A.T. Kearney, Inc.
225 Reinekers Lane
P.O. Box 1405
Alexandria, Virginia 22313
703 836 6210

Management
Consultants

ATKEARNEY

August 29, 1988

Ms. Rowena Sheffield
Regional Project Officer
U.S. Environmental Protection Agency
Region IV
345 Courtland Street, N.E.
Atlanta, GA 30365

Reference: EPA Contract No. 68-01-7038; Work Assignment No. R04-03-75; Kerr-McGee Chemical Corporation, Columbus, Mississippi (MSD 990866329); Interim RFA Report

Dear Ms. Sheffield:

Enclosed please find the Interim RCRA Facility Assessment Report (RFA) for the Kerr-McGee Chemical Corporation facility. This assessment resulted in the identification of 41 solid waste management units (SWMUs) and one other area of concern (AOC).

The facility has detected in groundwater monitoring wells creosote and pentachlorophenol constituents resulting from the former use of the Aeration Impoundment (SWMU 28) and Sedimentation Impoundment (SWMU 29). The facility has formally closed these impoundments under Mississippi Department of Natural Resources Bureau of Pollution Control (MDNRBPC) approval. Apparently, the major contributors to hazardous constituents in the groundwater were these impoundments. The facility conducted a sampling program after closure to determine if residual contamination remained. Contamination was detected in the soil indicating clean closure was not accomplished.

The Kerr-McGee facility has been in operation since 1928. It is a wood treating facility using the preservative creosote. From 1928 until 1976, pentachlorophenol was also used as a preservative. From 1970 to 1974, xylene was used as a drying agent for the untreated wood. The original process area was destroyed by fire in 1974. Shortly after the fire, the facility began to rebuild the plant and has continued to upgrade operations, buildings, and the site since that time.

This facility's operations are similar to other wood treating facilities; creosote drippage and spillage from treatment and storage processes occur routinely and systematically throughout the Kerr-McGee facility. Examples of typical SWMUs which exhibited soil staining by creosote, as observed

during the VSI, include the Truck Unloading Area Sump (SWMU 18), Vapor Tank Sump (SWMU 16), Drip Track (SWMU 34), Black Tie Storage Area (SWMU 36), and the Drainage Ditches (SWMU 37). Soil and sediment sampling has been suggested in these areas. The SWMUs which have been implicated in contributing to groundwater contamination are the Aeration Impoundment (SWMU 28) and Sedimentation Impoundment (SWMU 29).

The facility has seven land-based units where creosote and pentachlorophenol wastes have been treated and/or disposed in the past, such as the Aeration Impoundment (SWMU 28), Sedimentation Impoundment (SWMU 29), Sand Filter Bed 1 (SWMU 30), Sand Filter Bed 2 (SWMU 31), Cooling Tower Surface Impoundment (SWMU 38), Waste Pile 1 (SWMU 32) and Waste Pile 2 (SWMU 33). These units pose a high potential for release to soil and groundwater.

In 1988, the facility constructed a new Drip Track (SWMU 34) in front of the pressure cylinders. Prior to 1988, preservative dripped on bare soil beneath the Drip Track. The preservatives that have been used by the facility are creosote, and prior to 1976, pentachlorophenol. The facility constructed this new Drip Track after four feet of visibly contaminated soil was removed. The facility sampled the soil six inches below the surface after the visibly contaminated soil was removed. Results from the soil sampling, provided to A.T. Kearney by the facility after the VSI, indicate there is residual contamination in the soil from past operations when the treated wood was allowed to drip directly onto bare soil. Further soil sampling has been suggested to determine the extent of contamination.

Results of groundwater analyses detected K001 constituents in the monitoring wells CMW-3, CMW-4 and CMW-5, therefore the facility was required to conduct a groundwater assessment. According to the regulations, RCRA facilities are required to conduct a groundwater assessment if there are confirmed significant analytical differences after interim status monitoring.

Based on observations made during the VSI, it appears that a RCRA Facility Investigation (RFI) should be conducted at the facility. It is suggested that the sampling described in Chapter V of this report be conducted during the RFI.

Please feel free to call me or Phebe Davol, the Work Assignment Manager, (who can be reached at 703/683-7932) if you have any questions.

Sincerely,

Gayle Kline

Gayle Kline
Technical Director

Enclosure

cc: B. Foster, EPA Region IV
N. Bethune, EPA Region IV
J. Levin
J. Grieve
G. Bennsky
P. Davol
L. Venkateshwara
D. LaRusso
W. Rohrer, DPRA

0054x

INTERIM RCRA FACILITY ASSESSMENT

KERR-MCGEE CHEMICAL CORPORATION
COLUMBUS, MISSISSIPPI 39701

EPA I.D. No MSD 990866329

Prepared for:

U.S. Environmental Protection Agency
Region IV
345 Courtland Street, N.E.
Atlanta, GA 30365

Prepared by:

Kearney/Centaur
A Division of A.T. Kearney, Inc.
225 Reinekers Lane
Alexandria, Virginia 22314

EPA Contract No. 68-01-7038
Work Assignment No. R04-03-75

August 1988

INTERIM RCRA FACILITY ASSESSMENT REPORT

KERR-MCGEE CHEMICAL CORPORATION
COLUMBUS, MISSISSIPPI
EPA I.D. No. MSD 990866329

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INTERIM RCRA FACILITY ASSESSMENT REPORT

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I. INTRODUCTION

The 1984 Hazardous and Solid Waste Amendments (HSWA) to the Resource Conservation and Recovery Act (RCRA) provide new authority to the Environmental Protection Agency (EPA) to require comprehensive corrective action for releases of hazardous waste and hazardous constituents from solid waste management units (SWMUs) and other areas of concern (AOCs) at all operating, closed, or closing RCRA-regulated facilities. The intent of this authority is to address previously unregulated releases to air, surface water, soil, groundwater, and from the generation of subsurface gas. In order to accomplish this objective, a RCRA Facility Assessment (RFA) is undertaken, consisting of a Preliminary Review (PR) of available and relevant documents, a Visual Site Inspection (VSI), and, if appropriate, a Sampling Visit (SV).

This report was prepared using a review of the file material maintained at the offices of U.S. EPA Region IV and Mississippi Department of Natural Resource, Bureau of Pollution Control (MDNRBPC), and a VSI performed on June 23, 1988 of the Kerr-McGee Chemical Corporation, Forest Products Division facility in Columbus, Mississippi.

The Kerr-McGee Chemical Corporation facility has been in operation since 1928. It is a wood treating facility using the preservative creosote. From 1928 until 1976, pentachlorophenol was also used as a preservative. From 1970 to 1974, xylene was used as a drying agent for the untreated wood. From approximately 1928 to June 1986, the facility utilized two surface impoundments for storage, treatment, and ultimate disposal of creosote and pentachlorophenol, wastewater, and sludges from the wood treating operations. The surface impoundments, designated in this report as Aeration Impoundment (SWMU 28) and Sedimentation Impoundment (SWMU 29) were closed on June 18, 1986 in accordance with a closure plan approved by the MDNRBPC. The units were certified closed on June 19, 1988. Following closure of the impoundments, the facility conducted a sampling program to determine if residual contamination remained.

Contamination was detected in the soil indicating clean closure was not accomplished. The facility has a groundwater monitoring system for the surface impoundment area and the process area. This groundwater monitoring system consists of eighteen wells where groundwater contamination has been detected.

In 1988, the facility constructed a new Drip Track (SWMU 34) in front of the pressure cylinders. Prior to 1988, preservative dripped on bare soil beneath the Drip Track (SWMU 34). The preservatives that have been used by the facility are creosote, and prior to 1976, pentachlorophenol. The facility constructed this new Drip Track (SWMU 34) after four feet of visually contaminated soil was removed. The facility sampled the soil 6-inches below the surface after the visually contaminated soil was removed. Results from the soil sampling, provided to A.T. Kearney by the facility after the VSI, indicates there is residual contamination in the soil from past operations when the treated wood was allowed to drip directly onto bare soil. These results are provided in Attachment E. Further soil sampling has been suggested to determine the extent of contamination.

Section II discusses the facility's location, history, process description, waste management, and history of releases. A listing of the SWMUs and AOCs identified by this study is presented in Section III. Conclusions regarding the release potential and suggested further actions for each unit or area are discussed in Section IV. Suggested sampling approaches, when appropriate, are provided in Section V. References used to prepare this report are listed in Section VI. Observations made during the VSI are documented in the Photograph Log included in Attachment A. A summary of the information developed for each of the SWMUs and AOCs identified during a review of the file material and the VSI is presented in Attachment B. Attachment C is the groundwater analytical results from June 1981 through December 1984 for the Kerr-McGee Facility. Attachment D is the groundwater analytical results from February 1987 through December 1987. Attachment E is the Drip Track (SWMU 34) soil analytical data from January 1988. Attachment F is the soil analytical results from the Aeration Impoundment (SWMU 28) and Sedimentation Impoundment (SWMU 29) from October 1986.

Table 1 provides a listing of the SWMUs and the AOCs identified during this assessment. Figure 1 shows the approximate locations of the identified SWMUs and AOCs.

TABLE 1

SOLID WASTE MANAGEMENT UNITS AND
OTHER AREAS OF CONCERN

KERR-MCGEE CHEMICAL CORP.
FOREST PRODUCTS DIVISION
COLUMBUS, MISSISSIPPI

SWMU NUMBER	NAME	OPERATIONAL STATUS
1.	Front Door Pit	Active
2.	Front Door Pit North Sump	Active
3.	Front Door Pit South Sump	Active
4.	Retort Sump	Active
5.	Drip Collection Tank 1	Inactive
6.	Drip Collection Tank 2	Inactive
7.	Drip Collection Tank 3	Inactive
8.	Work Tank 1	Active
9.	Work Tank 2	Active
10.	Work Tank 3	Active
11.	Work Tank 4	Active
12.	Work Tank 5	Active
13.	Overhead Pipes	Active
14.	Sap Tank	Active
15.	Sump for Tank Car Unloading	Active
16.	Vapor Tank Sump	Inactive
17.	Wastewater Underground Pipes	Active
18.	Truck Unloading Area Sump	Inactive
19.	Wood Boiler	Active
20.	Creosote Storage Area Sump	Active
21.	Primary Oil/Water Separator	Active
22.	Polymer Addition Area	Active
23.	Secondary Dual Compartment Oil/Water Separator	Active
24.	Holding Tank 1	Active
25.	Holding Tank 2	Active
26.	Holding Tank 3	Active

TABLE 1 (Cont'd)

SOLID WASTE MANAGEMENT UNITS AND
OTHER AREAS OF CONCERN

KERR-MCGEE CHEMICAL CORP.
FOREST PRODUCTS DIVISION
COLUMBUS, MISSISSIPPI

SWMU NUMBER	NAME	OPERATIONAL STATUS
27.	Holding Tank 4	Active
* 28.	Aeration Impoundment	Inactive-MDNRBPC closed
* 29.	Sedimentation Impoundment	Inactive-MDNRBPC closed
30.	Sand Filter Bed 1	Inactive
31.	Sand Filter Bed 2	Inactive
32.	Waste Pile 1	Inactive
33.	Waste Pile 2	Inactive
34.	Drip Track	Active
35.	Drip Track Sump and Drain	Active
36.	Black Tie Storage Area	Active
37.	Drainage Ditches	Active
38.	Cooling Tower Surface Impoundment	Inactive
39.	Two Cooling Tower Basins	Active
40.	Rainwater Tank	Active
41.	Cyclone Dumpster	Active
Areas of Concern		
A.	Creosote Storage Tanks	Active

*Undergoing closure under RCRA.

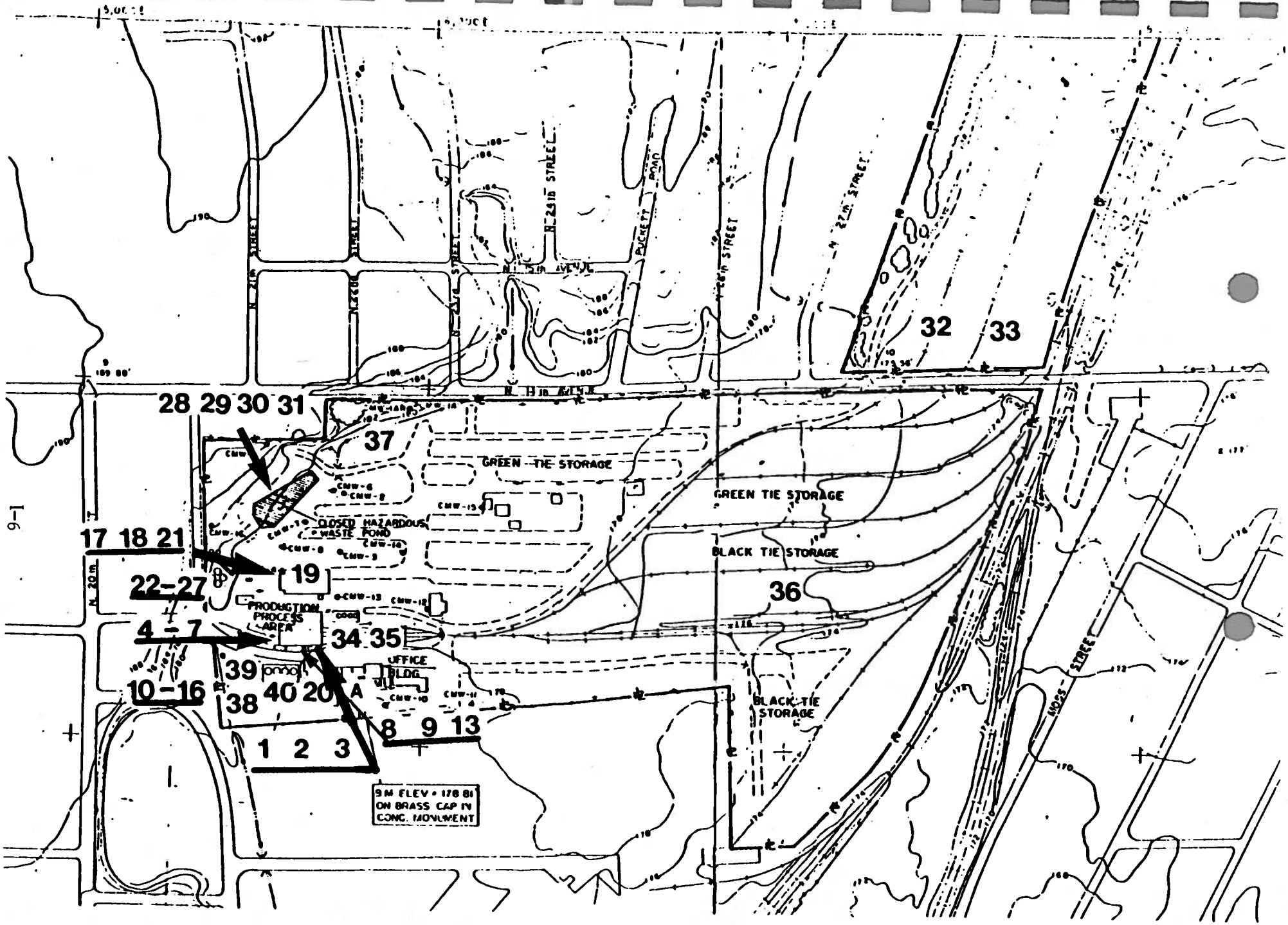


Figure 1: Kerr-McGee Chemical Corporation, Forest Products Division SWMU and AOC Location Map.

II. FACILITY DESCRIPTION

Location and Surrounding Land Use

The Kerr-McGee Chemical Corporation, Forest Products Division referred, to as the Kerr-McGee facility (in this report) is located in Lowndes County, Mississippi, northeast of Columbus (Reference 8). Figure 2 shows a map of the area indicating the location and topography of the facility. The main facility consists of approximately 90 acres and includes the process area and woodlands owned by the facility (Reference 6). The land use surrounding the facility is primarily residential and industrial (Reference 7). There are residences less than 500 feet from the facility (Reference 21).

Climate and Meteorology

The climate in the Lowndes County area is characterized by long, hot summers and mild, short winters (Reference 18). In the summer, the mean temperature is 80 °F and the average daily maximum is 92 °F. In winter, the mean temperature is 46 °F and the average daily minimum is 34 °F (Reference 18).

The total annual precipitation is 50.06 inches, with the greatest rainfall occurring from April through September (References 8 and 18). The average seasonal snowfall is two inches (Reference 18). The prevailing winds are generally from the northwest. There are periodically severe local storms, which may include tornadoes (Reference 18). Thunderstorms occur on approximately 60 days each year, predominantly in the summer. The average wind speed is 3.7 knots and is calm 30 percent of the time (Reference 8).

Topography, Surface Drainage, and Flood Plain

The Kerr-McGee facility is located on the eastern edge of the Mississippi Embayment which is a broad inlet arm of the Gulf Coastal Plain (Reference 13). The topography of the area has been modified by erosion of the Tombigbee River and its tributaries (Reference 19).

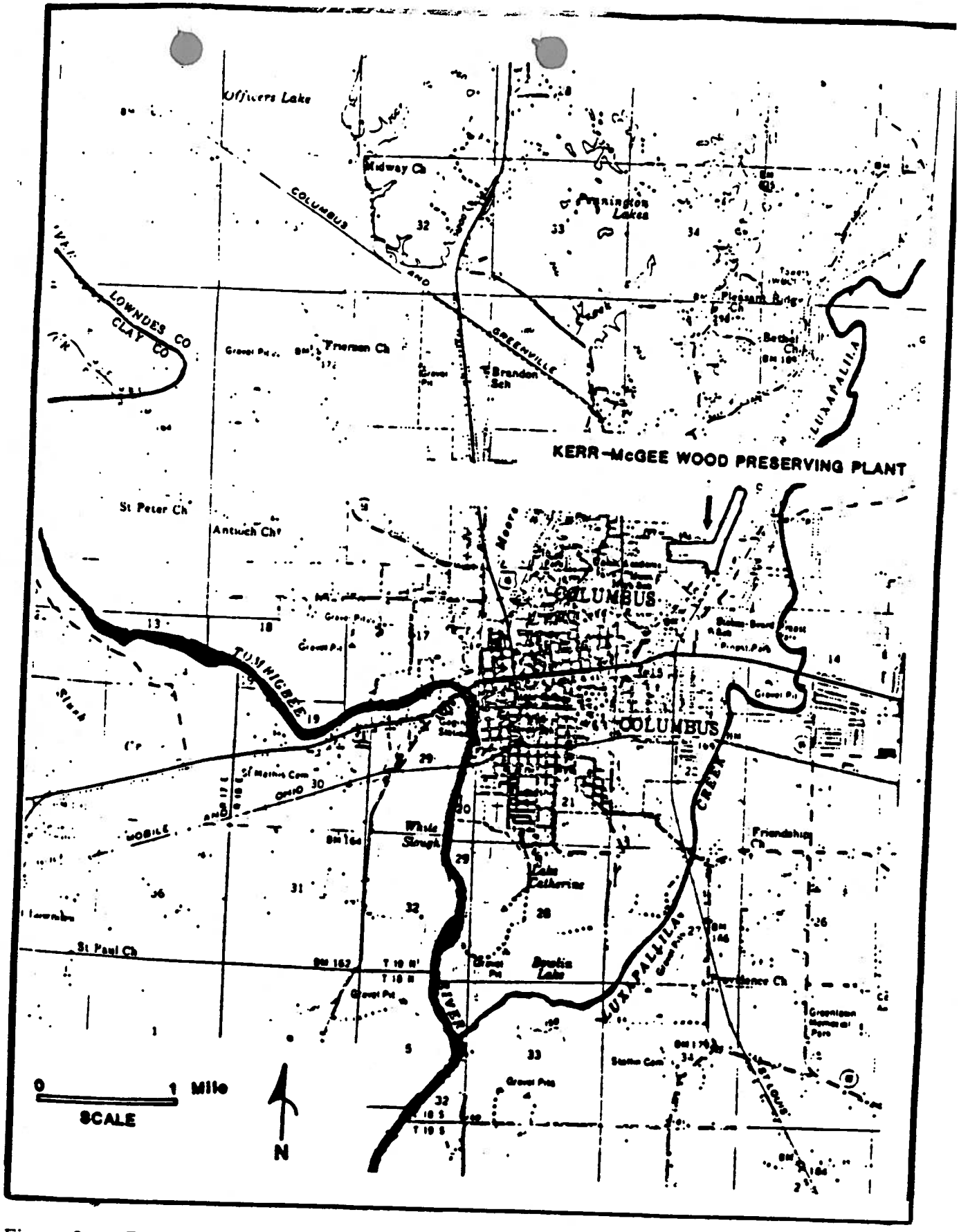


Figure 2: Topographic and Location Map of Area Surrounding Kerr-McGee Facility (Reference 8).

Elevations at the facility range from 168 to 190 feet above mean sea level (Reference 27).

The facility's boundary is generally located approximately 2,000 feet from the 100-year flood plain of the Luxapalila Creek. However, a small section in the northeast generally near Waste Pile 1 (SWMU 32) and Waste Pile 2 (SWMU 33) lies within the 100-year flood plain of the Luxapalila Creek (Reference 8). Stormwater drainage is predominantly to the north towards N. 14th Avenue and the stormwater drainage ditch is located east of the Aeration Impoundment (SWMU 28) and Sedimentation Impoundment (SWMU 29) (Reference 21). The Luxapalila Creek is the surface water body closest to the facility, approximately one mile to the east. The Luxapalila Creek joins the Tombigbee River approximately four miles southwest of the facility (Reference 18).

Geology and Soils

The Kerr-McGee facility is underlain by Quaternery and Upper Cretaceous sediments. These sediments dip at a low angle towards the west (Reference 19). A geologic cross section taken from the facility's Post-closure Permit Application (Reference 8) is provided in Figure 3.

According to documents prepared by the facility, the Quaternary alluvial deposits underlying the facility are approximately 25 feet thick and consist of clay, silt, sand, and gravel. The Eutaw Formation lies beneath the alluvial deposits. The Eutaw Formation is approximately 120 feet thick and is characterized by glauconitic sands (Reference 6). The McShan Formation, composed of sand and clay, underlies the Eutaw Formation and is approximately 100 to 150 feet thick (Reference 13).

According to the soil survey for Lowndes County and the Post-Closure Permit Application for the Kerr-McGee facility, there are two principal soil series present at the facility, the Rosella silt loam and the Prentiss-Urban land complex (References 8 and 19). The Rosella silt loam is a poorly drained soil on broad flats and in depressions with slopes ranging from 0 to 2 percent. The soil is strongly

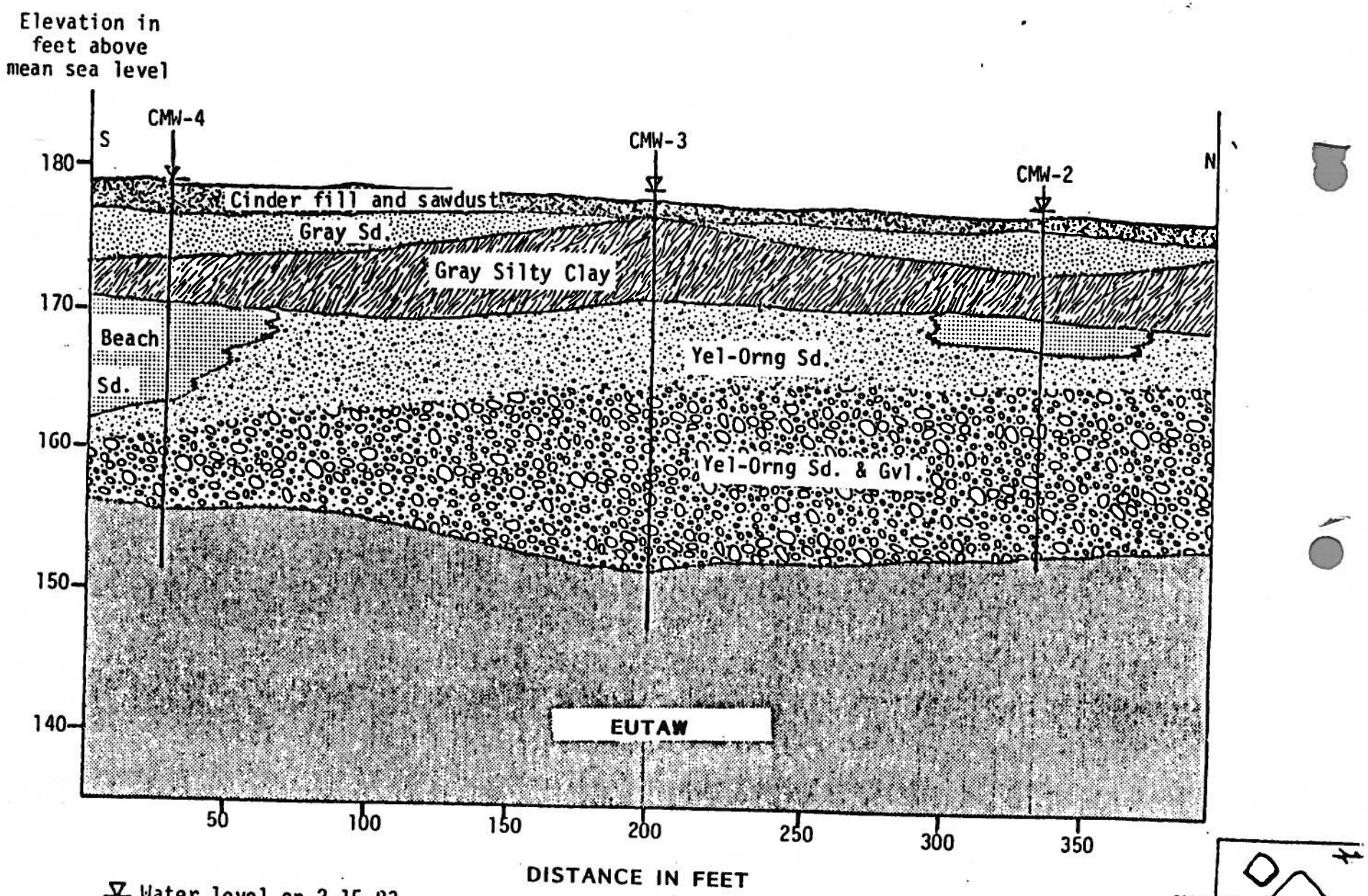


Figure 3: Geologic Cross Section of Kerr-McGee Facility (Reference 8)

acidic with a low permeability (Reference 19). The Prentiss–Urban land complex is a strongly acidic, moderately well–drained soil (Reference 19).

Groundwater and Surface Water Hydrology

Documents prepared by Kerr–McGee indicate that ground water in the Quaternary alluvial sediments beneath the facility is under unconfined conditions. These alluvial sediments average 20 feet in thickness and receive recharge in the form of precipitation according to Kerr–McGee (Reference 8). In the northern portion of the facility, the shallow ground water discharges at the surface in the form of seeps (Reference 21). According to the facility's Post–Closure Permit Application, flow in the alluvial aquifer is to the southeast and the shallow ground water discharges to Luxapalila Creek. Figure 4 is a map, constructed by the facility, of the potentiometric surface in the alluvial sediment.

The Eutaw and McShan Formations are a major source of water to industrial and domestic users in the region according to the facility (Reference 8). Transmissibility values reported by Kerr–McGee for the Eutaw Formation range from 5,000 to 14,000 gpd/foot with a storage coefficient of 0.0002. The facility also reports that the McShan Formation in the vicinity of Columbus has a hydraulic conductivity of 100 gpd/ft^2.

Ownership and Regulatory History

The facility was built in 1928 by T.J. Moss and was acquired by the Kerr–McGee Chemical Corporation in 1964. Facility representatives were unable to provide information regarding T.J. Moss' operations and waste management practices. The facility has been a wood preserving facility since 1928 and the land use prior to 1928 is not known. The facility produces treated railroad ties, switch ties, crossings, and pilings using a creosote–based solution. Prior to 1976, the facility also used pentachlorophenol as a preservative. The facility's two main clients are Burlington Northern and Norfolk Southern railroads (Reference 21).

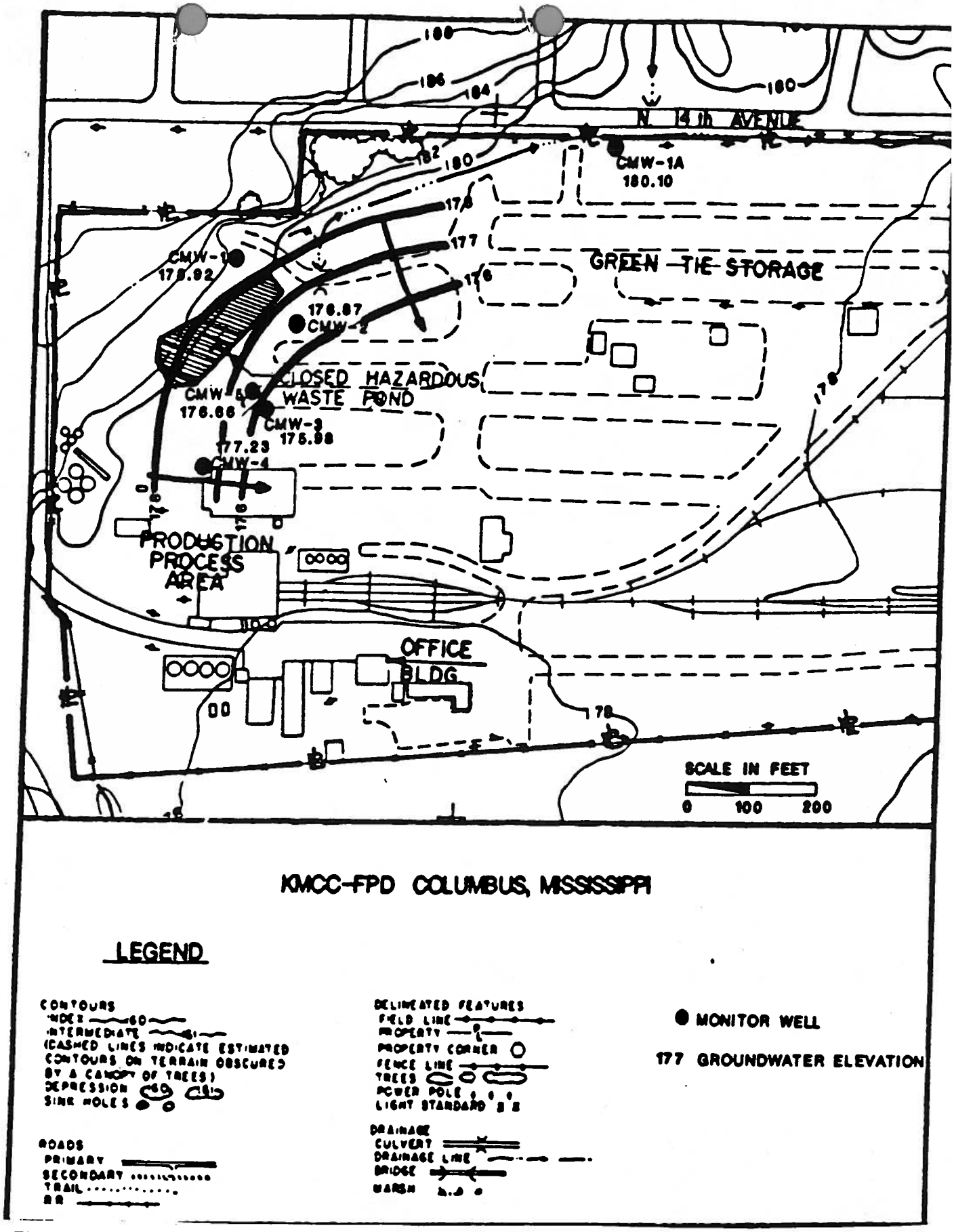


Figure 4: Potentiometric Surface Elevation Map for Kerr-McGee Facility (as determined on December 1, 1987) (Reference 24).

On January 27, 1981, the facility notified U.S. EPA of the operation of the Aeration Impoundment (SWMU 28), the Sedimentation Impoundment (SWMU 29), Holding Tank 1 (SWMU 24), Holding Tank 2 (SWMU 25), Holding Tank 3 (SWMU 26) and Holding Tank 4 (SWMU 27) through the submittal of the Part A permit application. The facility also submitted a Solid Waste Management Unit Response Letter and notified EPA of the existence of two waste piles, Waste Pile 1 (SWMU 32) and Waste Pile 2 (SWMU 33) and three wastewater treatment units and waste recycling operation units. The wastewater treatment units included the Sand Filter Bed 1 (SWMU 31), Sand Filter 2 (SWMU 32), Aeration Impoundment (SWMU 28), and Sedimentation Impoundment (SWMU 29). The process involves the recycling of creosote from the Primary Oil/Water Separator (SWMU 21) and Secondary Dual Compartment Oil/Water Separator (SWMU 23) to the work tanks, Work Tank 1 (SWMU 8), Work Tank 2 (SWMU 9), Work Tank 3 (SWMU 10), Work Tank 4 (SWMU 11) and Work Tank 5 (SWMU 12) (Reference 17).

The Kerr-McGee facility operated two hazardous waste surface impoundments, the Aeration Impoundment (SWMU 28) and the Sedimentation Impoundment (SWMU 29) as part of the wastewater treatment system. These units managed a hazardous waste designated as K001. K001 wastes are defined in 40 CFR Part 261 as "bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol." The facility closed the units on June 18, 1986, in accordance with the closure plan approved by MDNRBPC (Reference 7). Following closure of the Aeration Impoundment (SWMU 28) and Sedimentation Impoundment (SWMU 29), the facility conducted a sampling program to determine if there was residual contamination. Contamination was detected in the soil and clean closure was not accomplished (Reference 9). The soil analytical results are provided in Attachment F. A Post-Closure permit application was submitted to the MDNRBPC on March 12, 1987 (Reference 8).

The Kerr-McGee facility installed a groundwater monitoring detection system to monitor the Aeration Impoundment (SWMU 28) and Sedimentation Impoundment (SWMU 29) in June 1981. This system consisted of one upgradient and three (3) downgradient wells drilled to the top of Eutaw Formation, approximately ~~160~~ 150 feet below the surface (Reference 22).

On September 9, 1983, the facility notified MDNRBPC, in its first semi-annual submittal of groundwater monitoring results, that all downgradient monitoring wells detected "statistically significant differences" from background for the indicator parameters specific conductivity and pH. The second semi-annual results submitted on February 8, 1984, confirmed these statistical differences. The data are provided in Attachment C. Therefore, on March 19, 1984, the facility submitted a Groundwater Quality Assessment Plan. This plan was prepared to determine the source of the statistical difference and to evaluate the migration of the constituents. As part of this plan, the facility installed two additional monitoring wells. The location of the monitoring wells at the facility are illustrated in Figure 5 (Reference 13). The groundwater was analyzed for the Appendix VIII K001 constituents (see Table 2).

