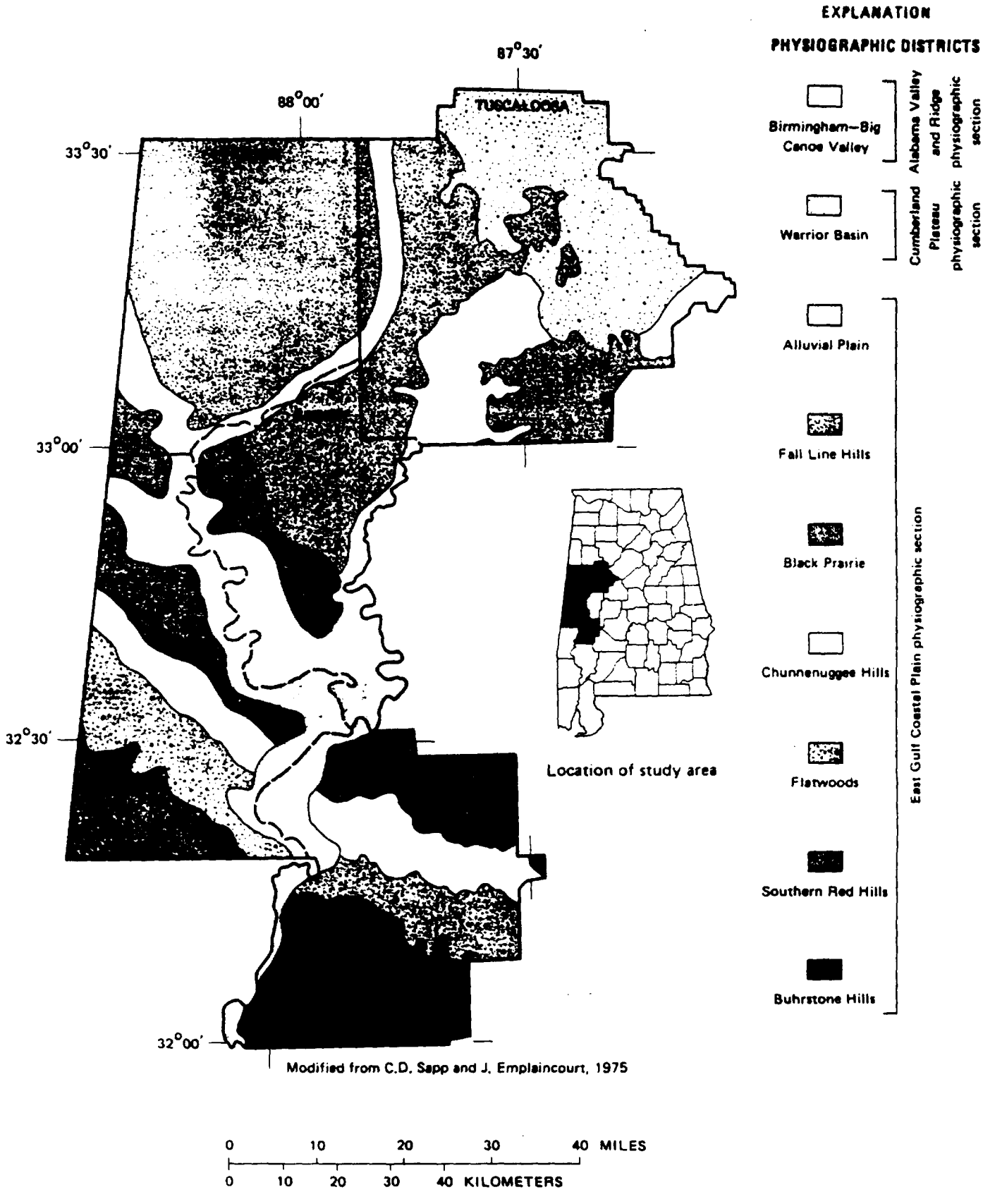


Figure 1.--Physiographic divisions of the study area.

Northeastern Tuscaloosa County is in the Warrior Basin district of the Cumberland Plateau physiographic section. This area is part of a synclinal plateau of moderate relief.

In all five counties in the study area, the parts adjacent to large rivers are in the Alluvial-Deltaic Plain district of the East Gulf Coastal Plain physiographic section. This area is characterized by broad, flat, flood plains and terraces along the Tombigbee, Black Warrior, and Sipsey Rivers.

The remainder of Tuscaloosa County, the majority of Pickens County, and the northern part of Greene County are in the Fall-Line Hills district of the East Gulf Coastal Plain physiographic section. These areas consist mainly of flat to moderately-rolling sandy uplands dissected by deeply-entrenched southward and southwestward flowing streams.

Central Greene County and northern Sumter and Marengo Counties are in the Black Prairie district of the East Gulf Coastal Plain physiographic section. The Black Prairie, named for black soil that is common in the area, is a gently- to moderately-rolling prairie that is characterized by extensive grasslands but very few trees.

Southwest of the Black Prairie in Sumter and Marengo Counties is the Chunnenuggee Hills district of the East Gulf Coastal Plain physiographic section. This area is characterized by sandy cuestas that have fairly steep northward-facing escarpments and gently-to moderately-rolling backslopes.

Southwest of the Chunnenuggee Hills district in Sumter and Marengo Counties is the Southern Red Hills district of the East Gulf Coastal Plain physiographic section. The district is a southward sloping upland of moderate relief which includes the Flatwoods lowland along the northern edge and the rugged Buhrstone Hills in the southern edge in extreme southern Marengo County.

Previous Investigations

Information on the geology of the area was published as early as 1858 in the second biennial report of the Geological Survey of Alabama by Michael Toumey, the first State Geologist. A detailed description of the geology of Alabama and a revised geologic map were published by the Geological Survey of Alabama in 1926 (Adams and others, 1926).

The first information on ground water in the area was published in 1907 (Smith, 1907). Other reports that contain information on the geology and ground-water resources of the area are "Notes on Deposits of Selma and Ripley Age in Alabama" (Monroe, 1941), "Ground Water Resources of the Cretaceous Area of Alabama" (Carlston, 1944), "Geology and Ground Water Resources of Greene County, Alabama" (Wahl, 1966), "Geology and Ground Water Resources of Marengo County, Alabama" (Newton and others, 1961), "Ground-Water Resources of Pickens County, Alabama, a Reconnaissance" (Wahl, 1965), "Water Availability and Geology of Sumter County, Alabama" (Davis and others, 1980), and "Ground-Water Resources and Geology of Tuscaloosa County, Alabama" (Paulson and others, 1962).

Acknowledgments

The authors wish to thank the many persons who have contributed information and assistance during the field investigation and during the preparation of this report. Special appreciation is extended to the waterworks personnel of the ground-water systems in the study area who have helped locate public-supply wells and furnished information on well construction and water use.

GEOHYDROLOGY

Geologic formations that crop out in and underlie the study area range in age from Cambrian to Quaternary (fig. 2). Sedimentary rocks of Paleozoic age crop out in the eastern part of Tuscaloosa County. These rocks range in age from Cambrian to Pennsylvanian. Unconsolidated sedimentary deposits of Late Cretaceous age crop out in the remainder of Tuscaloosa County, all of Pickens and Greene Counties, and in all but southernmost parts of Sumter and Marengo Counties where sedimentary deposits of Tertiary age crop out. Alluvial and terrace deposits overlie older rocks in and adjacent to the flood plains of the Black Warrior, Sipsey, and Tombigbee Rivers and larger streams in the study area. A generalized subsurface section of formations underlying the study area is shown in figure 3. This schematic section does not represent an actual cross section. It is intended to show all the geologic units that crop out in Area 6 and their relative positions. No one cross section could include all these units and lie within the area on a map because of the alignment of the counties within Area 6. A summary of the thickness, lithology, and water-bearing properties of each geologic unit that underlies the study area is given in table 1.

Paleozoic Rocks

Sedimentary rocks that range in age from Cambrian to Pennsylvanian crop out in eastern Tuscaloosa County. Geologic units, from oldest to youngest, include the Brierfield, Ketona, and Bibb Dolomites of Cambrian age, the Knox Dolomite or Knox Group where it is divided of Cambrian and Ordovician age, the Longview, Newala, and Little Oak Limestones of Ordovician age, and the Fort Payne Chert and Floyd Shale of Mississippian age. These rocks, which crop out in an area of about 50 mi^2 in southeastern Tuscaloosa County, are complexly folded and faulted and, except for the Floyd Shale, are deeply weathered. No large-capacity wells have been drilled in this part of Tuscaloosa County, but the limestones and dolomites are potential sources of large water supplies. For example, a municipal spring discharging from the Brierfield Dolomite at the city of Montevallo in nearby Shelby County flowed at a rate of more than 1,000 gal/min (gallons per minute) in 1968, and a well developed in the Brierfield Dolomite in Montevallo had a drawdown in water level of only 32 feet when pumped at 340 gal/min in 1962. The Pennsylvanian age Pottsville Formation crops out in northeastern Tuscaloosa County. The Pottsville Formation consists chiefly of sandstone, conglomerate, siltstone, and shale with beds of coal and underclay. It strikes northwest and dips to the southwest at 30 to 200 ft/mi (feet per mile) (Harkins and others, 1980). Large water supplies generally are not available from the Pottsville Formation and no municipal wells tap the Pottsville within the study area.

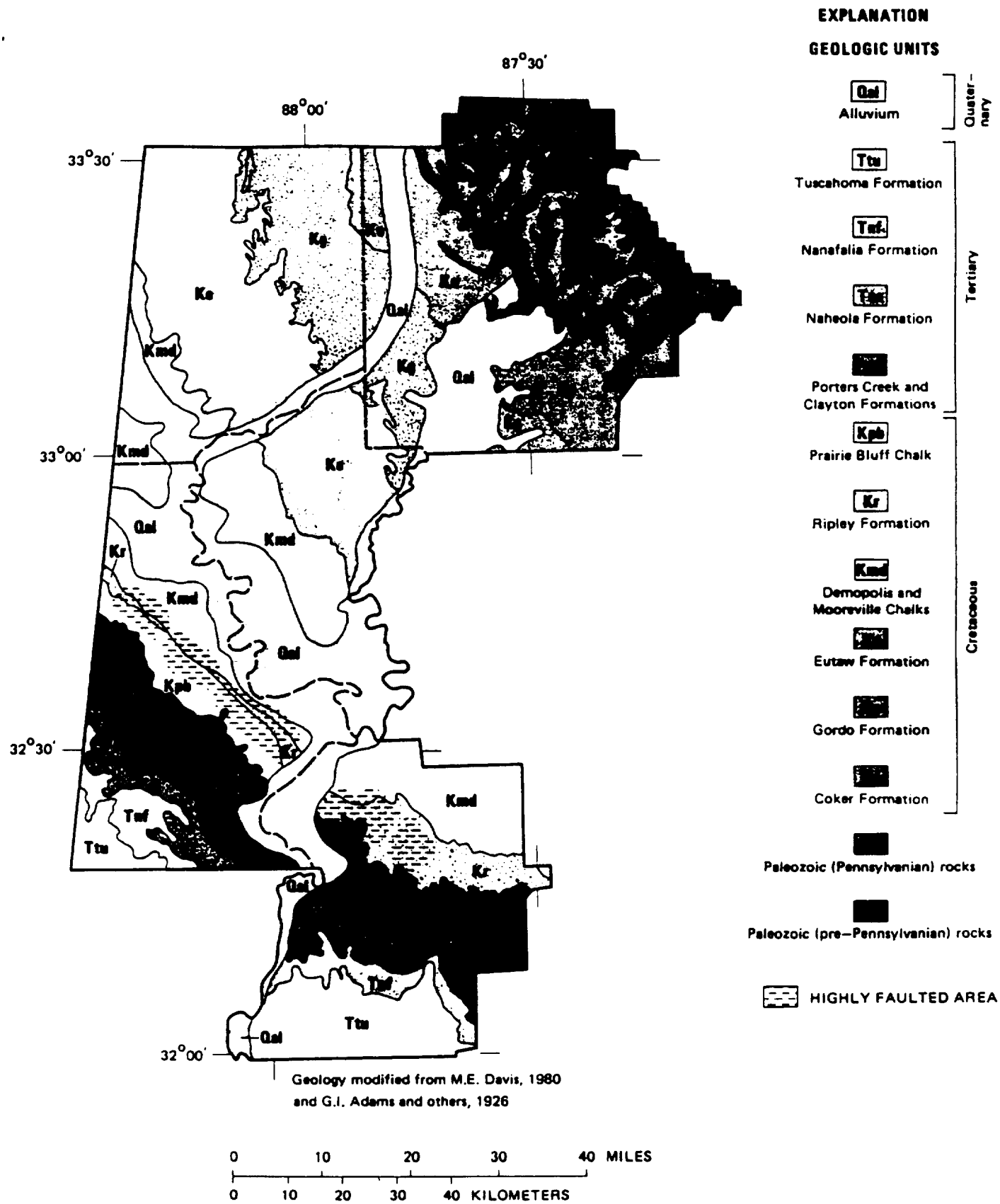


Figure 2.--Generalized geology of the study area.

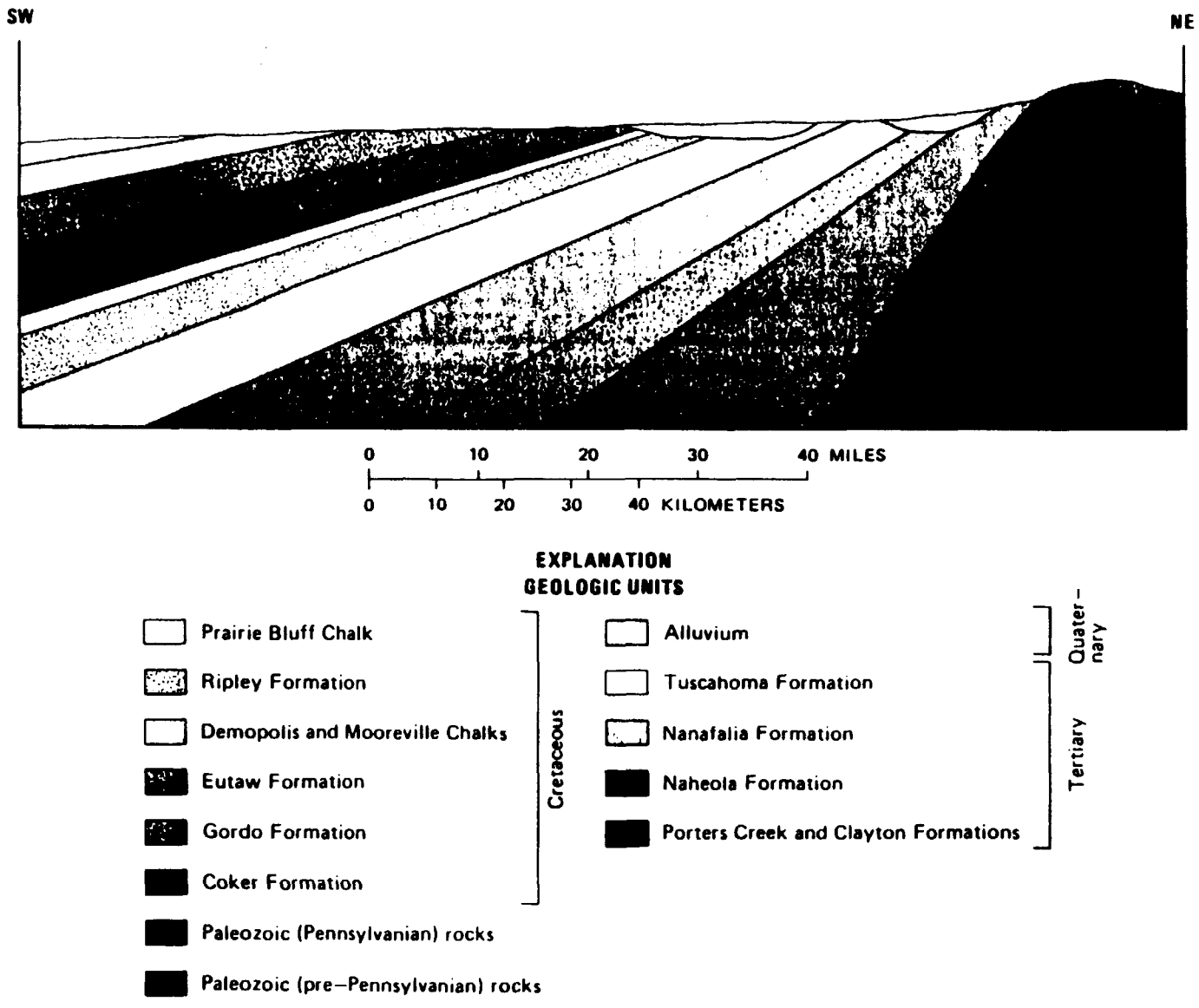


Figure 3.--Generalized geologic section of the study area.

Cretaceous Formations

Coker Formation

The Coker Formation crops out in Tuscaloosa County and in streambeds in eastern Pickens County (see fig. 2). The Coker underlies all of the study area south and southwest of its area of outcrop.

The Coker Formation consists of a basal nonmarine zone of gravel, marine sand and clay. In most parts of the study area, the basal zone is generally separated from the marine sand beds by 50 feet or more of clay. A clay zone is usually present at the top of the Coker. Where this clay exists, it serves as a confining unit between the Coker aquifer and the overlying Gordo aquifer (see figs. 3 and 4). However, over much of the area, the two aquifers are hydraulically connected and are treated as one aquifer referred to as the Tuscaloosa aquifer for purposes of the potentiometric map of this report (fig. 4). The Coker Formation ranges in thickness from less than 100 feet where only the basal beds remain to more than 1,000 feet in southernmost parts of the study area.

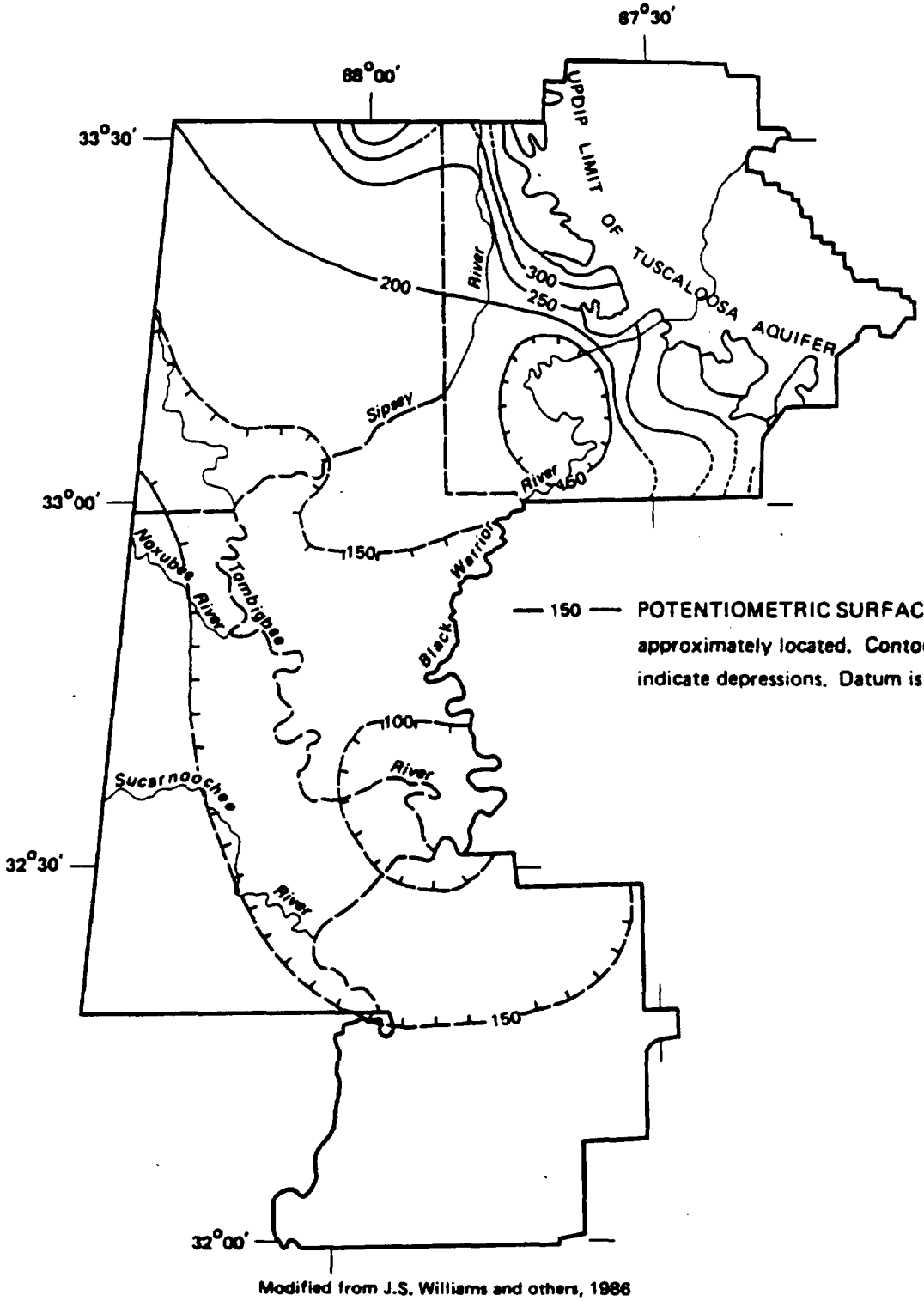
The towns of Coker and Gordo, and the Buhl-Elrod-Holman Water System pump from the Coker aquifer. However, the Coker is not used extensively farther downdip where shallower aquifers are available. An electric log of an oil test well in southwestern Pickens County indicates that the Coker contains relatively fresh water to a depth of 1,750 feet in that area (Wahl, 1965).

Gordo Formation

The Gordo Formation overlies the Coker Formation and crops out in southwestern Tuscaloosa County, northeastern Pickens County and in a small part of northeastern Greene County (see fig. 2). Like the Coker, it dips to the southwest and underlies the formations that crop out south of it. The Gordo consists of a basal zone of gravelly sand overlain by alternating lenticular beds of sand and varicolored mottled clay. It ranges in thickness from less than 100 feet at outcrops to nearly 400 feet in the subsurface in the southern part of the study area. The towns of Aliceville, Reform, Faunsdale, and Union pump from the Gordo aquifer.

Eutaw Formation

The Eutaw Formation overlies the Gordo Formation and crops out over the central part of Pickens County, northern Greene County, and a small part of southwestern Tuscaloosa County. The Eutaw consists of upper and lower zones of marine sand separated by a zone of clay. It ranges in thickness from less than 200 to 400 feet where the entire formation is present. The lower part of the formation consists of 30 to 50 feet of glauconitic sand interbedded with sandy clay. The middle part consists of 50 to 150 feet of calcareous clay and sandy clay. The upper part, the Tombigbee Sand Member, consists of 25 to 100 feet of massive glauconitic sand interbedded with calcareous sandstone and sandy limestone. In part of the area the McShan Formation underlies the Eutaw



Modified from J.S. Williams and others, 1986

Figure 4.--Potentiometric surface of the Tuscaloosa aquifer, fall 1982.

Tertiary Formations

Tertiary deposits in the study area are limited to the Clayton, Porters Creek, and Naheola Formations of the Midway Group and the Nanafalia and Tuscahoma Formations of the Wilcox Group.

Clayton and Porters Creek Formations

The Clayton Formation overlies the Prairie Bluff Formation in Sumter and Marengo Counties. It consists of silty calcareous clay, clayey sandstone, and silty chalk in Sumter County; and sandy chalk and calcareous clayey sand in Marengo County. The Porters Creek Formation overlies the Clayton Formation and crops out in a belt southwest of the Clayton in central Sumter and Marengo Counties. The Porters Creek consists of massive gray marine clays. The clay produces a low-lying topography called the "Flatwoods." The combined thickness of the Clayton and Porters Creek Formations in Sumter and Marengo Counties is 270 to 370 feet. Neither unit is a major aquifer in Sumter or Marengo Counties.

Naheola Formation

The Naheola Formation overlies the Porters Creek Formation and crops out southwest of it in Marengo and Sumter Counties. It consists of fine- and coarse-grained sand, silty clay, and beds of lignite. It is about 120 feet thick and is not a major aquifer in the study area.

Nanafalia Formation

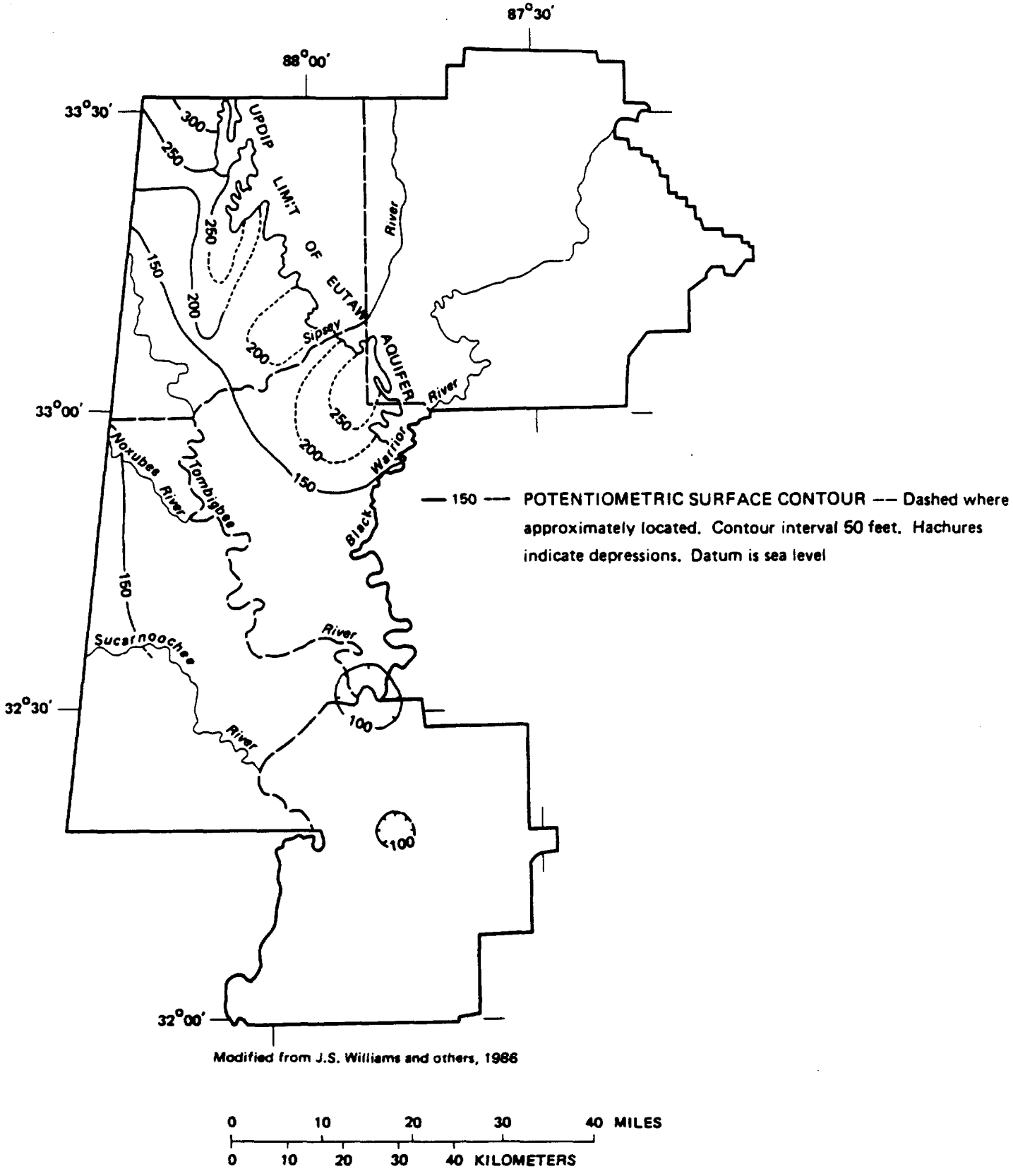
The Nanafalia Formation crops out southwest of the Naheola Formation in Marengo and Sumter Counties. It consists of sand, sandy marl, sandy clay, and lignite. The Nanafalia is about 150 to 200 feet thick in Sumter and Marengo Counties and is tapped by the city wells of Myrtlewood and Sweetwater in southern Marengo County.

Tuscahoma Formation

The Tuscahoma Formation crops out in southernmost Marengo County and southwestern Sumter County. The contact with the overlying Hatchetigbee Formation lies outside the study area to the south. The Tuscahoma consists of about 275 feet of clay, fine- to coarse-grained sand, and fossiliferous glauconitic marl. It is not a major aquifer in the study area.

Quaternary Deposits

Quaternary alluvial deposits overlie older formations throughout a large part of the study area (fig. 2). These deposits, which underlie flood plains of present and ancestral large streams, consist mainly of gravel, sand, silt,



Modified from J.S. Williams and others, 1986

Figure 5.--Potentiometric surface of the Eutaw aquifer, fall 1982.

Wells are used for domestic, stock, industrial, and irrigation purposes. The amount of water used for these purposes was estimated to be 7.7 Mgal/d in 1982 (Baker, 1983). A significant amount of water is lost from the aquifers through flowing artesian wells. For example, about 3.2 Mgal/d was discharging through wells that flow in Tuscaloosa County in 1958 (Miller and Causey, 1958); about 2.7 Mgal/d in Greene County in 1965 (Wahl, 1966); about 2 Mgal/d in Pickens County in 1963 (Wahl, 1965); and more than 1 Mgal/d in Marengo County in 1961 (Newton and others, 1961). Many wells which formerly flowed have ceased to flow as a result of lowering of the potentiometric surface of the aquifers.

Effects of Withdrawals from the Aquifers

Long-term withdrawals of water from the major aquifers have resulted in lowering of the potentiometric surface and formation of depressions on the potentiometric surface of water in the aquifers. Depressions have formed in the Coker and Gordo aquifers (fig. 4) at Demopolis and in the vicinity of the Black Warrior River south of Tuscaloosa. A depression also exists at Demopolis in the Eutaw aquifer (fig. 5). The depressions at Demopolis are partly a result of pumping in both aquifers there. However, these and the depression on the Black Warrior River and the trough-like depression in the Nanafalia aquifer along the Tombigbee River (fig. 6) also reflect natural discharge to the rivers.

SUSCEPTIBILITY OF THE AQUIFERS TO SURFACE CONTAMINATION

All recharge areas for the major aquifers in the study area are susceptible to surface contamination (plate 1). However, throughout most of the study area the recharge areas are in rural settings that are used for timberlands, farms, or pastures. Usually, the depth of the water-producing zone being tapped and its horizontal distance from the aquifer outcrop provide some buffer from surface contamination (table 2). Shallow wells in outcrop areas are more susceptible, but none are considered highly susceptible. The areas most susceptible to future contamination are the flood plains of the Black Warrior, Sipsey, and Tombigbee Rivers, which are underlain by terrace and alluvial deposits that are in hydraulic connection with the major aquifers.

The recharge areas of the minor aquifers (the Paleozoic rocks, the Ripley, Naheola, and Tuscahoma Formations) are also susceptible to contamination from the surface. However, they are not included in the susceptible area on the map because they do not contain actively pumped public supply wells within the study area. Some of these aquifers, notably the Paleozoic limestone, contain public supply wells outside the area in neighboring counties, and are potential sources of public supply within the study area. For instance, the Paleozoic limestone is recharged in Tuscaloosa County and is the source of public supply for the city of West Blocton in adjacent Bibb County.

SELECTED REFERENCES

Adams, G.I., Butts, Charles, Stevenson, L.W., and Cook, C.W., 1926, Geology of Alabama: Geological Survey of Alabama Special Report 14, 312 p.

Alabama Department of Economic and Community Affairs, 1984, Alabama county data book 1984: Office of State Planning and Federal Programs, State of Alabama, 92 p.

Baker, R.M., 1983, Use of water in Alabama, 1982: Geological Survey of Alabama Information Series 59C, 49 p.

Carlston, C.W., 1944, Ground-water resources of the Cretaceous area of Alabama: Geological Survey of Alabama Special Report 18, 203 p.

Conant, L.C., and Monroe, W.H., 1945, Stratigraphy of the Tuscaloosa group in the Tuscaloosa and Cottondale quadrangles, Alabama: U.S. Geological Survey Oil and Gas Investigations Preliminary Map 37.

Davis, M.E., 1980, Ground-water levels in Alabama for observation wells measured periodically August 1952 through July 1977: Geological Survey of Alabama Circular 105, 74 p.

Davis, M.E., Sanford, T.J., Jr., and Jefferson, P.O., 1980, Water availability and geology of Sumter County, Alabama: Geological Survey of Alabama Map 158, 69 p.

Drennen, C.W., 1953, Reclassification of the outcropping Tuscaloosa Group in Alabama: American Association of Petroleum Geologists Bulletin V. 37, Number 3, p. 522-538.

Fenneman, N.M., 1938, Physiography of Eastern United States: New York, McGraw-Hill Book Co., 714 p.

