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CDM FEDERAL PROGRAMS CORPORATION

RCRA FACILITY ASSESSMENT - INTERIM FINAL REPORT
CEDAR CHEMICAL CORPORATION
VICKSBURG, MISSISSIPPI

Prepared for

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Office of Waste Programs Enforcement
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TABLE OF CONTENTS

I. EXECUTIVE SUMMARY 1

II. INTRODUCTION 10
- A. File Search and VSI 10
- B. Facility History 11
- C. Regulatory History 15
- D. Process Description 25
- E. Waste Management 28
- F. Environmental and Demographic Setting 30
  - 1. Meteorology 30
  - 2. Floodplain and Surface Waters 30
  - 3. Soils and Geology 31
  - 4. Ground Water 33
  - 5. Toxicological Evaluation 36

III. SWMU DESCRIPTIONS 41

IV. SUMMARY 93

V. REFERENCES 98

APPENDIX A VSI LOG BOOK A-1

APPENDIX B VSI PHOTOGRAPH LOG B-1

APPENDIX C SAMPLING DATA SUMMARY C-1

APPENDIX D PROCESS AREA SEWERS AND SURFACE WATER DRAINAGE REPORTS D-1

LIST OF TABLES

Table I-1	SWMU/AOC Assessment Summary	5
Table II-1	Facility Inspections At Cedar Chemical Corporation	20
Table II-2	Summary of SWMUs with Confirmed Contamination	37
Table IV-1	List of all Solid Waste Management Units (SWMUs)	94
Table IV-2	List of SWMUs Requiring No Further Action . .	95
Table IV-3	List of SWMUs that are RCRA-Regulated Units .	96
Table IV-4	List of SWMUs Requiring an RFI	97

LIST OF FIGURES

Figure II-1	Facility Location Map	12
Figure II-2	Cedar Chemical Corporation Vicksburg Facility	13
Figure II-3	Boring Log of No. MW-16	32
Figure II-4	Monitoring Well Locations	34
Figure II-5	Log of Ground-Water Observation Well	35
Figure III-1	South Plant SWMU Map	42
Figure III-2	Area Specific SWMU Map	73
Figure III-3	North Plant SWMU Map	74

I. EXECUTIVE SUMMARY

The 1984 Hazardous and Solid Waste Amendments (HSWA) to the Resource Conservation and Recovery Act (RCRA) authorized EPA to require corrective action for releases of hazardous waste and/or hazardous constituents from Solid Waste Management Units (SWMUs) and other Areas of Concern (AOCs) at all operating, closed or closing RCRA-regulated facilities. The intention of this authority is to address previously unregulated releases to air, surface water, soil and ground water. The generation of subsurface gas is also addressed. The first phase of the corrective action program, as established by EPA, is development of a RCRA Facility Assessment (RFA). The RFA is a structured investigative process which includes a Preliminary Review (PR) of all available relevant documents, a Visual Site Inspection (VSI) and, if appropriate, a Sampling Visit (SV).

This RFA addresses the Cedar Chemical Corporation (CCC) facility near Vicksburg, Mississippi. It is based on a PR of U.S. EPA Region IV and the Mississippi Department of Natural Resources (MSDNR) files and a VSI of the facility. The PR was conducted during May and June 1990, and the VSI was conducted on July 31, 1990. The submissions of this interim final RFA report was delayed until October 1991 by contractual issues.

The purpose of the RFA is to identify SWMUs and AOCs located at the facility, and to evaluate their potential for release of hazardous constituents to the air, surface water, soil and ground water, along with the potential for subsurface gas generation. In addition to SWMUs, AOCs are also identified. AOCs may be potential sources of release of hazardous constituents to the environment which do not necessarily involve wastes.

The Cedar Chemical Corporation facility is a chemical production plant located near Vicksburg, Mississippi. The CCC facility is separated into two sections known as the North Plant and the South Plant. The North Plant is involved in fertilizer manufacturing activities and produces potassium nitrate, chlorine, and nitrogen tetroxide. The South Plant formerly produced many pesticides and other organic compounds, including Dinoseb, Toxaphene and Atrazine, but is currently only producing nitric acid for consumption at the North Plant.

The CCC facility has had two recorded releases. On March 7, 1978, a 10,000-gallon storage tank of methyl parathion exploded at the South Plant, triggering in the explosion of three to four hundred 55-gallon drums, the burning of the storage structure, and the burning of a sodium-nitro-phenol warehouse. No

environmental effects were noted in the subsequent inspections conducted by the MSDNR. The second release occurred on February 5, 1983 when the dike on the east side of the South Plant Surface Impoundment (SWMU 3b) breached, releasing approximately 700,000 gallons of wastewater into Stouts Bayou. Again, no environmental effects were observed by the MSDNR.

Waste management practices at CCC focus primarily on the containment and treatment of process wastewaters and stormwater runoff. In the North Plant, the process wastewaters are contained, transported and treated before being released under NPDES Permit No. MS0027995. Treatment consists of neutralizing the acidic wastewaters in the North Plant Neutralization System (SWMU 22). Prior to the installation of this system in 1988, the wastewaters were neutralized with lime in the now Inactive North Plant Surface Impoundment (SWMU 23). The wastewaters treated at the North Plant originate from both the process areas and from the scrubbers which are used to treat the off-gases generated in fertilizer production. Stormwater runoff which is not contained by the North Plant Containment System (SWMU 24) flows via the North Plant Drainage Ditches (SWMU 33) into Stouts Bayou. This bayou flows south along the eastern border of the facility. The North Plant also collects waste oils for recycling.

In the South Plant, process wastewaters and stormwater runoff are collected and channeled to the South Plant Surface Impoundments (SWMU 3). The wastewaters are then treated by a Calgon Adsorption System (SWMU 4) before being released to surface waters. Any stormwater runoff which is not channeled to the impoundments flows into the South Plant Drainage Ditches (SWMU 13). The drainage ditch running along the western border of the facility also receives the NPDES permitted discharges from both the North and South Plants. This ditch flows west through a large wetland into Hennessey's Bayou.

The facility discarded both hazardous and nonhazardous solid wastes in the Inactive Landfill (SWMU 2). The unlined landfill went through a non-RCRA type closure in the early 1980's. Solid wastes generated at the South Plant after this unit ceased operation are either drummed for disposal offsite or temporarily discarded in the Junkyard and Waste Piles (SWMU 34), which are cleared out periodically. At the time of the VSI, a large Scrap Metal Dumpster (SWMU 19) was also present in the South Plant. The dumpster was used for the collection of large debris generated from the dismantling of the former production areas.

After three submissions of Part B Permit Applications, CCC was formally denied a RCRA Permit in July 1986. CCC then decided to contest the ruling by claiming that their South Plant Surface Impoundments (SWMU 3) should not be RCRA-regulated. The

Mississippi Commission on Natural Resources upheld Cedar's position by declaring the Dinoseb and Toxaphene losses found in the impoundment to be exempt from RCRA regulation by the "de minimus" exclusion of the mixture rule in 40 CFR Part 261.3. However, the facility has a RCRA-regulated storage unit (the Drum Storage Area, SWMU 1a) which is subject to regulatory and statutory requirements including corrective action requirements.

In October 1989, the EPA completed an Endangerment Assessment of the Cedar Chemical, Vicksburg facility. The Assessment included a Determination of Release from a Sampling Investigation conducted in February 1989 and from previous inspections of the facility. The investigations had found contaminants in soil and ground-water samples. The 1989 investigation found that soil samples taken from various locations at the South Plant showed concentrations of Dinoseb ranging from 15 µg/kg to 380,000 µg/kg. In the same investigation, two monitoring wells detected cyanide in the ground water, ranging from 0.14 mg/kg to 58.0 mg/kg. Sampling of the monitoring wells also detected Atrazine, Cyanazine and Propazine in the ground water.

As a result of the Endangerment Assessment, a RCRA Facility Assessment was requested to investigate the SWMUs and AOCs located at the facility. A total of 21 SWMUs were identified at the South Plant, 12 SWMUs at the North Plant, and one SWMU (the Junkyard and Waste Piles - SWMU 34) which was located throughout both Plants. No AOCs were identified.

Due to the amount of contamination found throughout the facility, an RFI is suggested for the following twenty-six units:

- Drum Storage Area (SWMU 1)
- Inactive Landfill Area (SWMU 2)
- South Plant Surface Impoundments (SWMU 3)
- Carbon Adsorption System (SWMU 4)
- South Plant Drainage System (SWMU 5)
- Former Dinoseb Production Area (SWMU 7)
- Dinoseb Off-Loading Area (SWMU 8)
- Dinoseb Drumming Area and Drains (SWMU 9)
- Former MSMA Production Area (SWMU 11)
- Former MSMA Salt Unloading Area (SWMU 12)
- South Plant Drainage Ditches (SWMU 13)
- Former Toxaphene Production Area (SWMU 14)
- Former Methyl Parathion Production Area (SWMU 15)
- Former Atrazine Production Area (SWMU 16)
- Returned Product Storage Area (SWMU 17)
- Former Blue Tank (SWMU 18)
- Railroad Car Unloading Station (SWMU 20)
- North Plant Neutralization System (SWMU 22)
- Inactive North Plant Surface Impoundment (SWMU 23)
- Wastewater Pipes (SWMU 25)
- C-10 Scrubber (SWMU 26)

- Oil Collection Unit (SWMU 29)
- Waste Oil SAA (SWMU 30)
- No. 6 Fuel Oil Area (SWMU 31)
- North Plant Drainage Ditches (SWMU 33)
- Junkyard and Waste Piles (SWMU 34).

Refer to the Executive Summary Table, Table I-1 for a synopsis of the facility SWMUs.

II. INTRODUCTION

The 1984 HSWA to the RCRA authorized EPA to require corrective action for releases of hazardous wastes and/or hazardous constituents at facilities authorized to operate under interim status. The intent of this authority is to address previously unregulated releases to air, surface water, soil and ground water. The generation of subsurface gas is also addressed. The first phase of the corrective action program, as established by EPA, is development of a RFA. The RFA includes a Preliminary Review (PR) of all available relevant documents, a VSI and, if appropriate, a SV.

This Chapter provides a summary of the file search and VSI, a description of facility's history, regulatory history, process operations, waste management practices, environment, and demographic setting. The SWMUs are described in Chapter III. Tables categorizing the units are presented in Chapter IV. The references used in this report are listed in Chapter VI. Appendix A contains the VSI log book and Appendix B presents the photographs documenting the physical condition of the SWMUs at the time of the VSI. Appendices C & D provide sampling data summaries and drainage reports for the facility's process sewers and surface waters.

A. File Search and VSI

This RFA report is based on a review of file material available at EPA Regional and State Offices, and on observations made during the VSI. The file review was conducted during May 1990 and included a review of RCRA, CERCLA, Clean Air and NPDES files available at EPA Region IV, Atlanta, Georgia, and the Mississippi Department of Natural Resources (MSDNR), Jackson, Mississippi. The VSI was conducted on July 31, 1990 at the Cedar Chemical Corporation facility near Vicksburg, Mississippi.

The Kearney VSI Team arrived at the Cedar Chemical facility at approximately 9:00 a.m. on July 31, 1990. The Team was greeted by facility representatives, Mr. Steven Boswell and Mr. Dave Madsen.

The VSI introductory meeting began at approximately 9:30 a.m. Attending the meeting were:

J. Evans	A.T. Kearney
R. Behl	A.T. Kearney
S. Boswell	Cedar Chemical Corporation
D. Madsen	Cedar Chemical Corporation

During the meeting, all raw materials and waste streams were discussed. The facility's history and operations were also discussed. Facility representatives provided layout drawings of the two plants and a hydrogeologic report characterizing the ground-water conditions at the facility.

The introductory meeting adjourned at approximately 10:30 a.m. At this time, the Team was joined by Mr. Toby Cook of MSDNR. Mr. Boswell and Mr. Cook accompanied the VSI Team on a tour of the facility. The Team viewed the SWMUs located in the South Plant area during the morning session (SWMUs 1 through 21). The temperature was approximately 90°F; skies were clear. The VSI Team adjourned for lunch at approximately 12:30 p.m.

The VSI resumed at 1:30 p.m. to view the North Plant (SWMUs 22 through 32). Following the tour, the VSI Team met with Mr. Boswell and Mr. Cook for a closeout meeting. Mr. Boswell of Cedar Chemical Corporation took photographs of the facility, along with J. Evans of the VSI Team, until his camera malfunctioned. At the request of the facility, it was agreed that Cedar Chemical Corporation would be provided copies of photographs taken by the VSI Team through the EPA Work Assignment Manager. The VSI Team left the facility at approximately 4:30 p.m.

B. Facility History

Cedar Chemical Corporation owns a chemical production facility located near Vicksburg, Mississippi. The CCC facility is separated into two sections known as the North Plant and the South Plant. The North Plant currently produces potassium nitrate, chlorine, and nitrogen tetroxide (References 11, 257). The South Plant formerly produced many pesticides and other organic compounds but is currently only producing nitric acid for consumption at the North Plant (References 11, 133, 257).

The CCC facility is outlined on the USGS map of Vicksburg West, Mississippi (Figure II-1, page 12). It encompasses approximately 600 acres of land, of which approximately 20 percent is utilized by the North and South Plants. The facility is located southwest of Vicksburg, with a majority of the land between U.S. Highway 61 and Business U.S. Highway 61 (Figure II-2, page 13). The northwest point of the property extends as far as the Mississippi River bank. The North and South Plants are located along the Illinois Central Railroad, bounded on the east by Stout's Bayou and on the south by Hennessey's Bayou. The facility coordinates are latitude 32° 18', longitude 90° 05' (References 5, 133).

TABLE I-1
CEDAR CHEMICAL CORPORATION
SWMU/AOC ASSESSMENT SUMMARY

SWMU/AOC	TYPE OF UNIT	YEARS IN OPERATION	WASTES MANAGED	POLLUTANT MIGRATION PATHWAYS [4]	EVIDENCE OF RELEASES	EXPOSURE POTENTIAL [1]	NEED FOR INTERIM MEASURES	RECOMMENDATION		
								RFI	NO FURTHER ACTION	FURTHER ASSESSMENT
27. Cooler Scrubber	Air Pollution Control Device	1980 to present	Fertilizer production off-gases, such as chlorine and NO2; acidic wastewater	--	NO	--	--		X[6]	
28. End Product Scrubber	Air Pollution Control Device	1980 to present	Air containing fertilizer particles such as potassium and nitrogen	--	NO	--	--		X[6]	
29. Oil Collection Unit	Collection Unit	1985 to present	Waste oils	GW, S, SS	NO	U	--	X		
30. Waste Oil SAA	Outdoor Drum Staging Area	1985 to present	Waste oils	GW, S	YES	H	--	X		
31. No. 6 Fuel Oil Area	Former Heating Oil Containment Structure	1960's to 1970's	Waste fuel oils	GW, S, SS	NO	U	--	X		
32. C-15 Scrubber	Air Pollution Control Device	Approx. 1980 to present	Fertilizer production, off-gases, and particulate matter	--	NO	--	--		X[6]	
33. North Plant Drainage Ditches	Drainage Ditches	Approx. 1960 to present	Stormwater runoff from the North Plant	--	NO	--	--	X		
34. Junkyard and Waste Piles	Temporary Disposal Areas	Approx. 1954 to present	Pesticide contaminated debris; refuse from North and South Plant facilities	GW, SW, S	YES	H	--	X		

1 H designates a moderate, H designates a high, and U designates Unknown exposure potential; see SWMU description for substantiation
2 Releases to surface waters are regulated via NPDES Permit No. MS0027995
3 An evaluation of the sewer system utilizing dye tests should be performed
4 GW designates Groundwater, SW designates Surface Water, S designates Soil, A designates Air, and SS designates Subsurface Gas
5 The unit was constructed over the former location of SWMU 15 and has therefore been recommended for an RFI
6 Releases to air are regulated via MS Air Permit No. 2780-00041

TABLE I-1
CEDAR CHEMICAL CORPORATION
SWMU/AOC ASSESSMENT SUMMARY

SWMU/AOC	TYPE OF UNIT	YEARS IN OPERATION	WASTES MANAGED	POLLUTANT MIGRATION PATHWAYS[4]	EVIDENCE OF RELEASES	EXPOSURE POTENTIAL[1]	NEED FOR INTERIM MEASURES	RECOMMENDATION		
								RFI	NO FURTHER ACTION	FURTHER ASSESSMENT
1. Drum Storage Areas	Less than 90 Day Storage Area	Varies	MSMA by-product salts, and solid wastes from the production of Dinoseb, Toxaphene, Atrazine, and MSMA	GW, S SW	YES	H M	--	X		
2. Inactive Landfill	Unlined Landfill	1972 to November 1980	Dinoseb formulation drums; debris from the methyl parathion fire; drums of hydrolyzed cyanuric acid, spent activated carbon, dimethyl urea, isopropyl amine, sodium nitrophenol liners, empty bromine bottles, phosphorous trichloride and sulfochloride, and dimethyl phosphorous sulfochloride; plus Dinoseb-contaminated soils and wastewater	GW, SW, S SS,A	YES	H M	--	X		
3. South Plant Surface Impoundments	Unlined Retention Ponds	1955 to present	Wastewaters containing Toxaphene, Dinoseb, MSMA, Atrazine and methyl parathion	GW, SW, S	YES	H	--	X		
4. Carbon Adsorption System	Neutralizing System	Mid 1970's to present	Wastewaters containing Toxaphene, Dinoseb, MSMA, Atrazine and methyl parathion	GW, SW, S	YES	M	--	X[2]		
5. South Plant Drainage System	Drainage System	Varies from 1950's to present	Nitric acid process water, and stormwater containing Toxaphene, Dinoseb, MSMA, Atrazine and methyl parathion	GW, SW, S	YES	M	--	X[3]		

[1] M designates a moderate, H designates a high, and U designates Unknown exposure potential; see SWMU description for substantiation
[2] Releases to surface waters are regulated via NPDES Permit No. MS0027995
[3] An evaluation of the sewer system utilizing dye tests should be performed
[4] GW designates Groundwater, SW designates Surface Water, S designates Soil, A designates Air, and SS designates Subsurface Gas
[5] The unit was constructed over the former location of SWMU 15 and has therefore been recommended for an RFI
[6] Releases to air are regulated via MS Air Permit No. 2780-00041

TABLE 1-1
CEDAR CHEMICAL CORPORATION
SWMU/AOC ASSESSMENT SUMMARY

SWMU/AOC	TYPE OF UNIT	YEARS IN OPERATION	WASTES MANAGED	POLLUTANT MIGRATION PATHWAYS[4]	EVIDENCE OF RELEASES	EXPOSURE POTENTIAL[1]	NEED FOR INTERIM MEASURES	RECOMMENDATION		
								RFI	NO FURTHER ACTION	FURTHER ASSESSMENT
6. South Plant Hill Tank	Storage Tank	Early 1960's to 1989	Neutralized wastewater containing Dinoseb	--	NO	--	--		X	
7. Former Dinoseb Production Area	Inactive Production Area	1973 to December 1986	Spills of Dinoseb, DEHPA, and EHN	GW, S, SW	YES	H	--	X		
8. Dinoseb Off-Loading Area	Inactive Loading/ Unloading Area	1973 to December 1986	Dinoseb spillage	GW, S	YES	H	--	X		
9. Dinoseb Drumming Area and Drains	Inactive Product Drumming Area	1973 to December 1986	Dinoseb spillage	GW, S	YES	H	--	X		
10. Dinoseb Stock Storage Area	Storage Area	1973 to present	Dinoseb stock	--	NO	--	--		X	
11. Former MSMA Production Area	Inactive Production Area	January 1983 to present	MSMA production spillage, including methanol, MSMA by-product salts and arsenic; demolition debris suspected of contamination from MSMA	GW, S	YES	H	--	X[5]		
12. Former MSMA Salt Unloading Area	Waste Unloading Area and Dumpsters	January 1983 to July 1984	MSMA by-product salts and wastewaters which may contain traces of arsenic	GW, S	NO	H	--	X		

1 H designates a moderate, H designates a high, and U designates Unknown exposure potential; see SWMU description for substantiation
2 Releases to surface waters are regulated via NPDES Permit No. MS0027995
3 An evaluation of the sewer system utilizing dye tests should be performed
4 GW designates Groundwater, SW designates Surface Water, S designates Soil, A designates Air, and SS designates Subsurface Gas
5 The unit was constructed over the former location of SWMU 15 and has therefore been recommended for an RFI
6 Rel[redacted] to [redacted] r[redacted]ced v[redacted] Air [redacted]it No. [redacted]0-00[redacted]

TABLE I-1
CEDAR CHEMICAL CORPORATION
SWMU/AOC ASSESSMENT SUMMARY

SWMU/AOC	TYPE OF UNIT	YEARS IN OPERATION	WASTES MANAGED	POLLUTANT MIGRATION PATHWAYS[4]	EVIDENCE OF RELEASES	EXPOSURE POTENTIAL[1]	NEED FOR INTERIM MEASURES	RECOMMENDATION		
								RFI	NO FURTHER ACTION	FURTHER ASSESSMENT
13. South Plant Drainage Ditches	Unlined Drainage Ditches	Approx. 1954 to present	Stormwater runoff from the South Plant which may have contained Atrazine, Dinoseb, Toxaphene, arsenic or MSMA	GW, SW, S	YES	H	--	X		
14. Former Toxaphene Production Area	Inactive Production Area	1973 to 1982	Toxaphene, DEHPA and EHN production spillage	GW, S	YES	H	--	X		
15. Former Methyl Parathion Production Area	Inactive Production Area	Mid 1970's	Methyl parathion spillage	GW, S	YES	H	--	X		
16. Former Atrazine Production Area	Inactive Production Area	1973 to 1979	Atrazine production spillage	GW, SW, S	YES	H	--	X		
17. Returned Product Storage Area	Temporary Staging Area	1973 to present	Drums of returned Dinoseb product	GW, SW, S	YES	H	--	X		
18. Former Blue Tank	Storage Tank	1983 to approx. 1986	Unneutralized Dinoseb process wastewater	GW, S	YES	H	--	X		
19. Scrap Metal Dumpster	Open-topped Rolloff Container	Mid 1980's to present	Scrap material from the dismantling of the MSMA production area	--	NO	--	--		X	

1 M designates a moderate, H designates a high, and U designates Unknown exposure potential; see SWMU description for substantiation
2 Releases to surface waters are regulated via NPDES Permit No. MS0027995
3 An evaluation of the sewer system utilizing dye tests should be performed
4 GW designates Groundwater, SW designates Surface Water, S designates Soil, A designates Air, and SS designates Subsurface Gas
5 The unit was constructed over the former location of SWMU 15 and has therefore been recommended for an RFI
6 Releases to air are regulated via MS Air Permit No. 2780-00041

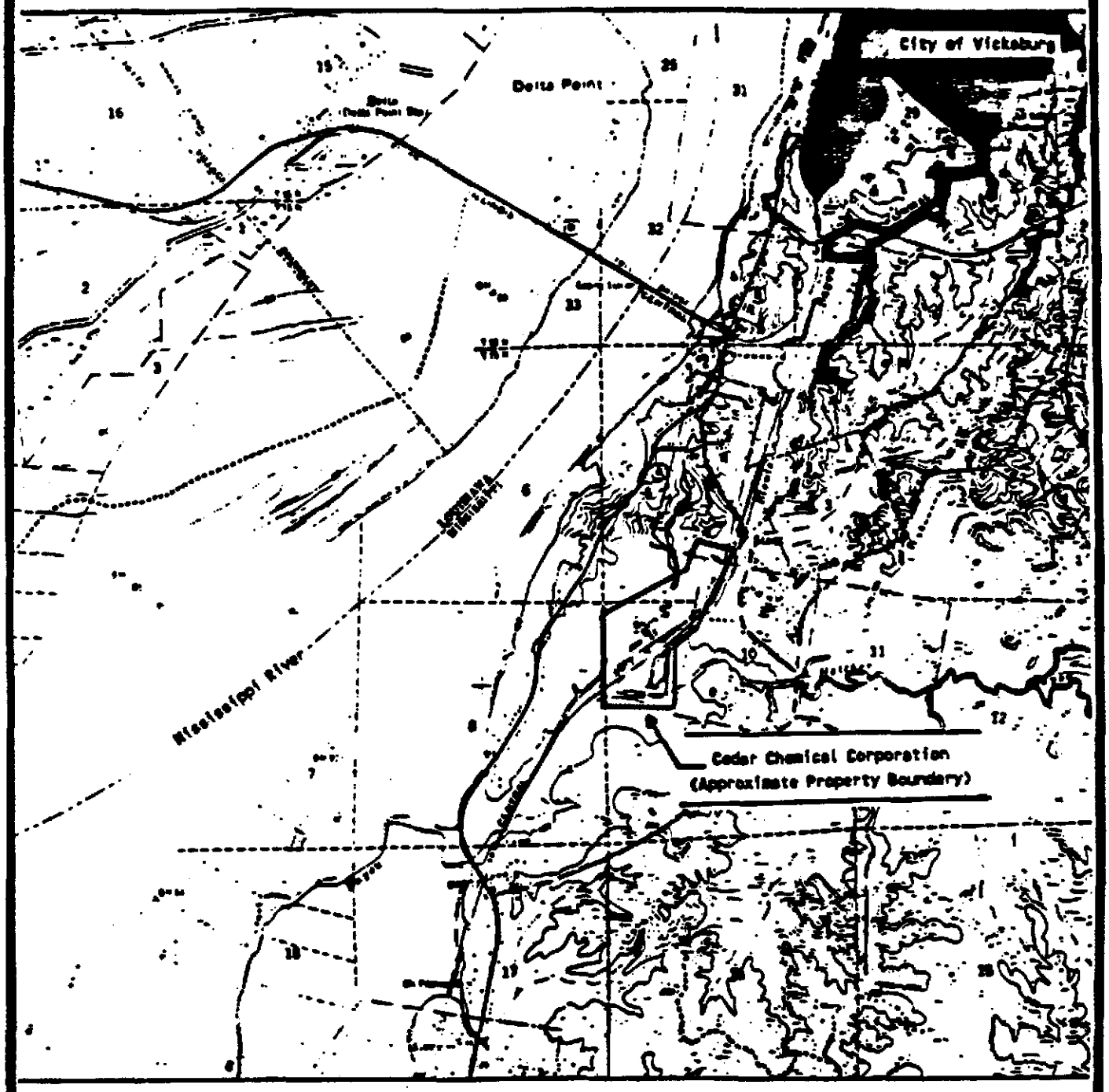
TABLE I-1
CEDAR CHEMICAL CORPORATION
SWMU/AOC ASSESSMENT SUMMARY

SWMU/AOC	TYPE OF UNIT	YEARS IN OPERATION	WASTES MANAGED	POLLUTANT MIGRATION PATHWAYS[4]	EVIDENCE OF RELEASES	EXPOSURE POTENTIAL[1]	NEED FOR INTERIM MEASURES	RECOMMENDATION		
								RFI	NO FURTHER ACTION	FURTHER ASSESSMENT
20. Railroad Car Unloading Station	Loading/ Unloading Station	Approx. 1955 to present	Spillage of raw materials and products, including Dinoseb, Toxaphene, MSMA, Atrazine and methyl parathion	GW, S	NO	U	--	X		
21. Vacuum Truck	Tank Truck	Mid 1980's to present	Wastewater contaminated with Dinoseb, Toxaphene, MSMA, arsenic, Atrazine and methyl parathion	--	NO	--	--	-	X	
22. North Plant Neutralization System	Treatment Unit with In-ground Sumps	December 1988 to present	All wastewater from the North Plant, including drainage from hoses, safety showers, and stormwater runoff	GW	NO	U	--	X[2]		
23. Inactive North Plant Surface Impoundment	Equalization/ Neutralization Pond	1962 to present	Acidic effluent from the North Plant, including process water from the production of potassium nitrate, nitrogen tetroxide, and chlorine	GW, S	NO	U	--	X[2]		
24. North Plant Containment System	Spillage and Runoff Collection System	Varies from Mid 1970's to present	Acidic wastewaters from fertilizer manufacturing operations	--	NO	--	--		X	
25. Wastewater Pipes	Pipes	1960's to present	Acidic and alkaline wastewater	GW, S	NO	U	--	X		
26. C-10 Scrubber	Air Pollution Control Device	1980 to present	Fertilizer production off-gases, such as chlorine and NO2; acidic wastewater	GW, S	NO	U	--	X[6]		

[1] M designates a moderate, H designates a high, and U designates Unknown exposure potential; see SWMU description for substantiation
[2] Releases to surface waters are regulated via NPDES Permit No. MS0027995
[3] An evaluation of the sewer system utilizing dye tests should be performed
[4] GW designates Groundwater, SW designates Surface Water, S designates Soil, A designates Air, and SS designates Subsurface Gas
[5] The unit was constructed over the former location of SWMU 15 and has therefore been recommended for an RFI
[6] Releases to air are regulated via MS Air Permit No. 2780-00041

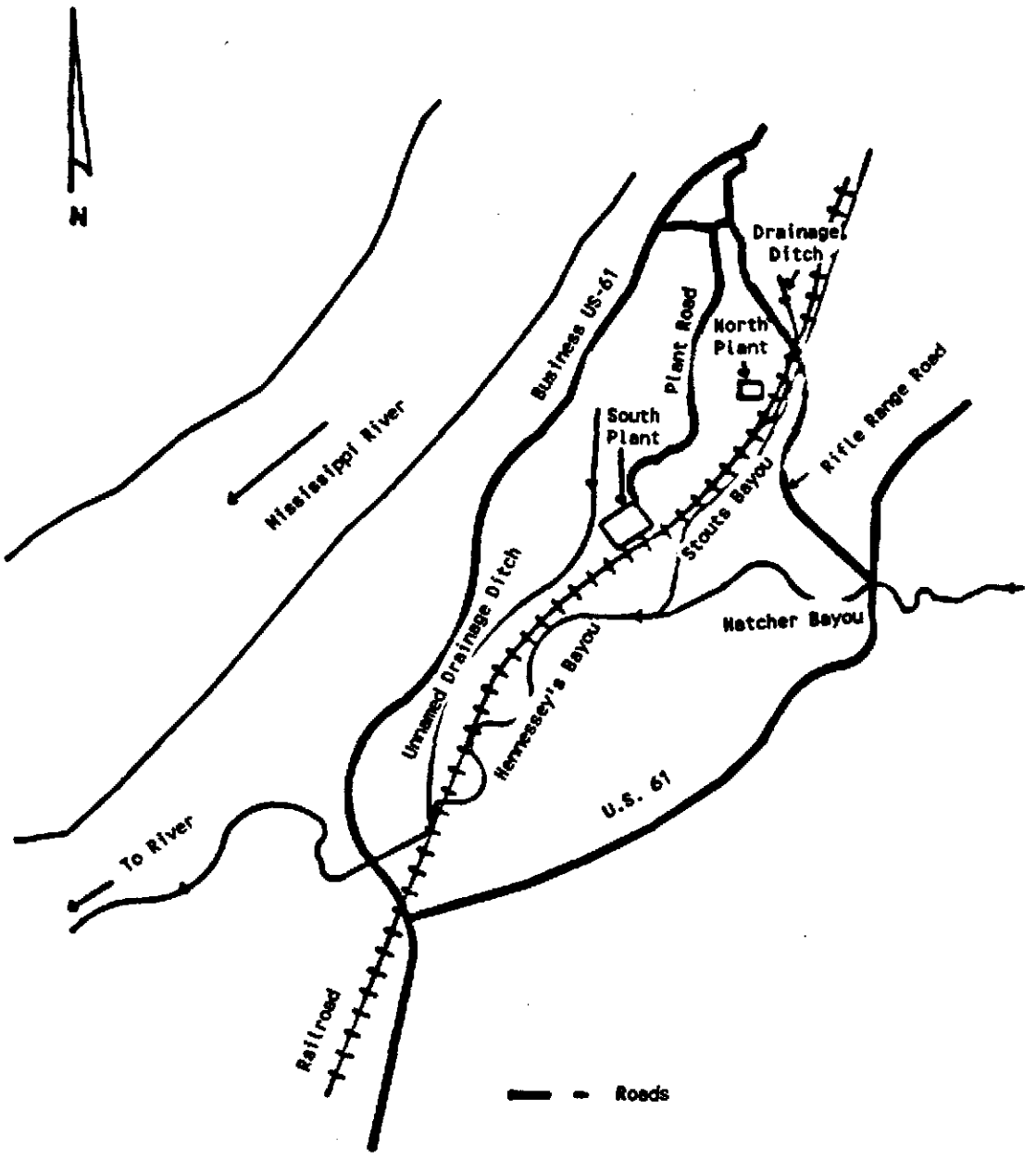
FIGURE II-1 Facility Location Map

GENERAL LOCATION MAP OF THE CEDAR CHEMICAL CORPORATION FACILITY IN VICKSBURG, MISSISSIPPI



Reproduced from U.S. Department of Interior, Geological Survey, 1962. Topographic map, Vicksburg West Quandrangle, Mississippi-Louisiana. (From Reference 33)

Figure II-2
Cedar Chemical Corporation Vicksburg Facility



Approximate Scale 1:24000

Reproduced from U.S. Environmental Protection Agency, February 1987. RCRA Environmental Investigation, Cedar Chemical Company, Vicksburg, Mississippi.

(Reference 5)

The CCC facility is bordered by light industry on the south, light residential areas spanning from north to southwest, and rural areas spanning from northeast to south (References 133, 257). The closest residence is approximately 0.25 miles from the plant (Reference 133). The facility is approximately three miles from the nearest densely populated area; however, a school is located within a one mile radius of the facility and a hospital within a two mile radius (References 183, 257). Prior to use by the chemical companies, the land on which the facility is located was primarily farm land (Reference 257).

The CCC facility originally started under two separate ownerships. The South Plant began operations in approximately 1954 as Spencer Chemical Company. In 1964, Spencer was purchased by Gulf Oil. The North Plant was established in 1961 by Southwest Potash. In 1972, the two plants were purchased and merged by the Vicksburg Chemical Company (Reference 257). Vicksburg was bought out by Vertac Chemical Corporation (VCC) in 1975. VCC was taken over by the holding company, Dyticon, Inc., in 1978 (Reference 133). The facility underwent a structural reorganization in 1986, when it became known as Cedar Chemical Corporation (CCC), a sister company to VCC (References 27, 107). This corresponded to the purchase of the business from Dyticon, Inc. by Fermenta A.B. of Sweden. The business again changed ownership in 1988 when Trans Resources bought portions of CCC, including the Vicksburg Chemical Division (Reference 257). A small portion of the South Plant is not owned by CCC. It is referred to as the Perkins Company or Former Gulf Formaldehyde Plant and is owned by Borden (References 5, 257).

When the South Plant began as Spencer, the main products were nitric acid, ammonia, unspecified fertilizers and ammonium nitrate. The main products from the original North Plant were potassium nitrate and chlorine. In 1973, the Vicksburg Chemical Company began producing of the pesticides Atrazine, Toxaphene and Dinoseb at the South Plant. Vertac Chemical Corporation (VCC) continued producing Atrazine until approximately 1979 and produced Toxaphene until 1982. Dinoseb was produced until CCC took control in 1986 (References 17, 257).

The Toxaphene facility was also used by VCC for the production of Diethylhexyl Phosphoric Acid (DEHPA) and 2-ethyl-hexyl nitrate (EHN). DEHPA was produced in six-week runs in 1978, 1984 and 1985 (References 132, 154). EHN was produced for approximately two months in 1984 (Reference 142). Methyl parathion was also produced at the South Plant until approximately 1978 when the facility was damaged by a large explosion and fire (References 255, 257).

In 1983, VCC converted the former methyl parathion facility into a facility for the production of the arsenic herbicide monosodium methanearsonate (MSMA). This facility was also capable of producing disodium methanearsonate (DSMA) and sodium cacodylate. MSMA production continued until some time in 1984 (References 213, 214, 257). The South Plant has also produced dimethyl urea, isopropyl amine, dinitro-ortho-cresol, Cyanazine, UNIHIB, and the intermediates, sulfonated ortho-sec-butyl phenol (OSBP) and diethylhexyl phosphochloridate (References 5, 17).

The only chemicals being produced at the time of the VSI were nitric acid in the South Plant, and potassium nitrate, chlorine and nitrogen tetroxide in the North Plant (Reference 257). The nitric acid in the South Plant is produced in a facility which was built in 1986 in accordance with New Source Performance Standards (NSPS). The former nitric acid facility reportedly experienced emissions problems from an ineffective catalytic reducer (Reference 260).