During 1987, the analytical results for the upgradient monitoring well CMW-1A and downgradient monitoring well CMW-2 showed all K001 constituents to be below the detection limit for the year. Results from the three other wells (CMW-3, CMW-4, and CMW-5) indicate the presence of K001 constituents (Reference 22). Naphthalene, fluoranthene, benzo(a) anthracene, benzo(a) pyrene, carbazole, and phenanthrene were detected in monitoring well CMW-3 in the various sampling episodes. The highest concentration of fluoranthene was 158 parts per billion (ppb). Acenaphthylene, fluoranthene, phenanthrene, naphthalene, and carbazole were detected in monitoring well CMW-4 in all four sampling quarters. The highest concentration of naphthalene was 13.5 parts per million (ppm). Naphthalene was detected in the first, third, and fourth quarters in monitoring well CMW-5 as concentrations ranging from 2 to 3.16 ppb (Reference 24). The analytical results for monitoring wells CMW-3, CMW-4 and CMW-5 are summarized in Table 3. The complete groundwater analytical results are provided in Attachment D.

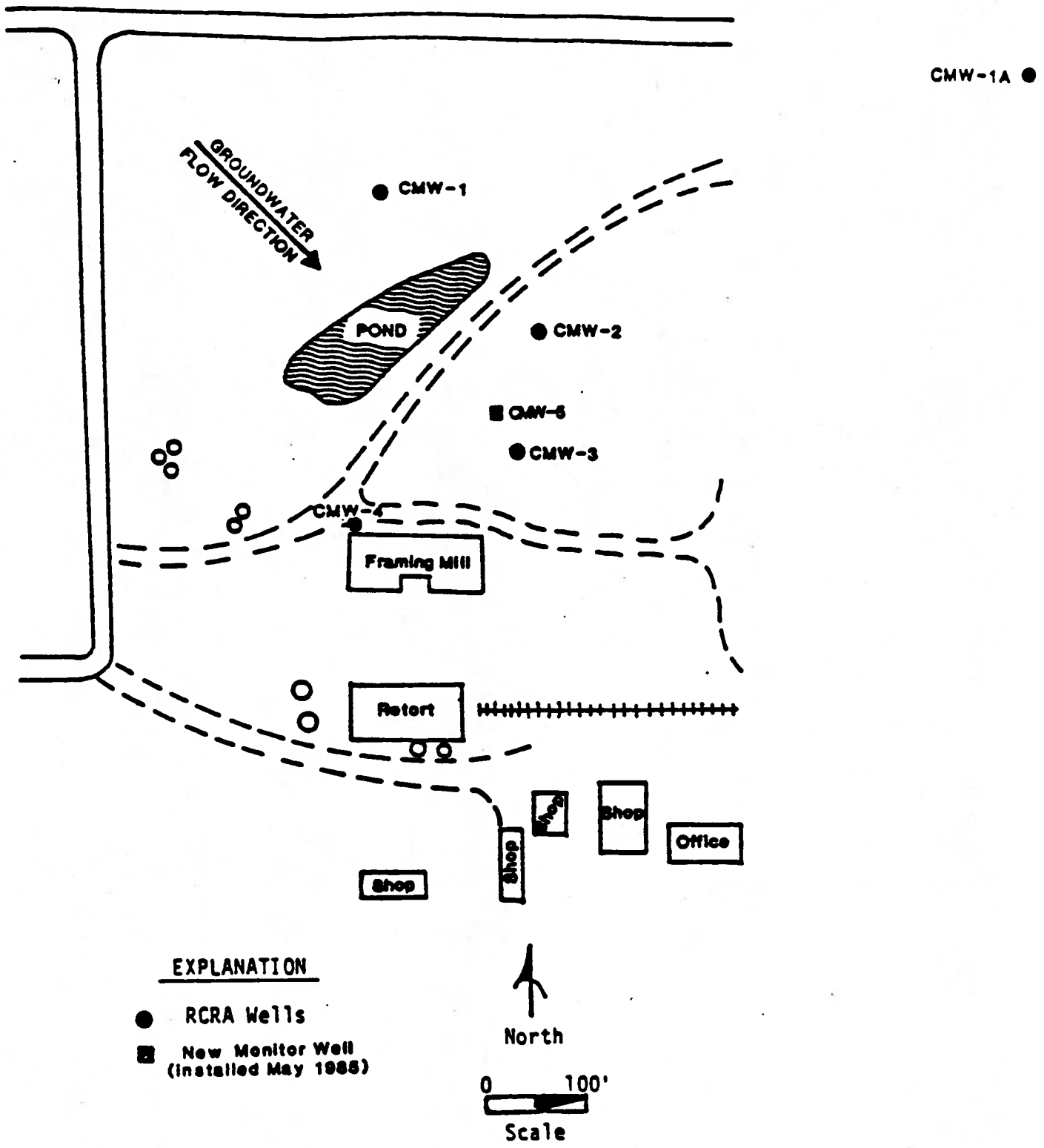


Figure 5: Location of Groundwater Monitoring Wells at Kerr-McGee Facility as of December 1987 (Reference 22).

TABLE 2. MAJOR CONSTITUENTS OF THE WOOD PRESERVATIVE WHICH WAS UTILIZED AT THE KERR-MCGEE FACILITY (REFERENCE 22)

APPENDIX VIII

PRIMARY CREOSOTE AND PENTACHLOROPHENOL CONSTITUENTS

Acid Compounds

2-Chlorophenol
2,4 - Dimethylphenol
p-Chloro-m-creosol
Pentachlorophenol
Phenol
2,4,6 - Trichlorophenol
2,3,4,6 - Tetrachlorophenol
2,4 - Dinitrophenol

Base/Neutral Compounds

Acenaphthylene
Benzo(a)anthracene
Benzo(b)pyrene
Benzo(b)fluoranthene
Dibenzo(a)anthracene
Fluoranthene
Indeno(1,2,3-c,d) pyrene
Naphthalene
Phenanthrene
Carbazole

TABLE 3. ANALYTICAL RESULTS FROM GROUNDWATER MONITORING WELL SAMPLES (REFERENCE 24)

Monitoring Well CMW-3

Parameter	Date			
	02-11-87	04-09-87	07-27-87	12-01-87
	Concentration*			
Naphthalene	9.7	<1.6	21.4	100
Fluoranthene	158	12.3	15.6	19.3
Benzo(a)anthracene	9.15	<7.8	<7.8	<7.8
Benzo(a)pyrene	4.55	<2.5	<2.5	<2.5
Carbazole	11.5	<10	<10	12.9
Phenanthrene	109	<5.4	2.8	60.8

Monitoring Well CMW-4

Parameter	Date			
	02-11-87	04-09-87	07-22-87	12-01-87
	Concentration*			
Acenaphthylene	87.9	91	83.2	77.5
Fluoranthene	113	23.3	17.9	25
Phenanthrene	264	200	153	197
Naphthalene	4270	3890	13500	3400
Carbazole	138	181	150	211

Monitoring Well CMW-5

Parameter	Date			
	02-11-87	04-09-87	07-22-87	12-01-87
	Concentration*			
Naphthalene	2	<1.6	3.16	2.03

*All concentrations are in parts per billion (ppb).

On September 2, 1987, the facility notified the MDNRBPC of the detection of groundwater contamination. The facility and MDNRBPC met on September 21, 1987, to discuss the facility's Groundwater Quality Assessment Plan and revisions to the Part 265 Post-Closure Plan (Reference 10). On September 25, 1987, a Groundwater Quality Assessment Plan was submitted to MDNRBPC and approved by MDNRBPC on February 9, 1988 (Reference 22). The facility started construction of these wells on March 14, 1988. Twelve additional wells were constructed as part of this assessment making a total of 18 monitoring wells at the facility. This includes four stainless steel monitoring wells near the Aeration Impoundment (SWMU 28) and Sedimentation Impoundment (SWMU 29) for long-term monitoring, and eight polyvinyl chloride (PVC) cased monitoring wells throughout the production process area for the detection of the contaminant plume and further characterization of the site hydrogeology (Reference 22). Location of all of the wells is illustrated in Figure 6. Groundwater samples were collected in April, 1988. These results were not made available prior to completion of this report.

The facility is operating under a permit (PT 90021) for its wastewater discharge to the Columbus Publicly Owned Treatment Works (POTW). This permit was issued by the Mississippi Pollution Control Permit Board on May 1, 1984, and expires on April 30, 1989 (Reference 16). The Mississippi Pollution Control Permit Board placed discharge limitations for the following parameters: total phenol, oil and grease, copper, chromium and arsenic. The facility submitted an application on October 29, 1984, for a state operating permit for a proposed upgrade of the wastewater treatment system prior to discharge to the POTW (References 3 and 4). This upgrade was necessary in order to close the Aeration Impoundment (SWMU 28) and the Sedimentation Impoundment (SWMU 29). The upgrade consisted of installing four holding tanks, Holding Tank 1 (SWMU 24), Holding Tank 2 (SWMU 25), Holding Tank 3 (SWMU 26) and Holding Tank 4 (SWMU 27).

The Kerr-McGee facility was issued an air permit (1680-00020) on July 22, 1986, by the State of Mississippi Air Pollution Control for the operation of a CB D-6 boiler (Emission Point 001), a Vogt 14435 wood-waste boiler or Wood Boiler

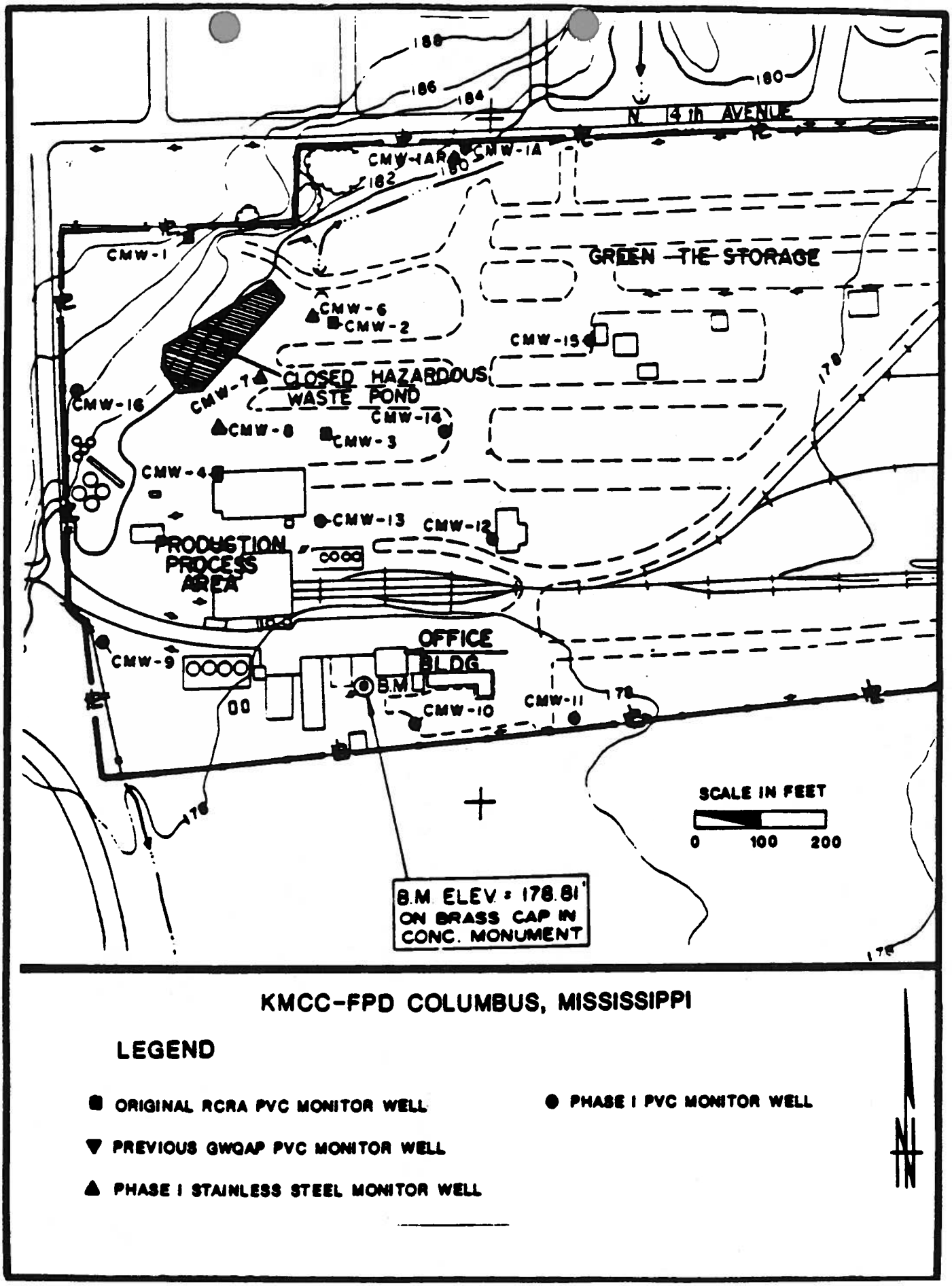


Figure 6: Location of Groundwater Monitoring Wells at Kerr-McGee Facility as of April 1988 (with no modification from Reference 22).

(Note: The Closed Hazardous Waste Pond in the figure is the Aeration and Sedimentation Impoundments (SWMUs 28 and 29)

(SWMU 19) (Emission Point 002), and two wood processing cyclones (Emission Point 003) (Reference 2). The Wood Boiler (SWMU 19) stopped burning wood in 1987. This boiler previously burned wood treated with preservative (Reference 21). Both boilers now burn oil and gas (Reference 21).

Process Descriptions/Description of Wastes

The Kerr–McGee facility is a wood treating facility which manufactures railroad crossties and switch ties using creosote as the preservative. From 1928 to 1976, pentachlorophenol was also used as the wood treating preservative (Reference 8).

The green lumber, brought to the facility by railroad, is first sorted according to species and grade by a mechanical sorter. The three species of wood used by the facility are mixed hardwood, oaks, and southern yellow pine (Reference 21). The wood is sawed to the appropriate length and then notched by a sorter incisor to allow the free flow of water. The lumber is seasoned by air drying or by artificial means using the Boulton process. For the natural air drying, the wood is stacked in a drying yard for 8 to 12 months. Seasoning by the Boulton process is done in the pressure cylinders.

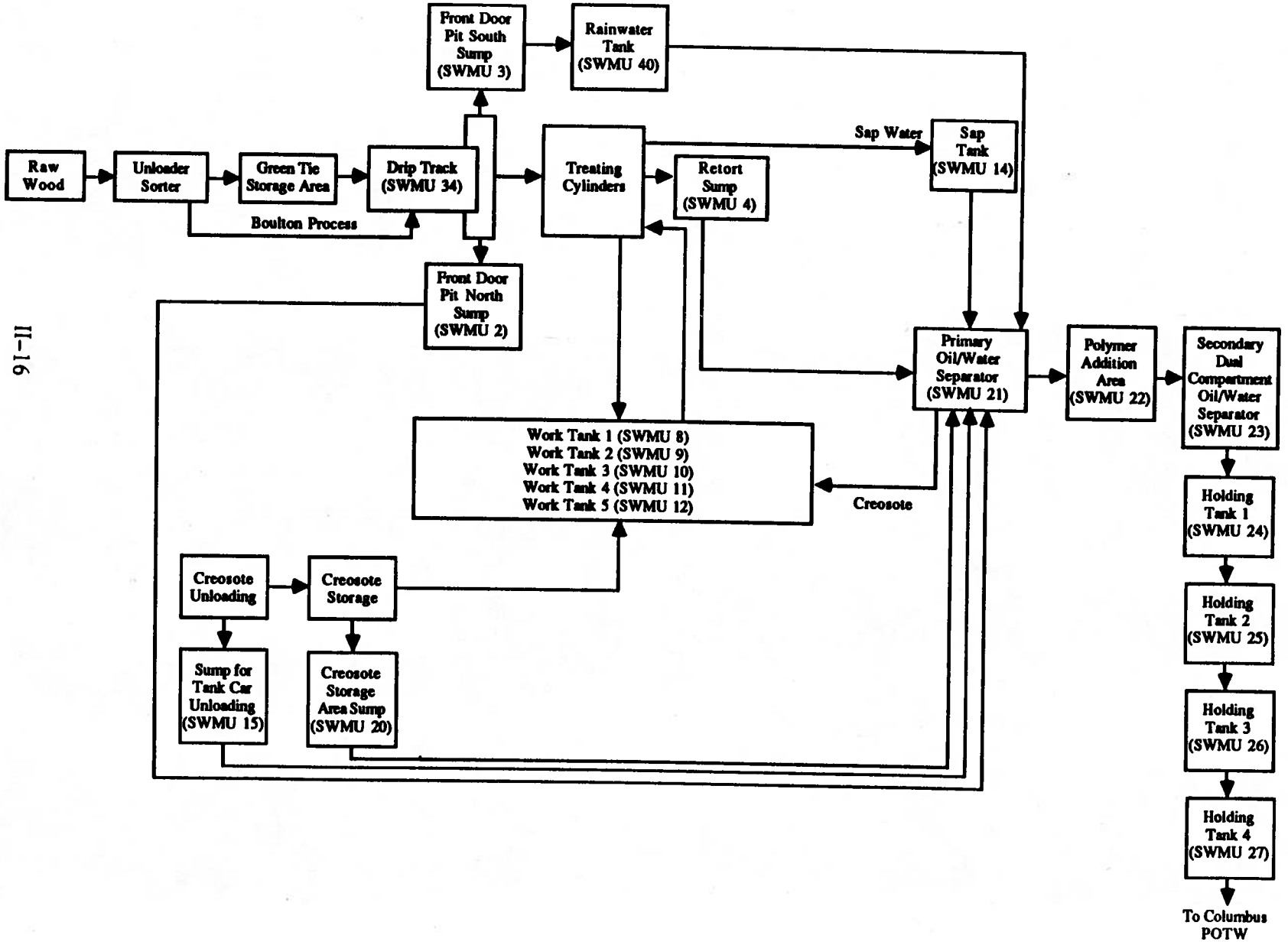
For the air–dried wood, the wood is tied onto trams and placed in a pressure cylinder. The cylinder is then filled with creosote. There are three pressure cylinders at the facility. The cylinders are 300 feet long and 8 feet in diameter. These cylinders are heated to 180° F and pressure of 180 pounds per square inch (psi) is applied. The wood is drained and a vacuum applied. In the Boulton process, the wood is tied to trams and placed in the pressure cylinder which is heated to 180° F and placed under a vacuum until the wood is dry. A treating solution of hot creosote is pumped into the cylinder and a pressure of 180 psi is applied. The wood is then allowed to drain and placed under a vacuum to remove the excess preservative (Reference 21). The excess preservative is returned to the Work Tanks 1 through 5 (SWMUs 8 through 12). After the treatment process, the wood is dried on the Drip Track (SWMU 34) for 12 to 24 hours and then stacked in the Black Tie Storage Area (SWMU 36).

For each of the three cylinders, approximately 300 gallons of contaminated wastewater is generated per cycle from the air drying and treatment method. During normal operating conditions, one cycle per cylinder per day generates a total of almost 1,000 gallons of wastewater per day. This wastewater is composed primarily of vacuum seal water and condensate (Reference 3). The Boulton drying and treatment generates 6,000 gallons of wastewater per cycle and consists of wood sap (approximately 1,800 gallons), vacuum seal water (approximately 3,900 gallons) and contact condensate (Reference 3). The volume of wastewater generated per day is a maximum amount of 15,000 gallons per day (gpd) (Reference 4). There is an average of 6,500 gallons of non-contact steam condensate produced per day in addition to wastewater. This steam condensate is basically clean process water (Reference 4). Flow diagrams for current and former waste water disposition at the facility are provided in Figures 7 and 8.

The wastewater analysis from the preliminary report "Proposed changes in the handling and treatment of process wastewater," prepared by Continental Engineering Service for Kerr-McGee, indicates that the raw wastewater contains 162.8 mg/l oil and grease, 208.7 mg/l phenol, 1.0 mg/l pentachlorophenol, 322 mg/l BOD_5, and a pH of 5.18 (Reference 5).

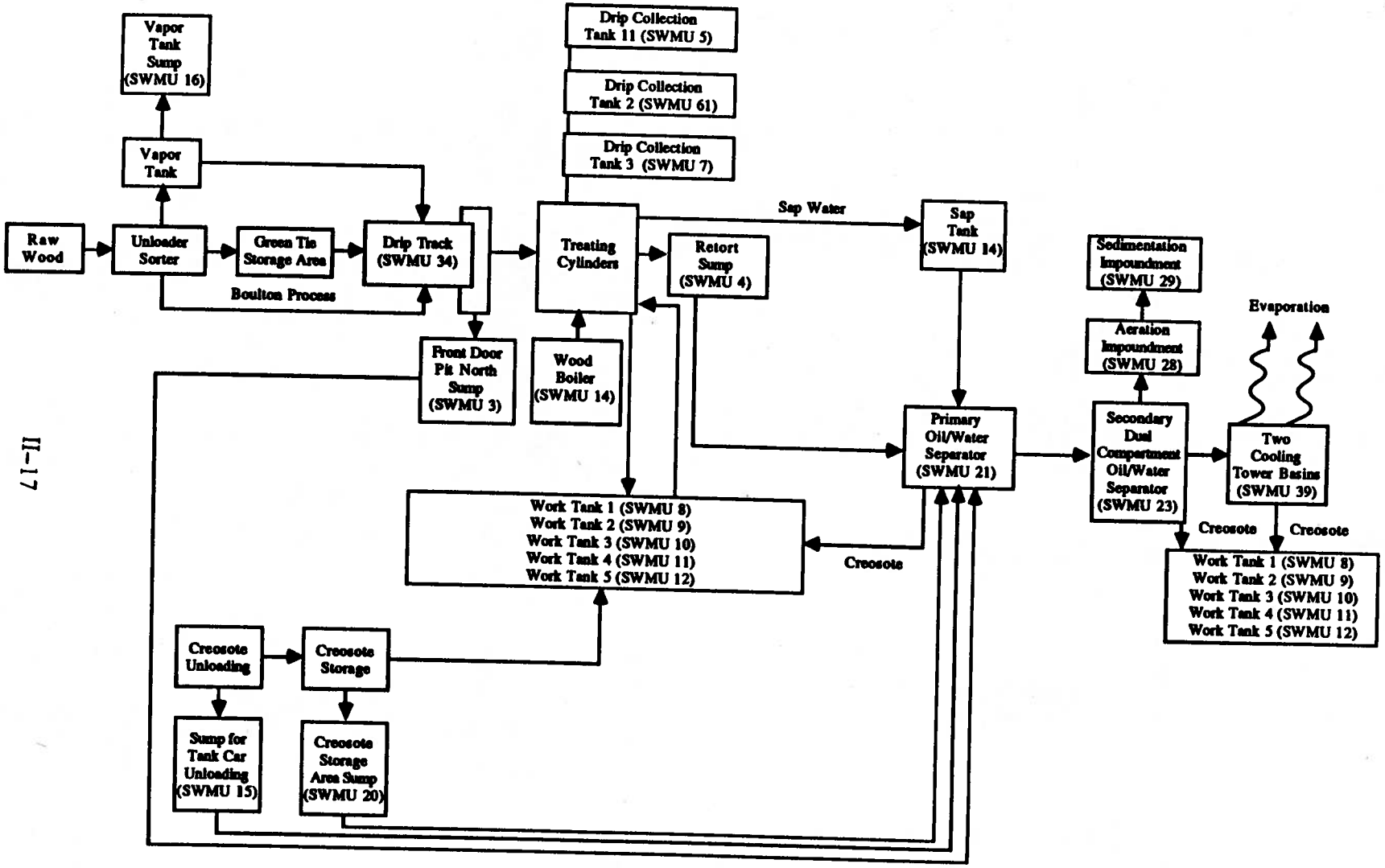
The creosote used in the process arrives at the facility in tank cars which are unloaded from the top in order to minimize spillage. Prior to January 1988, the tank cars were unloaded from the bottom. The facility has not reported any spills associated with this unloading. There are three storage tanks with a total capacity of 150,000 gallons which receive the creosote. The creosote is then pumped to the five work tanks, Work Tank 1 (SWMU 8), Work Tank 2 (SWMU 9), Work Tank 3 (SWMU 10), Work Tank 4 (SWMU 11), and Work Tank 5 (SWMU 12). The creosote is routed to and from the tanks to the retort area (pressure cylinders) by Overhead Pipes (SWMU 13).

Figure 7. Flow Diagram of Current Wastewater Disposition at Kerr-McGee Facility (Reference 17, 21)



2.451bb

Figure 8. Flow Diagram of Former Wastewater Disposition at Kerr-McGee Facility Prior to 1988 (Reference 17, 21)



3.451bh

There have been several changes to the processes used at the facility. The original process area was destroyed by fire in 1974 and was rebuilt. Shortly after the fire, the facility began to rebuild the plant and has continued to upgrade operations, building, and the site since that time. The specific details of the fire and resulting damage were not made available prior to the completion of this report. Pentachlorophenol was used as the wood treatment preservative between 1928 and 1976 (Reference 21).

Between 1970 and 1974, the facility used three xylene vapor tanks to dry the wood. This practice was discontinued because of the high cost (Reference 21). The wastewater (consisting of xylene and water) flowed to a distillation unit and from there to the Vapor Tank Sump (SWMU 19). This distillation unit has been removed from the facility.

Waste Management

The waste sawdust and wood chips generated from the sorting and notching process moves by a conveyor belt to a cyclone which empties into the Cyclone Dumpster (SWMU 41) and is sent off site to the Columbus sanitary landfill (Reference 21). Prior to the summer of 1987, the waste sawdust and wood chips were sent to Waste Pile 1 (SWMU 32) and Waste Pile 2 (SWMU 33) or burned in the Wood Boiler (SWMU 19). In addition, ends of treated wood ties were also sent to those units.

The sludge residue, generated in the pressure cylinders, is either removed manually and sent off site in drums or reused in the process (Reference 21). The wastewater and drippage generated from the treatment process goes to a Retort Sump (SWMU 4) located west of the retort area. Wastewater from the sump flows to the Primary/Oil Water Separator (SWMU 21). The Retort Sump (SWMU 4) is steam cleaned on an as-needed basis and the waste is drummed and sent off site (Reference 1).

The current Drip Track (SWMU 34), which receives the waste creosote after the treatment process, began operation in March 1988. Prior to the installation of this unit, the creosote waste dripped onto soil. This Drip Track (SWMU 34) was constructed after 4 feet of visually contaminated soil was excavated and sent to a hazardous waste landfill. The facility collected soil samples after the visually contaminated soil was removed. The soil samples were taken at a depth of six inches below the level of visually contaminated soil. The facility and EPA split the samples and had the samples analyzed for primary creosote and pentachlorophenol constituents. Table 4 provides the maximum concentrations detected for each parameter. The complete results are provided in Attachment E. The results indicate that there is residual contamination remaining in the soil. The current Drip Track (SWMU 34) was constructed with a bottom layer of 1 to 1 1/2 feet clay (10^{-7} cm/sec permeability) overlain by 12 inches of concrete with a 6-inch concrete berm. The wastewater and waste creosote drippage from the Drip Track (SWMU 34) flows to the Drip Track Sump and Drain (SWMU 35) and is pumped to the Primary Oil/Water Separator (SWMU 21) via Wastewater Underground Pipes (SWMU 17) (Reference 21).

Prior to 1986, the wastewater treatment system consisted of the Primary Oil/Water Separator (SWMU 21), the Secondary Dual Compartment Oil/Water Separator (SWMU 23), an Aeration Impoundment (SWMU 28) and a Sedimentation Impoundment (SWMU 29). The wastewater first passed through a Primary Oil/Water Separator (SWMU 21) and then split into two streams for parallel passage through a Secondary Dual Compartment Oil/Water Separator (SWMU 23) then to the Aeration Impoundment (SWMU 28) and finally to the Sedimentation Impoundment (SWMU 29) before discharge to the Columbus POTW. The creosote that settles in these separators was recovered and returned to the two cooling towers. This recycling process was terminated in 1986 after the facility received odor complaints from the nearby residents (Reference 21). The two cooling towers are now only used to cool water and are located in the Two Cooling Tower Basins (SWMU 39). Prior to 1970,

TABLE 4

Maximum Concentrations of K001 Constituents Detected in Samples From Drip Track (SWMU 34)

(Note: Complete Analyses are provided in Attachment E)

Parameter	Concentration (ppm)
2-Chlorophenol	ND*
2,4-Dimethylphenol	14.4
2,4-Dinitrophenol	ND
p-Chloro-m-creosol	10.0
Pentachlorophenol	358.0
Phenol	23.2
2,4,6-Trichlorophenol	1.87
2,3,4,6-Tetrachlorophenol	11.0
Acenaphthylene	113.0
Benzo(a)anthracene	476.0
Benzo(a)pyrene	193.0
Benzo(b)fluoranthene	810.0
Dibenzo(a,h)anthracene	ND
Fluoranthene	2180.0
Indeno(1,2,3-c,d)pyrene	4.06
Naphthalene	1,930.0
Phenanthrene	3,420.0
Carbazole	340.0

*Not detected in any sample.

before the construction of two cooling towers, the cooling water was discharged to the Cooling Tower Surface Impoundment (SWMU 38).

In June 1986, the Aeration Impoundment (SWMU 28) and the Sedimentation Impoundment (SWMU 29) were closed in accordance with an MDNRBPC-approved closure plan. The facility upgraded their treatment system and obtained an operating permit to discharge to the Columbus POTW. Under the new system, the wastewater flows to the Primary Oil/Water Separator (SWMU 21) and then to the Polymer Area (SWMU 22) where two polymers, Amerfloc 10 and Amerfloc S310 are added. The wastewater then flows to the Secondary Dual Compartment Oil/Water Separator (SWMU 23). The effluent is then pumped into a series of Holding Tanks 1 through 4 (SWMUs 24 through 27) (Reference 3). The wastewater from the Holding Tank 4 (SWMU 27) is discharged to the Columbus POTW (Reference 3).

Approximately 6,500 gallons per day of steam condensate is produced during the treatment process. The steam condensate is processed non-contact water (Reference 3). Four condensate tanks receive the steam condensate. The condensate is then discharged to the Holding Tank 1 (SWMU 24).

History of Releases

Groundwater and soil contamination have been detected at the Kerr-McGee facility. The details of the contamination are described below.

As part of the wastewater treatment system, the Kerr-McGee facility discharged wastewater containing creosote and pentachlorophenol into the Aeration Impoundment (SWMU 28) and Sedimentation Impoundment (SWMU 29). The facility closed the impoundments on June 18, 1986, with a closure plan approved by MDNRBPC. Following closure, the facility conducted a sampling program to determine if clean closure had been accomplished. Contamination was detected in the soil; consequently, clean closure was not accomplished (Reference 7). The soil analytical results are provided in Attachment F.

The facility installed groundwater monitoring wells in June 1981 (Reference 6). On September 9, 1983, the facility notified the MDNRBPC in its first semi-annual submittal that all downgradient monitoring wells detected "statistically significant differences" from background for indicator parameters of specific conductivity and pH. This was confirmed in the second semi-annual results submitted on February 8, 1984 (Reference 13). These data are provided in Attachment C. The facility installed two additional wells to monitor and evaluate the migration of the constituents (Reference 13).

During 1987, the analytical results for the upgradient monitoring well CMW-1A and monitoring well CMW-2 showed all K001 constituents to be below the detection limit for the year. Three other wells (CMW-3, CMW-4, and CMW-5) indicate the presence of K001 constituents (Reference 22). Naphthalene, fluoranthene, benzo(a) anthracene, benzo(a) pyrene, carbazole, and phenanthrene were detected in monitoring well CMW-3 in the various sampling episodes. The highest concentration of fluoranthene was 158 parts per billion (ppb). Acenaphthylene, fluoranthene, phenanthrene, naphthalene, and carbazole were detected in monitoring well CMW-4 in all four sampling quarters. The highest concentration of naphthalene was 13.5 parts per million (ppm). Naphthalene was detected in monitoring well CMW-5 in the first, third and fourth quarters at concentrations ranging from 2 to 3.16 ppb. Table 3 provides a summary of sampling results for monitoring wells CMW-3, CMW-4, and CMW-5 (Reference 13). The complete groundwater data are provided in Attachment D. On March 14, 1988, the facility installed four stainless steel monitoring wells near the Aeration Impoundment (SWMU 28) and the Sedimentation Impoundment (SWMU 29) and eight PVC-cased monitoring wells throughout the process area for the detection of contaminant plume and further characterization of the site hydrogeology (Reference 22). Groundwater samples were collected in April, 1988. The results of the analyses were not made available prior to completion of this report.

III. SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN

The PR and VSI for the Kerr-McGee facility identified 41 SWMUs and one AOC. Detail unit descriptions are included in Attachment B of this report. Of the units identified, nine SWMUs and the one AOC were determined to have a low potential for release to all environmental media based on such factors as design, operation and condition of the unit, types of wastes managed, and release controls for the unit. No further action is suggested for these units at this time. An overview of these units is presented below and a summary of the units is presented in Table 5.

The remaining 32 SWMUs were determined to have a potential for release to one or more environmental pathway. These units are summarized in Table 6 and detailed conclusions and further actions are presented in this section.

Description of Units with Low or No Potential for Release

There are four Holding Tanks (SWMUs 24, 25, 26 and 27) that are part of the facility's Wastewater Treatment System and used to hold creosote wastewaters are at various points in the treatment process. All tanks are above-ground, were observed to be in good condition, and are located on a concrete pad.

Overhead Pipes (SWMU 13) are used to transfer creosote (new and waste) between the Work Tanks (SWMUs 8-12). During the VSI, the pipes were observed to be in good condition with no signs of leaking or cracking.

The Rainwater Tank (SWMU 40) is used to manage creosote wastewaters and rainwater. The tank is closed and located within a contained area. Treated and green wood shavings are managed at the Cyclone Dumpster (SWMU 41). This unit is a metal dumpster observed to be in good condition with no evidence of spillage or staining.

TABLE 5

UNITS WITH LOW OR NO POTENTIAL FOR RELEASE AND REQUIRING NO FURTHER ACTION

SWMU/AOC		Description	Period of Operation	Release Control
13.	Overhead Pipes	Above-ground creosote pipes.	1928 to present	Located above-ground; good condition.
19.	Wood Boiler	Burns oil or gas to produce steam for the process. Burned creosote-treated wood ties in the past.	Unknown to present	Enclosed and underlain by concrete.
24.	Holding Tank 1	Above-ground tank for creosote wastewater treatment.	1984 to present	On concrete pad.
25.	Holding Tank 2	Above-ground tank for creosote wastewater treatment.	1984 to present	On concrete pad.
26.	Holding Tank 3	Above-ground tank for creosote wastewater treatment.	1984 to present	On concrete pad.
27.	Holding Tank 4	Above-ground tank for creosote wastewater treatment.	1984 to present	On concrete pad.
39.	Two Cooling Tower Basins	Above-ground Basins.	Unknown to present	Manages non-contact cooling water; concrete pad w/ dike.
40.	Rainwater Tank	Above-ground Tank.	1928 to present	Concrete pad with dike.
41.	Cyclone Dumpster	Above-ground dumpster for wood chip waste.	1987 to present	Located above-ground. Good condition.
A.	Creosote Storage Tanks	Above-ground Tanks.	1928 to present	Concrete pad with dike.