Gardner, R.A., 1981, Model of the ground-water flow system of the Gordo and Eutaw aquifers in west-central Alabama: Geological Survey of Alabama Bulletin 118, 30 p.

Harkins, J.R., and others, 1980, Hydrologic assessment, eastern coal province area 23, Alabama: U.S. Geological Survey Water-Resources Investigations Report 80-683, 76 p.

Miller, J.D., Jr., and Causey, L.V., 1958, Geology and ground-water resources of Tuscaloosa County, Alabama, an interim report: Geological Survey of Alabama Information Series 14, 71 p.

Monroe, W.H., 1941, Notes on deposits of Selma and Ripley age in Alabama: Geological Survey of Alabama Bulletin 48, 150 p.

Newton, J.G., McCain, J.F., and Knight, A.L., 1971, Water availability of Marengo County, Alabama: Geological Survey of Alabama Map 98, 21 p.

Table 1.—Generalized section of geologic formations in the study area, and their water-bearing properties

Era-them	System	Series	Group	Geologic unit	Thickness (ft)	Lithology	Water-bearing properties	Quality of water
Cenozoic	Quaternary	Holocene		Alluvium	0-60	Clay, silt, sand, and gravel	Supplies water to shallow dug wells and driven wells in the flood plains of the major streams and rivers. Adjacent to major streams, where induced recharge is possible, large quantities of water can be withdrawn from these beds.	Water is soft and generally has a chloride content of less than 41 mg/L. Locally contains iron in excess of 0.3 mg/L.
		Pleistocene		Terrace deposits	100	Clay, silt, sand, and gravel	Will yield 10 gal/min or more to individual wells where saturated sands are of sufficient thickness.	
	Tertiary	Pliocene	Wilcox Group	Tuscahoma	275	Sand, crossbedded; laminated silty clay and sand; fine-grained glauconitic beds of sand; two sandy glauconitic fossiliferous marl zones near the middle of the formation	Upper part of formation is a fair aquifer. Sand beds in lower parts of formation are good aquifers and supply water for domestic and farm use.	Water is soft to hard, generally has a chloride content of less than 250 mg/L, and may locally have an iron content in excess of 0.3 mg/L.
				Nanafalia Formation	150-200	Interbedded clay, claystone, and glauconitic sandy fossiliferous marl; crossbedded micaceous sand and thin-bedded sandy silt in lower 5 to 50 ft	Very good aquifer; supplies water to many drilled artesian wells south of the area of outcrop of the formation.	Water generally is soft to hard and contains less than 700 mg/L dissolved solids and 100 mg/L chloride. Locally, water contains iron in excess of 0.3 mg/L.
			Midway Group	Naheola Formation	120	Sand and sandy marl; fine- to medium-grained, glauconitic in upper 10-30 ft; fine-grained interlaminated sand and silty clay and beds of fine-grained sand in lower 70 to 90 ft	Upper sand beds yield small supply of water to dug wells and a few drilled wells for domestic and farm use. Lower part of formation is relatively impermeable and is not known to yield water to wells in the area.	Water generally is soft and contains less than 45 mg/L chloride. Locally, water contains iron in excess of 0.3 mg/L.
				Porters Creek Formation	200	Marl, fossiliferous in upper 25 ft; massive clay, silty sand, sandstone, and massive calcareous clay in lower 175 ft	Relatively impermeable and not an aquifer. A few dug wells in the outcrop area of formation tap water in upper weathered zone.	
				Clayton Formation	70-170	Limestone, chalky, argillaceous in upper 20 to 40 ft; sandy fossiliferous limestone; medium-grained micaceous sand, and calcareous micaceous sandy silt in lower part	Wells developed in weathered sandy limestone beds in this formation may supply adequate water of moderate hardness for domestic and farm use.	Water is generally soft to moderately hard and low in dissolved solids and chloride contents.

Table 1.—Generalized section of geologic formations in the study area, and their water-bearing properties (continued)

Era-them	System	Series	Group	Geologic unit	Thickness (ft)	Lithology	Water-bearing properties	Quality of water
Mesozoic	Cretaceous	Upper Cretaceous	Selma Group	Prairie Bluff Chalk	10-60	Silty and sandy fossiliferous chalk and calcareous clay	Relatively impermeable; not a source of water.	
				Ripley Formation	150-200	Fine- to coarse-grained glauconitic sand, sandy fossiliferous clay and thin beds of fossiliferous calcareous sandstone and sandy limestone	Because these beds are fine-grained and micaceous, the development of wells is sometimes difficult.	Water generally is soft to moderately hard and contains less than 250 mg/L chloride and 1,000 mg/L dissolved solids. Locally, water contains iron in excess of 0.3 mg/L.
				Demopolis Chalk	0-440	Fossiliferous chalk; sandy silty fossiliferous chalk, and silty fossiliferous calcareous clay	Relatively impermeable; not a source of water supply.	
				Moorevillle Chalk	0-420	Upper 10 to 20 ft consists of beds of dense limestone about 1 ft thick separated by fossiliferous sandy chalk; lower part consists of fossiliferous silty to fine sandy chalk and calcareous sandy fossiliferous clay	Relatively impermeable; not a source of water supply.	
				Eutaw Formation (Includes McShan Formation)	0-400	Upper part consists of medium-grained crossbedded glauconitic sand interbedded with silty clay; lower part consists of medium to very coarse grained glauconitic sand interbedded with laminated to thin-bedded micaceous sandy clay	Will yield 2 Mgal/d or more to individual wells. Excellent aquifer.	Soft to hard but generally is soft to moderately hard. Iron in excess of 0.3 mg/L in some locations. Contains less than 250 mg/L of dissolved solids in its northern extent, increasingly higher to the south. Chloride content exceeds 1,000 mg/L in the southern part of the aquifer.
			Tuscaloosa Group	Gordo Formation	0-400	Poorly sorted coarse-grained sand and chert gravel in lower part of formation; upper part consists of laminated to massive clay and lenticular sand beds	Will yield 1 to 2 Mgal/d or more to individual wells. Excellent aquifer.	Soft to moderately hard and contains less than 200 mg/L of dissolved solids. Commonly contains iron in excess of 0.3 mg/L. May be sufficiently mineralized in the southern extent of the aquifer to be objectionable to other uses.
				Coker Formation	0-1,000	Sand, very fine to coarse grained; basal sand 100 to 200 ft thick and is generally gravelly. Partly carbonaceous sandy clay	Potential source of 1 Mgal/d or more to individual wells. Excellent aquifer.	Soft to hard and contains less than 250 mg/L of dissolved solids in northern part of the aquifer. May be sufficiently mineralized to be objectionable for some uses in the southern extent of the aquifer. Iron levels often exceed 0.3 mg/L.
	Pennsylvanian			Pottsville Formation	2,000+	Sandstone, siltstone, and shale, interbedded with conglomerate, coal, and underclay; orthoquartzite at the base and subgraywacke at the top. Shale, silty; numerous coal beds and underclays	Water occurs in joints, fractures, and bedding planes; yields sufficient for domestic use; no large capacity wells have been drilled in the study area.	Soft to hard. Iron content may exceed 0.3 mg/L.
Paleozoic	Mississippian to Cambrian			Floyd Shale, Fort Payne Chert, Little Oak Limestone, Newala Limestone, Longview Limestone, Knox Dolomite (part), Bibb Dolomite, Ketona Dolomite, and Brierfield Dolomite	1,000+	Dolomite, limestone, chert, and shale	Potential source of large water supplies from limestones and dolomites; no large-capacity wells have been drilled in the study area.	Moderately hard to hard. Dissolved solids generally less than 300 mg/L. Iron content is usually less than 0.3 mg/L.

Table 2.--Records of public water-supply wells in the study area (continued)

Well number	Geographic coordinate number	Well owner	Drilled by	Well depth (feet)	Well diam. (inches)	Water bearing unit	Altitude of land surface	Water level above (-) or below Land Surface Datum	Date of measurement	Method of lift	Use of well	Remarks
8	325432087514701	Greene County Dog Racing Track, Eutaw	Causey Drilling Co., Inc. 05/18/77	425	4	Kg	200	46.4	08/15/77	S	P	Well 1 casing: 4 in. from surface to 405 ft. 2 in. screen from 405 to 425 ft. Drawdown 7 ft after pumping 40 gal/min for 28 hrs on 05/10/77.
9	325435087515001	Greene County Dog Racing Track, Eutaw	Causey Drilling Co., Inc. 06/09/77	420	4	Kg	200	48.52	09/10/77	S	P	Well 2 casing: 4 in. from surface to 400 ft. 2 in. screen from 400 to 420 ft. Drawdown 22 ft after pumping 75 gal/min for 24 hrs on 09/10/77.
10	324910087535501	Greene County Housing Authority, Eutaw	Graves Drilling Co., Inc. 09/74	1197	10	Ke	165	8	03/10/75	T	P	Casing: 10 in. from surface to 1,088 ft. 6 in. screen from 1,090 to 1,130 ft. Drawdown 500 ft after pumping 375 gal/min for 12 hrs on 03/10/75.
11	330309087563901	Town of Union	Graves Drilling Co., Inc. 07/26/78	374	6.25	Kg	210	40.65	07/26/78	S	P	Casing: 6.25 in. from surface to 275 ft. 4 in. from 254 to 314 ft. 4 in. screen from 316 to 374 ft. Drawdown 33 ft after pumping 225 gal/min for 24 hrs on 07/26/78.
12	323012087492701	City of Demopolis	Layne-Central Co. 1951	1002	18	Ke	160	49.3 77 82	12/11/58 1970 1985	T	P	Well 2: Screen from 882 ft to 942 ft. Drawdown 190 ft after pumping 560 gal/min for 11 hrs on 12/11/57.
13	323006087481701	City of Demopolis	Layne-Central Co. 1959	980	18 8	Ke	174	65 65 72 85	1959 1960 1970 1985	T	P	Well 3: Screen from 900 to 970 ft. Drawdown 62.5 ft after pumping 554 gal/min for 8 hrs in 1959.
14	323123087501201	City of Demopolis	Layne-Central Co. 1931	926	8	Ke	90	- 8.3	07/10/67	T	P	Well 1: Estimated flow 150 gal/min on 07/10/67. Well reworked in about 1980.
15	323013087471401	City of Demopolis	Layne-Central Co. 02/20/69	993	18	Ke	145	29 29 42	02/20/69 01/09/78 10/10/85	T	P	Well 4 casing: 18 in. to 900 ft. 8 in. below. Screen from 903 to 913 ft, from 918 to 958 ft, and from 963 to 983 ft. Drawdown 74 ft after pumping 500 gal/min for 24 hrs
16	322615087354501	City of Faunsdale	Powell Drilling Co. 11/22/78	1035	8	Kg	305	130 172.3	11/78 1982	T	P	Screen from 990 ft to 1,031 ft. Drawdown 40 ft after pumping 150 gal/min for 24 hrs

TABLE 4. Records of public water supply, [illegible] and Bond, 1.64 (continued)

Well number	Geographic coordinate number	Well owner	Drilled by	Well depth (feet)	Well diam. (inches)	Water bearing unit	Altitude of land surface	Water level above (-) or below Land Surface Datum	Date of measurement	Method of lift	Use of well	Remarks
24	321601087372801	City of Thomaston	F.C. Null 03/01/50	1235	8 6	Ke	185	37.7	02/22/56	T	P	Well 1 casing: 8 in. from surface to 234 ft. 6 in. from 219 to 1235 ft. 6 in. screen from 1,190 to 1,230 ft. Drawdown 75.7 ft after pumping 46 gal/min for 24 hrs on 02/21/56.
25	330741088091101	City of Alice-ville	Layne-Central Co. 1943	443	12 8	Kg	198	27	1943	T	N	City well casing: 12 in. from s surface to 393 ft. 8 in. screen from 393 to 443 ft.
26	330713088100501	City of Alice-ville	Layne-Central Co. 12/21/42	489	12 8	Kg	169	- 3	1943	T	P	P.O.W. well 1 casing: 12 in. from surface to 429.5 ft. 8 in. from 368 to 434.5 ft. 8 in. screen from 434.5 to 484.5 ft. Drawdown 59 ft after pumping 700 gal/min for 36 hrs.
27	330712088100701	City of Alice-ville	Layne-Central Co. 12/14/42	359	12 8	Ke	173	13	10/43	T	P	P.O.W. well 2 casing: 12 in. from surface to 300 ft. 8 in. from 236.5 to 305 ft. 8 in. screen from 305 to 355 ft. Drawdown 60 ft after pumping 650 gal/min for 36 hrs on 05/21/47.
28	330718088085501	City of Alice-ville	Acme Drilling Co. 05/24/72	421	16 8	Kg	182	30	09/05/72	T	P	Well 1 casing: 16 in. from surface to 302 ft. 8 in. casing from 252 to 299 ft and 335 to 390 ft. 8 in. screen from 299 to 335 ft and 390 to 421 ft.
29	331555088054801	City of Carroll-ton	Layne-Central Co. 1935	160	18 8	Kg	271	62.28	04/16/86	N	N	Casing slotted 135 to 160 ft.
30	331555088054802	City of Carroll-ton	Layne-Central Co. 07/27/48	163	10 6	Kg	271			N	N	Casing: 10 in. from surface to 120.75 ft. 6 in. from 97 to 139.5 ft. 6 in. screen from 139.5 to 160 ft. Drawdown 18 ft after pumping 160 gal/min for 4 hrs on 08/17/48.
31	331914087541401	City of Gordo	Gray Artesian Well Co.	460	6	Kc	278	35 81.41	11/02/50 04/16/86	T	N	Casing: 6 in. from surface to 400 ft. Screen from 400 to 460 ft.

Table 2.--Records of public water-supply wells in the study area (continued)

Well number	Geographic coordinate number	Well owner	Drilled by	Well depth (feet)	Well diam. (inches)	Water bearing unit	Altitude of land surface	Water level above (-) or below Land Surface Datum	Date of measurement	Method of lift	Use of well	Remarks
42	331058087342504	City of Tuscaloosa	Layne-Central Co. 08/03/62	88	16	Kc	175	5	08/03/62	T	N	Drawdown 60 ft after pumping 500 gal/min for 48 hrs.
43	330927087361501	City of Tuscaloosa	Layne-Central Co. 04/71	142	12	Kc	130	11	04/01/71	T	N	Screen from 112 to 132 ft. Drawdown 52 ft after pumping 703 gal/min for 8 hrs.
44	330927087361601	City of Tuscaloosa	Layne-Central Co. 01/71	162	12	Kc	130	10	01/22/71	T	N	Screen from 132 to 152 ft.
45	330906087363901	City of Tuscaloosa	Layne-Central Co. 02/71	149	12	Kc	130	12	02/16/71	T	N	Screen from 119 to 139 ft. Drawdown 38 ft after pumping 536 gal/min for 1 hr.
46	331450087412101	Town of Coker	Graves Drilling Co. 07/21/67	182	4	Kc	180	37.36	09/21/67	T	P	Screen from 162 to 182 ft. Drawdown 20 ft after pumping 125 gal/min for 8 hrs 28 min.
47	331446087411701	Town of Coker	Graves Drilling Co. 04/15/74	205	4	Kc	180	42.5	03/28/74	T	P	Drawdown 27.5 ft after pumping 169 gal/min for 8 hrs.
48	331526087480201	Buhl-Elrod-Holman Water System	Graves Drilling Co. 04/02/85	108	4	Qal	240	Ground Level	03/13/85	S	P	Well 1. Screen from 67 to 107 ft. Drawdown 55 ft after pumping 100 gal/min for 24 hrs.
49	331526087480202	Buhl-Elrod-Holman Water System	Graves Drilling Co. 04/02/85	336	4	Kc	240	49.2	03/13/85	S	P	Well 2. Screen from 284 to 335 ft. Drawdown 80 ft after pumping 140 gal/min for 24 hrs.

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Reference No.25

HYDROGEOLOGIC ASSESSMENT

LAWTER INTERNATIONAL, SOUTHERN RESINS PLANT

MOUNDVILLE, ALABAMA

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April 1985

HYDROGEOLOGIC ASSESSMENT
LAWTER INTERNATIONAL, SOUTHERN RESINS PLANT
MOUNDVILLE, ALABAMA

PURPOSE AND SCOPE

The Southern Resins Plant of Lawter International has stored lime filter-cake waste on the plant site at Moundville, Alabama. This storage of waste material on the property has raised concern by ADEM regarding potential contamination of groundwater beneath the storage area. The purpose of this report is to assess the geology and hydrogeology of the plant site, evaluate existing data concerning groundwater in the area, identify data needs and propose a groundwater monitoring well network and sampling plan to detect if any groundwater contamination has occurred.

The scope of work included two visits to the site, a records search of government agencies' files for wells located near the site, obtaining published reports on local geology and hydrology, and sampling and analysis of water from an onsite well.

PLANT LOCATION

The Southern Resins Plant is located on a 64 acre tract in Section 36, T24N, R4E, 13 miles south of Tuscaloosa. The plant site is bounded by Carthage Branch Creek and the Black Warrior River and is within Tuscaloosa County and the Moundville Town limits.

The plant site terrain is a river terrace, 60 feet above the Black Warrior River. The edge of the terrace has been sharply incised on all but the east side by steep-walled

erosion channels. Total relief on the site is about 75 feet. The plant layout is shown on Figure 1.

Surface drainage from the site is radially away from the plant and into either Carthage Branch or the Black Warrior River.

PLANT SITE GEOLOGY AND HYDROGEOLOGY

The geology and hydrogeology of the Moundville area is described in a Geological Survey of Alabama report (SM-136) on the water resources of Hale County. The plant site is located on a remnant of a river terrace along the Black Warrior River. The terrace elevation varies from 50 to 70 feet above the present level of the river. The north edge of the terrace is located on a horseshoe bend in the Black Warrior River and the riverbank is actively eroding. As a result of this erosion, about 50 feet of the terrace deposits and underlying formation are exposed in the riverbank.

The upper 30 feet of the terrace consists of beds of yellow-brown sandy gravel, yellow or white fine-to-coarse sand and an upper layer about five feet thick of light gray or yellow-brown sandy and silty clay. These deposits were laid down in an alluvial environment and the sands and gravel consist of very well-rounded quartz and granite fragments.

The terrace deposits lie unconformably on the Gordo Formation of the Tuscaloosa Group. The contact between the terrace deposits and the Gordo Formation is marked in the outcrop by a thin layer of iron-cemented sandstone. This layer has a thickness of about 1/2 inch.

The top of the Gordo Formation, as exposed in the riverbank, is a massive-bedded light gray clay or claystone. East and

north of the plant site, the Gordo Formation outcrops and has a reported thickness of over 300 feet. The formation consists of light gray or mottled red and gray clay layers and light tan to red-brown sand and gravel layers. The lower part of the Gordo is reported to be more coarse-grained than the upper section.

The Gordo Formation unconformably overlies the Coker Formation which overlies the Paleozoic Pottsville Formation. The Coker has a reported thickness of up to 600 feet of interbedded yellow-brown sands and clays. The Coker is reported to be more coarse-grained than the Gordo.

Wells in the Moundville area are usually completed in the Gordo Aquifer at a depth of 150 to 180 feet or in the Coker Aquifer at a depth of over 400 feet. In the lower terrain along the river and west of Highway 69, the potentiometric surface in the Coker Aquifer is above land surface and the wells flow naturally.

There is a standby well at the Southern Resins plant with a reported depth of 400 feet, which would be in the Coker Aquifer. Chemical analysis of a water sample from the onsite well indicated the absence of any organic compounds in the groundwater (see attached testing results). There are several other wells in Moundville which produce from the Coker Aquifer. The Moundville water supply is from wells in both the Coker and Gordo Aquifers.

In the bluffs around the plant site, there are contact springs at the interface between the terrace deposits and the Gordo Formation. These contact springs are widely distributed along the river bank and none of the springs produces more than about 10 gpm. It appears that infiltration on the land surface at the plant moves downward through the

terrace deposits to the top of the Gordo Formation and then moves laterally toward the outcrop in the riverbank or erosion cuts.

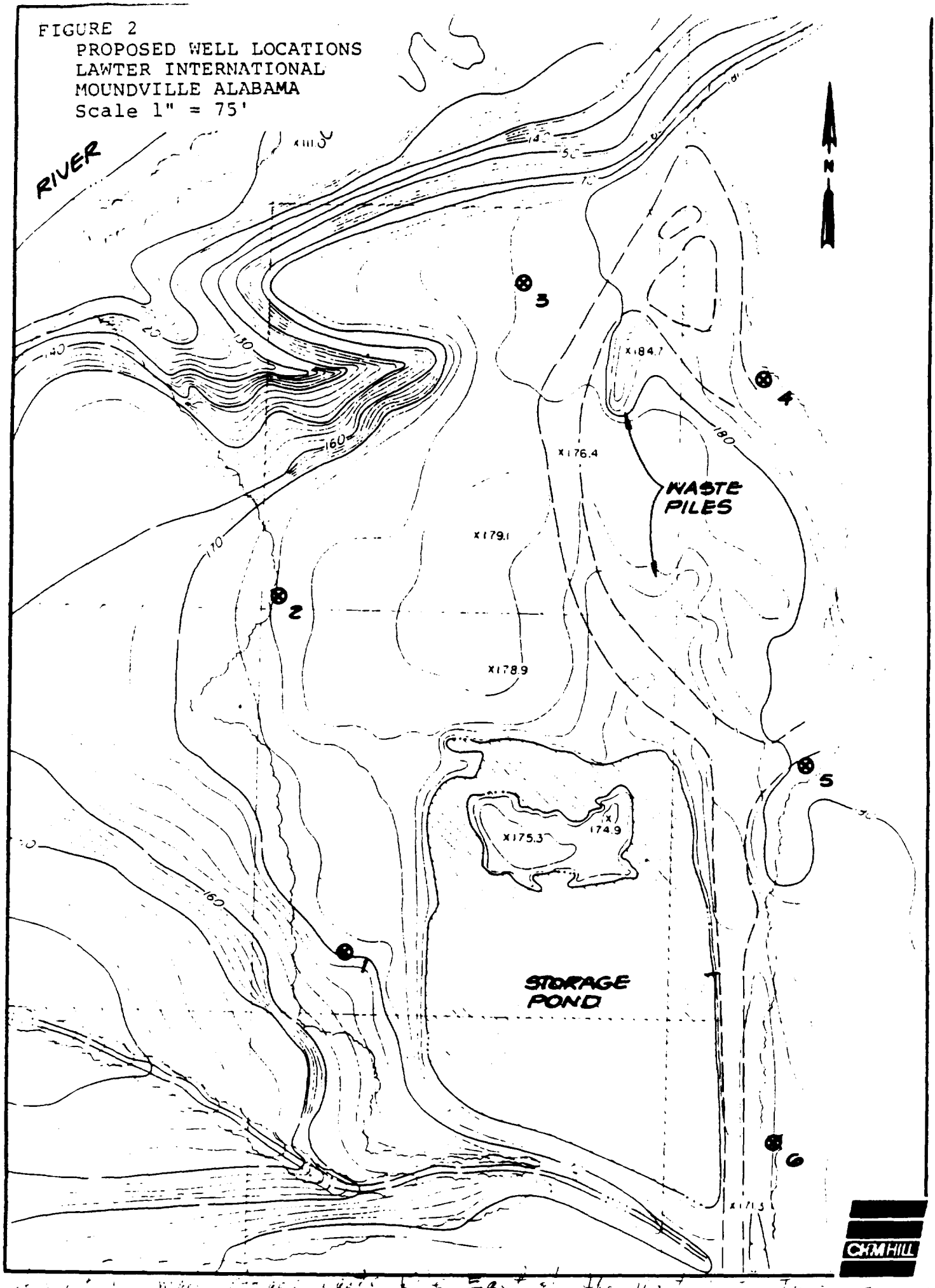
Since the plant site has well-incised channels around the margin of the terrace with contact springs evident in all of the channels, it is probable that groundwater flow is radial toward the nearest surface drainage. This hypothesis could be modified somewhat by the regional dip to the southwest in the Gordo Formation and by variations in the permeability of the terrace deposits. In order to evaluate the actual groundwater flow direction, monitor wells should be installed and measured, and the contact springs should be mapped and their elevations determined.

PROPOSED GROUNDWATER MONITORING PLAN

The primary area of concern at the plant site for groundwater monitoring is that portion of the site which lies north of the waste treatment plant. Lime filter-cake waste was stored in this area, on the land surface. Figure 2 shows the topography of this area.

It is recommended that six monitor wells be constructed around the perimeter of this area with the proposed well locations shown on Figure 2. The wells should be drilled into the top of the Gordo Formation and completed with four-inch diameter steel casing and a 2½-foot length of four-inch stainless steel well screen placed at the contact between the Gordo Formation and the terrace deposits. The screened interval would be gravel packed with a seal of bentonite pellets above the gravel pack and then cement-grout filled to land surface.

FIGURE 2
PROPOSED WELL LOCATIONS
LAWTER INTERNATIONAL
MOUNDVILLE ALABAMA
Scale 1" = 75'



It is also recommended that the first well be drilled to a depth of 100 feet, so that a geophysical log can be made of the top of the Gordo formation and the terrace deposits. This well would be backfilled after logging and subsequently be completed at the contact between the terrace deposits and the Gordo Formation.

After the wells are completed, the drilling mud would be thinned with hexametaphosphate and the wells would be developed by air surging to remove mud and fine sand. The elevation of the well casing tops would be surveyed and a protective cap would be installed.

Sampling Plan

For the initial evaluation, the wells would be sampled twice in a two week period. The samples would be analyzed for the attached set of EPA priority pollutants and primary drinking water standards. After evaluation of the initial analyses, additional monitoring will be considered.

ANALYTICAL RESULTS

for

CH_2M Hill

VOLATILE ORGANICS

Parameter		Units	Detection Limit	4731-01	4731-02
1V	Acrolein	ug/l	100	ND	ND
2V	Acrylonitrile	ug/l	100	ND	ND
3V	Benzene	ug/l	5	ND	ND
4V	Bis(chloromethyl)ether	ug/l	5	ND	ND
5V	Bromoform	ug/l	5	ND	ND
6V	Carbon tetrachloride	ug/l	5	ND	ND
7V	Chlorobenzene	ug/l	5	ND	ND
8V	Chlorodibromomethane	ug/l	5	ND	ND
9V	Chloroethane	ug/l	10	ND	ND
10V	2-Chloroethylvinyl ether	ug/l	5	ND	ND
11V	Chloroform	ug/l	5	ND	ND
12V	Dichlorobromomethane	ug/l	5	ND	ND
13V	Dichlorodifluoromethane	ug/l	10	ND	ND
14V	1,1-Dichloroethane	ug/l	5	ND	ND
15V	1,2-Dichloroethane	ug/l	5	ND	ND
16V	1,1-Dichloroethylene	ug/l	5	ND	ND
17V	1,2-Dichloropropane	ug/l	5	ND	ND
18V	1,3-Dichloropropylene	ug/l	5	ND	ND
19V	Ethylbenzene	ug/l	5	ND	ND
20V	Methylbromide	ug/l	10	ND	ND
21V	Methylchloride	ug/l	10	ND	ND
22V	Methylene chloride	ug/l	15	ND	ND
23V	1,1,2,2-Tetrachloroethane	ug/l	5	ND	ND
24V	Tetrachloroethylene	ug/l	5	ND	ND
25V	Toluene	ug/l	5	ND	ND
26V	1,2-trans-Dichloroethylene	ug/l	5	ND	ND
27V	1,1,1-Trichloroethane	ug/l	5	ND	ND
28V	1,1,2-Trichloroethane	ug/l	5	ND	ND
29V	Trichloroethylene	ug/l	5	ND	ND
30V	Trichlorofluoromethane	ug/l	10	ND	ND
31V	Vinyl chloride	ug/l	10	ND	ND

ND = Not detected.

SAMPLE RESULTS
LAWTER INTERNATIONAL--ONSITE WELL

ANALYTICAL RESULTS

for

CH$_2$M Hill

BASE/NEUTRAL COMPOUNDS

Parameter	Units	Detection Limit	4731-01
1B Acenaphthene	ug/l	5	ND
2B Acenaphthylene	ug/l	5	ND
3B Anthracene	ug/l	5	ND
4B Benzidine	ug/l	50	ND
5B Benzo(a)anthracene	ug/l	5	ND
6B Benzo(a)pyrene	ug/l	5	ND
7B Benzofluoranthene (b)	ug/l	5	ND
8B Benzo (ghi) perylene	ug/l	5	ND
9B Benzo (k) fluoranthene	ug/l	5	ND
10B Bis(2-chloroethoxy)methane	ug/l	5	ND
11B Bis (2-chloroethyl)ether	ug/l	5	ND
12B Bis (2-chloroiso-propyl)ether	ug/l	5	ND
13B Bis (2-ethylhexyl)phthalate	ug/l	5	ND
14B 4-Bromophenyl phenylether	ug/l	5	ND
15B Butyl benzyl phthalate	ug/l	5	ND
16B 2-Chloronaphthalene	ug/l	5	ND
17B 4-Chlorophenyl phenylether	ug/l	5	ND
18B Chrysene	ug/l	5	ND
19B Dibenzo(a,h) anthracene	ug/l	5	ND
20B 1,2-Dichlorobenzene	ug/l	5	ND
21B 1,3-Dichlorobenzene	ug/l	5	ND
22B 1,4-Dichlorobenzene	ug/l	5	ND
23B 3,3'-Dichlorobenzidine	ug/l	20	ND
24B Diethyl phthalate	ug/l	20	ND
25B Dimethyl phthalate	ug/l	5	ND
26B Di-n-butyl phthalate	ug/l	5	ND
27B 2,4-Dinitrotoluene	ug/l	5	ND
28B 2,6-Dinitrotoluene	ug/l	5	ND
29B Di-n-octyl phthalate	ug/l	5	ND
30B 1,2-Diphenylhydrazine*	ug/l	5	ND
31B Fluoranthene	ug/l	5	ND

ND = Not detected. *Measured as azobenzene.

ANALYTICAL RESULTS

for

CH$_2$M Hill

BASE NEUTRAL COMPOUNDS (Cont'd.)

Parameter	Units	Detection Limit	4731-01
32B Fluorene	ug/l	5	ND
33B Hexachlorobenzene	ug/l	5	ND
34B Hexachlorobutadiene	ug/l	5	ND
35B Hexachlorocyclopentadiene	ug/l	5	ND
36B Hexachloroethane	ug/l	5	ND
37B Indeno(1,2,3-cd)pyrene	ug/l	5	ND
38B Isophorone	ug/l	5	ND
39B Naphthalene	ug/l	5	ND
40B Nitrobenzene	ug/l	5	ND
41B N-Nitrosodimethylamine	ug/l	5	ND
42B N-Nitrosodi-n-propylamine	ug/l	5	ND
43B N-Nitrosodiphenylamine	ug/l	5	ND
44B Phenanthrene	ug/l	5	ND
45B Pyrene	ug/l	5	ND
46B 1,2,4-Trichlorobenzene	ug/l	5	ND

ACID COMPOUNDS

Parameter	Units	Detection Limit	4731-01
1A 2-Chlorophenol	ug/l	5	ND
2A 2,4-Dichlorophenol	ug/l	5	ND
3A 2,4-Dimethylphenol	ug/l	5	ND
4A 4,6-Dinitro-o-cresol	ug/l	25	ND
5A 2,4-Dinitrophenol	ug/l	50	ND
6A 2-Nitrophenol	ug/l	5	ND
7A 4-Nitrophenol	ug/l	10	ND
8A p-Chloro-m-cresol	ug/l	5	ND
9A Pentachlorophenol	ug/l	5	ND
10A Phenol	ug/l	10	ND
11A 2,4,6-Trichlorophenol	ug/l	5	ND

ND = Not detected. NR = Not requested.