The CCC facility has had two recorded releases, both prior to Cedar Chemical acquiring the facility. On March 7, 1978, a 10,000-gallon storage tank of methyl parathion exploded, triggering the explosion of three to four hundred 55-gallon drums, the burning of the storage structure, and the burning of a sodium-nitro-phenol warehouse. No environmental effects were noted in subsequent visual inspections conducted by the MSDNR (Reference 255). No sampling data exists, however, to support this statement.

On February 5, 1983, the dike on the east side of the South Plant Surface Impoundment (SWMU 3b) failed, releasing approximately 700,000 gallons of wastewater into Stout's Bayou. The last sampling of Dinoseb in the impoundment before the breach indicated levels of 4 ppm. Sampling efforts were apparently made after the breach along the breached area of the dike, but no data was available. Visual inspections of the bayous indicated no apparent environmental effects (Reference 200).

C. Regulatory History

Part A and Part B Permit Applications

Pursuant to Section 3005 of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Section 6930, Cedar Chemical Corporation, as Vertac Chemical Corporation (VCC), submitted Part A of its hazardous waste permit application on November 18, 1980, thus gaining interim status. The Notification of Hazardous Waste Activity had been submitted previously on June 23, 1980, pursuant to Section 3010 of RCRA (Reference 5). In the Part A Application, VCC registered as a treatment, storage, and disposal facility (TSD) producing potassium nitrate and pesticides - dinobutyl phenol (Dinoseb) and Toxaphene (Reference 252).

A revised Part A Permit Application was submitted to U.S. EPA Region IV in September 1981 (References 239, 240). VCC submitted its Part B Permit Application, along with another modified Part A, on August 10, 1983. The modifications to the company's Part A referred to the listing of units and waste streams at the facility (Reference 183). The facility's Part B Permit Application was found to be deficient with respect to closure, post-closure and ground-water monitoring plans (Reference 160). After five revisions, CCC submitted another Part B Application on June 18, 1985 (References 128, 133, 148, 150). Once again the application was found to be deficient in the areas of closure and post-closure plans, contingency plans, and ground-water monitoring plans (Reference 111).

On July 31, 1986, CCC was formally denied a RCRA permit. CCC was required to submit a closure/post-closure plan or to amend the plan in the application to meet the specifications of the Mississippi Hazardous Waste Management Regulations (MHWMR) Part 265 within 15 days (Reference 95).

CCC has had numerous contacts with the MSDNR regarding compliance with the MHWMR, along with numerous inspections of the facility (see Table II-1, page 20). Beginning in 1980, VCC received Commission Order No. 520-80 requiring compliance with NPDES Permit No. MS0027995 (References 251, 252). In 1982, VCC received Commission Order No. 599-82 in an effort to accelerate actions to reduce releases from VCC's Inactive Landfill (SWMU 2) and South Plant Surface Impoundments (SWMU 3) (Reference 209). VCC received Commission Order No. 611-83 on June 8, 1983, in response to the rupturing of a dike in the South Plant Surface Impoundment (SWMU 3b) in January 1983 (Reference 184).

In 1984, Commission Order No. 717-84 was issued requiring VCC to submit a revised Part B Permit Application and ground-water monitoring plan (Reference 159). After submission of the revised Part B in June 1985, Commission Order No. 948-85 was issued defining a January 10, 1986 deadline for the items still needing revision. (References 109, 11, 133). The CCC submittal of January 1986 was again found to be deficient. A list of recommendations was sent to CCC on July 2, 1986, along with the request for a show-cause meeting on July 8th (Reference 100). In the meeting, MSDNR discussed with CCC their RCRA history and the current violations. A hearing was scheduled for July 22, 1986 before the Mississippi Commission on Natural Resources regarding a penalty for the violations and a compliance schedule (References 97, 99).

CCC responded by filing a Motion to Dismiss based on the theory that the South Plant Surface Impoundments (SWMU 3) should not be RCRA-regulated and thus should not be governed by the Mississippi Commission on Natural Resources (Reference 98). The hearing

before the Commission was delayed until August 26th at CCC's request. Commission Order No. 1046-86 was issued in response to the hearing. The Order defined the penalty and compliance schedule which would apply to CCC if they failed to demonstrate that the South Plant Surface Impoundments (SWMU 3) should not be RCRA-regulated at the hearing scheduled for September 16, 1986 (Reference 92).

CCC's position regarding the declassification of the surface impoundment was based on the "de minimus" exclusion from the "mixture rule" in 40 CFR Part 261.3. This exclusion includes any losses from normal manufacturing operations of the product (Reference 89). The argument that the MSDNR brought forth was that releases from the Returned Product and Drum Storage Areas (SWMUs 17 & 1), which are not part of the manufacturing operations, could end up in the impoundment. CCC contested this by demonstrating that the drainage system from these areas had been segregated from the system entering the South Plant Surface Impoundments (SWMU 3). Furthermore, since November 1985, any losses of Dinoseb from production had been collected and either recycled or disposed of offsite. These points were brought forward at the Commission meeting on September 16, 1986, but no decision was rendered (References 85, 113).

The MSDNR and EPA requested that the hearing be expanded to determine if the South Plant Surface Impoundments (SWMU 3) were regulated under RCRA due to the containment of past wastes associated with the production of Toxaphene. These wastes included untreated process wastewater from the production of Toxaphene (K098), and the associated wastewater sludge (K041). CCC contested this theory by claiming that their Toxaphene process was different from the one used by EPA to set the standards, and therefore, the wastewater created was different (References 80, 85). On December 17, 1986, the Commission ruled in favor of CCC by placing into effect Order of Dismissal No. 1153-86 (Reference 75). On August 5, 1987, the Commission ruled in favor of CCC again by issuing Order of Dismissal No. 1253-87, incorporating Order No. 1153-86 and vacating Order No. 1046-86. Toxaphene losses were declared exempt by the "de minimus" exclusion in 40 CFR Part 261.3, just as Dinoseb losses had been (Reference 54).

EPA maintains that the Drum Storage Area (SWMU 1a), having been found mismanaged in numerous inspections (Refer to Table II-1, page 20), is not a less than 90-day storage unit and therefore cannot operate without interim status or a permit (Reference 50). Since the storage violations cited against CCC in August 1986 had not been resolved, Commission Order No. 1162-87 was issued on January 28, 1987 against CCC (Reference 71). CCC's mismanagement of the Drum Storage Area (SWMU 1a) was the basis for two more Orders issued by the Commission: Order No. 1217-87 was issued

with a monetary fine on April 22, 1987; and Order No. 1316-88, along with another monetary fine, was issued on February 10, 1988 (References 44, 62).

On December 17, 1987, representatives from CCC, MSDNR, and EPA met to discuss the regulatory status of the facility. CCC proposed to contain the South Plant Surface Impoundments (SWMU 3) by consolidating the sediment into a Solid Waste Consolidation Area (SWCA) (SWMU 3d), solidifying it, and capping it such that the remainder of the impoundment could still be used for the treatment of nonhazardous waste streams (References 35, 36, 37).

MSDNR agreed to provide RCRA-guided comments on the technical aspects of the plan, once submitted (Reference 34).

CCC submitted formal closure plans to the MSDNR on August 4, 1988 (Reference 27). The MSDNR suggested some modifications to the plan for meeting RCRA requirements, but again stated that they were not certifying that the closure was in compliance with RCRA. CCC planned to go forward with the modified plans unless EPA voiced an objection (Reference 21). On January 27, 1989, CCC reported to the MSDNR that the contract had been confirmed and the contractor had moved on site to begin closure (Reference 18).

From a Sampling Investigation performed in February 1989 and from previous inspections of the facility, the Director of Waste Management, Region IV, issued a Determination of Release for CCC on October 13, 1989. From this determination it was further asserted that corrective actions must be taken to protect the environment. By October 30, 1989 an Endangerment Assessment was completed regarding contamination at CCC, with the exception of dioxin testing. Dioxin testing of the Inactive Landfill (SWMU 2) was scheduled later, and if necessary, the risk assessment will be revised based on these results (Reference 5).

NPDES Permit History

CCC (as VCC) first obtained its NPDES Permit No. MS0027995 prior to 1980 (Reference 252). The Permit was renewed on December 1, 1981, to expire in June 1986 (Reference 233). VCC's permit included three outfalls. Outfall 001 was defined with limits of 1.4 kg/day-daily average for Dinoseb, 68 kg/day-daily average for total suspended solids, and 0.05 kg/day-daily average for Toxaphene. Outfall 002 had a limit of 2727 kg/day-daily average for nitrate and Outfall 003 had a limit of 2868 kg/day-daily average for nitrate (Reference 102).

On March 1, 1985, the MSDNR requested a meeting with VCC to discuss chronic noncompliance of NPDES limits with respect to pH, Dinoseb levels, and nitrate-nitrogen levels. The meeting was

held on March 22, 1985. On April 29, 1985, VCC submitted a report explaining that new pH control valves were to be installed, that some of the Dinoseb excursions were related to the pH problem (since a high pH causes decreased carbon-adsorption), that the other Dinoseb releases were due to premature carbon breakthrough, and that the nitrate-nitrogen excursions were related to process problems which had already been corrected (Reference 130).

Another problem arose with VCC's NPDES permit excursions in June 1985. Due to heavy rainfall, the South Plant Surface Impoundment (SWMU 3) was bypassed on three different occasions to avoid breaching the dike. VCC did not notify the MSDNR within 72-hours of each event and did not submit a plan to avoid recurrence. VCC subsequently requested a meeting to decide upon guidelines for future situations of similar nature (Reference 123). On September 6, 1985, the MSDNR met with VCC specifically to set up the new guidelines for bypassing the impoundment. These were defined as: 1) when the contents of the dike reach within six inches of overflow; and 2) when threat of human life is apparent (Reference 118).

VCC's NPDES permit came up for renewal in April 1986. The permit was reissued without any changes to effluent limits for Outfalls 001, 002, and 003 (Reference 102). VCC had requested, on March 10, 1986, for permission to use an alternative method of process wastewater disposal. The proposed method utilized the low-concentration Dinoseb wastewater (210 mg/l) as a marginal fertilizer for agricultural fields. The MSDNR requested guidance from the EPA in regulating or approving such a proposal. The proposal was accepted and incorporated into the NPDES permit as Outfall 004 (References 102, 104).

On July 5, 1989, CCC reapplied for their NPDES permit. Having ceased producing organic chemicals, the facility no longer generated wastewater from the production of Dinoseb. Thus, Outfall 004 was not included in this application. Only nitric acid, potassium nitrate, chlorine and nitrogen tetroxide were listed as presently being produced at CCC (Reference 11).

Air Permit History

In 1980, VCC, in order to obtain an Air Emissions Permit, had to submit an emissions survey and install additional facilities to reduce or eliminate air releases - about which the Air Division had received many complaints (References 252, 253). The facility's Permit covered air emissions from the production of nitric acid, potassium nitrate, Toxaphene, Atrazine and Dinoseb (Reference 249). A comprehensive list of compliance inspections at the CCC facility is presented in Table II-1.

Table II-1

Facility Inspections At Cedar Chemical Corporation
Vicksburg Facility
(Page 1 Of 5)

DATE	TYPE OF INSPECTION	PERFORMED BY	SWMU-RELATED FINDINGS	REFERENCE NUMBER
Jul 27, 1981	RCRA Compliance	EPA	Open and leaking drums in Drum Storage Area (SWMU 1a) and Returned-Product Storage Area (SWMU 17).	236, 237
Oct 6, 1981	Follow-Up RCRA	MSDNR	Storage Areas cleaned up, one deteriorating drum still not contained (SWMUs 1a, 17).	236, 237
Oct 28, 1981	Hazardous Waste Site Investigation	EPA	Inactive Landfill (SWMU 2) only partially covered with grass; yellow ground stains visible in many areas. Yellow stains visible throughout South Plant processing areas. All surface runoff from Inactive Landfill (SWMU 2) did not enter the South Plant Surface Impoundments (SWMU 3): (1) East corner - runoff drained south into Hennessey Bayou; heavy erosion damage noted. (2) Western edge - runoff soaking into ground before reaching Hennessey Bayou; also showed severe erosion.	228
Sep 17, 1982	NPDES Compliance	MSDNR	Yellow stains around Inactive Landfill (SWMU 2) Runoff from Inactive Landfill (SWMU 2) entering North Plant Drainage Ditches (SWMU 33).	215
Feb 8, 1983	Release Investigation	MSDNR	Dike break on east side of South Plant Surface Impoundment (SWMU 3) released ~ 700,000 gallons of wastewater into Stouts/Hennessey Bayou.	200
Oct 3, 1983	Compliance Evaluation	MSDNR	Work had begun on capping the Inactive Landfill (SWMU 2). Condition of South Plant Surface Impoundments (SWMU 3) dike deteriorated - work was to have begun already. 25 drums in Former MSMA Production Area (SWMU 11) were not within containment or under a roof.	179

TABLE II-1

FACILITY INSPECTIONS AT CEDAR CHEMICAL CORPORATION
VICKSBURG FACILITY
(PAGE 2 OF 5)

DATE	TYPE OF INSPECTION	PERFORMED BY	SWMU-RELATED FINDINGS	REFERENCE NUMBER
Oct 11, 1983	Remedial Actions	MSDNR	Inactive Landfill (SWMU 2) capped - high hill area lowered and clean soil brought in, ditch west of landfill had not been capped. Work on South Plant Surface Impoundments (SWMU 3) dike had begun.	174
Oct 31, 1983	Compliance Evaluation	MSDNR	South Plant Surface Impoundments (SWMU 3) dike improvements on-going.	171
Nov 17, 1983	Compliance Evaluation	MSDNR	Grading and capping of Inactive Landfill (SWMU 2) did not extend as far as plans had been approved - western ditch along railroad track had filled with sediment and was supposed to be capped. South Plant Surface Impoundments (SWMU 3) dike construction completed; seeding of both areas finished.	168
Sep 20, 1984	NPDES Compliance Inspection	MSDNR	C-10 Scrubber (SWMU 26) had a break in the curbing allowing a small amount of wastewater to leave the area. A leak was observed in the dike around the DEHPA Facility, (Former Toxaphene Production Area - SWMU 14), with some liquid pooled outside the dike. Dike of South Plant Surface Impoundments (SWMU 3) was showing some erosion. Vegetative growth on Inactive Landfill and South Plant Surface Impoundment was not taking (SWMUs 2, 3).	146

TABLE II-1

FACILITY INSPECTIONS AT CEDAR CHEMICAL CORPORATION
VICKSBURG FACILITY
(PAGE 3 OF 5)

DATE	TYPE OF INSPECTION	PERFORMED BY	SWMU-RELATED FINDINGS	REFERENCE NUMBER
Dec 14, 1984	Compliance Evaluation	MSDNR	Grassing of Inactive Landfill and South Plant Surface Impoundment areas to prevent erosion appeared to be helping (SWMUs 2, 3).	140
Jul 22, 1985	NPDES Compliance	MSDNR	Dike of Inactive North Plant Surface Impoundment (SWMU 23) was very weak at one end.	122
Nov 22, 1985	Interim Status Compliance	MSDNR	Eastern corner of South Plant Surface Impoundments (SWMU 3) showed evidence of a recent release - yellow stains were observed on the dike and dead vegetation was noticed along the natural drainage path to the Bayou. Drum Storage Area (SWMU 1a) in disarray. Plant process areas had numerous small spills on the ground. Deteriorated asbestos pipe insulation noticed in many areas.	110
Aug 7, 1986	RCRA Generator and Closure Inspection	EPA	Land adjacent to the road had eroded into the South Plant Surface Impoundment (SWMU 3) Drum Storage Area (SWMU 1a) contained many leaking drums; some containers were stored on broken pallets and it was obvious that many drums had been stored for longer than 90 days. Large spills were observed on the ground in the Drum Storage and Returned-Product Storage Areas (SWMUs 1a, 17) and floor drains and sumps were overflowing with waste-contaminated water. Yellow and black stains were noticed on the ground throughout the facility.	86

TABLE II-1

FACILITY INSPECTIONS AT CEDAR CHEMICAL CORPORATION
VICKSBURG FACILITY
(PAGE 4 OF 5)

DATE	TYPE OF INSPECTION	PERFORMED BY	SWMU-RELATED FINDINGS	REFERENCE NUMBER
Aug 12, 1986	Generator	MSDNR	Drum Storage Area (SWMU 1a) contained many deteriorated and leaking drums and was cluttered with much unnecessary equipment. Evidence of frequent spills was noticed in the Drum Storage Area and Returned-Product Storage Areas (SWMUs 1a, 17).	93
Jan 13, 1987	Sampling Reconnaissance	MSDNR	Former Dinoseb Production Area (SWMU 7) was flooded with approximately four inches of liquid. Yellow floor stains noted in Returned-Product Storage Area (SWMU 17).	73
Feb 19, 1987	RCRA Interim Status Compliance and NPDES Compliance Sampling	EPA	Former Dinoseb Production Area (SWMU 7) was observed with two inches of standing yellowish liquid present. At two points, the liquid was going over the berm and into a catch basin outside the area (South Plant Drainage System - SWMU 5). Drum Storage Area (SWMU 1a) had leaking, corroded and open drums present. Evidence of erosion was noted on various locations of the South Plant Surface Impoundments (SWMU 3). Two locations adjacent to the South Plant Surface Impoundment (SWMU 3) had standing liquid - possibly indicating seepage. A water cut on the southwest side of the South Plant Surface Impoundment (SWMU 3) was the source of unknown liquid entering the Impoundment. The Inactive Landfill (SWMU 2) had ponding on its surface and showed evidence of erosion.	65, 70

TABLE II-1

FACILITY INSPECTIONS AT CEDAR CHEMICAL CORPORATION
VICKSBURG FACILITY
(PAGE 5 OF 5)

DATE	TYPE OF INSPECTION	PERFORMED BY	SWMU RELATED FINDINGS	REFERENCE NUMBER
Nov 17, 1987	RCRA Interim Status and Comprehensive GW Monitoring	EPA MSDNR	Drums in Drum Storage Area (SWMU 1a) were in decent condition, but a few were noticed without proper labeling. The facility has attempted to clean the floor in the Returned-Product Storage Area (SWMU 17) by sweeping, scraping and chipping the cement. They've also tried reacting the Dinoseb with hydrogen peroxide and a ferrous ion catalyst to remove the stains.	46, 48
Feb 1, 1989	RCRA Compliance Evaluation and Sampling Investigation	MSDNR EPA	Drum Storage Area (SWMU 1a) in good condition, however inspection reports were not accurate.	12, 17

D. Process Description

The CCC facility consists of two separate manufacturing plants built in the early 1950s under different corporate ownerships. These plants shared a common boundary and were later acquired by Vertac Corporation in 1975, thereby becoming one operating facility (References 5, 12, 46). At the time of the VSI, the facility operated under the name of Cedar Chemical Corporation. The two separate plants are referred to as the North and South Plants (Reference 257).

The North Plant is used to manufacture potassium nitrate and potassium nitrate by-products such as chlorine gas, nitrogen tetroxide, and traces of bromine. The South Plant manufactures nitric acid for sale and for use by the North Plant. The South Plant was used to manufacture various agricultural chemicals under Vertac Corporation management during the mid-1970s to mid-1980s. The agricultural chemicals that were produced at the South Plant included Atrazine, Cyanazine, 2-sec-butyl-4,6-dinitrophenyl (DNBP/Dinoseb), methyl parathion, Toxaphene, and monosodium methanearsonate (MSMA) (References 5, 12, 17, 46).

Potassium nitrate is produced by combining potassium chloride and nitric acid. This reaction also forms chlorine and nitrogen tetroxide. The potassium nitrate is crystallized, centrifuged, dried, prilled, and then bagged or bulk stored in warehouses located at the North Plant. The potassium nitrate plant operates at approximately 16.7 tons per hour. The plant operates 24 hours per day, seven days per week (References 2, 13, 14).

Nitric acid is produced by combining ammonia, air, and water. Ammonia and air are passed through a platinum gauze catalyst allowing the ammonia to burn to produce the oxide. Nitrogen dioxide is produced as the gases are cooled and condensed. The nitrogen dioxide is then dissolved in water at an adsorption tower to form nitric acid. The nitric acid plant operates at a rate of 260 tons per day (References 2, 13, 259).

Facility representatives could not provide information pertaining to the past pesticide manufacturing activities conducted at the South Plant. The following process descriptions were prepared by using the available reference material as well as information provided in the Farm Chemicals Handbook, the British Crop Protection Council's Pesticide Manual, the Pesticide Manufacturing and Toxic Materials Control Encyclopedia, and the Herbicide Handbook of the Weed Science Society of America (Reference 259). The actual volumes of product manufactured could not be estimated from the generic manufacturing processes.

Dinoseb (2-(1-methylpropyl)-4,6-dinitrophenol) was produced at the South Plant from 1973 to December 1986. Dinoseb is produced by reacting 6-alkylphenol with concentrated sulfuric acid until the phenol is converted into a sulfonic acid derivative. The derivative is then dissolved in water. Nitric acid is added to the solution and agitated to convert the sulfonic acid derivative to the dinitrophenol compound. Following the addition of nitric acid, the mixture is stirred, cooled and the dinitro derivative is separated by either filtration, extraction with solvent, or decantation. According to facility representatives, the chelating agent ethylenediaminetriacetic acid (EDTA/versene) was also used in the production of Dinoseb (References 257, 259). The manufacture of Dinoseb may have created air emissions containing sulfur dioxide (1.2 kg/metric ton) and hydrocarbons (1.0 kg/metric ton). Most wastes from the production of Dinoseb were probably created from spillage of the product. The Vertac Corporation produced a phenol form and an ammonium salt form of Dinoseb. However, it could not be determined from the available file material whether one or both forms were produced at the Vicksburg facility. Dinoseb was banned by EPA due to significant risks of developmental toxicity. Remaining stocks retained by the facility were stored in the Dinoseb Stock Storage Area (SWMU 10) at the time of the VSI (Reference 5).

Toxaphene was produced at the facility's South Plant from 1973 to 1982. Wastes associated with this process are untreated process wastewater (K098) and wastewater treatment sludge (K041). Toxaphene is produced by combining camphene (a terpene produced from pine stumps) and chlorine. According to testimony from a Mississippi Order of Dismissal, the facility purchased camphene for the process rather than producing it themselves (Reference 27). The chlorination reaction used for the production of Toxaphene was conducted in a liquid phase utilizing approximately five parts carbon tetrachloride per part of camphene, with ultraviolet light as a catalyst. The carbon tetrachloride was removed from the reaction by distillation following the removal of excess chlorine and hydrochloric acid (HCl). Emulsifiable concentrate formulations of Toxaphene normally used mixed xylenes as carriers (Reference 259). Toxaphene production creates air emissions which may contain hydrogen chloride, chlorine, toluene, and a trace of Toxaphene. Emissions are generally controlled with alkali and water scrubbers, stripping, limestone adsorption, and baghouses. Muriatic acid is produced when waste hydrogen chloride gases from the chlorinator pass through a water absorber. The muriatic acid is either recovered or neutralized and disposed of via wastewater treatment. Emissions from dust formulation are usually vented to a baghouse and recycled to the formulation step (Reference 259).

Monosodium methanearsonate (MSMA) was produced at the facility's South Plant during 1983 and 1984. Wastes associated with this process are the by-product salts (K031). MSMA is produced

utilizing arsenic trioxide, caustic, and methyl chloride. The facility had plans to produce disodium methanearsonate (DSMA) and sodium cacodylate (Caco) after the MSMA process was underway. DSMA is used at higher application rates and is less soluble than MSMA and therefore is not as widely used as MSMA. It is not clear from the available file material whether these additional products were produced at the Vicksburg facility. The 1987 Farm Chemicals Handbook lists Vertac as a basic producer of both Caco and DSMA (Reference 259). MSMA is produced by combining arsenic trioxide with caustic to produce sodium arsenite. The facility initially used sodium arsenite solution rather than arsenic trioxide due to OSHA regulations (e.g., requiring a separate building and a dust collection system for emptying the drums of arsenic trioxide) (Reference 217).

Sodium arsenite, when reacted with methyl chloride, produces DSMA. Safety requirements to minimize trace levels of arsenic include the incorporation of sodium hypochlorite to oxidize the trivalent arsenic to pentavalent arsenic. The DSMA may be separated from the salt and sold as product or be used as an intermediate for the production of MSMA. Sulfuric acid is added to the DSMA to produce MSMA. This also produces waste salt and sodium sulfate. MSMA is recovered by centrifuging. The underflow salt cake is a waste. The overflow is further evaporated and cooled to precipitate the salts which are pumped as a slurry and returned to the centrifuge. The slurry underflow consisting of sodium sulfate and sodium chloride salts is disposed of via roll-off sludge dumpsters which are transferred offsite to a landfill. The overflow is MSMA. According to the available file material, 35,000 pounds of slurry were produced per day (Reference 217).

Caco is produced by combining MSMA with sulfur dioxide, caustic, and methyl chloride, in a manner similar to the MSMA process. Waste salts from the Caco process include sodium chloride, sodium sulfite, and sodium sulfate (References 213, 217).

Atrazine (6-chloro-N-ethyl-N'-(1-methylethyl)-1,3,5-triazine-2,4-diamine) is produced by combining cyanuric chloride with equivalent amounts of ethylamine followed by equivalent amounts of isopropylamine. The addition of isopropylamine is conducted in the presence of an acid-binding agent. Waste emissions containing hydrogen cyanide, HCl, and cyanuric acid were treated via an alkali scrubber. If dusts were produced, emissions of dusts were treated via filters or wet scrubbers. The process also produced wastewater in addition to the scrubber water (Reference 259). Some of the production vessels at the Former Atrazine Production Area (SWMU 16) contained a methanol-water coolant. The typical manufacturing plant in 1980 produced approximately 20,000 metric tons of Atrazine per year. There was

no information pertaining to the Cyanazine process in the available file material. However, these two herbicides are similar in activity and composition (Reference 259).

Methyl parathion is produced by combining o,o-dimethyl phosphorothionochloridate and sodium p-nitrophenoxide in an exothermic reaction at 80°C to 100°C. Lower temperatures such as from -10°C to +10°C can also be used to produce this material. The reaction is carried out at atmospheric pressure with reaction times ranging from approximately five hours at the high temperature and up to 18 hours at the lower temperature (Reference 259). Copper may be used as a catalyst or the reaction may be conducted in copper vessels. Potassium bromide may also be used as a cocatalyst. Other catalysts cited for the methyl parathion reaction include triethyl amine, tributyl amine, N-ethyl morpholine, and hexamethylene tetramine (Reference 259). Solvents used in this reaction may include benzene, alcohol, or chlorobenzene. According to the Pesticide Manufacturing and Toxic Materials Control Encyclopedia, the reaction product is an oily filtrate. The filtrate is separated into an oily layer and an aqueous layer. The oily layer may then be washed with dilute sodium carbonate solution, followed by a water wash and steam distillation to remove trimethyl thiophosphate. The material is cooled, then dried under vacuum to yield the product (Reference 259). The production of methyl parathion creates air emissions which may contain sulfur dioxide at approximately 410 kg/metric ton of pesticide produced. Small quantities of methyl parathion and methyl alcohol are also released to the air. Liquid wastes, including by-product HCl-NaCl, generally go through biological treatment before being released to the sewer. Sulfur and waste solvents are incinerated. Any sludges created are recycled and discharged to the sewer at a slow rate (Reference 259).

E. Waste Management

Waste management practices at CCC focus primarily on the containment and treatment of the process wastewaters and stormwater runoff. Solid wastes generated at the facility are either drummed and stored in the Drum Storage Area (SWMU 1) prior to offsite disposal, or discarded in the Junkyard and Wastes Piles (SWMU 34). Three Drum Storage Areas (SWMU 1a, 1b, and 1c) have been mentioned in the available file material. Air emissions at the facility are treated by various scrubbers.

In the North Plant, 0.26 million gallons per day of acidic wastewater are generated from potassium nitrate production. The acidic wastewater is generated at the End Product Scrubber (SWMU 28), the Cooler Scrubber (SWMU 27) and the production areas. Wastewater generated in the production areas is collected by the North Plant Containment System (SWMU 24) and treated at the North Plant Neutralization System (SWMU 22) prior to discharge to the Mississippi River under NPDES Permit No. 0027995. Off-gases from

the potassium nitrate production areas are treated by the C-10 and C-15 Scrubbers (SWMUs 26 and 32). Alkaline wastewater generated by the C-10 Scrubber (SWMU 26) is discharged to the North Plant Neutralization System (SWMU 22) to aid in the neutralization of the acidic wastewater received by that unit.

The Inactive North Plant Surface Impoundment (SWMU 23) was formerly used to treat the North Plant wastewaters. This unlined unit used lime to neutralize the wastewater before being replaced by the North Plant Neutralization System (SWMU 22) (Reference 257). Wastewater generated at the North Plant is transported between the units via the Wastewater Pipes (SWMU 25) (Reference 257). Stormwater runoff which is not collected by the North Plant Containment System (SWMU 24) flows into the North Plant Drainage Ditches (SWMU 33). The drainage ditches merge and flow under the railroad tracks into Stout's Bayou (References 5, 261).

Another waste management practice at the North Plant is the collection of waste oils for disposal offsite. Two waste management units were identified for this purpose: the Oil Collection Unit (SWMU 29), and the Waste Oil SAA (SWMU 30). Waste oils have also collected in a sump located in the No. 6 Fuel Oil Area (SWMU 31) (References 257, 258).

The South Plant generates 0.07 million gallons per day of acidic wastewater. The process wastewater and stormwater are discharged to the South Plant Surface Impoundments (SWMU 3a, 3b, and 3c). The combined wastewaters and stormwaters are discharged offsite after treatment in the Carbon Adsorption System (SWMU 4). The wastewater and stormwater are transferred between various units throughout the South Plant via the South Plant Drainage System (SWMU 5). Wastewater is collected at various sumps located in the former pesticide production areas. The contents of the sumps are removed via the Vacuum Truck (SWMU 21) and are also treated at the Carbon Adsorption System (SWMU 4). Any stormwater runoff from the South Plant, especially from around the Former Atrazine Production Area (SWMU 16), which is not collected by the South Plant Drainage System (SWMU 5) flows into the South Plant Drainage Ditches (SWMU 13). The South Plant Hill Tank and Former Blue Tank (SWMUs 6 and 18) were previously used to contain Dinoseb wastewater prior to treatment or discharge (References 5, 257).

The pesticide production areas at the South Plant include the Former Dinoseb Production Area (SWMU 7), the Former MSMA Production Area (SWMU 11), the Former Toxaphene Production Area (SWMU 14), the Former Methyl Parathion Production Area (SWMU 15), and the Former Atrazine Production Area (SWMU 16). Other units which may have received spillage from pesticide production include the Dinoseb Off-Loading Area (SWMU 8), the Dinoseb Drumming Area and Drains (SWMU 9), the Dinoseb Stock Storage Area (SWMU 10), the Former MSMA Salt Unloading Area (SWMU 12), and the

Returned Product Storage Area (SWMU 17). Roll-off sludge dumpsters from the Former MSMA Salt Unloading Area (SWMU 12) were transferred offsite to a ChemWaste landfill located in Alabama. The Railroad Car Unloading Station (SWMU 20) has potentially received spillage of not only the pesticide products, but also the raw materials. At the time of the VSI, a Scrap Metal Dumpster (SWMU 19) was located near the Former MSMA Production Area (SWMU 11) for the disposal of large debris from the dismantling of that area. Debris collected in the dumpster was to be disposed of offsite at a permitted landfill (References 5, 257).

The facility utilized an Inactive Landfill (SWMU 2) in the South Plant for the disposal of pesticides and pesticide-related materials during the 1970s. The unlined unit was subject to non-RCRA-type closure activities in the early 1980s (Reference 257). Runoff from this area is meant to flow to the South Plant Surface Impoundments (SWMU 3), but on occasion has been observed entering the South Plant Drainage Ditches (SWMU 13).

F. Environmental and Demographic Setting

1. Meteorology

Cedar Chemical Corporation is located on the western border of Warren County Mississippi, approximately forty miles west of the state capital, Jackson. Warren County lies along the Mississippi River on the western border of Mississippi (Reference 256).

The climate in Warren County ranges from hot and humid in the summer to mildly cold and humid in the winter. The summer temperatures average at or above 90°F. Winter temperatures generally stay around 50°F. Winds are typically light, gaining strength in the winter. Rainfall is generally heavy throughout the year, lessening in autumn. The yearly average rainfall is approximately 50 inches and snow is rare (Reference 256).

2. Floodplain and Surface Waters

Two distinct physiographic regions meet in Warren County. These are the alluvial plains associated with the Mississippi River and its tributaries, and the loess hills. The Cedar Chemical facility is located directly on the border of these two regions. East of the facility are small flood plains and the western area consists mainly of steep hills and bluffs (Reference 256). The facility ranges from 80 to 150 feet above mean sea level (Reference 5).

The Cedar Chemical facility is bordered on the east by Stout's Bayou. This bayou flows south and joins with Hatcher Bayou at the southeast corner of the South Plant Surface Impoundment (SWMU 3) to form Hennessey's Bayou. Hennessey's Bayou flows west along

the southwesterly border of the facility and eventually discharges into the Mississippi River. The bayous have median flow rates with constant variability due to weather conditions. Surface drainage at the North Plant is easterly into Stout's Bayou. In the South Plant, the surface drainage is predominantly in a southwesterly direction into the major South Plant Drainage Ditch (SWMU 13). The drainage ditch flows through a wetlands area into Hennessey's Bayou. Hennessey's Bayou flows south for approximately four miles into the Mississippi River. Portions of the CCC facility are within the floodplains of these bayous and are flooded during heavy rainfall events. The surface waters become contaminated from the contaminated soils which are washed into the bayous during flooding. The bayous are used by wildlife and for recreational fishing (References 5, 225, 256, 261). Process area sewers and surface water drainage have been described in greater detail in reports included as Appendix D. These reports include maps which show the runoff drainage pathways from each plant (Reference 261).

3. Soils and Geology

Approximately 60 percent of Warren County and all of the Cedar Chemical facility lie in an area that has been mapped as having Memphis-Natchez-Adler association soils. The Memphis and Memphis-Natchez soils encompass a majority of the land to the west of the facility, as well as the land between the plants and the inactive landfill area. Both the Memphis and Natchez soils were formed in loess. The Memphis soils are found along the narrow ridgetops and the higher areas of the slopes. Natchez soils are predominant along the lower and middle areas of the slopes. Both soil types accept water slowly but have a high capacity once the water has permeated. Both soils are well-drained and erosion is moderate. The Memphis soils have a silty clay loam subsoil, while the Natchez subsoil consists of silt loam. The Memphis Natchez soils are 0.25 to 1.5 feet thick and are underlain by 10 to 20 feet of silt or silty loam. These soils have a hydraulic conductivity of 0.8 to 2.5 inches per hour (Reference 256).