Two units, the Wood Boiler (SWMU 19) and the Two Cooling Tower Basins (SWMU 39), were designed to release to air. The types of wastes managed at both units has been changed (virgin fuel oil/non-contact cooling water, respectively) and no longer include hazardous waste or hazardous constituents. Therefore, there is no potential for on-going releases to air from these units.

Raw creosote is stored in large Creosote Storage Tanks (AOC A) that date back to 1928. The age of the units posed an initial concern. During the VSI, however, the tanks were observed to be located in a contained area and appeared to be in good condition.

Description of Units with a Potential for Release

There is a potential for release to one or more environmental pathways from the remaining 32 SWMUs. These units are listed in Table 6. These units include the unlined, land-based units where creosote and pentachlorophenol wastewater have been treated and/or disposed in the past, such as the Aeration Impoundment (SWMU 28), Sedimentation Impoundment (SWMU 29), Sand Filter Bed 1 (SWMU 30), Sand Filter Bed 2 (SWMU 31), and Cooling Tower Surface Impoundment (SWMU 38).

Various units used to manage waste creosotes, including Work Tank 1 (SWMU 8), Work Tank 2 (SWMU 9), Work Tank 3 (SWMU 10), Work Tank 4 (SWMU 11), Work Tank 5 (SWMU 12), Sap Tank (SWMU 14), Primary Oil/Water Separator (SWMU 21) and Secondary Dual Compartment Oil/Water Separator (SWMU 23) are open-topped or vented to the atmosphere. Creosote vapors were noted emanating from several of these units during the VSI.

Several units are below-grade (partially or totally) and the condition of the unit could not be verified during the VSI. There is a potential for release from these units if the integrity of the unit is impaired. These units include: Front Door Pit (SWMU 1), Front Door Pit North Sump (SWMU 2), Front Door Pit South Sump (SWMU 3), Retort Sump (SWMU 4), Sump for Tank Car Unloading (SWMU 15), Truck Unloading Area Sump (SWMU 18), Creosote Storage Area Sump (SWMU 20), Drip Collection Tank 1 (SWMU 5), Drip Collection Tank 2 (SWMU 6), Drip Collection Tank 3 (SWMU 7), Wastewater Underground Pipes (SWMU 17), Primary Oil/Water Separator (SWMU 21), Polymer Addition Area (SWMU 22), Secondary Dual Compartment Oil/Water Separator (SWMU 23), and Drip Track Sump and Drain (SWMU 35).

TABLE 6

SWMUs AND AOCs WITH A POTENTIAL FOR RELEASE

SWMU/AOC		Description	Period of Operation	Potentially Affected Media
1.	Front Door Pit	Concrete, in-ground pit	1974 to present	Soil, groundwater
2.	Front Door Pit North Sump	Concrete, in-ground sump	1974 to present	Soil, groundwater
3.	Front Door Pit South Sump	Steel, in-ground sump	1988 to present	Soil, groundwater
4.	Retort Sump	Concrete, in-ground sump	1974 to present	Soil, groundwater
5.	Drip Collection Tank 1	Underground tank	1928 to 1974	Soil, groundwater
6.	Drip Collection Tank 2	Underground tank	1928 to 1974	Soil, groundwater
7.	Drip Collection Tank 3	Underground tank	1928 to 1974	Soil, groundwater
8.	Work Tank 1	Above-ground tank	1928 to present	Air
9.	Work Tank 2	Above-ground tank	1928 to present	Air
10.	Work Tank 3	Above-ground tank overlying bare soil	1928 to present	Air, soil, groundwater
11.	Work Tank 4	Above-ground tank overlying bare soil	1928 to present	Air, soil, groundwater
12.	Work Tank 5	Above-ground tank overlying bare soil	1928 to present	Air, soil, groundwater
14.	Sap Tank	Above-ground, open-topped tank overlying soil	1928 to present	Air, soil, groundwater

TABLE 6

SWMUs AND AOCs WITH A POTENTIAL FOR RELEASE

(Continued)

SWMU/AOC		Description	Period of Operation	Potentially Affected Media
15.	Sump for Tank Car Unloading	Concrete, in-ground sump. Evidence of staining in soil surrounding the unit	1983 to present	Soil, groundwater
16.	Vapor Tank Sump	Concrete, in-ground sump	1970 to 1974	Soil, groundwater
17.	Wastewater Underground Pipes	Underground pipes	1928 to present	Soil, groundwater
18.	Truck Unloading Area Sump	Concrete, in-ground sump. Residue was observed in the sump	1982 to 1986	Soil, groundwater
20.	Creosote Storage Area Sump	Concrete, in-ground sump	1928 to present	Soil, groundwater
21.	Primary Oil/ Water Separator	Oil/water separator for creosote wastewater. Pentachlorophenol was used in the past, from 1928 to 1976	1974 to present	Air, soil, groundwater
22.	Polymer Addition Area	Used for creosote wastewater	1983 to present	Soil, groundwater
23.	Secondary Dual Compartment Oil/Water Separator	Oil/water separator for creosote wastewater. Pentachlophenol was also used in the past.	1965 to present	Air, soil, groundwater
28.	Aeration Impoundment	Former unlined surface impoundment containing waste creosote and pentachlorophenol	1928 to 1986	Soil, groundwater

TABLE 6

SWMUs AND AOCs WITH A POTENTIAL FOR RELEASE

(Continued)

SWMU/AOC		Description	Period of Operation	Potentially Affected Media
29.	Sedimentation Impoundment	Former unlined surface impoundment containing waste creosote and pentachlorophenol	1928 to 1986	Soil, groundwater
30.	Sand Filter Bed 1	Former unlined surface impoundment containing waste creosote and pentachlorophenol	Unknown to 1982	Soil, groundwater
31.	Sand Filter Bed 2	Former unlined surface impoundment containing waste creosote and pentachlorophenol	Unknown to 1982	Soil, groundwater
32.	Waste Pile 1	Former area for storage of scrap material	1974 to 1987	Soil, groundwater
33.	Waste Pile 2	Former area for storage of scrap material	1974 to 1987	Soil, groundwater
34.	Drip Track	Concrete pad for containment of creosote drippage from recently creosote-treated ties. Built on an excavated contaminated area	1988 to present	Soil, groundwater, air
35.	Drip Track Sump and Drain	Sump recovers creosote drippage from Drip Track (SWMU 34)	1988 to present	Soil, groundwater

TABLE 6

SWMUs AND AOCs WITH A POTENTIAL FOR RELEASE

(Continued)

SWMU/AOC		Description	Period of Operation	Potentially Affected Media
36.	Black Tie Storage Area	Outdoor storage area for treated wood overlying bare soil	1928 to present	Soil, groundwater
37.	Drainage Ditches	Unlined ditches drain to Luxa-palila Creek. Run-on/runoff ditches showed evidence of staining and dead vegetation	1928 to present	Soil, groundwater, and surface water
38.	Cooling Tower Surface Im-poundment	Former unlined surface impound-containing waste creosote, penta-chlorophenol and xylene	Unknown to 1980	Soil, groundwater

During the VSI, evidence of soil staining was noted for the Waste Pile 1 (SWMU 32), Waste Pile 2 (SWMU 33), Drip Track (SWMU 34), Black Tie Storage Area (SWMU 36), and Drainage Ditches (SWMU 37).

The Vapor Tank Sump (SWMU 16) was assessed as having a high potential for release because in the past, from 1970 to 1974, the drying chemical xylene was allowed to drain onto the surrounding soil.

IV. SUMMARY OF CONCLUSIONS AND SUGGESTED FURTHER ACTION

Solid waste management units and AOCs which have a potential for release are listed in this section. A summary assessment of the potential for release and further action are listed in Table 7. A detailed sampling approach for units for which sampling has been suggested is described in Table 8, Section V.

TABLE 7

SUMMARY OF CONCLUSIONS AND SUGGESTED FURTHER ACTION

SWMU/AOC	Potential for Release	Suggested Further Action
1. Front Door Pit 2. Front Door Pit North Sump 3. Front Door Pit South Sump 4. Retort Sump 18. Tank Unloading Sump Area 20. Creosote Storage Area Sump	The potential for release to air is low to moderate. While the units are open-topped, the total volume of waste in the unit at any one time would be small. The potential for release to surface water is low due to the distance to surface water and below-grade design of the units. The potential for release to soil, groundwater, and subsurface gas generation is dependent on the integrity of the unit.	Determine the integrity of the unit. If the integrity is impaired, conduct soil sampling in the area beneath the unit to determine if hazardous constituents have been released.
5. Drip Collection Tank 1 6. Drip Collection Tank 2 7. Drip Collection Tank 3	The potential for release to soil, groundwater, and for subsurface gas generation is dependent on the integrity of the units and whether wastes remain in place. The potential for release to air and surface water is low. The units are below-grade and covered with concrete.	Determine if there are residual wastes in these tanks and verify the integrity of the tanks. If the integrity is impaired, conduct soil sampling to determine if hazardous constituents have been released.
8. Work Tank 1 9. Work Tank 2	The potential for release to air is moderate to high since the units manage volatile wastes and are vented to the atmosphere. The potential for release to all other media is low since the tanks are above-ground and located within a concrete, diked area.	Determine the extent of releases to air for this unit. The need for further action will be based on whether hazardous constituents are being released in significant levels.

TABLE 7

SUMMARY OF CONCLUSIONS AND SUGGESTED FURTHER ACTION (Continued)

SWMU/AOC	Potential for Release	Suggested Further Action
10. Work Tank 3 11. Work Tank 4 12. Work Tank 5	There is a high potential for release from the tanks to the surrounding soil and groundwater due to the position of the tanks directly on soil, and soil staining observed during the VSI. The potential to release to air is moderate because of the volatile nature of materials handled and the vented construction of the tanks. There is a low potential for the generation of subsurface gas because these units are above ground. There is a low potential for release to surface water due to the distance to Luxapalila Creek.	Soil sampling should be conducted in the area of observed staining to determine if hazardous constituents have been released. Determine the extent of releases to the air from the vents. The need for further action will be based on whether significant releases are occurring.
14. Sap Tank	There is a high potential for release from the tank to surrounding soil and groundwater from past spills, since the unit is located over gravel and has been in operation for over 60 years. The potential for release to air is high because of the open-topped construction of the tank and volatile nature of the wastes. There is a low potential for the generation of subsurface gas because this unit is located above ground. There is low potential for release to surface water due to the distance to Luxapalila Creek.	Soil sampling should be conducted around the tank to determine if hazardous constituents have been released. Determine the extent of releases to air from this tank. Alternatively, consider covering the tank.

TABLE 7

SUMMARY OF CONCLUSIONS AND SUGGESTED FURTHER ACTION (Continued)

SWMU/AOC	Potential for Release	Suggested Further Action
15. Sump for Tank Car Unloading 16. Vapor Tank Sump	The potential for release to air is low due to the small volume of waste managed in the unit at any one time. The potential for subsurface gas generation is low due to the concrete, open design of the unit. The potential for release to soil and groundwater is high due to soil staining observed during the VSI. The potential for release to surface water is low due to the distance to Luxapalila Creek.	Conduct soil sampling in the stained areas to determine if hazardous constituents have been released.
17. Wastewater Underground Pipes	The potential for release to air and surface water is low due to the below-ground location of the pipes. The potential for release to soil, groundwater, and from subsurface gas generation is dependent on the integrity of the pipes.	Provide documentation for underground pipe locations. Determine the integrity of the pipes. If the integrity is impaired, conduct soil sampling to determine if hazardous constituents have been released. Repair the pipes as necessary.

TABLE 7

SUMMARY OF CONCLUSIONS AND SUGGESTED FURTHER ACTION (Continued)

SWMU/AOC	Potential for Release	Suggested Further Action
21. Primary Oil/ Water Separator 22. Polymer Addition Area	There is a low potential for release to air and for subsurface gas generation based on the dilute nature of the waste managed. The potential for release to soil, groundwater and for subsurface gas generation is dependent on the integrity of the units. The potential for release to surface water is low due to the distance from the Luxapalila Creek.	Determine the integrity of the unit. If the integrity is impaired, conduct soil sampling beneath the unit to determine if hazardous constituents have been released.
23. Secondary Dual Compartment Oil/Water Separator	The potential for release to air and for subsurface gas generation is low due to the dilute nature of the wastes managed. The potential for release to surface water is low due to the distance from the Luxapalila Creek. The potential for release to surface soil is high due to the soil staining observed during the VSI and if the unit integrity is impaired there is a high potential for release to subsoils and to groundwater.	Soil sampling should be conducted around the unit in the area of observed staining to determine if a release of hazardous constituents has occurred. In addition, determine the integrity of the unit. If the integrity is impaired, subsurface soil sampling may be warranted.

TABLE 7

SUMMARY OF CONCLUSIONS AND SUGGESTED FURTHER ACTION (Continued)

SWMU/AOC	Potential for Release	Suggested Further Action
28. Aeration Impoundment 29. Sedimentation Impoundment	The potential for release to air, surface water, and for subsurface gas generation is low since the units are inactive and have been closed. There is documented soil and groundwater contamnation from these units.	These units have been closed under an approved plan and are undergoing post-closure monitoring. Further actions for these units will be addressed by the RCRA Closure authority.
30. Sand Filter Bed 1 31. Sand Filter Bed 2 32. Waste Pile 1 33. Waste Pile 2	The potential for release to air and surface water is low due to the discontinued use of the units. The potential for release to soil and groundwater is high due to the unlined nature of the units. The potential for release from subsurface gas generation is low due to the nature of the wastes managed.	Conduct soil sampling in the area to determine if hazardous constituents have been released.
34. Drip Track	In the past, creosote dripped directly onto the soil. The current unit was constructed on an excavated contaminated area. Therefore, there is a high potential for ongoing releases to soil, groundwater, and for subsurface gas generation if there is residual contamination. The potential for release to air is moderate during the drying period for the creosote-treated ties due to the open-topped construction of the unit. The potential for release to surface water is low due to distance to Luxapalila Creek.	Provide information/documentation concerning the excavation of the area. Alternatively conduct soil sampling beneath the unit to determine if there is residual contamination.

TABLE 7

SUMMARY OF CONCLUSIONS AND SUGGESTED FURTHER ACTION (Continued)

SWMU/AOC	Potential for Release	Suggested Further Action
35. Drip Track Sump and Drain	The potential for release to air and for subsurface gas generation is low due to the dilute nature of the waste managed. The potential for release to surface water is low due to distance to the creek. The potential for release to soil and groundwater is dependent on the integrity of the units.	Determine the integrity of the sump and drain. If the integrity is impaired, conduct soil sampling in the area beneath the sump to determine if hazardous constituents have been released.
36. Black Tie Storage Area	The potential for release to air is low since most of the volatile constituents have dissipated since drying occurs at the Drip Track (SWMU 34). The potential for release due to subsurface gas generation is low due to the above-ground location of the unit. The potential for release to groundwater and soil is high due to observed soil staining during the VSI. The potential for release to surface water is low due to the distance to the Luxapalila Creek.	Conduct soil sampling in the area beneath the treated wood and at points of observed staining to determine if hazardous constituents have been released. Construct containment for these areas to prevent ongoing releases.

TABLE 7

SUMMARY OF CONCLUSIONS AND SUGGESTED FURTHER ACTION (Continued)

SWMU/AOC	Potential for Release	Suggested Further Action
37. Drainage Ditches	The potential for release to soil and groundwater is high based on observed soil staining. The potential for release to surface water is high because this unit drains directly to the creek. The potential for release to air and for subsurface gas generation is low due to the dilute nature of the waste.	Conduct soil sampling in the area of observed soil stains to determine if hazardous constituents have been released. Based on these results, sediment sampling may be warranted.
38. Cooling Tower Surface Impoundment	The potential for release to air, surface water and from subsurface gas generation is low due to the discontinued use of the units. The potential for release to soil and groundwater is high due to the unlined nature of the units and shallow groundwater.	Conduct a subsurface investigation to determine the nature, rate, and extent of contamination.

V. SUGGESTED SAMPLING STRATEGY

This section summarizes the suggested plan for sampling environmental media at SWMUs and AOCs where past or continuing potential for release exists. This information is summarized and presented in Table 8. Implementation of any suggested sampling and analysis should be closely coordinated with MDNRBPC.

TABLE 8

SAMPLING APPROACHES FOR SOLID WASTE MANAGEMENT UNITS AND OTHER AREAS OF CONCERN

SWMU or Other AOC	Suggested Sampling Approach
10. Work Tank 3 11. Work Tank 4 12. Work Tank 5 14. Sap Tank 15. Sump for Tank Car 16. Vapor Tank Sump 23. Secondary Dual Compartment Oil/Water Separator	Surface and shallow subsurface soil samples should be collected in the areas of observed staining and at points where drainage/runoff from the unit would be likely to occur. Samples should be analyzed for creosote constituents.
30. Sand Filter Bed 1 31. Sand Filter Bed 2 32. Waste Pile 1 33. Waste Pile 2	Sample the surface soil using a random grid in the former location of the units. In addition, for the Sand Filter Beds, collect subsurface soils. The depth of soil cores should be at least the estimated depth of the unit. Analyze the samples for Appendix IX semi-volatiles.
36. Black Tie Storage Area	Surface and shallow subsurface soil samples should be collected from beneath the treated wood and in areas of observed staining. Samples should be analyzed for creosote constituents.
37. Drainage Ditches	Surface and shallow subsurface soil samples should be collected in the areas of observed staining and at intervals along the entire length of the ditch. Samples should be analyzed for creosote constituents and the semivolatiles fraction of Appendix IX.

VI. REFERENCES

1. Mississippi Bureau of Pollution Control, Report of Inspection, Wood Preservers, Kerr-McGee Chemical Corporation, Forest Products Division, February 16, 1984.

2. Permit to Operate Air Emissions Equipment, Kerr-McGee Chemical Corporation, Forest Products Division, issued by State of Mississippi, July 22, 1986; Expires on August 1, 1989; Permit No. 1680-00020.

3. Correspondence from P.C. Gaskin, Kerr-McGee Chemical Corporation to William Spengler, MDNR, Bureau of Pollution Control; Re: Application for a State Operating Permit; October 29, 1984.

4. Kerr-McGee Chemical Corporation, Forest Products Division; Application for a State Operating Permit submitted to MDNRBPC, October 29, 1984.

5. "Proposed Changes in the Handling and Treatment of Process Wastewater at the Columbus, Mississippi Plant"; Prepared for Kerr-McGee Chemical Corporation, Forest Products Division by Continental Engineering Service (No Date).

6. "Groundwater Quality Assessment Plan," Kerr-McGee Chemical Corporation, Forest Products Division; Prepared by Roy K. Widmann, Kerr-McGee Corporation, Engineering Services Division; March 19, 1984.

7. "Impoundment Closure Report," Kerr-McGee Chemical Corporation, Forest Products Division; October 1986.

8. Kerr-McGee Chemical Corporation, Forest Products Division, Columbus, Mississippi Facility EPA I.D. No. MSD 990866329 Post-Closure Permit Application Volume I, March 12, 1987.

9. Correspondence from Undine Johnson, MDNR, Hazardous Waste Division to E.L. Creekmore, Kerr-McGee Chemical Corporation; Re: Kerr-McGee Chemical Corporation MSD 990866329 Inspection of June 24, 1987; July 16, 1987.

10. Correspondence from Charles Estes, MSDNR, Hazardous Waste Division, to Craig Brown US EPA, Waste Engineering Section; Re: Detection of Groundwater Contamination at the Kerr-McGee Chemical Corporation; September 25, 1987.

11. Correspondence from Jeffrey H. Bull, Kerr-McGee Chemical Corporation, Hazardous Waste Division, to Chuck Estes, MSDNR, Bureau of Pollution Control, Re: Kerr-McGee Corporation, Forest Products Division. Ground Water Monitoring Program; September 2, 1987.

12. Memorandum from Craig Brown, ALMS Unit, WES to Doyle Britain, West Unit, WCS Re: Discovery of Groundwater Contamination at Kerr-McGee, Columbus, Mississippi; September 14, 1987.

13. Groundwater Quality Assessment Plan, Kerr-McGee Chemical Corporation Forest Products Division Columbus, Mississippi, Prepared by S.M. Logan, Manager of Hydrology prepared for Nancy Jones MDNRBPC; September 25, 1987.

14. Correspondence from Jeffrey H. Bull, Kerr-McGee Chemical Corporation, Forest Products Division to Nancy E. Jones MDNRBPC, Re: Post-Closure Plan for the Kerr-McGee Chemical Corporation; November 6, 1987.

15. Kerr-McGee Chemical Corporation, Forest Products Division, Columbus, Mississippi, Wood Preserving Facility, Closure Plan for Hazardous Waste Surface Impoundments prepared for MDNRBPC; November 6, 1987.

16. State of Mississippi Water Pollution Control Permit to Operate a Waste Disposal System in accordance with National and State Pretreatment Standards; issued May 1, 1984; Expires April 30, 1987; Permit No. P790021.

17. Solid Waste Management Units Response Letter, submitted to US EPA. Date of submission not specified.

18. Part A Permit Application for Kerr-McGee Chemical Corporation submitted to US EPA Region IV; November 13, 1980.

19. U.S. Department of Agriculture, Soil Conservation Service. Soil Survey of Lowndes County, Mississippi, issued September 1979.

20. Blueprint For Documenting Compliance with the RCRA Amendments of 1984 - February 1, 1985; February 13, 1985.

21. Visual Site Inspection of the Kerr McGee facility, conducted by A.T. Kearney on June 23, 1988.

22. Phase I Drilling Results, Kerr-McGee Chemical Corporation, Forest Products Division Columbus, Mississippi, prepared by Stephen F. Loosbrock, submitted to MDNRBPC, June 21, 1988.

23. Post-Closure Permit Application Volume II, March 12, 1987, Kerr-McGee Chemical Corporation, Forest Products Division, Columbus, Mississippi Facility EPA I.D. No. MSD 990866329.

24. Annual Ground-Water Monitoring Report for 1987 Kerr-McGee Chemical Corporation, Forest Products Division Columbus. Mississippi EPA I.D. No. MSD 990866329, submitted to Mr. C. Estes MDNRBPC, March 1, 1988.

25. Impoundment Closure Report, Kerr-McGee Chemical Corporation, Forest Products Division Columbus, Mississippi Facility October 15, 1986.

26. Technical Reports for Kerr-McGee Chemical Corporation P.O. Box 25861, Oklahoma City, OK 73125 January 16, 1988.

27. Topographic map of Columbus North Quadrangle, Mississippi, 7.5 minute series, 1987.

ATTACHMENT A

VISUAL SITE INSPECTION SUMMARY AND PHOTOGRAPH LOG

APPENDIX A

VISUAL SITE INSPECTION SUMMARY AND PHOTOGRAPH LOG

This VSI summary and photograph log summarizes the activities and observations of representatives of A.T. Kearney, Inc. and Mississippi Department of Natural Resources, Bureau of Pollution Control during the June 23, 1988 visual site inspection of the Kerr-McGee Chemical Corporation, Forest Product Division in Columbus, Mississippi.

VSI SUMMARY

The following individuals were present for all of the VSI:

Names	Representing
Lata Venkateshwara	A.T. Kearney, Inc.
Dorothy LaRusso	Kearney/Centaur
David J. Bockelmann	MDNRBPC
E.L. Creekmore	Kerr-McGee Chemical Corporation
Jeffrey Bull	Kerr-McGee Chemical Corporation

An opening meeting was held at 8:15 a.m. on June 23 to discuss the purpose of the site visit and the planned itinerary. Jeffrey Bull briefly described the treating operations and waste streams generated at Kerr-McGee, and indicated the locations of SWMUs listed in the VSI agenda. After a discussion of the intent of the inspection and the RFA process, a tour of the facility and the SWMUs began.

The tour of the facility was concluded at 1:00 p.m. with a close-out meeting on June 23. The close-out meeting included a request for results from the soil removed from the Drip Track (SWMU 34).

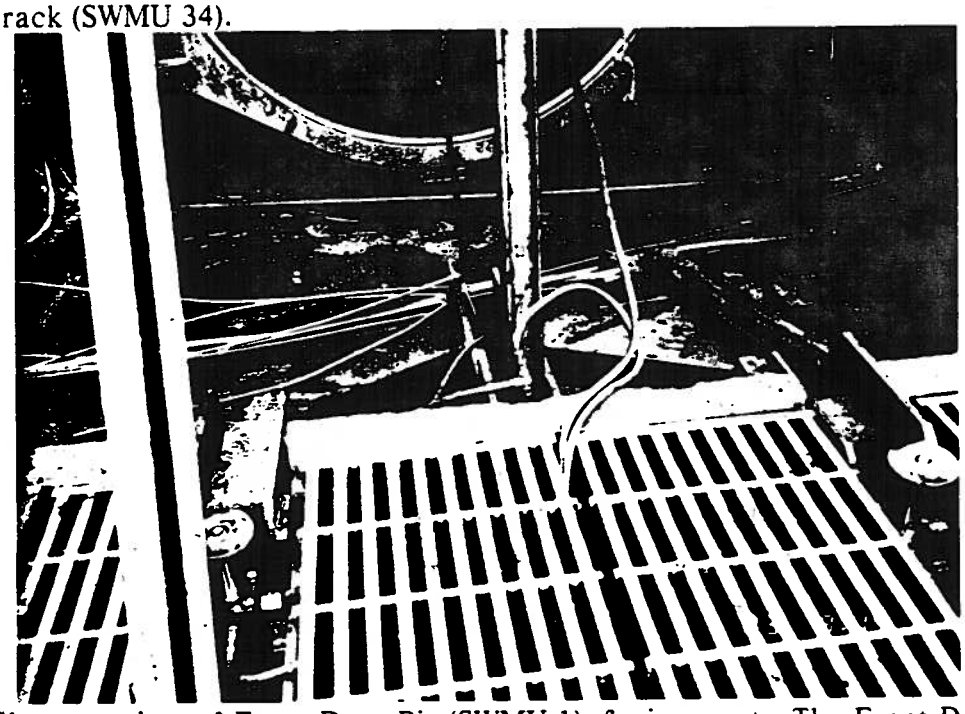
The weather during the VSI was hot and humid. Temperatures ranged from the low 80s to high 80s. HNu readings were taken at each SWMU and AOC at the facility. An HNu was used to monitor the organic vapors emanating from the units. This instrument was used for personnel safety, identification of unsafe working

conditions, and required levels of respiratory protection. This instrument detects total concentrations of many organic and inorganic gases and vapors in parts per million. The range of values detected during the VSI were 0.5 ppm to 20 ppm.

PHOTOGRAPH LOG

The photographs on the following pages document the observations made during the VSI. Dorothy LaRusso took the photographs using a Kodak Medalist VRG 35 with Kodak VR 100 ASA color print film. The photographs are provided to identify various observations of a unit. The photographs are identified by a number or letter which corresponds to the appropriate SWMU or AOC. The time and date of each photograph and when it was taken is provided on the right. In instances where several photographs are provided of one unit, these are designated with a number to the right of the decimal following the identifying number. For example, Photograph 10.2 is the second photograph taken of SWMU 10.

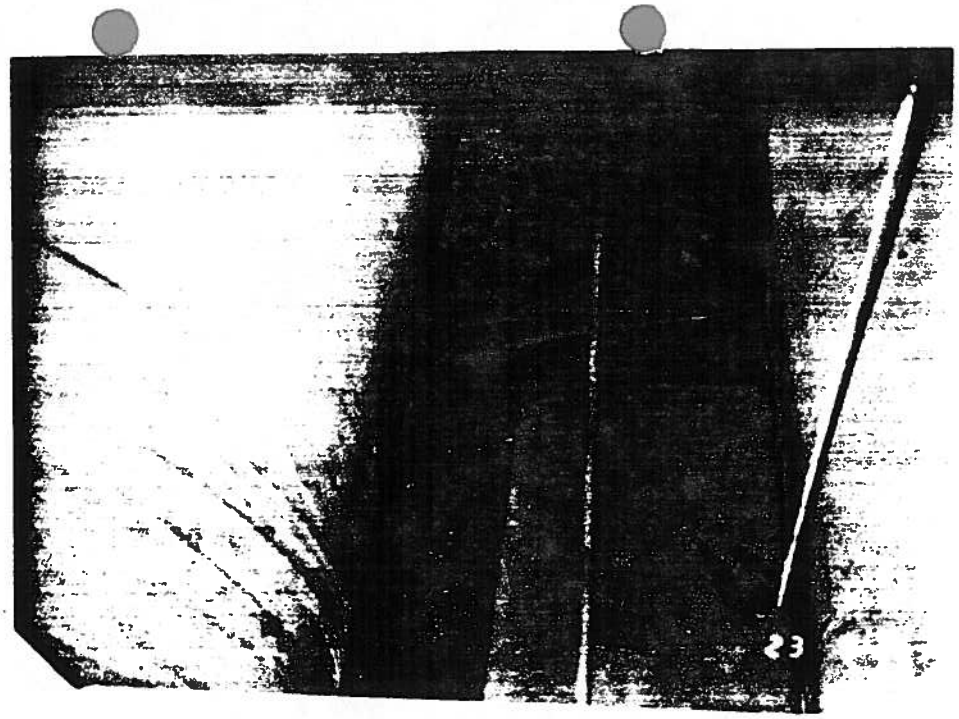
1.1 Overview of Front Door Pit (SWMU 1), facing west. The three pressure cylinders are located behind this unit. Work Tank 1 (SWMU 8) and Work Tank 2 (SWMU 9) are located immediately to the left and the Drip Track (SWMU 34) is in the foreground. Note the extensive staining on the Drip Track (SWMU 34).



1.2 Close-up view of Front Door Pit (SWMU 1), facing west. The Front Door Pit South Sump (SWMU 2) is located to the left (not in photograph) and the Front Door Pit North Sump (SWMU 3) is located to the right (not in photograph).

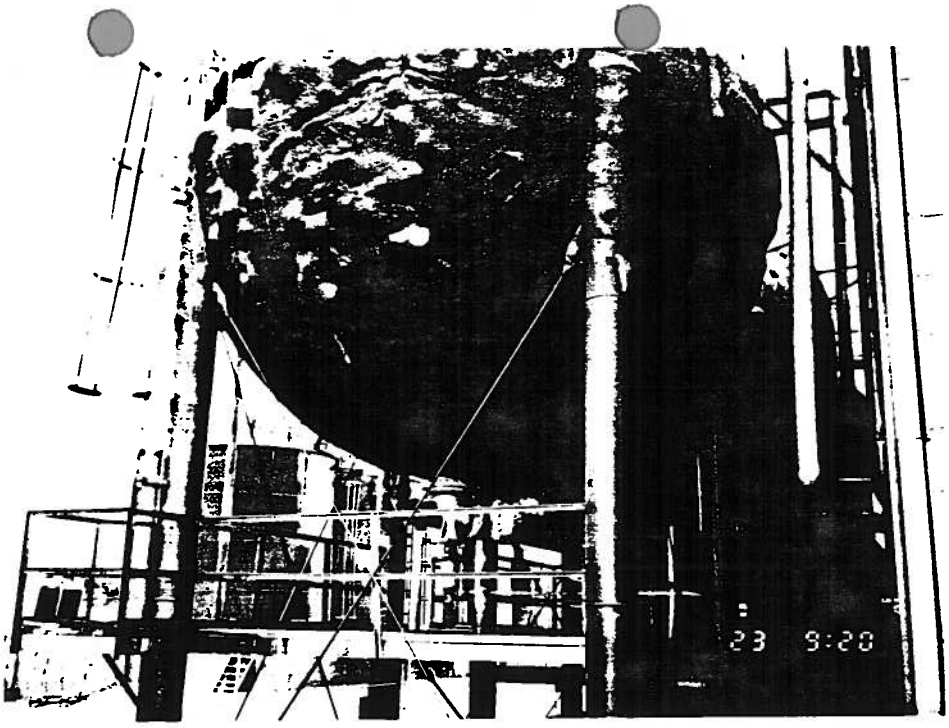
2. No photograph of the Front Door Pit North (SWMU 2) was available. The unit is located to the right of the Front Door Pit (SWMU 1) in photograph 1.2.

3. No photograph of the Front Door Pit South Sump (SWMU 3) was available. This unit is located to the left of the Front Door Pit (SWMU 1) in photograph 1.2.

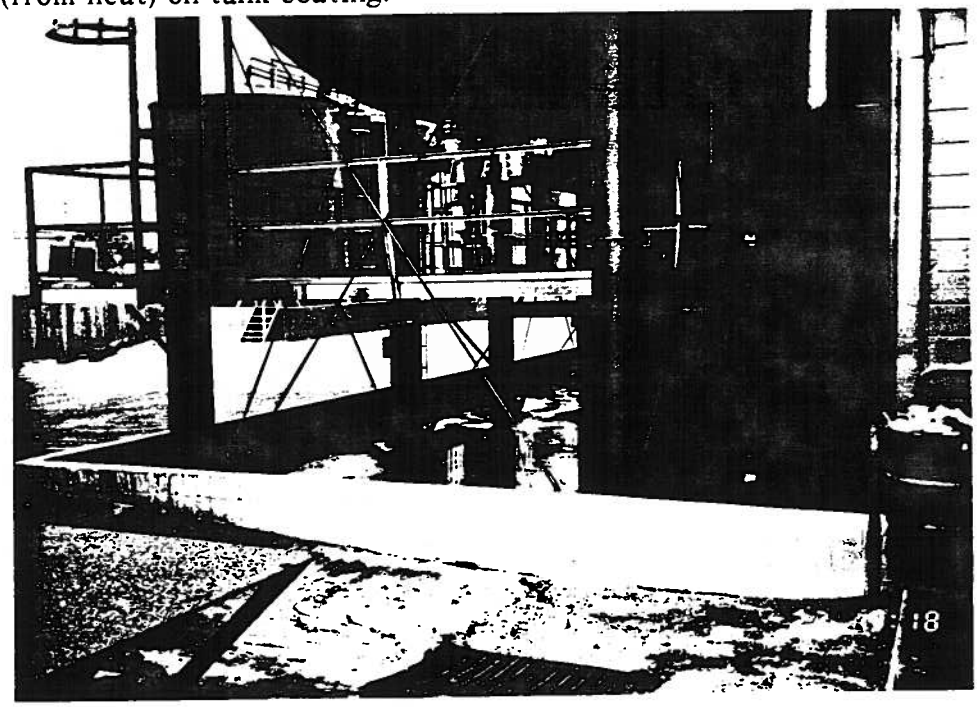


4. Close-up view of the Retort Sump (SWMU 4) between the two pressure cylinders. Note creosote residue on the concrete beneath the left cylinder.