VOLATILE COMPOUNDS

Chloromethane
Bromomethane
Vinyl Chloride
Chloroethane
Methylene Chloride
Trichlorofluoromethane
1,1-Dichloroethene
1,1-Dichloroethane
Trans-1,2-Dichloroethene
Chloroform
1,2-Dichloroethane
1,1,1-Trichloroethane
Carbon Tetrachloride
Bromodichloromethane
1,2-Dichloropropane
Trans-1,3-Dichloropropene
Trichloroethylene
Benzene
Dibromochloromethane
1,1,2-Trichloroethane
Cis-1,3-Dichloropropene
2-Chloroethyl vinyl ether
Bromoform
1,1,2,2-Tetrachloroethane
Tetrachloroethylene
Toluene
Chlorobenzene
Ethyl Benzene
Acrylonitrile
Acrolein
Dichlorodifluoromethane

BASE/NEUTRAL COMPOUNDS

4-Bromophenyl phenyl ether
Hexachlorobenzene
Phenanthrene
Anthracene
Dibutyl phthalate
Fluoranthene
Pyrene
Benzidine
Butyl benzyl phthalate
2,3,7,8-Tetrachlorodibenzo-p-dioxin
Benzo (a) anthracene
Chrysene
3,3'-Dichlorobenzidine
Bis (2-ethylhexyl) phthalate
Di-n-octyl phthalate
Benzo (b) fluoranthene
Benzo (k) fluoranthene
Benzo (a) pyrene
Indeno (1,2,3-cd) pyrene
Dibenzo (a,h) anthracene
Benzo (g,h,i) perylene
N-nitrosodimethylamine
Bis (chloromethyl) ether

Bis (2-chloroethyl) ether
1,3-Dichlorobenzene
1,4-Dichlorobenzene
1,2-Dichlorobenzene
Bis (2-Chloroisopropyl) ether
Hexachloroethane
N-nitroso-di-n-propylamine
Nitrobenzene
Isophorone
Bis (2-Chloroethoxy) methane
1,2,4-Trichlorobenzene
Naphthalene
Hexachlorobutadiene
Hexachlorocylopentadiene
2-Chloronaphthalene
Acenaphthylene
Dimethylphthalate
2,6-Dinitrotoluene
Acenaphthene
2,4-Dinitrotoluene
Fluorene
4-Chlorophenyl phenyl ether
Diethyl phthalate
N-nitrosodiphenylamine[3]
1,2-Diphenylhydrazine[4]

ACID COMPOUNDS

Phenol
2-Chlorophenol
2-Nitrophenol
2-4-Dimethylphenol
2-4-Dichlorophenol
4-Chloro-3-methylphenol
2,4,6-Trichlorophenol
2,4-Dinitrophenol
4-Nitrophenol
2-Methyl-4,6-dinitrophenol

EPA NATIONAL DRINKING WATER REGULATIONS

National Interim Primary Drinking Water Regulations† (milligrams per liter, ppm)		Recommended National Secondary Drinking Water Regulations‡ (milligrams per liter, ppm)	
Inorganics	Maximum Contaminant Level	Inorganics	Maximum Contaminant Level
Arsenic	0.05	Chloride	250.0
Barium	1.0	Copper	1.0
Cadmium	0.01	Iron	0.3
Chromium	0.05	Manganese	0.05
Lead	0.05	Sulfate	250.0
Mercury	0.002	Zinc	5.0
Nitrate (as N)	10.0	Total Dissolved Solids	500.0
Selenium	0.01		
Silver	0.05		
Fluoride	1.4 - 2.4*		
Organics			
Edrin	0.0002		
Y-BHC (Lindane)	0.004		
Methoxychlor	0.1		
Toxaphene	0.005		
2,4-Dichlorophenoxy-acetic acid (2,4-D)	0.1		
2,4,5-Trichlorophenoxy-propionic acid (2,4,5-TP Silvex)	0.01		
Total Trihalomethanes	0.1		

†As published in the Federal Register, Vol. 40, No. 248, December 24, 1975, 59566, and subsequently amended

‡Selected contaminants reported from: National Secondary Drinking Water Regulations, EPA-570/9-76-000, July, 1979

*The fluoride standard varies according to the annual average maximum daily air temperature for the location in which the community water system is situated.

Note: Total trihalomethanes is the sum of chloroform, dibromochloromethane, bromodichloromethane, and bromoform rounded to two significant figures.

Reference No.26

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Waterloo, Ontario

GROUNDWATER

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Table 2.2 Range of Values of Hydraulic Conductivity and Permeability

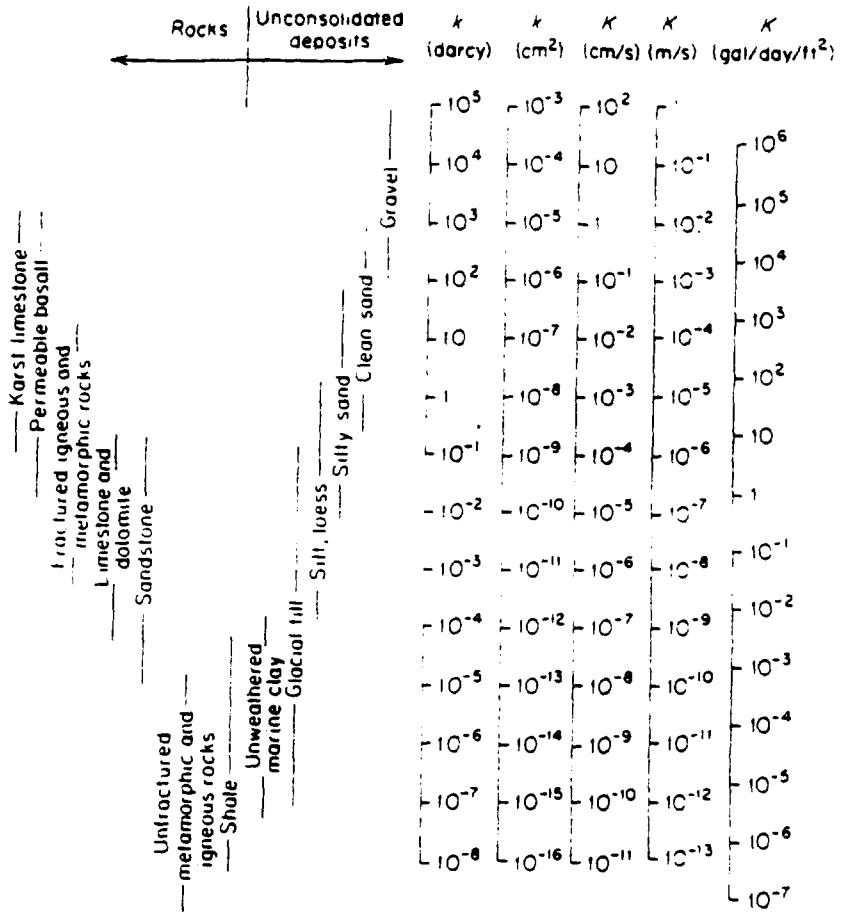

Table 2.3 Conversion Factors for Permeability and Hydraulic Conductivity Units

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

*To obtain k in ft^2, multiply k in cm^2 by 1.08×10^{-3}.

ALSO
CHECK
IRS MANUAL

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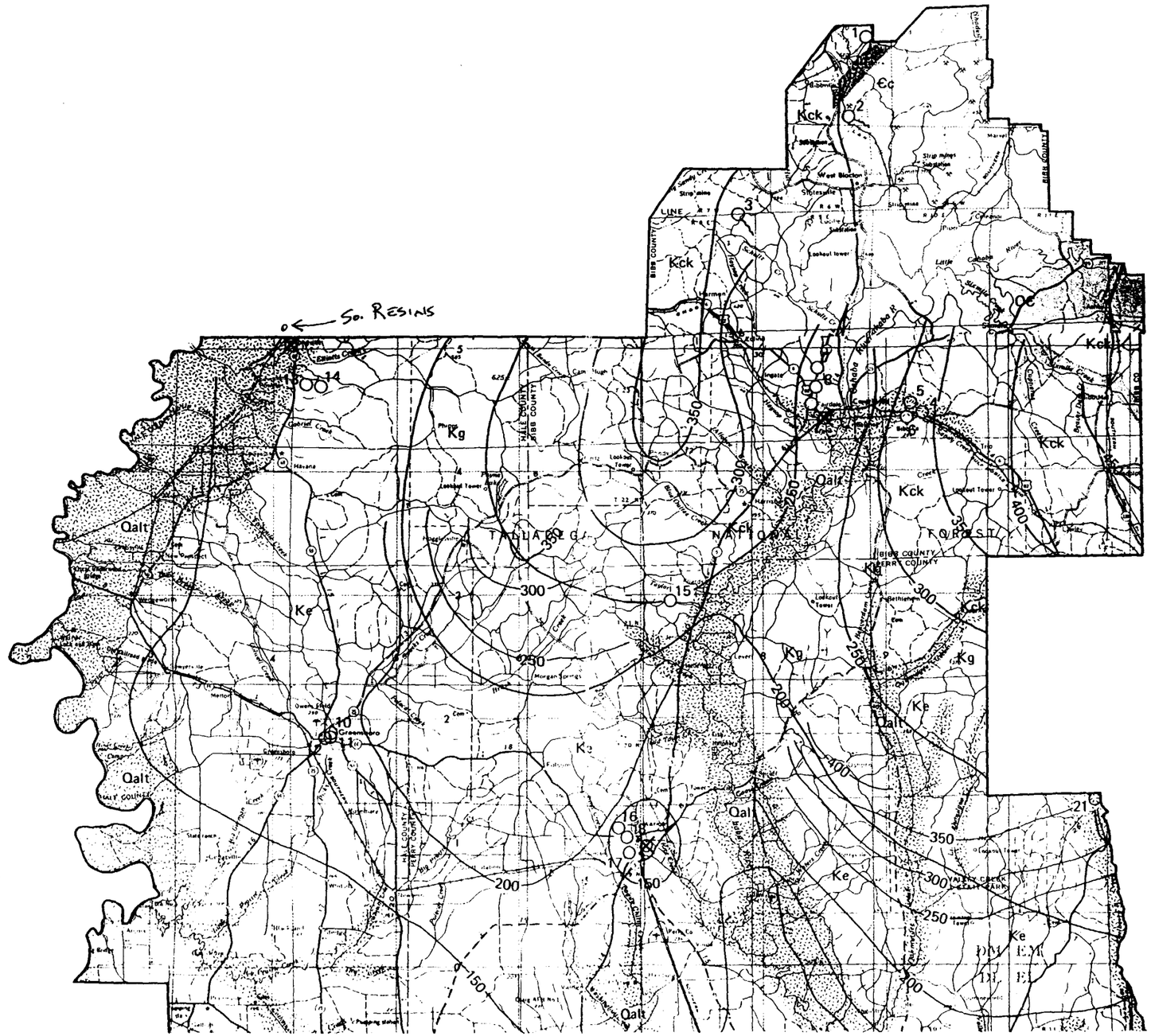
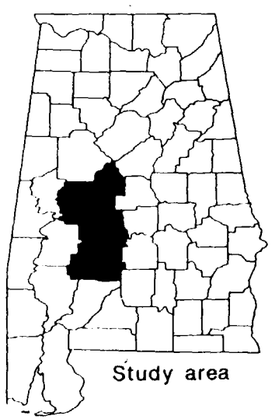
DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
ALABAMA DEPARTMENT OF ENVIRONMENTAL
MANAGEMENT

WATER RESOURCE INVESTIGATIONS
REPORT 87-4109 PLATE 1





Study area

EXPLANATION

RECHARGE AREAS FOR PRIMARY AQUIFERS
(Areas susceptible to contamination--Modified from Adams and others, 1926).

Quaternary — Qalt — Alluvial and terrace deposit aquifers.

Tertiary
- Tallahatta not shown due to scale.
- Tha — Hatchetigbee } Lisbon aquifer
- Ttu — Tuscahoma Sand } Lisbon aquifer
- Nanafalia aquifer

Cretaceous
- Kr — Ripley aquifer
- Ke — Eutaw aquifer } Tuscaloosa aquifer
- Kg — Gordo aquifer } Tuscaloosa aquifer
- Kck — Coker aquifer

Paleozoic
- O€ — Cambrian–Ordovician Limestone and Dolomite aquifers
- Conasauga aquifer

—200— POTENTIOMETRIC CONTOUR OF THE TUSCALOOSA AQUIFER--Shows altitude at which water level would have stood in tightly cased wells (1982). Hachures indicate depression. Contour interval 50 feet. Datum is sea level.

—150— POTENTIOMETRIC CONTOUR OF THE EUTAW AQUIFER--Shows altitude at which water level would have stood in tightly cased wells (1982). Hachures indicate depression. Contour interval 50 feet. Datum is sea level.

—50— POTENTIOMETRIC CONTOUR OF THE RIPLEY AQUIFER--Shows altitude at which water level would have stood in tightly cased wells (1982). Hachures indicate depression. Contour interval 50 feet. Datum is sea level.

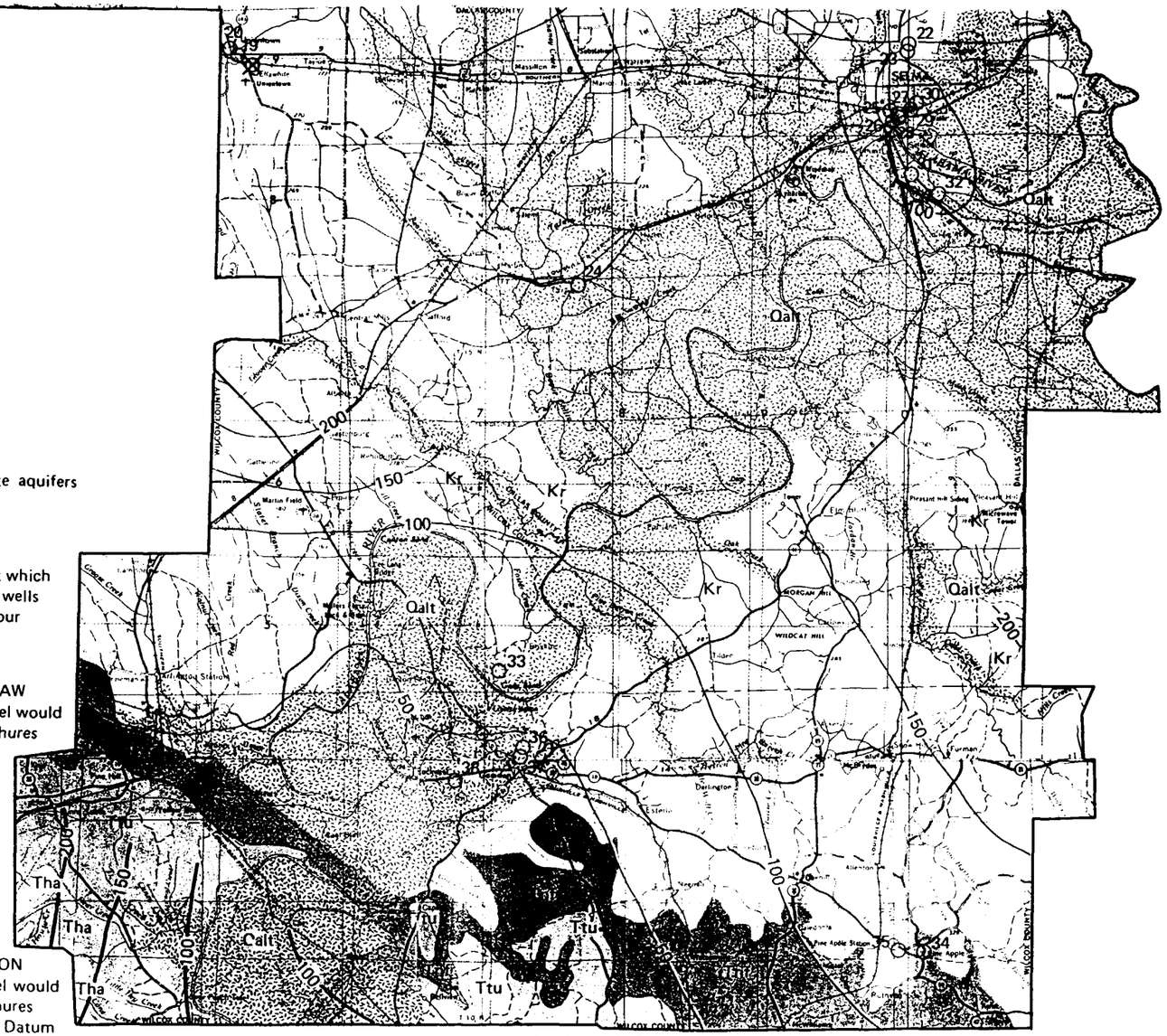
—100— POTENTIOMETRIC CONTOUR OF THE LISBON AQUIFER--Shows altitude at which water level would have stood in tightly cased wells (1982). Hachures indicate depression. Contour interval 50 feet. Datum is sea level.

AQUIFER BOUNDARY CONCEALED BY ALLUVIAL AND TERRACE DEPOSITS

○1 PUBLIC WATER–SUPPLY WELL--Numbers correspond to those given in table 1.

○2 PUBLIC WATER–SUPPLY SPRING--Numbers correspond to those given in table 1.

⊗ ABANDONED PUBLIC WATER–SUPPLY WELL.

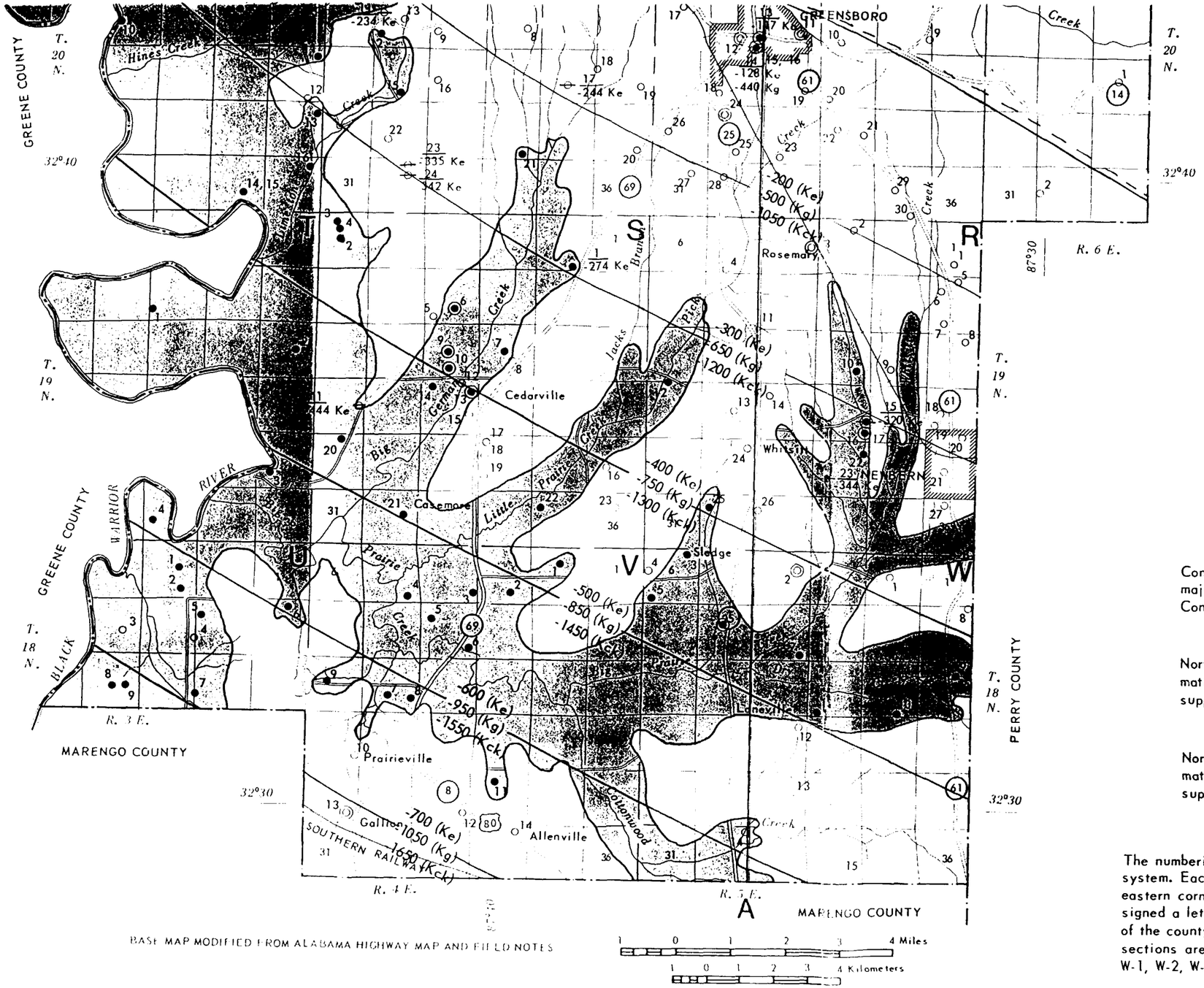


Base from U.S. Geological Survey 1:250,000 quadrangles Birmingham, 1955, revised 1969; Montgomery, 1955, revised 1969; and Andalusia, 1954, revised 1970

0 5 10 15 20 Miles

0 5 10 15 20 Kilometers

RECHARGE AREAS AND POTENTIOMETRIC SURFACES OF THE MAJOR AQUIFERS, AREAS SUSCEPTIBLE TO CONTAMINATION, AND LOCATIONS OF PUBLIC WATER–SUPPLY WELLS



Area of artesian flow

Nonflowing well and number

Flowing well and number

Industrial or municipal nonflowing well and number

Industrial or municipal flowing well and number

Spring and number

Control well and number

Number above line is well number; number below line indicates elevation, in feet related to mean sea level of base of major aquifer (Eutaw Ke, Gordo Kg, Coker Kck).

-400 (Ke)
-750 (Kg)
-1300 (Kck)

Contour showing approximate elevation of base of indicated major aquifer capable of yielding 1.5 mgd to individual wells. Contour interval in feet is variable.

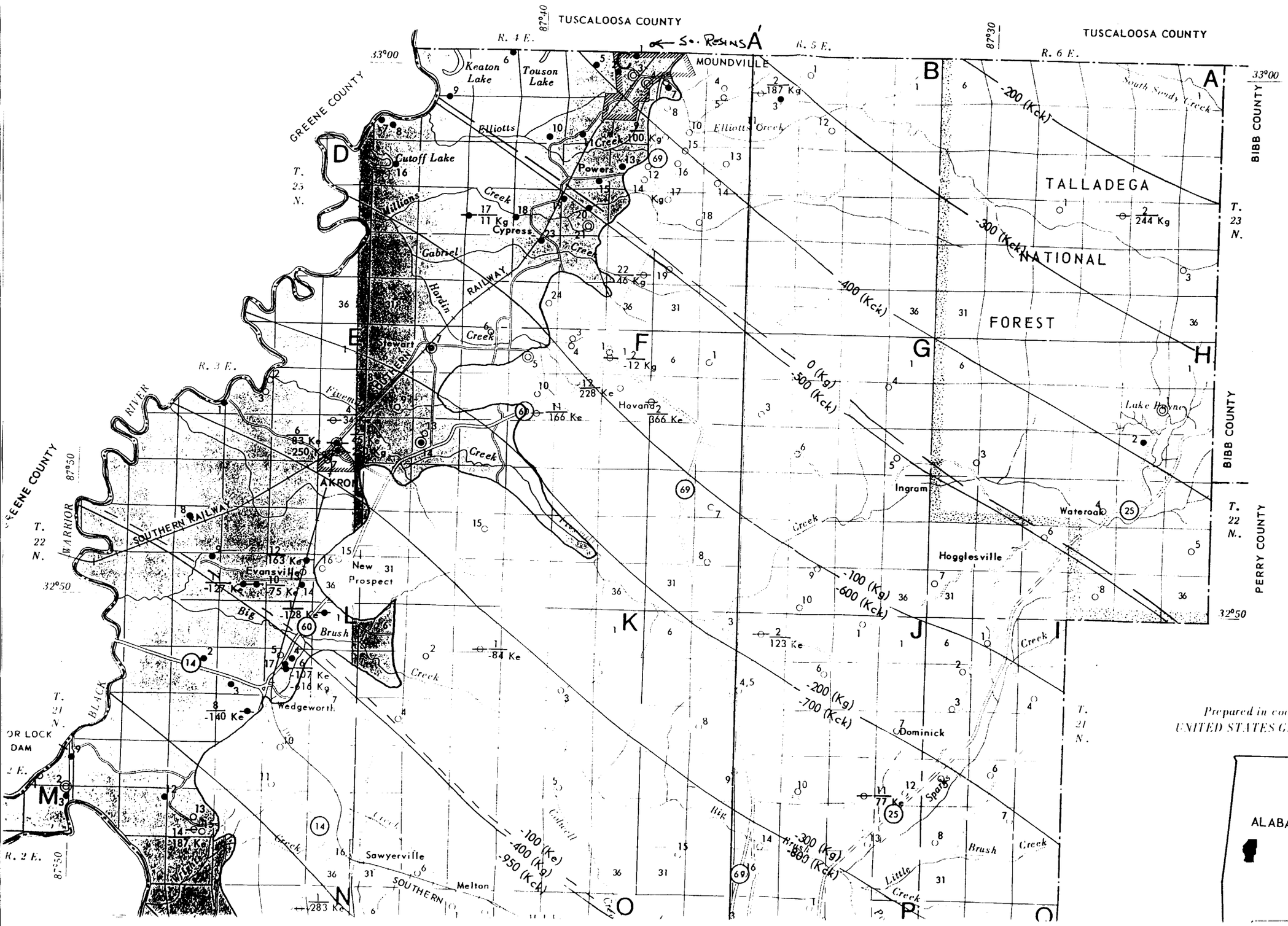
Northern extent of area in which major aquifer of the Eutaw Formation is capable of yielding 1.5 mgd to individual wells. Smaller supplies available north of this line.

Northern extent of area in which major aquifer of the Gordo Formation is capable of yielding 1.5 mgd to individual wells. Smaller supplies available north of this line.

Datum is mean sea level.

The numbering of wells and springs is based on the Federal Land classification system. Each township is divided into 36 sections, numbered from 1 in the northeastern corner to 36 in the southeastern corner. Similarly, each township is assigned a letter from A in the northeast township to W in the southwest township of the county. Wells are numbered consecutively 1, 2, 3, 4, in the same way that sections are numbered. For example; wells in township W would be designated W-1, W-2, W-3.

AVAILABILITY OF GROUND WATER IN HALE COUNTY, ALABAMA


TUSCALOOSA COUNTY
TUSCALOOSA COUNTY
GREENE COUNTY
BIBB COUNTY
PERRY COUNTY
R. 4 E.
R. 5 E.
R. 6 E.
R. 3 E.
R. 2 E.
T. 23 N.
T. 22 N.
T. 21 N.
33°00
32°50
87°40
87°30
87°50
MOUNDVILLE
Keaton Lake
Touson Lake
Cutoff Lake
Elliotts Creek
Powers
Cypress
Stewart
AKRON
New Prospect
Evansville
Wedgeworth
Sawyerville
Melton
Havana
Ingram
Waterloo
Hogglesville
Dominick
Lake Payne
South Sandy Creek
TALLADEGA
NATIONAL
FOREST
SOUTHERN RAILWAY
BLACK WARRIOR RIVER
OR LOCK DAM
-200 (Kck)
-300 (Kck)
-400 (Kck)
-500 (Kck)
-600 (Kck)
-700 (Kck)
-800 (Kck)
-950 (Kck)
0 (Kg)
-100 (Kg)
-200 (Kg)
-300 (Kg)
-400 (Kg)
-100 (Ke)
A
B
D
E
F
G
H
I
J
K
L
M
N
O
P
Prepared in cooperation with the
UNITED STATES GEOLOGICAL SURVEY
ALABAMA

GEOLOGICAL SURVEY OF ALABAMA

WALTER B. JONES, STATE GEOLOGIST

Information Series 14

GEOLOGY AND GROUND-WATER RESOURCES OF TUSCALOOSA COUNTY ALABAMA

An Interim Report

By
J. D. Miller, Jr.
and
L. V. Causey

Prepared by the
United States Geological Survey
in cooperation with the
Tuscaloosa County Board of Revenue
and the
Geological Survey of Alabama

University, Alabama
1958

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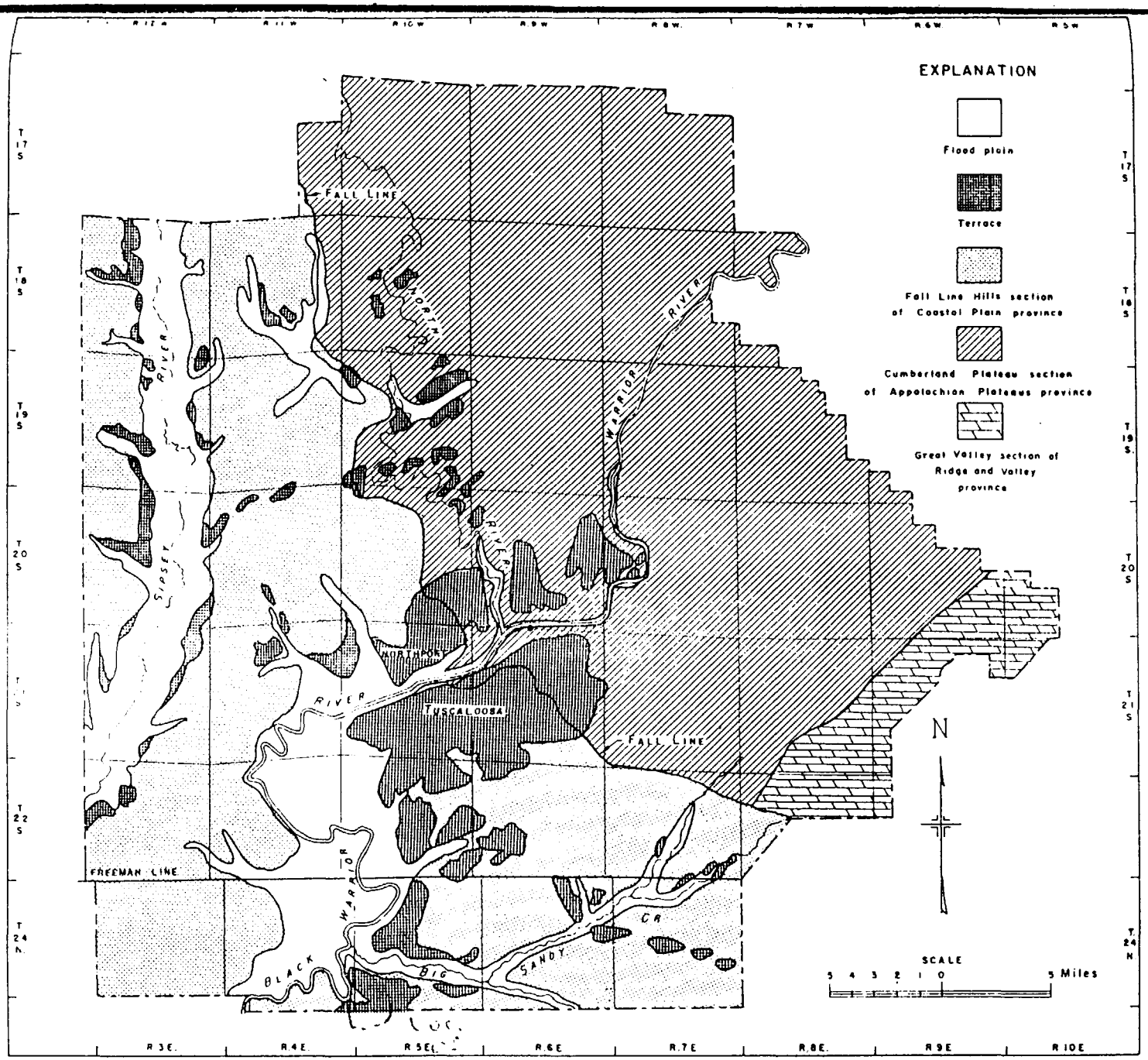


Figure 2.- Map of Tuscaloosa County, Ala., showing physiographic divisions

The Eutaw formation, of Late Cretaceous age, crops out in a small area in the southwest corner of the county, where it unconformably overlies the Gordo formation. It dips about 40 feet per mile to the southwest. The Eutaw consists predominantly of dark-red to rusty-brown sand containing lenses of gray to greenish-gray fissile clay and ranges in thickness from zero at the northern limit of its outcrop to about 50 feet in the southwest corner of the county. The basal part of the formation contains stringers of chert pebbles, which are an index to the contact with the underlying Gordo formation. The Eutaw formation is not an important source of water supply within the county; however, a few shallow wells used for domestic and stock supplies are dug in its basal sand and gravel.

Terrace deposits of Quaternary age, consisting of as much as 50 feet of sand, gravel, and clay, adjoin the flood plains of the Black Warrior and Sipsey Rivers and their tributary streams. Their distribution is shown in figure 2. They unconformably overlie older formations and occur at altitudes of 100 to 300 feet above the present Black Warrior River flood plain. The best preserved terrace in the county is that on which the city of Tuscaloosa and the University of Alabama are located. A few wells in these terrace deposits yield as much as 50 gpm each.

Quaternary alluvium, consisting of as much as 60 feet of sand, gravel, and clay, is present in most places along the Black Warrior and Sipsey Rivers and their tributaries. Many shallow wells in the southwestern part of the county obtain water for domestic and stock use from the alluvium. Some sand and gravel beds are very permeable, and in a few areas adjacent to the Black Warrior and Sipsey Rivers conditions are favorable for the construction of wells yielding as much as 1,000 gpm. Construction of large-capacity wells penetrating these beds should be preceded by test drilling and test pumping to determine the local extent of the permeable water-bearing deposits and their connection with the adjacent streams, which may serve as sources of abundant recharge.