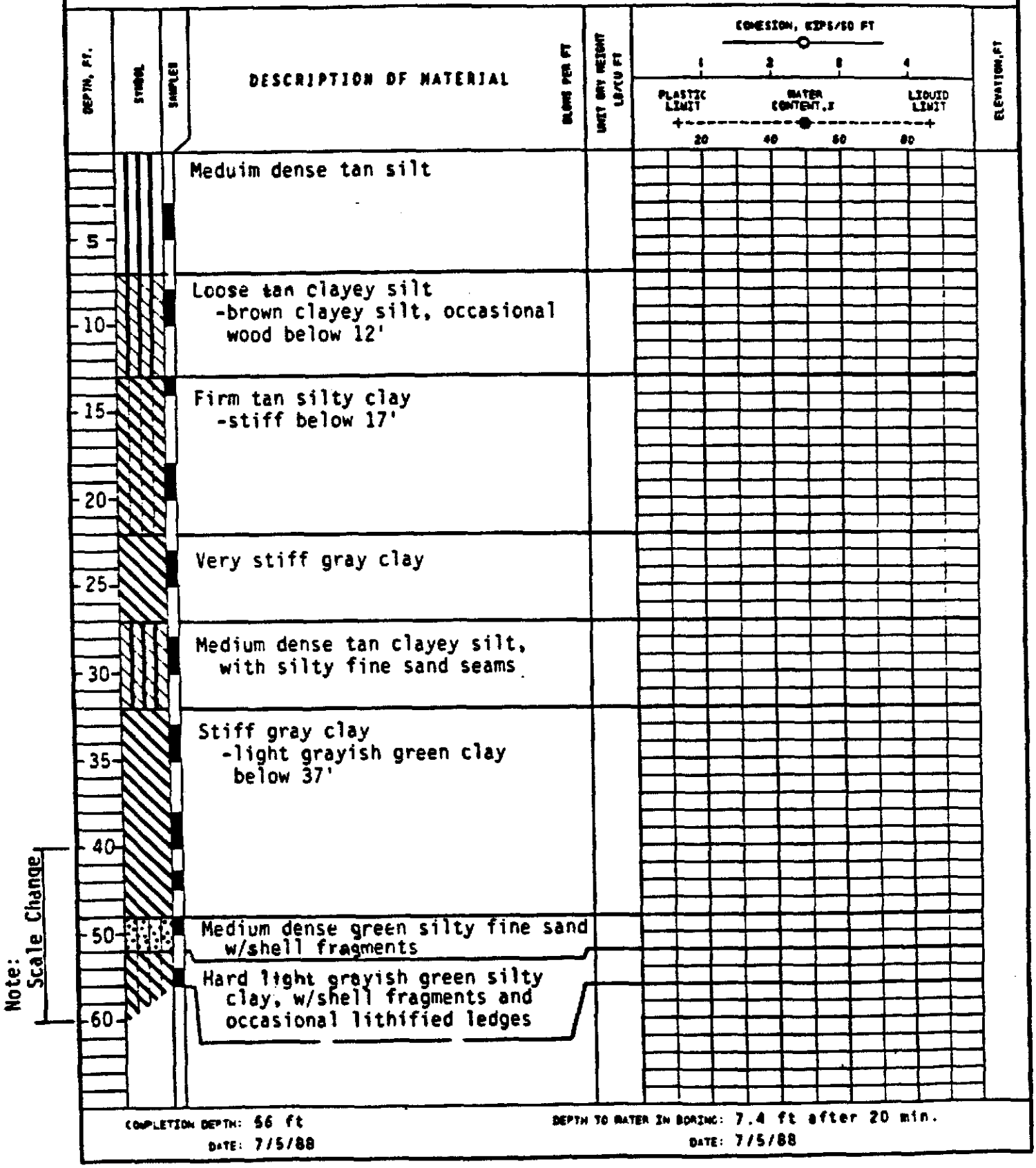
The south plant of the facility lies on silty soil. This land is very similar to the Memphis-Natchez silt loams, only it has been greatly altered by man. The land has been cut and filled to allow for building sites. The terrain is generally rolling hills with moderate to steep slopes. The soil maintains the same characteristics as the Memphis-Natchez soils (Reference 256). The boring log of MW-16, located in the center of the South Plant, gives an example of the soil layers beneath the facility (Reference 31). This information is provided in Figure II-3.

FIGURE II-3

Boring Log of No. MW-16
Vicksburg Chemical
Vicksburg, Mississippi

TYPE: Rotary wash & Shelby tube

LOCATION: See Plate 1



COMPLETION DEPTH: 56 ft
DATE: 7/5/88

DEPTH TO WATER IN BORING: 7.4 ft after 20 min.
DATE: 7/5/88

BASE, LINC, FURLOW ENGINEERS

PLATE 5

Reference 31

The north plant is split between Memphis-Natchez silt loams and Adler silt loam. The Memphis-Natchez silt loams in the plant area are severely eroded and the surface layer consists mainly of the upper subsoil layer. The other half of the north plant lies on Adler silt loam. The Adler silt loam also makes up the majority of the land east of the facility, including the South Plant Surface Impoundment (SWMU 3). Adler soils are moderately well drained and have a high water capacity. Adler soils are 4 to 6 feet thick and have a hydraulic conductivity of 0.8 to 2.5 inches per hour (Reference 256.) Specifically, boring logs indicate that the plant is underlain by a silty clay fill to a depth of approximately 10 feet and silty clay pleistocene loess from 10 to 50 feet below the surface. The loess is underlain by marl at a depth of approximately 50 feet (Reference 46).

4. Ground Water

The plant is underlain by a confined aquifer occurring between depths of 10 and 50 feet showing mildly artesian conditions. The aquifer is made up of pleistocene loess (silt) and is overlaid by a clayey cap at a depth of 10 feet and underlain by an impermeable marl at a depth of 50 feet. The aquifer has a hydraulic conductivity range of 1.93 to 5.5 gallons per day per square foot (gpd/ft^2) and a transmissivity range of 40 to 200 gpd/ft. The ground water beneath the facility could be classified as Class IIB, a potential source of drinking water (References 5, 12).

Ground-water gradients in the facility area are low (Reference 12). Shallow ground water moves in a north to south direction. Stout's Bayou and Hennessey's Bayou influence the ground-water flow direction and gradient. Ground-water mounding from either natural topographic effects or artificially induced recharge may exist beneath the Inactive Landfill (SWMU 2) and the South Plant Surface Impoundments (SWMU 3) (Reference 46). Ground-water velocities in the aquifer range from 0.01 to 0.18 feet per day (ft/d) (Reference 12). The ground water may receive contaminants via the infiltration of surface water through the contaminated unsaturated zone (Reference 5).

Sixteen ground-water monitoring wells are in place at the plant (see Figure II-4, page 34 for ground-water monitoring well locations) (Reference 12). A diagram of MW-16 demonstrates the general structure of the monitoring wells at the facility (Figure II-5, page 35) (Reference 31). Dinoseb and Atrazine have been detected in at least six of the monitoring wells, and arsenic in at least four. Dinoseb has been documented at 1130 µg/l in MW-1, and Atrazine in MW-8 at 191 mg/l. Other pesticides and inorganic elements have also been detected in the ground water at the facility. The contaminated ground water can discharge to either Stouts Bayou or Hennessey's Bayou (Reference 5). A summary of

Figure II-4

Monitoring Well Locations

(Reference 12)

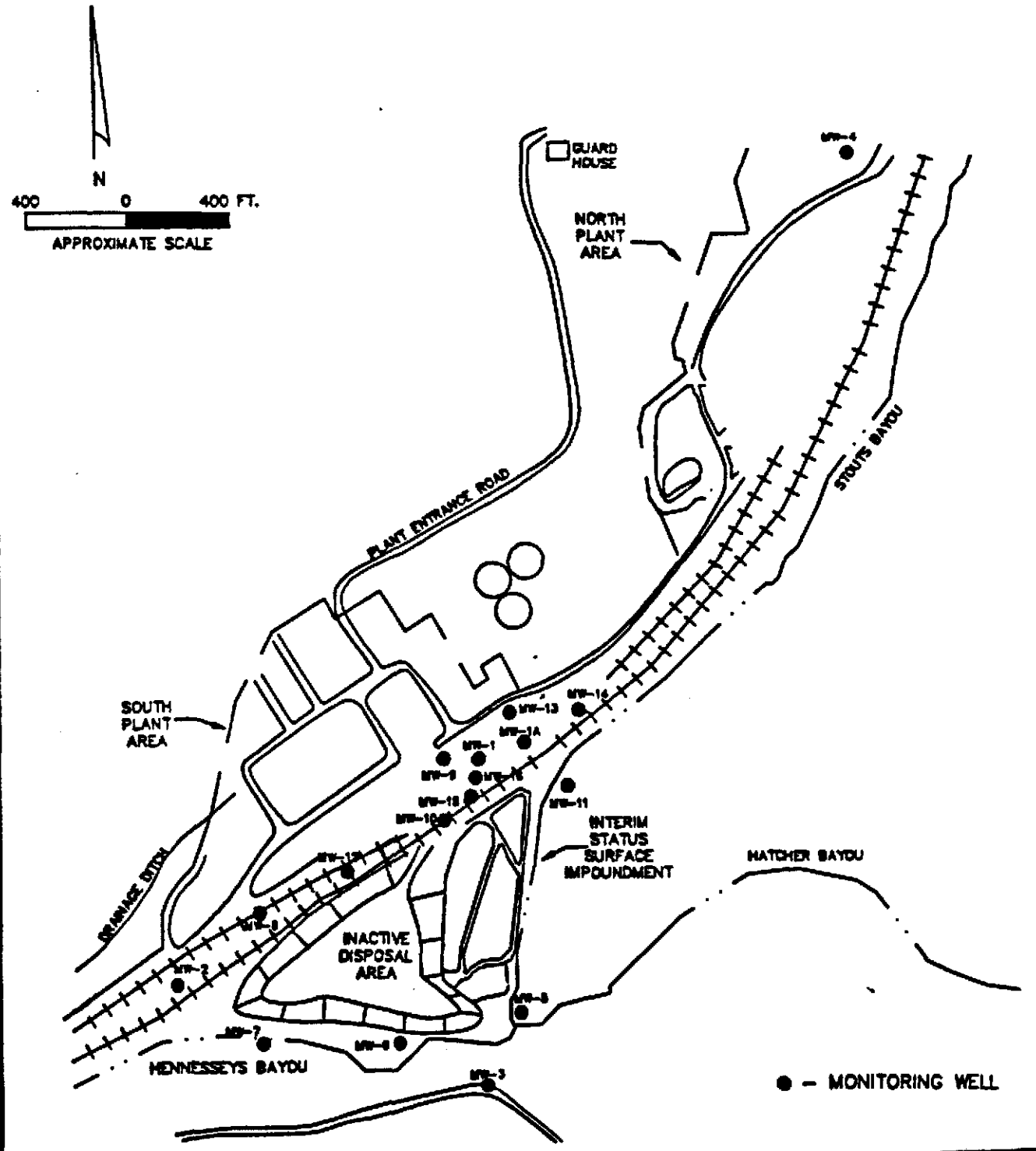


Figure II-5
Log of Groundwater Observation Well

Project & Location Vicksburg Chemical Vicksburg, Mississippi
Client Vicksburg Chemical Date of Report 7/15/88

Observation Well No. 16 Date Completed 7/16/88 Technician J. Malanchak
Riser Pipe: Material PVC Diameter 4 in. Type of Joints thread
Screen: Material PVC Slot Size .010" Diameter 4 in. Length 10 ft
Diameter of Borehole 8 in. Type of Filter Pack No. 3 blasing sand
Method of Placement of Filter Material 1¼" PVC tremie pipe
Type of Seal Above Screen bentonite pellets Backfill Above Seal cement/bentonite
Drilling Mud _____ used. Fresh Water Flush Before Setting Well Screen yes
Well Developed by air lift Development Time 1½ hrs
Groundwater Level @ 2 hrs N/A @ 24 hrs _____ Other _____

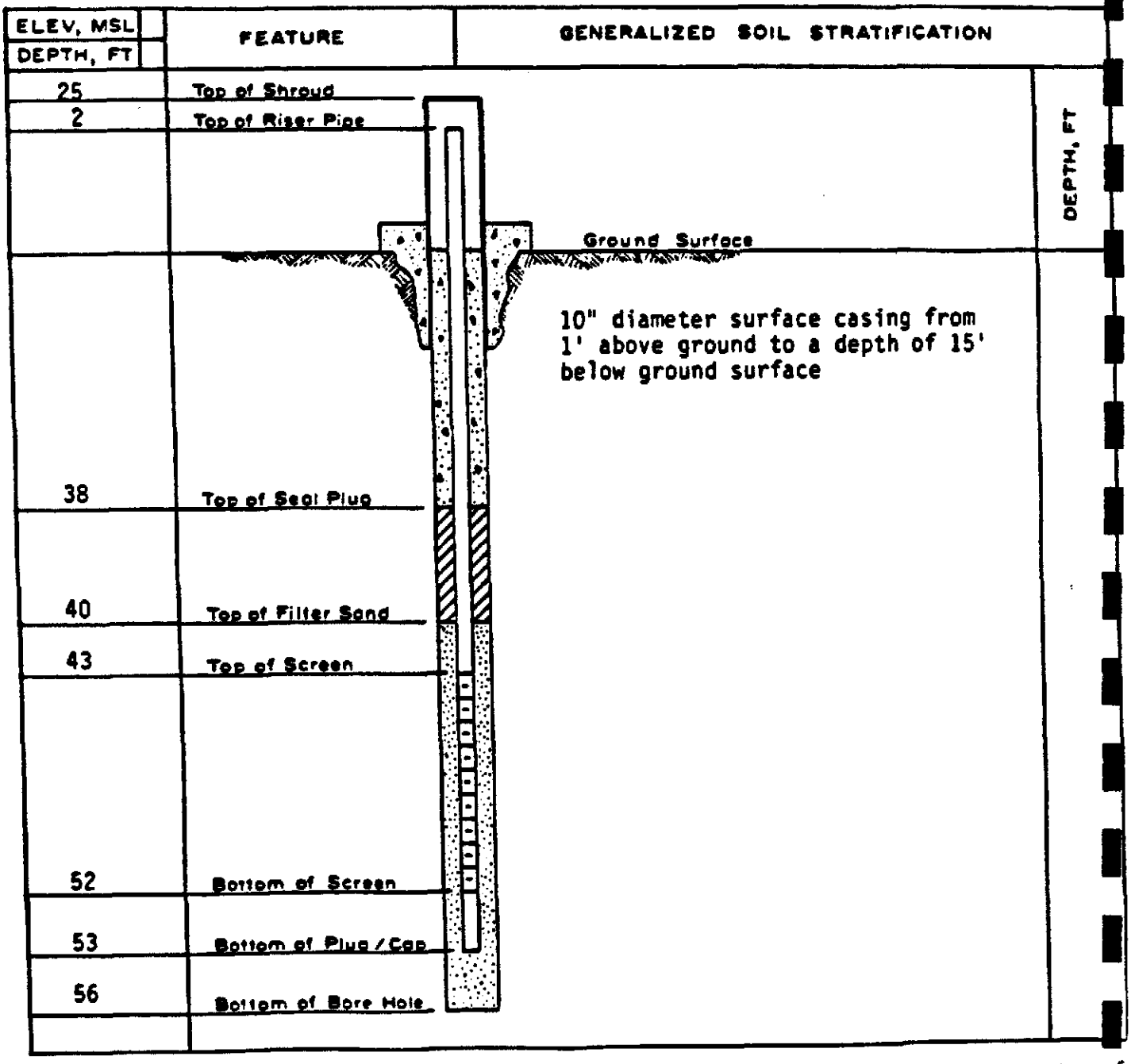


PLATE 6

the sampling data from CCC can be found in Appendix C, taken from the EPA Endangerment Assessment of October 1989, and the 1990 2nd Quarter Ground-Water Monitoring Report (Reference 5).

There are five public or private wells within a three-mile radius of the facility (Reference 27).

5. Toxicological Evaluation

The primary constituents of concern at the facility include Dinoseb, Toxaphene, arsenic, Atrazine, Arochlor-1254, and methyl parathion. Each of these have been found in either the soil or ground water at the facility (Reference 5). Table II-2 presents a summary of the SWMUs with confirmed contamination at the facility and the associated toxicological levels of concern.

Dinoseb has been banned from use as a pesticide by the EPA due to the significant health risk it creates for populations repeatedly exposed. These health risks include developmental toxicity, acute toxicity, reproductive toxicity, immunotoxicity and the induction of cataracts (Reference 5). Dinoseb is highly toxic to fish and moderately toxic to birds. The acute LD_{50} value (lethal dose for 50% of test population) for rats is estimated at 25 mg/kg, but this may vary depending upon formulation (References 259, 269).

Dinoseb is an orange solid which has been used in the past as a fungicide against mites and aphids, and as a contact herbicide to control seedling weeds and grasses in crops. Many applications of the pesticide were possible including preplant, preemergence and postemergence. Under normal use, buildup of the pesticide in the soil was prevented if the weather conditions were conducive to microbial breakdown. Dinoseb is not tightly absorbed in most agricultural soils, but may leach in porous, sandy soils (References 5, 259).

Toxaphene is one of the most widely used pesticides in the United States. The yellow wax, also known as Campheclor, is an organochlorine insecticide used on corn, cotton, and small grains. Long term observations have confirmed that residues are seldom present on agricultural crops. Toxaphene is considered to be moderately toxic with an acute oral LD_{50} for rats of 55 mg/kg. The pesticide, however, is highly toxic to many aquatic invertebrate and vertebrate species. In an effort to help protect freshwater aquatic life, the EPA set a concentration limit of 0.47 µg/l in freshwater (References 5, 259, 269).

Table II-2

Summary of SWMUs with Confirmed Contamination

SWMU Name/Number	Contaminant Concentrations	Type of Sample	LD_{50}[1]	LEVELS OF CONCERN MCL[2]	TLV[3]
1 Drum Storage Areas	550 mg/kg Arsenic	Soil	N/A	0.05 mg/l[7]	0.2 mg/m^3
	130 mg/kg Zinc	Soil	N/A	N/A[6] (5 mg/l secondary)	N/A
	5000 µg/kg Atrazine	Soil	1500 mg/kg	3µg/l	5 mg/m^3
	3700 µg/kg Toxaphene	Soil	55 mg/kg	0.003 mg/l[7]	0.5 mg/m^3
3 Surface Impoundment	13000 mg/l Dinoseb	Sediment	25 mg/kg	7 µg/l[7]	N/A
	2320 mg/kg Toxaphene	Sediment	55 mg/kg	0.003 mg/l[7]	0.5 mg/m^3
7 Former Dinoseb Production Area	640,000 µg/kg Dinoseb	Soil	25 mg/kg	7 µg/l[7]	N/A
9 Dinoseb Drumming Area/Drains	12,000-640,000 µg/kg Dinoseb	Soil	25 mg/kg	7 µg/l[7]	N/A
11 Former MSMA Production Area	820-1300 µg/kg Methyl Parathion	Soil/ Ground Water	6 mg/kg	N/A	0.2 mg/m^3
13 South Plant Drainage Ditches	550 mg/kg Arsenic	Soil	N/A	0.05 mg/l[7]	0.2 mg/m^3
	5000 µg/kg Atrazine	Soil	1500 mg/kg	3µg/l	5 mg/m^3
	240 µg/kg Cyanazine	Soil	149 mg/kg	N/A[6]	N/A
	3700 µg/kg Toxaphene	Soil	55 mg/kg	0.003 mg/l[7]	0.5 mg/m^3
14 Former Toxaphene Production Area	12,000 µg/kg Dinoseb	Soil	25 mg/kg	7 µg/l[7]	N/A
	47,000 µg/kg Toxaphene	Soil	55 mg/kg	0.003 mg/l[7]	0.5 mg/m^3
	94 mg/kg Zinc	Soil	N/A	N/A[6] (5 mg/l secondary)	N/A
15 Former Methyl Parathion Production Area	1300 µg/kg Methyl Parathion	Soil	6 mg/kg	N/A	0.2 mg/m^3
	820 µg/kg Methyl Parathion	Ground Water	6 mg/kg	N/A	0.2 mg/m^3
16 Former Atrazine Production Area	5000 µg/kg Atrazine	Soil	1500 mg/kg	3µg/l	5 mg/m^3

[1] Lethal dose for 50% of the population as applied orally to rats.
[2] Maximum Contaminant level as established under the Safe Drinking Water Act and RCRA for ground water.
[3] Threshold Limit Values as recommended by the American Conference of Governmental Industrial Hygienists (ACGIH) for airborne concentrations which workers may be exposed to on a daily basis
[4] Ground-water contamination in the vicinity has not been definitively linked to this unit.
[5] N/A not available/applicable.
[6] Listed for regulation.
[7] Proposed limit under review.

Table II-2 (Cont.)

Summary of SWMUs with Confirmed Contamination

SWMU Name/Number	Contaminant Concentrations	Type of Sample	LD_{50}[1]	LEVELS OF CONCERN MCL[2]	TLV[3]
17 Returned Product Storage Area	5000 µg/kg Atrazine	Soil	1500 mg/kg	3µg/l	5 mg/m^3
	3700 µg/kg Toxaphene	Soil	55 mg/kg	0.003 mg/l[7]	0.5 mg/m^3
	550 mg/kg Arsenic	Soil	N/A	0.05 mg/l[7]	0.2 mg/m^3
	130 mg/kg Zinc	Soil	N/A	N/A[6] (5 mg/l secondary)	N/A
20 Railroad Car Unloading Station[4]	1200 µg/l Dinoseb	Ground Water	25 mg/kg	7 µg/l[7]	N/A
	80 µg/l Atrazine	Ground Water	1500 mg/kg	3µg/l	5 mg/m^3
34 Junkyard/Waste Piles	5400 µg/kg Atrazine	Soil	1500 mg/kg	3µg/l	5 mg/m^3
	30 µg/kg Cyanazine	Soil	149 mg/kg	N/A[6]	N/A
	710 µg/kg Arochlor-1254	Soil	1010 mg/kg	0.5 µg/l	N/A
	3000 µg/kg Propazine	Soil	N/A	N/A	N/A

[1] Lethal dose for 50% of the population as applied orally to rats.
[2] Maximum Contaminant level as established under the Safe Drinking Water Act and RCRA for ground water.
[3] Threshold Limit Values as recommended by the American Conference of Governmental Industrial Hygienists (ACGIH) for airborne concentrations which workers may be exposed to on a daily basis
[4] Ground-water contamination in the vicinity has not been definitively linked to this unit.
[5] N/A not available/applicable.
[6] Listed for regulation.
[7] Proposed limit under review.

Toxaphene has been classified as a Class B2 carcinogen - a probable human carcinogen, and has reportedly been the cause of degenerative lesions in the liver and kidney. Health risks from Toxaphene include reproductive toxicity, fetotoxicity, and maternal toxicity (liver lesions). EPA has established a maximum contaminant level (MCL) under the Safe Drinking Water Act, and under RCRA, a ground-water concentration limit of 3 mg/l (References 5, 259, 265).

Toxaphene has the potential to be adsorbed in soil, to run off with soils, and to bioaccumulate. Food chain contamination is likely. The potential for leaching and biodegradation are very low (Reference 268).

The main source of arsenic at CCC was the production of the herbicide MSMA. MSMA, used to control grass weeds, was reportedly almost completely inactivated in soil by ion exchange and surface decomposition. In addition, MSMA was not toxic to fish. The primary health concern comes from the arsenic which is found in the waste salts from the production of MSMA (Reference 259).

Arsenic is classified as a Class A carcinogen - a definite human carcinogen. It is both a chronic and an acute toxin. Most human exposure comes from ingestion or inhalation. Human lethal doses vary depending upon absorption of the compounds. Some examples of lethal doses include 60 mg trivalent arsenic and 250 mg pentavalent arsenic. Chronic exposure to arsenic can lead to skin cancer and respiratory tract tumors. Symptoms of exposure include vomiting, diarrhea, skin lesions, peripheral neuropathy, peripheral vascular disease, and a garlicky odor of the breath and skin. EPA has established a drinking water MCL and ground-water concentration limit of 50 µg/l (References 5, 259, 264).

Arsenic transport in the environment is controlled largely by adsorption and desorption processes in the soil. Concentrations of arsenic found in water are generally lower than concentrations in nearby soils due in part to reduction by bacteria in marine environments. Bioaccumulation of arsenic occurs readily in some aquatic organisms, thus contamination of the food chain is likely (Reference 267).

Atrazine is a triazine herbicide used in the control of broadleaf and grassy weeds as are Propazine and Cyanazine. This colorless powder is more readily adsorbed on muck or clay soils. Leaching of the herbicide is limited by adsorption to certain soil constituents. Microbial activity assists in the breakdown of the herbicide making bioaccumulation unlikely. Solubility of the herbicide suggests that it may migrate in ground water (References 259, 268).

Atrazine has a low toxicity for aquatic life. Toxic signs in animals have been very non-specific. They include decreased activity, muscular weakness, and difficulty in breathing. One study of chronic toxicity in animals reported finding leukopenia - a decrease in white blood cell concentrations. Atrazine is absorbed through the skin fairly easily and may be an irritant to the skin and eyes. The acute oral LD_{50} for rats is 1500 mg/kg (References 5, 259, 269).

Arochlor-1254 is classified as a polychlorinated biphenyl (PCB). PCBs can be taken into the body through inhalation, ingestion, and transdermal absorption. Once in the body, PCBs tend to concentrate in fatty tissues. Chronic exposure can cause skin and stomach lesions, impairment of liver function, and peripheral neuropathy. PCBs are characterized as carcinogens and may lead to reproductive toxicity and fetotoxicity. Chronic threshold toxicity values could not be found for humans. For aquatic life, however, the chronic threshold values for vertebrates ranged from 0.3 to 9 µg/l, and for invertebrates, from 0.8 to 400 µg/l. The acute exposure limit of PCBs for ambient water quality is set at 2 µg/l. The MCL for PCBs as established by EPA is set at 0.5 mg/l (References 5, 264). PCBs have a low potential for leaching and biodegradation. They are adsorbed to soil organic matter and can bioaccumulate. Food chain contamination is likely. PCBs are known to be persistent in the environment (Reference 268).

Methyl parathion is an organophosphorus insecticide. The insecticide is highly toxic to mammals, primarily an acute toxin. The colorless crystals can enter the body through inhalation, ingestion, or transdermal absorption. The compound is considered non-toxic until it reaches the liver. At this point, methyl parathion is converted into paraoxon, which inhibits acetylcholinesterase activity. Severe acute toxic effects may include coma or death. Symptoms of exposure include headache, vertigo, blurred vision, salivation, lacrimation, muscular weakness, and difficulty in breathing. The acute oral LD_{50} for rats is 6 mg/kg (References 5, 259, 269).

Methyl parathion is biodegradable in soil, thus making bioaccumulation unlikely. However, residues have been observed and soil adsorption is possible. The volatility of the material could pose an inhalation problem if soils are disturbed (Reference 268).

III. SWMU DESCRIPTIONS

This section presents SWMU Data Sheets completed to provide descriptions and release assessments of the Solid Waste Management Units (SWMUs) identified during the PR and VSI of the Cedar Chemical Corporation in Vicksburg, Mississippi.

Prior to the individual SWMU Sheets are SWMU location maps for the South Plant (Figure III-1, page 42) and the North Plant (Figure III-2, page 73). The SWMUs are presented on these Figures by number as identified in the following descriptions.

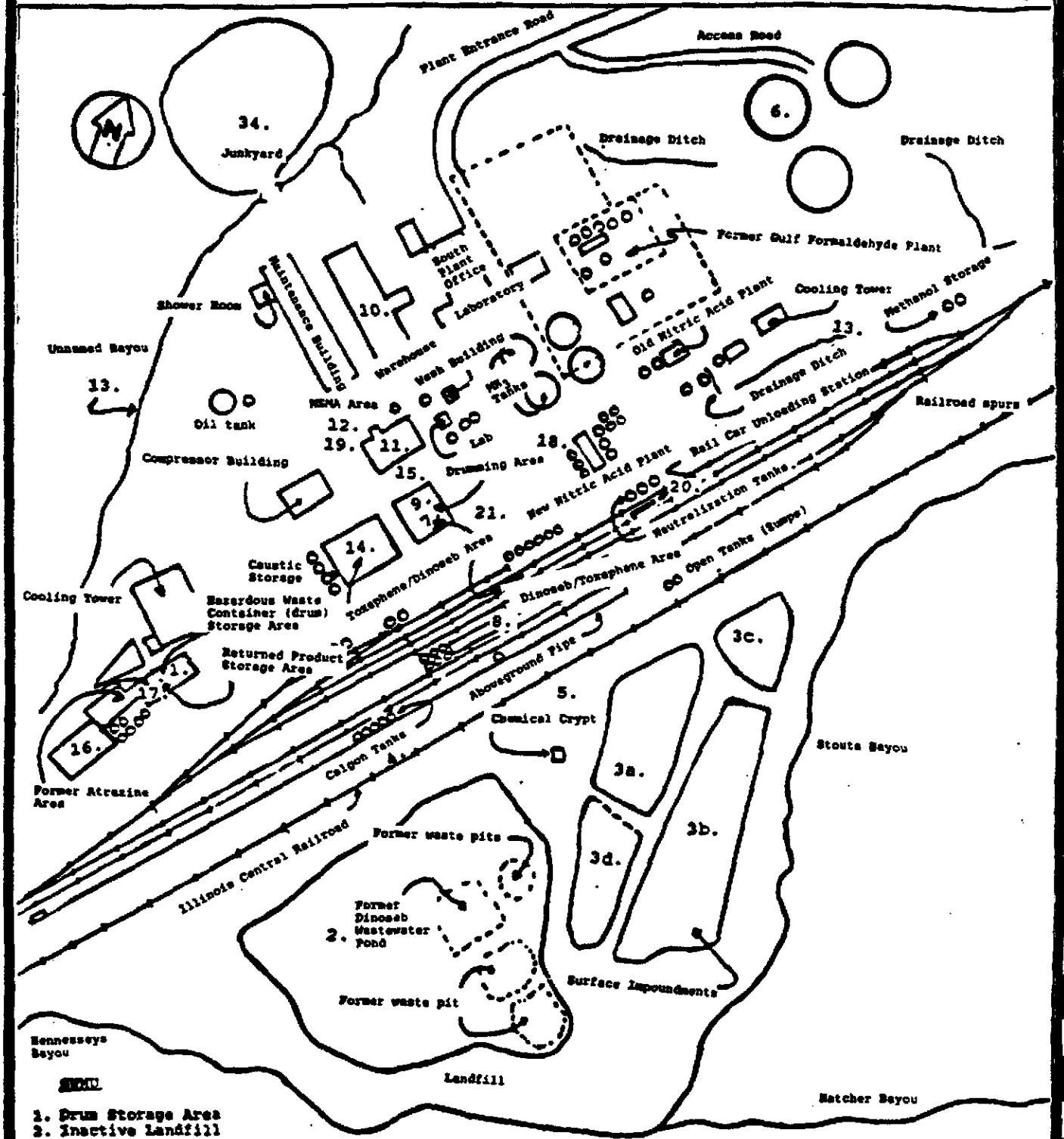
In the SWMU Data Sheets, the following designations are used to assess the unit's potential for release to the environment via the various pathways:

L (Low)	minimal potential for release
M (Medium)	moderate potential for release
H (High)	evidence suggests that release(s) have occurred
U (Unknown)	no information is available

FIGURE III-1

South Plant SWMU Map

(Reference 33)



SWMU locations not to scale

SWMU NUMBER: 1 **PHOTO NUMBER:** 1.1, 1.2

NAME: Drum Storage Areas

TYPE OF UNIT: Less-than-90 day storage areas

PERIOD OF OPERATION: Varies

PHYSICAL DESCRIPTION AND CONDITION: The unit consists of three drum storage areas (SWMUs 1a, 1b, 1c) located in the South Plant. SWMU 1a is located in the vicinity of the Former Atrazine Production Area (SWMU 16) in the south section of the South Plant. The area was initially used in 1980 to store drums of hazardous waste generated at the various pesticide production areas in the South Plant. At the time of the VSI, the area was utilized for staging drums of floor scrapings and similar hazardous wastes generated from the activities associated with dismantling the former pesticide production areas.

The capacity of the unit is approximately 1,000 55-gallon drums and covers an area 80 feet by 80 feet. The unit is constructed of concrete and was covered by a tin roof. The roof was reportedly blown down during a storm in the spring of 1990. Secondary containment consists of six-inch tall concrete curbs on the unit's south, west, and north sides. Runoff from the pad is collected via a concrete sump approximately 30 inches in diameter and two feet deep. The sump previously discharged to the South Plant Surface Impoundments (SWMUs 3a, 3b, 3c). The drain from the sump was plugged with concrete in February 1987 and the contents of the sump are presently removed via the Vacuum Truck (SWMU 21). The floor of the unit appeared pitted and stained yellow with Dinoseb. The concrete around the sump also appeared pitted and was covered with a white chalky material that appeared to be Atrazine. The major South Plant Drainage Ditch (SWMU 13) is situated west of the unit.

SWMU 1b was located between the drumming building and the New Nitric Acid Plant, in the central area of the South Plant. No secondary containment of the area existed. Wastes handled and period of operation are unknown for this unit. The third drum staging area, SWMU 1c, could not be located by facility representatives.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: Unit 1a formerly managed by-product salts from the production of MSMA, and solid wastes associated with Dinoseb, Toxaphene and Atrazine production. Currently, the unit is used to stage waste floor scrapings containing MSMA. However, no drums were observed at this unit at the time of the VSI. Information concerning the contents of the drums staged in SWMUs 1b and 1c could not be provided at the time of the VSI.

RELEASE PATHWAYS: Air (L) Surface Water (M) Soil (H)
Ground Water (H) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): The VSI team observed the base of SWMU 1a to be cracked, pitted, and stained yellow. The unit has a history of drum mismanagement including leaking drums and the storage of wastes in drums that were in poor condition (See Table II-1). Analysis of soil samples collected from an area immediately northwest of the unit during February 1987 indicated 550 mg/kg arsenic, 130 mg/kg zinc, 5000 µg/kg Atrazine, and 3,700 µg/kg Toxaphene.

RECOMMENDATIONS: No Further Action ( )
RFI Necessary (X)

REFERENCE(S): 5, 12, 17, 26, 28, 48, 65, 73, 85, 86, 93, 133 138, 183, 226, 239, 241, 244, 257, 258, 260

COMMENTS: The facility should determine the location and contents of drum storage areas 1b and 1c so that their potential for release can be determined.

SWMU NUMBER: 2

PHOTO NUMBER: 2.1, 2.2, 2.3, 2.4, 2.5, 4.1

NAME: Inactive Landfill

TYPE OF UNIT: Unlined landfill

PERIOD OF OPERATION: 1972 to November 1980

PHYSICAL DESCRIPTION AND CONDITION: The unit is located in the vicinity of the South Plant Impoundments (SWMUs 3a, 3b, 3c) in the southeast section of the South Plant. The unit consisted of a disposal area used to contain discarded drums and five unlined pits. One pit had been used in an attempt to dissolve the waste drums with hydrochloric acid. A large number of drums were reportedly removed from the unit in early 1980 and transferred offsite to a hazardous waste landfill. The unit was subject to a non-RCRA closure consisting of clay capping and vegetative cover. The landfill covers approximately two to three acres.

The unit is bounded on the northeast by the South Plant Surface Impoundments (SWMUs 3a, 3b, 3c) which are in the vicinity of the confluence of Stouts and Hatchers Bayou. The unit was covered in grass and weeds at the time of the VSI. The slope between the landfill and the surface impoundment was covered with a geotextile fabric. The cover was reportedly used to prevent soil erosion from the landfill interfering with the retrofitting activities being conducted at the impoundment. Three monitoring wells are in place to monitor the landfill area. Ground-water mounding from either natural topographic effects or artificially induced recharge may exist under this unit.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: According to a 1989 U.S. EPA Endangerment Assessment for the facility, the unit is known to have received at least 4000 empty Dinoseb formulation drums; residue and debris from the methyl parathion fire; 172 drums of hydrolyzed cyanuric acid from the production of Atrazine; 17 drums of spent activated carbon; 25 drums of dimethyl urea and isopropyl amine; 31 drums of sodium nitrophenol liners and empty bromine bottles; 80 drums of phosphorous trichloride, phosphorous sulfochloride, and dimethyl phosphorous sulfochloride.

Three pits at the landfill received sediment from the South Plant Surface Impoundments (SWMU 3) consisting of soil and Dinoseb. One pit received 200,000 gallons of Dinoseb wastewater. Another pit was used to neutralize empty Dinoseb drums with HCl. The wastes disposed in the unit prior to 1975 were not recorded.

RELEASE PATHWAYS: Air (M) Surface Water (H) Soil (H)
Ground Water (H) Subsurface Gas (M)

HISTORY AND/OR EVIDENCE OF RELEASE(S): There is documented ground-water contamination resulting from past waste management practices at this unit. In addition, since volatile wastes including toluene and carbon tetrachloride from toxaphene production may have been disposed of in the unit, hazardous discharges to the air and the creation of subsurface gas should be investigated. Traces of carbon tetrachloride were found in soil/sediment samples taken from the unit in a Hazardous Waste Site Investigation of January 26, 1982.

RECOMMENDATIONS: No Further Action ( )
RFI Necessary (X)

REFERENCE(S): 5, 9, 133, 136, 138, 140, 162, 163, 167, 168, 170, 173, 174, 179, 183, 202, 203, 204, 206, 209, 215, 218, 224, 228, 239, 244, 254, 257, 258

COMMENTS: Capping of the area was the subject of Commission Order No. 599-82, issued November 10, 1982.

SWMU NUMBER: 3 **PHOTO NUMBER:** 3.1, 3.2, 3.3, 3.4, 3.5, 2.5

NAME: South Plant Surface Impoundments

TYPE OF UNIT: Unlined retention ponds

PERIOD OF OPERATION: 1955 to present

PHYSICAL DESCRIPTION AND CONDITION: The unit is located in the immediate vicinity of the Inactive Landfill (SWMU 2) in the southeast section of the South Plant. The unit is bounded to the east by Stouts Bayou. Beyond Stouts Bayou is the city of Vicksburg POTW. The unit was undergoing retrofitting activities at the time of the VSI. The impoundments receive stormwater from the South Plant; wastewater from the North Plant that does not meet the facility's NPDES discharge requirements; and backwash from the Carbon Adsorption System (SWMU 4). In the past, the unit consisted of three unlined surface impoundments (SWMUs 3a, 3b, and 3c) with combined capacities of 3,500,000 to 6,000,000 gallons. With the closure activities, another area has been established, the Solid Waste Consolidation Area (SWMU 3d). At the time of the VSI, wastewater was expected to flow from Impoundment C to Impoundment B, and through Impoundment A after the completion of the retrofitting activities. The three impoundments encompassed approximately 3.9 acres.