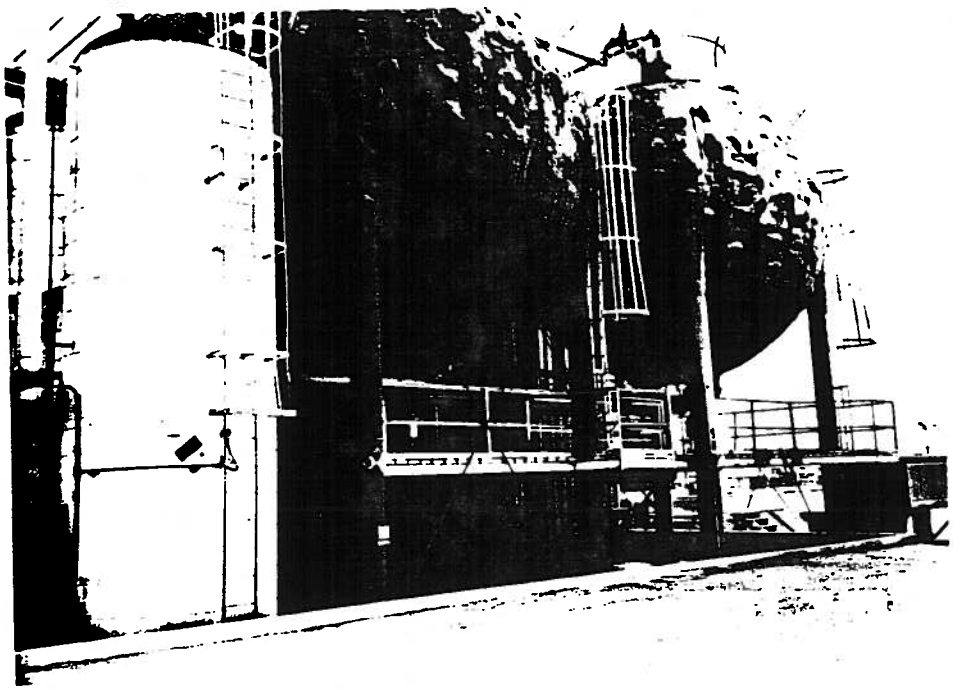
5., 6., 7. No photographs were available for these units. The exact location of Drip Collection Tank 1 (SWMU 5), Drip Collection Tank 2 (SWMU 6) and Drip Collection Tank 3 (SWMU 7) are not known. Facility personnel speculate they are located beneath the pressure cylinder, shown in Photograph 4.



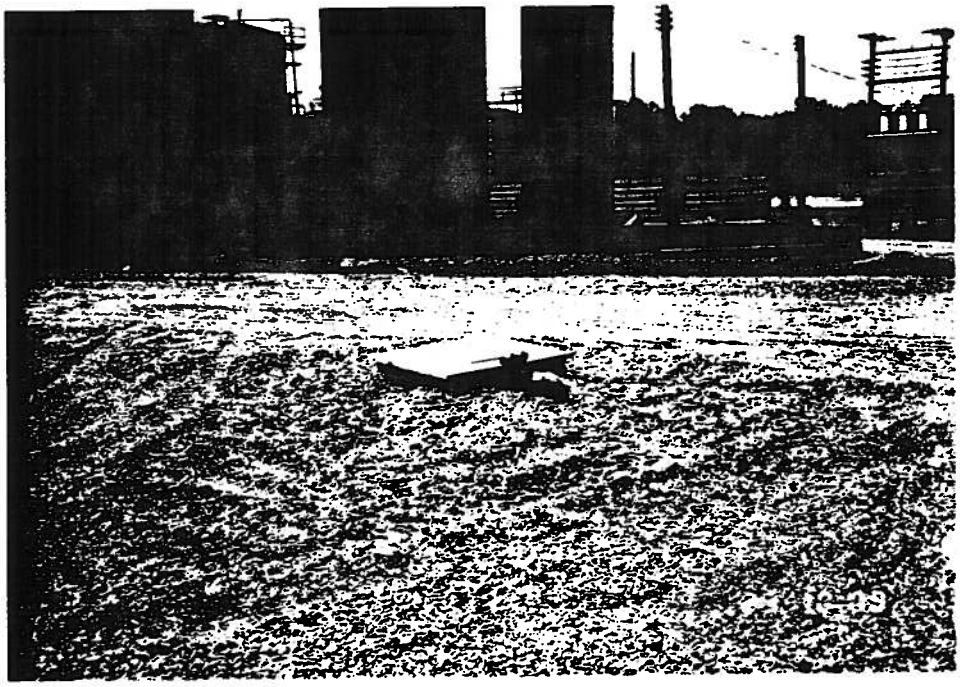
8.1 View of Work Tank 1 (SWMU 8) located in the foreground and Work Tank 2 (SWMU 9) located to the right in the background, facing south. The raw creosote storage area is to the left in the background. Note blistering (from heat) on tank coating.



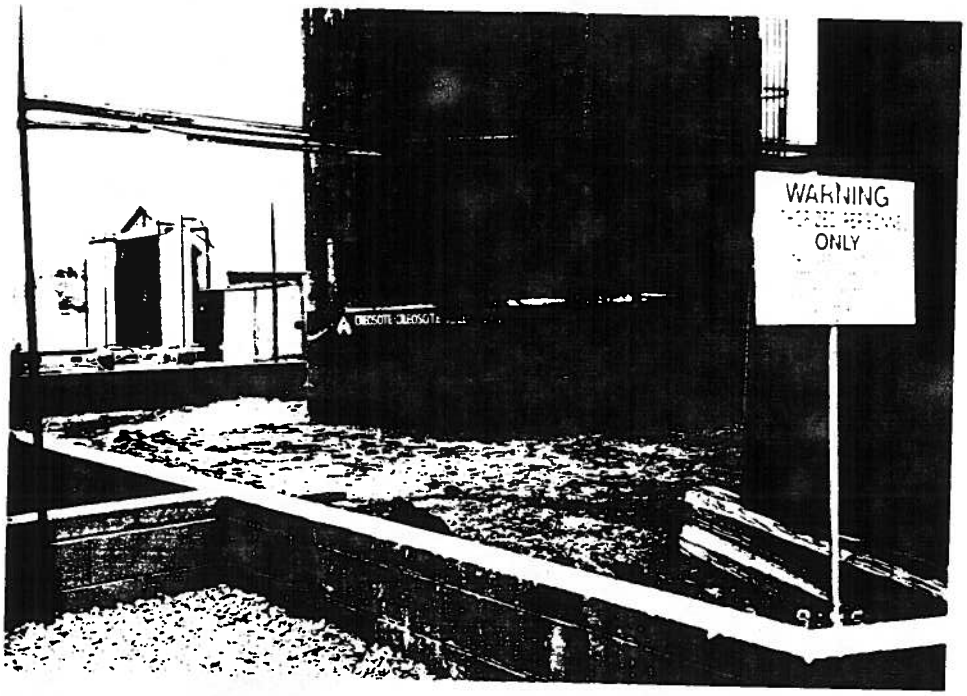
8.2 Close-up view of the containment area surrounding Work Tank 1 (SWMU 8) and Work Tank 2 (SWMU 9), facing south. Note the heavy stains on the concrete under the tanks. These stains have accumulated over time and the facility periodically steam cleans this area.



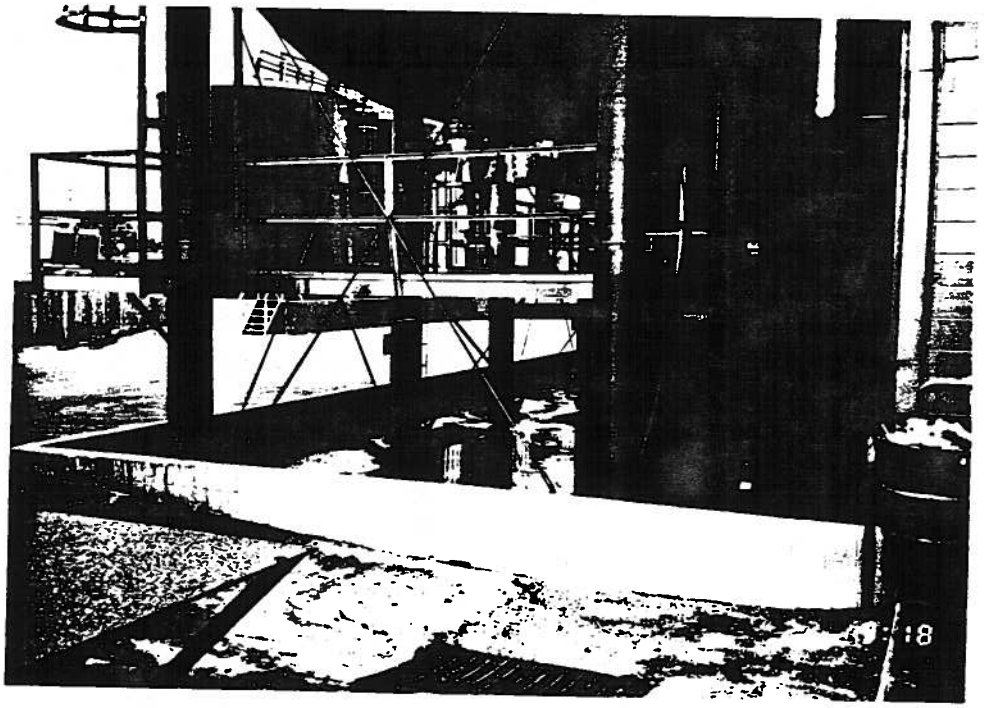
9. View of Work Tank 2 (SWMU 9) located in the center and Work Tank 1 (SWMU 8) is located to the extreme right, facing north. Note the vents on top of the tanks. The tank coating is blistered from excessive heat. The white tank to the left is the reuping tank which is an intermediate tank in the creosote transfer process.



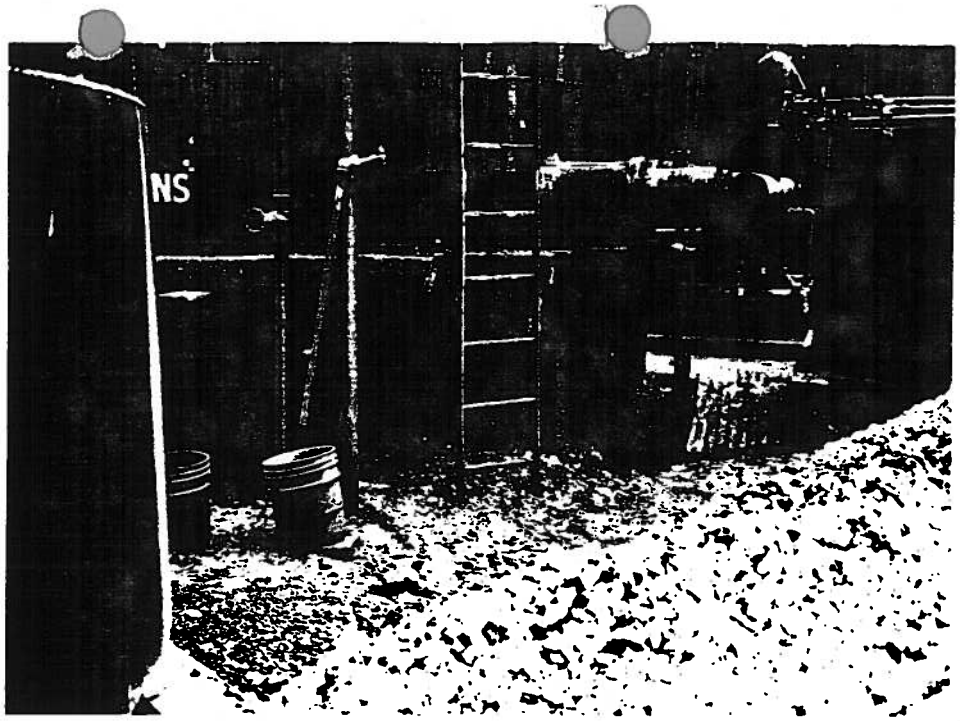
10., 11. Overview of Work Tank 3 (SWMU 10) located to the left, Work Tank 4 (SWMU 11) located to the rear, and Work Tank 5 (SWMU 12) located to the right, facing south.



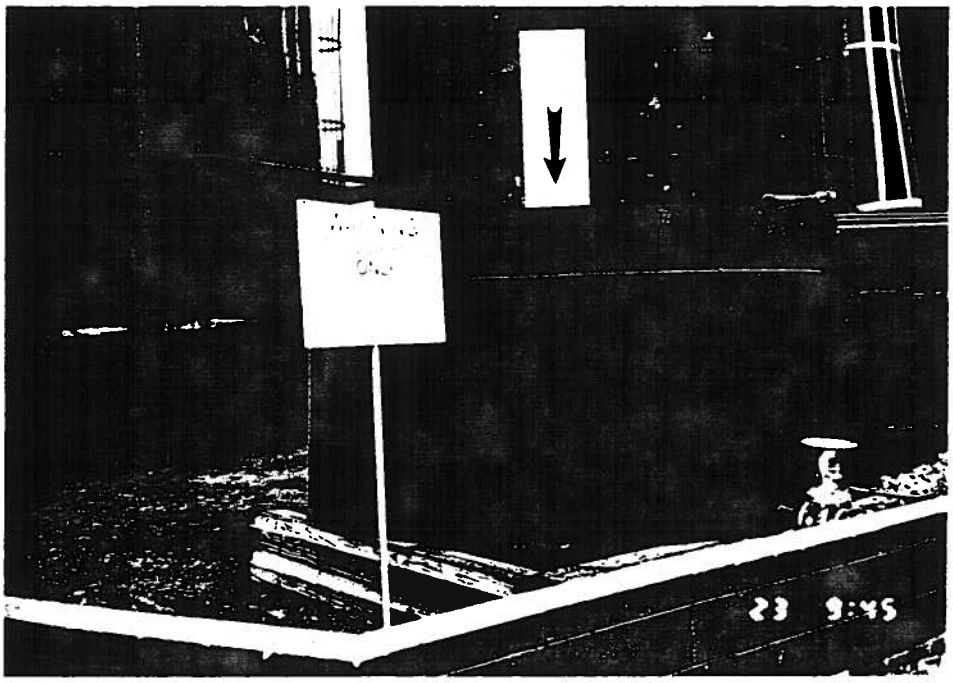
12. Close-up view of Work Tank 5 (SWMU 12) in the center and Work Tank 4 (SWMU 11) is to the extreme right background, and Sap Tank (SWMU 14) in the right foreground, facing west. Note spillage Work Tank 5 (SWMU 12) and the soil staining around the units.



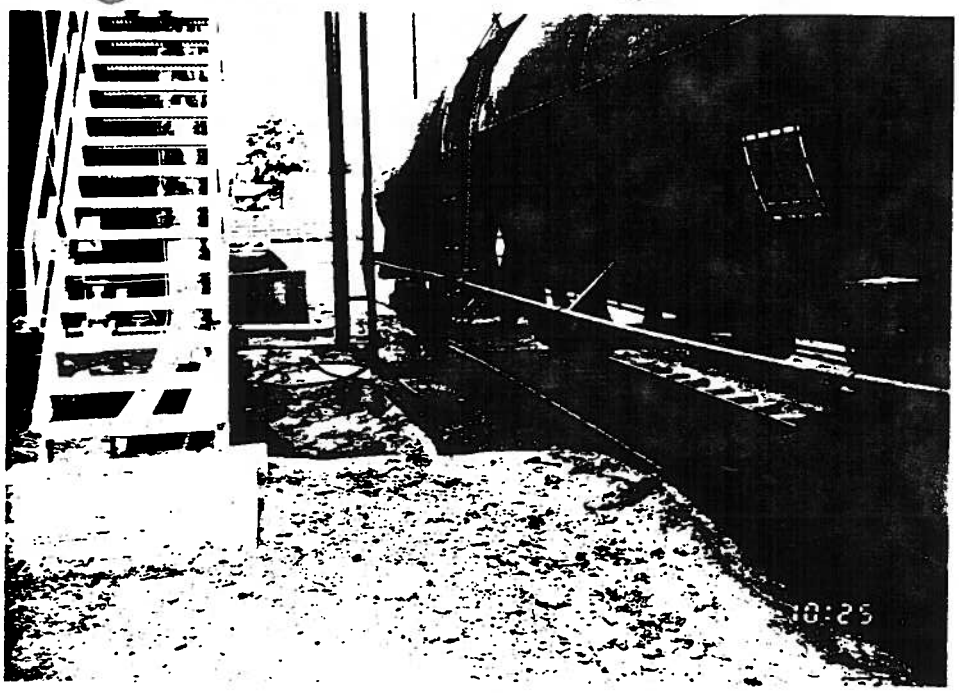
13.1 View of the Overhead Pipes (SWMU 13) connecting Work Tank 1 (SWMU 8) and Work Tank 2 (SWMU 9) to the retort area. Note creosote drippage on the concrete beneath the tanks.



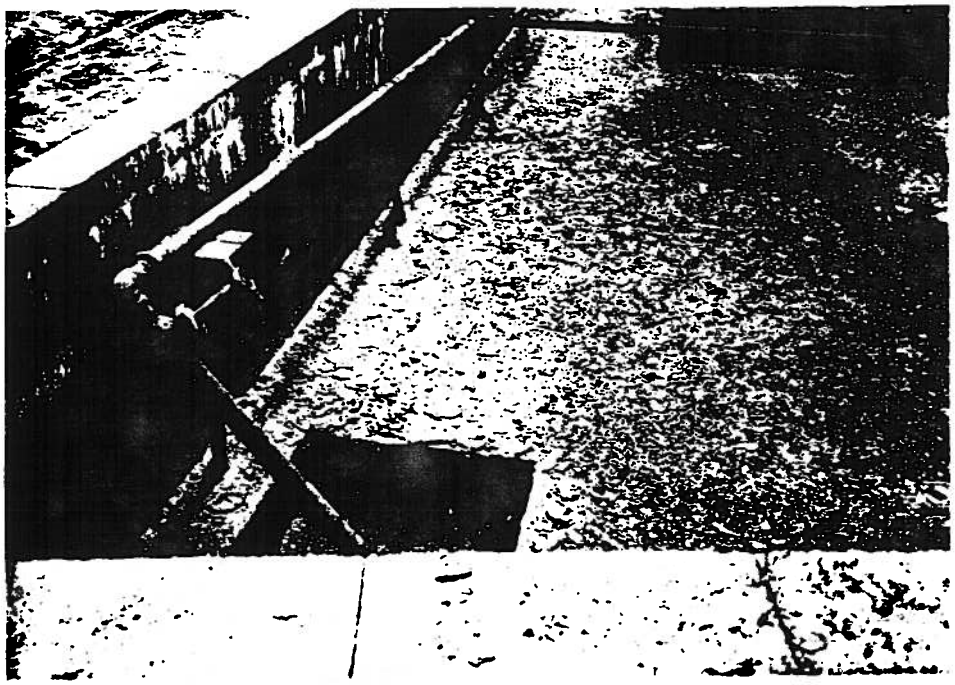
13.2 View of the Overhead Pipes (SWMU 13) connecting Work Tank 4 (SWMU 11) to the retort area, facing east. Note soil staining in the area around the tanks.



14. View of the Sap Tank (SWMU 14) (indicated by arrow). This tank is elevated above ground by wooden pallets. The Work Tank 4 (SWMU 11) is behind the unit and Work Tank 5 (SWMU 12) is in the left background.

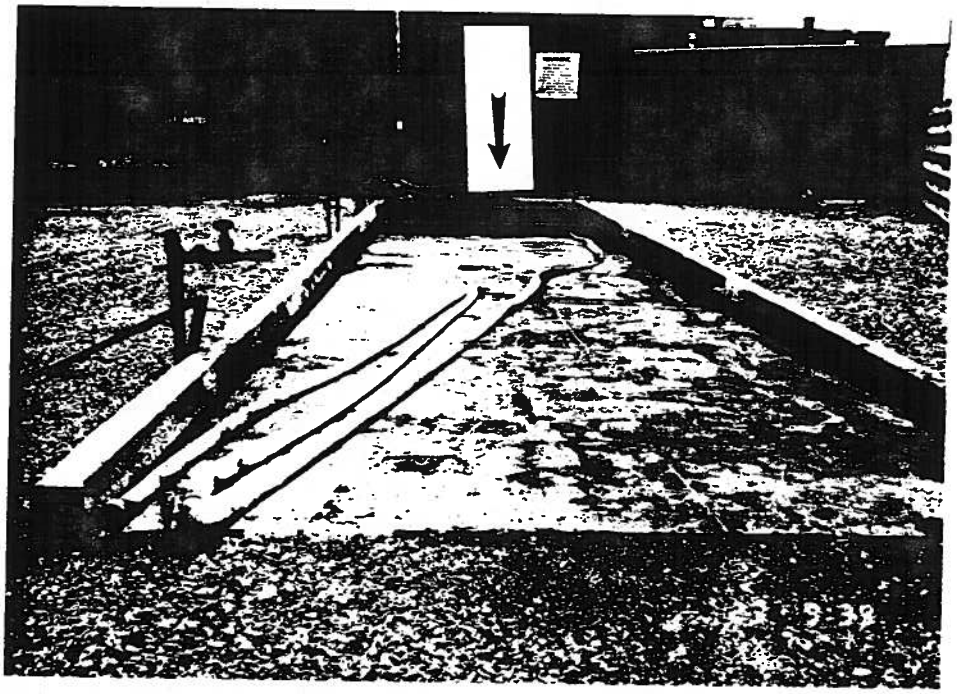


15. View of Sump for Tank Car Unloading (SWMU 15), facing east. Note the soil staining surrounding the sump.

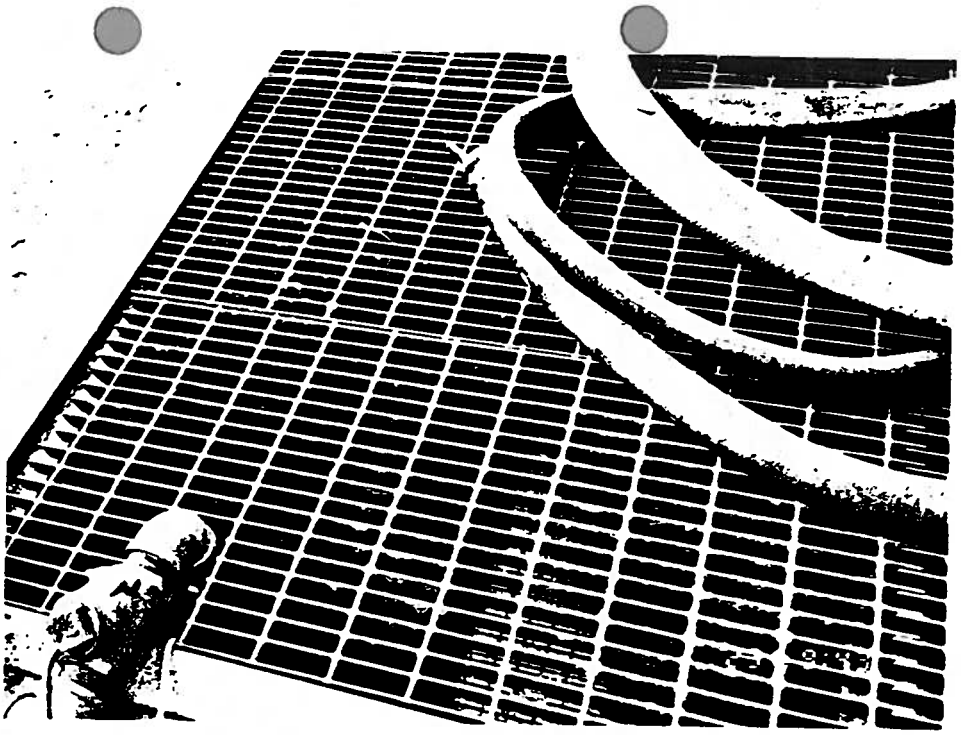


16. View of Vapor Tank Sump (SWMU 16) located in the center of the photograph. Note the residue in the sump and the four-foot high concrete berm.

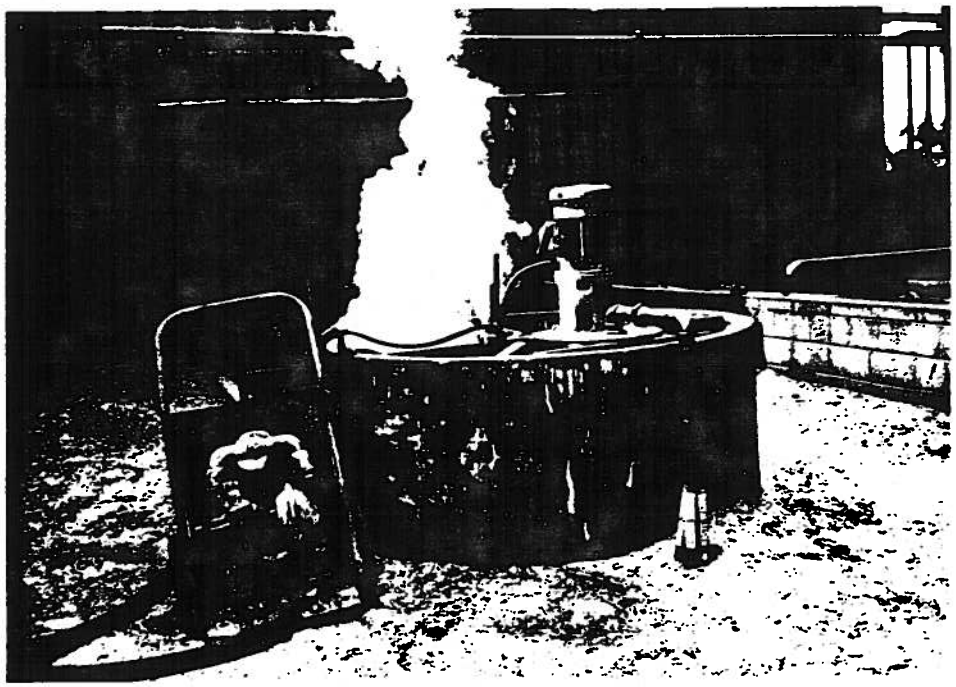
17. No photograph is available for the Wastewater Underground Pipes (SWMU 17). These pipes are located underground.



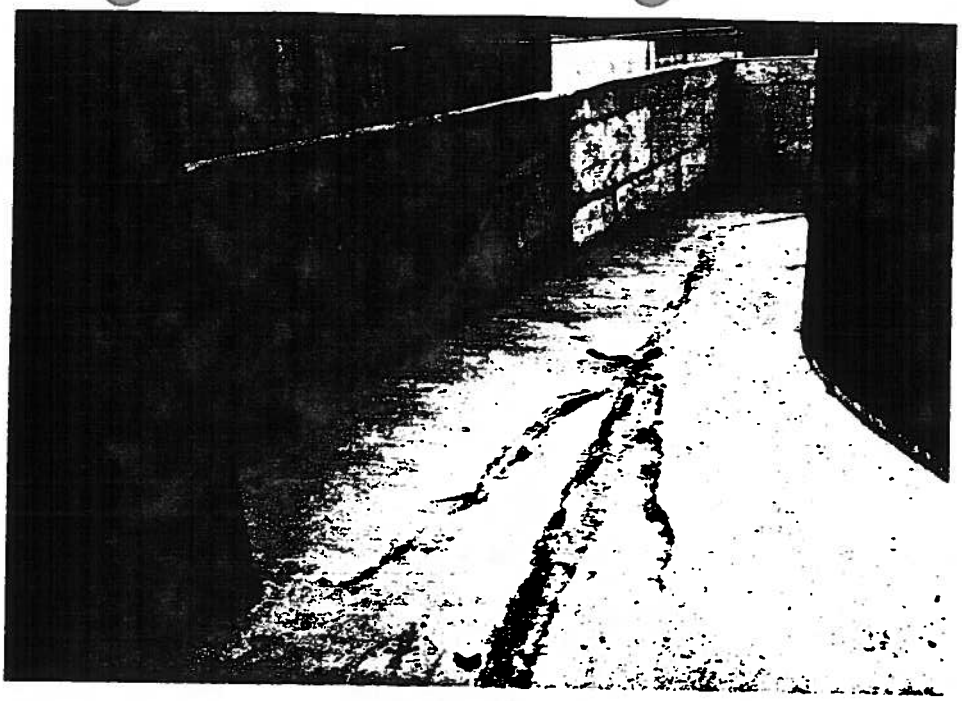
18.1 View of Truck Unloading Area Sump (SWMU 18) (indicated by arrow). The truck unloading area is in the foreground. The Sap Tank (SWMU 14) is located to the left in the background.



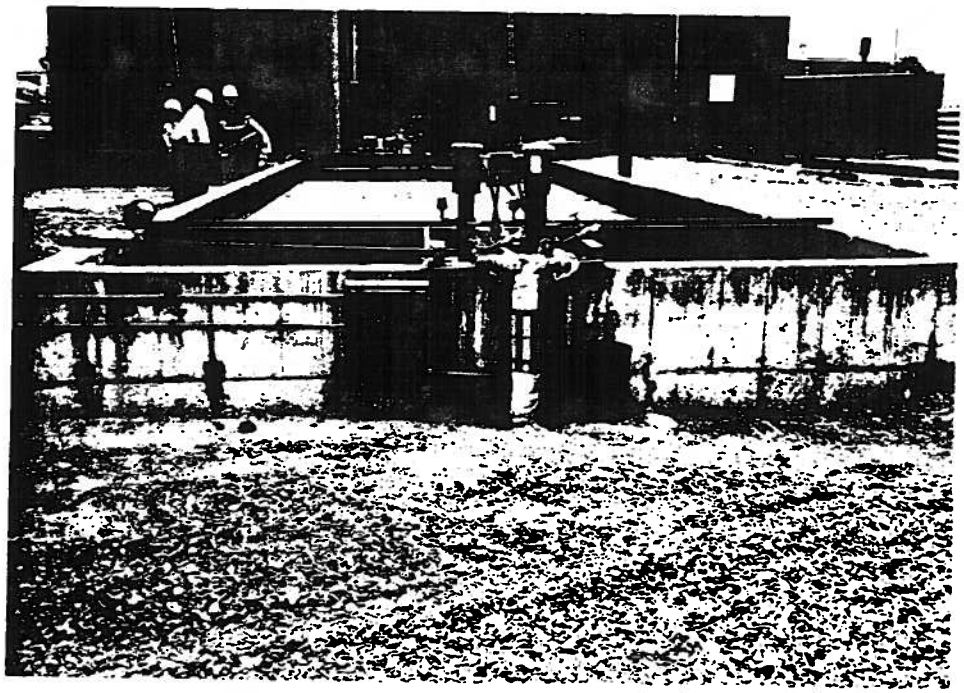
18.2 Close-up view of Truck Unloading Area Sump (SWMU 18). Note steel grate covering the unit and oily sheen of liquid inside the sump.



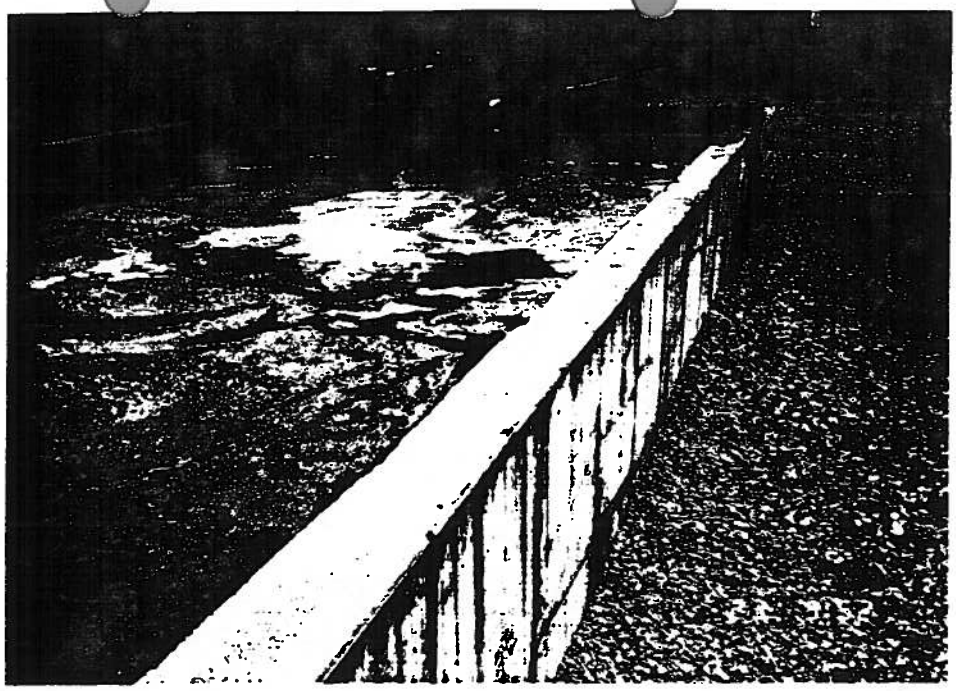
19. The Wood Boiler (SWMU 19) is inside the green building in the background. The condensor, used in the process and emanating steam is located in the foreground.



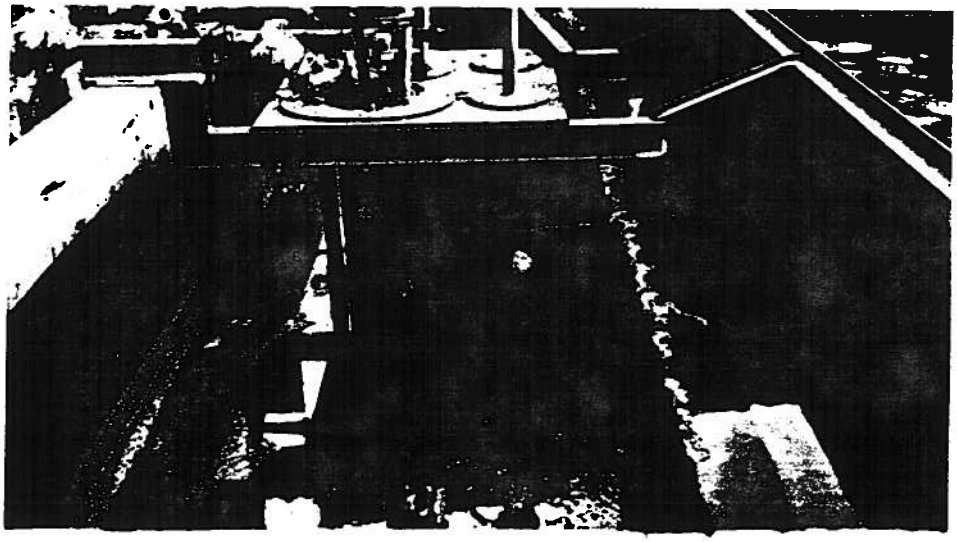
20. View of the Creosote Storage Area Sump (SWMU 20) (indicated by arrow), facing south. Note the cracks in the Creosote Storage Tank Containment Area (AOC A).