GROUND WATER

Ground water is water that is below the land surface in the zone of saturation, where the rocks are saturated with water under hydrostatic pressure (pressure greater than atmosphere). The top of this zone is called the water table, and its position is shown by the level at which water stands in nonartesian wells. Only the water in the zone of saturation can be pumped from wells or will supply the flow to springs. Ground water is derived from precipitation, which in Alabama is chiefly rain. A part of the precipitation on the land surface runs off immediately and becomes streamflow, collects in ponds, or flows to the oceans; a part returns to the atmosphere by evaporation and by transpiration of plants, and a part seeps downward through the soil and rocks to become ground

water. The ground water moves from higher to lower levels, generally but not necessarily down the dip of the bedding, later to seep into bodies of surface water or to be discharged into the atmosphere by evaporation and transpiration.

Water infiltrating the soil first enters a zone of aeration (fig. 3), which lies between the land surface and the zone of saturation. A part of the water entering the zone of aeration is used to satisfy soil-moisture requirements, being held in this zone by molecular forces which counteract the force of gravity, and a part seeps downward into the zone of saturation.

Occurrence and Storage

Ground water occurs in the rocks of the earth's crust, in open spaces between the particles composing the rocks, and in fractures and openings along bedding planes. The number, size, shape, and distribution of these openings vary with location and rock type, and they control the storage and movement of ground water.

The porosity of a rock is its property of containing voids or open spaces. Porosity is the ratio, expressed as a percentage, of open space in a rock to the total volume of the rock. It is influenced by the size, shape, and arrangement and the degree of sorting, compaction, and cementation of the particles, and by the amount of fracturing, solution, and recrystallization of the rock after its initial formation.

The permeability of a rock is its ability to transmit water under a hydraulic gradient. It may be expressed as the rate, in gallons per day (gpd), at which water will flow through a cross section of the rock 1 foot square, under a unit hydraulic gradient (a loss in head of 1 foot for each foot of travel of the water, regardless of the direction of movement). Clay generally has a high porosity but a low permeability because its numerous pore spaces are very small. Sand or gravel may have a lower porosity than clay but a higher permeability because the interconnected open spaces are large. Permeable rock zones through which ground water moves freely enough to supply wells are called "aquifers."

Water-Table and Artesian Conditions

The water table is the upper surface of the zone of saturation except where that surface is formed by the bottom of a bed of clay or other relatively impermeable material which confines the water under artesian pressure (fig. 4). Unconfined water in the zone of saturation moves slowly through the rocks in a direction determined by the slope of the water

table. The water table is not a level or stationary surface; its variations from place to place and from time to time in shape and elevation are controlled by the permeability and structure of the rocks, variations in rainfall which affect the rate of recharge, and variations in the rate of discharge of water through wells and springs.

Artesian water is ground water that is confined under pressure by relatively impermeable overlying and underlying rocks (the confining beds, fig. 4). It occurs where rainfall and runoff have seeped into an aquifer and have passed between beds of clay or other relatively impermeable material.

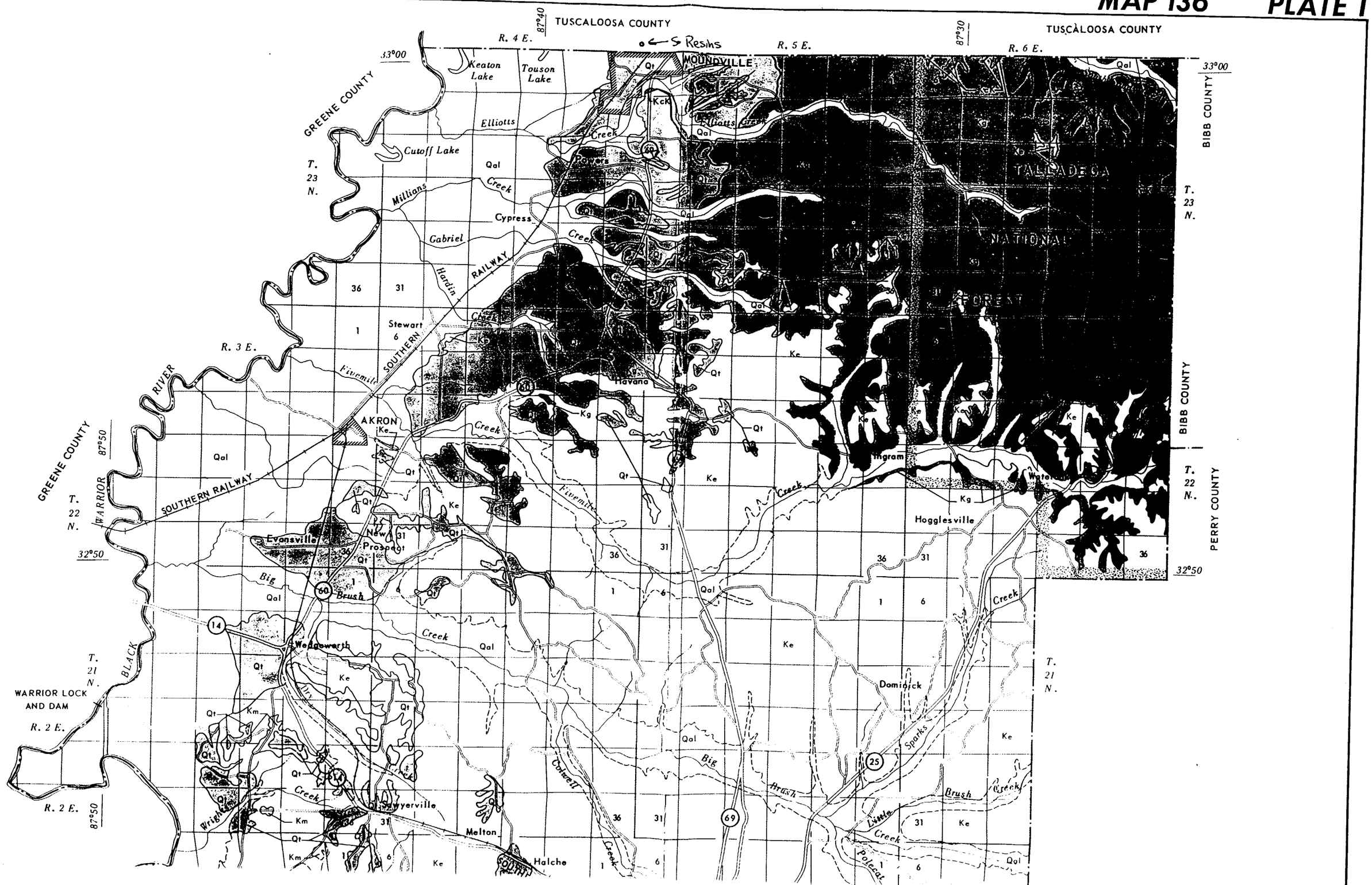
The pressure exerted on ground water by the weight of water at higher levels is known as hydrostatic pressure.

Under artesian conditions the hydrostatic pressure is sufficient to cause the water in a well to rise above the bottom of the confining bed. The imaginary surface to which water will rise in tightly cased artesian wells is called the "piezometric surface." An artesian well will flow if the piezometric surface is higher than the land surface.

Water-Table and Artesian Systems in Tuscaloosa County

The water in the alluvial and terrace deposits and in the area of outcrop of sand beds in the Eutaw, Gordo, and Coker formations occurs under water-table conditions. Shallow dug, bored and drilled wells in these beds supply water to most of the rural population in the southwestern half of the county. The water levels in these shallow wells respond quickly to precipitation or to its lack; during periods of drought many of the shallow wells become dry because the water table declines below the bottom of the well.

In Tuscaloosa County artesian wells can be obtained in the water-bearing sand and gravel beds in the Coker formation and the sandstone, shale, and coal beds in the Pottsville formation (pl. 1). Four flowing wells (A-8, F-3, H-16, I-6) yield water from the Pottsville formation in lowland areas in the northeastern and central parts of the county (table 1; pl. 1). Because few data are available, these artesian areas cannot be defined. Flows of about 1 gpm or less are obtained from wells in the Pottsville formation and the water is used for domestic purposes and for stock. About 90 wells in the Coker formation in lowland areas adjacent to the Black Warrior and Sipsey Rivers and their tributaries (pl. 1) flow, yielding less than 1 to about 150 gpm. Well QQ-41, at the plant of the Southern Pine Chemical Recovery Corp. at Hull, had a flow of 150 gpm and a pressure head of 10.2 feet above the land surface on October 15, 1956. Approximately 3.2 mgd of water, equivalent


TUSCALOOSA COUNTY
TUSCALOOSA COUNTY
GREENE COUNTY
GREENE COUNTY
BIBB COUNTY
BIBB COUNTY
PERRY COUNTY
WARRIOR LOCK AND DAM
R. 2 E.
R. 3 E.
R. 4 E.
R. 5 E.
R. 6 E.
T. 23 N.
T. 22 N.
T. 21 N.
33°00
32°50
87°50
87°40
87°30
MOUNDVILLE
Keaton Lake
Touson Lake
Elliotts Creek
Cutoff Lake
Millians Creek
Cypress Creek
Gabriel Creek
Hardin Creek
Stewart Creek
Fivemile Creek
AKRON
Havana
Ingram
Hogglesville
Evansville
New Prospect
Big Brush Creek
Wedgeworth
Dry Creek
Sparks
Colwell Creek
Big Brush Creek
Little Brush Creek
Polecat Creek
Dominick
Sawyerville
Wright Creek
Melton
Halche
SOUTHERN RAILWAY
WARRIOR RIVER
BLACK WARRIOR RIVER
TALLADEGA NATIONAL FOREST
Qal
Qt
Ke
Kg
Km
Kck
14
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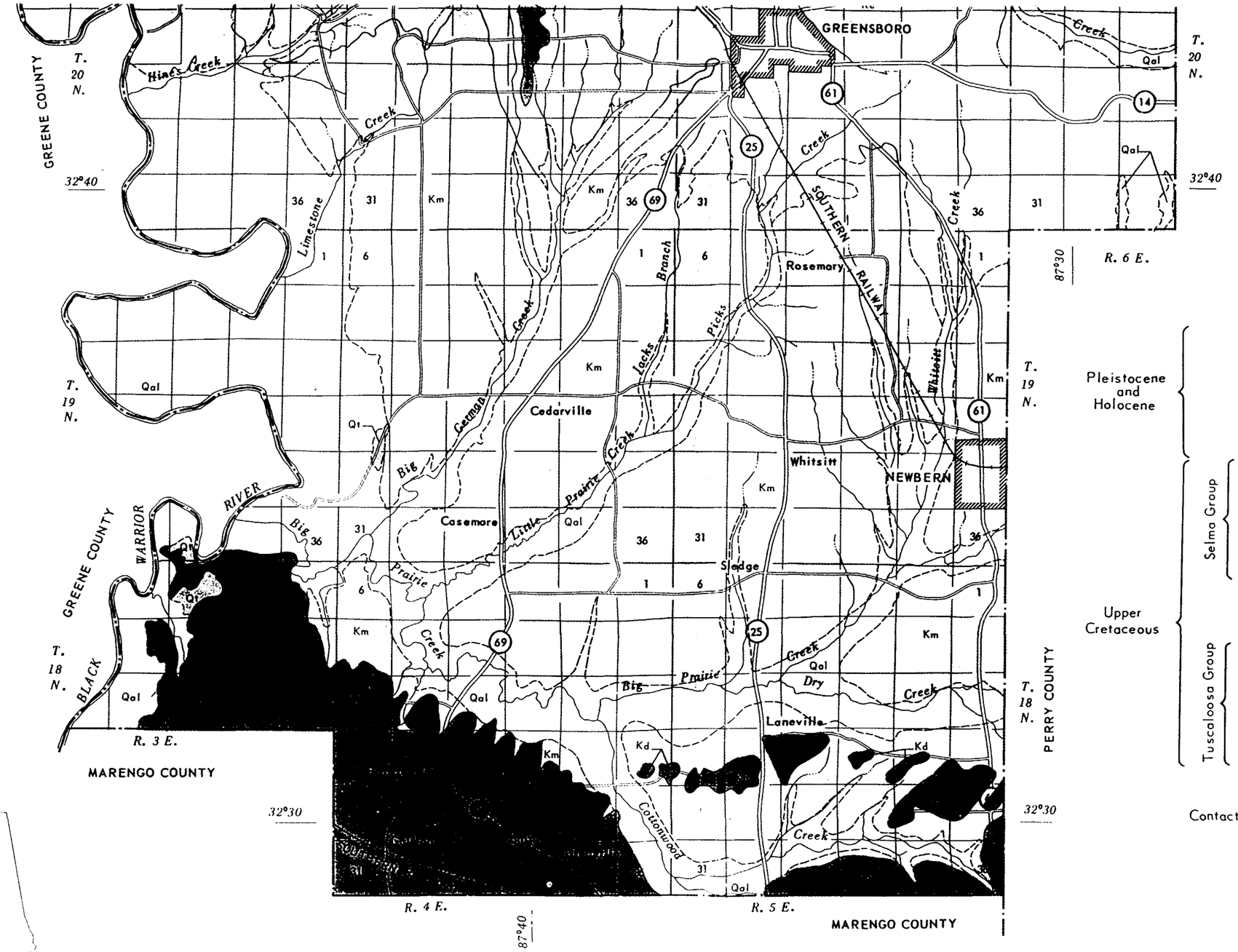

EXPLANATION

QUATERNARY	Pleistocene and Holocene	Qal	Alluvium
		Pb	Terrace deposits
CRETACEOUS	Upper Cretaceous	Selma Group	Demopolis Chalk
			Km — Mooreville Chalk
			Ke — Eutaw Formation
		Tuscaloosa Group	Gordo Formation
			Coker Formation

Contact: dashed where inferred

BASE MAP MODIFIED FROM ALABAMA HIGHWAY MAP AND FIELD NOTES

1 0 1 2 3 4 Miles

1 0 1 2 3 4 Kilometers

GEOLOGIC MAP OF HALE COUNTY, ALABAMA

BY
THOMAS H. SANFORD
1975

Prepared in cooperation with the
UNITED STATES GEOLOGICAL SURVEY

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SAMUEL McIVER

LOGBOOK REQUIREMENTS
REVISED - NOVEMBER 29, 1988

NOTE: ALL LANGUAGE SHOULD BE FACTUAL AND OBJECTIVE

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

I have read and understood the phase I of the work plan for this facility.

10/25/89 Samuel McIver
Samuel McIver

10/25/89 Kenneth D. Sanders
Kenneth D. Sanders

10/25/89 Martin Atkinson
Martin Atkinson

10/25/89 2

1455 Arrived on Cracker Rd Sunny About 75°F and Hot with Blue skies

1500 The plant is in operation and the facility is excessible because their are no fences or any restrainsts.

1510 Cracker Rd is the only way in a out of the facility. The Building has several sections

Samuel McEwen

10/25/89 3

1520 The facility has a railroad track that runs to the warehouse that looks as though it is made of tin and it has rust spots on the roof and sides.

1525 The plant has ditches that runs along the left side and across the front of the facility. The plant is surrounded with woods on the left rear and right sides.

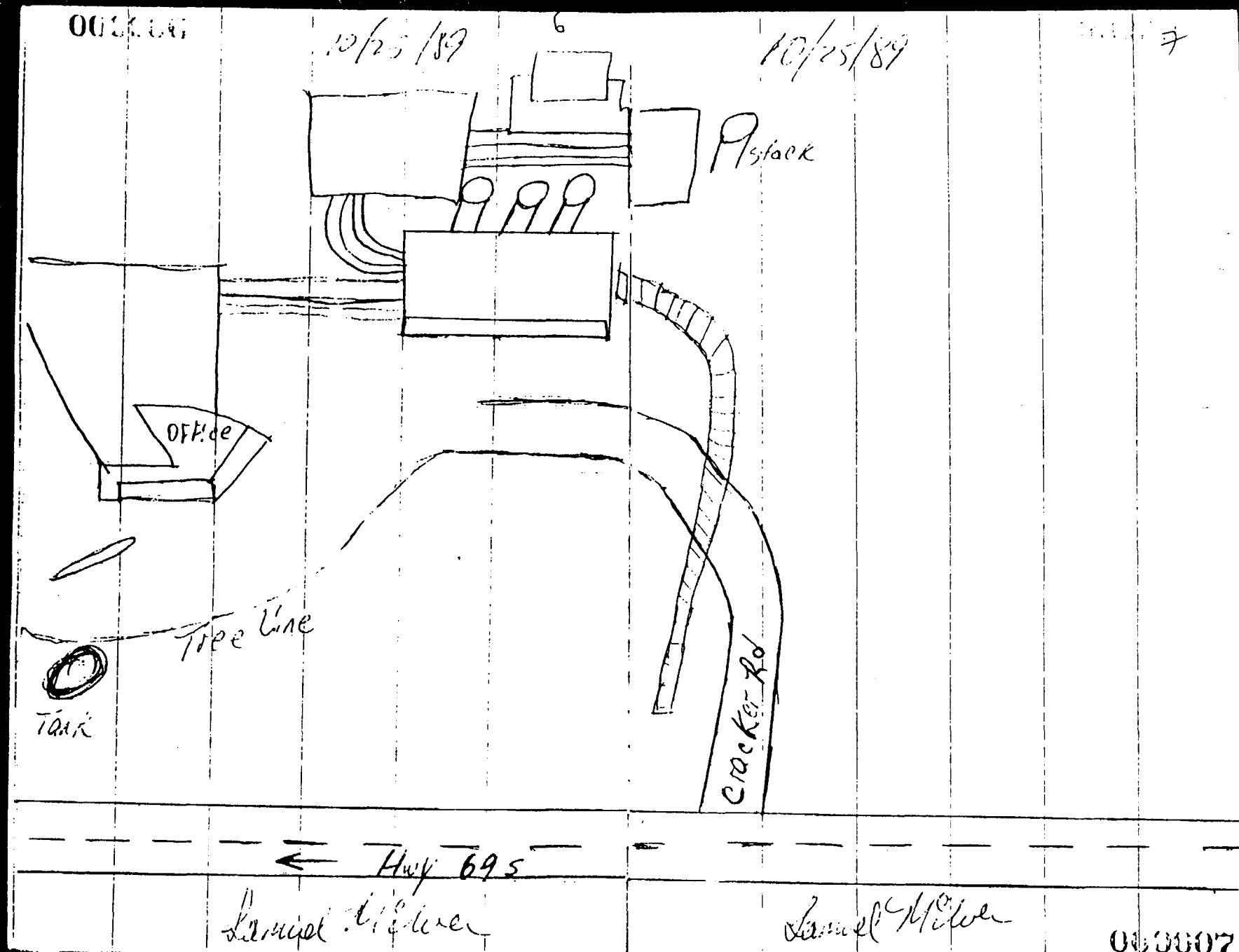
Samuel McEwen

1530 The facility also has a guard booth but it doesn't look as though it's being used.

1530 There is a Company called B+W Heads, the Company produces Tanks Heads for metal Tanks and Dome Tops.

1530 The Land in the site vicinity is used for both industrial and residential purposes.

Samuel McCain



10/25/89
6
10/25/89
7
stack
Office
Tree Line
Tank
Cracker Rd
Hwy 69 S
Samuel McIver
Samuel McIver

8

This project was reassigned to me on November 8, 1989

[illegible]
Nathan McCoy

9

I have read and understand the work plan for this [illegible]

[illegible]
11-16-89
Nathan S. McCoy

11-16-81 [illegible]

1000 [illegible] Arrive at Mountville Water Dept.

Met with Mr. Rodgers of Mountville and Mr. Rhodes of Hale County Water System

I was given a Map of Hale Co System
Hale Co buys water from Greensboro, for southern half of Co. and Mountville, for northern half of Co.

Greensboro Supply - 1351 Connections
Mountville Supply - 844 Connections

not [illegible] to [illegible] system

11-16-81 [illegible]

Mountville Water System

Source: 2 wells on Hwy 44
cabinet 244 ft. deep
300 gpm yield
2 tanks 150,000 gals each

405 Connections
Most hook up if water available. No wells in City limits
Does not know of any private wells in Area
Draw water lines on Map of Mountville

1100 [illegible] [illegible] Mountville Water Dept.

000012

11-16-89 [illegible]

1115 CST Arrive at Southern Resin Division

Verify location on Topo Map.

Plant is not fenced
offset from Road 400 feet
Guard House at front unattended
Drainage looks like it
falls to Back of Property

1150 CST Left plant area

Drive Vicinity for nearest
private well

Nearest Resident is Next to
plant ENTRANCE ROAD
See Topo - Houses on City water
noted Hose [illegible] in Yard
Site is in Tuscaloosa Co.

11-16-89 [illegible]

B&W Heat is Adjacent
Manufacturing Plant with
hundreds of Drums on Long
Dock
Large storage tanks in Back
of Drum Area

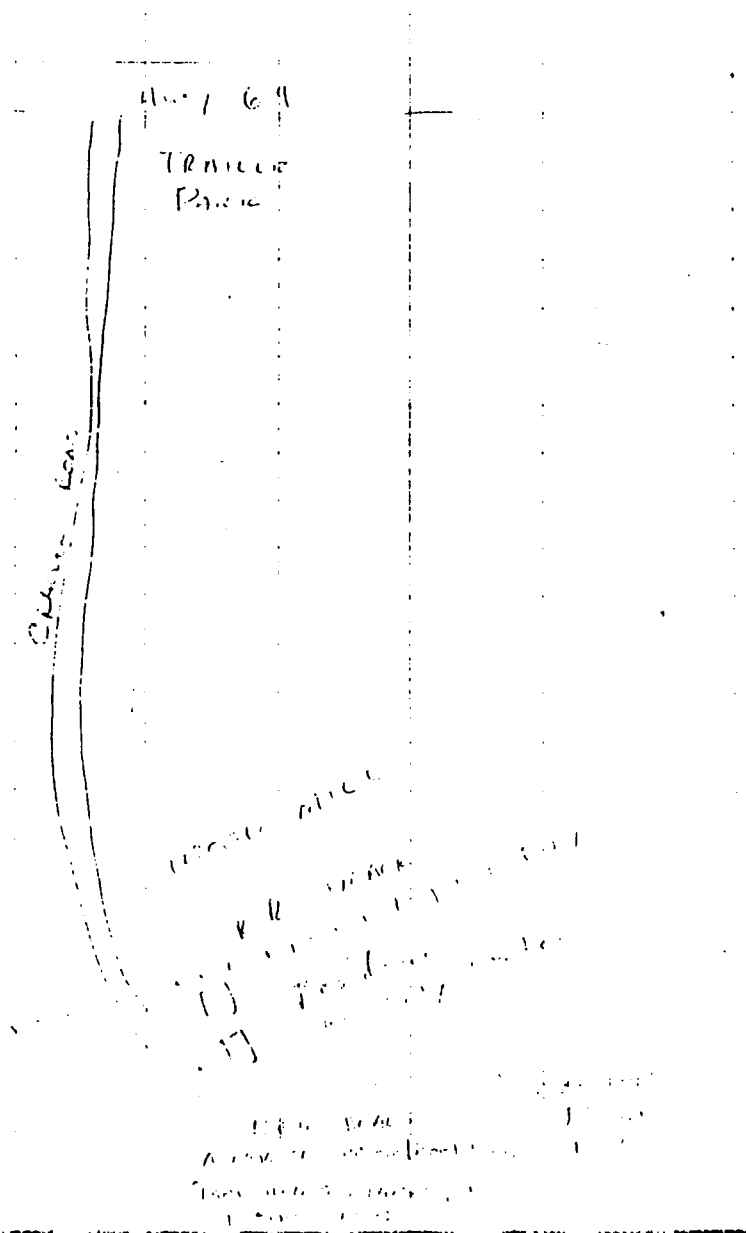
No wells sited within
4 miles of Site

1245 CST Arrive at Ingerwood
Hours water System
met with James
Crocker
given map of system

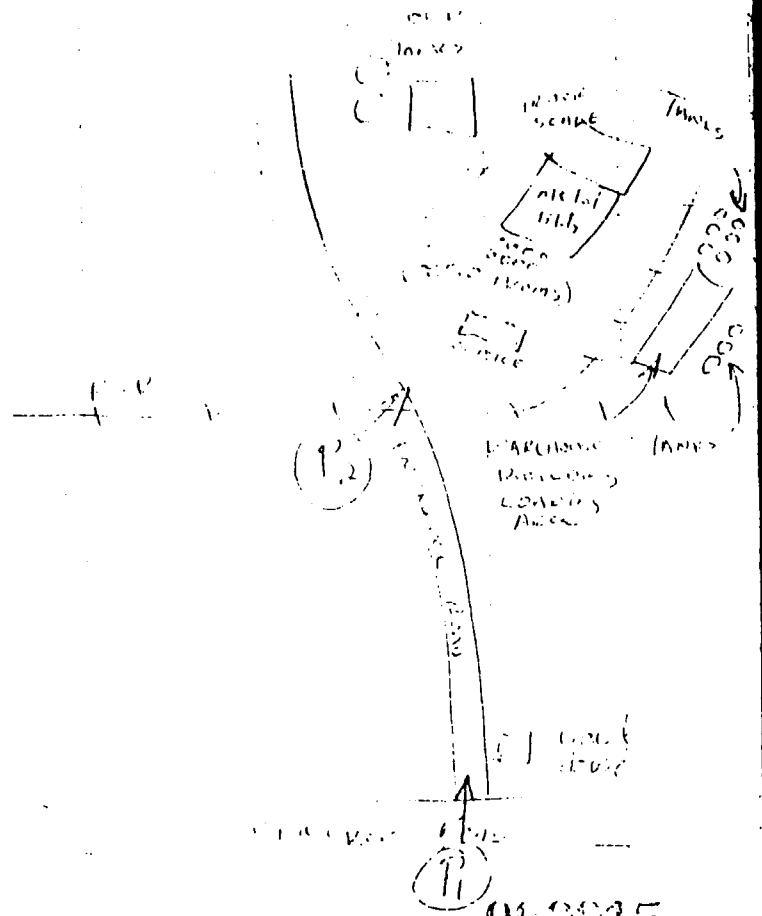
Maybe 2 or 3 Doesnot know of too many Private wells
Buy water from City of
Tuscaloosa who gets water from
Surface water Intake at Lake
Tuscaloosa
Serve Hwy 69 to Hwy 95
846 Connections
Not required to hook up

000013

11-10-89 [illegible]



11-10-89 [illegible]



"Rite in the Rain"®

ALL-WEATHER

LEVEL

Notebook No. 311

F4-2683

Southern Resin Division
Moundville, Tuscaloosa Cty, AL
TDD No: F4-9011-22
Proj. Man.: Sheri Panabaker

LOGBOOK REQUIREMENTS
REVISED - NOVEMBER 20, 1988

NOTE: ALL LANGUAGE SHOULD BE FACTUAL AND OBJECTIVE

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

12/13/90

All entries into this logbook will be made by myself, Sheri Panabaker, Project Manager. Each page will be signed and dated. Any and all corrections will be properly intiled (SP).

Signature: Sheri Panabaker

All notes and observations made during this investigation will be included in this logbook.

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

Health & Safety Plan, Study Plan + Work Plan.

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

Sheri Panabaker

12/10/90 2

Sheri Panabaker She Pa
Carter Helm Carter Helm
Ken Sanders Ken Sanders
Mark Hitchcock Mark A Hitchcock

1900 leave for Moundville, AL

1200 Arrive in Tuscaloosa

1400 S. Panabaker & Carter Helm arrived at southern resin Division and met w/ Terry Sheehan + Rick Hansen of Lawter Int & South Resin, respectively, and Ken Bittner of South Resin. Both Terry and Ken gave us a tour of the plant and I picked sampling locations & the area to be used as the clean zone

Sheri Pa

12/10/90

There are drums of waste to be burned all over the plant area.

1420 Two resin plants; use rosin to make rosin based resins used in paints, inks primarily & some adhesives

Other plant produces resins derived from hydrocarbons from petrochemical comp. Both presently active wastes: dust which is put in drums & recycled.

Other drums used to store offspec materials, filter bags (40th bags used to filter product) and lime filter cakes. Product (liquid) goes through powder & moist lime put in incinerator

Sheri Pand

12/10/90 4

filter cake used to be put into waste pile & stored until incinerator put on line in June ~ July 1990. Approved by ADEM in June

(ADEM) George Sullivan - Incinerator (air)
Fred Mason - GW

Jack Honeycutt
Frank North
Ron Gore
Bernard Cox

Been in operation for a year prior to June to get bugs out. temp. permits.

Above drums have resin waste in them and filter cake

hydrocarbon plant - continuous process
Other plant - batch process

operations began in 1966

Sher Pa

12/10/90 5

The main used pond has a concrete pad beneath it where dirt to be burned is placed on top.

top of property by MW-8, overlooks Black Warrior River about 50-60 feet above the river
There are 3 guys fishing in the river.

Used to be a varnish plant until early 70's or so when Lawter bought the plant made resins as well as varnish

In the future, equipment not used will be removed.

Sher Pa

12/10/90 6

Directly east of plant used to be an asphalt plant

Around 1985 two of the ponds were tested by ADEM + then the water was let out.

Prior to 1977 used to use soda ash + ~~[illegible]~~ sup water then changed to lime

put discharge water into the old surface impound until WWTP built in 1/80. then water treated + changed to creek.

resin comes out acidic so send liquid resin

[illegible] Paul

12/10/90

through lime to a pH of ≈ 8. Lime sup ~~[illegible]~~ is then filter out using plates + then blown w/ nitrogen to dry out. Lime filter cake contains a little resin, and solvents and a little diatomous earth

buy streams and use what's capable of being polormerized, make product (solid hard resin) then what's not capable of being polormerized (called plant solvent) is sold to other places.

City supplies water for the plant. The ~~[illegible]~~ water well was used for process water for a short period of time

[illegible] Paul

12/10/90

Terrance Sheehan declined split samples and said purged water is dumped onto the ground from the monitoring wells by their consultants, Tuscaloosa Testing.

Not all the monitoring wells are grouted. They are all 2" PVC w/ 10-foot screens. All the well are inside protective steel casing & locked.

Mr. Sheehan has given me well data for all 11 monit. wells for the last two quarters & a report on a study of whats emmitted from the air stack of the incinerator and a list of haz. materials used per SARA Title III, 5311.

Shei Pan

12/11/90

Sunny, high mid-60s

0800 meeting in parking lot and pulling the trip blank

Station # SR-TB-01 and icing it down to 4°C.

The case number for this study is and the project number for this study is.

0900 arrived on site and met w/ Terrance Sheehan of Lawter International and Rick Hansen and Ken Bittner of Southern Resin Div. and J. P. Martin and James Adams of CH2M Hill. They have decided to split

Shei Pand

12/11/90

samples, though not all the ones we will be collecting. we discussed sampling locations.

0930 finished meeting the others and are looking for the area to be used as the clean area and background samples. setting up bathing, decon area, and paperwork area

1000 calibrating HNU # 81632

Sherri Paul

12/11/90

After study the monit. well data & after looking over the site & based on additional info mentioned by Mr. Sleeman & recorded in the logbog yesterday, I have decided to add some additional samples.
mw #7 of their plant numbering cannot be sampled, this corresponds to NUS/EPA sampling location SR-MW-02. Instead I will sample wells, 10, 11, & 12 of their #ing system. & renumber our location accordingly. Also SR-SB-03 will not be collected since there is a concrete pad under the soil in the old lagoon.

Sheri Paul

12/11/90

the facility is not surrounded by a fence, though the Black Warrior River borders the west side of the property. Site access is easy. They are going to split all of the samples, soil and water both.

1100 James Adams has now provided us with jars to split sample and were beginning to start collecting the samples for background SR-SS-01 & SR-SB-01.

Sheri Pand

12/11/90

1105 collecting SR-SS-01 from ≈ 5-6 inches HS soil is drysh + med. dk brown w/reddish tinge sand w/ some clay. collected from the northernmost portion of developed property (unwooded) upgradient. Samplers: C. Helm & K. Sanders splitting the sample w/ the Lawton Intronal personnel. See field sheet for specific info.

HNu - 4 ppm

Sheri Pand

12/11/90

1125 collecting subsurface soil sample SR-SB-01
HNU <1ppm = 4 ft bls, reddish dry sand w/ clay
Samplers: C. Helm + K. Sanders
HNU <1ppm

1150 J.P. Martin, Ken B, + T. Sheehan arrived at clean area we're preparing to go to a surface impoundment + waste pile area

1210 collecting surface soil sample SR-SS-02 from previous location of waste pile used to store lime filter cake
HNU <1ppm The entire area is covered in drums on

Stei Park

12/11/90

pallets filled w/ lime filter cake. Only accessible area is east of the drums.
collecting sample 2-3" bls reddish sand w/ some clay. Samplers: C. Helm + K. Sanders HNU <1ppm
one drum that's open is full of resin, soft + sticky
drums are in various stages of deterioration + are rusty + not all are sealed shut well

HNU <1ppm
1240 collecting subsurface soil sample SR-SB-02, 8" bls
HNU <1ppm clay primarily w/ some sand, gray and reddish color.