Prior to the retrofitting activities, each impoundment was 10 to 15 feet deep including sludge, possibly reaching the confined aquifer below the area. The impoundment embankments are constructed of soil (loess, common to the area) and are vegetated with grass for erosion prevention. The south border of the unit is adjacent to Hennessey's Bayou and the eastern border parallels Stouts Bayou. The sludges from Impoundment A were solidified with lime kiln dust and disposed of in the Solid Waste Consolidation Area (SWCA) within the area previously covered by Impoundment A. The SWCA consists of a double-lined landfill. Sludges from the other two impoundments will also be disposed of in the SWCA (SWMU 3d).

South Plant Impoundment A (SWMU 3a) is situated between Impoundment B (SWMU 3b) and the Inactive Landfill (SWMU 2). Impoundment A previously received wastewater from the South Plant. At the time of the VSI, the impoundment was being retrofitted with a 60 mm liner and was not receiving any wastewater. The liner reportedly had leaks which were expected

to be repaired by the installation contractor. Pipes were observed in place for use when Impoundment A (SWMU 3a) became operational. Impoundment A was rectangular in shape with dimensions of 600 feet by 150 feet and the impoundment encompassed approximately 2.1 acres. With SWCA (SWMU 3d) taking approximately half of the previous area, Impoundment A was last estimated as being 300 feet by 165 feet. The SWCA (SWMU 3d) was described by a facility representative as being somewhat triangular in shape, with a base of approximately 300 feet and a hypotenuse of approximately 360 feet. As of October 1990, retrofitting of Impoundment A was complete and closure procedures had been started on Impoundment B.

South Plant Impoundment B (SWMU 3b) is situated between Impoundment A and Stouts Bayou. Impoundment B receives secondary wastewater through a pump. At the time of the VSI, soil discoloration and scum were observed along the pond's edge. The pond is rectangular in shape with dimensions of 450 feet by 150 feet and encompasses approximately 1.5 acres.

South Plant Impoundment C (SWMU 3c) is situated northwest of the Impoundments A and B. At the time of the VSI, Impoundment C received all wastewater and stormwater runoff from the South Plant. Impoundments A and C were connected by a 10-foot cut-away section of the dividing dike-road at the time of the VSI. The impoundments are expected to be connected by pipes in the future. Impoundment C is triangular, encompassing approximately 0.3 acres. The impoundment is scheduled to be lined after Impoundment B is completed. Impoundment C also receives backwash from the Carbon Adsorption System (SWMU 4) and any effluent from the North Plant Neutralization System (SWMU 22) which does not meet the pH range (pH 6 to 9) for discharge. The VSI team observed an oil-like sheen on the water surface in the vicinity of one of the pipes discharging to the impoundment, and soils stained with what appeared to be Dinoseb along the southern edge.

The South Plant Surface Impoundments were determined as not falling under RCRA regulation by the Mississippi Commission of Natural Resources in December 1986 and again in August 1987. On December 17, 1986 the Commission found the impoundments exempt under the de minimus exclusion as applied to Dinoseb wastes received. On August 5, 1987 the Commission found that Toxaphene wastes received by the impoundments also fell under the de minimus exclusion. In an effort to please EPA, CCC in December 1987 proposed to consolidate wastes from the impoundments in

accordance with RCRA standards such that the impoundments could still be used for non-hazardous wastes. While the activities being performed at the site have been reviewed by MSDNR, MSDNR has not certified the closure as in compliance with RCRA.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit receives stormwater containing "de minimus" quantities of Dinoseb and acidic wastewater from the fertilizer manufacturing operations. In the past, the unit received wastewaters containing Toxaphene, Dinoseb, Atrazine, MSMA, and methyl parathion.

RELEASE PATHWAYS: Air (L) Surface Water (H) Soil (H)
Ground Water (H) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): There is documented soil contamination resulting from past waste management practices conducted at this unit. Up to 13,000 mg/l Dinoseb and up to 2,320 mg/kg Toxaphene were detected in sediment samples taken from the impoundment during 1986. Ground-water mounding from either natural topographic effects or artificially induced recharge may exist beneath this unit.

RECOMMENDATIONS: No Further Action ( )
RFI Necessary (X)

REFERENCE(S): 5, 46, 48, 49, 65, 72, 73, 80, 85, 86, 77, 88, 89, 91, 110, 113, 118, 123, 133, 136, 138, 140, 141, 145, 146, 162, 163, 167, 168, 172, 173, 174, 176, 180, 183, 184, 185, 187, 189, 191, 193, 199, 200, 211, 228, 239, 241, 244, 257, 258, 260

Comments: None

SWMU NUMBER: 4 **PHOTO NUMBER:** 4.1, 4.2, 4.3, 8.1

NAME: Carbon Adsorption System

TYPE OF UNIT: Neutralizing system

PERIOD OF OPERATION: Mid-1970's to present

PHYSICAL DESCRIPTION AND CONDITION: This unit is located along the railroad tracks in the south section of the South Plant. The system consists of six vertical tanks containing approximately 20,000 pounds each of activated carbon and two wastewater holding tanks (river tanks). The wastewater is contained by the two aboveground vertical river tanks prior to treatment in the carbon adsorption tanks. These tanks are constructed of carbon steel with capacities of approximately 12,000 to 15,000 gallons. The tanks receive wastewater collected by the Vacuum Truck (SWMU 21) and combined stormwater and wastewater contained by the South Plant Surface Impoundments (SWMUs 3a, 3b and 3c). The river tanks discharge into the carbon adsorption tanks. The adsorption tanks are connected in series and are designed to remove pesticides from the wastewater. Wastewater flows from the top to the bottom of each tank. The adsorption unit has a treatment capacity of 1,200,000 gallons per day.

At the time of the VSI, the system was set up as two units, each unit consisting of two tanks in series. An additional tank is used for standby and another is used as back-up. One unit in series is used for treating the wastewater collected by the Vacuum Truck (SWMU 21) which is discharged to the unit via a sump within the secondary containment. The other unit in series treats the liquid effluent from the South Plant Surface Impoundments (SWMUs 3a, 3b, and 3c). Both units discharge the treated wastewaters offsite via NPDES-permitted Outfall 001 which flows to the Mississippi River. Backwash water from the unit is returned to the surface impoundment and the spent carbon is transferred offsite for regeneration. Secondary containment for the unit consists of a concrete pad approximately 100 feet long, 20 feet wide, with containment curbs approximately 1 foot tall. The sump, utilized during the Vacuum Truck (SWMU 21) unloading operations, is approximately four feet long, four feet wide, and three feet deep. The concrete pad was stained yellow with what appeared to be Dinoseb. The concrete around the sump appeared stained and eroded.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: In the past the unit received wastewater containing Dinoseb, Atrazine, methyl parathion, MSMA and Toxaphene. At the time of the VSI, the unit received stormwater containing "de minimus" amounts of Dinoseb as well as wastewater (containing Dinoseb, Atrazine, Toxaphene, MSMA, and methyl parathion) collected from sumps by the Vacuum Truck (SWMU 21).

RELEASE PATHWAYS: Air (L) Surface Water (M) Soil (M)
Ground-Water (M) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): Although releases to surface water are regulated via the facility's NPDES permit, there have been several excursions consisting of releases of untreated wastewater.

RECOMMENDATIONS: No Further Action ( )
RFI Necessary (X)

REFERENCE(S): 5, 83, 113, 123, 130, 133, 139, 183, 219, 223, 226, 228, 239, 244, 257, 258

COMMENTS: None

SWMU NUMBER: 5 **PHOTO NUMBER:** 5.1

NAME: South Plant Drainage System

TYPE OF UNIT: Drainage system

PERIOD OF OPERATION: The unit consists of drains, sumps, trenches, and pipes of varying ages dating from the 1950's to present.

PHYSICAL DESCRIPTION AND CONDITION: This unit is located throughout the South Plant. The unit is designed to transfer stormwater and process water to the South Plant Surface Impoundments (SWMUs 3a, 3b, and 3c) and offsite. The drainage system receives process and stormwater from the processing area, product loading and unloading areas, the drumming building, and the nitric acid production area. The pipes are made of varying materials of construction with diameters ranging from 4 to 24 inches. The materials of construction include cast iron, carbon steel, vitrified clay, reinforced concrete, fiberglass reinforced plastic, and polyvinyl chloride (PVC). Sumps and trenches are also of varying dimensions, but are primarily constructed of concrete. Most wastewaters received by this unit were formerly discharged to the South Plant Surface Impoundments (SWMU 3), although some areas discharged to the major South Plant Drainage Ditch (SWMU 13). Facility representatives reported that around November 1985 all areas related to the handling of Dinoseb were sealed off from the surface impoundments. At the time of the VSI, it was difficult to determine the drainage pathways since the piping is located underground. Wastewater collected in the sealed-off areas is reportedly removed by the Vacuum Truck (SWMU 21).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit receives and transfers nitric acid process water, and stormwater containing Dinoseb, Atrazine, MSMA, methyl parathion, and Toxaphene.

RELEASE PATHWAYS: Air (L) Surface Water (M) Soil (M)
Ground Water (M) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): The Endangerment Assessment prepared by EPA has documented Dinoseb in sediment and liquid samples from this unit. In addition, an evaluation conducted by Environmental Protection Systems, Inc. in March 1986 indicated that pipes in the nitric acid line leaked.

RECOMMENDATIONS: No Further Action ( )
RFI Necessary (X)

REFERENCE(S): 5, 257, 258, 261

COMMENTS: Integrity testing of the South Plant sewers and surface water drainage should be performed again to determine the release potential of this system.

SWMU NUMBER: 6 **PHOTO NUMBER:** 6.1

NAME: South Plant Hill Tank

TYPE OF UNIT: Storage tank

PERIOD OF OPERATION: Early 1960's to 1989

PHYSICAL DESCRIPTION AND CONDITION: The unit was located on a hill between the South and North Plants. The unit was a carbon steel tank with a capacity of 1,600,000 gallons. The unit's dimensions were 300 feet by 300 feet. The tank was used to store neutralized wastewater from Dinoseb production before disposal offsite or release under the facility's NPDES permit through the Carbon Adsorption System (SWMU 4). The tank was formerly used to store NH_4NO_3 solution. Two other tanks were situated in the immediate vicinity of the unit and utilized for nitric acid storage. In 1989 the tank was sold as scrap metal after the stored wastewater was discharged to the Carbon Adsorption System (SWMU 4). The VSI team observed the former location of the unit which consisted of the soil berm and the concrete pads.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit received neutralized wastewater containing Dinoseb.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Ground Water (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE: No evidence of release was observed during the VSI or identified in the available file material.

RECOMMENDATIONS: No Further Action (X)
RFI Necessary ( )

REFERENCE(S): 5, 65, 86, 133, 138, 176, 183, 187, 196, 226, 239, 241, 244, 257, 258

COMMENTS: The unit was originally declared as a treatment unit on the facility's 1980 Part A application, but the facility later classified it as a storage tank on their 1983 application.

SWMU NUMBER: 7 **PHOTO NUMBER:** 7.1

NAME: Former Dinoseb Production Area

TYPE OF UNIT: Inactive production area

PERIOD OF OPERATION: 1973 to December 1986

PHYSICAL DESCRIPTION AND CONDITION: The unit is located between the MSMA facility and the railroad tracks in the central section of the South Plant. The unit consists of sumps, trenches, production vessels, and a storage tank associated with the Dinoseb production operations. The production area is approximately 40 feet long and 25 feet wide. The exact nature of the operations could not be provided by facility representatives. The VSI team observed what appeared to be yellow Dinoseb stains outside the production facility on the surrounding gravel-covered area.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: This area contains spills from the production of Dinoseb, along with DEHPA and 2-ethyl-henyl-nitrate (EHN) which were also produced in this area.

RELEASE PATHWAYS: Air (L) Surface Water (H) Soil (H)
Ground Water (H) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): The VSI team observed yellow stained areas outside the production area. Previous NPDES and RCRA compliance inspection personnel also noted spills in the vicinity of the former unit (see Table II-1, page 20). Analysis of soil samples collected immediately north of the unit during February 1987 indicated 640,000 µg/kg Dinoseb.

RECOMMENDATIONS: No Further Action ( )
RFI Necessary (X)

REFERENCE(S): 5, 65, 73, 132, 146, 154, 257, 258, 259

COMMENTS: None

SWMU NUMBER: 8 **PHOTO NUMBER:** 8.1, 8.2, 8.3

NAME: Dinoseb Off-Loading Area

TYPE OF UNIT: Inactive loading/unloading area

PERIOD OF OPERATION: 1973 to December 1986

PHYSICAL DESCRIPTION AND CONDITION: The unit is located in the central section of the South Plant. It consists of a concrete pad and a sump situated in the southwest corner of the pad. The pad was used to contain spillage associated with the truck loading/unloading operations at the Dinoseb Drumming Area and Drains (SWMU 9). The contents of the sump are periodically emptied by the Vacuum Truck (SWMU 21) for treatment at the Carbon Adsorption System (SWMU 4). The pad is approximately 25 feet long and 15 feet wide. The sump is approximately 2 feet long, 1.5 feet wide, and approximately 2 feet deep. The concrete curbs, concrete pad, and the concrete surrounding the sump appeared stained (yellow) and in poor condition. The liquid contained by the sump had a yellow-brown scum floating on the surface that appeared to be Dinoseb.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit received Dinoseb spillage.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (H)
Ground Water (H) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): An endangerment study prepared by EPA identified the unit as a potential area of release due to Dinoseb traces found in the ground water. The inspection noted the possibility of Dinoseb wastes being present in the sump. It could not be determined if the Dinoseb-like material observed in the sump at the time of the VSI was due to contaminated ground water seeping into the sump or whether the unit contained collected rainfall contaminated with Dinoseb.

RECOMMENDATIONS: No Further Action ( )
RFI Necessary (X)

REFERENCE(S): 5, 65, 70, 73, 257, 258

COMMENTS: None

SWMU NUMBER: 9 **PHOTO NUMBER:** 9.1

NAME: Dinoseb Drumming Area and Drains

TYPE OF UNIT: Inactive product drumming area

PERIOD OF OPERATION: 1973 to December 1986

PHYSICAL DESCRIPTION AND CONDITION: This unit is located inside a warehouse in the central section of the South Plant in the vicinity of the Dinoseb Off-Loading Area (SWMU 8). The VSI team observed a concrete trench situated inside a warehouse that was approximately 30 feet long, 1 foot wide, and 1 foot deep. The trench is connected to a sump approximately three feet long, two feet wide, and two feet deep. The drain and sump collection system were formerly routed to the South Plant Surface Impoundments (SWMUs 3a, 3b, and 3c). According to facility representatives, the unit was sealed off from the South Plant Drainage System (SWMU 5) before November 1985. The sump and drain have reportedly been emptied by the Vacuum Truck (SWMU 21) since 1985. The VSI team observed yellow stains that appeared to be Dinoseb on the floor, on either side of the trench.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit received Dinoseb spillage.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (H)
Ground Water (H) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): An endangerment study prepared by EPA identified the unit as a potential area of release due to Dinoseb found in ground water and soil. Soil samples from the immediate vicinity of the unit contained Dinoseb concentrations of 640,000 µg/kg and 12,000 µg/kg.

RECOMMENDATIONS: No Further Action ( )
RFI Necessary (X)

REFERENCE(S): 5, 257, 258

COMMENTS: None

SWMU NUMBER: 10 **PHOTO NUMBER:** 10.1

NAME: Dinoseb Stock Storage Area

TYPE OF UNIT: Storage area

PERIOD OF OPERATION: 1973 to present

PHYSICAL DESCRIPTION AND CONDITION: The unit is located inside a warehouse in the central section of the South Plant. The unit consists of an area approximately 20 feet by 30 feet within the warehouse used to stage Dinoseb drums and containers until the EPA determines the method of disposal for the Dinoseb product. The drums were underlain by concrete that appeared in good condition at the time of the VSI.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit manages the facility's existing and returned Dinoseb stock.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Ground Water (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): No evidence of release was observed during the VSI or identified in the available file material.

RECOMMENDATIONS: No Further Action (X)
RFI Necessary ( )

REFERENCE(S): 257, 258

COMMENTS: None

SWMU NUMBER: 11 **PHOTO NUMBER:** 11.1, 11.2

NAME: Former MSMA Production Area

TYPE OF UNIT: Inactive production area

PERIOD OF OPERATION: January 1983 to Present

PHYSICAL DESCRIPTION AND CONDITION: The unit is located in the central section of the South Plant. The unit consists of concrete trenches, sumps, production trenches and product storage tanks which are partially covered by roofing. The unit was being dismantled at the time of the VSI. According to facility representatives, rainwater and spillage collected in the trenches were contained in a 10,000-gallon steel tank and recycled through the process, or treated in a 6,000-gallon carbon steel tank, drummed and disposed of offsite through deep-well injection. The tanks had been dismantled at the time of the VSI. The debris not contaminated with MSMA was stored in the Former MSMA Salt Unloading Area (SWMU 12) before being disposed of offsite. Floor sweepings and other debris suspected of being contaminated with MSMA, were being collected in three 55-gallon drums located within this area. The drums were to be transferred to the Drum Storage Area (SWMU 1a) when full. This unit was constructed over the remains of the Former methyl parathion Production Area (SWMU 15).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit formerly received rainwater collected within the containment area and spillage related to the production of MSMA including methanol, by-product salts and arsenic. In addition, spillage and debris from methyl parathion production was also handled in this area. At the time of the VSI, the area contained demolition debris which was possibly contaminated with MSMA.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (H)
Ground Water (H) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): No evidence of release was observed during the VSI. The 1989 Endangerment Assessment documented soil contamination with levels of arsenic up to 550 mg/kg. The soil sample used for analysis, however, was not collected in the immediate vicinity of the unit. Soil and ground-water samples from this vicinity did, however, indicate methyl parathion concentrations of approximately 820 µg/kg to 1300 µg/kg.

RECOMMENDATIONS: No Further Action ( )
RFI Necessary (X)

REFERENCE(S): 5, 179, 257, 258, 214, 217, 259

COMMENTS: None

SWMU 12

Page 1 of 2

SWMU NUMBER: 12 **PHOTO NUMBER:** 12.1, 12.2, 11.2

NAME: Former MSMA Salt Unloading Area

TYPE OF UNIT: Waste unloading area and dumpsters

PERIOD OF OPERATION: January 1983 to July 1984

PHYSICAL DESCRIPTION AND CONDITION: The unit is located adjacent to the Former MSMA Production Area (SWMU 11). The unit was used to off-load MSMA salts generated by the MSMA production area. The MSMA by-product salts were discharged from a centrifuge into polyethylene lined roll-off sludge dumpsters. Full containers were transferred offsite to a ChemWaste landfill in Alabama. The area consisted of two unloading bays (approximately 15 feet long and 10 feet wide) which were partially covered by roofing and underlain by concrete that appeared in good condition at the time of the VSI. The bays were situated adjacent to the building. Secondary containment was provided by concrete curbs approximately four inches tall that appeared in poor condition. Currently the area is being used for the containment of the wastes produced from the dismantling activities of the production area. The scraps are being tested for arsenic content to determine whether they can be sold as scrap metal or if they must be disposed of as hazardous wastes.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: Managed by-product salts from the production of MSMA (K031, contains arsenic as a constituent) and wastewaters which may include traces of arsenic. At the time of the VSI, debris from the dismantling operations were staged at this unit.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (M)
Ground Water (M) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): An inspection conducted on September 28, 1983 observed approximately 25 drums of MSMA waste in poor condition located in a noncontained area. No spillage was identified in the available file material as a result of these activities; however, sampling is suggested.

RECOMMENDATIONS: No Further Action ( )
RFI Necessary (X)

REFERENCE(S): 5, 80, 119, 136, 138, 178, 179, 211, 213, 214, 217, 257, 258

COMMENTS: None

SWMU 13

Page 1 of 1

SWMU NUMBER: 13 **PHOTO NUMBER:** No Photograph

NAME: South Plant Drainage Ditches

TYPE OF UNIT: Unlined drainage ditches

PERIOD OF OPERATION: Approximately 1954 to present

PHYSICAL DESCRIPTION AND CONDITION: A few minor natural unlined drainage ditches and one major unlined drainage ditch are located at the South Plant. The minor ditches are located primarily in the northern area of the South Plant and do not appear to discharge to surface waters. The major drainage ditch flows along the western border of the South Plant (this is referred to as an unnamed bayou on the SWMU map). This major drainage ditch receives runoff from the South Plant and the NPDES permitted discharges. The ditch flows south through a large wetland into Hennessey's Bayou, which in turn flows into the Mississippi River.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The drainage ditches receive stormwater runoff from the South Plant and the neutralized wastewater from the North Plant. The South Plant runoff may contain residues from the production and handling of Atrazine, Dinoseb, MSMA and Toxaphene. The major drainage ditch has received drainage from the Former Atrazine Production Area (SWMU 16) and the Returned Product and Drum Storage Areas (SWMUs 17 and 1).

RELEASE PATHWAYS: Air (L) Surface Water (H) Soil (H)
Ground Water (H) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): Soil samples taken in the vicinity of the South Plant's major drainage ditch behind the Former Atrazine Production Area (SWMU 16), showed contamination of arsenic (550 mg/kg), Atrazine (5000 µg/kg), Cyanazine (240 µg/kg) and Toxaphene (3700 µg/kg).

RECOMMENDATIONS: No Further Action ( )
RFI Necessary (X)

REFERENCE(S): 5, 33, 257, 261

COMMENTS: None

SWMU NUMBER: 14 **PHOTO NUMBER:** 14.1

NAME: Former Toxaphene Production Area

TYPE OF UNIT: Inactive production area

PERIOD OF OPERATION: 1973 to 1982

PHYSICAL DESCRIPTION AND CONDITION: The unit is located in the central section of the South Plant adjacent to the Former Dinoseb Production Area (SWMU 7). The area is unsheltered and consists of concrete trenches, sumps, production vessels and product storage tanks associated with the Toxaphene production operations. The production area is approximately 80 feet long and 25 feet wide. The exact nature of the operations conducted at the unit could not be provided by facility personnel.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: This unit received rainwater collected within the containment area and spillage from the production of Toxaphene, DEHPA, and EHN.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (H)
Ground Water (H) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): The 1989 EPA Endangerment Assessment included analyses of soil samples collected immediately southeast of the unit which indicated 12,000 µg/kg Dinoseb, 47,000 µg/kg Toxaphene, and 94 mg/kg zinc.

RECOMMENDATIONS: No Further Action ( )
RFI Necessary (X)

REFERENCE(S): 5, 257, 258, 259

COMMENTS: None

SWMU 15

SWMU NUMBER: 15 **PHOTO NUMBER:** 11.1, 11.2, 12.1, 12.2

NAME: Former methyl parathion Production Area

TYPE OF UNIT: Inactive production area

PERIOD OF OPERATION: Mid 1970's

PHYSICAL DESCRIPTION AND CONDITION: The former production area was located at the same site as the Former MSMA Production Area (SWMU 11) in the central section of the South Plant. The unit consisted of trenches, sumps, production tanks and vessels associated with methyl parathion operations. The production facility was destroyed by fire in the mid 1970's. The debris associated with that event was disposed of in the Inactive Landfill (SWMU 2). Analysis of sediment samples collected from the South Plant Surface Impoundments (SWMU 3) indicate up to 400 mg/kg methyl parathion.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit received spillage associated with the production of methyl parathion.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (H)
Ground Water (H) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): Details of the fire were not provided by facility representatives. Analysis of soil samples collected in the vicinity of the south end of the South Plant and ground water from MW-10 during February 1989 indicate 1300 µg/kg and 820 µg/kg, respectively, of methyl parathion.

RECOMMENDATIONS: No Further Action ( )
RFI Necessary (X)

REFERENCE(S): 5, 257, 258, 259

COMMENTS: None

SWMU NUMBER: 16 **PHOTO NUMBER:** 16.1, 16.2, 17.1, 1.1

NAME: Former Atrazine Production Area

TYPE OF UNIT: Inactive production area

PERIOD OF OPERATION: 1973 to 1979

PHYSICAL DESCRIPTION AND CONDITION: This area is located adjacent to the Drum Storage Areas (SWMU 1a) and the Returned Product Storage Area (SWMU 17) in the south section of the South Plant. The unit consisted of concrete trenches, sumps, production vessels, and tanks associated with Atrazine production operations. The production area is approximately 100 feet long and 25 feet wide with a roof and concrete floor. The exact nature of the operations conducted at the unit could not be provided by facility personnel. The major South Plant Drainage Ditches (SWMU 13) are located immediately west of the unit.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit received spillage associated with Atrazine production operations.

RELEASE PATHWAYS: Air (L) Surface Water (H) Soil (H)
Ground Water (H) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): The VSI team observed an Atrazine-like odor in the immediate vicinity of the unit. Analysis of soil samples collected immediately west of the unit during February 1987 indicated 5000 µg/kg Atrazine.

RECOMMENDATIONS: No Further Action ( )
RFI Necessary (X)

REFERENCE(S): 5, 257, 258, 259

COMMENTS: None

SWMU NUMBER: 17 **PHOTO NUMBER:** 1.1, 1.2

NAME: Returned Product Storage Area

TYPE OF UNIT: Temporary staging area

PERIOD OF OPERATION: 1973 to present

PHYSICAL DESCRIPTION AND CONDITION: The unit is located adjacent to the Drum Storage Areas (SWMU 1) in the south section of the South Plant. The unit was an area used to store returned pesticide products. It was reportedly located on a concrete slab floor with a metal roof, and shared a sump with the Drum Storage Areas (SWMU 1). According to an EPA Endangerment Assessment, this unit was, at times, indistinguishable from the Drum Storage Areas (SWMU 1). The unit and the Drum Storage Areas (SWMU 1) have a history of drum mismanagement. At the time of the VSI, the unit was no longer in use but had not undergone closure. The major South Plant Drainage Ditches (SWMU 13) are located immediately west of the unit.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit formerly received drums of returned Dinoseb product and blends.

RELEASE PATHWAYS: Air (L) Surface Water (H) Soil (H)
Ground Water (H) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): This unit has been cited in many inspections for deteriorated and leaking drums (refer to Table II-1, page 20). Analysis of soil samples collected from the immediate vicinity of the unit during February 1987 indicated 5,000 µg/kg Atrazine, 3,700 µg/kg Toxaphene, 550 mg/kg arsenic, and 130 mg/kg zinc.

RECOMMENDATIONS: No Further Action ( )
RFI Necessary (X)

REFERENCE(S): 5, 46, 48, 86, 93, 236, 237, 257, 258, 260

COMMENTS: None

SWMU NUMBER: 18 **PHOTO NUMBER:** 5.1

NAME: Former Blue Tank

TYPE OF UNIT: Storage tank

PERIOD OF OPERATION: 1983 to approximately 1986

PHYSICAL DESCRIPTION AND CONDITION: The unit was located north of the Former Dinoseb Production Area (SWMU 7) and adjacent to the Nitric Acid Production Area in the South Plant. The unit was used as a holding tank for untreated Dinoseb wastewater to reduce the quantity of wastewater discharged to the Carbon Adsorption System (SWMU 4) from the South Plant Hill Tank (SWMU 6). Untreated Dinoseb wastewater was stored in the tank prior to offsite deep well injection. The tank was reportedly leased to the facility from the deep well injection contractor. The original tank was fiberglass and had a capacity of 16,000 gallons. According to the available file material, the tank leaked after two failed repair attempts. The fiberglass tank was replaced by a stainless steel tank which was formerly a facility product tank. It could not be determined whether the fiberglass tank was used after the repair incidents in 1983 or whether the facility continued to use the stainless steel tank. The facility representatives could not provide exact details pertaining to the operation of the unit.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The tank received unneutralized Dinoseb process wastewater prior to offsite deep-well injection.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (H)
Ground Water (H) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): The unit has a history of leaking. The VSI team observed a gravel covered area at the reported location of the former unit.

RECOMMENDATIONS: No Further Action ( )
RFI Necessary (X)

REFERENCE(S): 138, 183, 196, 257, 258

COMMENTS: None

SWMU NUMBER: 19 **PHOTO NUMBER:** 19.1

NAME: Scrap Metal Dumpster

TYPE OF UNIT: Open-topped rolloff container

PERIOD OF OPERATION: Mid 1980's to present

PHYSICAL DESCRIPTION AND CONDITION: The unit is located on concrete pavement outside the Former MSMA Production Area (SWMU 11) in the central section of the South Plant. The unit is used to store non-hazardous demolition debris associated with the dismantling operations of the Former MSMA Production Area (SWMU 11). The wastes are transferred to an industrial landfill for scrap metal recycling. The dumpster is skid mounted and is approximately 18 feet long, 8 feet wide, and 6 feet tall.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: This unit contains scrap material from the dismantling of the MSMA production area.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Ground Water (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): No evidence of release was observed during the VSI or identified in the available file material.

RECOMMENDATIONS: No Further Action (X)
RFI Necessary ( )

REFERENCE(S): 257, 258

COMMENTS: None

SWMU 20

Page 1 of 1

SWMU NUMBER: 20 **PHOTO NUMBER:** No Photograph

NAME: Railroad Car Unloading Station

TYPE OF UNIT: Loading/unloading station

PERIOD OF OPERATION: Approximately 1955 to present

PHYSICAL DESCRIPTION AND CONDITION: As shown in Figure III-2, the unit is located in the central section of the South Plant, east of the New Nitric Acid Plant. The unit consists of the primary area for the loading/unloading of materials for the various operations conducted at the South Plant. No secondary containment was evident at the time of the VSI. The operational details of the unit were not specified in the available file material or by the facility representative. Stormwater runoff from the unit either enters the South Plant Drainage Ditches (SWMU 13) or the South Plant Drainage System (SWMU 5).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit has received spillage from the loading/unloading operations conducted there. The spillage may include Dinoseb, Toxaphene, Atrazine, MSMA, or the various raw materials used in the production of these pesticides.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (U)
Ground Water (U) Subsurface Gas (L)

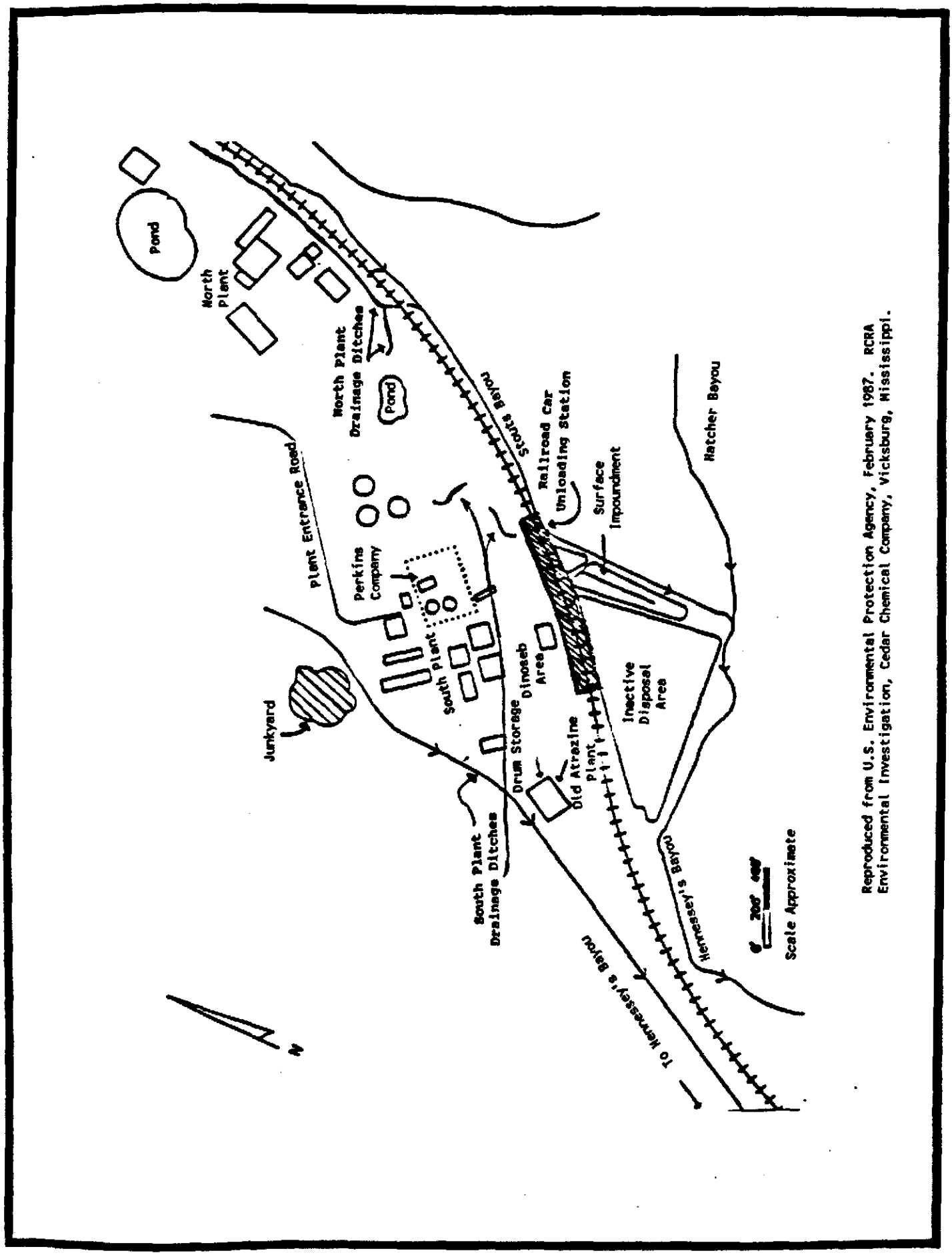
HISTORY AND/OR EVIDENCE OF RELEASE(S): Ground-water sampling in the vicinity of the unit has found Dinoseb and Atrazine at concentrations of 1,200 µg/l and 80 µg/l, respectively. This ground water contamination has not been definitely linked to this unit.