21.1 View of the Primary Oil/Water Separator (SWMU 21), facing east. Note unit is partially in ground and surrounded by soil.

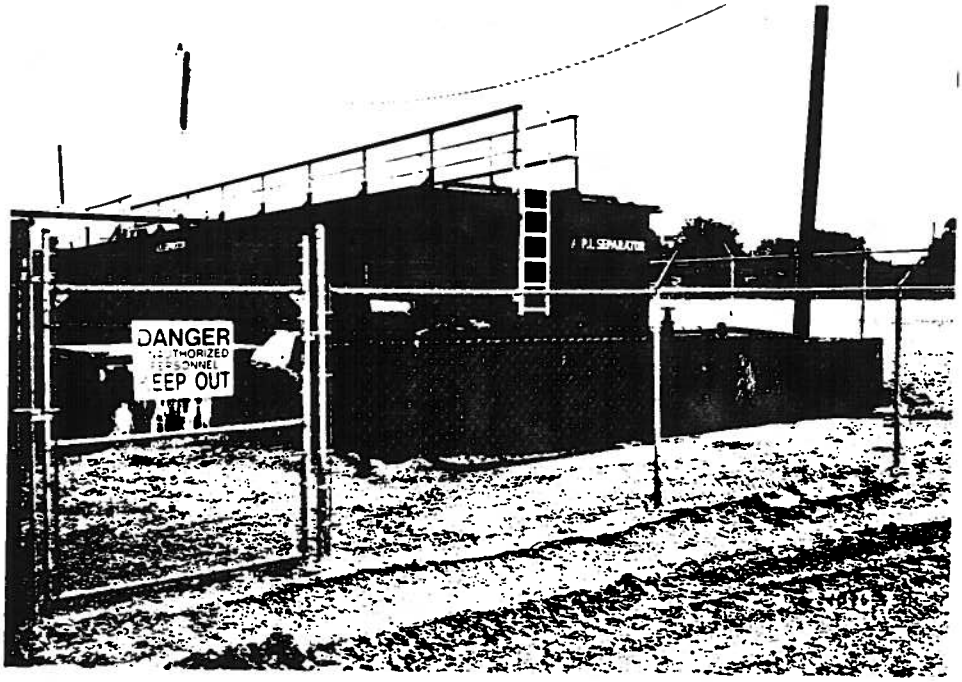


21.2 Close-up view of the Primary Oil/Water Separator (SWMU 21), facing east. Note the emulsified material on the liquid surface.

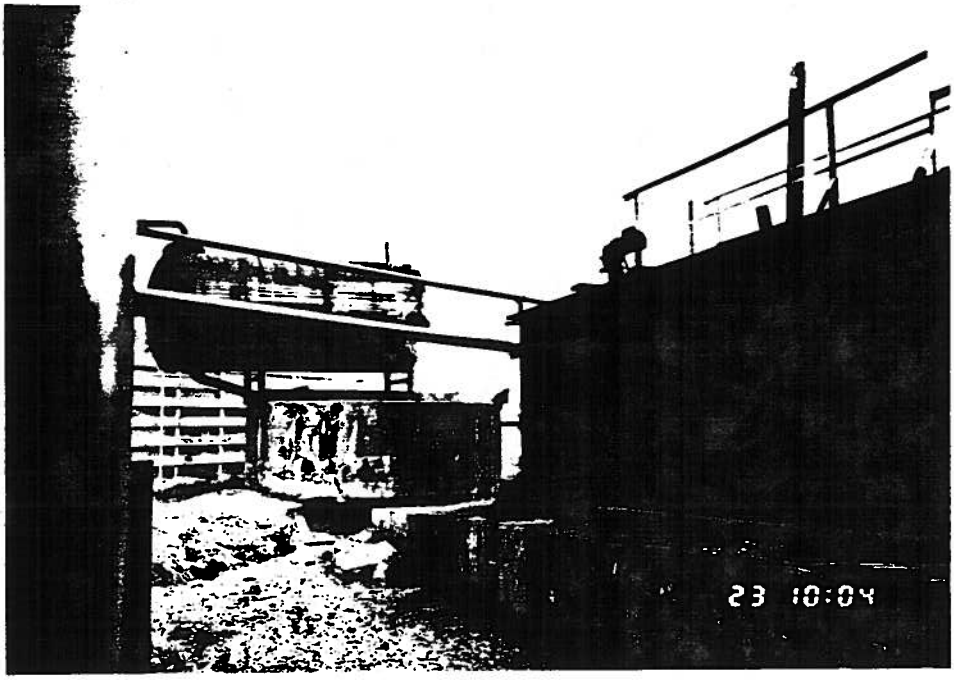


21.3 Close-up view of the Primary Oil/Water Separator (SWMU 21), facing west. Note the emulsified material on the surface of the liquid.

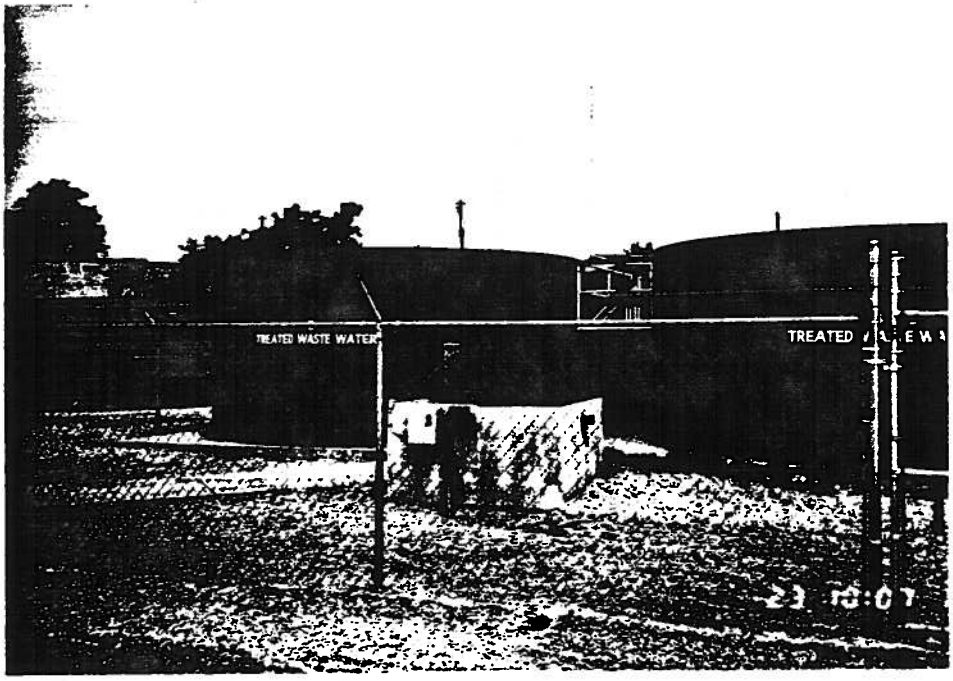
22. No photograph was available for the Polymer Addition Area (SWMU 22). This unit is located underground.



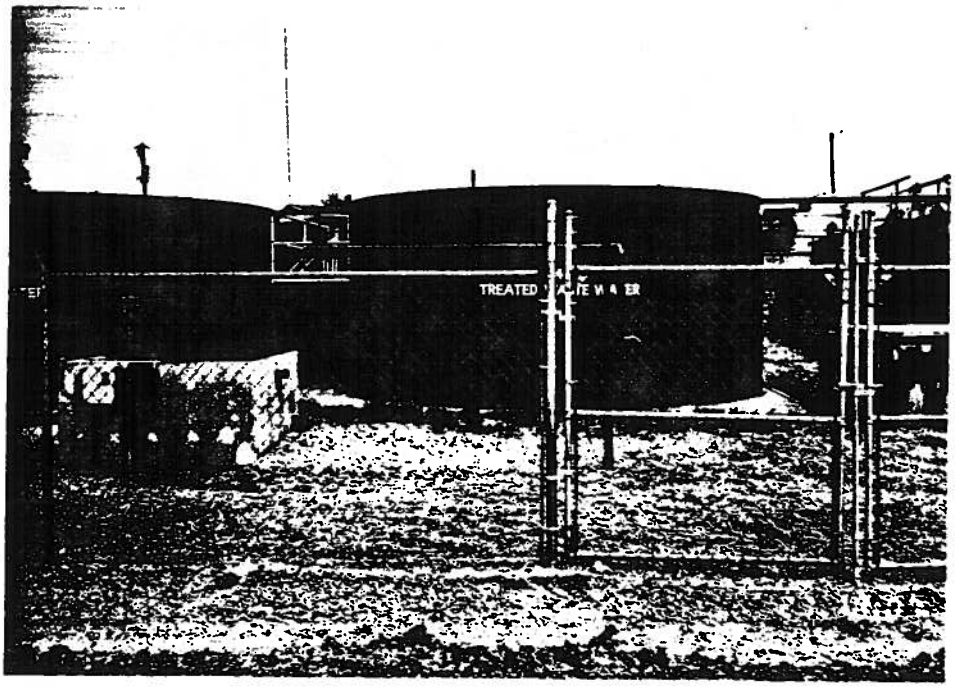
23.1 View of the Secondary Dual Compartment Oil/Water Separator (SWMU 23), facing west. Note the four-foot high concrete pad elevating the unit above the soil.



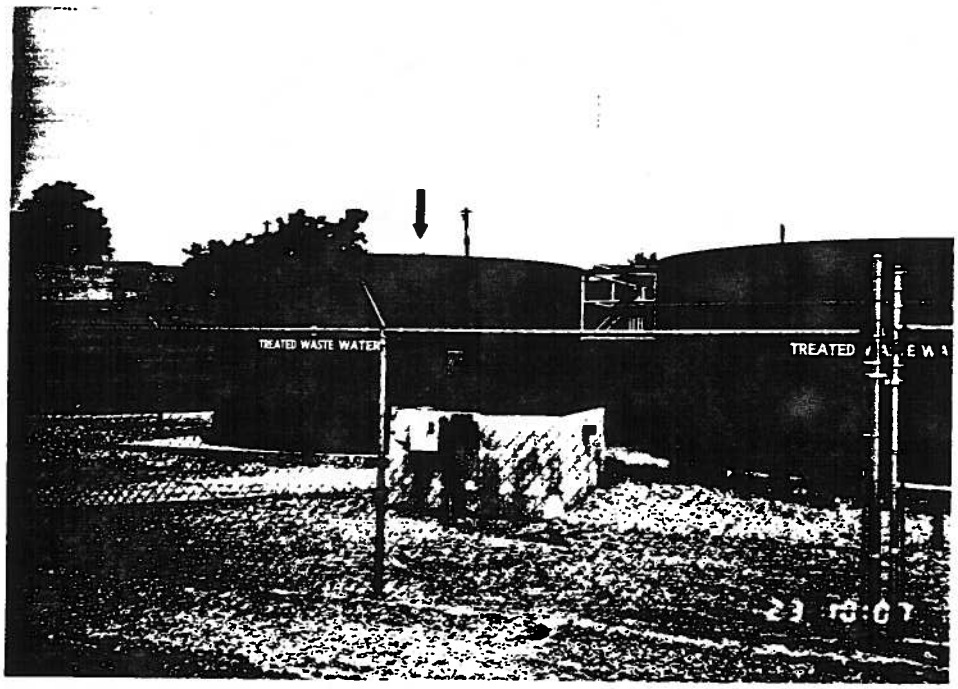
23.2 Close-up view of the Secondary Dual Compartment Oil/Water Separator (SWMU 23) facing northwest. Note the stains on the concrete pad beneath the unit and on the surrounding gravel and soil.



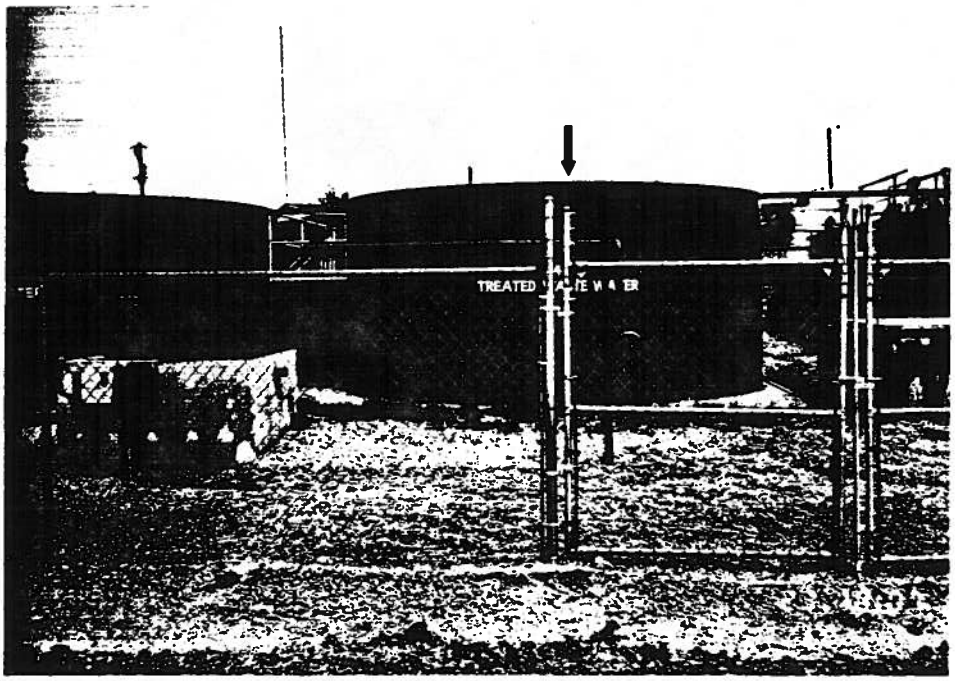
24. View of Holding Tank 1 (SWMU 24) located directly behind Holding Tank 3 (SWMU 26), facing west. Holding Tank 3 (SWMU 26) and Holding Tank 4 (SWMU 27) are located in the foreground.



25. Holding Tank 2 (SWMU 25) is located directly behind Holding Tank 4 (SWMU 27) in the foreground, facing west. Secondary Dual Compartment Oil/Water Separator (SWMU 23) is located at the extreme right background.



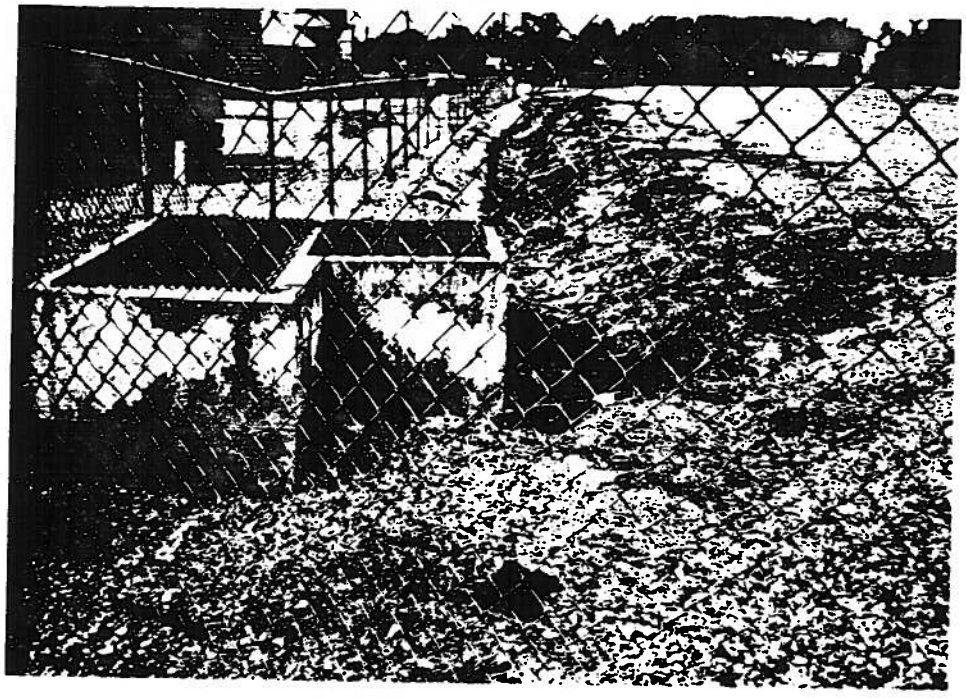
26. View of Holding Tank 3 (SWMU 26) (indicated by arrow), facing west. Holding Tank 4 (SWMU 27) is to the right. Concrete structure in foreground is wastewater discharge point to the POTW.



27. View of Holding Tank 4 (SWMU 27) (indicated by arrow), facing west. Note concrete pad, without secondary containment, beneath the tank and gravel surrounding the pad.

28.1, 29.1, 30.1, 31.1 Aeration Impoundment (SWMU 28), Sedimentation Impoundment (SWMU 29), Sand Filter Bed 1 (SWMU 30) and Sand Filter Bed 2 (SWMU 31) are located in this fenced area, facing northwest. The exact location of these units are not known. Note the Drainage Ditch (SWMU 37) in the background within the fenced area.

28.2, 29.2, 30.2, 31.2 Close-up view of Aeration Impoundment (SWMU 28), Sedimentation Impoundment (SWMU 29), Sand Filter Bed 1 (SWMU 30) and Sand Filter Bed 2 (SWMU 31) are located in this fenced area, facing northwest. Note the Drainage Ditch (SWMU 37) in the foreground.



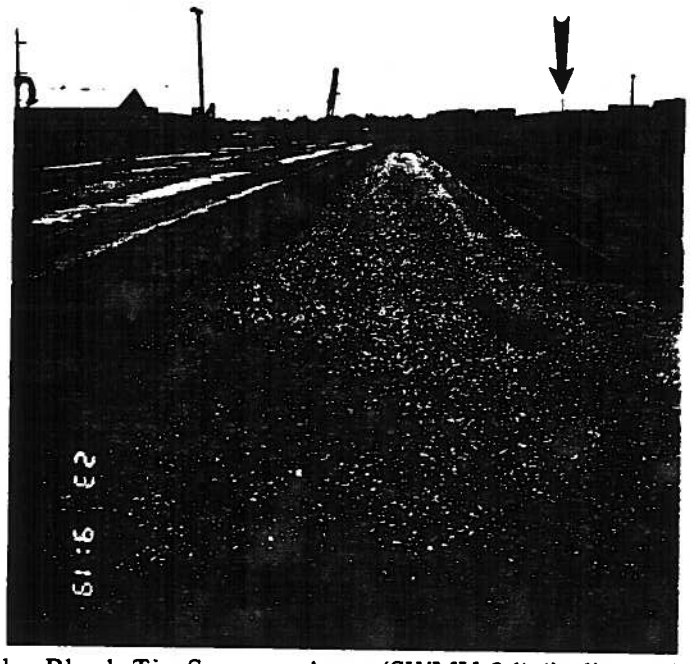
28.3, 29.3, 30.3, 31.3 Aeration Impoundment (SWMU 28), Sedimentation Impoundment (SWMU 29), Sand Filter Bed 1 (SWMU 30) and Sand Filter Bed 2 (SWMU 31) are located in this fenced area, facing south. Note the Drainage Ditch (SWMU 37) in the background with the fenced area. The concrete structure is the POTW discharge and monitoring point.

32.1 View of the Waste Pile 1 (SWMU 32) and Waste Pile 2 (SWMU 33),
33.1 facing south. The exact boundary between these units is not known. A green wood storage area is located in the background.

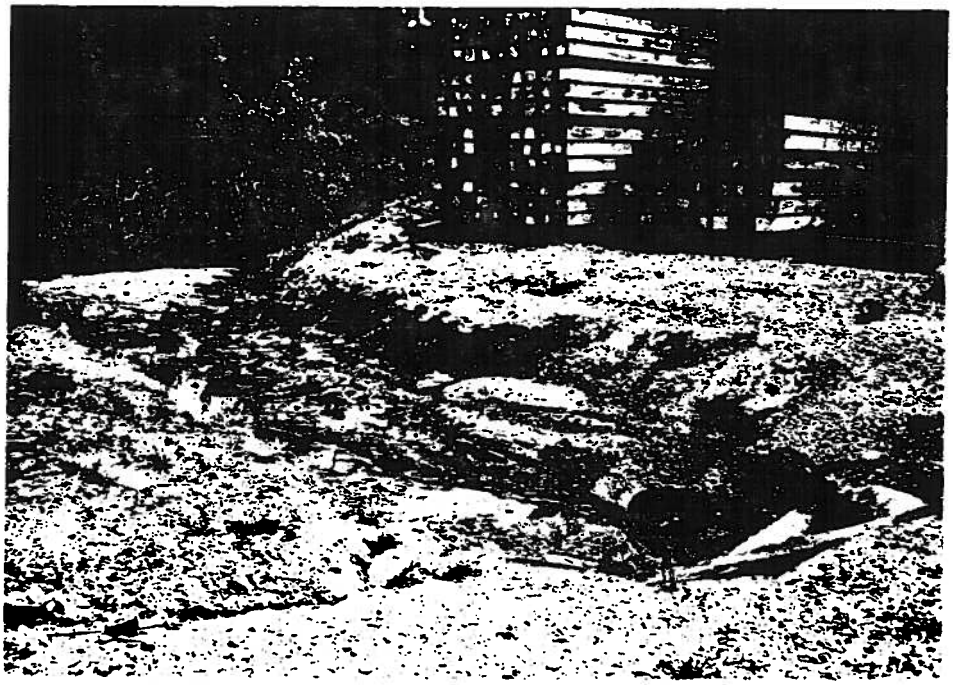
32.2, Closeup view of Waste Pile 1 (SWMU 32) and Waste Pile 2 (SWMU 33).
33.2 Note the wood debris remaining from the former unit and dark staining on the soil at upper left corner of photograph.

34. View of the Drip Track (SWMU 34), facing east. Note the creosote on the concrete between the tracks to the left and some drippage on gravel and ties to the right. The Black Tie Storage Area (SWMU 36) is located in the background. Refer to photograph 1.1 for a close-up view of the Drip Track (SWMU 34).

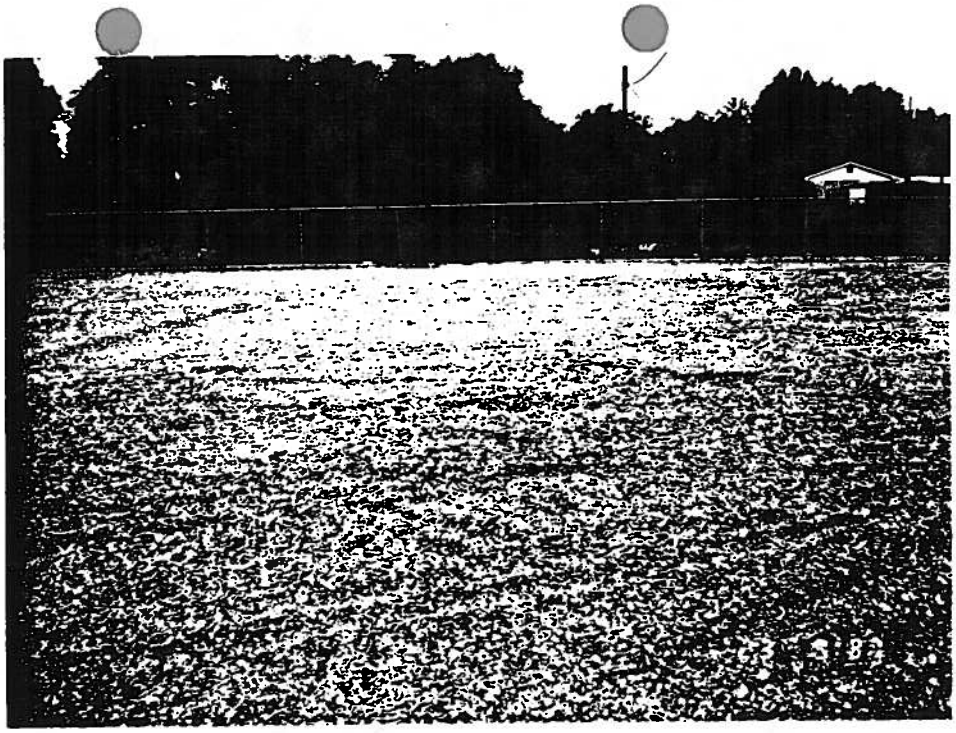
35. No photograph was available for the Drip Track Sump and Drain (SWMU 35). These units are below ground.



36. View of the Black Tie Storage Area (SWMU 36) (indicated by arrow), facing east. The Drip Track (SWMU 34) is located in the left foreground.

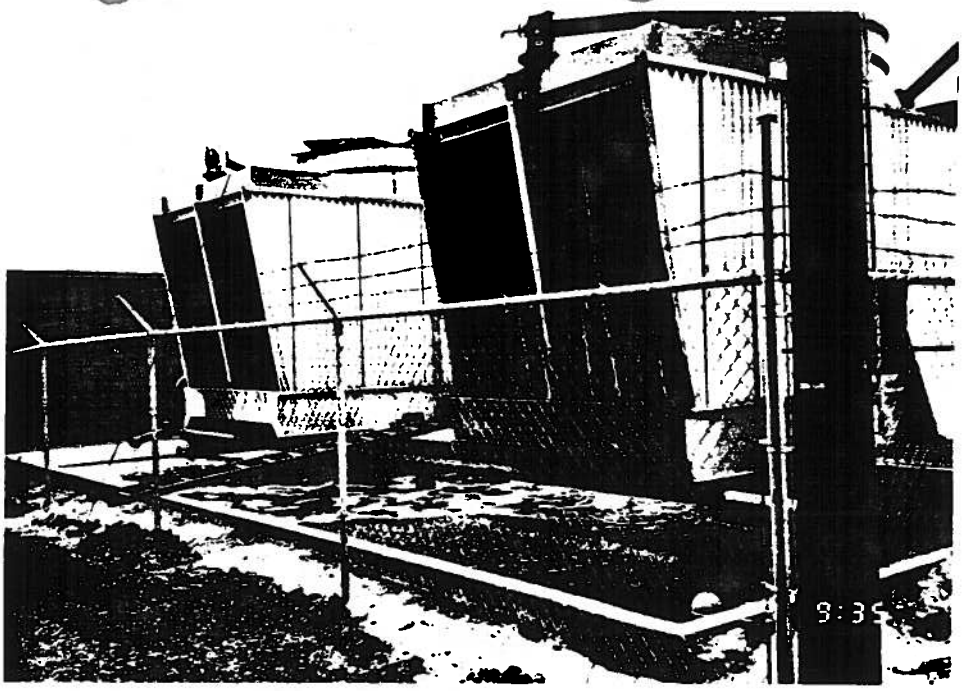


37.1 View of the Drainage Ditch (SWMU 37), facing north. Note the emulsified material on the water and sparse vegetation.

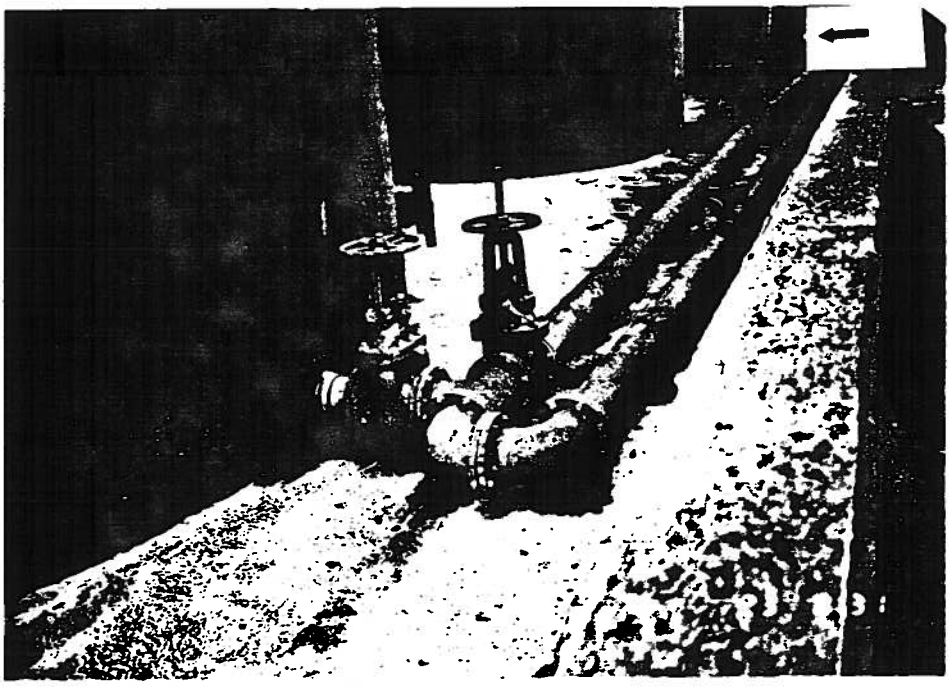


38.1 View of the closed Cooling Tower Surface Impoundment (SWMU 38), facing west. Note the close proximity of the residences in the right background.

38.2 View of the closed Cooling Tower Surface Impoundment (SWMU 38), facing west. Note the close proximity of the residences.

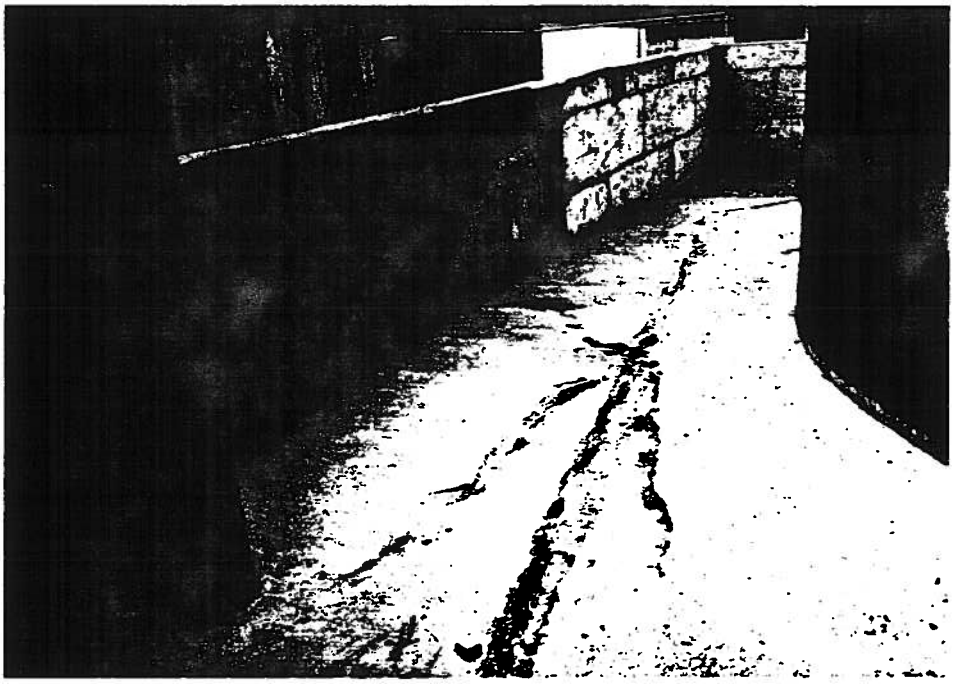


39. View of the Two Cooling Tower Basins (SWMU 39), facing southeast. Note water discharged from the cooling towers is collected in the concrete basin area.



40. View of the Rainwater Tank (SWMU 40) (indicated by arrow), last tank in the background, facing west. Note the leaks from the valves onto the Creosote Storage Tank Containment Area (AOC A).

41. No photograph was taken of this unit because it was included after the VSI.



AOC A View of the Creosote Storage Tanks (AOC A). Note the cracks in the concrete pad.

ATTACHMENT B

DESCRIPTION OF SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN WHICH HAVE A POTENTIAL FOR RELEASE

1. UNIT NAME: Front Door Pit (Photo Nos. 1.1 and 1.2)

Unit Description: This unit is an in-ground pit located in front of the retort area in the central part of the facility. This unit is constructed of concrete. The unit is 4 feet long and 2 feet wide, and is surrounded by a 6-inch high berm. Spills and leaks from the cylinders are received by this unit. The waste from this unit flows to the Front Door Pit North Sump (SWMU 2)

Operational Status: This unit is active and was constructed in 1974.

Waste Managed: This unit contains waste creosote drippage from the pressure cylinders. The waste from this unit flows to the Front Door Pit North Sump (SWMU 2). From 1928 to 1976, this unit also received pentachlorophenol treating solution.

Release Controls: This unit is constructed of concrete, with a 6-inch high berm.

Release History: No releases were reported in available file material. During the VSI, the HNu detected vapors of 3.2 ppm near the unit. Odors were noted emanating from the unit and stains were observed within the concrete area. The facility periodically steam cleans the area, and the waste residue is sent to a hazardous waste landfill.

Because the unit contained wastes at the time of the VSI, the condition of the concrete pit could not be assessed.

References: 21

2. UNIT NAME: Front Door Pit North Sump (No photo)

Unit Description:	This unit is a sump located north of the Front Door Pit (SWMU 1) in the central part of the facility. The concrete sump is approximately 20 feet long by five feet wide by one foot deep. The sump receives creosote and wastewater drippage from the Drip Track (SWMU 34) and the pressure cylinders. The waste is routed by the Wastewater Underground Pipes (SWMU 17) to the Primary Oil/Water Separator (SWMU 21).
Operational Status:	This unit is active and has been in operation since 1974.
Waste Managed:	The Front Door Pit North Sump (SWMU 2) receives creosote drippage from the Drip Track (SWMU 34) and the pressure cylinders. Between 1928 and 1976, this unit received wastewater containing pentachlorophenol.
Release Controls:	The sump is recessed in concrete.
Release History:	No releases were reported in available file material. During the VSI, staining was observed outside the concrete sump area.
References:	21

3. UNIT NAME: Front Door Pit South Sump (No photo)

Unit Description: This unit is a sump located south of the Front Door Pit (SWMU 1) in the central part of the facility. The steel sump is approximately 20 feet long by five feet wide by one foot deep. The sump receives rainwater and drippage from Work Tank 1 (SWMU 8) and Work Tank 2 (SWMU 9) and the wastewater is routed to the Rainwater Tank (SWMU 40).

Operational Status: This unit is active and has been in operation since early 1988.

Waste Managed: This unit manages creosote drippage from Work Tank 1 (SWMU 8) and Work Tank 2 (SWMU 9).

Release Controls: The sump is constructed of steel. There are no other release controls.

Release History: No releases were reported in the available file material. During the VSI, staining and residue were observed in the sump area.