Stei Park

12/11/90

Samplers: C. Helm, K. Sanders

1300 Collecting surface soil sample (SP-SS-03) from the main storage pond (surface impoundment) in which the soil is presently being sent through the offsite incinerator. This sample is collected from soil that's been incinerated & which is being put back onto the ground in areas that don't have a concrete pad.
Samplers: C. Helm, K. Sanders
Sample collected from 3"-4" down in pile
HNU < 1ppm

Sheri Paul

12/11/90

1310 Collecting surface soil sample (SP-SS-04) from same surf. imp. & SP-SS-03, but soil has not been incinerated yet. Sample taken from 3"-4" down in pile. Samplers: K. Sanders, C. Helm
HNU < 1ppm

1330 All NUS personnel left site for lunch

1430 Arrived back on site from lunch preparing to take further samples

Sheri Paul

12/11/90

1500 Called about adding extra samples, found out there is no lab space at the CLP lab & the ESD lab is closed for the week so can't add any samples. I am changing the sample locations. No subsurface soil samples will be collected since the primary concern is the surface water runoff pathway, i.e. we will add some of the surface water and sediment samples requested by ESD & remove the subsurface soils. Also depth to groundwater ranges from about 28 to 40 ft bls & subsurface soils could not be obtained from the saturated zone anyway.

Sh Pal

12/11/90

HNU < 1ppm

1545 Collecting surface soil sample SR-SS-03 (previous SR-SS-03 TMP) is being scrapped as well as the previously collected subsurface soil samples. This sample is being collected from an old surface impoundment no longer in use, downgradient from the first surface impoundment sampled. Med brown [illegible] some clay, 3" bls. Samples C. Helm & K. Sanders. The pond is also adjacent (W)

Sh Pal

20

12/11/90

& downgradient from active WWTP
& incinerator is directly east of WWTP.

1600 Collecting surface soil
sample SR-SS-05 from
previous location of
waste pile of lime
filter cake, sample
is brown to gray soil,
very dry, gravel area
samples C. Helm &
K. Sanden. Drums are
located all around sample
area. sample from 3" bls
HNU < 1ppm

Mr. Sheehan of Lawter Intern.
has given us permission to dump
the purge water from the mont.
wells onto the ground as he will write
in [illegible] 14 [illegible] book.

Sheri Paul

21

12/11/90

IN COLLECTING SAMPLES
FROM THE MONITORING
WELLS, I PERMIT H.U.S.
TO THE DISPOSE OF PURGED
WATER ON THE GROUND.

[illegible]

We will purge monitoring wells
on 12/12/90, tommorrow.

1630 Begining to clean up site
area to go home

Sheri Paul

12/11/90

1700 leaving site for the day

Steve Parker

12/12/90

0615 met to leave for the site and get ice, etc.

0700 Arrived at the site
James Adams of CH2M Hill is here
Sunny, high in the 60s F.

Setting up hotline + decorning area

Steve Parker

12/12/90

0900 Collecting ~~sediment +~~ SCP 12/12/90 surface water sample SR-SW-04 from downgradient location on the Black Warrior River, below where Cathridge Branch flows into the river
Samplers: C. Helm, S. Panabaker
HNU <1ppm

0910 Collecting sediment sample SR-SD-04 from same location as SR-SW-04, med. brown sand. Samplers: C. Helm & S. Panabaker

Shei Pan

12/12/90

After collecting the past two samples, the CH2M Hill representative had to go get more jars for the remaining two surface water & sediment samples.

1015 Collecting surface water SR-SW-03 from Cathridge Branch Creek near where it flows into the Black Warrior River & ~~below~~ where surface water runoff from various areas of the plant come into the creek. Samplers C. Helm & S. Panabaker. HNU <1ppm

Shei Pan

12/12/90

I've decided to not take the upgradient surface water sample from the Black Warrior River since I'll have one upgradient on Cathridge creek. Surface water runoff flows south to cathridge Branch creek. Water from the last pond of the WWTP that's discharge to the creek (they have an NPDES permit) is very cloudy so we are taking a sample here instead of upgradient of the Black Warrior

1030 collecting sediment sample SR-SD-03 from same place as SR-SW-03, med brown sand samples C Helm & S. Pand

Shei Pand

12/12/90

1100 collecting surface water sample SR-SW-02 from intersection of drainage creek from WWTP & cathridge Branch, water is white cloudy. Samples: C. Helm & S. Pandal

HNU < 1ppm

1100 collecting sediment sample SR-SD-02 from same location as SR-SW-02. med brown sand w/ pepples

Shei Pand

12/12/90

1210 Collecting surface water sample SR-SW-01 from an up gradient location on Cathridge Branch Creek. Samplers: C. Helm + S. Pan
HNU <1 ppm

1215 collecting sediment sample SR-SD-01 from same location as SR-SW-01. Samplers C. Helm + S. Panabaker

Shei Pan

12/12/90

HNU <1 ppm

1320 collecting surface water sample SR-SW-05 from an old sludge pond located south of the waste water treatment plant, called the U-Pond. Samplers S. Panabaker & C. Helm. split samples w/ CH2M Hill.

1330 collecting sediment sample SR-SD-05 from same location as SR-SW-05. There is resin on the bottom of the pond, in w/ the sediment samples

Shei Pan

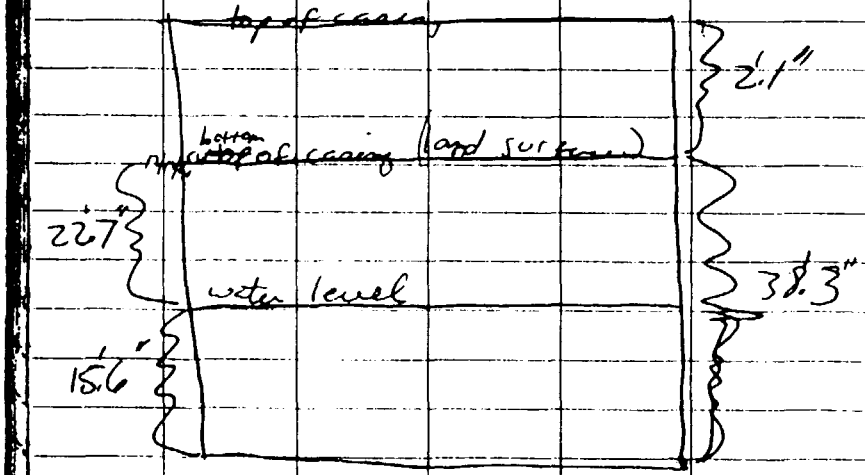
12/12/90

After studying quarterly monitoring well results, I've decided to take samples from 3 upgradient wells, #s 10, 11, 12 since they show the most contamination.

1415 Started setting up monitoring well SR-MW-03

Reading of HNu < 1 ppm
casing is 2" PVC

Measuring water depth & well depth



Sher Park

12/12/90

1 volume = 0.163 for 2" diam. well
3 volumes = 3 x 0.163 = 0.49

∴ 15.6' x 0.49 = 7.6 gallons

∴ purge 7.6 gallons

∴ Since 4 bailers = 1 gallon
x 7.5
30 bailers

HNu < 1 ppm
1430 Started purging well
Purging by Ken Sanders & C. Helm

1445 rope broke & bailer fell down well

I am going to get treble hooks & fishing line
Ken S. & C. Helm are setting up at SR-MW-04

Sher Park

12/12/90

1510 back on site w/ hooks & line, I am watching the samples. M. Hitchcock deconned the hooks & line & is attempting to get the bailer out.

1530 bailer is out of well & mark is back w/ samples

12/12/90 #5 Ken Sanders has measured water depth & well depth in SR-MW-04. HNu <1ppm

Mark H. locked samples in truck & has come back over to help sample

HNu <1ppm

1550 Mark H. is purging SR-MW-03, he is purging 30 bailers full of water

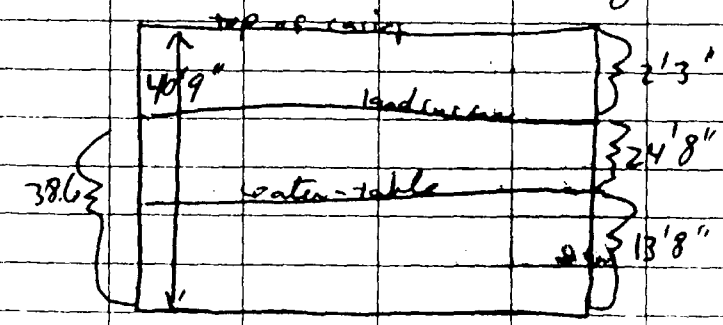
Shei Pan

12/12/90

#12/12/90

1615 Mark H is collecting groundwater sample SR-MW-03 (well # 10 according to Southern Resins #ing).

1630 C. Helm is purging monitoring well SR-MW-05 (# 12 accord. to Southern Resin's #ing).



Shei Panabel

12/12/90

Therefore: 1 vol = 0.163
3 vol = 0.49

∴ 13'8" x 0.49 = 6.7 gallon

4 bails = 1 gallon
x 6.7
27 bails

1650 Started collecting SR-MW-05

1720 finished collecting SR-MW-05
started to clean up
equipment & pack up

we split all samples
w/ Southern Resins and
turned the samples over
to James Adams of CH2M Hill

Sheri Panabe

12/12/90

1800 leaving site

Sheri Panabe

"Rite in the Rain"®

ALL-WEATHER

LEVEL

Notebook No. 311

F4-2684

Southern Resin Division
Moundville, Tuscaloosa Cty, AL
TDD No.: F4-9011-22
Proj. Man.: Sheri Panabaker

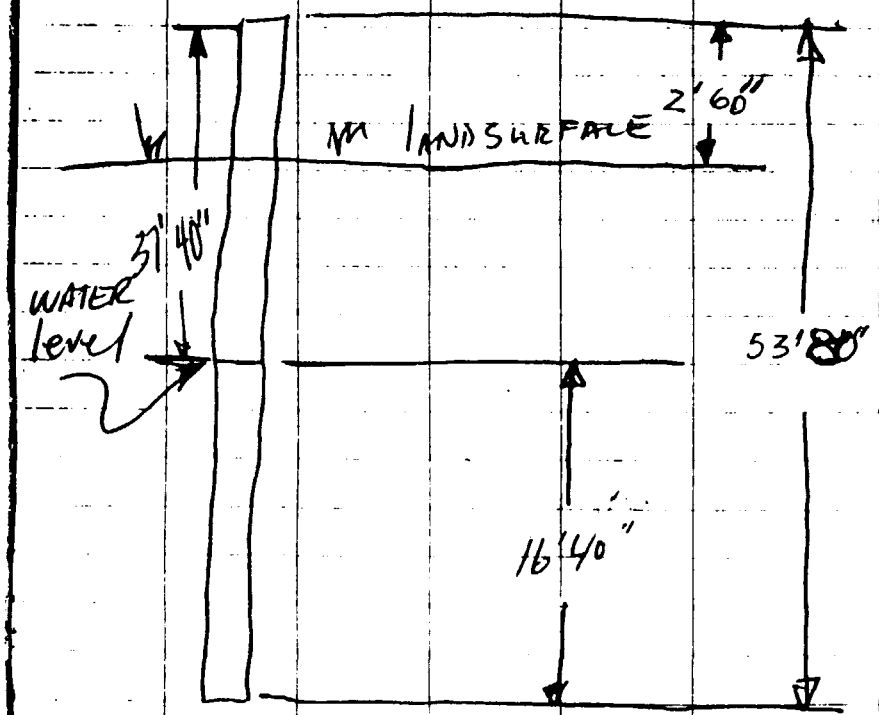
This logbook is an extension of logbook FY- and is issued to Mark Hitchcock.
Sherri Panabaker

4

~~0800~~ Weather: Clear, foggy, 33°F

0745 STARTED SETTING UP BACKGROUND monitoring well SR-MW-01
EPA 192273

0800 took HNU Reading, From Breathing zone read 0 looking reading from casing read 0. casing is 2" PVC.



Mark A Hitchcock

0810 Started measuring water depth in casing.

1 volume = 0.163
3 volume = 0.49

16'4 x 0.49 = 8.036

purge 8 gallons

0835 started Purging

4 bailes = 1 gallon
x 8
32 bailes

0920 Finished purging well #8 (SR MW#01) at 8 gallons.

0930 taking sample SR-MW-01, also taking extra volume for Matrix Duplicate
Samples M. Hitchcock & K. Sanders

Mark A. Hitchcock

5

6

1000 FINISHED SAMPLING SR-MW-01

Mark Hutchinson

Shi Pa

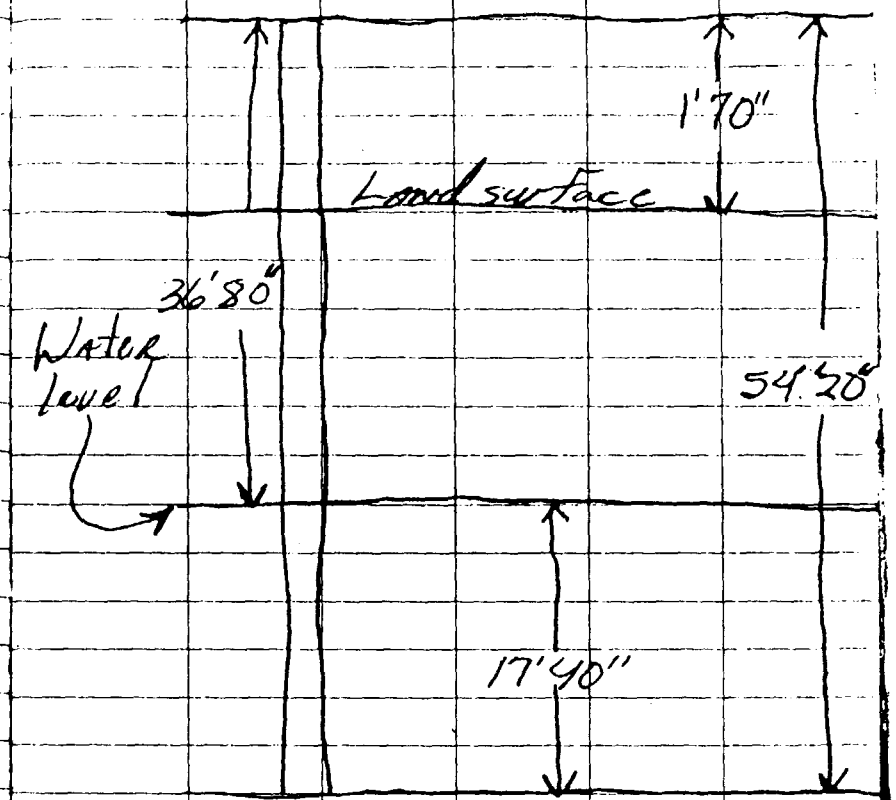
7

MONORITING WELLS & Surface Water

NO.	purge volume	total Depth	water Depth	total water	CASING SIZE	time TAKEN	DATE 1990	PH	COND	TEMP	COMMENTS
MW-01	8 gal 32 bale	53'8"	37'4"	16'4"	2" PVC	0930	12-12	4.22	X10 10.88	19°C 66°F	MATRIX DUPLICATE
MW-02	8 gal 32 bales	54'20"	36'8"	17'4"	2.0" PVC	1305	12-12	4.98	X10 19.11	20°C	
MW-03	7.6 gal 30 bales	40'4"	~~25'8"~~ 24'8"	15'6"	2.0" PVC	1615	12-12	5.09	X100 2.04	18°C	
MW-04	6 gal 24 bales	41'00"	28.5"	12'7"	2.0" PVC	1530	12-12	5.02	X100 5.17	17°C	
MW-05	6.7 gal 27 bales	~~40'4~~ 40'9"	~~25'8~~ 26'11"	~~15'6~~ 13'8"	2.0" PVC	1650	12-12	5.04	X100 10.47	18°C	
SW-01						~~0900~~ 1210	12-12	5.93	7.47 X10	19°C	
SW-02						1050	12-12	7.2	4.53 X100	21°C	
SW-03						1015	12-12	6.42	X10 8.04	22°C	
SW-04						0900	12-12	6.71	X100 3.27	15°C	
SW-05						1320	12-12	6.30	X100 3.42	20°C	

12/12/90

Logbook is now transfered to Ken Sanders.
Steve Panabaker



11:50 Started setting up Monituring well SR-MW-02
EPA 192273-HNU

11:55 Took HNU reading from breathing zone, reading of 0. From casing ~~a reading~~ to ground surface is 1" PVC.
KDS

Kenneth Sanders

12:00 Started measuring water depth in casing.

1 volume = 0.163
3 volume = 0.49

17'4 x 0.49 = 8.526

Kenneth Sanders

Purge 8 gallons

12:15 Started purging

4 bails = 1 gallon
x8
32 bails

13:05 Started taking sample SR-MW-02 and also taking split samples CHM2HiH from well #3.

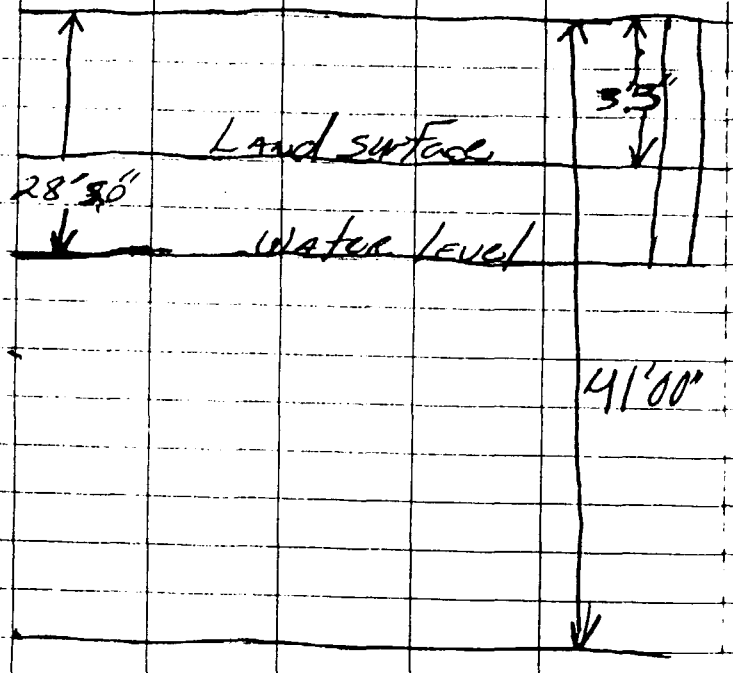
13:40 Finished sampling SR MW-02

Kenneth Sanders

Kenneth Sanders

1456 Started setting up for monitoring well SR-MW-04 ERP 192273

1458 Took HNU reading from breathing zone, reading 0. Took reading from casing - reading 0. Casing is 3'3" in depth.



Kenneth Sanders

1505 Finished measuring depths concerning casing.

1 volume = 0.163
3 volumes = 0.49

12.7 x 0.49 = 6.223
Purge 6 gallons

15:10 Started purging
4 bails = 1 gallons
x 6
24 bails

15:30 Started taking sample SR MW-04 and also split sample for CH2M Hill from well #11

Kenneth Sanders

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

METALS DATA REPORT 01/31/91

PROJECT NO. 91-171 SAMPLE NO. 53628 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL
STATION ID: MW-05 COLLECTION START: 12/12/90 1650 STOP: 00/00/00
CASE NUMBER: 15499 SAS NUMBER: MD NUMBER: Z729

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
180000	ALUMINUM	1300	MANGANESE
14UJ	ANTIMONY	0.3UJ	MERCURY
3UR	ARSENIC	42	NICKEL
890	BARIUM	14000	POTASSIUM
5U	BERYLLIUM	20UR	SELENIUM
9	CADMIUM	2U	SILVER
20000	CALCIUM	100000	SODIUM
430	CHROMIUM	10U	THALLIUM
30U	COBALT	NA	TIN
120	COPPER	570	VANADIUM
240000	IRON	200	ZINC
59	LEAD		
19000	MAGNESIUM		

REMARKS
RECOMMENDED HOLDING TIME EXCEEDED-HG
HOLDING TIME EXCEEDED-CN

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.

SPECIFIED ANALYSIS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53628 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL
STATION ID: MW-05 COLLECTION START: 12/12/90 1650 STOP: 00/00/00
CASE NO.: 15499 SAS NO.: D. NO.: Z729 MD NO: Z729

RESULTS	UNITS	PARAMETER
10UJ	UG/L	CYANIDE

REMARKS
RECOMMENDED HOLDING TIME EXCEEDED-HG
HOLDING TIME EXCEEDED-CN

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.

01/31/91

METALS DATA REPORT

*** ***
** PROJECT NO. 91-171 SAMPLE NO. 53622 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: S PANABAKER **
** SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL **
** STATION ID: SW-01 COLLECTION START: 12/12/90 1210 STOP: 00/00/00 **
** CASE NUMBER: 15499 SAS NUMBER: MD NUMBER: 2723 **
** **
*** ***

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
220	ALUMINUM	84	MANGANESE
14UJ	ANTIMONY	0.20UJ	MERCURY
3UR	ARSENIC	4U	NICKEL
56	BARIUM	1200	POTASSIUM
1U	BERYLLIUM	4UR	SELENIUM
3U	CADMIUM	2U	SILVER
2600	CALCIUM	2800	SODIUM
4U	CHROMIUM	2U	THALLIUM
4U	COBALT	NA	TIN
3U	COPPER	2U	VANADIUM
570U	IRON	6U	ZINC
5	LEAD		
1900	MAGNESIUM		

REMARKS
RECOMMENDED HOLDING TIME EXCEEDED-HG
HOLDING TIME EXCEEDED-CN

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.

01/30/91

SPECIFIED ANALYSIS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53622 SAMPLE TYPE: SURFACEWA	PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV	CITY: MOUNDVILLE ST: AL
STATION ID: SW-01	COLLECTION START: 12/12/90 1210 STOP: 00/00/00
CASE.NO.: 15499 SAS NO.:	D. NO.: Z723 MD NO: Z723

RESULTS	UNITS	PARAMETER
10UJ	UG/L	CYANIDE

REMARKS
RECOMMENDED HOLDING TIME EXCEEDED-HG
HOLDING TIME EXCEEDED-CN

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.

01/31/91

METALS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53619 SAMPLE TYPE: SURFACEWA
SOURCE: SOUTHERN RESINS DIV
STATION ID: SW-02
CASE NUMBER: 15499 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1050 STOP: 00/00/00
MD NUMBER: Z720

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
670	ALUMINUM	110	MANGANESE
14UJ	ANTIMONY	0.20UJ	MERCURY
3UR	ARSENIC	4U	NICKEL
48	BARIUM	2200	POTASSIUM
1U	BERYLLIUM	4UR	SELENIUM
3U	CADMIUM	2U	SILVER
12000	CALCIUM	98000	SODIUM
4U	CHROMIUM	10U	THALLIUM
4U	COBALT	NA	TIN
9U	COPPER	2U	VANADIUM
1100	IRON	50U	ZINC
4	LEAD		
2100	MAGNESIUM		

REMARKS
RECOMMENDED HOLDING TIME EXCEEDED-HG
HOLDING TIME EXCEEDED-CN

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
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SPECIFIED ANALYSIS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53619 SAMPLE TYPE: SURFACEWA
SOURCE: SOUTHERN RESINS DIV
STATION ID: SW-02
CASE NO.: 15499 SAS NO.:

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1050 STOP: 00/00/00
D. NO.: Z720 MD NO: Z720

RESULTS	UNITS	PARAMETER
10UJ	UG/L	CYANIDE

REMARKS
RECOMMENDED HOLDING TIME EXCEEDED-HG
HOLDING TIME EXCEEDED-CN

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.

METALS DATA REPORT 01/31/91

PROJECT NO. 91-171 SAMPLE NO. 53620 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL
STATION ID: SW-03 COLLECTION START: 12/12/90 1015 STOP: 00/00/00
CASE NUMBER: 15499 SAS NUMBER: MD NUMBER: Z721

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
70U	ALUMINUM	130	MANGANESE
14UJ	ANTIMONY	0.20UJ	MERCURY
3UR	ARSENIC	4U	NICKEL
55	BARIUM	1500	POTASSIUM
1U	BERYLLIUM	4UR	SELENIUM
3U	CADMIUM	2U	SILVER
3900	CALCIUM	3300	SODIUM
4U	CHROMIUM	2U	THALLIUM
4U	COBALT	NA	TIN
2U	COPPER	2U	VANADIUM
360	IRON	5U	ZINC
4U	LEAD		
1900	MAGNESIUM		

REMARKS
RECOMMENDED HOLDING TIME EXCEEDED-HG
HOLDING TIME EXCEEDED-CN

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.

01/30/91

SPECIFIED ANALYSIS DATA REPORT

PROJECT NO. 91-171   SAMPLE NO. 53620   SAMPLE TYPE: SURFACEWA   PROG ELEM: NSF   COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV   CITY: MOUNDVILLE   ST: AL
STATION ID: SW-03   COLLECTION START: 12/12/90 1015   STOP: 00/00/00
CASE.NO.: 15499   SAS NO.:   D. NO.: Z721   MD NO: Z721

RESULTS	UNITS	PARAMETER
10UJ	UG/L	CYANIDE

REMARKS
RECOMMENDED HOLDING TIME EXCEEDED-HG
HOLDING TIME EXCEEDED-CN

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.

01/31/91

METALS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53615 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL
STATION ID: SW-04 COLLECTION START: 12/12/90 0900 STOP: 00/00/00
CASE NUMBER: 15499 SAS NUMBER: MD NUMBER: Z716

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
630	ALUMINUM	130	MANGANESE
14UJ	ANTIMONY	0.20UJ	MERCURY
3UR	ARSENIC	4U	NICKEL
94	BARIUM	2400	POTASSIUM
1U	BERYLLIUM	4UR	SELENIUM
3U	CADMIUM	2U	SILVER
16000	CALCIUM	22000	SODIUM
4U	CHROMIUM	2U	THALLIUM
4U	COBALT	NA	TIN
4U	COPPER	2U	VANADIUM
1000	IRON	10U	ZINC
3U	LEAD		
8200	MAGNESIUM		

REMARKS
RECOMMENDED HOLDING TIME EXCEEDED-HG
HOLDING TIME EXCEEDED-CN

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.

01/30/91

SPECIFIED ANALYSIS DATA REPORT

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**   PROJECT NO. 91-171    SAMPLE NO. 53615  SAMPLE TYPE: SURFACEWA   PROG ELEM: NSF   COLLECTED BY: S PANABAKER                **
**   SOURCE: SOUTHERN RESINS DIV                                      CITY: MOUNDVILLE            ST: AL                          **
**   STATION ID: SW-04                                                COLLECTION START: 12/12/90  0900   STOP: 00/00/00           **
**   CASE.NO.: 15499          SAS NO.:                                D. NO.: Z716               MD NO: Z716                      **
**                                                                                                                                  **
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RESULTS	UNITS	PARAMETER
10UJ	UG/L	CYANIDE

REMARKS

RECOMMENDED HOLDING TIME EXCEEDED-HG
HOLDING TIME EXCEEDED-CN

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.

01/31/91

METALS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53625 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL
STATION ID: SW-05 COLLECTION START: 12/12/90 1320 STOP: 00/00/00
CASE NUMBER: 15499 SAS NUMBER: MD NUMBER: Z726

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
13000	ALUMINUM	220	MANGANESE
14UJ	ANTIMONY	0.20UJ	MERCURY
5UJ	ARSENIC	5U	NICKEL
25	BARIUM	3500	POTASSIUM
1U	BERYLLIUM	20UR	SELENIUM
3U	CADMIUM	2U	SILVER
1700	CALCIUM	61000	SODIUM
6U	CHROMIUM	10U	THALLIUM
4U	COBALT	NA	TIN
8U	COPPER	15	VANADIUM
5200	IRON	50U	ZINC
8	LEAD		
700	MAGNESIUM		

REMARKS
RECOMMENDED HOLDING TIME EXCEEDED-HG
HOLDING TIME EXCEEDED-CN

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.

01/30/91

SPECIFIED ANALYSIS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53625 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL
STATION ID: SW-05 COLLECTION START: 12/12/90 1320 STOP: 00/00/00
CASE.NO.: 15499 SAS NO.: D. NO.: Z726 MD NO: Z726

RESULTS	UNITS	PARAMETER
10UJ	UG/L	CYANIDE

REMARKS
RECOMMENDED HOLDING TIME EXCEEDED-HG
HOLDING TIME EXCEEDED-CN

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.

01/31/91

METALS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53608 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL
STATION ID: PB-01 COLLECTION START: 12/11/90 0800 STOP: 00/00/00
CASE NUMBER: 15499 SAS NUMBER: MD NUMBER: Z706

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
80U	ALUMINUM	1U	MANGANESE
14UJ	ANTIMONY	0.20UJ	MERCURY
3UR	ARSENIC	4U	NICKEL
2U	BARIUM	68U	POTASSIUM
1U	BERYLLIUM	4UR	SELENIUM
3U	CADMIUM	2U	SILVER
19U	CALCIUM	50U	SODIUM
4U	CHROMIUM	2U	THALLIUM
4U	COBALT	NA	TIN
2U	COPPER	2U	VANADIUM
80U	IRON	5U	ZINC
3U	LEAD		
17U	MAGNESIUM		

REMARKS
RECOMMENDED HOLDING TIME EXCEEDED-HG
HOLDING TIME EXCEEDED-CN

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.

01/30/91

SPECIFIED ANALYSIS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53608 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL
STATION ID: PB-01 COLLECTION START: 12/11/90 0800 STOP: 00/00/00
CASE.NO.: 15499 SAS NO.: D. NO.: MD NO: Z706

RESULTS	UNITS	PARAMETER
10UJ	UG/L	CYANIDE

REMARKS
RECOMMENDED HOLDING TIME EXCEEDED-HG
HOLDING TIME EXCEEDED-CN

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.

04/02/91

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53614 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL
STATION ID: MW-01 COLLECTION START: 12/12/90 0930 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z715

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

UG/L	ANALYTICAL RESULTS
20U	1,2-DICHLOROPROPANE
20U	CIS-1,3-DICHLOROPROPENE
20U	TRICHLOROETHENE(TRICHLOROETHYLENE)
20U	DIBROMOCHLOROMETHANE
20U	1,1,2-TRICHLOROETHANE
220	BENZENE
20U	TRANS-1,3-DICHLOROPROPENE
20U	BROMOFORM
20U	METHYL ISOBUTYL KETONE
20U	METHYL BUTYL KETONE
20U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
20U	1,1,2,2-TETRACHLOROETHANE
35	TOLUENE
20U	CHLOROBENZENE
75	ETHYL BENZENE
62	STYRENE
370	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.

04/02/91

MISCELLANEOUS PURGEABLE ORGANICS - DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53614 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL
STATION ID: MW-01 COLLECTION START: 12/12/90 0930 STOP: 00/00/00
CASE.NO.: 15499 SAS NO.: D. NO.: Z715 MD NO: Z715

ANALYTICAL RESULTS UG/L

60JN	PROPYLBENZENE
50JN	PROPENYLBENZENE
200JN	ETHYLMETHYLBENZENE

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.

04/02/91

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53614 SAMPLE TYPE: GROUNDWA
SOURCE: SOUTHERN RESINS DIV
STATION ID: MW-01

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 0930 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z715

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
27O	NAPHTHALENE
10U	4-CHLOROANILINE
10U	HEXACHLOROBUTADIENE
10U	4-CHLORO-3-METHYLPHENOL
10U	2-METHYLNAPHTHALENE
10U	HEXACHLOROCYCLOPENTADIENE (HCCP)
10U	2,4,6-TRICHLOROPHENOL
50U	2,4,5-TRICHLOROPHENOL
10U	2-CHLORONAPHTHALENE
50U	2-NITROANILINE
10U	DIMETHYL PHTHALATE
10U	ACENAPHTHYLENE
10U	2,6-DINITROTOLUENE

UG/L	ANALYTICAL RESULTS
50U	3-NITROANILINE
10U	ACENAPHTHENE
50U	2,4-DINITROPHENOL
50U	4-NITROPHENOL
10U	DIBENZOFURAN
10U	2,4-DINITROTOLUENE
10U	DIETHYL PHTHALATE
10U	4-CHLOROPHENYL PHENYL ETHER
10U	FLUORENE
50U	4-NITROANILINE
50U	2-METHYL-4,6-DINITROPHENOL
10U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
10U	4-BROMOPHENYL PHENYL ETHER
10U	HEXACHLOROBENZENE (HCB)
50U	PENTACHLOROPHENOL
10U	PHENANTHRENE
10U	ANTHRACENE
10U	CARBAZOLE
10U	DI-N-BUTYLPHTHALATE
10U	FLUORANTHENE
10U	PYRENE
10U	BENZYL BUTYL PHTHALATE
10U	3,3'-DICHLOROBENZIDINE
10UJ	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

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.

04/02/91

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

*** ***
** PROJECT NO. 91-171 SAMPLE NO. 53614 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: S PANABAKER **
** SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL **
** STATION ID: MW-01 COLLECTION START: 12/12/90 0930 STOP: 00/00/00 **
** CASE.NO.: 15499 SAS NO.: D. NO.: Z715 MD NO: Z715 **
** **
*** ***

ANALYTICAL RESULTS UG/L

10JN	DIETHYLBENZENE
20JN	METHYLCYCLOPROPENYLBENZENE
200JN	AMINOHEXANOIC ACID
10JN	TETRAHYDROMETHYLNAPHTHALENE
100J	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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*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.