RECOMMENDATIONS: No Further Action ( )
RFI Necessary (X)

REFERENCE(S): 5, 33, 260

COMMENTS: None

Figure III-2
Area Specific SWMU Map

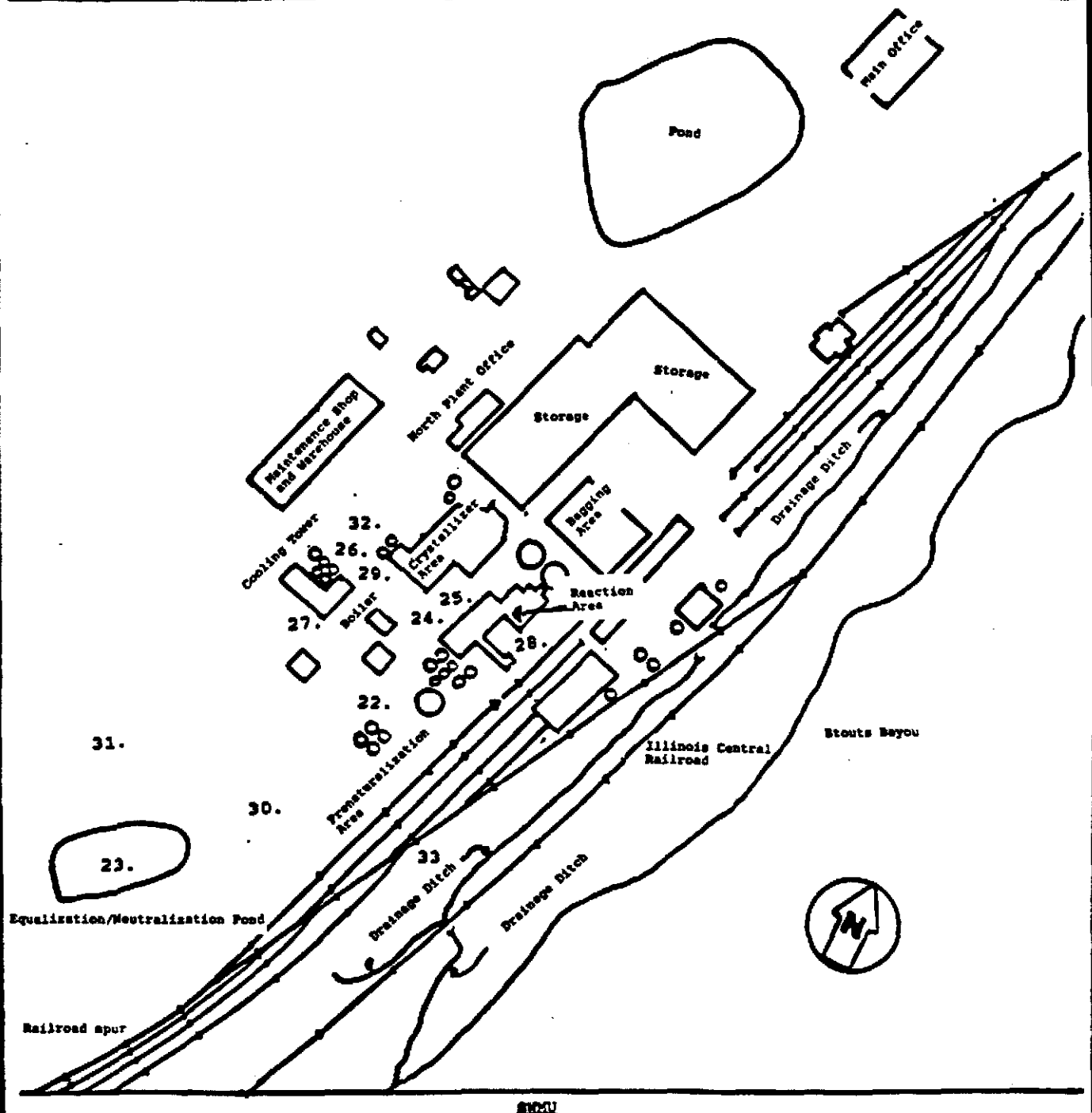


(Reference 5)

FIGURE III-3

North Plant SWMU Map

(Reference 33)



SWMU

22. North Plant Neutralization System
23. Inactive North Plant Surface Impoundment
24. North Plant Containment System
25. Wastewater Pipes
26. C-10 Scrubber
27. Cooler Scrubber
28. End Product Scrubber
29. Oil Collection Unit
30. Waste Oil SAA
31. No. 6 Fuel Oil Area
32. C-15 Scrubber
33. North Plant Drainage Ditches

SWMU 21

SWMU NUMBER: 21 **PHOTO NUMBER:** 21.1

NAME: Vacuum Truck

TYPE OF UNIT: Tank truck

PERIOD OF OPERATION: Mid 1980's to Present

PHYSICAL DESCRIPTION AND CONDITION: The unit consists of a stainless steel tank with an approximate capacity of 500 gallons mounted on a medium sized truck. The truck is equipped with pump and hoses used to collect wastewater from the sumps located at the Drum Storage Areas (SWMU 1), the Dinoseb Off-Loading Area (SWMU 8), and the numerous sumps associated with the South Plant Drainage System (SWMU 5). The contents of the truck are emptied into the Carbon Adsorption System (SWMU 4). At the time of the VSI, the truck was parked in the vicinity of the Dinoseb Off-Loading Area (SWMU 8), in the central section of the South Plant.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit manages wastewater contaminated with Dinoseb, Toxaphene, MSMA, arsenic, Atrazine, and methyl parathion.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Ground Water (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): No evidence of release was observed during the VSI or identified in the available file material.

RECOMMENDATIONS: No Further Action (X)
RFI Necessary ( )

REFERENCE(S): 257, 258

COMMENTS: None

SWMU NUMBER: 22 **PHOTO NUMBER:** 22.1, 22.2, 22.3

NAME: North Plant Neutralization System

TYPE OF UNIT: Treatment unit with in-ground sumps

PERIOD OF OPERATION: December 1988 to present

PHYSICAL DESCRIPTION AND CONDITION: The unit is primarily located in the south-central section of the North Plant, with three pump tanks located in the northern area of the South Plant. The unit is a neutralization system designed to treat acidic wastewaters generated by, and stormwater from, the fertilizer production areas. The unit neutralizes wastewater utilizing sodium hydroxide. The system consists of two neutralization tanks constructed of fiberglass reinforced plastic and a sump constructed of concrete. Piping interconnects the sump and neutralization tanks with the South Plant pump tanks for wastewater discharge. The unit receives wastewater from the North Plant Containment System (SWMU 24), the C-10 Scrubber (SWMU 26), the Cooler Scrubber (SWMU 27), and the End Product Scrubber (SWMU 28) via the Wastewater Pipes (SWMU 25). The tank capacities are approximately 500 gallons each and the tanks are elevated above the gravel covered surface by concrete pads approximately 1 foot tall. The in-ground concrete sump is approximately ten feet long, six feet wide, and five feet deep. The sump is covered with a fiberglass grate and contained by concrete curbing. The unit neutralizes wastewater from the North Plant, then discharges it to the Mississippi River through NPDES-permitted Outfall 002 or via the pump tanks at the South Plant to Outfall 003.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: This unit manages all wastewater from the North Plant, including drainage from safety showers, hoses, and stormwater runoff.

RELEASE PATHWAYS: Air (L) Surface Water (*) Soil (L)
Ground Water (U) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): No evidence of unpermitted releases was observed during the VSI or identified in the available file material. However, since concrete is not impermeable, integrity testing of the unit should be performed.

RECOMMENDATIONS: No Further Action ( )
RFI Necessary (X)

REFERENCE(S): 5, 33, 257, 258, 260

COMMENTS: *Releases to surface water are regulated via NPDES Permit No. MS0027995. Integrity testing of this unit has been suggested.

SWMU NUMBER: 23 **PHOTO NUMBER:** 23.1, 23.2

NAME: Inactive North Plant Surface Impoundment

TYPE OF UNIT: Equalization/neutralization pond

PERIOD OF OPERATION: 1962 to present

PHYSICAL DESCRIPTION AND CONDITION: This unit is an unlined impoundment located between the North and South Plants. It was formerly used for pH control of wastewater from the North Plant. The pH was controlled using limestone held in a pit adjacent to the impoundment. Since the commissioning of the North Plant Neutralization System (SWMU 22) in December 1988, the wastewater is no longer routed through the impoundment. At the time of the VSI, the pond contained liquid which the facility representatives asserted was rainwater.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The pond was used to neutralize the acidic effluent from the North Plant including process water from the production of potassium nitrate, nitrogen tetroxide, and chlorine; in addition, the pond also receives rainwater and boiler and cooling tower blowdowns from the potassium nitrate plant.

RELEASE PATHWAYS: Air (L) Surface Water (*) Soil (U)
Ground Water (U) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): No evidence of unpermitted releases was observed during the VSI. The facility has had problems in the past, around 1985, with nitrate-nitrogen excursions of the NPDES Permit limitations. The excursions were controlled by procedural changes. Refer to Chapter II, Regulatory History Section, for more details. Since the pH of the liquid in the unit is unknown, further investigation is necessary.

RECOMMENDATIONS: No Further Action ( )
RFI Necessary (X)

REFERENCE(S): 5, 48, 86, 138, 183, 228, 257, 258

COMMENTS: *Releases to surface water are regulated via NPDES Permit #MS0027995. Analysis of the standard liquid in this impoundment has been suggested.

SWMU 24

SWMU NUMBER: 24 **PHOTO NUMBER:** 24.1, 24.2

NAME: North Plant Containment System

TYPE OF UNIT: Spillage and runoff collection system

PERIOD OF OPERATION: Varying ages from the mid-1970's to present

PHYSICAL DESCRIPTION AND CONDITION: The unit is located throughout the fertilizer production areas in the central section of the North Plant. The unit consists of concrete pads, curbs, and trenches designed to collect minor spillage and runoff from unsheltered concrete pads situated beneath the production areas. The concrete trenches are connected to the North Plant Neutralization System (SWMU 22) via the Wastewater Pipes (SWMU 25). There are approximately 300 linear feet of trenches within the containment system.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit manages acidic wastewater from the fertilizer manufacturing operations.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Ground Water (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): No evidence of release was observed during the VSI or identified in the available file material.

RECOMMENDATIONS: No Further Action (X)
RFI Necessary ( )

REFERENCE(S): 257, 258

COMMENTS: None

SWMU NUMBER: 25 **PHOTO NUMBER:** 22.1, 24.1

NAME: Wastewater Pipes

TYPE OF UNIT: Pipes of varying ages and materials of construction

PERIOD OF OPERATION: 1960's to present

PHYSICAL DESCRIPTION AND CONDITION: The unit consists of pipes of varying dimensions and materials of construction located throughout the North Plant. The pipes are used to transfer acidic wastewaters from the North Plant Containment System (SWMU 24), the C-10 Scrubber (SWMU 26), the Cooler Scrubber (SWMU 27), and the End Product Scrubber (SWMU 28) to the North Plant Neutralization System (SWMU 22) and then offsite through an NPDES-permitted outfall. The pipes are constructed of carbon steel and PVC and are located above and below ground.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit transfers wastewater, acidic and alkaline, to the North Plant Neutralization System (SWMU 22).

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (U)
Ground Water (U) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): No evidence of release was observed during the VSI or identified in the available file material. However, integrity testing of the unit is suggested.

RECOMMENDATIONS: No Further Action ( )
RFI Necessary (X)

REFERENCE(S): 257, 258, 261

COMMENTS: Integrity testing of this unit is suggested.

SWMU NUMBER: 26 **PHOTO NUMBER:** 26.1, 22.3

NAME: C-10 Scrubber

TYPE OF UNIT: Air pollution control device

PERIOD OF OPERATION: 1980 to present

PHYSICAL DESCRIPTION AND CONDITION: The unit is located in the central section of the North Plant in the vicinity of the North Plant Neutralization System (SWMU 22). The unit is used to scrub chlorine off-gases generated by the fertilizer production operations. The unit consists of two scrubbing columns approximately 25 feet tall and 4 feet in diameter. The columns are constructed of reinforced concrete. One column is used at a time; the other column is used as a back-up unit. The scrubbers utilize sodium hydroxide (NaOH). The scrubber water containing sodium hydroxide is discharged to and utilized by the North Plant Neutralization System (SWMU 22). Secondary containment for wastewater consists of concrete curbing around the unit. Air emissions are regulated by conditions specified in Mississippi (MS) Air Permit No. 2780-00041.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit receives fertilizer production off-gases such as chlorine and NO_2. Scrubber liquid is recycled until it reaches 2% or less NaOH at which time it is discharged to the North Plant Neutralization System (SWMU 22) via the Wastewater Pipes (SWMU 25).

RELEASE PATHWAYS: Air (*) Surface Water (L) Soil (U)
Ground Water (U) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): The VSI team observed a brown emission (NO_2) discharging from the scrubber. According to facility representatives, the emissions were the result of the operations associated with rebuilding one of the scrubbers. An NPDES compliance inspection in September 1984 documented a break in the curbing around this unit with some wastewater escaping (refer to Table II-1, page 20).

RECOMMENDATIONS: No Further Action ( )
RFI Necessary (X)

REFERENCE(S): 2, 119, 146, 257, 258

COMMENTS: *Releases to air are regulated via MS Air Permit No. 2780-00041.

SWMU 27

SWMU NUMBER: 27 **PHOTO NUMBER:** 27.1

NAME: Cooler Scrubber

TYPE OF UNIT: Air pollution control device

PERIOD OF OPERATION: 1980 to present

PHYSICAL DESCRIPTION AND CONDITION: The unit is situated between the dryer and cooler at the crystallization area in the central section of the North Plant. The unit is used to scrub the off-gases generated by cooling the fertilizer after it is dried. The off-gases are scrubbed with water which is discharged to the North Plant Neutralization System (SWMU 22) via the Wastewater Pipes (SWMU 25). The scrubber is approximately 15 feet long and is constructed of carbon steel.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit scrubs the off-gases generated by cooling the fertilizer, thus producing acidic wastewater which is discharged to the Wastewater Pipes (SWMU 25).

RELEASE PATHWAYS: Air (*) Surface Water (L) Soil (L)
Ground Water (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): No evidence of unpermitted releases was observed during the VSI or identified in the available file material.

RECOMMENDATIONS: No Further Action (X)
RFI Necessary ( )

REFERENCE(S): 1, 257, 258

COMMENTS: *Releases to air are regulated via MS Air permit 2780-00041

SWMU NUMBER: 28 **PHOTO NUMBER:** 28.1

NAME: End Product Scrubber

TYPE OF UNIT: Air pollution control device

PERIOD OF OPERATION: 1980 to present

PHYSICAL DESCRIPTION AND CONDITION: This unit is located in the east section of the North Plant. The unit is used to scrub fertilizer particles generated during the fertilizer bagging operations. The unit utilizes water which is discharged to the North Plant Neutralization System (SWMU 22) via the Wastewater Pipes (SWMU 25). The unit is a small venturi type scrubber constructed of carbon steel. The scrubber receives air containing fertilizer particles via ducts approximately one foot in diameter.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit receives air containing fertilizer particles containing potassium and nitrogen. The water used by the scrubber is discharged to the North Plant Neutralization System (SWMU 22) via the Wastewater Pipes (SWMU 25).

RELEASE PATHWAYS: Air (*) Surface Water (L) Soil (L)
Ground Water (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): No evidence of unpermitted releases was observed during the VSI or identified in the available file material.

RECOMMENDATIONS: No Further Action (X)
RFI Necessary ( )

REFERENCE(S): 1, 257, 258

COMMENTS: *Releases to air are regulated via MS Air Permit No. 2780-00041.

SWMU 29

Page 1 of 1

SWMU NUMBER: 29 **PHOTO NUMBER:** 29.1

NAME: Oil Collection Unit

TYPE OF UNIT: Collection unit

PERIOD OF OPERATION: 1985 to present

PHYSICAL DESCRIPTION AND CONDITION: The unit is located beneath the potassium nitrate cooler in the central section of the North Plant. The unit is used to collect waste oil drippage from the potassium nitrate cooling cylinder. The collection unit consists of a metal pipe approximately five feet long which connects an oil funnel-type collector to a 55-gallon drum. The oil discharges through the pipe via gravity. Oil stains were observed along the walls adjacent to the pipe and drum. The unit is underlain by concrete. The condition of the concrete could not be observed due to a thick pile of absorbent used to cover the area surrounding the drum.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit receives waste oils.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (U)
Ground Water (U) Subsurface Gas (U)

HISTORY AND/OR EVIDENCE OF RELEASE(S): Oil stains were observed along the walls adjacent to the pipe and drum during the VSI. The potential for release to soil and ground water is dependent upon the integrity of the concrete underlying the area. The unit's integrity should be determined.

RECOMMENDATIONS: No Further Action ( )
RFI Necessary (X)

REFERENCE(S): 1, 257, 258

COMMENTS: Integrity testing of this unit is suggested.

SWMU 30

SWMU NUMBER: 30 **PHOTO NUMBER:** 30.1

NAME: Waste Oil Satellite Accumulation Area

TYPE OF UNIT: Outdoor drum staging area

PERIOD OF OPERATION: 1985 to present

PHYSICAL DESCRIPTION AND CONDITION: The unit is located in the south section of the North Plant downgradient from the Inactive North Plant Surface Impoundment (SWMU 23). The unit consists of an unlined, gravel covered area used to stage drums of waste lubricant oils prior to offsite recycling. The area is situated in the vicinity of a lubricant storage area which consists of a concrete slab partially covered by a metal roof. The VSI Team observed dark stains in the immediate vicinity of the waste oil staging area and the lubricant storage area.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit receives waste oils.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (H)
Ground Water (H) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): Dark stains were observed on the gravel cover surrounding and in the immediate vicinity of the unit. No evidence of release was identified in the available file material.

RECOMMENDATIONS: No Further Action ( )
RFI Necessary (X)

REFERENCE(S): 257, 258

COMMENTS: None

SWMU NUMBER: 31 **PHOTO NUMBER:** 31.1

NAME: No. 6 Fuel Oil Area

TYPE OF UNIT: Former heating oil containment structure

PERIOD OF OPERATION: 1960's to 1970's

PHYSICAL DESCRIPTION AND CONDITION: This unit is located in the south section of the North Plant. The unit consists of an earthen dike surrounding two aboveground storage tanks, an aboveground sump to collect spillage during loading and unloading activities, and the associated metal pipes. The tanks have a capacity of approximately 15,000 gallons and are situated upgradient from the sump. The dike area was drained via a metal pipe that discharged in the immediate vicinity of the sump. The metal pipes were used to transfer product between the unloading area and the tanks. The metal pipes are approximately 50 feet long. Two additional belowground metal pipes were used to transfer No. 6 fuel oil to the boilers located in the North Plant. The concrete sump is ten feet long, four feet wide, and has walls that are three feet high.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: This unit manages spills and leaks associated with handling No. 6 fuel oils.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (U)
Ground Water (U) Subsurface Gas (U)

HISTORY AND/OR EVIDENCE OF RELEASE(S): The VSI team observed a residual layer of No. 6 fuel oil inside the concrete sump. The residual fuel in the sump should be removed and disposed of and the integrity of the sump and pipes should be determined. The potential for release to soil and ground water is dependent upon the integrity of the sump containment structure and pipes.

RECOMMENDATIONS: No Further Action ( )
RFI Necessary (X)

REFERENCE(S): 257, 258

COMMENTS: Integrity testing of this unit is suggested.

SWMU NUMBER: 32 **PHOTO NUMBER:** 32.1

NAME: C-15 Scrubber

TYPE OF UNIT: Air pollution control device

PERIOD OF OPERATION: Approximately 1980 to present

PHYSICAL DESCRIPTION AND CONDITION: The unit is located in the central area of the North Plant, adjacent to the Crystallization Area. The unit consists of a rectifier scrubber/sieve tower utilized in the production of potassium nitrate. The scrubbing liquid is water which is recycled through the process.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit receives fertilizer production off-gasses, such as chlorine and NO_2, and particulate matter.

RELEASE PATHWAYS: Air (*) Surface Water (L) Soil (L)
Ground Water (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): No evidence of unpermitted releases of hazardous constituents was identified in the available file material or observed during the VSI.

RECOMMENDATIONS: No Further Action (X)
RFI Necessary ( )

REFERENCES: 1, 2, 257, 258

COMMENTS: *Releases to air are regulated via MS Air Permit No. 2780-00041.

SWMU 33

SWMU NUMBER: 33 **PHOTO NUMBER:** No Photograph

NAME: North Plant Drainage Ditches

TYPE OF UNIT: Drainage ditches

PERIOD OF OPERATION: Approximately 1960 to present

PHYSICAL DESCRIPTION AND CONDITION: An unlined drainage ditch runs along the railroad tracks, across from and parallel to Stouts Bayou. The location of this unit is shown in Figure III-2 (see page 73). The ditch receives drainage from the northern portion of the North Plant. A smaller branch which receives drainage from the North Plant, joins the drainage ditch at the southern end of the North Plant and flows under the tracks and into Stouts Bayou.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The drainage ditches receive stormwater runoff from the North Plant which is not contained by the various drainage systems.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Ground Water (L) Subsurface (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): No evidence of release of hazardous constituents was observed in the available file material or during the VSI. Since possible contamination is not visible to the naked eye, sampling is necessary to determine possibility of release of hazardous constituents.

RECOMMENDATIONS: No Further Action ( )
RFI Necessary (X)

REFERENCES: 5, 33, 257

COMMENTS: None

SWMU NUMBER: 34 **PHOTO NUMBER:** No Photograph

NAME: Junkyard and Waste Piles

TYPE OF UNIT: Temporary disposal areas

PERIOD OF OPERATION: Approximately 1954 to present

PHYSICAL DESCRIPTION AND CONDITION: The main junkyard is located on the western border of the South Plant, adjacent to the major South Plant Drainage Ditch (SWMU 13). Other waste piles have been observed throughout both the North and South Plants. The operations concerning the units are unclear from the available file material. A facility representative has stated that the area is used for temporary disposal of old equipment, paint, or other scrap materials. The former piles have reportedly been removed for recycling.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: These units have received debris from the various operations at the facility including old equipment and paint. From the analysis of a soil sample taken from the junkyard, it appears that pesticide-contaminated wastes may have been disposed in the area.

RELEASE PATHWAYS: Air (L) Surface Water (H) Soil (H)
Ground Water (H) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): A RCRA Environmental Investigation of February 1987 found the soil from the junkyard to be contaminated with Atrazine (5400 µg/kg) Cyanazine (approximately 30 µg/kg), Arochlor-1254 (710 µg/kg) and Propazine (approximately 3000 µg/kg).

RECOMMENDATIONS: No Further Action ( )
RFI Necessary (X)

REFERENCES: 5, 33, 260

COMMENTS: None

IV. SUMMARY

Chapter IV consists of four tables which list the Solid Waste Management Units (SWMUs) identified during the VSI conducted on July 31, 1990 and categorize them according to the findings and recommendations developed in the SWMU Data Sheets in Chapter III. Table IV-1 lists all SWMUs identified during the VSI. Table IV-2 is a listing of the SWMUs requiring no further action at this time. Table IV-3 lists the RCRA-regulated units. Table IV-4 lists the SWMUs requiring RFI activities.

Table IV-1

Cedar Chemical Corporation Vicksburg Facility

List of all Solid Waste Management Units (SWMUs)

SWMU Number	SWMU Name
	South Plant
1.	Drum Storage Areas
2.	Inactive Landfill
3.	South Plant Surface Impoundments
4.	Carbon Adsorption System
5.	South Plant Drainage System
6.	South Plant Hill Tank
7.	Former Dinoseb Production Area
8.	Dinoseb Off-Loading Area
9.	Dinoseb Drumming Area and Drains
10.	Dinoseb Stock Storage Area
11.	Former MSMA Production Area
12.	Former MSMA Salt Unloading Area
13.	South Plant Drainage Ditches
14.	Former Toxaphene Production Area
15.	Former Methyl Parathion Production Area
16.	Former Atrazine Production Area
17.	Returned Product Storage Area
18.	Former Blue Tank
19.	Scrap Metal Dumpster
20.	Railroad Car Unloading Station
21.	Vacuum Truck
	North Plant
22.	North Plant Neutralization System
23.	Inactive North Plant Surface Impoundment
24.	North Plant Containment System
25.	Wastewater Pipes
26.	C-10 Scrubber
27.	Cooler Scrubber
28.	End Product Scrubber
29.	Oil Collection Unit
30.	Waste Oil SAA
31.	No. 6 Fuel Oil Area
32.	C-15 Scrubber
33.	North Plant Drainage Ditches
	Both Plants
34.	Junkyard and Waste Piles

Table IV-2

Cedar Chemical Corporation Vicksburg Facility

List of SWMUs Requiring No Further Action

SWMU Number	SWMU Name
	South Plant
6.	South Plant Hill Tank
10.	Dinoseb Stock Storage Area
19.	Scrap Metal Dumpster
21.	Vacuum Truck
	North Plant
24.	North Plant Containment System
27.	Cooler Scrubber
28.	End Product Scrubber
32.	C-15 Scrubber

Table IV-3

Cedar Chemical Corporation Vicksburg Facility

List of SWMUs that are RCRA-Regulated Units

SWMU Number	SWMU Name
1a.	Drum Storage Area

Table IV-4

Cedar Chemical Corporation Vicksburg Facility

List of SWMUs Requiring an RFI*

SWMU Number	SWMU Name
	South Plant
1.	Drum Storage Areas
2.	Inactive Landfill
3.	South Plant Surface Impoundments
4.	Carbon Adsorption System
5.	South Plant Drainage System
7.	Former Dinoseb Production Area
8.	Dinoseb Off-Loading Area
9.	Dinoseb Drumming Area and Drains
11.	Former MSMA Production Area
12.	Former MSMA Salt Unloading Area
13.	South Plant Drainage Ditches
14.	Former Toxaphene Production Area
15.	Former Methyl Parathion Production Area
16.	Former Atrazine Production Area
17.	Returned Product Storage Area
18.	Former Blue Tank
20.	Railroad Car Unloading Station
	North Plant
22.	North Plant Neutralization System
23.	Inactive North Plant Surface Impoundment
25.	Wastewater Pipes
26.	C-10 Scrubber
29.	Oil Collection Unit
30.	Waste Oil Satellite Accumulation Area
31.	No. 6 Fuel Oil Area
33.	North Plant Drainage Ditches
34.	Junkyard and Waste Piles

* See SWMU descriptions for more details concerning suggested RFI activities for each unit.

V. REFERENCES

1. State of Mississippi Air Pollution Control Permit, No. 2780-00041, for Cedar Chemical Corporation, Initially issued to cover Performance Evaluation; Modified May 8, 1990 to cover operations of air emissions equipment until June 1, 1991.

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3. Correspondence between Cedar Chemical Corporation, Steven T. Boswell, and MSDNR, Bureau of Pollution Control, Kenneth A. Lafleur. RE: Request and Authorization for one-time discharge from re-drumming process, January-February, February 21, 1990.

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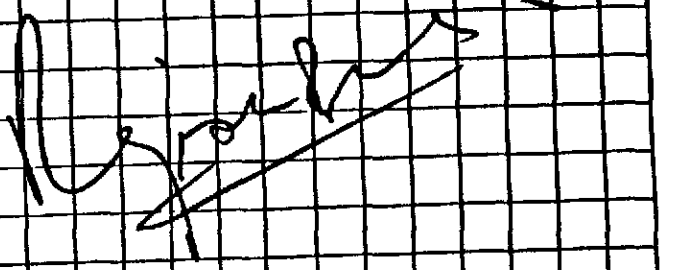
APPENDIX A

VSI LOG BOOK

Cedar Chemical Corp.

7/31/90



1953 products been there
since 1953
Spencer Chemical
+
occupied the South Plant
manufactured +
HNO3 & Ammonium
fertilizer solution & NH3

Spencer until 1969.

in 1969 Gulf Oil bought Spencer

Gulf Oil till 1972.

Jan 1961 S&W Potash
put in the North Plant
made HNO3 & Cl2.

were SW Potash till 1972

in 1972 Vicksburg Chem bought both plants

1972 - 1978 - Vicksburg Chemical

in 1978 it became Vertac Chemical

1978 - 1986 - Vertac Chem.

in 1986 it became Vicksburg Chem. Div of Cedar

Cedar bought by Fermenta A B in 1986

in 1988 Trans Resources bought portion of Cedar.

Area farmland prior to 1973.

1973 → first made dinoseb to mod. till Dec 1986

Atrazine manf. from] 1973 – 1979

Toxaphene manf. from] 1973 – 1982 not sure

MSMAA manf. from] – 1983 – 1984

made HNO_3 for dinoseb
manf. at plant. Bought H_2SO_4
& bought ortho secondary butyl
phenol use for dinoseb
manf.

Presently at Plant.
Two or 3 grades of KNO_3
made for fertilizer & glass
manf.

NH_3 & KCl are raw materials
for HNO_3 manufacture.

South Plant Hill →

inactive landfill had several ponds to which discharge from [illegible] production took place.

The area was subject to closure in 1979/1980. The ponds were emptied & dirt filled.

Removed material & sent to BFI landfill in Louisiana in early 1980s.

Hills Tank → There were 3 tanks each 1.6 x 10^6 gallons capacity initially. NH_4NO_3 solution tanks during Spencer Chemicals.

Two tanks were converted as warehouses for parts.

The third was used to store

dinoseb neutralized Waste water.

Blue Tank — acted as a booster tank for dinoseb waste water

Carbon Neamplim unit.

6 units

1 Standby
1 empty
2 for surface runoff.
2 for contaminated water

MSMA Drain Water tank.

used for rain water storage → sent for deep well injection off site

Land Use

light residential

Plant is 640 acres in size

W NW → light commercial (motel/restaurants).

W & SW → rural residential.

S → light industrial/industrial

SE → rural

E → city WW treatment plant adjacent to creek (Stout's Bayou)

NE → rural to light residential.

2/3 miles to denser population areas.

WW handling

waste oil sent off site for recycling (about twice a year)

Waiting for F PA to get stored disposal (banned waste)

---

9. Sponds A, B & C used to catch stormwater runoff.

Flow is from

C → B → A

Any WW not meeting PA levels of 2-9 from the North Plant for NPDES discharge gets divided to these ponds.

18. → leak in the liner installed. The contractor expected to fix them.

20. 3 ℄ underground fuel storage tanks removed in Dec 1988

P.C. [illegible] in the
[illegible] Concrete

South Mill Plant Tank

1.6 million gallon
tanks

sold for [illegible] in 1989.

Water collecting was
brought [illegible] the
plant A, B, C [illegible]
[illegible] Carbon [illegible]
unit.

MSMA Salt cake bay

Loading area
2 bays.

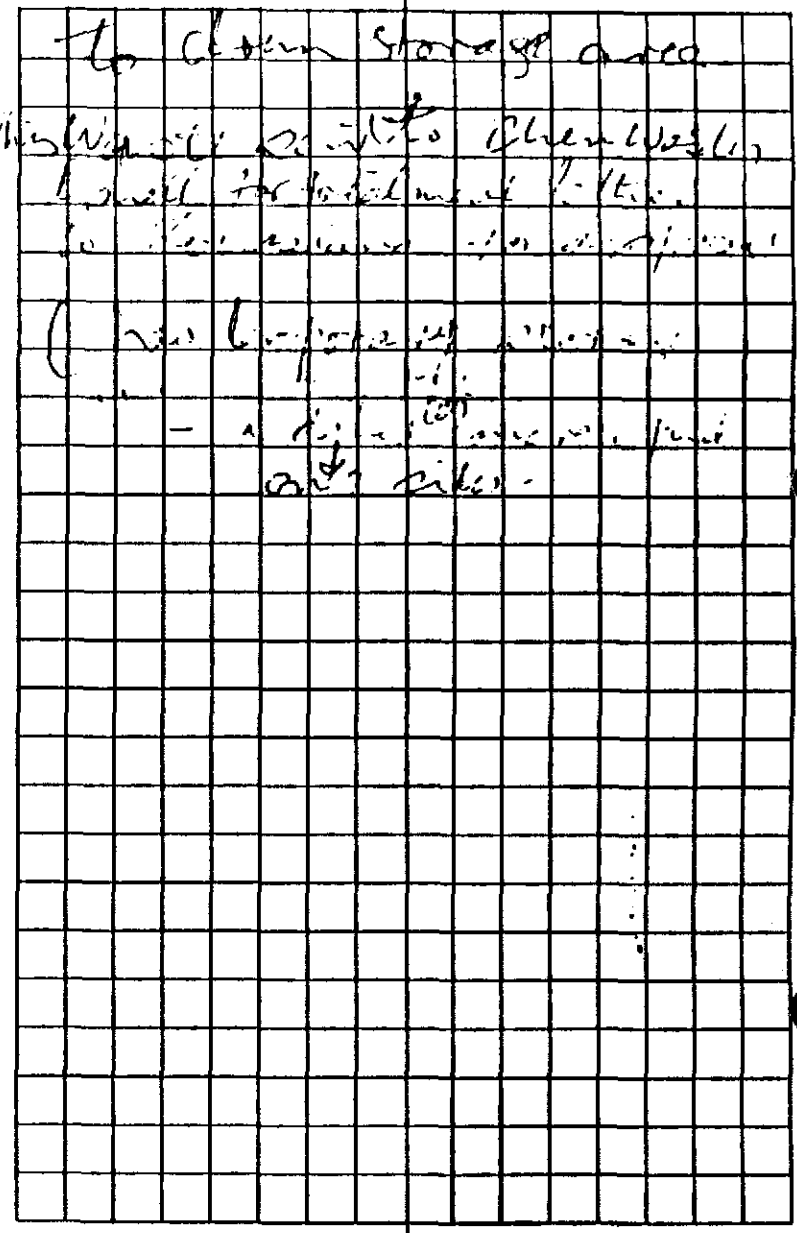
Salt cake from ceiling unloaded into hired containers & disposed off on offsite landfill (Chem Waste Alabama)

Stopped operations in 1954

Plant being dismantled

Scrap being tested for arsenic to determine if floor dismantled area can be sold or to take disposed off properly.

HW ~~[illegible]~~ (floor sweeping etc) [illegible] instruments removed →



to drum storage area

This [illegible] to Chem Waste [illegible] for [illegible] [illegible]

[illegible]

[illegible]

- [illegible]

[illegible]

1. [illegible] Storage area

[illegible] storage area
[illegible] continuous
[illegible]

— [illegible]
[illegible]

— floor is pitted.

Atrazine Satellite Waste
Storage Area

— Floor sweeping contaminated
with Atrazine

Calgon Carbon Adsorption Unit

been there since 1970's

treats discharge from the pond.

water accumulated by vacuum trucks from various places in the plant such as sumps etc

2 in series for vacuum trucks collected WW

2 in series for runoff

1 standby
1 empty.

flow top down.

discharges to outfall #1.

Spent Carbon sent for reactivation by Calgon at Pittsburgh.

River Tanks — (2)

Holding tank for circulating / recirculating through Carbon

~~River~~

Ponds / Truck → River tanks

↓

Carbon Adsorption Units

↓

outfall #1.

Containment for the 6 carbon Adsorption & 2 river tanks

leaks/water collected discharged to a sump.

pumped out into the river tanks

Toxaphene Plant & Dinoseb Plant

next to each other

yellowish color ~~[illegible]~~ of soil due to dinoseb contamination.

Surface impoundment A, B & C being retrofitted with 6 X 10^6 gallons

double lined 60 mm HDPE

Storm water run off.

One surface impoundment being lined.

The two other impoundments will be lined later

(covered (abandoned)
Capped landfill

3 monitoring wells

NORTH PLANT.

Neutralization Tank –

WW from drains in the plant – (safety showers, hoses run off)

discharges to the river outfall #2.
via a sump.
(operating since Dec 1988)

C-10 Scrubbers – (2 scrubbers one being rebuilt)

scrubbing out (Cl_2, NO_2 with from process vent)
NaOH
↓ NaCl

this also used in the neutralization tank.

Fuel Oil Tanks -

Trust

- there have been out of use for over 15 years)

The loading area was last used in 1978-79

- Heavy sludge contamination in the loading area containment

Equilization pond -

was used for PH control

unlined

Whole water came into a limestone box, the PH control was reached & discharge stored in the equilization pond.

North Plant Scrubber ~~used for high HNO_3 with natural gas~~

HNO_3 vapor is scrubbed by water

Old Hopper for baghouse

below Venturi Scrubber

Venturi Scrubber (green)

used for scrubbing hot gases generated from drying the product.

Waste water discharged to plant conveyance system & then to treatment.

bag house —

used for screening KNO_3 dust for recalling from KNO_3 pellets

KNO_3 reclaimed

Satellite storage area — lubricating used oil drums — picked up by a recycling company

Final product storage area

for →

area used for storage of lubricating oils

#1 – South plant ponds (approx 150 gpm)

#2 – North plant (approx 250 gpm)

#3 – Combined 1 & 2 outfall flow

↓

discharges to the Mississippi river.

Combined flow – 400 gpm (approx)

~~Dino~~

Toluene & Versene Tanks

These chemicals were used in the manufacture of dinosels

EDTA & diethanol amine & water

Dinoseb storage area

Dinoseb drums stored here (banned product) until an EPA inspector dispose them is found

- Since Spencer Chemical 1953
- acquired South plant
  Nitric Acid
  Ammonium + Ammonia
  Fertilizers + Ammon Nitrate.
- 1964 Gulf Oil bought Spencer.
  until 1972

- 1961 Southwest Potash put in
  urea Plant
  Southwest Potash.
  K Nitrate + Urea.
- until 1972
  In 1972 Vicksburg Chemical bought
  both Plants. until 1978
  became
  1978 Vertac Chemical
  until
  1986 Vicksburg Chemical of
  Cedar
  Fermenta AB Swedish Co.

  1989 Trans Resources bought
  portions of Cedar including
  both plants.

As far as facility is aware
No activity prior to 1953.

Dinoseb in 1973
until Dec 1986

Atrazine 1973 + 79/78

Toxaphene @ 1982

MSMA 83 + 84

Dinoseb - nitric acid for
Dinoseb
Sulfuric Acid bought
Ortho sec butanol

Potassium Nitrate make.

by Ammonia + Potassium chloride

@140 employees 24 hrs

Fuel Storage Tanks Removed in 1988 under State Supervision

SOUTH PLANT HILL

Inactive Landfill had ponds for neutralizing dinoseb waters. Area was subject to closure type activity filled w/soil

Large # of drums in early 1980 removed went to reported BFI landfills in Louisiana.

Hill Tank

- Form 1.6 mill gal Tank under Spencer were Ammonium Nitrate Tanks.
- Two tanks became warehouses.
- Held neutralized dinoseb wastewater. spent nitrate unit

Carbon Treated based on cost

Deep well.

(3)

Ask employees about blue tank
may have received
dinoseb wastewater.
may have been a boost
Tank

Carbon units are in series
pumped to 001.
RO + contaminated dinoseb
FO

MSMA send off for Deepwell
rainwater
Accumulation.

CMU area was Tox.

Methyl parathion plan was dismantled
78 - 83 explosion in 1978
ensued + Fire
see f records.

MSMA was build over methyl
parathion

North of area light residential

Plant owned 640 Acres.