References: 21

4. UNIT NAME: Retort Sump (Photo No. 4)

Unit Description:	This unit is a sump located at the west end of the retort area in the central part of the facility. The sump is constructed of concrete with a 6–inch high concrete berm. This unit receives wastewater and drippage from the three pressure cylinders. The waste from this unit flows to the Primary Oil Water Separator (SWMU 21) through Wastewater Underground Pipes (SWMU 17).
Operational Status:	This unit is active and was constructed in 1974.
Waste Managed:	Wastewater containing creosote flows through the unit. Between 1928 and 1976, this unit received wastewater containing pentachlorophenol.
Release Controls:	This unit is constructed of concrete with a 6–inch high concrete berm in an enclosed area.
Release History:	No releases were reported in the available file material. During the VSI, the HNu detected vapors of 3.2 ppm near the sump unit and odors were noted emanating from the Retort Sump (SWMU 4).
References:	21

5. UNIT NAME: Drip Collection Tank 1 (No photo)
6. UNIT NAME: Drip Collection Tank 2 (No photo)
7. UNIT NAME: Drip Collection Tank 3 (No photo)

Unit Description: These inactive tanks reportedly underlie the three pressure cylinders in the process area located in the central section of the facility. The units are labelled Drip Collection Tank 1 (SWMU 5), Drip Collection Tank 2 (SWMU 6), and Drip Collection Tank 3 (SWMU 7) going from north to south. According to facility representatives, each tank was approximately 10 feet long and four feet in diameter and received spillage from the retort cylinder. Reportedly, these tanks contain creosote and pentachlorophenol residue. The facility did not provide details on any waste removal activities. These units were not observed during the VSI because they are underground and covered by concrete.

Operational Status: These tanks were in operation from 1928 to 1974.

Waste Managed: These tanks managed wastewater and sludges containing pentachlorophenol and creosote.

Release Controls: These units are underlain by concrete.

Release History: No evidence of release was reported in the available file material. Because the units have been covered by concrete, they could not be observed during the VSI.

References: 21

8. UNIT NAME: Work Tank 1 (Photo Nos. 8.1, 8.2 and 9)
9. UNIT NAME: Work Tank 2 (Photo Nos. 8.1, 8.2 and 9)

Unit Description: These units are tanks used for storage and heating new or recycled creosote prior to pumping into the creosote treatment cylinders. The unit is located south of the Retort Process Area in the south part of the facility. Work Tank 1 is south of the Front Door Pit (SWMU 1) and Work Tank 2 (SWMU 9) is west of Work Tank 1 (SWMU 8). These steel tanks have a total capacity of approximately 50,000 gallons. These tanks are equipped with heating coils to reduce the viscosity and facilitate material transfer. These tanks are spherical. The tank coating has blistered from excessive heat. A venting system is located on the top of each tank. The creosote is routed to the pressure cylinders from these tanks by the Overhead Pipes (SWMU 13). The creosote that drips from this unit goes to the Front Door Pit South Sump (SWMU 3).

Operational Status: These units are active and have been in operation since 1928.

Waste Managed: These units manage creosote, and between 1928 and 1976 managed pentachlorophenol.

Release Controls: The tanks are located above a concrete pad within a concrete diked area.

Release History: Staining of the concrete underlying these tanks was observed during the VSI. However, the staining was confined to the contaminated area.

References: 21

10. UNIT NAME: Work Tank 3 (Photo No. 10)
11. UNIT NAME: Work Tank 4 (Photo Nos. 1 and 11)
12. UNIT NAME: Work Tank 5 (Photo No. 12)

Unit Description: These units are work tanks, located west of the retort process area in the west central part of the facility. These tanks are constructed of steel and each tank has a capacity of over 30,000 gallons. A venting system is located on top of the tanks. These tanks are equipped with heating coils to reduce the viscosity and facilitate material transfer. The creosote is routed to the pressure cylinders from these tanks by Overhead Pipes (SWMU 13). These tanks are surrounded by a six-inch concrete berm and they overlie gravel.

Operational Status: 1928 to present.

Waste Managed: These units manage waste creosote, and between 1928 and 1976 managed pentachlorophenol.

Release Controls: These units overlie soil and are surrounded by a one-foot high concrete berm.

Release History: Soil staining was observed around the tanks during the VSI.

References: 21

13. UNIT NAME: Overhead Pipes (Photo Nos. 13.1 and 13.2)

Unit Description: These units are above-ground pipes located between the treating building and the work tanks. This unit routes the new and recycled preservative between the pressure cylinders and Work Tank 1 (SWMU 8) Work Tank 2 (SWMU 9), Work Tank 3 (SWMU 10), Work Tank 4 (SWMU 11), and Work Tank 5 (SWMU 12). The pipes are constructed of steel and range in size from three inches to eight inches in diameter. Valves are located at various pipe joints. During the VSI, the pipes appeared to be in good condition and there was no evidence of leaks or breaks.

Operational Status: Some of the pipes have been in use since at least 1928 and have been replaced as needed.

Waste Managed: The pipes managed creosote, and between 1928 to 1976 managed pentachlorophenol.

Release Controls: The pipes are above ground and have valves to control the flow of material.

Release History: No evidence of release was noted in a review of the file material or during the VSI.

References: 21

14. UNIT NAME: Sap Tank (Photo No. 14)

Unit Description:	This unit is an above-ground tank, located west of the retort process area in the west central part of the facility. This tank is constructed of steel and has a capacity of 15,000 gallons. This unit receives wastewater from the condensate tanks and discharges it to the Primary Oil/Water Separator (SWMU 21). This tank is open topped and overlies gravel. This unit is surrounded by a six-inch high concrete berm. Work Tank 3 (SWMU 10), Work Tank 4 (SWMU 11) and Work Tank 5 (SWMU 12) are also located within this bermed area.
Operational Status:	1928 to present.
Waste Managed:	This unit receives wastewater containing creosote. Between 1928 to 1976, wastewater containing pentachlorophenol was received by the unit.
Release Controls:	This unit is elevated above gravel by wood beams and is surrounded by a 1-foot high concrete berm.
Release History:	No releases were noted in a review of available file material. During the VSI, odors were noted emanating from the open tank.
References:	21

15. UNIT NAME: Sump for Tank Car Unloading (Photo No. 15)

Unit Description: This unit is a sump located northeast of the Primary Oil/Water Separator (SWMU 21). This unit receives waste runoff and spills from the tank car unloading area. This unit is constructed of concrete and is 10 feet long, seven feet wide and five feet in height.

Operational Status: This unit is active and began operating in 1983.

Waste Managed: Spills and runoff from the tank car unloading area are collected in this unit. Creosote wastes are managed in this unit.

Release Controls: This unit is constructed of concrete, and has an automatic level detector to detect the level of waste runoff and spills.

Release History: During the VSI, there was staining of the soil surrounding this unit and the HNu detected vapor concentrations of 0.5 ppm.

References: 21

16. UNIT NAME: Vapor Tank Sump (Photo No. 16)

Unit Description:	This unit is an inactive sump. This unit received spills and runoff from the three vapor tanks. This unit is constructed of concrete in a containment area surrounded by a 4-foot high concrete berm. The unit has a pipe which formerly discharged to the surrounding soil.
Operational Status:	This unit was used from 1970 to 1974.
Waste Managed:	Spills and runoff containing xylene were received by this unit.
Release Controls:	This unit is constructed of concrete, with a 4-foot high concrete berm.
Release History:	During the VSI, black residue a few inches thick was observed in the unit and in soil outside the unit. Outside the bermed area, staining was observed in the vicinity of the discharge pipe.
References:	21

17. UNIT NAME: Wastewater Underground Pipes (No photo)

Unit Description:	These units are underground pipes located between the process area and the Primary Oil/Water Separator (SWMU 21). Wastewater, containing creosote, is routed through the pipes to the Primary Oil/Water Separator (SWMU 21). These pipes were not observed during the VSI because they are located underground.
Operational Status:	Some of the pipes have been in use since at least 1928. According to the facility, these pipes are replaced as needed.
Waste Managed:	The pipes manage wastewater containing creosote. Between 1928 and 1976, the unit managed wastewater containing pentachlorophenol.
Release Controls:	There are no known release controls.
Release History:	No evidence of release was noted in a review of the file material or during the VSI.
References:	21

18. UNIT NAME: Truck Unloading Area Sump (Photo Nos. 18.1 and 18.2)

Unit Description: This unit is an inactive sump and is located to the west of the pressure cylinders in the west central part of the facility. This unit collects spills from the truck unloading operation. This sump is an in-ground unit and is constructed of concrete. This sump is 7 feet by 10 feet and 5 feet deep. This sump discharges into the Primary Oil/Water Separator (SWMU 21). A steel grate covers the unit.

Operational Status: This unit operated from 1982 to 1986.

Waste Managed: This unit collects creosote spills from the truck unloading operations.

Release Controls: The sump is concrete lined.

Release History: During the VSI, oil liquid was observed inside the sump.

References: 21

19. UNIT NAME: Wood Boiler (Photo No. 19)

Unit Description:	This unit is a boiler and is located north of the treatment area in the central part of the facility. This unit is used to produce steam for the treatment process. This unit is operating under an air permit No. 1680-00020 which was issued on July 22, 1986 and expires on August 1, 1989. Until 1987, this unit was used to burn wood waste which included 5% treated wood and 95% green wood. The unit now burns oil or gas.
Operational Status:	This unit is active and the date of startup was prior to 1976.
Waste Managed:	Until 1987, this unit burned creosote-treated wood. Between the date of start up and 1987, this unit burned pentachlorophenol-treated wood ties.
Release Controls:	This unit is an enclosed area underlain by concrete.
Release History:	No releases have been reported for this unit during a review of available file material.
References:	2, 21

20. UNIT NAME: Creosote Storage Area Sump (Photo No. 20)

Unit Description: This unit is a sump for collection of spillage and leaks located within a diked area for the creosote storage tanks. The area is situated southwest of the process area in the south section of the facility. The concrete sump is five feet square by one and one-half feet deep. Three creosote storage tanks and one stormwater tank are located adjacent to the sump within a diked area. Waste is routed to the Primary Oil/Water Separator (SWMU 21) by Wastewater Underground Pipes (SWMU 17).

Operational Status: The unit has been in operation since 1928 and is currently active.

Waste Managed: The sump collects precipitation and drippage from the creosote storage tanks. Between 1928 and 1976, pentachlorophenol was also stored in these tanks.

Release Controls: The sump is constructed of concrete and located within a three-foot high diked area.

Release History: No evidence of release was observed during the VSI or through review of available file material.

References: 21

21. UNIT NAME: Primary Oil/Water Separator (Photos Nos. 21.1, 21.2 and 21.3)

Unit Description: This unit is an oil/water separator and is located in the southwest part of the facility. This unit is constructed of concrete with 4-foot high walls. The unit is slightly sloped. The deep part is 20 feet deep and the shallow part is eight feet deep. This unit is part of the wastewater treatment system receiving wastewater directly discharged from the wood treatment process. The wastewater flows from this unit to the Polymer Addition Area (SWMU 22), then to the Secondary Dual Compartment Oil Water Separator (SWMU 23). The recovered creosote is returned to Work Tank 1 (SWMU 8), Work Tank 2 (SWMU 9), Work Tank 3 (SWMU 10), Work Tank 4 (SWMU 11) and Work Tank 5 (SWMU 12).

Operational Status: This unit has been in operation since 1974.

Waste Managed: Wastewater flows through this unit. According to the facility representative, wastewater entering the unit has a creosote content of up to 25%, with an average of 2-3%. Reportedly, when the wastewater is discharged, the creosote content is less than 1%. Between 1974 and 1976, this unit received wastewater containing pentachlorophenol.

Release Controls: This unit is partially above ground and partially below ground.

Release History: During the VSI, the HNu detected vapor concentrations ranging from 3 to 20 ppm. The higher value was detected when wastewater was entering the unit.

References: 1, 6, 17, 21

22. UNIT NAME: Polymer Addition Area (No photo)

Unit Description: This unit adds polymer to the wastewater to enhance creosote separation. This unit is located north of the Primary Oil/Water Separator (SWMU 21). This unit is part of the wastewater treatment system. Wastewater flows from the Primary Oil Water Separator (SWMU 21) to this unit. The wastewater then flows into the Secondary Dual Compartment Oil/Water Separator (SWMU 22). This unit was not observed during the VSI because it is underground.

Operational Status: This unit is active, and the date of construction is 1983.

Waste Managed: According to the facility representative, the wastewater contains less than 1% creosote.

Release Controls: This unit is in an enclosed area.

Release History: This unit could not be observed during the VSI, due to the underground location. No evidence of release was noted through a review of available file material.

References: 5, 21

23. UNIT NAME: Secondary Dual Compartment Oil/Water Separator (Photo Nos. 23.1 and 23.2)

Unit Description: This unit is an open-topped oil/water separator. This unit is located south of Aeration Impoundment (SWMU 28) in the western part of the facility. This unit is 100 feet long and 10 feet in height, and is constructed of steel. This unit is part of the wastewater treatment system. Wastewater flows from the Polymer Addition Area (SWMU 22) to this unit. The wastewater then flows into the Holding Tank 1 (SWMU 24). Prior to 1986, the wastewater flowed to the Aeration Impoundment (SWMU 28). The recovered creosote is returned to Work Tank 1 (SWMU 8), Work Tank 2 (SWMU 9), Work Tank 3 (SWMU 10), Work Tank 4 (SWMU 11) and Work Tank 5 (SWMU 12).

Operational Status: This unit is active and the date of start-up is approximately 1965.

Waste Managed: Wastewater, containing creosote, flows through this unit. Prior to 1976, this unit managed wastewater containing pentachlorophenol.

Release Controls: This unit is above ground and located on a 4-foot high concrete pad.

Release History: During the VSI, staining was observed on the concrete and soil surrounding the unit.

References: 1, 6, 17, 21

24. UNIT NAME: Holding Tank 1 (Photo Nos. 24, 25, 26 and 27)
25. UNIT NAME: Holding Tank 2 (Photo Nos. 24, 25, 26 and 27)
26. UNIT NAME: Holding Tank 3 (Photo Nos. 24, 25, 26 and 27)
27. UNIT NAME: Holding Tank 4 (Photo Nos. 24, 25, 26 and 27)

Unit Description: These units are above-ground tanks located south of the Secondary Oil/Water Separator (SWMU 23). These tanks have a total capacity of 60,000 gallons and are constructed of steel. They are a part of the wastewater treatment system. Holding Tank 1 (SWMU 24) receives wastewater from the Secondary Dual Compartment Separator (SWMU 23) and flows to Holding Tank 2 (SWMU 25), Holding Tank 3 (SWMU 26), Holding Tank 4 (SWMU 27), and is then discharged to the Columbus POTW.

Operational Status: These units were installed in 1984 and are currently active.

Waste Managed: Wastewater containing creosote flows through these units.

Release Controls: These units are above ground and are underlain by concrete and are within a diked area.

Release History: No evidence of release was observed during the VSI, or through a review of available file material.

References: 3, 18, 21

28. UNIT NAME: Aeration Impoundment (Photo Nos. 28.1, 28.2, and 28.3)

Unit Description: This unit was a surface impoundment. This unit is located south of the Sedimentation Impoundment (SWMU 29). This unit is 50 feet in length and 50 feet in width and is lined with one foot of compacted clay. This unit was used in the treatment of wastewater from the Secondary Dual Compartment Oil Water Separator (SWMU 8). This unit was closed and fenced during the summer of 1986 with an approved closure plan. Visually contaminated soil was removed and replaced with soils with low permeability (coefficient of 10^{-7} cm/sec or less). The facility conducted a sampling program to determine if clean closure had been accomplished. Contamination was detected, and consequently clean closure was not accomplished. A Post-Closure Permit Application was submitted to MDNRBPC on March 12, 1987.

Operational Status: This unit was in operation from 1928 to June 18, 1986.

Waste Managed: Wastewater from the wood preserving process was stored in this unit. Analysis indicates that wastewater was contaminated with EPA hazardous waste K001, creosote and pentachlorophenol.

Release Controls: No release controls are associated with this unit.

Release History: There is documented groundwater contamination from this unit. The results of groundwater analysis are provided in Attachments C and D. Results of sampling activities performed during closure in 1986 indicated contamination of soil with K001 constituents. The soil sampling analytical results are provided in Attachment F.

References: 1, 6, 7, 8, 17, 21, 22

29. UNIT NAME: Sedimentation Impoundment (Photo Nos. 29.1, 29.2, and 29.3)

Unit Description: This unit is a surface impoundment. This unit is located north of the Aeration Impoundment (SWMU 14) and is approximately 229 feet long and 60 feet in wide. This unit is lined with approximately one foot of compacted clay. It was used in the treatment of wastewater from the wood preserving process. It received wastewater from the Aeration Impoundment (SWMU 14) prior to discharge to the Columbus POTW. This unit was closed and fenced in the summer of 1986 as part of an approved closure plan. Visually contaminated soil was removed and replaced with soils with low permeability (coefficient of 10^{-7} cm/sec or less). The facility conducted a sampling program to determine if a clean closure had been accomplished. Contamination was detected and consequently clean closure was not accomplished. A Post-Closure Permit Application was submitted to MDNRBPC on March 12, 1987.

Operational Status: This unit was in operation from 1928 to June 18, 1986.

Waste Managed: Wastewater from the wood preserving process was stored in this unit. Analysis indicates that this wastewater was contaminated with creosote and pentachlorophenol.

Release Controls: There were no known release controls for this unit.

Release History: There is documented groundwater contamination from these units. The results of groundwater analysis are provided in Attachments C and D. Results of sampling activities performed during closure in 1986 indicated contamination of soil with K001 constituents. The soil sampling analytical results are provided in Attachment F.

References: 1, 6, 7, 8, 17, 21, 22

30. UNIT NAME: Sand Filter Bed 1 (Photo Nos. 30.1, 30.2 and 30.3)
31. UNIT NAME: Sand Filter Bed 2 (Photo Nos. 31.1, 31.2 and 31.3)

Unit Description: These units are comprised of the two unlined former sand filter beds. Together, these units are 50 feet long and 20 feet wide and are located south and east of the Aeration Impoundment (SWMU 28). There is a fence surrounding this unit. The units are covered with gravel.

Operational Status: These units ceased receiving waste in 1979 and were closed in 1982. The facility representative did not know the date of startup.

Waste Managed: Creosote and pentachlorophenol wastes were filtered through these units.

Release Controls: There were no known release controls for these units.

Release History: No evidence of release was observed during the VSI. However, there is documented groundwater contamination in the area of this unit. It is unclear whether these units contributed to the contamination, since they are adjacent to the Aeration Impoundment (SWMU 28) and Sedimentation Impoundment (SWMU 29). The results of analysis of groundwater in the area of the unit are provided in Attachments C and D.

References: 17, 21

32. UNIT NAME: Waste Pile 1 (Photo Nos. 32.1 and 32.2)
33. UNIT NAME: Waste Pile 2 (Photo Nos. 33.1 and 33.2)

Unit Description: These waste piles are located north of 14th Avenue. The two units cover an area approximately 500 yards by 10 yards. According to the facility representative, the boundary between the two units cannot be determined. According to the facility representative, waste wood and metal were segregated and disposed here. The waste has been removed, and currently there is rubble on the site.

Operational Status: These units were in operation from 1974 to the summer of 1987.

Waste Managed: Waste metal and treated wood containing creosote and pentachlorophenol were disposed at these units.

Release Controls: There are no known release controls.

Release History: No evidence of release was noted in a review of the file material. There was some soil staining observed during the VSI.

References: 17, 21

34. UNIT NAME: Drip Track (Photo No. 34)

Unit Description: This unit is a drip track located east of the process area in the central section of the facility. This unit receives drippage after the wood is treated with creosote. This unit is approximately 533 feet long and constructed of concrete. Prior to the construction of this unit, the waste creosote dripped on bare soil at the same location. The current unit was constructed after 4 feet of visually contaminated soil was excavated and sent to a hazardous waste landfill. The facility collected soil samples after the visually contaminated soil was removed. These samples were collected six inches below the surface from which visually contaminated soil was removed. The facility had the samples analyzed for primary wood preserving constituent compounds. The data is provided in Attachment E. This data indicates there is residual contamination in the soil underlying the unit. The unit was constructed with a bottom layer of 1 to 1 1/2 feet of clay (permeability of 10^{-7} cm/sec) overlain by a crushed rock buffer layer of 1 to 1 1/2 feet, and in turn overlain by 12 inches of concrete with a six-inch concrete berm.

Operational Status: This unit is active, and was constructed in March 1988. Prior to startup of this unit, the creosote dripped directly onto the soil.

Waste Managed: This unit manages hazardous waste, identified as K001.

Release Controls: Waste from this unit goes to a Drip Track Sump and Drain (SWMU 35) located in the buffer layer and then drains to the Primary Oil/Water Separator (SWMU 21). This concrete unit is underlain by a clay layer (permeability of 10^{-7} cm/sec).

Release History: Minor soil staining was observed during the VSI outside the concrete pad area. Prior to construction of the concrete pad, waste creosote dripped directly onto the soil. The visibly contaminated soil was removed. Analyses indicate residual contamination does exist in the soil underlying the unit. These results are provided in Attachment E.

References: 21

35. UNIT NAME: Drip Track Sump and Drain (No photo)

Unit Description: This unit consists of a concrete trench and sump connected by an underground pipe located in the rock buffer zone of the Drip Track (SWMU 34). The concrete trench received creosote drippage from the treated wood ties. Liquids, including surface runoff and treating chemicals collected in this sump, are pumped to the Primary Oil/Water Separation (SWMU 21).

Operational Status: This unit is active and was constructed in March 1988.

Waste Managed: Surface runoff from the Drip Track (SWMU 34) which includes creosote drippage from the treated wood.

Release Controls: The trench and the sump are concrete lined.

Release History: No evidence of release was observed during the VSI or through a review of available file material.

References: 21

36. UNIT NAME: Black Tie Storage Area (Photo No. 36)

Unit Description: This unit consists of treated wood storage areas located throughout the facility but primarily east of the railroad tracks in the east section of the facility. There is also a storage area west of the green tie storage area in the northwest section of the facility.

Operational Status: These areas have been in use since 1928.

Waste Managed: These units receive creosote drippage from treated wood. In the past, between 1928 and 1976, this unit received drippage containing pentachlorophenol.

Release Controls: There are no known release controls for these areas.

Release History: In those storage areas observed during the VSI, stains were noted on the soil beneath and surrounding the treated wood. No evidence of release was noted in the review of the file material.

References: 21

37. UNIT NAME: Drainage Ditches (Photo No. 37)

Unit Description: There are several unlined drainage ditches located on the facility. These ditches collect surface water runoff from the facility and discharge to Luxapalila Creek. The general flow of these ditches is to the north.

Operational Status: This unit is active and no information was available regarding the start-up dates for these ditches.

Waste Managed: Surface water runoff from the facility.

Release Controls: There are no known release controls.

Release History: During the VSI, there was soil staining and dead vegetation observed in the ditches.

References: 21

38. UNIT NAME: Cooling Tower Surface Impoundment (Photo Nos. 38.1 and 38.2)

Unit Description: This unit was a surface impoundment. The exact location of this unit is unknown but is suspected of being located somewhere in the southwest corner of the facility. The approximate dimensions are 150 feet by 50 feet. Cooling water was run through this unit, prior to the construction of the Two Cooling Towers (SWMU 39). The unit is now covered by gravel.

Operational Status: The date of start-up is unknown. Use of the impoundment reportedly ceased in the 1980s.

Waste Managed: This unit received cooling water containing creosote and pentachlorophenol.

Release Controls: There were no release controls associated with this unit.

Release History: No evidence of release was observed during the VSI or through a review of available file material.

References: 21

39. UNIT NAME: Two Cooling Tower Basins (Photo No. 39)

Unit Description: This unit consists of two cooling tower basins. This unit and the cooling towers are used to cool water for the surface condensers. This unit is located west of the creosote storage tanks in the south part of the facility. Prior to July 1987, this unit received wastewater from the Secondary Dual Compartment Oil/Water Separator (SWMU 8) for recycling creosote.

Operational Status: The unit was used to evaporate creosote and pentachlorophenol wastewater until 1987. This unit is active, and the date of start-up is at least prior to 1974.

Waste Managed: Prior to 1987, this unit evaporated wastewater containing creosote and between 1928 to 1976, the unit evaporated wastewater containing pentachlorophenol. The unit now evaporates non-contact cooling water from the condensors.

Release Controls: This unit does not have a release control.

Release History: According to the facility representative during the VSI, there have been odor complaints where the unit was used for evaporation. No odors were noted during the VSI.

References: 21

40. UNIT NAME: Rainwater Tank (Photo No. 40)

Unit Description:	This unit is an above-ground tank and is located in the south part of the facility, west of the creosote storage tanks. This unit receives wastewater from the Front Door Pit South Sump (SWMU 3). In the past (date not specified), this unit was used to store creosote. This unit is within the diked area for the Creosote Storage Area Tanks Containment Area (AOC A). The wastewater is discharged to the Primary Oil/Water Separator (SWMU 21).
Operational Status:	This unit is active and was constructed in 1928.
Waste Managed:	This unit receives wastewater containing creosote and receives rainwater.
Release Controls:	This unit is above ground and in a 3-foot high diked area surrounded by concrete.
Release History:	No releases were noted in the available file material. During the VSI, minor leaking was observed from the valves. However, leakage was confined to the containment area.
References:	21

41. UNIT NAME: Cyclone Dumpster (No photo)

Unit Description: This unit is an above-ground dumpster located north of the treatment area in the central section of the facility. The unit's capacity is 30 cubic yards and the unit is constructed of steel. This unit receives wood waste from the cyclone. Approximately 20% of the wood shavings are treated wood. The waste from this unit is disposed of at the City of Columbus Landfill. This unit overlies bare soil.

Operational Status: This unit is active and was constructed in 1987.

Waste Managed: This unit receives creosote-treated wood shavings and green wood shavings.

Release Controls: This unit is above ground and covered.

Release History: No evidence of release was observed during the VSI or through a review of available file material.

References: 21

OTHER AREAS OF CONCERN

A. Creosote Storage Tanks (Photo No. AOC A)

The facility stores raw creosote in an area located south of the process area in the southern part of the facility. This area is constructed of concrete with a 3-foot-high berm. This unit has been active since 1928 and is approximately 50 feet long and 10 feet wide.

Because of the age and size of the unit, there was concern of possible releases if the tanks leaked. During the VSI, the tanks were observed to be in good condition.

ATTACHMENT C

Groundwater analyses from June 1981 through December 1984. These data are taken from the Post-Closure Permit Application Volume II, March 12, 1987, Kerr-McGee Chemical Corporation, Forest Products Division, Columbus, Mississippi Facility EPA ID. No. MSD 990866329.

APPENDIX M

GROUNDWATER MONITORING DATA

GROUNDWATER DATA FOR:

WELL CMW-1

KERR MCGEE FOREST PRODUCTS
COLUMBUS,MISSISSIPPI
WELL #CMW1

DATE	ELEV FT AMSL	pH SU	SC UMHOS/CM	TOC PPM	TOH PPM
26-Jun-81	174.82				
27-Aug-81	178.92				
13-Oct-81	178.42				
29-Oct-81	179.42	5.3	140	15	<.05
29-Oct-81		5.4	140	15	<.05
29-Oct-81		5.1	140	17	<.05
29-Oct-81		5.3	140	14	<.05
20-Apr-82	183.92	4.6	250	<1	<.05
20-Apr-82		4.7	260	<1	<.05
20-Apr-82					
20-Apr-82		4.6	260	<1	<.05
20-Apr-82		4.6	250	<1	<.05
22-Apr-82	183.34				
21-Jul-82	179.75				
21-Jul-82		4.3	170	2	<.05
21-Jul-82		4.6	170	2	<.05
21-Jul-82		4.2	170	2	<.05
21-Jul-82		4.3	170	2	<.05
22-Jul-82	179.59				
29-Sep-82	181.82	4.3	155	2	<.05
29-Sep-82					
29-Sep-82		4.3	155	2	<.05
29-Sep-82		4.3	155	2	<.05
29-Sep-82		4.3	155	2	<.05
13-Jan-83		4.7	189	2	<.05
13-Jan-83		4.6	195	2	<.05
13-Jan-83		4.7	192	2	<.05
13-Jan-83		4.7	189	3	<.05
15-Feb-83	181.82				
02-Mar-83	182.25				
01-Jul-83	182.25				
05-Jul-83	181.15	4.7	232	1.6	0
05-Jul-83		4.6	232	1.8	0
05-Jul-83		4.6	232	1.8	0
05-Jul-83					
05-Jul-83		4.7	232	1.6	0
21-Oct-83	181.38				

KERR MCGEE FOREST PRODUCTS
COLUMBUS, MISSISSIPPI
WELL #CMW1

DATE	ELEV FT AMSL	pH SU	SC UMHOS/CM	TOC PPM	TOH PPM
22-Nov-83	182				
02-Dec-83	181.59	4.5	163	<1	<.05
02-Dec-83		4.6	164	<1	<.05
02-Dec-83		4.5	164	<1	<.05
02-Dec-83					
02-Dec-83		4.5	164	<1	<.05
29-Dec-83	182				
23-Jan-84	176.42				
25-Apr-84					
12-Jun-84	176.95				
13-Jun-84	180.28	4	215	1.8	<.05
13-Jun-84		4	215	2.2	<.05
13-Jun-84		4	215	2.1	<.05
13-Jun-84		4	215	2.4	<.05
30-Aug-84		4.8	180	<1	<.05
30-Aug-84		4.2	182	1.8	<.05
30-Aug-84		4.2	179	1.6	<.05
30-Aug-84		4.6	175	2	<.05
26-Oct-84		4.2	161	1.2	<.05
26-Oct-84		4.4	162	1.2	<.05
26-Oct-84		4.4	161	1.2	<.05
26-Oct-84		4.3	160	1.2	<.05
22-Dec-84		4.4	119	2	<.05
22-Dec-84		4.4	131	1.8	<.05
22-Dec-84		4.3	131	2	<.05
22-Dec-84		4.3	135	7.2	<.05

KERR MCGEE FOREST PRODUCTS
COLUMBUS, MISSISSIPPI
WELL #CMW1

DATE	Cl PPM	Fe PPM	Mn PPM	PHENOLS PPM	Na PPM	SO4 PPM
29-Oct-81	28	0.1	0.2	0.004	19	30
20-Apr-82				<.002		
29-Sep-82	19	<.1	<.002	16	29	6.1
02-Dec-83	17	0.1	0.12	0.03	23	48
13-Jun-84				0.002		
13-Jun-84				0.003		
13-Jun-84				0.003		
13-Jun-84				0.004		
30-Aug-84				<.002		
30-Aug-84				<.002		
30-Aug-84				<.002		
30-Aug-84				<.002		
26-Oct-84				0.011		
26-Oct-84				0.008		
26-Oct-84	11	0.06	0.09	0.005	16	26
26-Oct-84				0.013		
22-Dec-84				0.01		
22-Dec-84				0.005		
22-Dec-84				0.008		
22-Dec-84				0.002		

KERR MCGEE FOREST PR[illegible]TS
COLUMBUS, MISSISSIPPI
WELL #CMW1

DATE	As PPM	Ba PPM	Cd PPM	Cr PPM	Fl PPM	Pb PPM	Hg PPM	Se PPM	Ag PPM	NO3 PPM	COLIFORM CT/100ML	TURBIDITY TBU
29-Oct-81	<.01	<.2	<.01	<.01	0.05	<.01	<.001	<.01	<.01	1.8	<1	
29-Sep-82	<.03	<.5	<.005	<.03	<.1	<.03	<.001	<.005	<.03		<1	

KERR MCGEE FOREST PRODUCTS
COLUMBUS, MISSISSIPPI
WELL #CMW1

DATE	ENDRIN PPM	LINDANE PPM	METHOXY CL PPM	TOXAPHENE PPM	2,4-D PPM	2,4,5-TP PPM	Ra UPI/L	ALPHA	BETA
29-Oct-81	<.0002	<.004	<.1	<.005	<.1	<.01	<.6	<2	<3
29-Sep-82	<.0002	<.004	<.1	<.005	<.1	<.01		<4	12 PM4

KERR MCGEE ...L PRODUCTS
COLUMBUS,M...SISSIPPI
WELL #CMW1

DATE	PCLPHENOL PPB	PHENOL PPB	CLPHENOL PPB	PCLMCRESO PPB	DMPHENOL PPB	DIPHENOL PPB	CREOSOTE PPB	TCLPHENOL PPB	TETPHENOL PPB	NAPHTHALE PPB	ACENAPHTH PPB	FLUORANTH PPB	CHRYSENE PPB	BANTHRAN PPB	BPYRENE PPB	BANTHRAC PPB	IPYRENE PPB	B(B)FLUO PPB	B(H)FLUO PPB	OIL&GREA PPM
25-Apr-84	<.5	<.1	<.5	<.5	<.5	<.5	<.5	<.5		<.05	<.05	<.05	<.05	<.05	<.0	<.05	<1	<.5		

GROUNDWATER DATA FOR:

WELL CMW-1A

KERR MCGEE FOREST PRODUCTS
COLUMBUS, MISSISSIPPI
WELL #CMW1A

DATE	ELEV FT AMSL	pH SU	SC UMHOS/CM	TOC PPM	TOH PPM
12-Jun-84	173.01				
13-Jun-84	177.99	6.3	472	2.6	<.05
13-Jun-84		6.3	472	2.2	<.05
13-Jun-84		6.2	472	2.2	<.05
13-Jun-84		6.3	472	2	<.05
30-Aug-84		6.5	390	1.8	<.05
30-Aug-84		6.5	392	2	<.05
30-Aug-84		6.5	398	2.2	<.05
30-Aug-84		6.6	395	3.2	<.05
26-Oct-84		6.8	259	1.2	<.05
26-Oct-84		6.8	265	1.8	<.05
26-Oct-84		6.8	259	1.2	<.05
26-Oct-84		6.8	266	1.2	<.05
22-Dec-84	180.04	6.2	201	3.6	<.05
22-Dec-84		6.3	145	7.8	<.05
22-Dec-84		6.4	166	14	<.05
22-Dec-84		6.3	219	4	<.05
13-Apr-85	178.79	5.7	155	1.4	<0.05
13-Apr-85		5.6	169	1.2	<0.05
13-Apr-85		5.6	177	1.6	<0.05
13-Apr-85		5.7	162	1.4	<0.05
16-May-85		5.68	159	2.2	0.07
22-Jul-85		6.98	150	9.7	0.061
22-Jul-85		6.97	154	9.4	0.053
22-Jul-85		6.9	154	9.5	0.049
22-Jul-85		6.85	148	9.5	0.056
11-Oct-85		6.1	160	2	0.037
11-Oct-85		5.99	140	2.1	0.033
11-Oct-85		6.02	140	2	0.031
11-Oct-85		6.1	140	2	0.035
13-Feb-86	180.85	5.26	211	1.9	0.027
13-Feb-86		5.25	210	2	0.022
13-Feb-86		5.25	212	2.3	0.3
13-Feb-86		5.24	206	2.3	0.29
01-May-86	180.57	5.9	211	15	0.0254
01-May-86		6	193	17	0.025
01-May-86		5.9	197	12.2	0.0219
01-May-86		6	185	12.2	0.0242