PESTICIDES/PCB'S DATA REPORT 04/02/91

PROJECT NO. 91-171 SAMPLE NO. 53614 SAMPLE TYPE: GROUNDWA
SOURCE: SOUTHERN RESINS DIV
STATION ID: MW-01
CASE NUMBER: 15499 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 0930 STOP: 00/00/00
D. NUMBER: Z715

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)
1.0U	PCB-1221 (AROCLOR 1221)
2.0U	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
*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.

PURGEABLE ORGANICS DATA REPORT 04/02/91

PROJECT NO. 91-171 SAMPLE NO. 53624 SAMPLE TYPE: GROUNDWA
SOURCE: SOUTHERN RESINS DIV
STATION ID: MW-02

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1305 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z725

UG/L	ANALYTICAL RESULTS
10U	CHLOROMETHANE
10U	BROMOMETHANE
10U	VINYL CHLORIDE
10U	CHLOROETHANE
10U	METHYLENE CHLORIDE
10U	ACETONE
21	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

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.

04/02/91

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53624 SAMPLE TYPE: GROUNDWA
SOURCE: SOUTHERN RESINS DIV
STATION ID: MW-02

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1305 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z725

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
50U	2,4,5-TRICHLOROPHENOL
10U	2-CHLORONAPHTHALENE
50U	2-NITROANILINE
10U	DIMETHYL PHTHALATE
10U	ACENAPHTHYLENE
10U	2,6-DINITROTOLUENE

UG/L	ANALYTICAL RESULTS
50U	3-NITROANILINE
10U	ACENAPHTHENE
50U	2,4-DINITROPHENOL
50U	4-NITROPHENOL
10U	DIBENZOFURAN
10U	2,4-DINITROTOLUENE
10U	DIETHYL PHTHALATE
10U	4-CHLOROPHENYL PHENYL ETHER
10U	FLUORENE
50U	4-NITROANILINE
50U	2-METHYL-4,6-DINITROPHENOL
10U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
10U	4-BROMOPHENYL PHENYL ETHER
10U	HEXACHLOROBENZENE (HCB)
50U	PENTACHLOROPHENOL
10U	PHENANTHRENE
10U	ANTHRACENE
10U	CARBAZOLE
10U	DI-N-BUTYLPHTHALATE
10U	FLUORANTHENE
10U	PYRENE
10U	BENZYL BUTYL PHTHALATE
10U	3,3'-DICHLOROBENZIDINE
10UJ	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

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.

04/02/91

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53624 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL
STATION ID: MW-02 COLLECTION START: 12/12/90 1305 STOP: 00/00/00
CASE.NO.: 15499 SAS NO.: D. NO.: Z725 MD NO: Z725

ANALYTICAL RESULTS UG/L

400JN	AMINOHEXANOIC ACID
50J	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.
*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.

04/02/91

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 91-171   SAMPLE NO. 53624   SAMPLE TYPE: GROUNDWA   PROG ELEM: NSF   COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV   CITY: MOUNDVILLE   ST: AL
STATION ID: MW-02   COLLECTION START: 12/12/90 1305   STOP: 00/00/00
CASE NUMBER: 15499   SAS NUMBER: D. NUMBER: Z725

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
0.050U	ALPHA-BHC	0.50U	METHOXYCHLOR
0.050U	BETA-BHC	0.060J	ENDRIN KETONE
0.050U	DELTA-BHC	0.10U	ENDRIN ALDEHYDE
0.050U	GAMMA-BHC (LINDANE)	--	CHLORDANE (TECH. MIXTURE) /1
0.050U	HEPTACHLOR	0.030J	GAMMA-CHLORDANE /2
0.050U	ALDRIN	0.040J	ALPHA-CHLORDANE /2
0.050U	HEPTACHLOR EPOXIDE	5.0U	TOXAPHENE
0.050U	ENDOSULFAN I (ALPHA)	1.0U	PCB-1016 (AROCLOR 1016)
0.10U	DIELDRIN	1.0U	PCB-1221 (AROCLOR 1221)
0.062J	4,4'-DDE (P,P'-DDE)	2.0U	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)
0.054J	4,4'-DDT (P,P'-DDT)		

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.

04/02/91

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53627 SAMPLE TYPE: GROUNDWA
SOURCE: SOUTHERN RESINS DIV
STATION ID: MW-03

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1615 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z728

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
20U	CHLOROMETHANE	20U	1,2-DICHLOROPROPANE
20U	BROMOMETHANE	20U	CIS-1,3-DICHLOROPROPENE
20U	VINYL CHLORIDE	20U	TRICHLOROETHENE(TRICHLOROETHYLENE)
20U	CHLOROETHANE	20U	DIBROMOCHLOROMETHANE
20U	METHYLENE CHLORIDE	20U	1,1,2-TRICHLOROETHANE
20U	ACETONE	27	BENZENE
14J	CARBON DISULFIDE	20U	TRANS-1,3-DICHLOROPROPENE
20U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)	20U	BROMOFORM
20U	1,1-DICHLOROETHANE	20U	METHYL ISOBUTYL KETONE
20U	1,2-DICHLOROETHENE (TOTAL)	20U	METHYL BUTYL KETONE
20U	CHLOROFORM	20U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
20U	1,2-DICHLOROETHANE	20U	1,1,2,2-TETRACHLOROETHANE
20U	METHYL ETHYL KETONE	40	TOLUENE
20U	1,1,1-TRICHLOROETHANE	20U	CHLOROBENZENE
20U	CARBON TETRACHLORIDE	84	ETHYL BENZENE
20U	BROMODICHLOROMETHANE	78	STYRENE
		330	TOTAL XYLENES

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.

04/02/91

MISCELLANEOUS PURGEABLE ORGANICS - DATA REPORT

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**   PROJECT NO. 91-171   SAMPLE NO. 53627  SAMPLE TYPE: GROUNDWA    PROG ELEM: NSF   COLLECTED BY: S PANABAKER              **
**   SOURCE: SOUTHERN RESINS DIV                                     CITY: MOUNDVILLE              ST: AL                    **
**   STATION ID: MW-03                                               COLLECTION START: 12/12/90  1615   STOP: 00/00/00       **
**   CASE.NO.: 15499         SAS NO.:                                D. NO.: Z728                 MD NO: Z728                **
**                                                                                                                           **
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ANALYTICAL RESULTS UG/L

300JN	ETHYLMETHYLBENZENE (3 ISOMERS)
80JN	TRIMETHYLBENZENE
60JN	PROPYLBENZENE

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.

04/02/91

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53627 SAMPLE TYPE: GROUNDWA
SOURCE: SOUTHERN RESINS DIV
STATION ID: MW-03

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1615 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z728

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
140	NAPHTHALENE
10U	4-CHLOROANILINE
10U	HEXACHLOROBUTADIENE
10U	4-CHLORO-3-METHYLPHENOL
10U	2-METHYLNAPHTHALENE
10U	HEXACHLOROCYCLOPENTADIENE (HCCP)
10U	2,4,6-TRICHLOROPHENOL
50U	2,4,5-TRICHLOROPHENOL
10U	2-CHLORONAPHTHALENE
50U	2-NITROANILINE
10U	DIMETHYL PHTHALATE
10U	ACENAPHTHYLENE
10U	2,6-DINITROTOLUENE

UG/L	ANALYTICAL RESULTS
50U	3-NITROANILINE
10U	ACENAPHTHENE
50U	2,4-DINITROPHENOL
50U	4-NITROPHENOL
10U	DIBENZOFURAN
10U	2,4-DINITROTOLUENE
10U	DIETHYL PHTHALATE
10U	4-CHLOROPHENYL PHENYL ETHER
10U	FLUORENE
50U	4-NITROANILINE
10U	2-METHYL-4,6-DINITROPHENOL
10U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
10U	4-BROMOPHENYL PHENYL ETHER
10U	HEXACHLOROBENZENE (HCB)
2J	PENTACHLOROPHENOL
10U	PHENANTHRENE
10U	ANTHRACENE
10U	CARBAZOLE
1J	DI-N-BUTYLPHTHALATE
10U	FLUORANTHENE
10U	PYRENE
10U	BENZYL BUTYL PHTHALATE
10U	3,3'-DICHLOROBENZIDINE
10UJ	BENZO(A)ANTHRACENE
10U	CHRYSENE
20U	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

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.

04/02/91

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53627 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL
STATION ID: MW-03 COLLECTION START: 12/12/90 1615 STOP: 00/00/00
CASE.NO.: 15499 SAS NO.: D. NO.: Z728 MD NO: Z728

ANALYTICAL RESULTS UG/L

900J	9 UNIDENTIFIED COMPOUNDS
80JN	PROPADIENYLBENZENE
100JN	ETHYLDIMETHYLBENZENE (3 ISOMERS)
40JN	METHYLINDENE
300JN	AMINOHEXANOIC ACID

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.

04/02/91

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53627 SAMPLE TYPE: GROUNDWA
SOURCE: SOUTHERN RESINS DIV
STATION ID: MW-03
CASE NUMBER: 15499 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1615 STOP: 00/00/00
D. NUMBER: 2728

UG/L	ANALYTICAL RESULTS
0.050U	ALPHA-BHC
0.050U	BETA-BHC
0.021J	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)
1.0U	PCB-1221 (AROCLOR 1221)
2.0U	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)

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.

04/02/91

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53626 SAMPLE TYPE: GROUNDWA
SOURCE: SOUTHERN RESINS DIV
STATION ID: MW-04

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1530 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z727

UG/L	ANALYTICAL RESULTS
100U	CHLOROMETHANE
100U	BROMOMETHANE
100U	VINYL CHLORIDE
100U	CHLOROETHANE
200U	METHYLENE CHLORIDE
400U	ACETONE
24J	CARBON DISULFIDE
100U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)
100U	1,1-DICHLOROETHANE
100U	1,2-DICHLOROETHENE (TOTAL)
100U	CHLOROFORM
100U	1,2-DICHLOROETHANE
100U	METHYL ETHYL KETONE
100U	1,1,1-TRICHLOROETHANE
100U	CARBON TETRACHLORIDE
100U	BROMODICHLOROMETHANE

UG/L	ANALYTICAL RESULTS
100U	1,2-DICHLOROPROPANE
100U	CIS-1,3-DICHLOROPROPENE
100U	TRICHLOROETHENE(TRICHLOROETHYLENE)
100U	DIBROMOCHLOROMETHANE
100U	1,1,2-TRICHLOROETHANE
120	BENZENE
100U	TRANS-1,3-DICHLOROPROPENE
100U	BROMOFORM
100U	METHYL ISOBUTYL KETONE
100U	METHYL BUTYL KETONE
100U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
100U	1,1,2,2-TETRACHLOROETHANE
78J	TOLUENE
100U	CHLOROBENZENE
410	ETHYL BENZENE
280	STYRENE
2300	TOTAL XYLENES

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.

04/02/91

MISCELLANEOUS PURGEABLE ORGANICS - DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53626 SAMPLE TYPE: GROUNDWA
SOURCE: SOUTHERN RESINS DIV
STATION ID: MW-04
CASE.NO.: 15499 SAS NO.:

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1530 STOP: 00/00/00
D. NO.: Z727 MD NO: Z727

ANALYTICAL RESULTS UG/L

400JN	PROPENYLBENZENE
400JN	PROPYLBENZENE
2000JN	ETHYLMETHYLBENZENE (2 ISOMERS)

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.

04/02/91

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53626 SAMPLE TYPE: GROUNDWA
SOURCE: SOUTHERN RESINS DIV
STATION ID: MW-04

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1530 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z727

UG/L	ANALYTICAL RESULTS
100U	PHENOL
100U	BIS(2-CHLOROETHYL) ETHER
100U	2-CHLOROPHENOL
100U	1,3-DICHLOROBENZENE
100U	1,4-DICHLOROBENZENE
100U	1,2-DICHLOROBENZENE
100U	2-METHYLPHENOL
100U	2,2'-CHLOROISOPROPYLETHER
100U	(3-AND/OR 4-)METHYLPHENOL
100U	N-NITROSODI-N-PROPYLAMINE
100U	HEXACHLOROETHANE
100U	NITROBENZENE
100U	ISOPHORONE
100U	2-NITROPHENOL
100U	2,4-DIMETHYLPHENOL
100U	BIS(2-CHLOROETHOXY) METHANE
100U	2,4-DICHLOROPHENOL
100U	1,2,4-TRICHLOROBENZENE
750	NAPHTHALENE
100U	4-CHLOROANILINE
100U	HEXACHLOROBUTADIENE
100U	4-CHLORO-3-METHYLPHENOL
100U	2-METHYLNAPHTHALENE
100U	HEXACHLOROCYCLOPENTADIENE (HCCP)
100U	2,4,6-TRICHLOROPHENOL
500U	2,4,5-TRICHLOROPHENOL
100U	2-CHLORONAPHTHALENE
500U	2-NITROANILINE
100U	DIMETHYL PHTHALATE
100U	ACENAPHTHYLENE
100U	2,6-DINITROTOLUENE

UG/L	ANALYTICAL RESULTS
500U	3-NITROANILINE
100U	ACENAPHTHENE
500U	2,4-DINITROPHENOL
500U	4-NITROPHENOL
100U	DIBENZOFURAN
100U	2,4-DINITROTOLUENE
100U	DIETHYL PHTHALATE
100U	4-CHLOROPHENYL PHENYL ETHER
100U	FLUORENE
500U	4-NITROANILINE
500U	2-METHYL-4,6-DINITROPHENOL
100U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
100U	4-BROMOPHENYL PHENYL ETHER
100U	HEXACHLOROBENZENE (HCB)
500U	PENTACHLOROPHENOL
100U	PHENANTHRENE
100U	ANTHRACENE
100U	CARBAZOLE
100U	DI-N-BUTYLPHTHALATE
100U	FLUORANTHENE
100U	PYRENE
100U	BENZYL BUTYL PHTHALATE
100U	3,3'-DICHLOROBENZIDINE
100UJ	BENZO(A)ANTHRACENE
100U	CHRYSENE
100U	BIS(2-ETHYLHEXYL) PHTHALATE
100U	DI-N-OCTYLPHTHALATE
100U	BENZO(B AND/OR K)FLUORANTHENE
100U	BENZO-A-PYRENE
100U	INDENO (1,2,3-CD) PYRENE
100U	DIBENZO(A,H)ANTHRACENE
100U	BENZO(GHI)PERYLENE

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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MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

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** PROJECT NO. 91-171 SAMPLE NO. 53626 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: S PANABAKER **
** SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL **
** STATION ID: MW-04 COLLECTION START: 12/12/90 1530 STOP: 00/00/00 **
** CASE.NO.: 15499 SAS NO.: D. NO.: Z727 MD NO: Z727 **
** **
*** ***

ANALYTICAL RESULTS UG/L

700JN	PROPADIENYLBENZENE
500JN	ETHYLDIMETHYLBENZENE (2 ISOMERS)
70JN	METHYLPROPENYLBENZENE
200JN	ETHENYLETHYLBENZENE
100JN	METHYLINDENE
100JN	TETRAHYDROCYCLOPROPINDENE
100JN	METHYLBENZOIC ACID
400JN	AMINOHEXANOIC ACID
3000J	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.
*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.

04/02/91

PESTICIDES/PCB'S DATA REPORT

** PROJECT NO. 91-171 SAMPLE NO. 53626 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: S PANABAKER
** SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL
** STATION ID: MW-04 COLLECTION START: 12/12/90 1530 STOP: 00/00/00
** CASE NUMBER: 15499 SAS NUMBER: D. NUMBER: Z727

UG/L	ANALYTICAL RESULTS
0.050U	ALPHA-BHC
0.067U	BETA-BHC
0.074	DELTA-BHC
0.050U	GAMMA-BHC (LINDANE)
0.040J	HEPTACHLOR
0.050U	ALDRIN
0.050U	HEPTACHLOR EPOXIDE
0.050U	ENDOSULFAN I (ALPHA)
0.10U	DIELDRIN
0.029J	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
0.027J	GAMMA-CHLORDANE /2
0.089	ALPHA-CHLORDANE /2
5.0U	TOXAPHENE
1.0U	PCB-1016 (AROCLOR 1016)
1.0U	PCB-1221 (AROCLOR 1221)
2.0U	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)

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.

04/02/91

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53628 SAMPLE TYPE: GROUNDWA
SOURCE: SOUTHERN RESINS DIV
STATION ID: MW-05

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1650 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z729

UG/L	ANALYTICAL RESULTS
25UJ	CHLOROMETHANE
25UJ	BROMOMETHANE
25UJ	VINYL CHLORIDE
25UJ	CHLOROETHANE
25UJ	METHYLENE CHLORIDE
25UJ	ACETONE
42J	CARBON DISULFIDE
25UJ	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)
25UJ	1,1-DICHLOROETHANE
25UJ	1,2-DICHLOROETHENE (TOTAL)
25UJ	CHLOROFORM
25UJ	1,2-DICHLOROETHANE
25UJ	METHYL ETHYL KETONE
25UJ	1,1,1-TRICHLOROETHANE
25UJ	CARBON TETRACHLORIDE
25UJ	BROMODICHLOROMETHANE

UG/L	ANALYTICAL RESULTS
25UJ	1,2-DICHLOROPROPANE
25UJ	CIS-1,3-DICHLOROPROPENE
25UJ	TRICHLOROETHENE(TRICHLOROETHYLENE)
25UJ	DIBROMOCHLOROMETHANE
25UJ	1,1,2-TRICHLOROETHANE
45J	BENZENE
25UJ	TRANS-1,3-DICHLOROPROPENE
25UJ	BROMOFORM
25UJ	METHYL ISOBUTYL KETONE
25UJ	METHYL BUTYL KETONE
25UJ	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
25UJ	1,1,2,2-TETRACHLOROETHANE
61J	TOLUENE
25UJ	CHLOROBENZENE
140J	ETHYL BENZENE
130J	STYRENE
740J	TOTAL XYLENES

REMARKS
HOLDING TIMES EXCEEDED(40 CFR 136,OCTOBER 26,1984)

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. 04/02/91

MISCELLANEOUS PURGEABLE ORGANICS - DATA REPORT

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**  PROJECT NO. 91-171   SAMPLE NO. 53628  SAMPLE TYPE: GROUNDWA    PROG ELEM: NSF   COLLECTED BY: S PANABAKER          **
**  SOURCE: SOUTHERN RESINS DIV                                     CITY: MOUNDVILLE             ST: AL                 **
**  STATION ID: MW-05                                               COLLECTION START: 12/12/90  1650   STOP: 00/00/00   **
**  CASE.NO.: 15499             SAS NO.:                            D. NO.: Z729                MD NO: Z729             **
**                                                                                                                      **
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ANALYTICAL RESULTS UG/L

700JN	ETHYLMETHYLBENZENE (3 ISOMERS)
100JN	PROPENYLBENZENE
100JN	PROPYLBENZENE
600JN	TRIMETHYLBENZENE (2 ISOMERS)

REMARKS ***REMARKS***
HOLDING TIMES EXCEEDED(40 CFR 136,OCTOBER 26,1984)

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.

04/02/91

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53628 SAMPLE TYPE: GROUNDWA
SOURCE: SOUTHERN RESINS DIV
STATION ID: MW-05

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1650 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: 2729

UG/L	ANALYTICAL RESULTS
30U	PHENOL
30U	BIS(2-CHLOROETHYL) ETHER
30U	2-CHLOROPHENOL
30U	1,3-DICHLOROBENZENE
30U	1,4-DICHLOROBENZENE
30U	1,2-DICHLOROBENZENE
30U	2-METHYLPHENOL
30U	2,2'-CHLOROISOPROPYLETHER
30U	(3-AND/OR 4-)METHYLPHENOL
30U	N-NITROSODI-N-PROPYLAMINE
30U	HEXACHLOROETHANE
30U	NITROBENZENE
30U	ISOPHORONE
30U	2-NITROPHENOL
30U	2,4-DIMETHYLPHENOL
30U	BIS(2-CHLOROETHOXY) METHANE
30U	2,4-DICHLOROPHENOL
30U	1,2,4-TRICHLOROBENZENE
17O	NAPHTHALENE
30U	4-CHLOROANILINE
30U	HEXACHLOROBUTADIENE
30U	4-CHLORO-3-METHYLPHENOL
30U	2-METHYLNAPHTHALENE
30U	HEXACHLOROCYCLOPENTADIENE (HCCP)
30U	2,4,6-TRICHLOROPHENOL
150U	2,4,5-TRICHLOROPHENOL
30U	2-CHLORONAPHTHALENE
150U	2-NITROANILINE
30U	DIMETHYL PHTHALATE
30U	ACENAPHTHYLENE
30U	2,6-DINITROTOLUENE

UG/L	ANALYTICAL RESULTS
150U	3-NITROANILINE
30U	ACENAPHTHENE
150U	2,4-DINITROPHENOL
150U	4-NITROPHENOL
30U	DIBENZOFURAN
30U	2,4-DINITROTOLUENE
30U	DIETHYL PHTHALATE
30U	4-CHLOROPHENYL PHENYL ETHER
30U	FLUORENE
150U	4-NITROANILINE
150U	2-METHYL-4,6-DINITROPHENOL
30U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
30U	4-BROMOPHENYL PHENYL ETHER
30U	HEXACHLOROBENZENE (HCB)
150U	PENTACHLOROPHENOL
30U	PHENANTHRENE
30U	ANTHRACENE
30U	CARBAZOLE
30U	DI-N-BUTYLPHTHALATE
30U	FLUORANTHENE
30U	PYRENE
30U	BENZYL BUTYL PHTHALATE
30U	3,3'-DICHLOROBENZIDINE
30UJ	BENZO(A)ANTHRACENE
30U	CHRYSENE
30U	BIS(2-ETHYLHEXYL) PHTHALATE
30U	DI-N-OCTYLPHTHALATE
30U	BENZO(B AND/OR K)FLUORANTHENE
30U	BENZO-A-PYRENE
30U	INDENO (1,2,3-CD) PYRENE
30U	DIBENZO(A,H)ANTHRACENE
30U	BENZO(GHI)PERYLENE

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.

04/02/91

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

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**   PROJECT NO. 91-171   SAMPLE NO. 53628  SAMPLE TYPE: GROUNDWA     PROG ELEM: NSF   COLLECTED BY: S PANABAKER              **
**   SOURCE: SOUTHERN RESINS DIV                                      CITY: MOUNDVILLE              ST: AL                       **
**   STATION ID: MW-05                                                COLLECTION START: 12/12/90  1650  STOP: 00/00/00           **
**   CASE.NO.: 15499          SAS NO.:                                D. NO.: Z729                MD NO: Z729                    **
**                                                                                                                               **
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ANALYTICAL RESULTS UG/L

90JN	PROPADIENYLBENZENE
90JN	ETHYLDIMETHYLBENZENE
50JN	TETRAMETHYLBENZENE
300JN	AMINOHEXANOIC ACID
1000J	10 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.

04/02/91

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53628 SAMPLE TYPE: GROUNDWA PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL
STATION ID: MW-05 COLLECTION START: 12/12/90 1650 STOP: 00/00/00
CASE NUMBER: 15499 SAS NUMBER: D. NUMBER: Z729

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
0.097	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	1.0U	PCB-1221 (AROCLOR 1221)
0.10U	4,4'-DDE (P,P'-DDE)	2.0U	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
*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.

04/02/91

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53622 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL
STATION ID: SW-01 COLLECTION START: 12/12/90 1210 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z723

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

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.

04/02/91

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53622 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL
STATION ID: SW-01 COLLECTION START: 12/12/90 1210 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z723

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
10U	PHENOL	50U	3-NITROANILINE
10U	BIS(2-CHLOROETHYL) ETHER	10U	ACENAPHTHENE
10U	2-CHLOROPHENOL	50U	2,4-DINITROPHENOL
10U	1,3-DICHLOROBENZENE	50U	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	50U	4-NITROANILINE
10U	HEXACHLOROETHANE	50U	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	50U	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)	10UJ	BENZO(A)ANTHRACENE
10U	2,4,6-TRICHLOROPHENOL	10U	CHRYSENE
50U	2,4,5-TRICHLOROPHENOL	10U	BIS(2-ETHYLHEXYL) PHTHALATE
10U	2-CHLORONAPHTHALENE	10U	DI-N-OCTYLPHTHALATE
50U	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

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.

04/02/91

PESTICIDES/PCB'S DATA REPORT

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** PROJECT NO. 91-171    SAMPLE NO. 53622  SAMPLE TYPE: SURFACEWA   PROG ELEM: NSF   COLLECTED BY: S PANABAKER **
** SOURCE: SOUTHERN RESINS DIV                                      CITY: MOUNDVILLE            ST: AL            **
** STATION ID: SW-01                                                COLLECTION START: 12/12/90  1210   STOP: 00/00/00 **
** CASE NUMBER: 15499          SAS NUMBER:                           D. NUMBER: Z723                              **
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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	1.0U	PCB-1221 (AROCLOR 1221)
0.10U	4,4'-DDE (P,P'-DDE)	2.0U	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

*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.

04/02/91

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53619 SAMPLE TYPE: SURFACEWA
SOURCE: SOUTHERN RESINS DIV
STATION ID: SW-02

CASE NO.: 15499 SAS NO.:

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1050 STOP: 00/00/00

D. NO.: Z720

UG/L	ANALYTICAL RESULTS
20U	CHLOROMETHANE
20U	BROMOMETHANE
20U	VINYL CHLORIDE
20U	CHLOROETHANE
20U	METHYLENE CHLORIDE
200U	ACETONE
20U	CARBON DISULFIDE
20U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)
20U	1,1-DICHLOROETHANE
20U	1,2-DICHLOROETHENE (TOTAL)
20U	CHLOROFORM
20U	1,2-DICHLOROETHANE
20U	METHYL ETHYL KETONE
2J	1,1,1-TRICHLOROETHANE
20U	CARBON TETRACHLORIDE
20U	BROMODICHLOROMETHANE

UG/L	ANALYTICAL RESULTS
20U	1,2-DICHLOROPROPANE
20U	CIS-1,3-DICHLOROPROPENE
20U	TRICHLOROETHENE(TRICHLOROETHYLENE)
20U	DIBROMOCHLOROMETHANE
20U	1,1,2-TRICHLOROETHANE
2J	BENZENE
20U	TRANS-1,3-DICHLOROPROPENE
20U	BROMOFORM
2J	METHYL ISOBUTYL KETONE
20U	METHYL BUTYL KETONE
20U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
20U	1,1,2,2-TETRACHLOROETHANE
3J	TOLUENE
20U	CHLOROBENZENE
2J	ETHYL BENZENE
20U	STYRENE
22	TOTAL XYLENES

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. 04/02/91

MISCELLANEOUS PURGEABLE ORGANICS - DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53619 SAMPLE TYPE: SURFACEWA	PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV	CITY: MOUNDVILLE ST: AL
STATION ID: SW-02	COLLECTION START: 12/12/90 1050 STOP: 00/00/00
CASE.NO.: 15499 SAS NO.:	D. NO.: Z720 MD NO: Z720

ANALYTICAL RESULTS UG/L

20JN	DIMETHOXYMETHANE
30JN	METHYLPROPENAL
50JN	DIMETHYLBUTANONE
80JN	METHYLCYCLOPENTANONE
600JN	TETRAMETHYLPENTANONE
100JN	ETHYLMETHYLBENZENE (2 ISOMERS)
30JN	DECANE
40J	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.

04/02/91

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53619 SAMPLE TYPE: SURFACEWA
SOURCE: SOUTHERN RESINS DIV
STATION ID: SW-02

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1050 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z720

UG/L	ANALYTICAL RESULTS
50U	PHENOL
50U	BIS(2-CHLOROETHYL) ETHER
50U	2-CHLOROPHENOL
50U	1,3-DICHLOROBENZENE
50U	1,4-DICHLOROBENZENE
50U	1,2-DICHLOROBENZENE
50U	2-METHYLPHENOL
50U	2,2'-CHLOROISOPROPYLETHER
50U	(3-AND/OR 4-)METHYLPHENOL
50U	N-NITROSODI-N-PROPYLAMINE
50U	HEXACHLOROETHANE
50U	NITROBENZENE
50U	ISOPHORONE
50U	2-NITROPHENOL
50U	2,4-DIMETHYLPHENOL
50U	BIS(2-CHLOROETHOXY) METHANE
50U	2,4-DICHLOROPHENOL
50U	1,2,4-TRICHLOROBENZENE
50U	NAPHTHALENE
50U	4-CHLOROANILINE
50U	HEXACHLOROBUTADIENE
50U	4-CHLORO-3-METHYLPHENOL
50U	2-METHYLNAPHTHALENE
50U	HEXACHLOROCYCLOPENTADIENE (HCCP)
50U	2,4,6-TRICHLOROPHENOL
250U	2,4,5-TRICHLOROPHENOL
50U	2-CHLORONAPHTHALENE
250U	2-NITROANILINE
50U	DIMETHYL PHTHALATE
50U	ACENAPHTHYLENE
50U	2,6-DINITROTOLUENE

UG/L	ANALYTICAL RESULTS
250U	3-NITROANILINE
50U	ACENAPHTHENE
250U	2,4-DINITROPHENOL
250U	4-NITROPHENOL
50U	DIBENZOFURAN
50U	2,4-DINITROTOLUENE
50U	DIETHYL PHTHALATE
50U	4-CHLOROPHENYL PHENYL ETHER
50U	FLUORENE
250U	4-NITROANILINE
250U	2-METHYL-4,6-DINITROPHENOL
50U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
50U	4-BROMOPHENYL PHENYL ETHER
50U	HEXACHLOROBENZENE (HCB)
250U	PENTACHLOROPHENOL
50U	PHENANTHRENE
50U	ANTHRACENE
50U	CARBAZOLE
50U	DI-N-BUTYLPHTHALATE
50U	FLUORANTHENE
50U	PYRENE
50U	BENZYL BUTYL PHTHALATE
50U	3,3'-DICHLOROBENZIDINE
50UJ	BENZO(A)ANTHRACENE
50U	CHRYSENE
50U	BIS(2-ETHYLHEXYL) PHTHALATE
50U	DI-N-OCTYLPHTHALATE
50U	BENZO(B AND/OR K)FLUORANTHENE
50U	BENZO-A-PYRENE
50U	INDENO (1,2,3-CD) PYRENE
50U	DIBENZO(A,H)ANTHRACENE
50U	BENZO(GHI)PERYLENE

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.

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53619 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL
STATION ID: SW-02 COLLECTION START: 12/12/90 1050 STOP: 00/00/00
CASE.NO.: 15499 SAS NO.: D. NO.: Z720 MD NO: Z720

ANALYTICAL RESULTS UG/L

9000J	18 UNIDENTIFIED COMPOUNDS
900JN	BUTYLBENZOIC ACID

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.

04/02/91

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53619 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL
STATION ID: SW-02 COLLECTION START: 12/12/90 1050 STOP: 00/00/00
CASE NUMBER: 15499 SAS NUMBER: D. NUMBER: Z720

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	1.0U	PCB-1221 (AROCLOR 1221)
0.10U	4,4'-DDE (P,P'-DDE)	2.0U	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
*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.

04/02/91

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53620 SAMPLE TYPE: SURFACEWA
SOURCE: SOUTHERN RESINS DIV
STATION ID: SW-03

CASE NO.: 15499 SAS NO.:

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1015 STOP: 00/00/00

D. NO.: Z721

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

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.

04/02/91

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53620 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL
STATION ID: SW-03 COLLECTION START: 12/12/90 1015 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z721

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
50U	2,4,5-TRICHLOROPHENOL
10U	2-CHLORONAPHTHALENE
50U	2-NITROANILINE
10U	DIMETHYL PHTHALATE
10U	ACENAPHTHYLENE
10U	2,6-DINITROTOLUENE

UG/L	ANALYTICAL RESULTS
50U	3-NITROANILINE
10U	ACENAPHTHENE
50U	2,4-DINITROPHENOL
50U	4-NITROPHENOL
10U	DIBENZOFURAN
10U	2,4-DINITROTOLUENE
10U	DIETHYL PHTHALATE
10U	4-CHLOROPHENYL PHENYL ETHER
10U	FLUORENE
50U	4-NITROANILINE
50U	2-METHYL-4,6-DINITROPHENOL
10U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
10U	4-BROMOPHENYL PHENYL ETHER
10U	HEXACHLOROBENZENE (HCB)
50U	PENTACHLOROPHENOL
10U	PHENANTHRENE
10U	ANTHRACENE
10U	CARBAZOLE
10U	DI-N-BUTYLPHTHALATE
10U	FLUORANTHENE
10U	PYRENE
10U	BENZYL BUTYL PHTHALATE
10U	3,3'-DICHLOROBENZIDINE
10UJ	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

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.