Northwest light commercial
+ Intersection of
WASHington + P20

West + SW Residential
light residential/rural

South light Industrial
Missippi Power
Petroleum Rural

Southeast Rural

east is city WWTP
Stouts bayou.

N/east Rural to light residential.

2 - 3 miles for any
dense population

- Potassium Nitrate to NPDES pH control.

- Waste oil off site to Reclaimer 2x/year.

- Dinoseb stock waiting for EPA to come & get it. Need to view stock.

- A new Nitric Acid plant constructed in 1986 replaced old one.

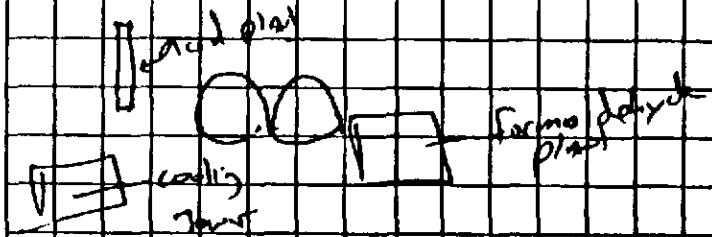
GW Quarterly sampling
State Order - 87

S.I. Closure has leak

VS 1 Meeting
9-10

Roll 1

#1 #2 Hill Tank (may be South Hill)
facing south
- early 1989 dismantled
- scrap dealer off site.



RO off toward plant
end up at Pods A,B,C
through carbon treatment.

Transformers in vicinity and
PCBs

MSMA SALT CAKE Loading/Un.

#3 overview facing south

#4 close-up facing NE

SCRAP METAL CONTAINER
off-site

#5 SCRAP METAL CONTAINER NEXT TO MSMA SALT CAKE UNLOADING AREA facing NORTH

#6 #7 SATELLITE ACCUMULATION AREA in MSMA BLDG
floor sweepings from clean-up of MSMA BLDG

#8 HAZARDOUS WASTE STORAGE AREA facing north
had roof damage in storm in may.

#9 Sump For the Waste Storage Area Pump Rec Sump Vacuum Truck & ADSORBERS

Concrete lined trench

#10, 11 Overview of Atrazine Plant facing SE this unit is next to the Hazardous Waste Storage Area. Wastewaters west south proc.

#12 ATRAZINE SAA

View inside ATRAZINE PRODUCTION BLDG showing SAA for floor sweepings

#13 Overview of Calgon Unit

CALGON SYSTEM utilizing
Activated carbon
1970s receives discharge
from ponds water
accumulated by Vacuum Trucks
out of sumps etc.

2 in series one for pond
one set for the
VACUUM TRUCKS.
granulated activated charcoal
top down >
monitor output
if takes too long
River Tanks hold prior and
after use to circulate or
Recirculate waters

#14 ABSORBERS facing SE

#15 Close up of sump
carbon steel tanks
calgon picks up

Transferred via slurry

#16 overview of Toxaphene plant and the Dinoseb plant located beyond the red-marked steel beam

#17 View of Dinoseb Area
yellowish color is dinoseb

#18 + 19 Retrofitted Pond

20 SMALL POND

21 ~~[illegible]~~ medium Pond

22 close-up small pond

23 - 26 LANDFILL
has 3 wells

27 Geotextile cover between Landfill and Ponds.

1:15 pm Returned from lunch

NORTH PLANT

Neutralization ~~Plan~~ Tanks

North Side > safety showers Runoff to River via NPDES
Receives water from

1 - 28 # Neutralization Tanks
Sump

29 Tanks

scrub
Chlorine
Caustic from scrubbers (sodium chloride)
used to neutralize the
Runoff water.

30 # SCRUBBERS

pipes - overhead PVC pipes

31 Emissions

in air permit
vents off process

cooling water w/ nitrates
pH adjustment in
cooling tower.

#32 #6 fuel oil sump.

Potassium Nitrate Column.

33 + 34 OLD NEUTRALIZATION
POND

showing neutralization box
+
pond
old pre treatment

#35 Crystalization Area
for Potassium Nitrate

KNO_3
nitric acid
crystalized in nitric acid

#36 Trench in crystallization Area

#37 Scrubber
C-15

#38 Used oil drum + Pipe

ROLL 2

#1 Used oil drum + Pipe

#2 Hopper Area

#3 Scrubber for cooling off gasses
Cooler Scrubber.
uses returned scrubber water to process

C-15 — for dryer
smaller cooler scrubber

baghouse goes back to product area

use water for ENP product
off-load Area.
drawn through water
wate to Neut Area
KNO_3

4 End product Scrubber

5-6 Run off areas ~
North plot

7 Lub oil Rack +
waste oil SAA

8 OUTFALL

9 VACUUM TRUCK

10 VERSAR TANKS + OFF load Area
EDTA
Diethylamine

11-14 Dimosch Sticks
+
Wooding Area

15 Blue Tank

Will Send Facility a copy -

Final VS @ 3:00 pm

Hot

APPENDIX B

VSI PHOTOGRAPH LOG

APPENDIX C

SAMPLING DATA SUMMARY

II. CONTAMINANTS FOUND AT THE SITE

A. Environmental Investigations

In September and October of 1986, MSDNR conducted sampling investigations at CCC. During the investigations, samples were taken from the influent to the surface impoundment, the water and sediment in the impoundment, soils that could be washed through the sewers into the surface impoundment, sumps that drain into the impoundment, the hazardous waste container storage area, and the returned product storage area.

The September investigation found 330,000 mg/kg of dinoseb in the sediment at the returned product storage area. The sediment in cell 1 of the surface impoundment contained 13,000 mg/kg of dinoseb. Dinoseb was also detected in the water samples taken from the sump below the dinoseb drumming area, the sump near the returned product storage area, the sump northwest of the dinoseb plant and the influent pipe to the surface impoundment. Atrazine, arsenic, total chromium, and lead were also found at levels of concern in these areas.

The October investigation was conducted to further define the composition of the surface impoundment sludge. Analyses for arsenic, atrazine, Aroclor-1254, dinoseb, toxaphene, 4-nitrophenol, methyl parathion, and 1,2-dichlorobenzene were conducted on composite sediment samples from eleven (11) different locations (See Tables 3 and 4). The highest concentrations of contaminants were found at depths of two to four feet.

EPA also conducted sampling investigations at the CCC facility in Vicksburg. In October of 1981, EPA inspected the facility and noted that the landfill had surface runoff coming from it. Samples were collected from four locations: (1) Stouts Bayou upstream of the facility, (2) Hennesseys Bayou downstream of the facility, (3) an eroded area at the east corner of the landfill, and (4) a small valley at the west corner of the landfill. The sediment from the eroded area at the east end of the landfill contained several constituents of concern including: cyanazine, atrazine, toxaphene, Arochlor-1254, and cyanide. The sediment samples collected from the small valley contained cyanide, atrazine and toxaphene as well as other compounds.

In August 1985, EPA conducted a preliminary assessment/site investigation (PA/SI) at CCC. The report states that releases of hazardous waste or hazardous waste constituents had occurred or were thought to have occurred. Additionally the report noted that several contaminated seeps or run-off streams were observed near Hennesseys Bayou.

In February of 1987, EPA performed a RCRA Environmental Investigation at CCC, which included the sampling of sediment, soil, surface water, groundwater, and stream benthos at and around the facility (see Figure 5). Numerous chemical compounds used or produced at CCC, were detected in the groundwater, surface water, sediment, and soil samples.

Four of the five groundwater monitoring wells sampled were contaminated with organic compounds. Analysis of samples taken from MW-1, located east of the dinoseb production area, identified organic compounds ranging in

concentration from 2 ug/l of tetrachlorophenol to 562 ug/l of dinoseb. Other organic compounds detected were: atrazine, bromacil, trichloroethene, pentachlorophenol, and cyanazine. The other three wells contained from two to five organic contaminants (See Table 5).

Six composite soil samples were collected from various areas around the south plant. Organic compounds were detected in each of the six samples. The analytical data is summarized in Table 6.

Eight surface water and eight stream sediment samples were collected during the investigation. The samples generally showed an increase in organic concentrations downstream of the facility. The data for these samples are summarized in Tables 7 and 8.

Stream sediment data may be found in Table 8.

In February 1989, EPA again conducted a sampling investigation at CCC. The investigation included groundwater and soil samples. Generally, the samples showed contamination with organics and metals (see Tables 11 and 12). Cyanide was detected in two wells and atrazine, cyanazine and propazine were detected in a third well. Dinoseb was detected in the soil samples ranging in concentration from 15 ug/kg to 380,000 ug/kg. Additionally, six other pesticide/PCB compounds were detected in the soil samples.

On October 13, 1989, the Director of the Waste Management Division, Region IV determined that: (1) there is or has been a release of hazardous waste and/or hazardous constituents into the environment from the CCC Facility, and (2) corrective action will be required to protect human health and the environment (See Attachment A).

B. Groundwater Investigations

On January 24, 1984, MSDEQ notified CCC that the facility was affecting the groundwater quality. As a result, CCC submitted a groundwater corrective action plan. On December 14, 1984, MSDEQ sampled groundwater monitoring wells at the CCC site. Organic compounds were detected in two of the wells sampled, MW-1 and MW-8. Compounds found in MW-1 included 1000 ug/l dinoseb and 15 ug/l trichloroethene. Compounds found in MW-8 included 60 ug/l 2,5-diethyltetrahydrofuran and 60 ug/l atrazine (See Table 9).

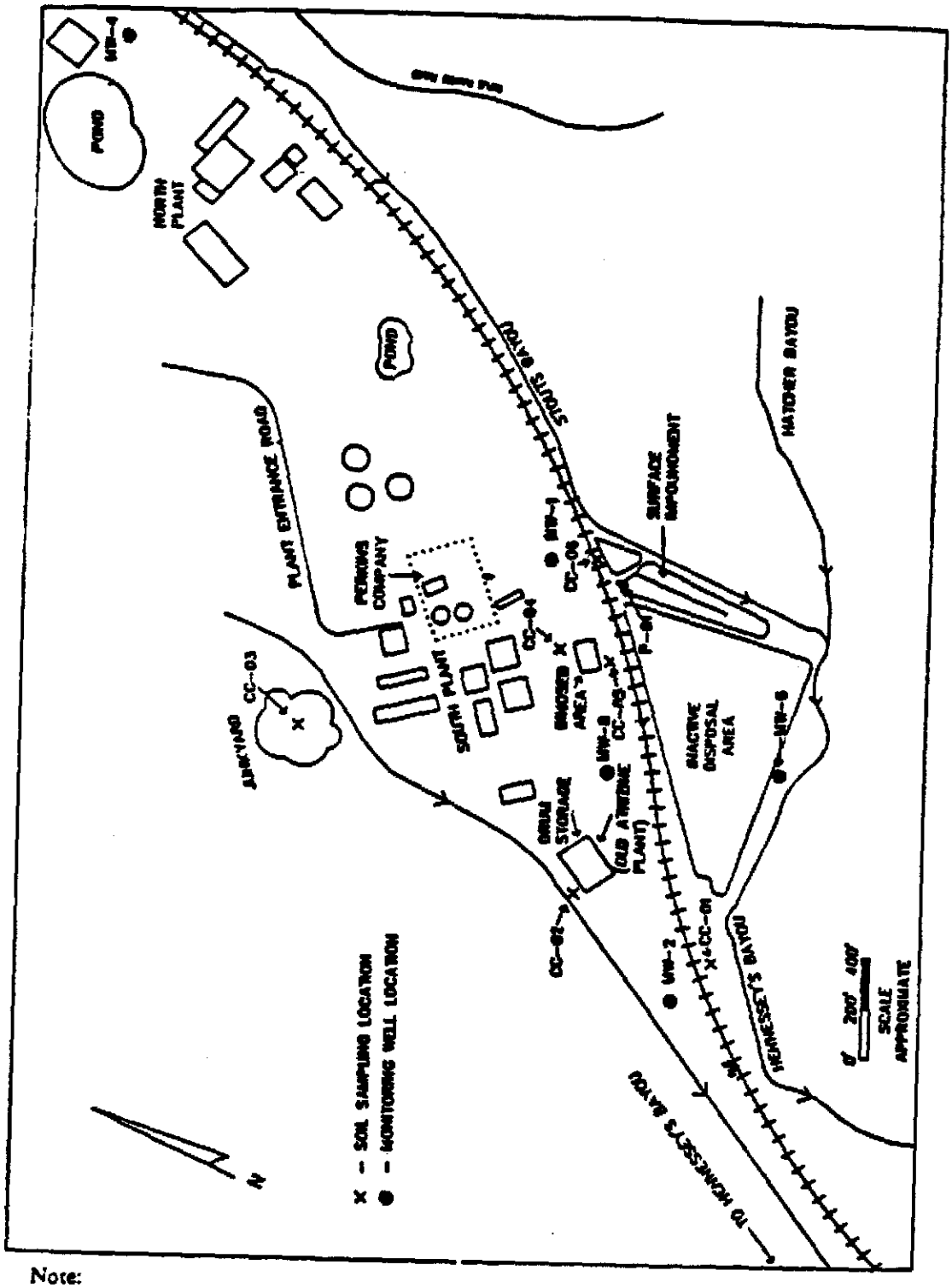
From May 23, 1985 through June 10, 1985, CCC sampled wells MW-1 through MW-8 and analysed the samples for Appendix VIII constituents. The results of the analyses, shown in Table 9, indicated the following:

- Concentrations of several chemicals were detected in well MW-1 but not detected in background well MW-4: chromium, chloroform, total cyanide, dinoseb, nickel, pentachlorophenol, and trichloroethene.

- Barium was detected in all wells. Wells MW-5 and MW-8 showed barium concentrations twice as high as background, and well MW-6 showed barium three times higher than background.

FIGURE 5

MONITORING WELL AND SOIL SAMPLING LOCATIONS
FEBRUARY 1987



Note:

Reproduced from U.S. Environmental Protection Agency, February 1987. RCRA Environmental Investigation, Cedar Chemical Company, Vicksburg, Mississippi.

TABLE 3

SUMMARY OF RESULTS OF DINOSEB FLOW STUDY

Sample Location ID Letter[a]	Sample Type/Location	Concentrations[b] (mg/L for liquids and mg/kg for solids)							
		Dinoseb	Atrazine	Total Chromium	Arsenic	Lead	Barium	Cadmium	Selenium
A	Water; Influent pipe to surface impoundment	8	trace	0.03	0.29	0.008	0.04	0.02	<0.[illegible]
B	Sludge; SI Cell No. 1	13,000	ND[b]	123	362	142	64.2	1.90	2.[illegible]
C	Water; SI Cell No. 2	6.3	0.07	0.05	0.74	0.01	0.06	0.01	0.05
C	Sludge; SI Cell No. 2	5.8	2.6	10.2	21	5.3	49.3	1.30	0.[illegible]
D	Water; sump at returned product storage area	23	15	0.03	2.47	0.005	0.02	0.02	[illegible]0
E	Water; sump below dinoseb drumming area	260	12	108	0.68	2.9	0.97	0.03	0.11
F	Sediment; returned product storage area	330,000	ND[c]	47.1	44.3	16.7	78.5	5.5	4.06
G	Soil; northwest of dinoseb plant	95	ND	40.1	27.8	170	71.5	3.0	1.27
H	Water; sump northwest of dinoseb plant	30	0.01	<0.03	0.02	0.02	0.05	0.01	<0.[illegible]3

Notes:

Data reproduced from Jack McCord, MDNR, September 22, 1986. Memorandum to file. Subject: September 3, 1986 sampling trip to Vicksburg Chemical.

a Sample location identification letters are used in Figure 5.

b Concentrations of chemicals in water are reported in mg/L. Concentrations of chemicals in soil or sludge are reported in mg/kg.

c ND indicates chemical not detected.

TABLE 4

SUMMARY OF RESULTS OF SURFACE IMPOUNDMENT SEDIMENT STUDY (MG/KG)

Composite Samples Sample Numbers	Concentrations (mg/kg) Arsenic	Atrazine	Aroclor 1254	Dinoseb	Toxaphene	Others	
** 0 to 2 feet							
1, 1A	114	8,000	ND[a]	1,600	17.5	4-Nitrophenol	70
2, 5	216	2,000	ND	160	18.1	---	
3, 4	108	360	ND	620	1.8	4-Nitrophenol	30
6, 7, 8	93.5	220	ND	15	1.2	4-Nitrophenol	Trace
9, 10, 11, 12	29.2	15	ND	11	ND	---	
13, 14	41	230	ND	10	ND	---	
15, 16	57.8	1,500	ND	4	ND	---	
17, 18	16.9	1,000	51.9	6	22	4-Nitrophenol	Trace
						Pentachlorophenol	1.2
19, 20	46.2	300	4.7	92	29	---	
21, 22, 24	50.3	5	9.2	60	4.6	---	
23, 25	96.5	--	33.8	--	42.9	---	
** 2 to 4 feet							
1, 1A	143	3,900	ND	5,910	2,320	Methyl Parathion	400
2, 5	66.9	78,000	ND	330	541	---	
3, 4	40.1	30,000	ND	1,100	381	4-Nitrophenol	50
6, 7, 8	7.9	15,000	ND	25	6.3	2,4-Dinitrophenol	Trace
						4-Nitrophenol	Trace
** 4 to 6 feet							
1, 1A	43.8	21,000	ND	64	536	1,2-Dichlorobensene	20
						Methyl Parathion	400
2, 5	7.1	3,000	58.4	40	223	---	
3, 4	14.5	9,000	ND	770	680	---	
6, 7, 8	9.0	8,000	37.1	170	322	---	

Notes:

Reproduced from Mississippi State Chemical Laboratory, Mississippi State University, November 18, 1986. Analytical Results of 19 Sediment Samples from Vicksburg Chemical Company.

[a] ND - Not detected.

TABLE 5

GROUND-WATER DATA -- SUMMARY OF HAZARDOUS CONSTITUENTS FEBRUARY 1987

Parameter (ug/L)	MW-1	MW-2	MW-4[a]	MW-6	MW-8	P-01[b]
Aluminum	1900	26,000	3,000	6,600	920	1,100
Arsenic	--	--	--	--	67	140
Barium	270	450	250	600	470	37
Chromium	38	64	--	11	--	75
Nickel	22	--	--	--	--	--
Strontium	760	560	250	610	350	85
Zinc	--	91	16	21	--	.13
Cyanide	--	NA	--	8	--	--
Atrazine	26	--	--	3.9	63	29
Bromacil	3JN	--	--	--	--	--
Bromodichloromethane	--	--	--	--	--	6.7
Carbon tetrachloride	--	--	--	--	--	70
Chlorobis(methylethyl)-triazinediamine	--	--	--	--	3JN	--
Chloroform	2.8J	--	--	--	--	42
Cyanazine	6.6J	--	--	1.2	0.82	1.3
Dibromochloromethane	--	--	--	--	--	4.2J
Dinoseb	562	--	--	--	--	200JN
Methyl parathion	--	--	--	--	--	0.011J
Phenol	--	1.0J	--	--	--	--
Pentachlorophenol	68	--	--	--	--	--
Petroleum product	N	N	--	N	N	--
Tetrachlorophenol	2JN	--	--	--	--	--
Trichloroethene	8.5	--	--	--	--	4.2J
Vinyl chloride	--	--	--	--	2.5J	--

Notes:

Data reproduced from U.S. Environmental Protection Agency, February 1987. RCRA Environmental Investigation, Cedar Chemical Company, Vicksburg, Mississippi.

[a] Upgradient well, used for comparison to wells downgradient of waste management units.

[b] Sample of influent liquid into surface impoundment.

-- Material was analyzed for but not detected.

J -- Estimated value.

N -- Presumptive evidence of presence of material.

NA -- Not analyzed.

TABLE 6

SOIL DATA -- SUMMARY OF HAZARDOUS CONSTITUENTS
FEBRUARY 1987

Parameter (mg/kg)	CC-01	CC-02	CC-03	CC-04	CC-05	CC-06
Aluminum	6,000	4,500	11,000 <	7,200	8,800	6,200
Arsenic	53	550 <	19	18	27	10J
Barium	100	72	150	100	140	210
Chromium	44	14	27	37	18	12
Mercury	--	--	0.1	--	--	0.25
Strontium	34	190	35	39	35	48
Zinc	53	130 <	65	75	94	35
(ug/kg)						
Atrazine	100,000JN	5,000 <	5,400 <	4,000	32J	25J
Cyanazine	6000JN	240 <	30J	--	--	--
Dinoseb	--	--	--	640,000	12,000	--
Heptachlor epoxide	38	--	--	--	--	--
Methyl ethyl ketone	--	--	--	23J	--	--
Aroclor-1254	--	--	710	--	--	200
Propazine	7,000JN	--	3,000JN	--	--	--
Toluene	--	--	--	3.8J	--	--
Toxaphene	6,700	3,700 <	--	--	47,000	--
Total PAHs	33,890	--	11,920	18,900	3,100	--
Total xylenes	--	--	--	2.8J	--	--

Notes:

Data reproduced from U.S. Environmental Protection Agency, February 1987. RCRA Environmental Investigation, Cedar Chemical Company, Vicksburg, Mississippi.

J = Estimated value.

N = Presumptive evidence of presence of material.

TABLE 7

SURFACE WATER DATA -- SUMMARY OF HAZARDOUS CONSTITUENTS FEBRUARY 1987

Parameter (ug/L)	A-1	A-2	A-3	B-1	B-2	C-1	D-1	E-1
Aluminum	260	370	1,100	440	780	3,900	2,900	420
Arsenic	--	--	--	--	--	--	--	89
Barium	80	120	220	170	170	170	160	170
Cyanide	6	--	--	--	--	--	--	--
Atrazine	--	0.18N	0.64JN	--	--	0.20N	0.28N	26A
Bromocyclohexene	--	--	1JN	--	--	--	--	--
Bromodichloromethane	3.6J	1.7J	1J	--	11	--	--	--
Carbon tetrachloride	--	--	--	--	--	--	1.3J	--
Chloroform	5.1	4.9J	16	--	14	--	2J	--
Chlorocyclohexanol	--	--	8JN	--	--	--	--	--
Chlorobis(methylethyl)-triasinediamine	--	--	--	--	--	--	--	8JN
Cyanazine	--	--	--	--	--	--	--	6.8A
Dibromochloromethane	2.7J	1.2J	--	--	--	--	--	--
Dichlorocyclohexane	--	--	70J	--	--	--	--	--
Diethyltetra-hydrofuran	--	7JN	10JN	--	--	--	--	--
Dihydroindolone	--	--	4JN	--	--	--	--	--
Dinoseb	--	--	--	--	--	--	--	4.6AN
Heptanol	--	--	8JN	--	--	--	--	--
Nitrosomorpholine	--	--	1JN	--	--	--	--	--
Arocior-1254	--	--	3.0	--	--	--	--	--
Trichloroethene	--	--	--	--	--	--	--	11
Tri(butoxyethanol)-phosphate	--	--	--	8JN	8JN	--	--	--
Toluene	0.8J	--	--	--	--	--	--	--
Three unidentified compounds	--	--	70J	--	--	--	--	--

Notes:

Data reproduced from U.S. Environmental Protection Agency, February 1987. RCRA Environmental Investigation, Cedar Chemical Company, Vicksburg, Mississippi.

A = Average value.

J = Estimated value.

N = Presumptive evidence of presence of material.

TABLE 8

STREAM SEDIMENT DATA -- SUMMARY OF HAZARDOUS CONSTITUENTS FEBRUARY 1987

Parameter (mg/kg)	A-1s	A-2s	A-3s	B-1s	B-2s	C-1s	D-1s	E-1s
Aluminum	7,400	11,000	4,500	5,500	8,400	13,000	11,000	5,000
Arsenic	--	9.2	--	--	--	6.0	6.9	44
Barium	120	260	220	120	130	62	170	96
Chromium	13	22	97	17	14	12	17	71
Nickel	11	21	14	8.4	13	7.0	16	9.6
Lead	14	20	13	45	21	11	15	8.8
Mercury	--	0.12	--	--	--	--	--	--
Strontium	33	24	84	51	28	19	29	35
Zinc	66	78	35	51	62	19	52	41
ug/kg								
Atrazine	--	--	--	--	--	--	--	970
Chloroform	--	--	8.4	--	--	--	--	--
Chrysene	1,300J	--	--	--	--	--	--	--
Fluoranthene	1,300J	--	--	--	--	--	--	--
Aroclor-1254	--	3,700	--	--	--	--	--	7,400
Pyrene	1,400J	--	--	--	--	--	--	660J
Toluene	--	--	--	--	38	--	--	--
Total unidentified alkylhydrocarbons	--	--	--	--	200J	--	--	--

Notes:

Data reproduced from U.S. Environmental Protection Agency February 1987. RCRA Environmental Investigation, Cedar Chemical Company, Vicksburg, Mississippi.

A = Average value.

J = Estimated value.

N = Presumptive evidence of presence of material.

TABLE 9

SUMMARY OF ANALYSES OF WATER SAMPLES FROM MONITORING WELLS MW-1 THROUGH MW-8

Constituent	Concentration (ug/L) and Well Number[a] 1	2	3	4	5	6	7	8
Sampled by Respondent on October 31, 1983[b]								
Atrazine (mg/L)	62.6	22.4	--[g]	--	NR[h]	75.0	4.5	191
Dinoseb	117	<25	--	--	NR	<25	<25	<25
Toxaphene	<0.3	<0.3	--	--	NR	<0.3	<0.3	<0.3
Sampled by MBPC on November 9, 1983[c]								
2-Bromo-cyclo-hexanol	5	--	--	ND[i]	ND	ND	ND	ND
Atrazine	ND	--	--	ND	ND	20	ND	150
Dinoseb	1200	--	--	ND	ND	ND	ND	ND
Sampled by Respondent in November 1983[d]								
Atrazine	80[j]	10	--	--	10	100	<10	110
Dinoseb	<25	<25	--	--	<25	<25	<25	<25
Toxaphene	<5	<5	--	--	<5	<5	<5	<5
Total organic halide[j]	0.22	0.11	--	NR	0.046	0.054	0.044	0.014
Specific conductance (umhos)[k]	3988	1022	--	NR	1448	1491	778	1095
Sampled by MBPC on December 14, 1984[e]								
2-Bromo-cyclo-hexanol	100	--	--	--	--	--	--	ND
2,5-Diethyl-tetrahydro-furan	ND	--	--	--	--	--	--	200
Atrazine	ND	--	--	--	--	--	--	60
Diethyl phthalate	140	--	--	--	--	--	--	ND
Dinoseb	1000	--	--	--	--	--	--	ND
Pentachloro-phenol	50	--	--	--	--	--	--	ND
Trichloroethene	15	--	--	--	--	--	--	ND

TABLE 9

SUMMARY OF ANALYSES OF WATER SAMPLES FROM MONITORING WELLS MW-1 THROUGH MW-8

Sheet 2 of 3

Constituent	Concentration (ug/L) and Well Number 1	2	3	4	5	6	7	8
Sampled by Respondent in May and June 1985[f]								
Aroclor-1254	<1.0	<1.0	<1	<1.0	1.1	<1	<1	<1.0
Arsenic	<10	<10	<10	<10	19	15	30	80
Barium	302	243	360	253	614	915	400	600
Chloroform	10.6	<10	<1.6	<10	<1.6	<1.6	<1.6	<10
Chromium	30	<30	<20	<30	<20	<20	<20	<30
Cyanide, Total	72	<25	<25	<25	<25	120	<25	<25
Copper	<10	<10	<10	<10	<10	20	<10	<10
Dinoseb	1130	<25	<10	<25	<10	<10	<10	<25
Mercury	<0.2	<0.2	<0.2	<0.2	0.2	0.2	<0.2	<0.2
Nickel	30	<20	<20	<20	<20	<20	<20	<20
Pentachloro-phenol	34	<25	<3.6	<25	<3.6	<3.6	<3.6	<25
Trichloro-ethene	19.5	<10	<1.9	<10	<1.9	<2.8	<1.9	<10

Notes:

[a] All concentrations are reported in ug/L except for atrazine as reported on October 31, 1983, which is reported in mg/L.

[b] Data reproduced from Dick Karkkainen, Vertac Chemical Corporation, January 13, 1984. Analytical Results for Ground-Water Sampling of Well Numbers 1, 2, 5, 6, 7, and 8, taken in November 1983 at the Vicksburg Plant. Letter to Charles Estes, MDNR.

[c] Data reproduced from James P. Minyard, Jr., Mississippi State Chemical Laboratory, December 16, 1983. Analytical Results for Vertac Well Water Samples taken November 9, 1983.

[d] Data reproduced from Dick Karkkainen, Vertac Chemical Corporation, March 9, 1984. Analytical Results for Ground-Water Sampling at the Vicksburg Plant. Letter to Chuck Estes, MDNR.

[e] Data reproduced from Mississippi State Chemical Laboratory, Mississippi State University, February 18, 1985. Analytical Results of Ground-Water Samples from Vertac Chemical Wells 1 and 8.

TABLE 9

SUMMARY OF ANALYSES OF WATER SAMPLES FROM MONITORING WELLS MW-1 THROUGH MW-8

Sheet 3 of 3

Notes (Continued):

f Data reproduced from John G. Hill, Vertac Chemical Corporation, September 4, 1985. Appendix VIII Analytical Results for Ground-Water Monitoring Wells at the Vicksburg Plant. Letter to Charles Estes, MDNR.

g -- indicates that the well was not sampled

h NR - not reported. These wells were reported to be sampled, but the data were not reported.

i ND - not detected.

j This value is semi-quantitative because of interference peak.

k These values are the results of averaging four measurements.

TABLE 10

ANALYSES OF WATER FROM SEVERAL WELLS FOR DINOSEB

Date	Dinoseb Concentration (ug/L) MW-1	MW-1A	MW-9	MW-15
October 15, 1985[a]	370	--[e]	ND[f]	--
December 6, 1985[a]	600	--	125	--
March 5, 1986[b]	940	--	<40	--
July 28, 1986[c]	--	265	--	--
July 29, 1986[c]	--	380	--	--
February 6, 1987[d]	--	290	<40	1130

Notes:

[a] Data reproduced from IT Corporation, January 8, 1986. Final Report, Groundwater Assessment Program, Prepared for Vertac Chemical Corporation, Vicksburg, Mississippi, IT Corporation Project No. 846545-02.

[b] Data reproduced from John G. Hill, Environmental Engineer, Vertac Chemical Corporation, March 12, 1986. Letter to Jack McCord, Mississippi Department of Natural Resources, Bureau of Pollution Control, Industrial Wastewater Section. Subject: Latest analytical results.

[c] Data reproduced from John G. Hill, Environmental Engineer, Vertac Chemical Corporation, August 4, 1986. Letter to Jack McCord, Mississippi Department of Natural Resources, Bureau of Pollution Control, Industrial Wastewater Section. Subject: Analytical results of ground-water samples from monitoring well MW-1A.

[d] Data reproduced from John G. Hill, Cedar Chemical Corporation, February 16, 1987. Letter to Jack McCord, Mississippi Department of Natural Resources, Bureau of Pollution Control, Industrial Wastewater Section. Subject: Commission Order No. 1046-86.

[e] -- indicates that the well was not sampled or the data not reported.

[f] ND indicates that the compound was analyzed for but not detected.

TABLE 11

ANALYTICAL DATA SUMMARY (GROUND WATER)
CEDAR CHEMICAL CORPORATION
VICKSBURG, MISSISSIPPI
FEBRUARY 1989

	CC-TB TRIP BLANK 02/01/89 1410	MW-4 UPGRADNT WELL 01/31/89 1230	MW-16 NEW WELL 01/31/89 1545	MW-6 DOWNGRAD WELL 02/01/89 0930	MW-7 DOWNGRAD WELL 02/01/89 1000	MW-2 DOWNGRAD WELL 02/01/89 1540
INORGANIC ELEMENTS	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
CALCIUM	--	97	74	220	100	150
IRON	--	0.59	3.8	3.9	3.4	3.3
MAGNESIUM	--	43	29	120	46	63
SODIUM	--	15	12	28	16	28
	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
ALUMINUM	--	620	410	3200	1300	2800
BARIUM	--	210	320	420	290	260
CHROMIUM	--	--	--	10	--	--
COBALT	--	--	--	19	--	--
MANGANESE	--	340	190	340	1100	480
STRONTIUM	--	230	270	490	310	460
TITANIUM	--	30	17	130	48	130
ZINC	--	13	20	22	15	36
GENERAL INORGANIC PARAMETERS	MG/L	MG/L	MG/L	MG/L	MG/L	MG/L
CYANIDE	--	--	--	.006	--	--
PESTICIDE/PCB COMPOUNDS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
ATRAZINE	--	--	--	17C	--	--
CYANAZINE	--	--	--	47C	--	--
DINOSEB (DNBP)	--	--	--	1.2	1.2	--
PROPAZINE	--	--	--	2.6C	--	--
EXTRACTABLE ORGANIC COMPOUNDS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
CHLOROBIS(METHYLETHYL)TRIAZINEDIAMINE	--	--	--	2.1N	--	--
PURGEABLE ORGANIC COMPOUNDS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
1,1,1-TRICHLOROETHANE	--	--	--	--	0.60J	--
CIS-1,2-DICHLOROETHENE	--	--	--	--	--	3.6J
TRICHLOROETHENE(TRICHLOROETHYLENE)	--	--	--	--	--	1.1J

FOOTNOTES

NA - NOT ANALYZED
J - ESTIMATED VALUE
N - PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
-- - MATERIAL WAS ANALYZED FOR BUT NOT DETECTED
C - CONFIRMED BY GC/MS

TABLE 12

ANALYTICAL DATA SUMMARY (SOIL)
CEDAR CHEMICAL CORPORATION
VICKSBURG, MISSISSIPPI
FEBRUARY 1989

	CC-BG BACKGRD SOIL 02/01/89 1300	CC-1 S. END OF PLANT 02/01/89 1310	CC-2 S.S. END IMPOUND 02/01/89 1355	CC-3 S.E. END LANDFILL 02/01/89 1420	CC-4 SW OF MW-10 02/01/89 1500
INORGANIC ELEMENTS	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
ALUMINUM	19000	8200	7200	12000	7100
ARSENIC	--	13	--	--	7.2
BARIUM	140	96	120	120	110
CALCIUM	1700	31000	30000	28000	31000
CHROMIUM	18	22	12	16	36
COBALT	6.7	3.3	4.3	9.2	2.9
COPPER	17	14	12	13	26
IRON	24000	20000	12000	16000	16000
LEAD	--	--	17	14	49
MAGNESIUM	3400	14000	15000	13000	8200
MANGANESE	730	420	460	330	220
MERCURY	--	--	--	--	0.26
MOLYBDENUM	--	--	--	--	2.5
NICKEL	19	12	12	15	13
POTASSIUM	1900	1100	1100	1400	910
SODIUM	--	--	370	380	270
STRONTIUM	22	28	32	29	32
TITANIUM	510	240	360	280	300
VANADIUM	44	22	22	28	19
YTTRIUM	11	8.2	9.3	11	6.7
ZINC	69	43	59	43	82
GENERAL INORGANIC PARAMETERS	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
CYANIDE	--	--	--	0.14	58.0A
PESTICIDE/PCB COMPOUNDS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
ATRAZINE	--	680J	200JN	100J	6800J
DIELDRIN	--	--	--	--	530J
DINOSEB (DNBP)	15	230000	96	57000	380000
ENDRIN	--	--	--	--	1500J
ENDRIN KETONE	--	--	--	--	430
HEPTACHLOR EPOXIDE	--	53	--	--	--
METHYL PARATHION	--	1300	--	--	820J
TOXAPHENE	--	48000	--	--	140000JN
EXTRACTABLE ORGANIC COMPOUNDS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
4-NITROPHENOL	--	920J	--	--	--
BENZO(B AND/OR K)FLUORANTHENE	--	290J	--	--	--
BENZO(GHI)PERYLENE	--	100J	--	--	--
CHRYSENE	--	180J	--	--	--
FLUORANTHENE	--	310J	--	--	--
HEXACHLOROBENZENE (HCB)	--	140J	--	--	--
PHENANTHRENE	--	190J	--	--	--
PYRENE	--	260J	--	--	--
(METHYLPROPYL)DINITROPHENOL	500JN	400000JN	200000JN	200JN	687JN
1 UNIDENTIFIED COMPOUND	--	--	--	--	200000J
2 UNIDENTIFIED COMPOUNDS	--	10000J	--	--	--
BUTYLDINITROANISOLE	--	10000JN	--	--	--
DIMETHYLHEPTANONE	--	--	600JN	800JN	--
HEXADECANOIC ACID	400JN	300JN	800JN	500JN	--
METHOXYNITROBENZENE	--	800JN	--	--	--
OCTANOIC ACID	--	--	300JN	200JN	--
PURGEABLE ORGANIC COMPOUNDS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
ACETONE	--	--	--	--	330J
METHYL ETHYL KETONE	--	--	--	--	94J
O-XYLENE	--	--	--	--	9.9J
FOUR UNIDENTIFIED COMPOUNDS	--	--	--	300JN	--
TRIMETHYLBENZENE	--	--	--	--	30JN

FOOTNOTES
A - AVERAGE VALUE
NA - NOT ANALYZED
J - ESTIMATED VALUE
N - PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
-- - MATERIAL WAS ANALYZED FOR BUT NOT DETECTED

- Arsenic was detected in wells MW-5, MW-6, and MW-8, but not in background well MW-4.