KERR MCGEE FOREST PRODUCTS
COLUMBUS, MISSISSIPPI
WELL OCMW1A

DATE	ELEV FT AMSL	pH SU	SC UMHOS/CM	TOC PPM	TOH PPM
28-Jul-86	180.37	5.37	198	1.7	0.0199
28-Jul-86		5.39	194	1.3	0.0171
28-Jul-86		5.38	189	1.59	0.0146
28-Jul-86		5.39	191	1.66	0.0171
01-Oct-86	180.24	5.63	184	4.37	0.344
01-Oct-86		5.59	185	4.24	0.343
01-Oct-86		5.6	183	4.33	0.344
01-Oct-86		5.67	182	4.02	0.345

KERR MCGEE FOREST PRODUCTS
COLUMBUS, MISSISSIPPI
WELL #CMW1A

DATE	Cl PPM	Fe PPM	Mn PPM	PHENOLS PPM	Na PPM	SO4 PPM
13-Jun-84				0.009		
13-Jun-84				0.009		
13-Jun-84				0.013		
13-Jun-84				0.01		
30-Aug-84				<.002		
30-Aug-84				<.002		
30-Aug-84				<.002		
30-Aug-84				<.002		
26-Oct-84				0.006		
26-Oct-84				0.011		
26-Oct-84	21	0.02	0.88	0.022	21	15
26-Oct-84				0.017		
22-Dec-84				0.005		
22-Dec-84				<.002		
22-Dec-84				<.002		
22-Dec-84				<.002		
11-Oct-85	21	5.5	0.49	0.03	19	58
01-Oct-86	21.4	11	0.2	0.052	23.2	37

KERR MCGEE FOREST PRODUCTS
COLUMBUS,MISSISSIPPI
WELL 8CMW1A

DATE	PCLPHENOL PPB	PHENOL PPB	CLPHENOL PPB	PCLMCRESO PPB	DMPHENOL PPB	DTPHENOL PPB	CREOSOTE PPB	TCLPHENOL PPB	TETPHENOL PPB	NAPHTHALE PPB	ACINAPHTH PPB	FLUBCANTH PPB	CHRYSENE PPB	BANTHRAN PPB	BPYRENE PPB	DBANTHRAC PPB	IPYRENE PPB	B(B)FLUO PPB	B(K)FLUO PPB	OIL&GREA PPM
22-Dec-84	<25	<25	<25	<25	<25	<250		<25	<10	<10	<10	<10	<10	<10	<10	<25	<25	<10		
13-Feb-86										<1.7	<3.6	<2.3		<0.1	<2.6	<10	<4.9	<5.0		
01-May-86										ND	ND	BMDL		ND	ND	ND	ND	ND		
28-Jul-86										ND	ND	ND		ND	ND	ND	ND	ND		
01-Oct-86										ND	ND	ND		ND	ND	ND	ND	ND		

GROUNDWATER DATA FOR:

WELL CMW-2

KERR MCGEE FOREST PRODUCTS
COLUMBUS, MISSISSIPPI
WELL #CMW2

DATE	ELEV FT AMSL	pH SU	SC UMHOS/CM	TOC PPM	TOH PPM
26-Jun-81	162.07				
27-Aug-81	176.48				
13-Oct-81	176.34				
29-Oct-81	176.88	6.3	430	61	<.05
20-Apr-82	178.55	6.3	320	22	<.05
22-Apr-82	177.3				
21-Jul-82	177.8	6	320	1	<.05
22-Jul-82	177.05				
29-Sep-82	177.34	5.9	360	4	<.05
13-Jan-83		6.2	289	<1	0.05
13-Jan-83		6.3	289	2	
13-Jan-83		6.3	289	2	
13-Jan-83		6.2	289	<1	
15-Feb-83	178.92				
02-Mar-83	178.92				
05-Jul-83		6.4	309	0	0
05-Jul-83		6.3	309	0	
05-Jul-83		6.4	309	0	
05-Jul-83		6.2	309	0	
05-Jul-83	179.38				
21-Oct-83	177.9				
22-Nov-83	177.86				
02-Dec-83	178.13	6	259	<1	<.05
02-Dec-83		6.1	260	<1	
02-Dec-83		6	259	<1	
02-Dec-83		6.1	260	<1	
29-Dec-83	176.52				
23-Jan-84	178.13				
13-Jun-84	178.11	5.7	408	1.4	<.05
13-Jun-84		5.6	408	<1	<.05
13-Jun-84		5.7	408	<1	<.05
13-Jun-84		5.6	408	<1	<.05

KERR MCGEE FOREST PRODUCTS
COLUMBUS, MISSISSIPPI
WELL #CMW2

DATE	ELEV FT AMSL	pH SU	SC UMHOS/CM	TOC PPM	TOH PPM
30-Aug-84		5.6	330	<1	<.05
30-Aug-84		5.6	332	1.4	<.05
30-Aug-84		5.5	325	<1	<.05
30-Aug-84		5.5	328	1	<.05
26-Oct-84		6.2	350	<1	<.05
26-Oct-84		6.2	347	1.2	<.05
26-Oct-84		6.2	351	<1	<.05
26-Oct-84		6.2	342	1.2	<.05
22-Dec-84	177.71	5.8	291	<1	
22-Dec-84		5.7	300	2	<.05
22-Dec-84		5.8	318	<1	
22-Dec-84		5.8	319	1.8	<.05
13-Apr-85	177.46	5.9	281	<1	<.05
13-Apr-85		6	289	<1	<.05
13-Apr-85		6	289	<1	<.05
13-Apr-85		6	292	<1	<.05
16-Jun-85		6.18	358	2.2	0.06
22-Jul-85		5.83	332	10.1	0.039
22-Jul-85		5.83	334	10.1	0.037
22-Jul-85		5.82	334	10.1	0.035
22-Jul-85		5.82	334	10.3	0.041
11-Oct-85		6.15	410	1.2	0.024
11-Oct-85		6.06	410	2.1	0.028
11-Oct-85		5.91	400	2	0.021
11-Oct-85		5.97	400	2	0.02
12-Feb-86	177.1	6.1	341	1.2	0.04
12-Feb-86		6.1	337	<1	0.047
12-Feb-86		6.1	337	1.4	0.053
12-Feb-86		6.1	334	1.5	0.05
01-May-86	176.68	6.6	351	2.3	0.0136
01-May-86		6.7	334	1.9	0.0082
01-May-86		6.7	330	2.3	0.0106
01-May-86		6.8	337	2.1	0.0154
28-Jul-86	177.17	5.99	357	<1	0.014
28-Jul-86		6	354	1.07	0.0155
28-Jul-86		6	350	1.05	0.0146
28-Jul-86		5.98	347	1.22	0.014
01-Oct-86	177.04	6.08	374	2.98	0.0551
01-Oct-86		6.12	372	2.99	0.0559

KERR MCGEE FOREST PRODUCTS
COLUMBUS, MISSISSIPPI
WELL #CMW2

DATE	ELEV FT AMSL	pH SU	SC UMHOS/CM	TOC PPM	TOH PPM
01-Oct-86		6.17	368	2.9	0.0538
01-Oct-86		6.19	366	3.14	0.0561

KERR MCGEE FOREST PRODUCTS
COLUMBUS, MISSISSIPPI
WELL #CMW2

DATE	Cl PPM	Fe PPM	Mn PPM	PHENOLS PPM	Na PPM	SO4 PPM
29-Oct-81	61	<.1	0.2	0.004	38	50
20-Apr-82				0.006		
21-Jul-82				<.007		
29-Sep-82	70	0.6	0.3	<.002	17	19
02-Dec-83	73	0.2	0.1	0.002	17	34
13-Jun-84				<.002		
13-Jun-84				<.002		
13-Jun-84				<.002		
13-Jun-84				<.002		
30-Aug-84				<.002		
30-Aug-84				<.002		
30-Aug-84				<.002		
30-Aug-84				<.002		
26-Oct-84	71	<.02	0.17	0.004	19	25
26-Oct-84				0.019		
26-Oct-84				0.011		
26-Oct-84				0.019		
22-Dec-84				<.002		
22-Dec-84				<.002		
22-Dec-84				<.002		
22-Dec-84				<.002		
22-Jul-85				0.16		
11-Oct-85	69	0.2	0.14	0.02	15	53
01-Oct-86	63.4	2.6	0.076	<.050	18.9	35

KERR MCGEE FOREST PRODUCTS
COLUMBUS, MISSISSIPPI
WELL #CMW2

DATE	As PPM	Ba PPM	Cd PPM	Cr PPM	Fl PPM	Pb PPM	Hg PPM	Se PPM	Ag PPM	NO3 PPM	COLIFORM CT/100ML	TURBIDI TSU
29-Oct-81	<.01	<.2	<.01	<.01	0.04	<.01	<.001	<.01	<.01	5.7	<1	
29-Sep-82	<.03	<.5	<.005	<.03	<.1	0.03	<.001	<.005	<.03	5.8	<1	

KERR MCGEE FOREST PRODUCTS
COLUMBUS, MISSISSIP
WELL #CMW2

DATE	ENDRIN PPM	LINDANE PPM	METHOXY CL PPM	TOXAPHENE PPM	2,4-D PPM	2,4,5-TP PPM	Ra UPI/L	ALPHA	BETA
29-Oct-81	<.0002	<.004	<.1	<.005	<.1	<.01	1 PM.8	38 PM15	22 PM6
29-Sep-82	<.0002	<.004	<.1	<.005	<.1	<.01	<2		9 PM3

KERR MCGEE FOREST PRODUCTS
COLUMBUS,MISSISSIPPI
WELL BCMW2

DATE	PCLPHENOL PPB	PHENOL PPB	CLPHENOL PPB	PCLMCRESO PPB	DMPHENOL PPB	DTPHENOL PPB	CREOSOTE PPB	TCLPHENOL PPB	TETPHENOL PPB	NAPHTHALE PPB	ACENAPHTH PPB	FLUORANTH PPB	CHRYSENE PPB	BANTHRAN PPB	BPYRENE PPB	DBANTHRAC PPB	IPYRENE PPB	B(B)FLUO PPB	B(K)FLUO PPB	OIL&GREA PPM
25-Apr-84	<500	<10	<500	<500	<500	<500	<500	<500		2800	<500	<500	<500	<500	<50	<500	<100	<500		
22-Dec-84	<25	<25	<25	<25	<25	<250		<25	<25	<10	<10	<10	<10	<10	<10	<25	<25	<10		
20-Feb-86										<1.6	<3.5	<2.2			<2.5	<7.8	<4.7			
01-May-86										ND	ND	ND		ND	ND	ND	ND	ND		
28-Jul-86										ND	ND	ND		ND	ND	ND	ND	ND		
01-Oct-86										ND	ND	ND		ND	ND	ND	ND	ND		

GROUNDWATER DATA FOR:

WELL CMW-3

KERR MCGEE FOREST PRODUCTS
COLUMBUS, MISSISSIPPI
WELL #CMW3

DATE	ELEV FT AMSL	pH SU	SC UMHOS/CM	TOC PPM	TOH PPM
27-Aug-81	175.7				
13-Oct-81	175.45				
29-Oct-81	176.07	6.7	510	160	<.05
20-Apr-82	178.07	6.1	380	48	
22-Apr-82	177.74				
21-Jul-82	176.99	5.7	380	2	<.05
05-Jul-83	178.82	5.7	336	2.4	0
05-Jul-83		5.8	336	2.2	0.05
05-Jul-83		5.9	336	1.8	0.06
05-Jul-83		5.9	336	2.4	0.05
21-Oct-83	178.62				
22-Nov-83	178.49				
02-Dec-83	178.15	6.1	293	<1	<.05
02-Dec-83		6.1	296	<1	<.05
02-Dec-83		6.1	298	<1	<.05
02-Dec-83		6.2	293	<1	<.05
29-Dec-83	178.01				
23-Jan-84	178.15				
12-Jun-84	172.45				
13-Jun-84	177.3	5.1	350	1	<.05
13-Jun-84		5.1	350	1	<.05
13-Jun-84		5.1	350	1	<.05
13-Jun-84		5.1	350	1.2	<.05
30-Aug-84		5.5	320	1.2	<.05
30-Aug-84		5.4	309	1.8	<.05
30-Aug-84		5.5	315	1.2	<.05
30-Aug-84		5.4	321	1.4	<.05
26-Oct-84		6.1	339	1.2	<.05
26-Oct-84		6.1	338	1.2	<.05
26-Oct-84		6.1	336	<1	<.05
26-Oct-84		6	330	<1	<.05
22-Dec-84	175.24	5.7	263	1.6	<.05
22-Dec-84		5.7	295	1.6	<.05

KERR MCGEE FOREST PRODUCTS
COLUMBUS, MISSISSIPPI
WELL #CMW3

DATE	ELEV FT AMSL	pH SU	SC UMHOS/CM	TOC PPM	TOH PPM
22-Dec-84		5.7	229	2.4	<.05
22-Dec-84		5.7	241	4.4	<.05
13-Apr-85	175.49	5.6	289	3.8	<.05
13-Apr-85		5.6	281	1.4	<.05
13-Apr-85		5.6	290	2	<.05
13-Apr-85		5.5	280	1.6	<.05
16-May-85		5.97	377	2.4	0.3
22-Jul-85		5.92	150	15.9	0.054
22-Jul-85		5.86	328	15.8	0.043
22-Jul-85		5.94	332	15.9	0.047
22-Jul-85		5.91	330	15.9	0.05
11-Oct-85		6.25	450	2.9	0.039
11-Oct-85		6.2	450	2.8	0.032
11-Oct-85		6.28	450	2.4	0.035
11-Oct-85		6.29	450	2.4	0.036
20-Feb-86	176.44	6.3	487	5	0.023
20-Feb-86		6.31	488	5.2	0.025
20-Feb-86		6.39	486	4.9	0.021
20-Feb-86		6.3	487	5	0.019
01-May-86	175.79	6.91	392	2.3	0.024
01-May-86		6.96	384	2.3	0.025
01-May-86		6.93	355	2.4	0.021
01-May-86		6.95	353	2.5	0.021
28-Jul-86	176.27	6.62	391	3.15	0.018
28-Jul-86		6.6	387	2.88	0.0148
28-Jul-86		6.58	393	3.5	0.0186
28-Jul-86		6.49	389	3.15	0.0159
01-Oct-86	175.98	6.19	382	5.2	0.221
01-Oct-86		6.22	381	5.19	0.221
01-Oct-86		6.26	377	5.08	0.22
01-Oct-86		6.23	374	5.05	0.222

KERR MCGEE FOREST PRODUCTS
COLUMBUS, MISSISSIPPI
WELL #CMW3

DATE	Cl PPM	Fe PPM	Mn PPM	PHENOLS PPM	Na PPM	SO4 PPM
29-Oct-81	59	<.1	0.7	0.002	36	20
20-Apr-82				<.01		
21-Jul-82				<.002		
02-Dec-83	67	0.8	0.18	0.007	30	12
13-Jun-84				<.002		
13-Jun-84				<.002		
13-Jun-84				<.002		
13-Jun-84				<.002		
30-Aug-84				0.006		
30-Aug-84				0.006		
30-Aug-84				<.002		
30-Aug-84				<.002		
26-Oct-84				0.011		
26-Oct-84				0.009		
26-Oct-84				0.013		
26-Oct-84	66	<.02	0.19	0.015	31	7.6
22-Dec-84				0.003		
22-Dec-84				0.003		
22-Dec-84				0.002		
22-Dec-84				<.002		
11-Oct-85	73	0.16	0.72	0.08	31	27
01-Oct-86	486	33.2	1.18	<.050	31.7	18

KERR MCGEE FOREST PRODUCTS
COLUMBUS, MISSISSIPPI
WELL #CMW3

DATE	As PPM	Ba PPM	Cd PPM	Cr PPM	Fl PPM	Pb PPM	Hg PPM	Se PPM	Ag PPM	NO3 PPM	COLIFORM CT/100ML	TURBIDITY TBU
29-Oct-81	0.01	<.2	<.01	<.01	0.04	<.01	<.001	<.01	<.01	2.7	<1	
29-Sep-82	0.03	<0.5	<0.005	0.03	<0.1	<0.03	<0.001	<0.005	<0.3	0.6	<1	<0

KERR MCGEE FOREST PRODUCTS
COLUMBUS, MISSISSIPPI
WELL #CMW3

DATE	ENDRIN PPM	LINDANE PPM	METHOXY CL PPM	TOXAPHENE PPM	2,4-D PPM	2,4,5-TP PPM	Ra UPI/L	ALPHA	BETA
29-Oct-81	<.0002	<.004	<.1	<.005	<.1	<.01	0.5 PM1.3	56 PM30	38 PM6
29-Sep-82	<0.0002	<.004	<.1	<.005	<.1	<.01	<3	14	

KERR MCGEE FOREST PRODUCTS
COLUMBUS, MISSISSIPPI
WELL OCMW3

DATE	PCLPHENOL PPB	PHENOL PPB	CLPHENOL PPB	PCLMCRESO PPB	DMPHENOL PPB	DTPHENOL PPB	CREOSOTE PPB	TCLPHENOL PPB	TETPHENOL PPB	NAPHTHALE PPB	ACENAPHTH PPB	FLUORANTH PPB	CHRYSENE PPB	BANTHRAN PPB	BPYRENE PPB	BBANTHRAC PPB	IPYRENE PPB	B(B)FLUO PPB	B(K)FLUO PPB	DIL&GREA PPM
25-Apr-84	<500	<10	<500	<500	<500	<500	<500	<500		<500	<500	<500	<500	<500	<50	<500	<100	<500		
22-Dec-84	<25	<25	<25	<25	15	<250		<25	<25	810	<40	16	<10	<10	<10	<25	<25	<10		
28-Feb-85	<25	<25	<25	<25	<25	<250		<25	<25	666	29	22	<10	<10	<10	<25	<25	<10		
22-Jul-85	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
27-Feb-86										<1.6	<3.5	<2.2		<7.8	<2.5	<10	<4.7	<4.8		
01-May-86										ND	ND	ND		ND	ND	ND	ND	ND		
28-Jul-86										ND	ND	ND		ND	ND	ND	ND	ND		
01-Oct-86										ND	ND	12.2		ND	ND	ND	ND	ND		

GROUNDWATER DATA FOR:

WELL CMW-4

KERR MCGEE FOREST PRODUCTS
COLUMBUS,MISSISSIPPI
WELL #CMW4

DATE	ELEV FT AMSL	pH SU	SC UMHOS/CM	TOC PPM	TOH PPM
26-Jun-81	177.52				
27-Aug-81	176.6				
13-Oct-81	176.52				
29-Oct-81	177.33	5.8	390	13	0.06
20-Apr-82	179.25				
22-Apr-82	179.16				
21-Jul-82	178	5.1	300	4	0.05
29-Sep-82	177.46	5.3	280	6	<.05
13-Jan-83		5.3	274	3	0.08
13-Jan-83		5.4	274	3	0.06
13-Jan-83		5.4	274	3	0.05
13-Jan-83		5.4	274	3	0.05
15-Feb-83	179.16				
02-Mar-83	179.16				
01-Jul-83	178.66				
05-Jul-83	178.66	5.6	408	4.8	0
05-Jul-83		5.6	408	4.6	0
05-Jul-83		5.7	408	5	0.05
05-Jul-83		5.6	408	2.8	0.05
21-Oct-83	178.56				
22-Nov-83	177.85				
02-Dec-83	179.08	5.6	254	3	<.05
02-Dec-83		5.6	262	2	<.05
02-Dec-83		5.6	254	2	<.05
02-Dec-83		5.6	257	2	<.05
29-Dec-83	178.91				
23-Jan-84	179.08				
12-Jun-84	177.28				
13-Jun-84	178.15	5.3	280	5.8	0.05
13-Jun-84		5.3	280	5.6	0.05

KERR MCGEE FOREST PRODUCTS
COLUMBUS, MISSISSIPPI
WELL #CMW4

DATE	ELEV FT AMSL	pH SU	SC UMHOS/CM	TOC PPM	TOH PPM
13-Jun-84		5.3	280	4.6	<.05
13-Jun-84		5.3	280	6.4	0.05
30-Aug-84		4.9	249	3.4	<.05
30-Aug-84		4.9	255	3.4	<.05
30-Aug-84		4.9	250	3.6	<.05
30-Aug-84		4.8	248	4.8	<.05
26-Oct-84		5.7	256	4	<.05
26-Oct-84		5.5	256	2.2	<.05
26-Oct-84		5.6	257	2.8	<.05
26-Oct-84		5.5	257	2.4	<.05
22-Dec-84	178.33	5.2	250	3	0.06
22-Dec-84		5.1	242	3.7	0.06
22-Dec-84		5.2	250	9.2	0.6
22-Dec-84		5.2	228	12	0.7
13-Apr-85	174.75	5	218	3.8	<.05
13-Apr-85		5.1	237	3.8	<.05
13-Apr-85		5	202	4	<.05
13-Apr-85		5	212	4.6	<.05
16-May-85		5.73	263	4	0.1
22-Jul-85		5.34	242	10	0.101
22-Jul-85		5.39	242	10.4	0.088
22-Jul-85		5.36	240	10.2	0.092
22-Jul-85		5.35	236	10	0.093
11-Oct-85		5.74	310	4.8	0.08
11-Oct-85		5.69	310	4.8	0.089
11-Oct-85		5.71	310	5.3	0.081
11-Oct-85		5.82	300	5.3	0.082
27-Feb-86	177.29	5.78	280	11.1	0.065
27-Feb-86		5.74	293	12.1	0.076
27-Feb-86		5.75	293	11.6	0.091
27-Feb-86		5.7	296	11.2	0.075
01-May-86	176.57	5.89	352	8.3	0.102
01-May-86		5.91	345	8.6	0.099
01-May-86		5.9	334	8.4	0.104
01-May-86		5.89	336	8.7	0.97
28-Jul-86	177.4	5.66	302	10.8	0.0745
28-Jul-86		5.66	304	11.4	0.0618
28-Jul-86		5.64	305	11.2	0.0736
28-Jul-86		5.63	300	11	0.0773

KERR MCGEE FOREST PRODUCTS
COLUMBUS, MISSISSIPPI
WELL #CMW4

DATE	ELEV FT AMSL	pH SU	SC UMHOS/CM	TOC PPM	TOH PPM
01-Oct-86	177.16	5.48	245	9.5	0.126
01-Oct-86		5.48	286	10.2	0.125
01-Oct-86		5.61	285	10	0.125
01-Oct-86		5.68	284	10.4	0.126

KERR MCGEE FOREST PRODUCTS
COLUMBUS, MISSISSIPPI
WELL #CMW4

DATE	Cl PPM	Fe PPM	Mn PPM	PHENOLS PPM	Na PPM	SO4 PPM
29-Oct-81	53	<.1	4.2	0.01	40	50
21-Jul-82				0.013		
29-Sep-82	39	0.5	0.7	0.021	28	18
02-Dec-83	67	0.4	0.46	0.072	41	22
13-Jun-84				0.088		
13-Jun-84				0.088		
13-Jun-84				0.082		
13-Jun-84				0.079		
30-Aug-84				0.038		
30-Aug-84				0.036		
30-Aug-84				0.032		
30-Aug-84				0.024		
26-Oct-84				0.027		
26-Oct-84	41	0.02	0.47	0.019	34	14
26-Oct-84				0.026		
26-Oct-84				0.029		
22-Dec-84				0.01		
22-Dec-84				0.003		
22-Jul-85				0.32		
11-Oct-85	49	0.29	0.8	0.08	7	114
01-Oct-86	52.8	22.9	1.3	<.050	37.9	18

KERR MCGEE FOREST PRODUCTS
COLUMBUS, MISSISSIPPI
WELL #CMW4

DATE	As PPM	Ba PPM	Cd PPM	Cr PPM	Fl PPM	Pb PPM	Hg PPM	Se PPM	Ag PPM	NO3 PPM	COLIFORM CT/100ML	TURBIDITY TBU
29-Oct-81	<.01	<.2	<.01	<.01	0.04	<.01	<.001	<.01	<.01	0.9	<1	
29-Sep-82	<.03	<.5	<.005	<.03	<.03	<.01	<.001	<.005	<.03	7.3	<1	

KERR MCGEE FOREST PRODUCTS
COLUMBUS, MISSISSIP
WELL #CMW4

DATE	ENDRIN PPM	LINDANE PPM	METHOXY CL PPM	TOXAPHENE PPM	2,4-D PPM	2,4,5-TP PPM	Ra UPI/L	ALPHA	BETA
29-Oct-81	<.0002	<.004	<.1	<.005	<.1	<.01	1.9 PM.8	31 PM15	38 PM6
29-Sep-82	<.0002	<.004	<.1	<.005	<.1	<.01	<.5	8 PM3	19 PM4

KERR MCGEE FOREST PRODUCTS
COLUMBUS,MISSISSIPPI
WELL OCMW4

DATE	PCLPHENOL PPB	PHENOL PPB	CLPHENOL PPB	PCLMCRESO PPB	DMPHENOL PPB	BTPHENOL PPB	CREOSOTE PPB	TCLPHENOL PPB	TETPHENOL PPB	NAPHTHALE PPB	ACINAPHTH PPB	FLUORANTH PPB	CHRYSENE PPB	BANTHRAN PPB	BPYRENE PPB	DBANTHRAC PPB	IPYRENE PPB	B(B)FLUO PPB	B(K)FLUO PPB	DIL&GREA PPM
25-Apr-84	<500	<10	<500	<500	<500	<500	<500	<500		<500	<500	<500	<500	<500	<50	<500	<100	<500		
22-Dec-84	<25	<25	<25	<25	<25	<250		<25	<25	<10	<10	<10	<10	<10	<10	<25	<25	<10		
28-Feb-86										1870	25.7	10		<4.8	<2.5	<10	<4.7			
01-May-86										ND	30.7	17.1		ND	ND	ND	ND	ND		
28-Jul-86										6270	56.6	24		ND	ND	ND	ND	ND		
01-Oct-86										4790	74.6	31.7		ND	ND	ND	ND	ND		

GROUNDWATER DATA FOR:

WELL CMW-5

KERR MCGEE FOREST PRODUCTS
COLUMBUS, MISSISSIPPI
WELL #CMW5

DATE	ELEV FT AMSL	pH SU	SC UMHOS/CM	TOC PPM	TOH PPM
22-Jul-85		7.38	578	47.3	0.062
22-Jul-85		7.38	590	47.2	0.063
22-Jul-85		7.38	583	47.3	0.058
22-Jul-85		7.38	593	47	0.057
11-Oct-85	176.87	6.67	370	2	0.021
11-Oct-85		6.76	370	2.4	0.019
11-Oct-85		6.78	380	3.6	0.015
11-Oct-85		6.8	370	2.4	0.016
20-Feb-86	176.87	6.41	415	1.7	0.24
20-Feb-86		6.45	417	1.5	0.22
20-Feb-86		6.46	423	1.9	0.26
20-Feb-86		6.47	424	1.9	0.22
01-May-86	176.13	6.37	435	14.5	0.033
01-May-86		6.37	422	14.6	0.025
01-May-86		6.39	430	14.4	0.033
01-May-86		6.36	424	14.6	0.028
28-Jul-86	176.92	6.2	425	4.5	0.028
28-Jul-86		6.22	421	4.54	0.0342
28-Jul-86		6.22	423	4.53	0.0325
28-Jul-86		6.23	417	4.54	0.0291
01-Oct-86	176.65	6	423	5.62	0.276
01-Oct-86		6.02	417	5.83	0.285
01-Oct-86		6.05	418	5.42	0.309
01-Oct-86		6.05	418	5.95	0.33

KERR MCGEE FOREST PRODUCTS
COLUMBUS, MISSISSIPPI
WELL #CMW5

DATE	Cl PPM	Fe PPM	Mn PPM	PHENOLS PPM	Na PPM	SO4 PPM
22-Jul-85				0.32		
11-Oct-85	63	0.85	0.64	0.05	21	82
01-Oct-86	76.3	153	1.47	0.164	39.5	25

KERR MCGEE FOREST PRODUCTS
COLUMBUS, MISSISSIPPI
WELL OCMW5

DATE	PCLPHENOL PPB	PHENOL PPB	CLPHENOL PPB	PCLMCRESO PPB	DNPHENOL PPB	DTPHENOL PPB	CREOSOTE PPB	TCLPHENOL PPB	TETPHENOL PPB	NAPHTHALE PPB	ACENAPHTH PPB	FLUORANTH PPB	CHRYSENE PPB	BANTHRAN PPB	BPYRENE PPB	DBANTHRAC PPB	IPYRENE PPB	B(B)FLUO PPB	B(H)FLUO PPB	OIL&GREA PPM
22-Jul-85	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	
28-Feb-86											<7	<4.4		<16	<5	<9.6	<9.4			
01-May-86										ND	ND	ND		ND	ND	ND	ND	ND		
28-Jul-86										ND	ND	2.59		ND	ND	ND	ND	ND		
01-Oct-86										2.18	ND	DMBL		ND	ND	ND	ND	ND		

ATTACHMENT D

Groundwater Analysis from February 1987 through December 1987. These data area from Annual Ground-Water Monitoring Report for 1987 Kerr-McGee Chemical Corporation, Forest Products Division, Columbus, Mississippi, EPA I.D. No. MSD990866329, submitted to Mr. C. Estes MDNRBPC, March 1, 1988.

Monitor Well CMW-1

KERR MCGEE FOREST P[illegible]UCTS
COLUMBUS,MISSISSIPPI
WELL 0CMW1

DATE	ELEV FT AMSL	pH SU	SC UMHOS/CM	TOC PPM	TOH PPM
10-Feb-87	181.75				
09-Apr-87	181.14				
22-Jul-87	179.78				
01-Dec-87	178.92				

Monitor Well CMW-1A
Analytical Results

KERR MCGEE FOREST PRODUCTS
COLUMBUS,MISSISSIPPI
WELL 0CMW1A

DATE	ELEV FT AMSL	pH SU	SC UMHOS/CM	TOC PPM	TOH PPM
10-Feb-87	181.32	5.13	198	1.8	
10-Feb-87		5.18	198	2	
10-Feb-87		5.19	199	2.1	
10-Feb-87		5.25	199	2.2	
09-Apr-87	181.17	5.2	214	2.5	0.018
09-Apr-87		5.24	214	2.5	0.019
09-Apr-87		5.25	215	2.5	0.021
09-Apr-87		5.26	215	2.6	0.026
22-Jul-87	180.48	5.08	196	3	0.015
22-Jul-87		5.09	199	3	0.017
22-Jul-87		5.11	199	3.1	0.018
22-Jul-87		5.11	200	3.1	0.018
01-Dec-87	180.1	5.21	189	3.1	0.020
01-Dec-87		5.21	194	3.2	0.022
01-Dec-87		5.21	195	3.2	0.030
01-Dec-87		5.22	198	3.2	0.037

DATE	Cl PPM	Fe PPM	Mn PPM	PHENOLS PPM	Na PPM	SO4 PPM
01-Dec-87	28	16	0.12	<.050	24	26

DATE		11-Feb-87	09-Apr-87	22-Jul-87	01-Dec-87
PENTACHLOROPHENOL	PPB				<3.6
PHENOL	PPB				<1.5
CHLOROPHENOL	PPB				<3.3
P-CHLOR-M-CRESOL	PPB				<3.0
2,4 DIMETHYLPHENOL	PPB				<2.7
2,4 DINITROPHENOL	PPB				<42
CREOSOTE	PPB				
TRICHLOROPHENOLS	PPB				<2.7
TETRACHLOROPHENOLS	PPB				<10
NAPHTHALENE	PPB	<1.6	<1.6	<1.6	<1.6
ACENAPHTHYLENE	PPB	<3.5	<3.5	<3.6	<3.5
FLUORANTHENE	PPB	<2.2	<2.2	<2.3	<2.2
CHRYSENE	PPB				
BENZO(a)ANTHRACENE	PPB	<7.8	<7.8	<8.0	<7.8
BENZO(a)PYRENE	PPB	<2.5	<2.5	<2.6	<2.5
DIBENZO(a)ANTHRACENE	PPB	<10	<10	<10	<10
INDENO(1,2,3-c,d)PYRENE	PPB	<4.7	<4.7	<4.8	<4.7
BENZO(b)FLUORANTHENE	PPB	<10	<10	<10	<10
BENZO(h)FLUORANTHENE	PPB				
PHENANTHRENE	PPB	<5.4	<5.4	<5.6	<5.4
CARBAZOLE	PPB	<10	<10	<10	<10

Monitor Well CMW-2
Analytical Results

KERR MCGEE FOREST PRODUCTS
COLUMBUS,MISSISSIPPI
WELL #CMW2

DATE	ELEV FT AMSL	pH SU	SC UMHOS/CM	TOC PPM	TOH PPM
10-Feb-87	178.36	5.89	340	1.9	0.013
10-Feb-87		5.93	343	2.1	0.014
10-Feb-87		5.96	344	2.2	0.016
10-Feb-87		5.96	345	2.6	0.018
09-Apr-87	178.36	5.83	367	3.4	0.027
09-Apr-87		5.86	368	3.6	0.061
09-Apr-87		5.88	368	3.7	0.071
09-Apr-87		5.89	369	4	0.089
22-Jul-87	177.5	6.01	380	2	0.054
22-Jul-87		6.03	382	2.1	0.069
22-Jul-87		6.06	382	2.1	0.069
22-Jul-87		6.08	382	2.3	0.071
01-Dec-87	176.87	6.12	367	3.2	<0.005
01-Dec-87		6.15	367	3.2	0.005
01-Dec-87		6.16	374	3.2	0.006
01-Dec-87		6.17	375	3.3	0.008

DATE	Cl PPM	Fe PPM	Mn PPM	PHENOLS PPM	Na PPM	SO4 PPM
01-Dec-87	67.8	37.7	0.17	<.050	17	25

DATE		11-Feb-87	09-Apr-87	22-Jul-87	01-Dec-87
PENTACHLOROPHENOL	PPB				<3.6
PHENOL	PPB				<1.5
CHLOROPHENOL	PPB				<3.3
P-CHLOR-M-CRESOL	PPB				<3.0
2,4 DIMETHYLPHENOL	PPB				<2.7
2,4 DINITROPHENOL	PPB				<42
CREOSOTE	PPB				
TRICHLOROPHENOLS	PPB				<2.7
TETRACHLOROPHENOLS	PPB				<10
NAPHTHALENE	PPB	<1.6	<1.6	<1.6	<1.6
ACENAPHTHYLENE	PPB	<3.5	<3.5	<3.6	<3.5
FLUORANTHENE	PPB	<2.2	<2.2	<2.2	<2.2
CHRYSENE	PPB				
BENZO(a)ANTHRACENE	PPB	<7.8	<7.8	<8.0	<7.8
BENZO(a)PYRENE	PPB	<2.5	<2.5	<2.6	<2.5
DIBENZO(a)ANTHRACENE	PPB	<10	<10	<10	<10
INDENO(1,2,3-c,d)PYRENE	PPB	<4.7	<4.7	<4.8	<4.7
BENZO(b)FLUORANTHENE	PPB	<10	<10	<10	<10
BENZO(h)FLUORANTHENE	PPB				
PHENANTHRENE	PPB	<5.4	<5.4	<5.5	<5.4
CARBAZOLE	PPB	<10	<10	<10	<10