04/02/91

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53620 SAMPLE TYPE: SURFACEWA
SOURCE: SOUTHERN RESINS DIV
STATION ID: SW-03
CASE NUMBER: 15499 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1015 STOP: 00/00/00
D. NUMBER: Z721

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)
1.0U	PCB-1221 (AROCLOR 1221)
2.0U	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)

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.

04/02/91

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53615 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL
STATION ID: SW-04 COLLECTION START: 12/12/90 0900 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z716

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.

04/02/91

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53615 SAMPLE TYPE: SURFACEWA
SOURCE: SOUTHERN RESINS DIV
STATION ID: SW-04

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 0900 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z716

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
50U	2,4,5-TRICHLOROPHENOL
10U	2-CHLORONAPHTHALENE
50U	2-NITROANILINE
10U	DIMETHYL PHTHALATE
10U	ACENAPHTHYLENE
10U	2,6-DINITROTOLUENE

UG/L	ANALYTICAL RESULTS
50U	3-NITROANILINE
10U	ACENAPHTHENE
50U	2,4-DINITROPHENOL
50U	4-NITROPHENOL
10U	DIBENZOFURAN
10U	2,4-DINITROTOLUENE
10U	DIETHYL PHTHALATE
10U	4-CHLOROPHENYL PHENYL ETHER
10U	FLUORENE
50U	4-NITROANILINE
50U	2-METHYL-4,6-DINITROPHENOL
10U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
10U	4-BROMOPHENYL PHENYL ETHER
10U	HEXACHLOROBENZENE (HCB)
50U	PENTACHLOROPHENOL
10U	PHENANTHRENE
10U	ANTHRACENE
10U	CARBAZOLE
10U	DI-N-BUTYLPHTHALATE
10U	FLUORANTHENE
10U	PYRENE
10U	BENZYL BUTYL PHTHALATE
10U	3,3'-DICHLOROBENZIDINE
10UJ	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

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.

04/02/91

PESTICIDES/PCB'S DATA REPORT

*** ***
** PROJECT NO. 91-171 SAMPLE NO. 53615 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: S PANABAKER **
** SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL **
** STATION ID: SW-04 COLLECTION START: 12/12/90 0900 STOP: 00/00/00 **
** CASE NUMBER: 15499 SAS NUMBER: D. NUMBER: 2716 **
** **
*** ***

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	1.0U	PCB-1221 (AROCLOR 1221)
0.10U	4,4'-DDE (P,P'-DDE)	2.0U	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.

PURGEABLE ORGANICS DATA REPORT 04/02/91

PROJECT NO. 91-171 SAMPLE NO. 53625 SAMPLE TYPE: SURFACEWA
SOURCE: SOUTHERN RESINS DIV
STATION ID: SW-05

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1320 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z726

UG/L	ANALYTICAL RESULTS
50U	CHLOROMETHANE
50U	BROMOMETHANE
50U	VINYL CHLORIDE
50U	CHLOROETHANE
50U	METHYLENE CHLORIDE
60U	ACETONE
6J	CARBON DISULFIDE
50U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)
50U	1,1-DICHLOROETHANE
50U	1,2-DICHLOROETHENE (TOTAL)
50U	CHLOROFORM
50U	1,2-DICHLOROETHANE
50U	METHYL ETHYL KETONE
50U	1,1,1-TRICHLOROETHANE
50U	CARBON TETRACHLORIDE
50U	BROMODICHLOROMETHANE

UG/L	ANALYTICAL RESULTS
50U	1,2-DICHLOROPROPANE
50U	CIS-1,3-DICHLOROPROPENE
50U	TRICHLOROETHENE(TRICHLOROETHYLENE)
50U	DIBROMOCHLOROMETHANE
50U	1,1,2-TRICHLOROETHANE
19J	BENZENE
50U	TRANS-1,3-DICHLOROPROPENE
50U	BROMOFORM
50U	METHYL ISOBUTYL KETONE
50U	METHYL BUTYL KETONE
50U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
50U	1,1,2,2-TETRACHLOROETHANE
18J	TOLUENE
50U	CHLOROBENZENE
45J	ETHYL BENZENE
50U	STYRENE
480	TOTAL XYLENES

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.

04/02/91

MISCELLANEOUS PURGEABLE ORGANICS - DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53625 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL
STATION ID: SW-05 COLLECTION START: 12/12/90 1320 STOP: 00/00/00
CASE.NO.: 15499 SAS NO.: D. NO.: Z726 MD NO: Z726

ANALYTICAL RESULTS UG/L

70JN	PROPENYLBENZENE
40JN	PROPYLBENZENE
800JN	ETHYLMETHYLBENZENE (2 ISOMERS)
300JN	TRIMETHYLBENZENE

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.

04/02/91

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 91-171   SAMPLE NO. 53625   SAMPLE TYPE: SURFACEWA   PROG ELEM: NSF   COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV   CITY: MOUNDVILLE   ST: AL
STATION ID: SW-05   COLLECTION START: 12/12/90 1320   STOP: 00/00/00

CASE NO.: 15499   SAS NO.:   D. NO.: Z726

UG/L	ANALYTICAL RESULTS	UG/L	ANALYTICAL RESULTS
50U	PHENOL	250U	3-NITROANILINE
50U	BIS(2-CHLOROETHYL) ETHER	50U	ACENAPHTHENE
50U	2-CHLOROPHENOL	250U	2,4-DINITROPHENOL
50U	1,3-DICHLOROBENZENE	250U	4-NITROPHENOL
50U	1,4-DICHLOROBENZENE	50U	DIBENZOFURAN
50U	1,2-DICHLOROBENZENE	50U	2,4-DINITROTOLUENE
50U	2-METHYLPHENOL	50U	DIETHYL PHTHALATE
50U	2,2'-CHLOROISOPROPYLETHER	50U	4-CHLOROPHENYL PHENYL ETHER
17J	(3-AND/OR 4-)METHYLPHENOL	50U	FLUORENE
50U	N-NITROSODI-N-PROPYLAMINE	250U	4-NITROANILINE
50U	HEXACHLOROETHANE	250U	2-METHYL-4,6-DINITROPHENOL
50U	NITROBENZENE	50U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
50U	ISOPHORONE	50U	4-BROMOPHENYL PHENYL ETHER
50U	2-NITROPHENOL	50U	HEXACHLOROBENZENE (HCB)
50U	2,4-DIMETHYLPHENOL	250U	PENTACHLOROPHENOL
50U	BIS(2-CHLOROETHOXY) METHANE	50U	PHENANTHRENE
50U	2,4-DICHLOROPHENOL	50U	ANTHRACENE
50U	1,2,4-TRICHLOROBENZENE	50U	CARBAZOLE
50U	NAPHTHALENE	50U	DI-N-BUTYLPHTHALATE
50U	4-CHLOROANILINE	50U	FLUORANTHENE
50U	HEXACHLOROBUTADIENE	50U	PYRENE
50U	4-CHLORO-3-METHYLPHENOL	50U	BENZYL BUTYL PHTHALATE
50U	2-METHYLNAPHTHALENE	50U	3,3'-DICHLOROBENZIDINE
50U	HEXACHLOROCYCLOPENTADIENE (HCCP)	50UJ	BENZO(A)ANTHRACENE
50U	2,4,6-TRICHLOROPHENOL	50U	CHRYSENE
250U	2,4,5-TRICHLOROPHENOL	50U	BIS(2-ETHYLHEXYL) PHTHALATE
50U	2-CHLORONAPHTHALENE	50U	DI-N-OCTYLPHTHALATE
250U	2-NITROANILINE	50U	BENZO(B AND/OR K)FLUORANTHENE
50U	DIMETHYL PHTHALATE	50U	BENZO-A-PYRENE
50U	ACENAPHTHYLENE	50U	INDENO (1,2,3-CD) PYRENE
50U	2,6-DINITROTOLUENE	50U	DIBENZO(A,H)ANTHRACENE
		50U	BENZO(GHI)PERYLENE

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.

04/02/91

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53625 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL
STATION ID: SW-05 COLLECTION START: 12/12/90 1320 STOP: 00/00/00
CASE.NO.: 15499 SAS NO.: D. NO.: Z726 MD NO: Z726

ANALYTICAL RESULTS UG/L

4000J	13 UNIDENTIFIED COMPOUNDS
2000JN	HEXAHYDROBENZOCYCLOHEPTATHIAZINE
100JN	METHYLENEPROPENYLBENZENE
100JN	METHYLBENZOFURAN

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.

04/02/91

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53625 SAMPLE TYPE: SURFACEWA
SOURCE: SOUTHERN RESINS DIV
STATION ID: SW-05
CASE NUMBER: 15499 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1320 STOP: 00/00/00
D. NUMBER: Z726

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)
1.0U	PCB-1221 (AROCLOR 1221)
2.0U	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)

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.

04/02/91

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53633 SAMPLE TYPE: SURFACEWA
SOURCE: SOUTHERN RESINS DIV
STATION ID: TB-01W

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/11/90 0800 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z706

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

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.

04/02/91

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53633 SAMPLE TYPE: SURFACEWA
SOURCE: SOUTHERN RESINS DIV
STATION ID: TB-01W

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/11/90 0800 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z706

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
50U	2,4,5-TRICHLOROPHENOL
10U	2-CHLORONAPHTHALENE
50U	2-NITROANILINE
10U	DIMETHYL PHTHALATE
10U	ACENAPHTHYLENE
10U	2,6-DINITROTOLUENE

UG/L	ANALYTICAL RESULTS
50U	3-NITROANILINE
10U	ACENAPHTHENE
50U	2,4-DINITROPHENOL
50U	4-NITROPHENOL
10U	DIBENZOFURAN
10U	2,4-DINITROTOLUENE
10U	DIETHYL PHTHALATE
10U	4-CHLOROPHENYL PHENYL ETHER
10U	FLUORENE
50U	4-NITROANILINE
50U	2-METHYL-4,6-DINITROPHENOL
10U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
10U	4-BROMOPHENYL PHENYL ETHER
10U	HEXACHLOROBENZENE (HCB)
50U	PENTACHLOROPHENOL
10U	PHENANTHRENE
10U	ANTHRACENE
10U	CARBAZOLE
10U	DI-N-BUTYLPHTHALATE
10U	FLUORANTHENE
10U	PYRENE
10U	BENZYL BUTYL PHTHALATE
10U	3,3'-DICHLOROBENZIDINE
10UJ	BENZO(A)ANTHRACENE
10U	CHRYSENE
20U	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

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.

04/02/91

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53633 SAMPLE TYPE: SURFACEWA PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL
STATION ID: TB-01W COLLECTION START: 12/11/90 0800 STOP: 00/00/00
CASE NUMBER: 15499 SAS NUMBER: D. NUMBER: Z706

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)
0.024J	DIELDRIN	1.0U	PCB-1221 (AROCLOR 1221)
0.10U	4,4'-DDE (P,P'-DDE)	2.0U	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)
0.032J	4,4'-DDT (P,P'-DDT)		

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.

04/02/91

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53609 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: SS-01

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/11/90 1105 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z707

UG/KG	ANALYTICAL RESULTS
11U	CHLOROMETHANE
11U	BROMOMETHANE
11U	VINYL CHLORIDE
11U	CHLOROETHANE
60U	METHYLENE CHLORIDE
30U	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
10	PERCENT MOISTURE

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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.

04/02/91

EXTRACTABLE ORGANICS DATA REPORT

** PROJECT NO. 91-171 SAMPLE NO. 53609 SAMPLE TYPE: SOIL
** SOURCE: SOUTHERN RESINS DIV
** STATION ID: SS-01
**
** CASE NO.: 15499 SAS NO.:

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/11/90 1105 STOP: 00/00/00
D. NO.: Z707

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
360UJ	2,2'-CHLOROISOPROPYLETHER
360U	(3-AND/OR 4-)METHYLPHENOL
360U	N-NITROSODI-N-PROPYLAMINE
360U	HEXACHLOROETHANE
360U	NITROBENZENE
360U	ISOPHORONE
360U	2-NITROPHENOL
360UR	2,4-DIMETHYLPHENOL
360U	BIS(2-CHLOROETHOXY) METHANE
360U	2,4-DICHLOROPHENOL
360UR	1,2,4-TRICHLOROBENZENE
360O	NAPHTHALENE
360U	4-CHLOROANILINE
360U	HEXACHLOROBUTADIENE
360U	4-CHLORO-3-METHYLPHENOL
140J	2-METHYLNAPHTHALENE
360U	HEXACHLOROCYCLOPENTADIENE (HCCP)
360U	2,4,6-TRICHLOROPHENOL
1900U	2,4,5-TRICHLOROPHENOL
360UR	2-CHLORONAPHTHALENE
1900U	2-NITROANILINE
360U	DIMETHYL PHTHALATE
360U	ACENAPHTHYLENE
360U	2,6-DINITROTOLUENE

UG/KG	ANALYTICAL RESULTS
1900UR	3-NITROANILINE
360U	ACENAPHTHENE
1900U	2,4-DINITROPHENOL
1900U	4-NITROPHENOL
360U	DIBENZOFURAN
360U	2,4-DINITROTOLUENE
360U	DIETHYL PHTHALATE
360U	4-CHLOROPHENYL PHENYL ETHER
360U	FLUORENE
1900U	4-NITROANILINE
1900U	2-METHYL-4,6-DINITROPHENOL
360U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
360U	4-BROMOPHENYL PHENYL ETHER
360U	HEXACHLOROBENZENE (HCB)
1900U	PENTACHLOROPHENOL
360U	PHENANTHRENE
360U	ANTHRACENE
360U	CARBAZOLE
360U	DI-N-BUTYLPHTHALATE
360U	FLUORANTHENE
360U	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
10	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.

04/02/91

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53609 SAMPLE TYPE: SOIL	PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV	CITY: MOUNDVILLE ST: AL
STATION ID: SS-01	COLLECTION START: 12/11/90 1105 STOP: 00/00/00
CASE.NO.: 15499 SAS NO.:	D. NO.: Z707 MD NO: Z707

ANALYTICAL RESULTS UG/KG

7000J	7 UNIDENTIFIED COMPOUNDS
400JN	OCTAHYDRODMETHANOINDENE
6000JN	ETHYLDIMETHYLBENZENE (4 ISOMERS)
2000JN	TETRAMETHYLBENZENE
800JN	DIHYDROMETHYLINDENE

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.

04/02/91

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53609 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: SS-01
CASE NUMBER: 15499 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/11/90 1105 STOP: 00/00/00
D. NUMBER: Z707

UG/KG	ANALYTICAL RESULTS
1.9U	ALPHA-BHC
1.9U	BETA-BHC
1.9U	DELTA-BHC
1.9U	GAMMA-BHC (LINDANE)
1.9U	HEPTACHLOR
1.9U	ALDRIN
1.9U	HEPTACHLOR EPOXIDE
1.9U	ENDOSULFAN I (ALPHA)
3.6U	DIELDRIN
3.6U	4,4'-DDE (P,P'-DDE)
3.6U	ENDRIN
3.6U	ENDOSULFAN II (BETA)
3.6U	4,4'-DDD (P,P'-DDD)
3.6U	ENDOSULFAN SULFATE
3.6U	4,4'-DDT (P,P'-DDT)

UG/KG	ANALYTICAL RESULTS
19U	METHOXYCHLOR
3.6U	ENDRIN KETONE
3.6U	ENDRIN ALDEHYDE
--	CHLORDANE (TECH. MIXTURE) /1
1.9U	GAMMA-CHLORDANE /2
1.9U	ALPHA-CHLORDANE /2
190U	TOXAPHENE
36U	PCB-1016 (AROCLOR 1016)
36U	PCB-1221 (AROCLOR 1221)
73U	PCB-1232 (AROCLOR 1232)
36U	PCB-1242 (AROCLOR 1242)
36U	PCB-1248 (AROCLOR 1248)
36U	PCB-1254 (AROCLOR 1254)
36U	PCB-1260 (AROCLOR 1260)
10	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.

04/02/91

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53610 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: SS-02

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/11/90 1210 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z711

UG/KG	ANALYTICAL RESULTS
11U	CHLOROMETHANE
11U	BROMOMETHANE
11U	VINYL CHLORIDE
11U	CHLOROETHANE
50U	METHYLENE CHLORIDE
30U	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
12	PERCENT MOISTURE

REMARKS

REMARKS

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

04/02/91

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53610 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: SS-02

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/11/90 1210 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z711

UG/KG	ANALYTICAL RESULTS
370UR	PHENOL
370UR	BIS(2-CHLOROETHYL) ETHER
370UR	2-CHLOROPHENOL
370UR	1,3-DICHLOROBENZENE
370UR	1,4-DICHLOROBENZENE
370UR	1,2-DICHLOROBENZENE
370UR	2-METHYLPHENOL
370UR	2,2'-CHLOROISOPROPYLETHER
370UR	(3-AND/OR 4-)METHYLPHENOL
370UR	N-NITROSODI-N-PROPYLAMINE
370UR	HEXACHLOROETHANE
370UR	NITROBENZENE
370UR	ISOPHORONE
370UR	2-NITROPHENOL
370UR	2,4-DIMETHYLPHENOL
370UR	BIS(2-CHLOROETHOXY) METHANE
370UR	2,4-DICHLOROPHENOL
370UR	1,2,4-TRICHLOROBENZENE
800UR	NAPHTHALENE
370UR	4-CHLOROANILINE
370UR	HEXACHLOROBUTADIENE
370UR	4-CHLORO-3-METHYLPHENOL
370UR	2-METHYLNAPHTHALENE
370UR	HEXACHLOROCYCLOPENTADIENE (HCCP)
370UR	2,4,6-TRICHLOROPHENOL
1900UR	2,4,5-TRICHLOROPHENOL
370UR	2-CHLORONAPHTHALENE
1900UR	2-NITROANILINE
370UR	DIMETHYL PHTHALATE
370UR	ACENAPHTHYLENE
370UR	2,6-DINITROTOLUENE

UG/KG	ANALYTICAL RESULTS
1900UR	3-NITROANILINE
370UR	ACENAPHTHENE
1900UR	2,4-DINITROPHENOL
1900UR	4-NITROPHENOL
370UR	DIBENZOFURAN
370UR	2,4-DINITROTOLUENE
370UR	DIETHYL PHTHALATE
370UR	4-CHLOROPHENYL PHENYL ETHER
370UR	FLUORENE
1900UR	4-NITROANILINE
1900UR	2-METHYL-4,6-DINITROPHENOL
370UR	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
370UR	4-BROMOPHENYL PHENYL ETHER
370UR	HEXACHLOROBENZENE (HCB)
1900UR	PENTACHLOROPHENOL
370UR	PHENANTHRENE
370UR	ANTHRACENE
370UR	CARBAZOLE
370UR	DI-N-BUTYLPHTHALATE
370UR	FLUORANTHENE
370UR	PYRENE
370UR	BENZYL BUTYL PHTHALATE
370UR	3,3'-DICHLOROBENZIDINE
370UR	BENZO(A)ANTHRACENE
370UR	CHRYSENE
370UR	BIS(2-ETHYLHEXYL) PHTHALATE
370UR	DI-N-OCTYLPHTHALATE
370UR	BENZO(B AND/OR K)FLUORANTHENE
370UR	BENZO-A-PYRENE
370UR	INDENO (1,2,3-CD) PYRENE
370UR	DIBENZO(A,H)ANTHRACENE
370UR	BENZO(GHI)PERYLENE
12	PERCENT MOISTURE

REMARKS
EXCESSIVE HOLDING TIME

REMARKS

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

04/02/91

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53610 SAMPLE TYPE: SOIL	PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV	CITY: MOUNDVILLE ST: AL
STATION ID: SS-02	COLLECTION START: 12/11/90 1210 STOP: 00/00/00
CASE.NO.: 15499 SAS NO.:	D. NO.: Z711 MD NO: Z711

ANALYTICAL RESULTS UG/KG

60000J 20 UNIDENTIFIED COMPOUNDS

REMARKS
EXCESSIVE HOLDING TIME

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.

04/02/91

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53610 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: SS-02
CASE NUMBER: 15499 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/11/90 1210 STOP: 00/00/00
D. NUMBER: Z711

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
1.9U	ALPHA-BHC	19U	METHOXYCHLOR
1.9U	BETA-BHC	3.7U	ENDRIN KETONE
1.9U	DELTA-BHC	3.7U	ENDRIN ALDEHYDE
1.9U	GAMMA-BHC (LINDANE)	--	CHLORDANE (TECH. MIXTURE) /1
1.9U	HEPTACHLOR	1.9U	GAMMA-CHLORDANE /2
1.9U	ALDRIN	1.9U	ALPHA-CHLORDANE /2
1.9U	HEPTACHLOR EPOXIDE	190U	TOXAPHENE
1.9U	ENDOSULFAN I (ALPHA)	37U	PCB-1016 (AROCLOR 1016)
3.7U	DIELDRIN	37U	PCB-1221 (AROCLOR 1221)
3.7U	4,4'-DDE (P,P'-DDE)	75U	PCB-1232 (AROCLOR 1232)
3.7U	ENDRIN	37U	PCB-1242 (AROCLOR 1242)
3.7U	ENDOSULFAN II (BETA)	37U	PCB-1248 (AROCLOR 1248)
3.7U	4,4'-DDD (P,P'-DDD)	37U	PCB-1254 (AROCLOR 1254)
3.7U	ENDOSULFAN SULFATE	37U	PCB-1260 (AROCLOR 1260)
3.7U	4,4'-DDT (P,P'-DDT)	12	PERCENT MOISTURE

REMARKS

REMARKS

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

04/02/91

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53612 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: SS-03

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/11/90 1545 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z713

UG/KG	ANALYTICAL RESULTS
12U	CHLOROMETHANE
12U	BROMOMETHANE
12U	VINYL CHLORIDE
12U	CHLOROETHANE
80U	METHYLENE CHLORIDE
40U	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
12U	TOTAL XYLENES
16	PERCENT MOISTURE

REMARKS

REMARKS

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

04/02/91

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53612 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL
STATION ID: SS-03 COLLECTION START: 12/11/90 1545 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z713

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
390UJ	2,2'-CHLOROISOPROPYLETHER
390U	(3-AND/OR 4-)METHYLPHENOL
390U	N-NITROSODI-N-PROPYLAMINE
390U	HEXACHLOROETHANE
390U	NITROBENZENE
390U	ISOPHORONE
390U	2-NITROPHENOL
390UR	2,4-DIMETHYLPHENOL
390U	BIS(2-CHLOROETHOXY) METHANE
390U	2,4-DICHLOROPHENOL
390UR	1,2,4-TRICHLOROBENZENE
500U	NAPHTHALENE
390U	4-CHLOROANILINE
390U	HEXACHLOROBUTADIENE
390U	4-CHLORO-3-METHYLPHENOL
390U	2-METHYLNAPHTHALENE
390U	HEXACHLOROCYCLOPENTADIENE (HCCP)
390U	2,4,6-TRICHLOROPHENOL
2000U	2,4,5-TRICHLOROPHENOL
390UR	2-CHLORONAPHTHALENE
2000U	2-NITROANILINE
390U	DIMETHYL PHTHALATE
390U	ACENAPHTHYLENE
390U	2,6-DINITROTOLUENE

UG/KG	ANALYTICAL RESULTS
2000UR	3-NITROANILINE
390U	ACENAPHTHENE
2000U	2,4-DINITROPHENOL
2000U	4-NITROPHENOL
390U	DIBENZOFURAN
390U	2,4-DINITROTOLUENE
390U	DIETHYL PHTHALATE
390U	4-CHLOROPHENYL PHENYL ETHER
390U	FLUORENE
2000U	4-NITROANILINE
2000U	2-METHYL-4,6-DINITROPHENOL
390U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
390U	4-BROMOPHENYL PHENYL ETHER
390U	HEXACHLOROBENZENE (HCB)
2000U	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
16	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.

04/02/91

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

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**   PROJECT NO. 91-171    SAMPLE NO. 53612  SAMPLE TYPE: SOIL        PROG ELEM: NSF   COLLECTED BY: S PANABAKER             **
**   SOURCE: SOUTHERN RESINS DIV                                      CITY: MOUNDVILLE            ST: AL                     **
**   STATION ID: SS-03                                                COLLECTION START: 12/11/90  1545   STOP: 00/00/00      **
**   CASE.NO.: 15499          SAS NO.:                                D. NO.: Z713                MD NO: Z713                **
**                                                                                                                           **
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ANALYTICAL RESULTS UG/KG

50000J	18 UNIDENTIFIED COMPOUNDS
1000JN	ETHYLDIMETHYLBENZENE

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.

04/02/91

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 91-171   SAMPLE NO. 53612   SAMPLE TYPE: SOIL   PROG ELEM: NSF   COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV   CITY: MOUNDVILLE   ST: AL
STATION ID: SS-03   COLLECTION START: 12/11/90 1545   STOP: 00/00/00
CASE NUMBER: 15499   SAS NUMBER: D. NUMBER: Z713

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
2.0U	ALPHA-BHC	20U	METHOXYCHLOR
2.0U	BETA-BHC	4.0U	ENDRIN KETONE
2.0U	DELTA-BHC	4.0U	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)	40U	PCB-1016 (AROCLOR 1016)
4.0U	DIELDRIN	40U	PCB-1221 (AROCLOR 1221)
4.0U	4,4'-DDE (P,P'-DDE)	80U	PCB-1232 (AROCLOR 1232)
4.0U	ENDRIN	40U	PCB-1242 (AROCLOR 1242)
4.0U	ENDOSULFAN II (BETA)	40U	PCB-1248 (AROCLOR 1248)
4.0U	4,4'-DDD (P,P'-DDD)	40U	PCB-1254 (AROCLOR 1254)
4.0U	ENDOSULFAN SULFATE	40U	PCB-1260 (AROCLOR 1260)
4.0U	4,4'-DDT (P,P'-DDT)	18	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.

04/02/91

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53611 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: SS-04

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/11/90 1310 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z710

UG/KG	ANALYTICAL RESULTS
1400U	CHLOROMETHANE
1400U	BROMOMETHANE
1400U	VINYL CHLORIDE
1400U	CHLOROETHANE
1400U	METHYLENE CHLORIDE
1400U	ACETONE
1400U	CARBON DISULFIDE
1400U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)
1400U	1,1-DICHLOROETHANE
1400U	1,2-DICHLOROETHENE (TOTAL)
1400U	CHLOROFORM
1400U	1,2-DICHLOROETHANE
1400U	METHYL ETHYL KETONE
1400U	1,1,1-TRICHLOROETHANE
1400U	CARBON TETRACHLORIDE
1400U	BROMODICHLOROMETHANE

UG/KG	ANALYTICAL RESULTS
1400U	1,2-DICHLOROPROPANE
1400U	CIS-1,3-DICHLOROPROPENE
1400U	TRICHLOROETHENE(TRICHLOROETHYLENE)
1400U	DIBROMOCHLOROMETHANE
1400U	1,1,2-TRICHLOROETHANE
9J	BENZENE
1400U	TRANS-1,3-DICHLOROPROPENE
1400U	BROMOFORM
1400U	METHYL ISOBUTYL KETONE
1400U	METHYL BUTYL KETONE
1400U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
1400U	1,1,2,2-TETRACHLOROETHANE
25	TOLUENE
1400U	CHLOROBENZENE
1900	ETHYL BENZENE
1600	STYRENE
16000	TOTAL XYLENES
13	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.

04/02/91

MISCELLANEOUS PURGEABLE ORGANICS - DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53611 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: SS-04
CASE.NO.: 15499 SAS NO.:

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/11/90 1310 STOP: 00/00/00
D. NO.: Z710 MD NO: Z710

ANALYTICAL RESULTS UG/KG

60000JN	ETHYLMETHYLBENZENE (2 ISOMERS)
100000JN	TRIMETHYLBENZENE (3 ISOMERS)
10000JN	ETHENYLMETHYLBENZENE
90000JN	TETRAHYDROMETHANOINDENE
50000JN	PROPENYLBENZENE (2 ISOMERS)
40000JN	METHYLPROPYLBENZENE

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.

04/02/91

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53611 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: SS-04

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/11/90 1310 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z710

UG/KG	ANALYTICAL RESULTS
5600U	PHENOL
5600U	BIS(2-CHLOROETHYL) ETHER
5600U	2-CHLOROPHENOL
5600U	1,3-DICHLOROBENZENE
5600U	1,4-DICHLOROBENZENE
5600U	1,2-DICHLOROBENZENE
5600U	2-METHYLPHENOL
5600UJ	2,2'-CHLOROISOPROPYLETHER
5600U	(3-AND/OR 4-)METHYLPHENOL
5600U	N-NITROSODI-N-PROPYLAMINE
5600U	HEXACHLOROETHANE
5600U	NITROBENZENE
5600U	ISOPHORONE
5600U	2-NITROPHENOL
5600UR	2,4-DIMETHYLPHENOL
5600U	BIS(2-CHLOROETHOXY) METHANE
5600U	2,4-DICHLOROPHENOL
5600UR	1,2,4-TRICHLOROBENZENE
64000	NAPHTHALENE
5600U	4-CHLOROANILINE
5600U	HEXACHLOROBUTADIENE
5600U	4-CHLORO-3-METHYLPHENOL
5100J	2-METHYLNAPHTHALENE
5600U	HEXACHLOROCYCLOPENTADIENE (HCCP)
5600U	2,4,6-TRICHLOROPHENOL
29000U	2,4,5-TRICHLOROPHENOL
5600UR	2-CHLORONAPHTHALENE
29000U	2-NITROANILINE
5600U	DIMETHYL PHTHALATE
5600U	ACENAPHTHYLENE
5600U	2,6-DINITROTOLUENE

UG/KG	ANALYTICAL RESULTS
29000UR	3-NITROANILINE
5600U	ACENAPHTHENE
29000U	2,4-DINITROPHENOL
29000U	4-NITROPHENOL
5600U	DIBENZOFURAN
5600U	2,4-DINITROTOLUENE
5600U	DIETHYL PHTHALATE
5600U	4-CHLOROPHENYL PHENYL ETHER
5600U	FLUORENE
29000U	4-NITROANILINE
29000U	2-METHYL-4,6-DINITROPHENOL
5600U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
5600U	4-BROMOPHENYL PHENYL ETHER
5600U	HEXACHLOROBENZENE (HCB)
29000U	PENTACHLOROPHENOL
5600U	PHENANTHRENE
5600U	ANTHRACENE
5600U	CARBAZOLE
5600U	DI-N-BUTYLPHTHALATE
5600U	FLUORANTHENE
5600U	PYRENE
5600U	BENZYL BUTYL PHTHALATE
5600U	3,3'-DICHLOROBENZIDINE
5600U	BENZO(A)ANTHRACENE
5600U	CHRYSENE
5600U	BIS(2-ETHYLHEXYL) PHTHALATE
5600U	DI-N-OCTYLPHTHALATE
5600U	BENZO(B AND/OR K)FLUORANTHENE
5600U	BENZO-A-PYRENE
5600U	INDENO (1,2,3-CD) PYRENE
5600U	DIBENZO(A,H)ANTHRACENE
5600U	BENZO(GHI)PERYLENE
13	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
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

04/02/91

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53611 SAMPLE TYPE: SOIL
PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV
CITY: MOUNDVILLE ST: AL
STATION ID: SS-04
COLLECTION START: 12/11/90 1310 STOP: 00/00/00
CASE.NO.: 15499 SAS NO.:
D. NO.: Z710 MD NO: Z710

ANALYTICAL RESULTS UG/KG

40000JN	TETRAMETHYLBENZENE
40000JN	ETHYLDIMETHYLBENZENE
600000J	13 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.

04/02/91

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53611 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: SS-04
CASE NUMBER: 15499 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/11/90 1310 STOP: 00/00/00
D. NUMBER: Z710

UG/KG	ANALYTICAL RESULTS
1.9U	ALPHA-BHC
1.9U	BETA-BHC
1.9U	DELTA-BHC
1.9U	GAMMA-BHC (LINDANE)
1.9U	HEPTACHLOR
1.9U	ALDRIN
1.9U	HEPTACHLOR EPOXIDE
1.9U	ENDOSULFAN I (ALPHA)
3.7U	DIELDRIN
3.7U	4,4'-DDE (P,P'-DDE)
3.7U	ENDRIN
3.7U	ENDOSULFAN II (BETA)
3.7U	4,4'-DDD (P,P'-DDD)
3.7U	ENDOSULFAN SULFATE
3.7U	4,4'-DDT (P,P'-DDT)

UG/KG	ANALYTICAL RESULTS
19U	METHOXYCHLOR
3.7U	ENDRIN KETONE
3.7U	ENDRIN ALDEHYDE
--	CHLORDANE (TECH. MIXTURE) /1
1.9U	GAMMA-CHLORDANE /2
1.9U	ALPHA-CHLORDANE /2
190U	TOXAPHENE
37U	PCB-1016 (AROCLOR 1016)
37U	PCB-1221 (AROCLOR 1221)
76U	PCB-1232 (AROCLOR 1232)
37U	PCB-1242 (AROCLOR 1242)
37U	PCB-1248 (AROCLOR 1248)
37U	PCB-1254 (AROCLOR 1254)
37U	PCB-1260 (AROCLOR 1260)
14	PERCENT MOISTURE

REMARKS

REMARKS

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

04/02/91

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53613 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: SS-05

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/11/90 1600 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z714

UG/KG	ANALYTICAL RESULTS
12U	CHLOROMETHANE
12U	BROMOMETHANE
12U	VINYL CHLORIDE
12U	CHLOROETHANE
90U	METHYLENE CHLORIDE
70U	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
12U	TOTAL XYLENES
14	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.