- Cyanide was detected in MW-1 and MW-6.

On several occasions CCC analyzed groundwater for the presence of dinoseb. Dinoseb was detected in concentrations ranging from 125 ug/l to 1130 ug/l (See Table 10).

On January 10, 1986, CCC submitted a groundwater assessment report. This report purported to define the rate and extent of migration of hazardous waste or hazardous waste constituents in the groundwater. The report concluded that the contamination was caused by surface water contamination. EPA has determined this report to be inadequate.

III. FACTORS AFFECTING MIGRATION

Several bayous flow through or near the CCC property (see Figures 3 and 4). Stouts Bayou flows south along the eastern perimeter of the facility. This bayou drains the south side of the City of Vicksburg. Hatcher Bayou flows from the east to the southwest and joins Stouts Bayou near the south side of the facility to form Hennesseys Bayou. This bayou flows south approximately four miles downstream until it meets the Mississippi River.

Several unnamed streams flow through or near the CCC property (See Figures 3 and 4). A small unnamed stream (shown as a drainage ditch in Figure 3) runs parallel to Stouts Bayou near the north plant, and is separated from Stouts Bayou by the Illinois Central Railroad. The northern branch of this unnamed stream flows from north of the north plant, while a small southern branch receives drainage from the north plant. These two branches combine before flowing under the tracks and into Stouts Bayou. Another unnamed tributary flows south and drains the western perimeter of the south plant. This tributary flows through a large wetland before entering Hennesseys Bayou near the railroad crossing.

The ground surface at CCC varies from 80 to 150 feet above mean sea level (MSL). Below the ground surface lie several strata. The top stratum consists of a silty clay (fill) extending from the surface to a depth of less than 10 feet. This stratum is underlain by a Pleistocene loess characterized as a silty clay-clayey silt extending from 10 to 50 feet below the surface. The loess overlays a stiff hard sandy clay and marl (Bryam member of the Vicksburg formation). The loess-marl contact is marked by variable sand and fossil fragments. A seam of sand with small gravel is associated with this initial clayey layer.

The aquifer below the CCC property is approximately 40 feet thick and consists almost exclusively of Pleistocene loess. The direction of groundwater movement is generally toward Stouts or Hennesseys Bayous. Calculated groundwater flow velocities are 0.01 to 0.20 feet per day in the direction of Stouts or Hennesseys Bayous. Groundwater flow velocities are reported to increase dramatically in the areas adjacent to the bayous. Withdrawal yields of less than one to two gallons per minute would be expected from wells placed in this aquifer.

Cedar Chemical Corporation
Groundwater Elevations
6/7 - 6/8/90

Well No.	Water Elevation
1A	108.4'
2	101.7'
4	108.5'
5	91.2'
6	92.2'
7	94.6'
8	104.1'
9	112.0'
10	108.8'
11	98.7'
12	110.7'
13	110.3'
14	107.9'
16	109.9'

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LABORATORY REPORT

CLIENT: VICKSBURG CHEMICAL DIV OF CEDAR CHEM DATE: 06/18/90
LOCATION: VICKSBURG, MS 39180 PROJECT LOCATION: VICKSBURG, MS.
COLLECTED BY: CLIENT RECEIPT DATE: 06/08/90
REPORT NO.: 13948 PROJECT NO.:
PAGE NO.: 1

ANALYTE	UNITS	LABORATORY RESULTS / REGULATORY LIMIT				ANALYSIS INFORMATION: ANALYST	DATE	TIME	BATCH QUALITY CONTROL: SPIKE VALUE	% RECOVERY	RELATIVE % DEVIATION
TEST RESULTS FOR SAMPLE LOG NUMBER:		18231.00									
Arsenic, Total	ug/l	<0.003				BSC	06/12/90	15:00	0.200	102	0
Dinitrobutylphenol	ug/l	<30				SCP	06/12/90	10:00	200	92	8.9
Methylene Chloride	ug/l	<0.1				SCP	06/14/90	11:45	40	93	9.3
Toxaphene	ug/l	<0.24				SCP	06/11/90	08:20	25	101	12

SUPPLEMENTARY INFORMATION:
Analyses conducted in accordance with 40 CFR, Part 261, November 1986, "Test Methods for Evaluating Solid Waste" (SW-846).

SAMPLE DESCRIPTION:
18231.00 GROUNDWATER MONITORING WELL 2

COLLECTION DATE/TIME:
06/08/90 06/08/90 08:32

CERTIFICATION:

Ray Hudnall
Quality Assurance and Quality Control

Analytical Services

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LABORATORY REPORT

CLIENT: VICKSBURG CHEMICAL DIV OF CEDAR CHEM DATE: 06/18/90 COLLECTED BY: CLIENT REPORT NO.: 13950 PAGE NO.: 1
LOCATION: VICKSBURG, MS 39180 PROJECT LOCATION: VICKSBURG, MS. RECEIPT DATE: 06/08/90 PROJECT NO.:

ANALYTE	UNITS	LABORATORY RESULTS / REGULATORY LIMIT				ANALYSIS INFORMATION			BATCH QUALITY CONTROL		
						ANALYST	DATE	TIME	SPIKE VALUE	% RECOVERY	RELATIVE % DEVIATION
TEST RESULTS FOR SAMPLE LOG NUMBER:		18233.00									
Arsenic, Total	ug/l	<0.003				OSC	06/12/90	13:00	0.200	102	0
Dinitrobutylphenol	ug/l	<30				SCP	06/12/90	10:00	200	92	8.9
Methylene Chloride	ug/l	<0.1				SCP	06/14/90	11:45	40	93	9.3
Toraphene	ug/l	<0.24				SCP	06/11/90	08:20	25	101	12

SUPPLEMENTARY INFORMATION:
Analyses conducted in accordance with 40 CFR, Part 261, November 1986, "Test Methods for Evaluating Solid Waste" (SW-846).

SAMPLE DESCRIPTION:
18233.00 GROUNDWATER MONITORING WELL 5

COLLECTION DATE/TIME:
06/07/90 06/07/90 10:45

CERTIFICATION:

Ray Hudnall
Quality Assurance and Quality Control

Herbert A. Johnston
Analytical Services

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LABORATORY REPORT

CLIENT: VICKSBURG CHEMICAL DIV OF CEDAR CHEM DATE: 06/18/90
LOCATION: VICKSBURG, MS 39180 PROJECT LOCATION: VICKSBURG, MS.
COLLECTED BY: CLIENT RECEIPT DATE: 06/08/90
REPORT NO.: 13952 PROJECT NO.:
PAGE NO.: 1

ANALYTE	UNITS	LABORATORY RESULTS / REGULATORY LIMIT				ANALYSIS INFORMATION: ANALYST	DATE	TIME	BATCH QUALITY CONTROL: SPIKE VALUE	% RECOVERY	RELATIVE % DEVIATION
TEST RESULTS FOR SAMPLE LOG NUMBER:		18235.00									
Arsenic, Total	ug/l	0.006				BSC	06/12/90	13:00	0.200	102	0
Dinitrobutylphenol	ug/l	<30				SCP	06/12/90	10:00	200	92	8.9
Methylene Chloride	ug/l	<0.1				SCP	06/14/90	11:45	40	93	9.3
Toxaphene	ug/l	<0.24				SCP	06/11/90	08:20	25	101	12

SUPPLEMENTARY INFORMATION:
Analyses conducted in accordance with 40 CFR, Part 261, November 1986, "Test Methods for Evaluating Solid Waste" (SW-846).

SAMPLE DESCRIPTION:
18235.00 GROUNDWATER MONITORING WELL 7

COLLECTION DATE/TIME:
06/07/90 06/07/90 11:15

CERTIFICATION:

Ray Hudnall
Quality Assurance and Quality Control

Herbert B. Johnston
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LABORATORY REPORT

CLIENT: VICKSBURG CHEMICAL DIV OF CEDAR CHEM
LOCATION: VICKSBURG, MS 39180
DATE: 06/18/90
PROJECT LOCATION: VICKSBURG, MS.
COLLECTED BY: CLIENT
RECEIPT DATE: 06/08/90
REPORT NO.: 13954
PROJECT NO.:
PAGE NO.: 1

ANALYTE	UNITS	LABORATORY RESULTS / REGULATORY LIMIT				ANALYSIS INFORMATION			BATCH QUALITY CONTROL		
						ANALYST	DATE	TIME	SPIKE VALUE	% RECOVERY	RELATIVE % DEVIATION
TEST RESULTS FOR SAMPLE LOG NUMBER:		18237.00									
Arsenic, Total	ug/l	0.004				BSC	06/12/90	13:00	0.200	102	0
Dinitrobutylphenol	ug/l	<30				SCP	06/12/90	10:00	200	92	8.9
Methylene Chloride	ug/l	<0.1				SCP	06/14/90	11:45	40	93	9.3
Toxaphene	ug/l	<0.24				SCP	06/11/90	08:20	25	101	12

SUPPLEMENTARY INFORMATION:
Analyses conducted in accordance with 40 CFR, Part 261, November 1986, "Test Methods for Evaluating Solid Waste" (SW-846).

SAMPLE DESCRIPTION:
18237.00 GROUNDWATER MONITORING WELL 9

COLLECTION DATE/TIME:
06/08/90 06/08/90 10:30

CERTIFICATION:

Ray Hudnall
Quality Assurance and Quality Control

Herbert R. Johnston
Analytical Services

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LABORATORY REPORT

CLIENT: VICKSBURG CHEMICAL DIV OF CEDAR CHEM DATE: 06/18/90
LOCATION: VICKSBURG, MS 39180 PROJECT LOCATION: VICKSBURG, MS.
COLLECTED BY: CLIENT RECEIPT DATE: 06/08/90
REPORT NO.: 13956 PROJECT NO.:
PAGE NO.: 1

ANALYTE	UNITS	LABORATORY RESULTS / REGULATORY LIMIT				ANALYSIS INFORMATION			BATCH QUALITY CONTROL		
						ANALYST	DATE	TIME	SPIKE VALUE	% RECOVERY	RELATIVE % DEVIATION
TEST RESULTS FOR SAMPLE LOG NUMBER:		10239.00									
Arsenic, Total	ug/l	0.004				BSC	06/12/90	13:00	0.200	102	0
Dinitrobutylphenol	ug/l	<30				SCP	06/12/90	10:00	200	92	8.9
Methylene Chloride	ug/l	<0.1				SCP	06/14/90	11:45	40	93	9.3
Toxaphene	ug/l	<0.24				SCP	06/11/90	08:20	25	101	12

SUPPLEMENTARY INFORMATION:
Analyses conducted in accordance with 40 CFR, Part 261, November 1986, "Test Methods for Evaluating Solid Waste" (SW-846).

SAMPLE DESCRIPTION:
10239.00 GROUNDWATER MONITORING WELL 11

COLLECTION DATE/TIME:
06/08/90 06/08/90 08:50

CERTIFICATION:

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LABORATORY REPORT

CLIENT: VICKSBURG CHEMICAL DIV OF CEDAR CHEM DATE: 06/18/90 COLLECTED BY: CLIENT REPORT NO.: 13958 PAGE NO.: 1
LOCATION: VICKSBURG, MS 39180 PROJECT LOCATION: VICKSBURG, MS. RECEIPT DATE: 06/08/90 PROJECT NO.:

ANALYTE	UNITS	LABORATORY RESULTS / REGULATORY LIMIT				ANALYSIS INFORMATION			BATCH QUALITY CONTROL		
						ANALYST	DATE	TIME	SPIKE VALUE	% RECOVERY	RELATIVE % DEVIATION
TEST RESULTS FOR SAMPLE LOG NUMBER:		18241.00									
Arsenic, Total	ug/l	0.008				BSC	06/12/90	15:00	0.200	102	0
Dinitrobutylphenol	ug/l	<30				SCP	06/12/90	10:00	200	92	8.9
Methylene Chloride	ug/l	<0.1				SCP	06/14/90	11:45	40	93	9.3
Toxaphene	ug/l	<0.24				SCP	06/11/90	08:20	25	101	12

SUPPLEMENTARY INFORMATION:
Analyses conducted in accordance with 40 CFR, Part 261, November 1986, "Test Methods for Evaluating Solid Waste" (SW-846).

SAMPLE DESCRIPTION:
18241.00 GROUNDWATER MONITORING WELL 13

COLLECTION DATE/TIME:
06/08/90 06/08/90 10:40

CERTIFICATION:

Ray Hudnall
Quality Assurance and Quality Control

Herbert R. Johnston
Analytical Services

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LABORATORY REPORT

CLIENT: VICKSBURG CHEMICAL DIV OF CEDAR CHEM
LOCATION: VICKSBURG, MS 39180
DATE: 06/18/90
PROJECT LOCATION: VICKSBURG, MS.
COLLECTED BY: CLIENT
RECEIPT DATE: 06/08/90
REPORT NO.: 13960
PROJECT NO.:
PAGE NO.: 1

ANALYTE	UNITS	LABORATORY RESULTS / REGULATORY LIMIT				ANALYSIS INFORMATION: ANALYST	DATE	TIME	BATCH QUALITY CONTROL: SPIKE VALUE	% RECOVERY	RELATIVE % DEVIATION
TEST RESULTS FOR SAMPLE LOG NUMBER:		18243.00									
Arsenic, Total	ug/l	<0.003				BSL	06/12/90	13:00	0.200	102	0
Dinitrobutylphenol	ug/l	<30				SCP	06/12/90	10:00	200	92	8.2
Methylene Chloride	ug/l	<0.1				SCP	06/14/90	11:45	40	93	9.3
Toxaphene	ug/l	<0.24				SCP	06/11/90	08:20	25	101	12

SUPPLEMENTARY INFORMATION:
Analyses conducted in accordance with 40 CFR, Part 261, November 1986, "Test Methods for Evaluating Solid Waste" (SW-846).

SAMPLE DESCRIPTION:
18243.00 GROUNDWATER MONITORING WELL 16

COLLECTION DATE/TIME:
06/08/90 06/08/90 10:20

CERTIFICATION:

Ray Hudnall
Quality Assurance and Quality Control

Herbert B. Johnston
Analytical Services

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APPENDIX D

PROCESS AREA SEWERS
AND SURFACE WATER DRAINAGE REPORTS

A PLANT EVALUATION AND INVESTIGATION OF THE SURFACE WATER DRAINAGE SYSTEMS

FOR

VERTAC CHEMICAL CORPORATION (NORTH PLANT)
VICKSBURG, MISSISSIPPI

Report No. 1.85.7953.03
December, 1985

ENVIRONMENTAL PROTECTION SYSTEMS, INC.

Engineering & Analytical

Jackson, Mississippi

A PLANT EVALUATION AND INVESTIGATION OF THE SURFACE WATER DRAINAGE SYSTEMS

FOR

VERTAC CHEMICAL CORPORATION (NORTH PLANT)
VICKSBURG, MISSISSIPPI

Prepared by

Environmental Protection Systems, Inc.
Jackson, Misssissipi
Pensacola, Florida
Mobile, Alabama

Report No. 1.85.7953.03
December, 1985

TABLE OF CONTENTS

		Page
1.0	INTRODUCTION	1
2.0	SCOPE OF SERVICES	2
3.0	NARRATIVE DESCRIPTION OF DRAINAGE AREA	
	3.1 North (N) Plant Area	3
	3.2 West (W) Plant Area	4
	3.3 South (S) Plant Area	4
	3.4 East (E) Plant Area	5
	3.5 Receiving Water	5
4.0	RECOMMENDATIONS	6
	TABLE:	
	Table: Stormwater Diversion Pipe - Material and Diameter North Plant	8
	DRAWINGS:	
	Drawing 1: Sewer System Map	11
	Drawing 2: Sewer System Map (Addendum)	12

1.0 INTRODUCTION

Vertac Chemical Corporation operates an agricultural chemical complex in Vicksburg, Mississippi. The operation complex is divided into North Plant and South Plant operations. The North Plant operation, which is the subject of this report, manufactures potassium nitrate (KNO_3), chlorine gas and liquid nitrogen tetroxide (N_2O_4). This plant has changed ownership several times since its inception, thus drawings of the surface water drainage system are out of date. Vertac Chemical Corporation, desiring to update its surface water drainage system drawing and to gather information for the purposes of understanding stormwater runoff, contracted Environmental Protection Systems, Inc. (EPS), to assist in this work.

2.0 SCOPE OF SERVICES

EPS has conducted Phase 2, the confirmatory phase of this surface water drainage system inventory. The purpose of Phase 2 was to identify all areas which contribute stormwater runoff to the plant's sewer system that is routed directly to the property boundaries of the North Plant. From the investigation, a detailed surface water drainage map for the North Plant has been prepared. A narrative description of the drainage area is included and, when observed, pipe materials and diameters are noted in the report (See Attached Table). Dry weather flows are noted but were not quantitatively measured. Nine dye tests and one clear water drainage test were conducted during the period November 21-22, 1985.

3.0 NARRATIVE DESCRIPTION OF DRAINAGE AREA

In 1984, the Environmental Protection Agency published regulations (49 FR 37996) addressing issues concerning the National Pollutant Discharge Elimination System (NPDES) program administered under the Clean Water Act. One aspect of those rules concerned the regulation of point sources of stormwater runoff and defined stormwater discharges as conveyances of stormwater contaminated by process waste, raw materials, toxics, hazardous pollutants, or oil and grease. Discharges from industrial lands or facilities are identified as point sources. Group I stormwater dischargers are those subject to effluent limitation guidelines or are located in an industrial plant or plant associated area. Group I dischargers are required to complete Form 1 plus submit a narrative description of the drainage area, the receiving waters, and any treatment applied to the discharge. In lieu of Form 2C data and sampling, applicants are required to indicate whether their discharges fall within the Group I or Group II category. The following sections contain descriptions of the North Plant areas which contribute untreated stormwater runoff directly to Stout's Bayou which borders the east side of the plant.

3.1 North (N) Plant Area

This area consists of the gravel parking lot north of the agricultural storage building, the road north to the plant gate, the track area north of the agricultural storage building, and the administration building and surrounding hills. General surface drainage in this area is downhill to the east on to the large gravel parking lot and plant road. East of the parking lot, which is the track area, ground elevations are indistinct, but general drainage is toward the east into the bayou. In the north area,

there is one main storm sewer (N-1) which originates at the agricultural storage building by collecting water from a surface trench surrounding the agricultural storage building and which proceeds northward from its origin (See Drawing 1). One section of this sewer (N-3) is routed underneath the plant road through an 18-inch culvert to a large collection box at the foot of the administration building hill (See Drawing 2). This collection box is also fed by a 15-inch reinforced concrete pipe (N-4) coming from the administration building area from an unknown source. From the collection box, the sewer turns eastward in twin 36-inch reinforced concrete pipes (N-5 and N-6) and empties into the bayou. The drain at the carwash empties into the southernmost of these twin culverts.

3.2 West (W) Plant Area

In this area are the instrument and electrical shop, the maintenance offices, and the maintenance shops and warehouse. At the north end of the shops and warehouse, a 10-inch steel culvert (W-2) passes underneath the plant road and drains onto the surface of the ground near the west wall of the agricultural storage building. At the southern end of the shops and warehouse is an unusual culvert (W-5/W-6), which makes a 90° turn (north to south turning east to west). The north end of this culvert is a 15-inch reinforced concrete pipe, while the east end is a 12-inch CMP. The fact that these two ends are connected was verified by a clear water drainage test.

3.3 South (S) Plant Area

This area includes everything south of the cooling tower, except the neutralization system. Surface drainage in this area is from west to east, eventually draining into the bayou east of the plant. There is a 30-inch

concrete culvert (S-1) collecting water from the hills behind the maintenance shops and warehouse which carries water to the southernmost collection box. There is also a new 24-inch plastic culvert (S-2) underneath the road leading up to the impoundment pond which drains over-the-ground to the east. Stormwater overflow from the neutralization system enters a collection box and is fed through an 18-inch concrete culvert (S-5) to the southernmost collection box. Stormwater drainage from the plant roads and the process area is collected in a drain at the northeast corner of the neutralization area and is diverted through a 20-inch plastic culvert (S-6) to the southernmost collection box. This collection box (the southernmost one) consists of two compartments connected by a 24-inch reinforced concrete pipe (S-9). In addition to the storm culverts already mentioned, the collection box also receives storm drainage through a 20-inch reinforced concrete (S-4) pipe from the direction of the South plant. From this main collection box, the water is routed to the property boundary through twin 36-inch reinforced concrete pipes (S-7 and S-8) which drain into the bayou.

3.4 East (E) Plant Area

The east plant area consists of the track area east of the plant process area. Stormwater in this area drains off the property over the surface of the ground. There is one 12-inch corrugated metal culvert (E-1) shown on old drawings; however, dye tests confirmed that this culvert is blocked and abandoned and that water fed into its drain ends up in the neutralization pits.

3.5 Receiving Water

All surface water diverted into the stormwater drainage system at Vertac Chemical Corporation's North Plant is received by Stout's Bayou which borders the east side of the north plant. This stream ultimately flows into the Mississippi River via Hennessey's Bayou.

4.0 RECOMMENDATIONS

This report addresses the immediate requirements of current NPDES rules concerning stormwater runoff; however, based on good business practices, EPS recommends the following:

1. EPS recommends that a baseline stormwater survey be conducted to include:
   a. Collecting water from the southernmost and northernmost collection boxes shortly after a significant rainfall end.
   b. Analyzing the stormwater for the principal pollutants it potentially could contain.
2. EPS recommends that a stormwater runoff model be developed to include:
   a. Design storm events
   b. Peak flow rate
   c. Total diversion volume
3. EPS recommends that the model be used to develop a concept design for an optimum diversion and impounding system.
4. EPS recommends that a stormwater management plan be prepared and implemented.
5. EPS recommends the preparation of a Spill Prevention Control and Countermeasure Plan, in accordance with 40 CFR 112, to include all chemical materials which may adversely affect the environment when spilled.

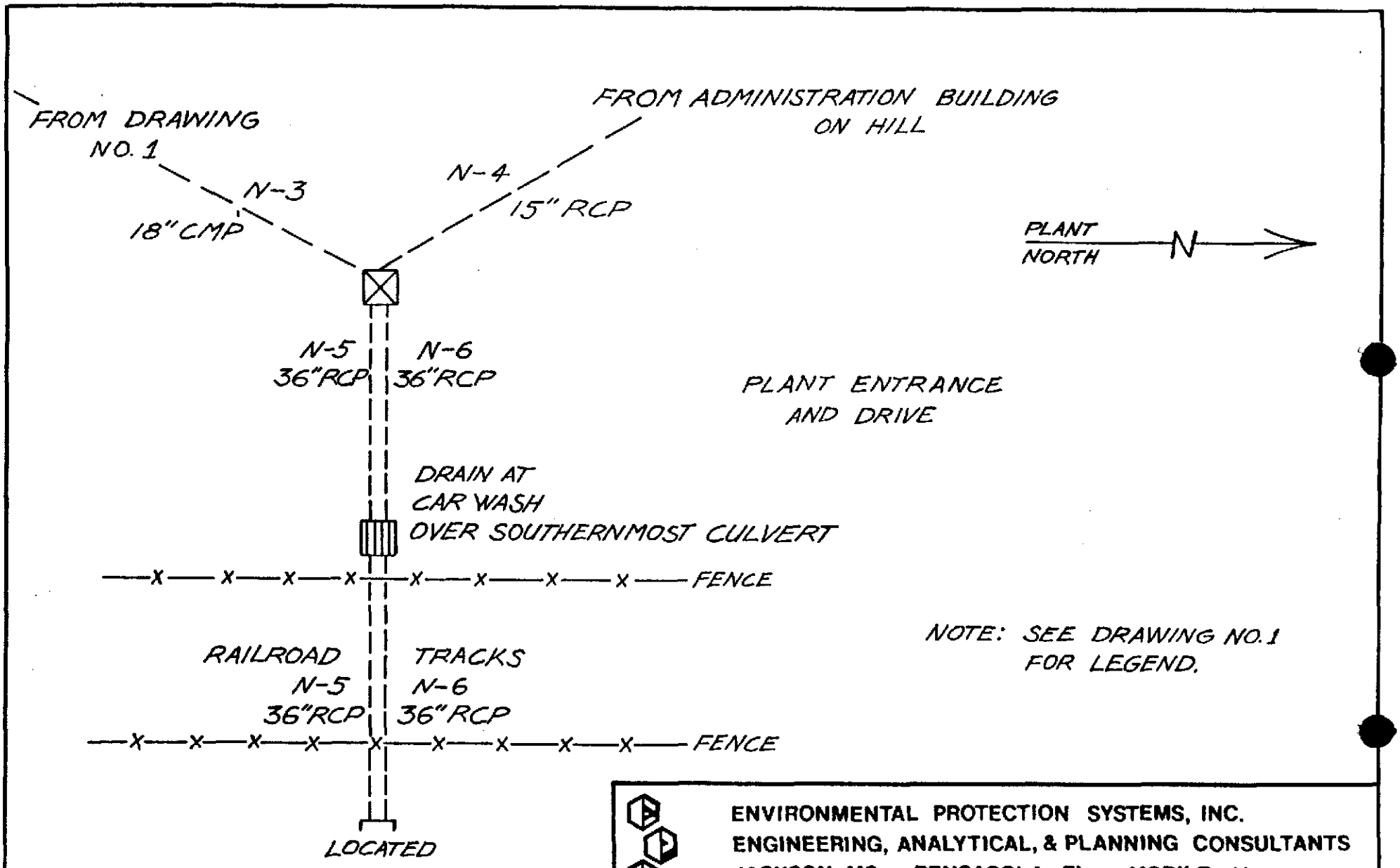
TABLE

TABLE
STORMWATER DIVERSION PIPE: MATERIAL AND DIAMETER
NORTH PLANT
VERTAC CHEMICAL CORPORATION
VICKSBURG, MISSISSIPPI

Reference: Drawings Nos. 1 and 2

Line No.	Pipe Material	Diameter (inches)	Dry Weather Notes (11/21-22/85)
N-1	Reinforced Concrete	15	Flowing 1 inch deep
N-2	Reinforced Concrete	15	Flowing 1 inch deep
N-3	Corrugated Metal	18	Flowing 1 inch deep
N-4	Reinforced Concrete	15	Dry
N-5	Reinforced Concrete	36	Dry
N-6	Reinforced Concrete	36	Flowing 1 inch deep
W-1	Carbon Steel	10	Dry
W-2	Carbon Steel	10	Flowing 1 inch deep
W-3	Corrugated Metal	10	Flowing 1 inch deep
W-4	Stainless Steel	6	Dry
W-5	Reinforced Concrete	15	Dry
W-6	Corrugated Metal	12	Dry
S-1	Reinforced Concrete	30	Dry
S-2	Corrugated Plastic	24	Dry
S-3	Reinforced Concrete	15	Apparently abandoned
S-4	Reinforced Concrete	20	Flowing 2 inches deep
S-5	Reinforced Concrete	18	Standing 3 inches deep
S-6	Corrugated Plastic	20	Standing 1 inch deep
S-7	Reinforced Concrete	36	Standing 2 inches deep
S-8	Reinforced Concrete	36	Standing 2 inches deep
S-9	Reinforced Concrete	24	Standing 1 inch deep
E-1	Corrugated Metal	12	Confirmed abandoned

DRAWINGS



ENVIRONMENTAL PROTECTION SYSTEMS, INC.
ENGINEERING, ANALYTICAL, & PLANNING CONSULTANTS
JACKSON, MS PENSACOLA, FL MOBILE, AL

PROJECT TITLE: VERTAC SEWER SYSTEM MAP	
SCALE: 1"=40'	DRAWN BY: SJA
DATE: 12-13-85	APPROVED BY: JED
PROJECT NO.: 1.85.7953.02	DRAWING NO.: 2

A PLANT EVALUATION AND INVESTIGATION OF THE PROCESS AREA SEWERS AND SURFACE WATER DRAINAGE FOR VERTAC CHEMICAL CORPORATION SOUTH PLANT VICKSBURG, MISSISSIPPI

Report No. 1.86.7954.01
March, 1986

ENVIRONMENTAL PROTECTION SYSTEMS, INC.

Engineers & Scientists

Jackson, Mississippi
Pensacola, Florida
Mobile, Alabama

A PLANT EVALUATION AND INVESTIGATION

OF

THE PROCESS AREA SEWERS AND SURFACE WATER DRAINAGE

FOR

VERTAC CHEMICAL CORPORATION
SOUTH PLANT
VICKSBURG, MISSISSIPPI

Prepared by

Environmental Protection Systems, Inc.
Jackson, Mississippi
Pensacola, Florida
Mobile, Alabama

Report No. 1.86.7954.01
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TABLE OF CONTENTS

		Page
1.0	INTRODUCTION	1
2.0	SCOPE OF SERVICES	2
3.0	NARRATIVE DESCRIPTION OF DRAINAGE AREA	3
3.1	Dinitro Processing Area Sewer	3
3.2	Sewers in the Central Block	5
3.3	Nitric Acid Area Sewers	7
3.4	Main Sewer Line	7
TABLE:		
	Process Area Drainage Pipe: Material and Diameter	9
DRAWING:		
	Process Area Sewer Map	11

1.0 INTRODUCTION

Vertac Chemical Corporation operates an agricultural chemical complex in Vicksburg, Mississippi. The operation complex is divided into North Plant and South Plant operations. The South Plant operation, which is the subject of this report, manufactures nitric acid, and technical pesticides (Dinoseb and MSMA). The plant has changed ownership several times since its inception; thus drawings of the process area sewers and surface water drainage system are out of date. Vertac Chemical Corporation, desiring to update its process area sewers and surface water drainage system drawing and to gather data for the purposes of understanding surface water runoff in the process areas, contracted Environmental Protection Systems, Inc. (EPS), to assist in this work.

2.0 SCOPE OF SERVICES

EPS has conducted Phase 3, the process area Confirmatory Phase of this surface water drainage system inventory. The purpose of Phase 3 was to identify all areas which contribute either process water or stormwater runoff to the plant's process sewer system that is routed to the plant neutralization and impoundment pond. From the investigation, the working map prepared in Phase 1, the Investigatory Phase, was used to develop a map of the drainage system in the process areas (See Drawing). In addition, elevation contour lines have been shown in one area where surface water flows were not obvious. A narrative description of the drainage system is included and, when observed, pipe materials and diameters are noted in the report (See Table). Dry weather flows were noted for drainage lines, when observed. Fifty dye tests were conducted between February 18 and March 7, 1986, and elevation readings were taken on February 20, 1986.

3.0 NARRATIVE DESCRIPTION OF DRAINAGE AREA

For the purposes of this report, the Vertac Chemical Corporation, South Plant, has been subdivided into three areas.

1. The Dinitro processing area and adjacent railroad track yard
2. The Drumming Building and adjacent abandoned process areas, constituting the central block of the South Plant
3. The Nitric Acid area including Ammonia Storage and the Cooling Tower

The following sections contain descriptions of these three South Plant areas which contribute stormwater runoff and process drainage to the plant neutralization and impoundment pond. A brief description of the main sewer lines collecting water from these three areas completes the drainage picture.

3.1 Dinitro Processing Area Sewer

The source of most stormwater in this relatively flat area is direct rainfall into the area. Some stormwater flows down the steep shoulder separating the Dinitro area from the upper part of the South Plant. The principal drainage lines flow north and south between railroad tracks, in the area between the Dinitro processing plant and the tank farm at the foot of the shoulder.

Immediately south of two red tanks and between the tank farm and the shoulder is a small drain. This drain is connected by a 6-inch line (DS-1) to a drain between the railroad tracks east of the tank farm. This second drain is approximately 35 feet north of the track switch adjacent to the south end of tank farm. An 8-inch line (DS-2) connects this drain to a

third one in the track area from which the sewer line turns north. An 8-inch line traveling east from this third drain is apparently plugged. A 10-inch line (DS-3) connects this third drain and the next drain to the north. Six-inch lines entering this latter drain from the east and west are apparently plugged. A 10-inch line (DS-4) connects the drain with a sump to the north. Behind the tank farm is another small drain just north of the Versene tank, which is connected by a 6-inch line (DS-7) to a drain just east of the tank farm. This drain is approximately 20 feet east of the wall adjacent to the Versene tank. A 6-inch line exits this drain to the east (DS-8) and apparently connects to the (DS-4). Water entering the sump in the railroad track area is pumped to a larger sump adjacent to the Dinitro process plant which diverts water to the impoundment pond. At the north end of this sewer system is a drain located between railroad tracks east of the tank labeled TEOA. A 6-inch line entering this drain has an unknown origin. The 10-inch line to the south (DS-6) connects to a drain just north of the sump located in the track area. Just south of a transformer, located between tanks, is a small drain which drains eastward through a 6-inch line (DS-9) to a drain in the track area which is further connected by a 6-inch line (DS-10) to DS-6. The drain at the south end of (DS-6) is connected to the sump by (DS-5). Dye tests verified that water entering any drain in this system ends up in the impoundment pond; however, the exact connection of this system to the main sewer line entering the pond is unclear.

There is another drain in this area located at the very north end of the tank farm. Dye poured into this drain showed up in the impoundment pond; however, its route is not clear.

At the north end of the Dinitro process area is a sump located under a railroad track. This sump clearly has an 8-inch line leaving it. Dye poured into the sump showed up at the impoundment pond; however, its route is also unclear.

3.2 Sewers in the Central Block of the South Plant

This area includes the abandoned boiler area, the compressor building, the old ammonia processing area, the caustic storage, and the drumming building. Principal sewers are located along the roadway defining the central block and down the west side of the center street.

Six round drains are located inside the abandoned boiler area. Dye poured into these drains showed up in the west ditch via the 24-inch clay pipe (WR-16). Three small square drains between the boiler area and the south road are connected to the sewer running along the south road. Dye poured into these three drains showed up in collection boxes along the south road sewer but also in the west ditch via WR-16. This means that the western drain on the south road sewer is connected to WR-16.

In the area adjacent to the compressor building, there are 5 drains which are plugged up with debris. Stormwater falling in this area collects in depressions associated with these drains until it evaporates.

Looking at the drains along the south road, the westernmost drain is connected to (WR-16) by CS-1. Going eastward along the road, CS-2 connects this drain to the next one. The 12-inch line (CS-3) connects the latter drain to the collection box located on the northwest corner of the

intersection of the south street with the center street. This collection box feeds water across the street through a 12-inch line (CS-4), receiving water from CS-3 and also from a set of drains channeling water southward along the center street (CS-5), (CS-6), (CS-7), and (CS-8). At the northeast corner of the same intersection is a collection box which receives water from a drain to the north via CS-9. This collection box routes stormwater via a 15-inch line (CS-10). The next collection box in the system receives water from the cooling tower and storage area located south of the south road.

Line X-1 is an 8-inch carbon steel line which diverts water from the storage area to the south road. Line X-2 is a culvert in front of the cooling tower which is plugged up and which connects to a drain (also plugged up) and ultimately, via a 6-inch line (X-3), connects to a drain where it joins water received via line X-1. This confluence is routed under the street in a 12-inch cast iron line (X-4) to the previously mentioned collection box located at the east end of CS-10. The 15-inch line (CS-11) diverts all this water to the collection box located at the northwest corner of the intersection of the south road and the east road. From this corner all the water travels northward through various drains and collection boxes to the northeast corner of the block via CS-12, CS-13, and CS-15. A drain located under the west end of the caustic tanks connects to this system via CS-14.

The center street is drained northward via lines labelled CS-16 through CS-22 to a collection box located at the north end of the block. This collection box is connected under the north street to the main sewer line

by a 10-inch clay pipe (CS-23). CS-24 connects an 18-inch clay process drain to the collection box at the northeast corner of the central block. This collection box is connected under the street to the main sewer line by CS-25.