Monitor Well CMW-3
Analytical Results

KERR MCGEE FOREST PRODUCTS
COLUMBUS,MISSISSIPPI
WELL #CMW3

DATE	ELEV FT AMSL	pH SU	SC UMHOS/CM	TOC PPM	TOH PPM
10-Feb-87	177.51	5.85	344	3.6	0.03
10-Feb-87		5.89	345	3.6	0.032
10-Feb-87		5.91	347	3.7	0.032
10-Feb-87		5.95	349	3.9	0.037
09-Apr-87	177.52	5.72	365	3.1	0.015
09-Apr-87		5.73	368	3.3	0.021
09-Apr-87		5.75	369	3.4	0.022
09-Apr-87		5.76	369	3.4	0.023
22-Jul-87	176.41	6.15	378	3.2	0.039
22-Jul-87		6.19	380	3.3	0.043
22-Jul-87		6.19	380	3.3	0.049
22-Jul-87		6.2	382	3.4	0.060
01-Dec-87	175.98	6.13	447	5.4	0.010
01-Dec-87		6.14	451	5.5	0.010
01-Dec-87		6.16	452	5.6	0.011
01-Dec-87		6.17	454	5.7	0.012

DATE	Cl PPM	Fe PPM	Mn PPM	PHENOLS PPM	Na PPM	SO4 PPM
01-Dec-87	69.1	16	1.42	<.050	31	8

DATE		11-Feb-87	09-Apr-87	22-Jul-87	01-Dec-87
PENTACHLOROPHENOL	PPB				<3.6
PHENOL	PPB				<1.5
CHLOROPHENOL	PPB				<3.3
P-CHLOR-M-CRESOL	PPB				<3.0
2,4 DIMETHYLPHENOL	PPB				<2.7
2,4 DINITROPHENOL	PPB				<42
CREOSOTE	PPB				
TRICHLOROPHENOLS	PPB				<2.7
TETRACHLOROPHENOLS	PPB				<10
NAPHTHALENE	PPB	9.76	<1.6	21.4	100
ACENAPHTHYLENE	PPB	<3.5	<3.5	<3.5	<3.5
FLUORANTHENE	PPB	158	12.3	15.6	19.3
CHRYSENE	PPB				
BENZO(a)ANTHRACENE	PPB	9.15	<7.8	<7.8	<7.8
BENZO(a)PYRENE	PPB	4.55	<2.5	<2.5	<2.5
DIBENZO(a)ANTHRACENE	PPB	<10	<10	<10	<10
INDENO(1,2,3-c,d)PYRENE	PPB	<4.7	<4.7	<4.7	<4.7
BENZO(b)FLUORANTHENE	PPB	<10	<10	<10	<10
BENZO(h)FLUORANTHENE	PPB				
PHENANTHRENE	PPB	109	<5.4	42.8	60.8
CARBAZOLE	PPB	11.5	<10	<10	12.9

Monitor Well CMW-4
Analytical Results

KERR MCGEE FOREST PRODUCTS
COLUMBUS, MISSISSIPPI
WELL MCMW4

DATE	ELEV FT AMSL	pH SU	SC UMHOS/CM	TOC PPM	TOH PPM
10-Feb-87	178.78	4.93	262	8.2	0.05
10-Feb-87		4.96	263	8.3	0.051
10-Feb-87		4.99	263	9	0.052
10-Feb-87		5.02	264	9	0.053
09-Apr-87	178.76	5.25	280	12	0.066
09-Apr-87		5.25	282	12.1	0.7
09-Apr-87		5.26	283	12.5	0.76
09-Apr-87		5.26	285	13.2	0.105
22-Jul-87	177.48	5.37	266	8.1	0.064
22-Jul-87		5.38	267	8.3	0.067
22-Jul-87		5.39	267	8.3	0.071
22-Jul-87		5.39	268	8.5	0.08
01-Dec-87	177.23	5.47	262	15.5	0.071
01-Dec-87		5.5	266	15.9	0.061
01-Dec-87		5.58	266	15.9	0.044
01-Dec-87		5.6	269	16.6	0.065

DATE	Cl PPM	Fe PPM	Mn PPM	PHENOLS PPM	Na PPM	SO4 PPM
01-Dec-87	41.4	20	0.662	<.050	32	48

DATE		11-Feb-87	09-Apr-87	22-Jul-87	01-Dec-87
PENTACHLOROPHENOL	PPB				<3.6
PHENOL	PPB				<1.5
CHLOROPHENOL	PPB				<3.3
P-CHLOR-M-CRESOL	PPB				<3.0
2,4 DIMETHYLPHENOL	PPB				<2.7
2,4 DINITROPHENOL	PPB				<42
CREOSOTE	PPB				
TRICHLOROPHENOLS	PPB				<2.7
TETRACHLOROPHENOLS	PPB				<10
NAPHTHALENE	PPB	4250	3890	13500	3400
ACENAPHTHYLENE	PPB	87.9	91	83.2	77.5
FLUORANTHENE	PPB	113	23.3	17.9	25
CHRYSENE	PPB				
BENZO(a)ANTHRACENE	PPB	<7.8	<7.8	<7.8	<7.8
BENZO(a)PYRENE	PPB	<2.5	<2.5	<2.5	<2.5
DIBENZO(a)ANTHRACENE	PPB	<10	<10	<10	<10
INDENO(1,2,3-c,d)PYRENE	PPB	<4.7	<4.7	<4.7	<4.7
BENZO(b)FLUORANTHENE	PPB	<10	<10	<10	<10
BENZO(h)FLUORANTHENE	PPB				
PHENANTHRENE	PPB	264	200	153	197
CARBAZOLE	PPB	138	181	150	211

ETC ENVIRONMENTAL TESTING and CERTIFICATION

APR 19, 198

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

FORP Base/Neutral Compounds - GC/MS Analysis Data (QR81)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
BD0655	KERR-MCGEE CHEMICAL CORPORATIO	KMCCFPDC0L	SSPJDPT3L	880116	1245	0

NPDES Number	Compound	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concen. ug/l	MDL ug/l a	First ug/l	Second ug/l	Blank Data ug/l	Concen. Added ug/l	% Recov	Unspiked Sample ug/l	Concen. Added ug/l	% Recov
2B	Acenaphthylene	BMDL	230	11.0	9.25	ND	100	89	ND	111	86
5B	Benzo(a)anthracene	ND	520	ND	ND	ND	100	92	ND	111	85
6B	Benzo(a)pyrene	ND	170	ND	ND	ND	100	110	ND	111	98
7B	Benzo(b)fluoranthene	ND	320	ND	ND	ND	100	265e	ND	111	189 e
19B	Dibenzo(a,h)anthracene	ND	670	ND	ND	ND	0	-	ND	0	-
31B	Fluoranthene	BMDL	150	11.2	8.09	ND	100	122	ND	111	86
37B	Indeno(1,2,3-c,d)pyrene	ND	310	ND	ND	ND	0	-	ND	0	-
39B	Naphthalene	8110	110	605	475	ND	100	75	ND	111	83
44B	Phenanthrene	433	360	78.8	72.3	ND	100	92	ND	111	83
	Carbazole	BMDL	670	77.5	57.2	ND	100	102	ND	111	83

a Extract required dilution which resulted in these elevated MDLs.

e Recovery manually verified.

ETC ENVIRONMENTAL TESTING and CERTIFICATION

Technical Report

for

KERR-MCGEE CHEMICAL CORP.

PO BOX 25861

OKLAHOMA CITY, OK 73125

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
BD0654	KERR-MCGEE CHEMICAL CORPORATION	KMCCFPDCOL	SSPJDPT5L	880116	1158	

Swep T. Davis

President

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ETC ENVIRONMENTAL TESTING and CERTIFICATION

FEB 12, 19

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

FORP Acid Compounds - GC/MS Analysis Data (QR80)

Chain of Custody Data Required for ETC Data Management Summary Reports

BD0654 KERR-MCGEE CHEMICAL CORPORATIO KMCCFPDCOL SSPJDPT5L 880116 1158

ETC Sample No. | Company | Facility | Sample Point | Date | Time | Elapsed Hours

NPDES Number	Compound	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concen. ug/l	MDL ug/l	First ug/l	Second ug/l	Blank Data ug/l	Concen. Added ug/l	% Recov	Unspiked Sample ug/l	Concen. Added ug/l	% Recov
1A	2-Chlorophenol	ND	3.4	ND	ND	ND	100	83	ND	122	5
3A	2,4-Dimethylphenol	ND	2.8	ND	ND	ND	100	86	ND	122	3
5A	2,4-Dinitrophenol	ND	43	ND	ND	ND	100	51	ND	122	59
8A	p-Chloro-m-cresol	ND	3.1	ND	ND	ND	100	117	ND	122	1
9A	Pentachlorophenol	ND	3.7	ND	ND	ND	100	121	ND	122	2
10A	Phenol	ND	1.5	ND	ND	ND	100	57	ND	122	2
11A	2,4,6-Trichlorophenol	ND	2.8	ND	ND	ND	100	92	ND	122	2
	2,3,4,6-Tetrachlorophenol	ND	10	ND	ND	ND	100	116	ND	122	3

a Variable recoveries due to sample matrix interference confirmed by this repeat analysis.

ETC ENVIRONMENTAL TESTING and CERTIFICATION

APR 19, 1988

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

FORP Base/Neutral Compounds - GC/MS Analysis Data (QR81)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
BD0654	KERR-MCGEE CHEMICAL CORPORATIO	KMCCFPDCOL	SSPJDPT5L	880116	1158	0

NPDES Number	Compound	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concen. ug/l	MDL ug/l	First ug/l	Second ug/l	Blank Data ug/l	Concen. Added ug/l	% Recov	Unspiked Sample ug/l	Concen. Added ug/l	% Rec
2B	Acenaphthylene	4.40	3.9	11.0	9.25	ND	100	89	ND	111	86
5B	Benzo(a)anthracene	ND	8.8	ND	ND	ND	100	92	ND	111	85
6B	Benzo(a)pyrene	ND	2.8	ND	ND	ND	100	110	ND	111	98
7B	Benzo(b)fluoranthene	ND	5.4	ND	ND	ND	100	265a	ND	111	189
19B	Dibenzo(a,h)anthracene	ND	11	ND	ND	ND	0	-	ND	0	-
31B	Fluoranthene	32.9	2.5	11.2	8.09	ND	100	122	ND	111	86
37B	Indeno(1,2,3-c,d)pyrene	ND	5.3	ND	ND	ND	0	-	ND	0	-
39B	Naphthalene	6.71	1.8	605	475	ND	100	75	ND	111	83
44B	Phenanthrene	71.5	6.1	78.8	72.3	ND	100	92	ND	111	83
	Carbazole	23.5	11	77.5	57.2	ND	100	102	ND	111	83

a Recovery manually verified.

ETC ENVIRONMENTAL TESTING and CERTIFICATION

Technical Report

for

KERR-MCGEE CHEMICAL CORP.

PO BOX 25861

OKLAHOMA CITY, OK 73125

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
E0648	KERR-MCGEE CHEMICAL CORPORATION	KMCCFPDCOL	SSPJDPT5I	880116	1158	

Swep T. Davis

President

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ETC ENVIRONMENTAL TESTING and CERTIFICATION

FEB 24, 198

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

FORP Acid Compounds - GC/MS Analysis Data (QR80)

Chain of Custody Data Required for ETC Data Management Summary Reports

BD0648 KERR-MCGEE CHEMICAL CORPORATIO KMCCFPDCOL SSFJDPT5I 880116 1158

ETC Sample No. | Company | Facility | Sample Point | Date | Time | Elapsed Hours

NPDES Number	Compound	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concen. ug/kg	MDL ug/kg	First ug/kg	Second ug/kg	Blank Data ug/kg	Concen. Added ug/kg	% Recov	Unspiked Sample ug/kg	Concen. Added ug/kg	% Recov
1A	2-Chlorophenol	ND	130	ND	ND	ND	0	-	ND	3860	59
3A	2,4-Dimethylphenol	BMDL	100	10.9	ND	ND	0	-	21.3	3860	[illegible]
5A	2,4-Dinitrophenol	ND	1600	ND	ND	ND	0	-	ND	3860	[illegible]
8A	p-Chloro-m-cresol	ND	110	ND	ND	ND	0	-	ND	3860	[illegible]
9A	Pentachlorophenol	357.	140	357.	126.	ND	0	-	313	3860	[illegible]
10A	Phenol	ND	57	ND	ND	ND	0	-	105	3860	[illegible]
11A	2,4,6-Trichlorophenol	ND	100	ND	ND	ND	0	-	ND	3860	[illegible]
	2,3,4,6-Tetrachlorophenol	ND	380	ND	ND	ND	0	-	ND	3860	[illegible]

. Variable replication, due to the non-homogeneous nature of the sample matrix, manually verified.

ETC ENVIRONMENTAL TESTING and CERTIFICATION

FEB 26, 1988

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

FORP Base/Neutral Compounds - GC/MS Analysis Data (QR81)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
BD0648	KERR-MCGEE CHEMICAL CORPORATIO	KMCCFPDCOL	SSPJCPT5I	880116	1158	

NPDES Number	Compound	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concen. ug/kg	MDL ug/kg[a]	First ug/kg	Second ug/kg	Blank Data ug/kg	Concen. Added ug/kg	% Recov	Unspiked Sample ug/kg	Concen. Added ug/kg	% Recov
2B	Acenaphthylene	BMDL	1300	1100	1150	ND	0	-	1690	3860	87
5B	Benzo(a)anthracene	8040	3000	8040	8220	ND	0	-	11200	3860	87
6B	Benzo(a)pyrene	3690	960	3690	3550	ND	0	-	8030	3860	[illegible]
7B	Benzo(b)fluoranthene	17400	3800	17400	15800	ND	0	-	15400	3860	[illegible]
19B	Dibenzo(a,h)anthracene	BMDL	3800	523	441	ND	0	-	1180	0	
31B	Fluoranthene	43000	840	43000	41000	ND	0	-	65300	3860	1
37B	Indeno(1,2,3-c,d)pyrene	BMDL	1800	1480	1570	ND	0	-	4990	0	
39B	Naphthalene	6800	610	6800	9830	ND	0	-	31300	3860	13
44B	Phenanthrene	58500	2100	58500	58400	ND	0	-	86500	3860	[illegible]
	Carbazole	5490	3800	5490	5040	ND	0	-	14700	3860	[illegible]

[a] Extract required dilution which resulted in these elevated MDLs.

[b] Recovery variable due to sample matrix interference.

ETC ENVIRONMENTAL TESTING and CERTIFICATION

Technical Report

for

KERR-MCGEE CHEMICAL CORP.

PO BOX 25861

OKLAHOMA CITY, OK 73125

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
BD0649	KERR-MCGEE CHEMICAL CORPORATION	KMCCFPDCOL	SSPJDPT4I	880116	1218	

Swep T. Davis

President

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ETC ENVIRONMENTAL TESTING and CERTIFICATION

FEB 24, 1988

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

FORP Acid Compounds - GC/MS Analysis Data (QR80)

Chain of Custody Data Required for ETC Data Management Summary Reports

BD0649 KERR-MCGEE CHEMICAL CORPORATIO KMCCFPDCOL SSPJDPT4I 880116 1218

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours

NPDES Number	Compound	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concen. ug/kg	MDL ug/kg	First ug/kg	Second ug/kg	Blank Data ug/kg	Concen. Added ug/kg	% Recov	Unspiked Sample ug/kg	Concen Added ug/kg	% Reco.
1A	2-Chlorophenol	ND	130	ND	ND	ND	0	-	ND	3860	80
3A	2,4-Dimethylphenol	1030	100	10.9	ND	ND	0	-	21.3	3860	71
5A	2,4-Dinitrophenol	ND	1600	ND	ND	ND	0	-	ND	3860	66
8A	p-Chloro-m-cresol	ND	110	ND	ND	ND	0	-	ND	3860	83
9A	Pentachlorophenol	273	140	357.	126.	ND	0	-	313	3860	118
10A	Phenol	596	57	ND	ND	ND	0	-	105	3860	79
11A	2,4,6-Trichlorophenol	ND	100	ND	ND	ND	0	-	ND	3860	89
	2,3,4,6-Tetrachlorophenol	ND	380	ND	ND	ND	0	-	ND	3860	70

* Variable recoveries, due to the non-homogeneous nature of the sample matrix, usually verified.

ETC ENVIRONMENTAL TESTING and CERTIFICATION

FEB 26, 1988

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

FORP Base/Neutral Compounds – GC/MS Analysis Data (QR81)

Chain of Custody Data Required for ETC Data Management Summary Reports

BD0649 KERR MCGEE CHEMICAL CORPORATIO KMCCF DCOL SSF JOPT4I 880116 1218

ETC Sample No. | Company | Facility | Sample Point | Date | Time | Elapsed Hours

NPDES Number	Compound	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concen. ug/kg	MDL ug/kg[a]	First ug/kg	Second ug/kg	Blank Data ug/kg	Concen. Added ug/kg	% Recov	Unspiked Sample ug/kg	Concen. Added ug/kg	% Recov
2B	Acenaphthylene	BMDL	13000	1100	1150	ND	0	-	1690	3860	8
5B	Benzo(a)anthracene	85300	30000	8040	8220	ND	0	-	11200	3860	8
6B	Benzo(a)pyrene	33100	9600	3690	3550	ND	0	-	8030	3860	
7B	Benzo(b)fluoranthene	142000	38000	17400	15800	ND	0	-	15400	3860	
19B	Dibenzo(a,h)anthracene	BMDL	38000	523	441	ND	0	-	1180	0	
31B	Fluoranthene	407000	8400	43000	41000	ND	0	-	65300	3860	1
37B	Indeno(1,2,3-c,d)pyrene	BMDL	18000	1480	1570	ND	0	-	4990	0	
39B	Naphthalene	316000	6100	6800	9830	ND	0	-	31300	3860	13
44B	Phenanthrene	629000	21000	58500	58400	ND	0	-	86500	3860	1
	Carbazole	43900	38000	5490	5040	ND	0	-	14700	3860	5

[a] Extract required dilution which resulted in these elevated MDLs.

[b] Recovery variable due to sample matrix interference.

ETC ENVIRONMENTAL TESTING and CERTIFICATION

Technical Report

for

KERR-MCGEE CHEMICAL CORP.

PO BOX 25861

OKLAHOMA CITY, OK 73125

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
BD0656	KERR-MCGEE CHEMICAL CORPORATION	KMCCFPDCOL	SSPJDPT4L	880116	1218	

Swep T. Davis

President

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ETC ENVIRONMENTAL TESTING and CERTIFICATION

FEB 12, 1988

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

FORP Acid Compounds - GC/MS Analysis Data (QR80)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
BD0656	KERR-MCGEE CHEMICAL CORPORATIO	KMCCFPDCOL	SSPJDPT4L	880116	1218	

NPDES Number	Compound	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concen. ug/l	MDL ug/l	First ug/l	Second ug/l	Blank Data ug/l	Concen. Added ug/l	% Recov	Unspiked Sample ug/l	Concen. Added ug/l	% Recov a
1A	2-Chlorophenol	ND	3.3	ND	ND	ND	100	83	ND	122	5
3A	2,4-Dimethylphenol	42.4	2.7	ND	ND	ND	100	86	ND	122	3
5A	2,4-Dinitrophenol	ND	42	ND	ND	ND	100	51	ND	122	59
8A	p-Chloro-m-cresol	ND	3.0	ND	ND	ND	100	117	ND	122	1
9A	Pentachlorophenol	ND	3.6	ND	ND	ND	100	121	ND	122	2
10A	Phenol	21.5	1.5	ND	ND	ND	100	57	ND	122	2
11A	2,4,6-Trichlorophenol	ND	2.7	ND	ND	ND	100	92	ND	122	2
	2,3,4,6-Tetrachlorophenol	BMDL	10	ND	ND	ND	100	116	ND	122	3

a Variable recoveries due to sample matrix interference confirmed by this repeat analysis.

ETC ENVIRONMENTAL TESTING and CERTIFICATION

APR 21, 1988

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

FORP Base/Neutral Compounds - GC/MS Analysis Data (QR81)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
BD0656	KERR-MCGEE CHEMICAL CORPORATIO	KMCCFPDCOL	SSPJDPT4L	880116	1218	0

NPDES Number	Compound	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concen. ug/l	MDL ug/l	First ug/l	Second ug/l	Blank Data ug/l	Concen. Added ug/l	% Recov	Unspiked Sample ug/l	Concen. Added ug/l	% Recov
2B	Acenaphthylene	69.3	3.6	ND	ND	ND	100	85	ND	101	73
5B	Benzo(a)anthracene	ND	8.0	ND	ND	ND	100	88	ND	101	64
6B	Benzo(a)pyrene	ND	2.6	ND	ND	ND	100	47	ND	101	55
7B	Benzo(b)fluoranthene	ND	4.9	ND	ND	ND	100	53	ND	101	54
19B	Dibenzo(a,h)anthracene	ND	10	ND	ND	ND	0	-	ND	0	-
31B	Fluoranthene	57.3	2.3	ND	ND	ND	100	58	ND	101	64
37B	Indeno(1,2,3-c,d)pyrene	ND	4.8	ND	ND	ND	0	-	ND	0	-
39B	Naphthalene	104	1.6	ND	ND	ND	100	91	ND	101	82
44B	Phenanthrene	396	5.6	ND	ND	ND	100	95	ND	101	62
	Carbazole	266	10	ND	ND	ND	100	73	ND	101	69

Technical Report

for

KERR-MCGEE CHEMICAL CORP.

PO BOX 25861

OKLAHOMA CITY, OK 73125

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
BD0653	KERR-MCGEE CHEMICAL CORPORATION	KMCCFPDCOL	SSPJDPT6L	880116	1135	

Swep T. Davis

President

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ETC ENVIRONMENTAL TESTING and CERTIFICATION

FEB 12,

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

FORP Acid Compounds – GC/MS Analysis Data (QR80)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
BD0653	KERR-MCGEE CHEMICAL CORPORATIO	KMCCFPDCOL	SSPJDPT6L	880116	1135	

NPDES Number	Compound	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concen. ug/l	MDL ug/l	First ug/l	Second ug/l	Blank Data ug/l	Concen. Added ug/l	% Recov	Unspiked Sample ug/l	Concen. Added ug/l	% Rec
1A	2-Chlorophenol	ND	3.5	ND	ND	ND	100	83	ND	122	
3A	2,4-Dimethylphenol	ND	2.9	ND	ND	ND	100	86	ND	122	
5A	2,4-Dinitrophenol	ND	45	ND	ND	ND	100	51	ND	122	5
8A	p-Chloro-m-cresol	ND	3.2	ND	ND	ND	100	117	ND	122	
9A	Pentachlorophenol	ND	3.9	ND	ND	ND	100	121	ND	122	
10A	Phenol	ND	1.6	ND	ND	ND	100	57	ND	122	
11A	2,4,6-Trichlorophenol	ND	2.9	ND	ND	ND	100	92	ND	122	
	2,3,4,6-Tetrachlorophenol	ND	11	ND	ND	ND	100	116	ND	122	

a Variable recoveries due to sample matrix interference confirmed by this repeat analysis.

ETC ENVIRONMENTAL TESTING and CERTIFICATION

APR 19, 1988

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

FORP Base/Neutral Compounds - GC/MS Analysis Data (QR81)

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
BD0653	KERR-MCGEE CHEMICAL CORPORATIO	KMCCFPDCOL	SSPJDPT6L	880116	1135	0

NPDES Number	Compound	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concen. ug/l	MDL ug/l	First ug/l	Second ug/l	Blank Data ug/l	Concen. Added ug/l	% Recov	Unspiked Sample ug/l	Concen. Added ug/l	Re
2B	Acenaphthylene	18.1	4.1	11.0	9.25	ND	100	89	ND	111	86
5B	Benzo(a)anthracene	ND	9.2	ND	ND	ND	100	92	ND	111	85
6B	Benzo(a)pyrene	ND	2.9	ND	ND	ND	100	110	ND	111	98
7B	Benzo(b)fluoranthene	ND	5.6	ND	ND	ND	100	265a	ND	111	189
19B	Dibenzo(a,h)anthracene	ND	12	ND	ND	ND	0	-	ND	0	-
31B	Fluoranthene	61.0	2.6	11.2	8.09	ND	100	122	ND	111	86
37B	Indeno(1,2,3-c,d)pyrene	ND	5.5	ND	ND	ND	0	-	ND	0	-
39B	Naphthalene	14.2	1.9	605	475	ND	100	75	ND	111	83
44B	Phenanthrene	236	6.4	78.8	72.3	ND	100	92	ND	111	83
	Carbazole	196	12	77.5	57.2	ND	100	102	ND	111	83

a Recovery manually verified.

Technical Report

for

KERR-MCGEE CHEMICAL CORP.

PO BOX 25861

OKLAHOMA CITY, OK 73125

Chain of Custody Data Acquired for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
[redacted]0647	KERR-MCGEE CHEMICAL CORPORATION	KMCCFPDCOL	SSPJDPT6I	880116	1135	

Swep T. Davis

President

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ETC ENVIRONMENTAL TESTING and CERTIFICATION

FEB 26, 198

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

FORP Base/Neutral Compounds - GC/MS Analysis Data (QR81)

Chain of Custody Data Required for ETC Data Management Summary Reports

BD0647 KERR-MCGEE CHEMICAL CORPORATIO KMCCFPDCOL SSPJDPT6I 880116 1135

ETC Sample No. | Company | Facility | Sample Point | Date | Time | Elapsed Hours

NPDES Number	Compound	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concen. ug/kg	MDL ug/kg	First ug/kg	Second ug/kg	Blank Data ug/kg	Concen. Added ug/kg	% Recov	Unspiked Sample ug/kg	Concen Added ug/kg	R
2B	Acenaphthylene	1690	1400	1100	1150	ND	0	-	1690	3860	
5B	Benzo(a)anthracene	11200	3000	8040	8220	ND	0	-	11200	3860	
6B	Benzo(a)pyrene	8030	970	3690	3550	ND	0	-	8030	3860	
7B	Benzo(b)fluoranthene	15400	3900	17400	15800	ND	0	-	15400	3860	
19B	Dibenzo(a,h)anthracene	BMDL	3900	523	441	ND	0	-	1180	0	
31B	Fluoranthene	65300	850	43000	41000	ND	0	-	65300	3860	
37B	Indeno(1,2,3-c,d)pyrene	4990	1800	1480	1570	ND	0	-	4990	0	
39B	Naphthalene	31300	620	6800	9830	ND	0	-	31300	3860	
44B	Phenanthrene	86500	2100	58500	58400	ND	0	-	86500	3860	
	Carbazole	14700	3900	5490	5040	ND	0	-	14700	3860	

@ Large final volume of extract resulted in these elevated MDLs.

Recovery variable due to sample matrix interference.

ETC ENVIRONMENTAL TESTING and CERTIFICATION

FEB 24, 1988

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

FORP Acid Compounds – GC/MS Analysis Data (QR80)

Chain of Custody Data Required for ETC Data Management Summary Reports

BD0647 KERR-MCGEE CHEMICAL CORPORATIO KMCCFPDCOL SSPJDPT6I 880116 1135

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours

NPDES Number	Compound	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concen. ug/kg	MDL ug/kg	First ug/kg	Second ug/kg	Blank Data ug/kg	Concen. Added ug/kg	% Recov	Unspiked Sample ug/kg	Concen Added ug/kg	% Rec
1A	2-Chlorophenol	ND	130	ND	ND	ND	0	-	ND	3860	
3A	2,4-Dimethylphenol	BMDL	100	10.9	ND	ND	0	-	21.3	3860	
5A	2,4-Dinitrophenol	ND	1600	ND	ND	ND	0	-	ND	3860	
8A	p-Chloro-m-cresol	ND	120	ND	ND	ND	0	-	ND	3860	
9A	Pentachlorophenol	313	140	357.	126.	ND	0	-	313	3860	
10A	Phenol	105	58	ND	ND	ND	0	-	105	3860	
11A	2,4,6-Trichlorophenol	ND	100	ND	ND	ND	0	-	ND	3860	
	2,3,4,6-Tetrachlorophenol	ND	390	ND	ND	ND	0	-	ND	3860	

* Variable restriction, due to the non-homogeneous nature of the [illegible] matrix, manually verified.

TABLE 1: QUANTITA[illegible] RESULTS

	Sample Point I.D.											
	IMP1-01		IMP2-01		IMP2-02		IMP2-03		IMP2-04		IMP2-05	
	SOIL	EP-TOX	SOIL	EP-TOX	SOIL	EP-TOX	SOIL	EP-TOX	SOIL	EP-TOX	SOIL	EP-TOX
PARAMETER	ug/Kg	ug/l	ug/Kg	ug/l	ug/Kg	ug/l	ug/Kg	ug/l	ug/Kg	ug/l	ug/Kg	ug/l
ACID COMPOUNDS												
2 - Chlorophenol	ND[1]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4 - Dimethylphenol	BMDL[2]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4 - Dinitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p- Chloro-m-cresol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenol	ND	3.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.53
2,4,6 - Trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6 - Tetrachlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BASE/NEUTRAL COMPOUNDS												
Acenaphthylene	1760	48.3	ND	ND	ND	ND	ND	ND	ND	4.04	ND	ND
Benzo(a)anthracene	8900	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)pyrene	3220	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	4700	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzo(a,h)anthracene	BMDL	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	88900	ND	ND	ND	ND	ND	97.7	8.76	ND	BMDL	ND	ND
Indeno(1,2,3-c,d)pyrene	792	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	7970	992	ND	ND	ND	ND	89.2	60.2	ND	8.11	ND	ND
Phenanthrene	52500	130	ND	ND	ND	ND	285	17.6	ND	7.53	ND	ND
Carbazole	8640	34.4	ND	ND	ND	ND	BMDL	BMDL	ND	ND	ND	ND

1. Not Detected

2. Below Method Detection Limit

Sample Point IMP1-01 is Sample No. 1, Impoundment No. 1

Sample Point IMP2-01 is Sample No. 1, Impoundment No. 2

ATTACHMENT F

Soil analytical results from the Aeration Impoundment (SWMU 28) and the Sedimentation Impoundment (SWMU 29) from October 1986. These data are taken from the Impoundment Closure Report Kerr-McGee Chemical Corporation Forest Products Division Columbus, Mississippi Facility, October 15, 1986.

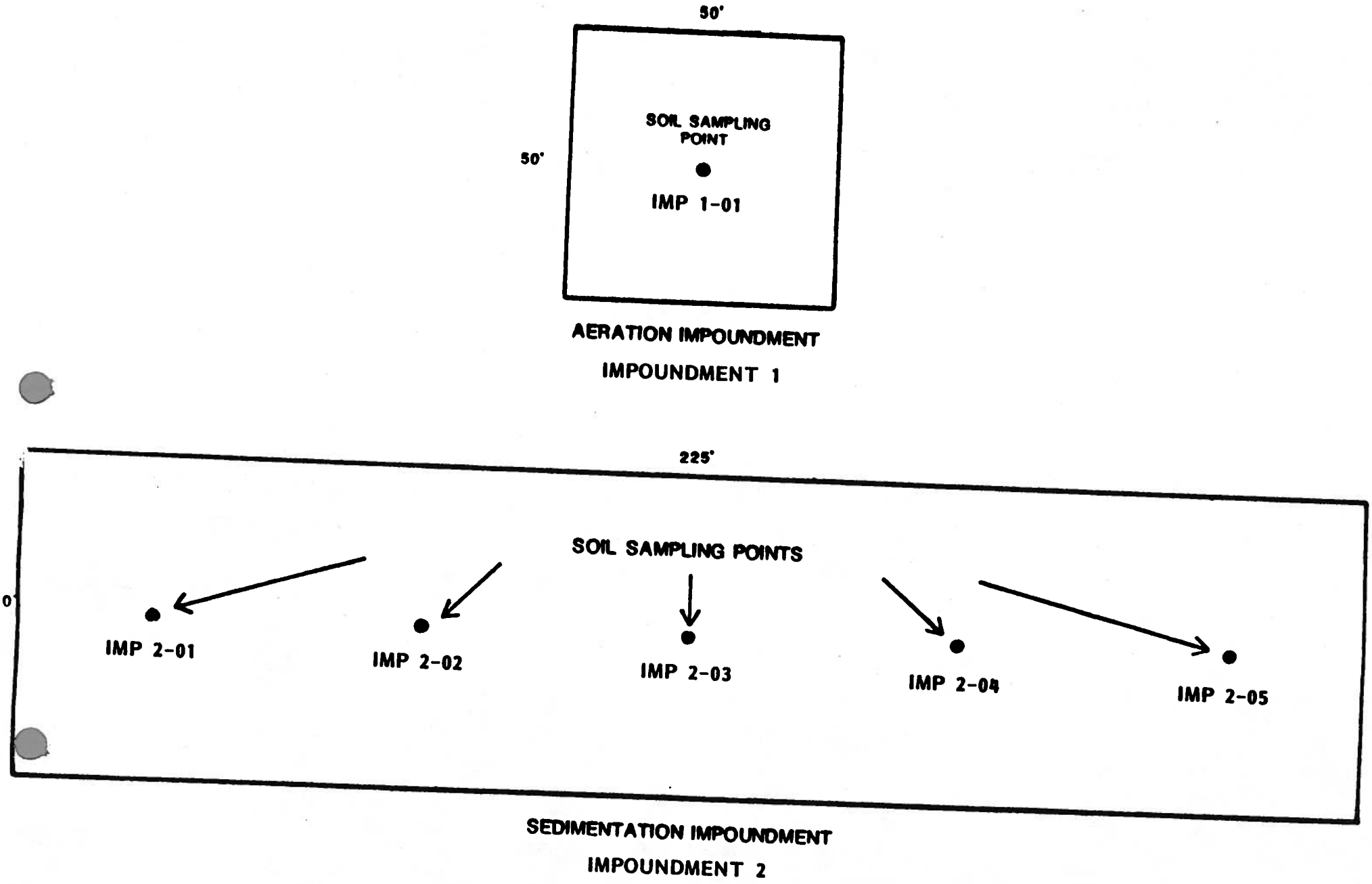

FIGURE 1
SOIL SAMPLING LOCATIONS