04/02/91

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53613 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: SS-05

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/11/90 1600 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z714

UG/KG	ANALYTICAL RESULTS
700U	PHENOL
380U	BIS(2-CHLOROETHYL) ETHER
380U	2-CHLOROPHENOL
380U	1,3-DICHLOROBENZENE
380U	1,4-DICHLOROBENZENE
380U	1,2-DICHLOROBENZENE
380U	2-METHYLPHENOL
380UJ	2,2'-CHLOROISOPROPYLETHER
380U	(3-AND/OR 4-)METHYLPHENOL
380U	N-NITROSODI-N-PROPYLAMINE
380U	HEXACHLOROETHANE
380U	NITROBENZENE
380U	ISOPHORONE
380U	2-NITROPHENOL
380UR	2,4-DIMETHYLPHENOL
380U	BIS(2-CHLOROETHOXY) METHANE
380U	2,4-DICHLOROPHENOL
380UR	1,2,4-TRICHLOROBENZENE
600U	NAPHTHALENE
380U	4-CHLOROANILINE
380U	HEXACHLOROBUTADIENE
380U	4-CHLORO-3-METHYLPHENOL
380U	2-METHYLNAPHTHALENE
380U	HEXACHLOROCYCLOPENTADIENE (HCCP)
380U	2,4,6-TRICHLOROPHENOL
2000U	2,4,5-TRICHLOROPHENOL
380UR	2-CHLORONAPHTHALENE
2000U	2-NITROANILINE
380U	DIMETHYL PHTHALATE
380U	ACENAPHTHYLENE
380U	2,6-DINITROTOLUENE

UG/KG	ANALYTICAL RESULTS
2000UR	3-NITROANILINE
380U	ACENAPHTHENE
2000U	2,4-DINITROPHENOL
2000U	4-NITROPHENOL
380U	DIBENZOFURAN
380U	2,4-DINITROTOLUENE
380U	DIETHYL PHTHALATE
380U	4-CHLOROPHENYL PHENYL ETHER
380U	FLUORENE
2000U	4-NITROANILINE
2000U	2-METHYL-4,6-DINITROPHENOL
380U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
380U	4-BROMOPHENYL PHENYL ETHER
380U	HEXACHLOROBENZENE (HCB)
2000U	PENTACHLOROPHENOL
380U	PHENANTHRENE
380U	ANTHRACENE
380U	CARBAZOLE
380U	DI-N-BUTYLPHTHALATE
380U	FLUORANTHENE
380U	PYRENE
380U	BENZYL BUTYL PHTHALATE
380U	3,3'-DICHLOROBENZIDINE
120J	BENZO(A)ANTHRACENE
380U	CHRYSENE
380U	BIS(2-ETHYLHEXYL) PHTHALATE
380U	DI-N-OCTYLPHTHALATE
380U	BENZO(B AND/OR K)FLUORANTHENE
380U	BENZO-A-PYRENE
380U	INDENO (1,2,3-CD) PYRENE
380U	DIBENZO(A,H)ANTHRACENE
380U	BENZO(GHI)PERYLENE
14	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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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

04/02/91

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53613 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: SS-05
CASE.NO.: 15499 SAS NO.:

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/11/90 1600 STOP: 00/00/00
D. NO.: Z714 MD NO: Z714

ANALYTICAL RESULTS UG/KG

4000JN	DIMETHYLETHYLETHOXYBENZENE
8000JN	DIMETHYLETHYLPHENOL
5000JN	TRIMETHYLPHENYLETHANONE
10000JN	OCTAHYDROPHENANTHRENECARBOXALDEHYDE (2 ISOMERS)
30000JN	HYDROXYPHENYLMETHYLETHYLPHENOL
10000JN	OCTAHYDROPHENANTHRENECARBOXYLIC ACID
100000J	12 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.

04/02/91

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53613 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: SS-05
CASE NUMBER: 15499 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/11/90 1600 STOP: 00/00/00
D. NUMBER: Z714

UG/KG	ANALYTICAL RESULTS
1.9U	ALPHA-BHC
1.9U	BETA-BHC
1.9U	DELTA-BHC
1.9U	GAMMA-BHC (LINDANE)
1.9U	HEPTACHLOR
1.9U	ALDRIN
1.9U	HEPTACHLOR EPOXIDE
1.9U	ENDOSULFAN I (ALPHA)
3.7U	DIELDRIN
3.7U	4,4'-DDE (P,P'-DDE)
3.7U	ENDRIN
3.7U	ENDOSULFAN II (BETA)
3.7U	4,4'-DDD (P,P'-DDD)
3.7U	ENDOSULFAN SULFATE
3.7U	4,4'-DDT (P,P'-DDT)

UG/KG	ANALYTICAL RESULTS
19U	METHOXYCHLOR
3.7U	ENDRIN KETONE
3.7U	ENDRIN ALDEHYDE
--	CHLORDANE (TECH. MIXTURE) /1
1.9U	GAMMA-CHLORDANE /2
1.9U	ALPHA-CHLORDANE /2
190U	TOXAPHENE
37U	PCB-1016 (AROCLOR 1016)
37U	PCB-1221 (AROCLOR 1221)
76U	PCB-1232 (AROCLOR 1232)
37U	PCB-1242 (AROCLOR 1242)
37U	PCB-1248 (AROCLOR 1248)
37U	PCB-1254 (AROCLOR 1254)
37U	PCB-1260 (AROCLOR 1260)
13	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.

04/02/91

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53634 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: TB-01S

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/11/90 0800 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z705

UG/KG	ANALYTICAL RESULTS
11U	CHLOROMETHANE
11U	BROMOMETHANE
11U	VINYL CHLORIDE
11U	CHLOROETHANE
50U	METHYLENE CHLORIDE
40U	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
6	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.
*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.

04/02/91

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53621 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: SD-01

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1215 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z722

UG/KG	ANALYTICAL RESULTS
12U	CHLOROMETHANE
12U	BROMOMETHANE
12U	VINYL CHLORIDE
12U	CHLOROETHANE
80U	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
12U	TOTAL XYLENES
19	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
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

04/02/91

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53621 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: SD-01

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1215 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z722

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
410UJ	2,2'-CHLOROISOPROPYLETHER
410U	(3-AND/OR 4-)METHYLPHENOL
410U	N-NITROSODI-N-PROPYLAMINE
410U	HEXACHLOROETHANE
410U	NITROBENZENE
410U	ISOPHORONE
410U	2-NITROPHENOL
410UR	2,4-DIMETHYLPHENOL
410U	BIS(2-CHLOROETHOXY) METHANE
410U	2,4-DICHLOROPHENOL
410UR	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
2100U	2,4,5-TRICHLOROPHENOL
410UR	2-CHLORONAPHTHALENE
2100U	2-NITROANILINE
410U	DIMETHYL PHTHALATE
410U	ACENAPHTHYLENE
410U	2,6-DINITROTOLUENE

UG/KG	ANALYTICAL RESULTS
2100UR	3-NITROANILINE
410U	ACENAPHTHENE
2100U	2,4-DINITROPHENOL
2100U	4-NITROPHENOL
410U	DIBENZOFURAN
410U	2,4-DINITROTOLUENE
410U	DIETHYL PHTHALATE
410U	4-CHLOROPHENYL PHENYL ETHER
410U	FLUORENE
2100U	4-NITROANILINE
2100U	2-METHYL-4,6-DINITROPHENOL
410U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
410U	4 BROMOPHENYL PHENYL ETHER
410U	HEXACHLOROBENZENE (HCB)
2100U	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
19	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
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

04/02/91

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53621 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: SD-01
CASE NUMBER: 15499 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1215 STOP: 00/00/00
D. NUMBER: Z722

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)
39U	PCB-1221 (AROCLOR 1221)
80U	PCB-1232 (AROCLOR 1232)
39U	PCB-1242 (AROCLOR 1242)
39U	PCB-1248 (AROCLOR 1248)
39U	PCB-1254 (AROCLOR 1254)
39U	PCB-1260 (AROCLOR 1260)
18	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
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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.

04/02/91

PURGEABLE ORGANICS DATA REPORT

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** PROJECT NO. 91-171    SAMPLE NO. 53618  SAMPLE TYPE: SOIL        PROG ELEM: NSF   COLLECTED BY: S PANABAKER
** SOURCE: SOUTHERN RESINS DIV                                       CITY: MOUNDVILLE            ST: AL
** STATION ID: SD-02                                                 COLLECTION START: 12/12/90  1100   STOP: 00/00/00
**
** CASE NO.: 15499                          SAS NO.:                 D. NO.: Z719
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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
NO SAMPLE CONTAINER RECEIVED

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.

04/02/91

EXTRACTABLE ORGANICS DATA REPORT

** PROJECT NO. 91-171 SAMPLE NO. 53618 SAMPLE TYPE: SOIL
** SOURCE: SOUTHERN RESINS DIV
** STATION ID: SD-02
**
** CASE NO.: 15499 SAS NO.:

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1100 STOP: 00/00/00
D. NO.: Z719

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
NO SAMPLE CONTAINER RECEIVED

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.

04/02/91

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53618 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: SD-02
CASE NUMBER: 15499 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1100 STOP: 00/00/00
D. NUMBER: Z719

UG/KG	ANALYTICAL RESULTS	UG/KG	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)	NA	PERCENT MOISTURE

REMARKS
NO SAMPLE CONTAINER RECEIVED

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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*C-CONFIRMED BY GCMS 1. WHEN NO VALUE IS REPORTED, SEE CHLORDANE CONSTITUENTS.

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

04/02/91

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53617 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: SD-03

CASE NO.: 15499 SAS NO.:

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1025 STOP: 00/00/00

D. NO.: Z718

UG/KG	ANALYTICAL RESULTS
13U	CHLOROMETHANE
13U	BROMOMETHANE
13U	VINYL CHLORIDE
13U	CHLOROETHANE
90U	METHYLENE CHLORIDE
40U	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
23	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.

04/02/91

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53617 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: SD-03

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1025 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z718

UG/KG	ANALYTICAL RESULTS
420UR	PHENOL
420UR	BIS(2-CHLOROETHYL) ETHER
420UR	2-CHLOROPHENOL
420UR	1,3-DICHLOROBENZENE
420UR	1,4-DICHLOROBENZENE
420UR	1,2-DICHLOROBENZENE
420UR	2-METHYLPHENOL
420UR	2,2'-CHLOROISOPROPYLETHER
420UR	(3-AND/OR 4-)METHYLPHENOL
420UR	N-NITROSODI-N-PROPYLAMINE
420UR	HEXACHLOROETHANE
420UR	NITROBENZENE
420UR	ISOPHORONE
420UR	2-NITROPHENOL
420UR	2,4-DIMETHYLPHENOL
420UR	BIS(2-CHLOROETHOXY) METHANE
420UR	2,4-DICHLOROPHENOL
420UR	1,2,4-TRICHLOROBENZENE
420UR	NAPHTHALENE
420UR	4-CHLOROANILINE
420UR	HEXACHLOROBUTADIENE
420UR	4-CHLORO-3-METHYLPHENOL
420UR	2-METHYLNAPHTHALENE
420UR	HEXACHLOROCYCLOPENTADIENE (HCCP)
420UR	2,4,6-TRICHLOROPHENOL
2200UR	2,4,5-TRICHLOROPHENOL
420UR	2-CHLORONAPHTHALENE
2200UR	2-NITROANILINE
420UR	DIMETHYL PHTHALATE
420UR	ACENAPHTHYLENE
420UR	2,6-DINITROTOLUENE

UG/KG	ANALYTICAL RESULTS
2200UR	3-NITROANILINE
420UR	ACENAPHTHENE
2200UR	2,4-DINITROPHENOL
2200UR	4-NITROPHENOL
420UR	DIBENZOFURAN
420UR	2,4-DINITROTOLUENE
420UR	DIETHYL PHTHALATE
420UR	4-CHLOROPHENYL PHENYL ETHER
420UR	FLUORENE
2200UR	4-NITROANILINE
2200UR	2-METHYL-4,6-DINITROPHENOL
420UR	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
420UR	4-BROMOPHENYL PHENYL ETHER
420UR	HEXACHLOROBENZENE (HCB)
2200UR	PENTACHLOROPHENOL
420UR	PHENANTHRENE
420UR	ANTHRACENE
420UR	CARBAZOLE
420UR	DI-N-BUTYLPHTHALATE
420UR	FLUORANTHENE
420UR	PYRENE
420UR	BENZYL BUTYL PHTHALATE
420UR	3,3'-DICHLOROBENZIDINE
420UR	BENZO(A)ANTHRACENE
420UR	CHRYSENE
450UR	BIS(2-ETHYLHEXYL) PHTHALATE
420UR	DI-N-OCTYLPHTHALATE
420UR	BENZO(B AND/OR K)FLUORANTHENE
420UR	BENZO-A-PYRENE
420UR	INDENO (1,2,3-CD) PYRENE
420UR	DIBENZO(A,H)ANTHRACENE
420UR	BENZO(GHI)PERYLENE
23	PERCENT MOISTURE

REMARKS
EXCESSIVE HOLDING TIME

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.

PESTICIDES/PCB'S DATA REPORT 04/02/91

PROJECT NO. 91-171 SAMPLE NO. 53617 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: SD-03
CASE NUMBER: 15499 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1025 STOP: 00/00/00
D. NUMBER: Z718

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
4.2U	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
22U	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)
42U	PCB-1221 (AROCLOR 1221)
86U	PCB-1232 (AROCLOR 1232)
42U	PCB-1242 (AROCLOR 1242)
42U	PCB-1248 (AROCLOR 1248)
42U	PCB-1254 (AROCLOR 1254)
42U	PCB-1260 (AROCLOR 1260)
23	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.

04/02/91

PURGEABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53616 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: SD-04

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 0910 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z717

UG/KG	ANALYTICAL RESULTS
12U	CHLOROMETHANE
12U	BROMOMETHANE
12U	VINYL CHLORIDE
12U	CHLOROETHANE
200U	METHYLENE CHLORIDE
40U	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
12U	TOTAL XYLENES
20	PERCENT MOISTURE

REMARKS

REMARKS

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

04/02/91

EXTRACTABLE ORGANICS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53616 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: SD-04

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 0910 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z717

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
410UJ	2,2'-CHLOROISOPROPYLETHER
410U	(3-AND/OR 4-)METHYLPHENOL
410U	N-NITROSODI-N-PROPYLAMINE
410U	HEXACHLOROETHANE
410U	NITROBENZENE
410U	ISOPHORONE
410U	2-NITROPHENOL
410UR	2,4-DIMETHYLPHENOL
410U	BIS(2-CHLOROETHOXY) METHANE
410U	2,4-DICHLOROPHENOL
410UR	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
2100U	2,4,5-TRICHLOROPHENOL
410UR	2-CHLORONAPHTHALENE
2100U	2-NITROANILINE
410U	DIMETHYL PHTHALATE
410U	ACENAPHTHYLENE
410U	2,6-DINITROTOLUENE

UG/KG	ANALYTICAL RESULTS
2100UR	3-NITROANILINE
410U	ACENAPHTHENE
2100U	2,4-DINITROPHENOL
2100U	4-NITROPHENOL
410U	DIBENZOFURAN
410U	2,4-DINITROTOLUENE
410U	DIETHYL PHTHALATE
410U	4-CHLOROPHENYL PHENYL ETHER
410U	FLUORENE
2100U	4-NITROANILINE
2100U	2-METHYL-4,6-DINITROPHENOL
410U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
410U	4-BROMOPHENYL PHENYL ETHER
410U	HEXACHLOROBENZENE (HCB)
2100U	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
20	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.
04/02/91

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

*** ***
** PROJECT NO. 91-171 SAMPLE NO. 53616 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: S PANABAKER **
** SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL **
** STATION ID: SD-04 COLLECTION START: 12/12/90 0910 STOP: 00/00/00 **
** CASE.NO.: 15499 SAS NO.: D. NO.: Z717 MD NO: Z717 **
** **
*** ***

ANALYTICAL RESULTS UG/KG

800J 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.

04/02/91

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53616 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: SD-04
CASE NUMBER: 15499 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 0910 STOP: 00/00/00
D. NUMBER: Z717

UG/KG	ANALYTICAL RESULTS
2.1U	ALPHA-BHC
2.1U	BETA-BHC
2.1U	DELTA-BHC
2.1U	GAMMA-BHC (LINDANE)
2.1U	HEPTACHLOR
2.1U	ALDRIN
2.1U	HEPTACHLOR EPOXIDE
2.1U	ENDOSULFAN I (ALPHA)
4.0U	DIELDRIN
4.0U	4,4'-DDE (P,P'-DDE)
4.0U	ENDRIN
4.0U	ENDOSULFAN II (BETA)
4.0U	4,4'-DDD (P,P'-DDD)
4.0U	ENDOSULFAN SULFATE
4.0U	4,4'-DDT (P,P'-DDT)

UG/KG	ANALYTICAL RESULTS
21U	METHOXYCHLOR
4.0U	ENDRIN KETONE
4.0U	ENDRIN ALDEHYDE
--	CHLORDANE (TECH. MIXTURE) /1
2.1U	GAMMA-CHLORDANE /2
2.1U	ALPHA-CHLORDANE /2
210U	TOXAPHENE
40U	PCB-1016 (AROCLOR 1016)
40U	PCB-1221 (AROCLOR 1221)
82U	PCB-1232 (AROCLOR 1232)
40U	PCB-1242 (AROCLOR 1242)
40U	PCB-1248 (AROCLOR 1248)
40U	PCB-1254 (AROCLOR 1254)
40U	PCB-1260 (AROCLOR 1260)
19	PERCENT MOISTURE

REMARKS

REMARKS

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

PURGEABLE ORGANICS DATA REPORT 04/02/91

PROJECT NO. 91-171 SAMPLE NO. 53623 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: SD-05

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1330 STOP: 00/00/00

CASE NO.: 15499 SAS NO.: D. NO.: Z724

UG/KG	ANALYTICAL RESULTS
1600U	CHLOROMETHANE
1600U	BROMOMETHANE
1600U	VINYL CHLORIDE
1600U	CHLOROETHANE
1600U	METHYLENE CHLORIDE
1600U	ACETONE
1600U	CARBON DISULFIDE
1600U	1,1-DICHLOROETHENE(1,1-DICHLOROETHYLENE)
1600U	1,1-DICHLOROETHANE
1600U	1,2-DICHLOROETHENE (TOTAL)
1600U	CHLOROFORM
1600U	1,2-DICHLOROETHANE
1600U	METHYL ETHYL KETONE
1600U	1,1,1-TRICHLOROETHANE
1600U	CARBON TETRACHLORIDE
1600U	BROMODICHLOROMETHANE

UG/KG	ANALYTICAL RESULTS
1600U	1,2-DICHLOROPROPANE
1600U	CIS-1,3-DICHLOROPROPENE
1600U	TRICHLOROETHENE(TRICHLOROETHYLENE)
1600U	DIBROMOCHLOROMETHANE
1600U	1,1,2-TRICHLOROETHANE
1600U	BENZENE
1600U	TRANS-1,3-DICHLOROPROPENE
1600U	BROMOFORM
1600U	METHYL ISOBUTYL KETONE
1600U	METHYL BUTYL KETONE
1600U	TETRACHLOROETHENE(TETRACHLOROETHYLENE)
1600U	1,1,2,2-TETRACHLOROETHANE
420J	TOLUENE
1600U	CHLOROBENZENE
3000	ETHYL BENZENE
1900	STYRENE
22000	TOTAL XYLENES
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.

04/02/91

MISCELLANEOUS PURGEABLE ORGANICS - DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53623 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL
STATION ID: SD-05 COLLECTION START: 12/12/90 1330 STOP: 00/00/00
CASE NO.: 15499 SAS NO.: D. NO.: Z724 MD NO: Z724

ANALYTICAL RESULTS UG/KG

70000JN	ETHYLMETHYLBENZENE (3 ISOMERS)
9000JN	PROPENYLBENZENE
30000JN	TRIMETHYLBENZENE
4000JN	DECANE
10000JN	PROPYLBENZENE

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

04/02/91

EXTRACTABLE ORGANICS DATA REPORT

*** ***
** PROJECT NO. 91-171 SAMPLE NO. 53623 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: S PANABAKER **
** SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL **
** STATION ID: SD-05 COLLECTION START: 12/12/90 1330 STOP: 00/00/00 **
** **
** CASE NO.: 15499 SAS NO.: D. NO.: 2724 **
*** ***

UG/KG	ANALYTICAL RESULTS
1300U	PHENOL
1300U	BIS(2-CHLOROETHYL) ETHER
1300U	2-CHLOROPHENOL
1300U	1,3-DICHLOROBENZENE
1300U	1,4-DICHLOROBENZENE
1300U	1,2-DICHLOROBENZENE
1300U	2-METHYLPHENOL
1300UJ	2,2'-CHLOROISOPROPYLETHER
1300U	(3-AND/OR 4-)METHYLPHENOL
1300U	N-NITROSODI-N-PROPYLAMINE
1300U	HEXACHLOROETHANE
1300U	NITROBENZENE
1300U	ISOPHORONE
1300U	2-NITROPHENOL
1300UR	2,4-DIMETHYLPHENOL
1300U	BIS(2-CHLOROETHOXY) METHANE
1300U	2,4-DICHLOROPHENOL
1300UR	1,2,4-TRICHLOROBENZENE
190000	NAPHTHALENE
1300U	4-CHLOROANILINE
1300U	HEXACHLOROBUTADIENE
1300U	4-CHLORO-3-METHYLPHENOL
7500	2-METHYLNAPHTHALENE
1300U	HEXACHLOROCYCLOPENTADIENE (HCCP)
1300U	2,4,6-TRICHLOROPHENOL
6600U	2,4,5-TRICHLOROPHENOL
1300UR	2-CHLORONAPHTHALENE
6600U	2-NITROANILINE
1300U	DIMETHYL PHTHALATE
1300U	ACENAPHTHYLENE
1300U	2,6-DINITROTOLUENE

UG/KG	ANALYTICAL RESULTS
6600UR	3-NITROANILINE
1300U	ACENAPHTHENE
6600U	2,4-DINITROPHENOL
6600U	4-NITROPHENOL
1300U	DIBENZOFURAN
1300U	2,4-DINITROTOLUENE
1300U	DIETHYL PHTHALATE
1300U	4-CHLOROPHENYL PHENYL ETHER
1300U	FLUORENE
6600U	4-NITROANILINE
6600U	2-METHYL-4,6-DINITROPHENOL
1300U	N-NITROSODIPHENYLAMINE/DIPHENYLAMINE
1300U	4-BROMOPHENYL PHENYL ETHER
1300U	HEXACHLOROBENZENE (HCB)
6600U	PENTACHLOROPHENOL
1300U	PHENANTHRENE
1300U	ANTHRACENE
1300U	CARBAZOLE
1300U	DI-N-BUTYLPHTHALATE
1300U	FLUORANTHENE
1300U	PYRENE
1300U	BENZYL BUTYL PHTHALATE
1300U	3,3'-DICHLOROBENZIDINE
1300U	BENZO(A)ANTHRACENE
1300U	CHRYSENE
1300U	BIS(2-ETHYLHEXYL) PHTHALATE
1300U	DI-N-OCTYLPHTHALATE
1300U	BENZO(B AND/OR K)FLUORANTHENE
1300U	BENZO-A-PYRENE
1300U	INDENO (1,2,3-CD) PYRENE
1300U	DIBENZO(A,H)ANTHRACENE
1300U	BENZO(GHI)PERYLENE
25	PERCENT MOISTURE

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

04/02/91

MISCELLANEOUS EXTRACTABLE COMPOUNDS - DATA REPORT

*** ***
** PROJECT NO. 91-171 SAMPLE NO. 53623 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: S PANABAKER **
** SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL **
** STATION ID: SD-05 COLLECTION START: 12/12/90 1330 STOP: 00/00/00 **
** CASE.NO.: 15499 SAS NO.: D. NO.: Z724 MD NO: Z724 **
** **
*** ***

ANALYTICAL RESULTS UG/KG

400000J	7 UNIDENTIFIED COMPOUNDS
50000JN	METHYLPROPYLBENZENE
100000JN	DIETHYLBENZENE
200000JN	ETHYLDIMETHYLBENZENE
90000JN	TETRAMETHYLBENZENE

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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*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.

04/02/91

PESTICIDES/PCB'S DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53623 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: SD-05
CASE NUMBER: 15499 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1330 STOP: 00/00/00
D. NUMBER: 2724

UG/KG	ANALYTICAL RESULTS	UG/KG	ANALYTICAL RESULTS
2.2U	ALPHA-BHC	22U	METHOXYCHLOR
2.2U	BETA-BHC	4.3U	ENDRIN KETONE
2.2U	DELTA-BHC	4.3U	ENDRIN ALDEHYDE
2.2U	GAMMA-BHC (LINDANE)	--	CHLORDANE (TECH. MIXTURE) /1
2.2U	HEPTACHLOR	2.2U	GAMMA-CHLORDANE /2
2.2U	ALDRIN	2.2U	ALPHA-CHLORDANE /2
2.2U	HEPTACHLOR EPOXIDE	220U	TOXAPHENE
2.2U	ENDOSULFAN I (ALPHA)	43U	PCB-1016 (AROCLOR 1016)
4.3U	DIELDRIN	43U	PCB-1221 (AROCLOR 1221)
4.3U	4,4'-DDE (P,P'-DDE)	87U	PCB-1232 (AROCLOR 1232)
4.3U	ENDRIN	43U	PCB-1242 (AROCLOR 1242)
4.3U	ENDOSULFAN II (BETA)	43U	PCB-1248 (AROCLOR 1248)
4.3U	4,4'-DDD (P,P'-DDD)	43U	PCB-1254 (AROCLOR 1254)
4.3U	ENDOSULFAN SULFATE	43U	PCB-1260 (AROCLOR 1260)
4.3U	4,4'-DDT (P,P'-DDT)	24	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.

01/31/91

METALS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53621 SAMPLE TYPE: SOIL
PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV
CITY: MOUNDVILLE ST: AL
STATION ID: SD-01
COLLECTION START: 12/12/90 1215 STOP: 00/00/00
CASE NUMBER: 15499 SAS NUMBER:
MD NUMBER: Z722

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
450	ALUMINUM	67	MANGANESE
4.1UJ	ANTIMONY	0.10U	MERCURY
0.70U	ARSENIC	0.96U	NICKEL
5	BARIUM	40	POTASSIUM
1U	BERYLLIUM	0.94UJ	SELENIUM
0.24U	CADMIUM	0.48U	SILVER
50U	CALCIUM	30U	SODIUM
2U	CHROMIUM	0.70U	THALLIUM
2U	COBALT	NA	TIN
2U	COPPER	2.5	VANADIUM
2500	IRON	5U	ZINC
1.1	LEAD	20	PERCENT MOISTURE
24	MAGNESIUM		

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.

01/30/91

SPECIFIED ANALYSIS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53621 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: SD-01
CASE.NO.: 15499 SAS NO.:

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1215 STOP: 00/00/00
D. NO.: 2722 MD NO: 2722

RESULTS	UNITS	PARAMETER
1.2U	MG/KG	CYANIDE

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

01/31/91

METALS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53618 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: SD-02
CASE NUMBER: 15499 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1100 STOP: 00/00/00
MD NUMBER: Z719

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
720	ALUMINUM	19	MANGANESE
4.1UJ	ANTIMONY	0.11U	MERCURY
2U	ARSENIC	2U	NICKEL
8.7	BARIUM	69	POTASSIUM
1U	BERYLLIUM	0.89UJ	SELENIUM
0.24U	CADMIUM	0.48U	SILVER
200	CALCIUM	90U	SODIUM
2U	CHROMIUM	0.66U	THALLIUM
2U	COBALT	NA	TIN
2U	COPPER	3.1	VANADIUM
2500	IRON	7U	ZINC
2.3	LEAD	16	PERCENT MOISTURE
42	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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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

01/30/91

SPECIFIED ANALYSIS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53618 SAMPLE TYPE: SOIL	PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV	CITY: MOUNDVILLE ST: AL
STATION ID: SD-02	COLLECTION START: 12/12/90 1100 STOP: 00/00/00
CASE.NO.: 15499 SAS NO.:	D. NO.: Z719 MD NO: Z719

RESULTS	UNITS	PARAMETER
1.2U	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.

METALS DATA REPORT 01/31/91

PROJECT NO. 91-171 SAMPLE NO. 53617 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: SD-03
CASE NUMBER: 15499 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1025 STOP: 00/00/00
MD NUMBER: Z718

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
340	ALUMINUM	28	MANGANESE
4.1UJ	ANTIMONY	0.12U	MERCURY
1U	ARSENIC	0.96U	NICKEL
4.1	BARIUM	35	POTASSIUM
1U	BERYLLIUM	0.87UJ	SELENIUM
0.24U	CADMIUM	0.48U	SILVER
60U	CALCIUM	30U	SODIUM
3U	CHROMIUM	0.65U	THALLIUM
0.48U	COBALT	NA	TIN
2U	COPPER	2.2	VANADIUM
2100	IRON	3U	ZINC
1.3	LEAD	21	PERCENT MOISTURE
16	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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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

01/30/91

SPECIFIED ANALYSIS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53617 SAMPLE TYPE: SOIL	PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV	CITY: MOUNDVILLE ST: AL
STATION ID: SD-03	COLLECTION START: 12/12/90 1025 STOP: 00/00/00
CASE.NO.: 15499 SAS NO.:	D. NO.: Z718 MD NO: Z718

RESULTS	UNITS	PARAMETER
1.30U	MG/KG	CYANIDE

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

01/31/91

METALS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53616 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: SD-04
CASE NUMBER: 15499 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 0910 STOP: 00/00/00
MD NUMBER: Z717

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
310	ALUMINUM	42	MANGANESE
4.2UJ	ANTIMONY	0.11U	MERCURY
2U	ARSENIC	2U	NICKEL
4.9	BARIUM	54	POTASSIUM
1U	BERYLLIUM	0.94UJ	SELENIUM
0.25U	CADMIUM	0.49U	SILVER
82	CALCIUM	30U	SODIUM
0.98U	CHROMIUM	0.71U	THALLIUM
2U	COBALT	NA	TIN
3U	COPPER	1.7	VANADIUM
1100	IRON	4U	ZINC
1	LEAD	19	PERCENT MOISTURE
31	MAGNESIUM		

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.

01/30/91

SPECIFIED ANALYSIS DATA REPORT

PROJECT NO. 91-171 SAMPLE NO. 53616 SAMPLE TYPE: SOIL	PROG ELEM: NSF COLLECTED BY: S PANABAKER
SOURCE: SOUTHERN RESINS DIV	CITY: MOUNDVILLE ST: AL
STATION ID: SD-04	COLLECTION START: 12/12/90 0910 STOP: 00/00/00
CASE NO.: 15499 SAS NO.:	D. NO.: Z717 MD NO: Z717

RESULTS	UNITS	PARAMETER
1.20U	MG/KG	CYANIDE

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

METALS DATA REPORT 01/31/91

PROJECT NO. 91-171 SAMPLE NO. 53623 SAMPLE TYPE: SOIL
SOURCE: SOUTHERN RESINS DIV
STATION ID: SD-05
CASE NUMBER: 15499 SAS NUMBER:

PROG ELEM: NSF COLLECTED BY: S PANABAKER
CITY: MOUNDVILLE ST: AL
COLLECTION START: 12/12/90 1330 STOP: 00/00/00
MD NUMBER: Z724

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
3800	ALUMINUM	42	MANGANESE
3.5UJ	ANTIMONY	0.12U	MERCURY
1U	ARSENIC	2U	NICKEL
20	BARIUM	160	POTASSIUM
0.21U	BERYLLIUM	1.1UJ	SELENIUM
0.21U	CADMIUM	0.41U	SILVER
240	CALCIUM	260	SODIUM
4U	CHROMIUM	0.85U	THALLIUM
2U	COBALT	NA	TIN
3U	COPPER	7.7	VANADIUM
3900	IRON	9.6	ZINC
4	LEAD	30	PERCENT MOISTURE
120	MAGNESIUM		

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

01/30/91

SPECIFIED ANALYSIS DATA REPORT

*** ***
** PROJECT NO. 91-171 SAMPLE NO. 53623 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: S PANABAKER **
** SOURCE: SOUTHERN RESINS DIV CITY: MOUNDVILLE ST: AL **
** STATION ID: SD-05 COLLECTION START: 12/12/90 1330 STOP: 00/00/00 **
** CASE.NO.: 15499 SAS NO.: D. NO.: Z724 MD NO: Z724 **
** **
*** ***

RESULTS	UNITS	PARAMETER
1.4U	MG/KG	CYANIDE

FOOTNOTES
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