3.3 Nitric-Acid Area Sewers

In the new nitric acid plant, there is an 8-inch PVC ground drain (NS-1) connected to the main sewer line. A 2-inch PVC drain originates at the sink inside the control room in this plant. A 3-inch carbon steel line originates under the plant boiler and carries blowdown to the main sewer. Ground drains located at the southwest corner of the old nitric acid plant are connected to the main sewer. Dye poured into these drains showed up in the main sewer via the collection box across the street from the office building. An old sewer originating in the Perkins plant and traveling east between the old nitric acid plant and the cooling tower has a drain next to a compressor. Dye poured into this drain showed up in the ditch along the plant road. The sewer is apparently connected to an underground north-south sewer at the foot of the shoulder, but there is also an apparent leak in the east-west line of the sewer in the vicinity of the road ditch. Drains at the cooling tower are connected to the sewer system located at the foot of the shoulder.

3.4 Main Sewer Line

A common sewer line receives water from all the previously described area sewers and diverts it to the impoundment pond. This sewer runs last from the office building to the pond and has a cross-connecting line running north-south along the foot of the shoulder dividing the upper plant area

from the railroad tracks. The east-west section consists of lines MS-1 through MS-6 and the north-south section consists of lines MS-7 through MS-11.

TABLE
PROCESS AREA DRAINAGE PIPE: MATERIAL AND DIAMETER
SOUTH PLANT
VERTAC CHEMICAL CORPORATION
VICKSBURG, MISSISSIPPI

Reference: Process Area Sewer Map

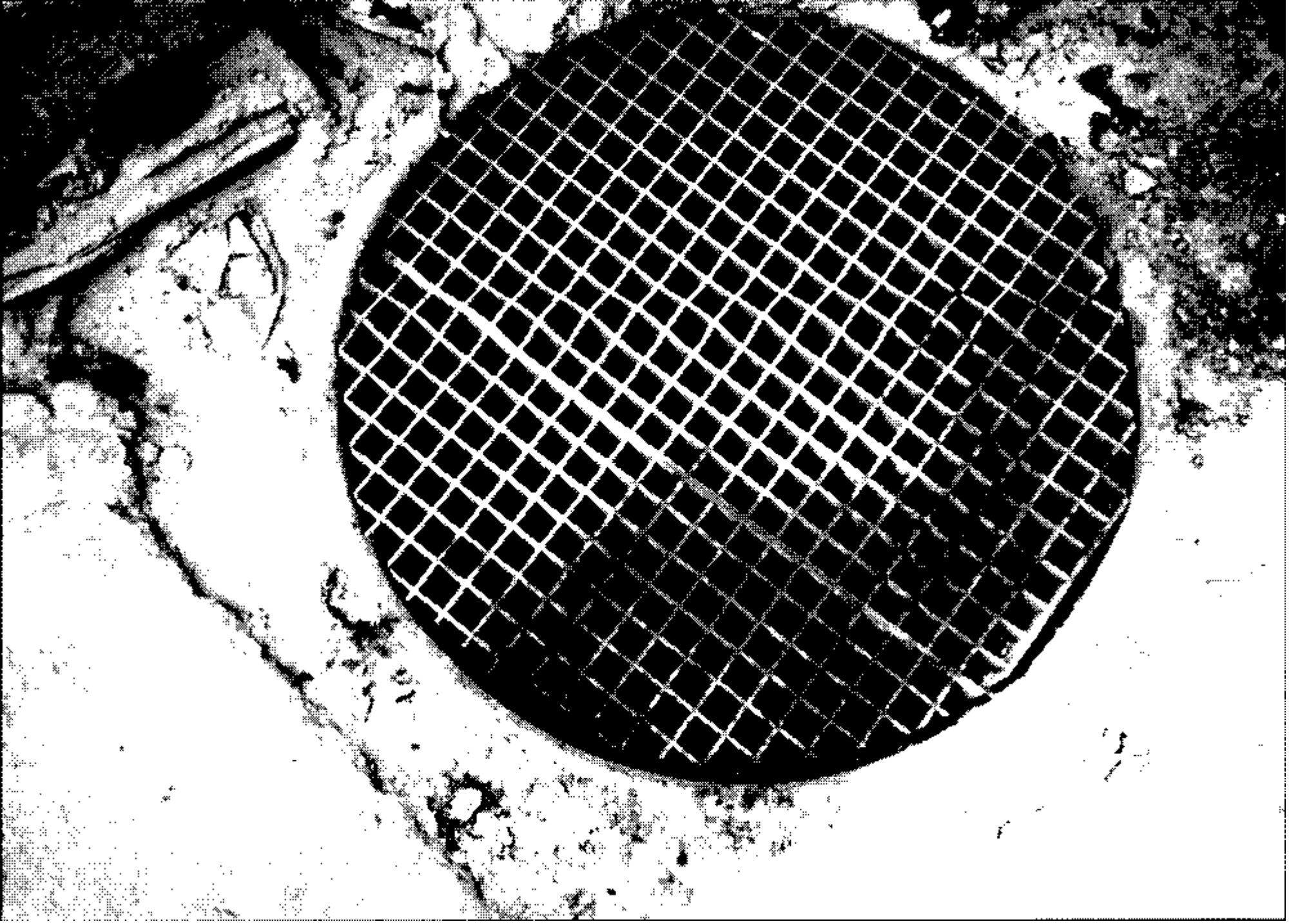
Line No.	Pipe Material	Diameter (Inches)	Dry Weather Notes (2/18-3/7/86)
DS-1	Cast Iron	6	Flowing 2 inches deep.
DS-2	Cast Iron	8	Flowing
DS-3	Cast Iron	10	Flowing
DS-4	Cast Iron	10	Flowing
DS-5	Unknown	Unknown	Not Observed
DS-6	Cast Iron	10	Dry at North End
DS-7	Cast Iron	6	Flowing
DS-8	Cast Iron	6	Flowing
DS-9	Cast Iron	6	Flowing
DS-10	Cast Iron	6	Flowing
CS-1	Unknown	Unknown	Not observed. Flow during dye test.
CS-2	Unknown	8	Stagnant
CS-3	Vitrified Clay	12	Stagnant
CS-4	Vitrified Clay	12	Stagnant
CS-5	Vitrified Clay	8	Stagnant
CS-6	Carbon Steel	8	Stagnant
CS-7	Carbon Steel	8	Stagnant
CS-8	Cast Iron	4	Dry
CS-9	Vitrified Clay	8	Flowing
CS-10	Vitrified Clay	15	Flowing 2 inches deep
CS-11	Vitrified Clay	15	Flowing 2 inches deep
CS-12	Reinforced Concrete	18	Flowing 2 inches deep
CS-13	Reinforced Concrete	24	Flowing 2 inches deep
CS-14	Vitrified Clay	12	Flowing
CS-15	Vitrified Clay	15	Flowing 3 inches deep
CS-16	Cast Iron	4	Dry
CS-17	Reinforced Concrete	12	Stagnant
CS-18	Reinforced Concrete	12	Flowing 1 inch deep
CS-19	Cast Iron	4	Dry
CS-20	Vitrified Clay	12	Flowing 1 inch deep
CS-21	Vitrified Clay	8	Dry
CS-22	Vitrified Clay	12	Flowing 2 inches deep
CS-23	Vitrified Clay	10	Flowing 4 inches deep
CS-24	Vitrified Clay	18	Flowing half-full
CS-25	Unknown	Unknown	Flowing
NS-1	Plastic-PVC	8	Dry
MS-1	Vitrified Clay	15	Flowing
MS-2	Unknown	Unknown	Flowing
MS-3	Unknown	Unknown	Flowing

TABLE
PROCESS AREA DRAINAGE PIPE: MATERIAL AND DIAMETER
SOUTH PLANT
VERTAC CHEMICAL CORPORATION
VICKSBURG, MISSISSIPPI
(CONTINUED)

Reference: Process Area Sewer Map

Line No.	Pipe Material	Diameter (Inches)	Dry Weather Notes (2/18-3/7/86)
MS-4	Unknown	Unknown	Flowing
MS-5	Unknown	Unknown	Flowing
MS-6	Plastic-FRP	24	Flowing 3/4 full
MS-7	Unknown	Unknown	Not observed
MS-8	Unknown	Unknown	Not observed
MS-9	Unknown	Unknown	Flowing
MS-10	Vitrified Clay	10	Flowing 4 inches deep
MS-11	Vitrified Clay	10	Flowing 4 inches deep
X-1	Carbon Steel	8	Dry
X-2	Carbon Steel	6	Dry
X-3	Carbon Steel	6	Dry
X-4	Cast Iron	12	Dry

1.1 Overview of the Drum Storage Area (SWMU 1) located in the vicinity of the Former Atrazine Production Area (SWMU 16) in the south section of the South Plant. The view is facing northwest. Note the dinoseb stains (yellow color) on the concrete. Many reports describe the Returned Product Storage Area (SWMU 17) as being indistinguishable from the Drum Storage Area (SWMU 1).



1.2 Close-up of the sump which received runoff from both the Drum Storage Area (SWMU 1) and the Returned Product Storage Area (SWMU 17). The contents of the sump are periodically emptied via the Vacuum Truck (SWMU 21). Note the poor condition of the concrete surrounding the sump and the white chalky substance that appeared to be atrazine. There was a strong atrazine like odor noted in the vicinity of the unit.

2.1 View of the Inactive Landfill (SWMU 2) located in the southeast section of the South Plant. The view is facing southeast. The photograph is a part of a panorama which is continued in subsequent photographs 2.2 through 2.3.

2.2 Continuation of Photograph 2.1 showing the Inactive Landfill (SWMU 2) facing south (right) to east (left).

2.3 Continuation of Photograph 2.2 showing the Inactive Landfill (SWMU 2) facing east (right) to northeast (left).

2.4 View of the Inactive Landfill (SWMU 2) facing north. The structure in the background is the City of Vicksburg water treatment plant.

2.5 View of the east section of the South Plant showing the slope of the hill between the Inactive Landfill (SWMU 2) and the South Plant Surface Impoundments (SWMU 3). The landfill is located at the top of the hill to the right of the photograph and the impoundments are located to the left of the photograph. The slope of the hillside is covered with a geotextile fabric in order to prevent soil erosion from interrupting the retrofitting activities being conducted at the impoundments. The view is facing east.

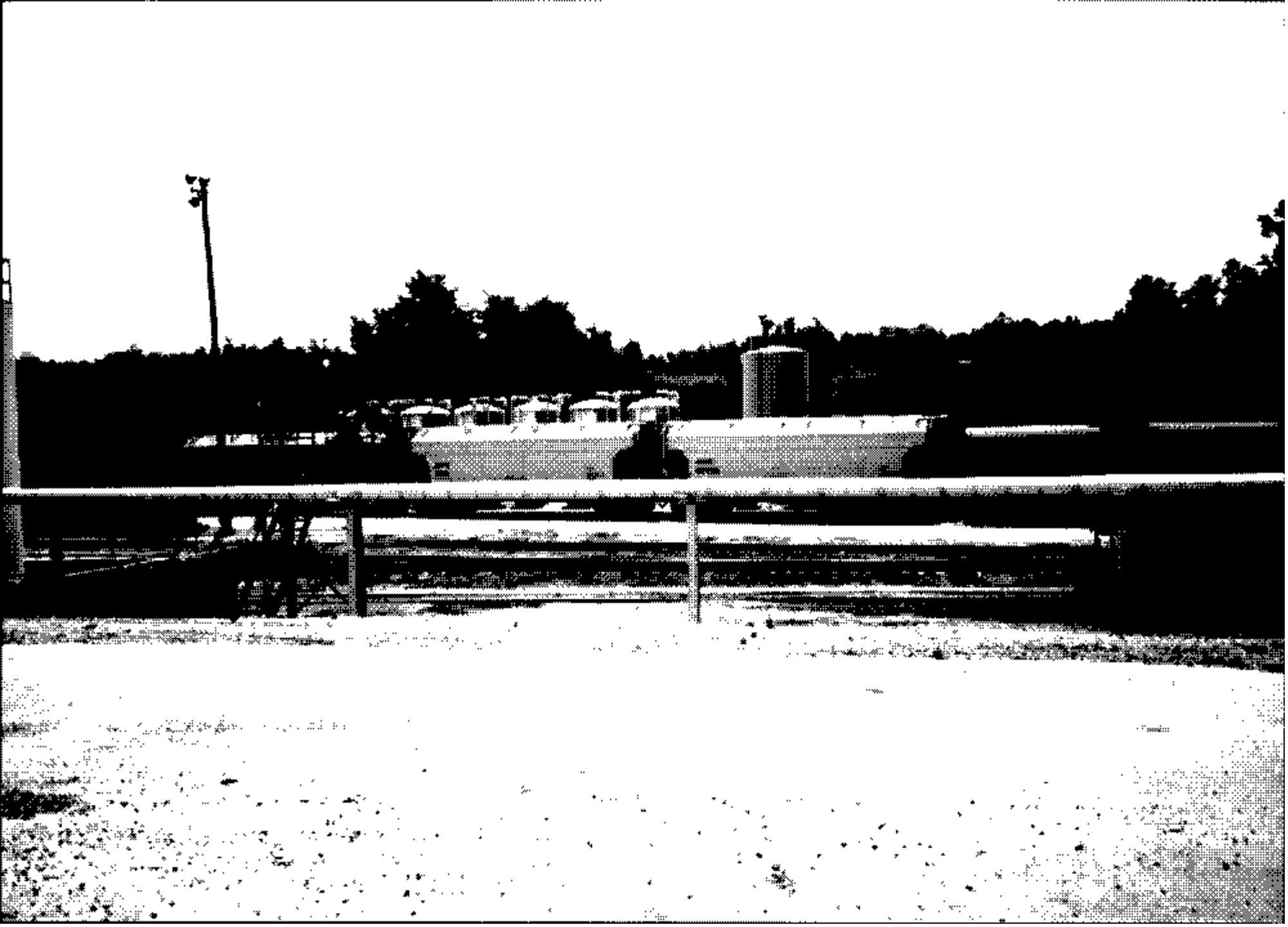
3.1 View of the South Plant Surface Impoundments (SWMU 3) showing the retrofitting activities being conducted at the Impoundment A (SWMU 3a). The view is facing northeast. The photograph is part of a panorama which is continued in photograph 3.2. Impoundment C (SWMU 3c) is located in the upper-left corner of the photograph indicated by the water discharging from the Lift Station.

3.2 Continuation of photograph 3.1 showing the South Plant Surface Impoundment A (SWMU 3a). The view is facing east.

3.3 View of South Plant Surface Impoundment C (SWMU 3c) facing northeast. Note the sheen on the water surface in the vicinity of the pipe in the lower left-hand corner of the photograph.

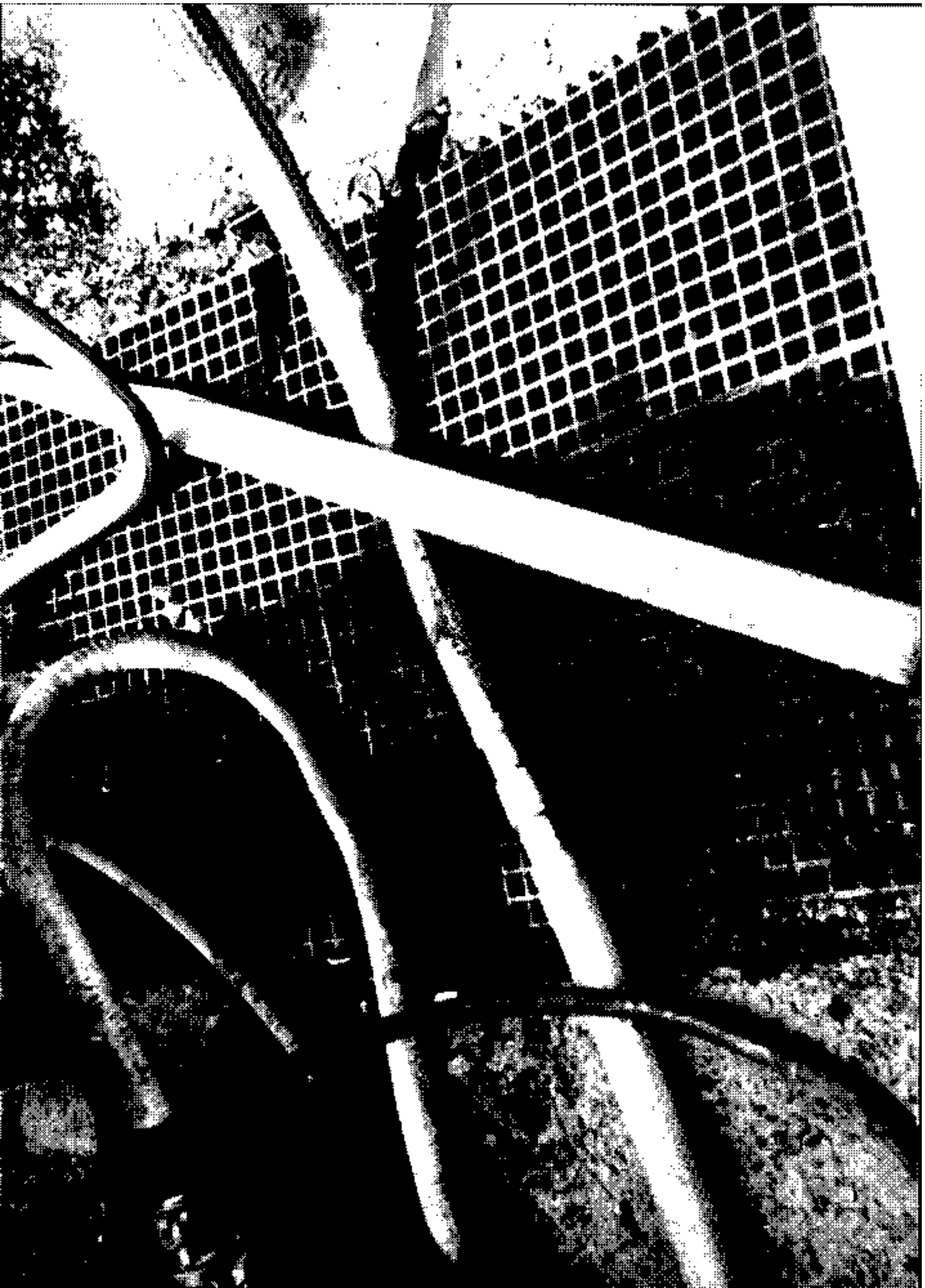
3.4 Close-up of the south edge of the South Plant Surface Impoundment C (SWMU 3c) showing soil stained with dinoseb.

3.5 View of South Plant Surface Impoundment B (SWMU 3b) facing southeast. Part of the Solid Waste Consolidation Area (SWMU 3d) can be seen in the upper-right hand corner of the photograph.

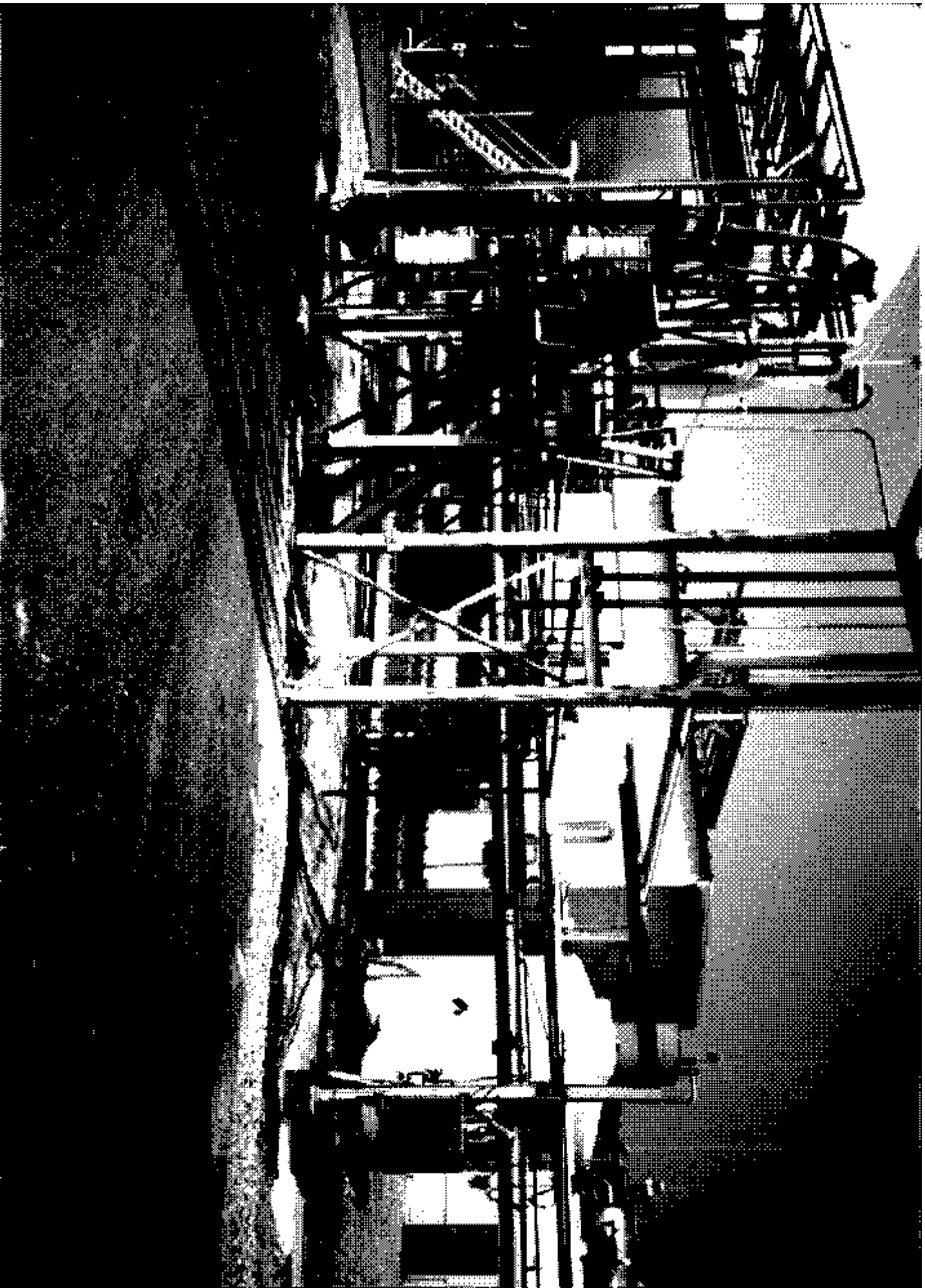


4.1 Overview of the South Plant facing southeast showing the Carbon Adsorption System (SWMU 4). The Carbon Adsorption System (SWMU 4) is the series of tanks situated beyond the railcars. A portion of the Dinoseb Off-loading Area (SWMU 8) is shown in the lower-left corner of the photograph and the Inactive Landfill (SWMU 2) is shown in the upper-left corner of the photograph.

4.2 View of the Carbon Adsorption System (SWMU 4) facing south. The tank shown in the photograph is one of the carbon columns. Note the yellow stains on the concrete pad.



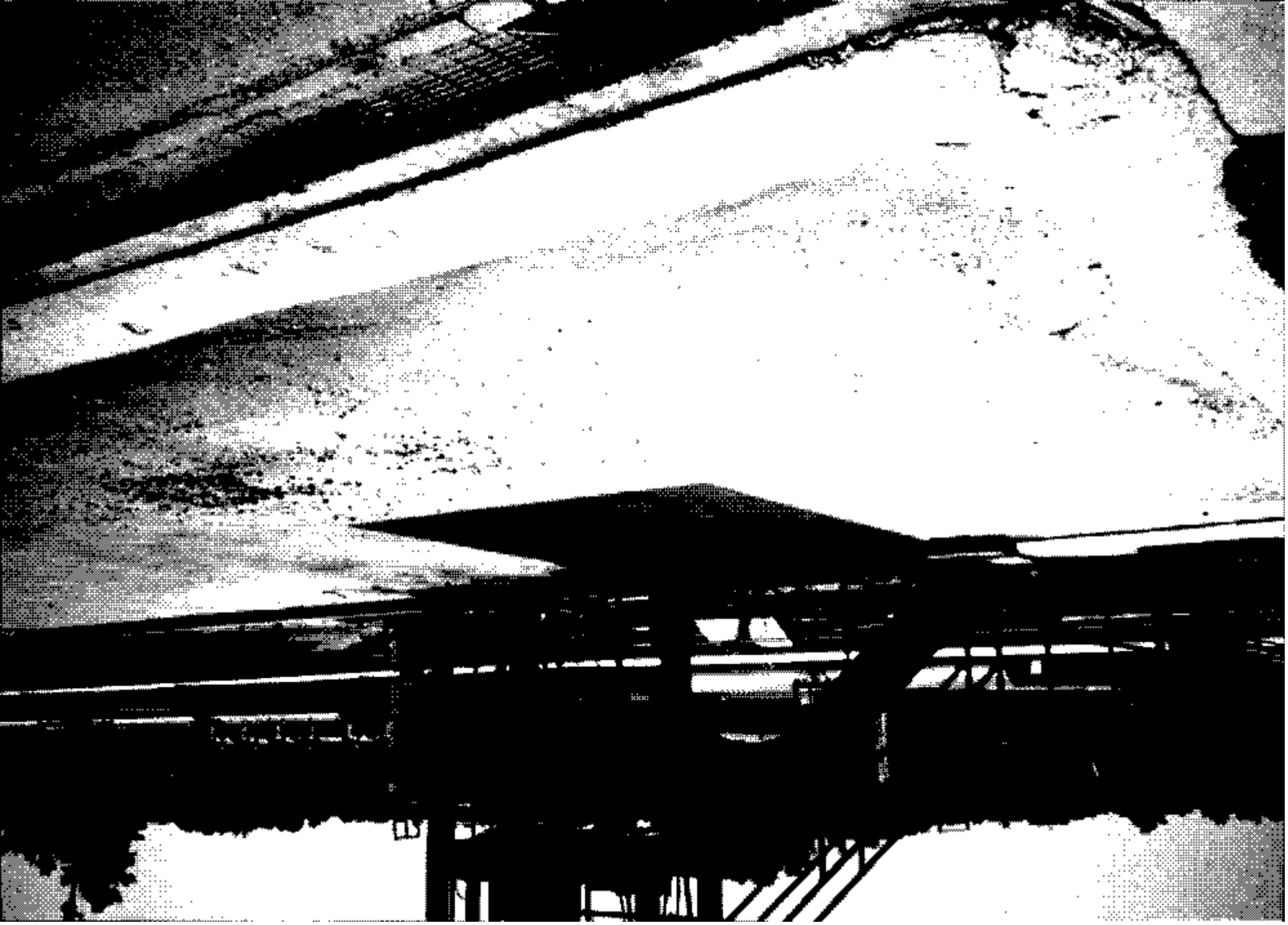
4.3 Close-up of the sump for the Carbon Adsorption System (SWMU 4) which is used for receiving collected wastewater from the Vacuum Truck (SWMU 21). Note the eroded condition of the concrete.



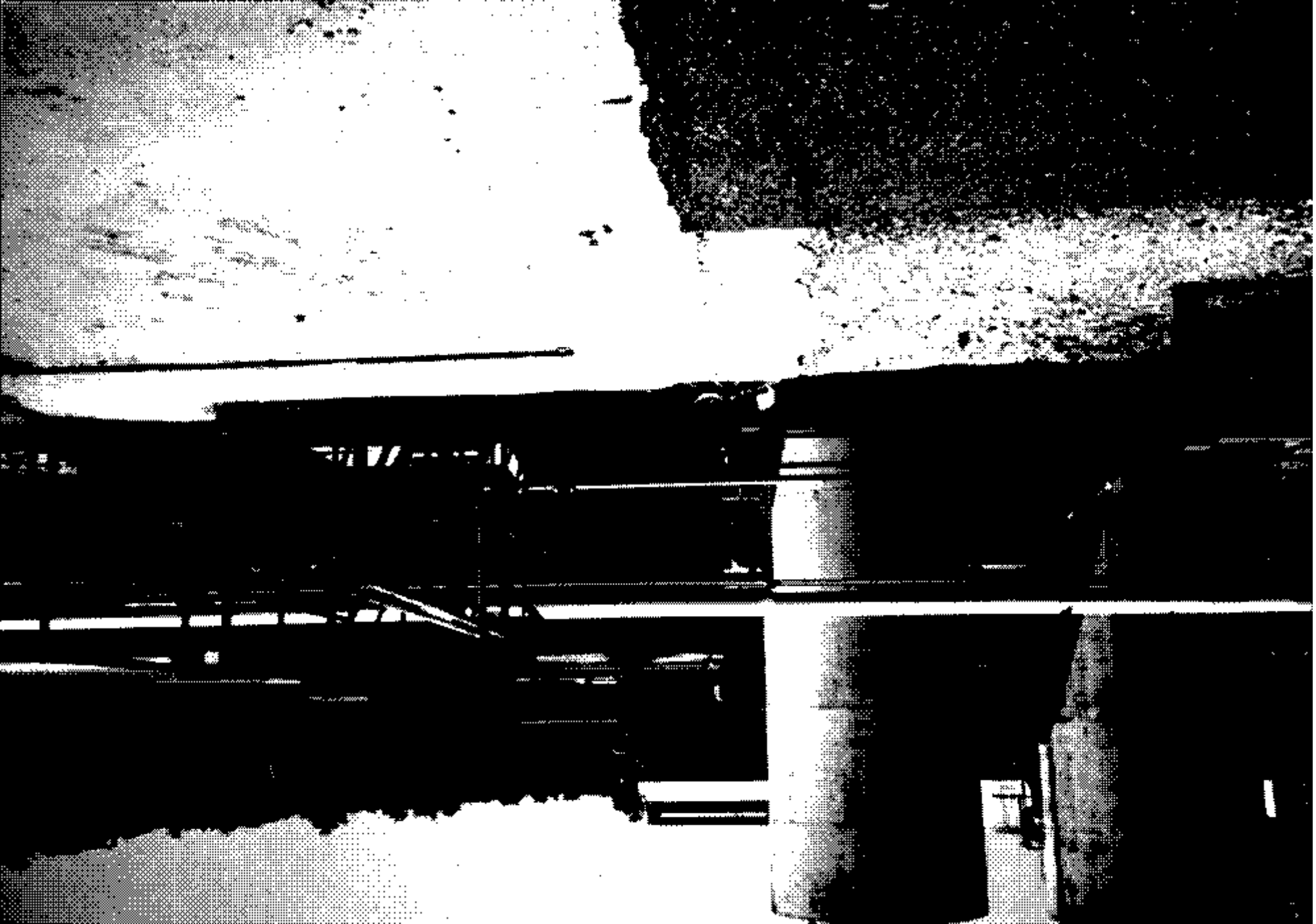
5.1 View of the central section of the South Plant showing a portion of the Nitric Acid Production Area and one of the ditches that are part of the South Plant Drainage System (SWMU 5). The Former Blue Tank (SWMU 18) was reportedly situated at this location. The view is facing northwest.

6.1 Overview of the northwest section of the South Plant showing the former location of the South Plant Hill Tank (SWMU 6). The South Plant Hill Tank (SWMU 6) was reportedly located in the left center of the photograph. A loading station was situated in the vicinity of the tree shown in the left-center of the photograph. The view is facing southeast. Note the brown vegetation around the area.

7.1 View of the Former Dinoseb Production Area (SWMU 7) located in the central section of the South Plant. The view is facing northwest. Note the yellow stains on the concrete and surrounding gravel-covered area.



8.1 View of the Dinoseb Off-Loading Area (SWMU 8) located in the central section of the South Plant. The view is facing southeast. Note the poor condition of the concrete curb shown in the lower-left corner of the photograph. The Carbon Adsorption System (SWMU 4) can be seen in the upper right hand corner of the photograph.



8.2 View of the Dinoseb Off-Loading Area (SWMU 8) showing the former storage tanks. The tank on the left previously contained toluene and the small brown tank on the right contained versene. Facility representatives could not provide information pertaining to the contents of the tank in the center.

8.3 Close-up of the sump in the Dinoseb Off-Loading Area (SWMU 8) located in the southwest corner of the pad. Note the poor condition of the concrete and the yellow-brown dinoseb scum floating on the surface of the water within the sump. The contents of the sump are periodically emptied via the Vacuum Truck (SWMU 21).

9.1 View of the Dinoseb Drumming Area and Drains (SWMU 9) located in the vicinity of the Dinoseb Off-Loading Area (SWMU 8) in the central section of the South Plant. The drums shown in the left-center of the photograph are empty.

10.1 View of the Dinoseb Stock Storage Area (SWMU 10) located inside a warehouse in the central section of the South Plant.

11.1 View of the Former MSMA Production Area (SWMU 11) located in the central section of the South Plant. The view is facing east. The three drums contain floor sweeping from the former production area that may contain hazardous constituents. This area was also the location of the Former Methyl Parathion Production Area (SWMU 15).

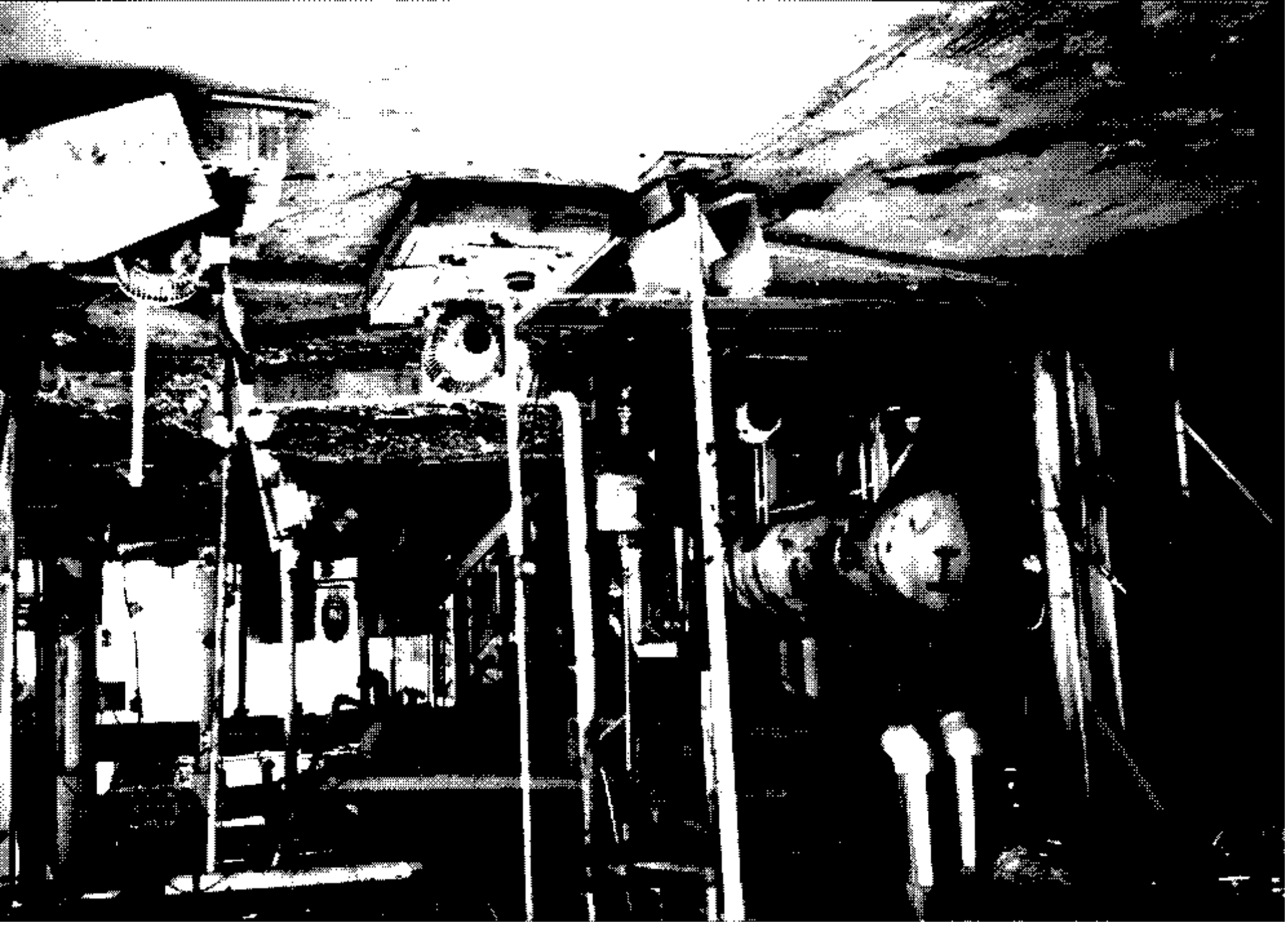
9.1 View of the Dinoseb Drumming Area and Drains (SWMU 9) located in the vicinity of the Dinoseb Off-Loading Area (SWMU 8) in the central section of the South Plant. The drums shown in the left-center of the photograph are empty.

11.2 View of the Former MSMA Production Area (SWMU 11) showing some process area drains. A portion of the Former MSMA Salt Unloading Area (SWMU 12) is shown in the lower-right corner of the photograph.

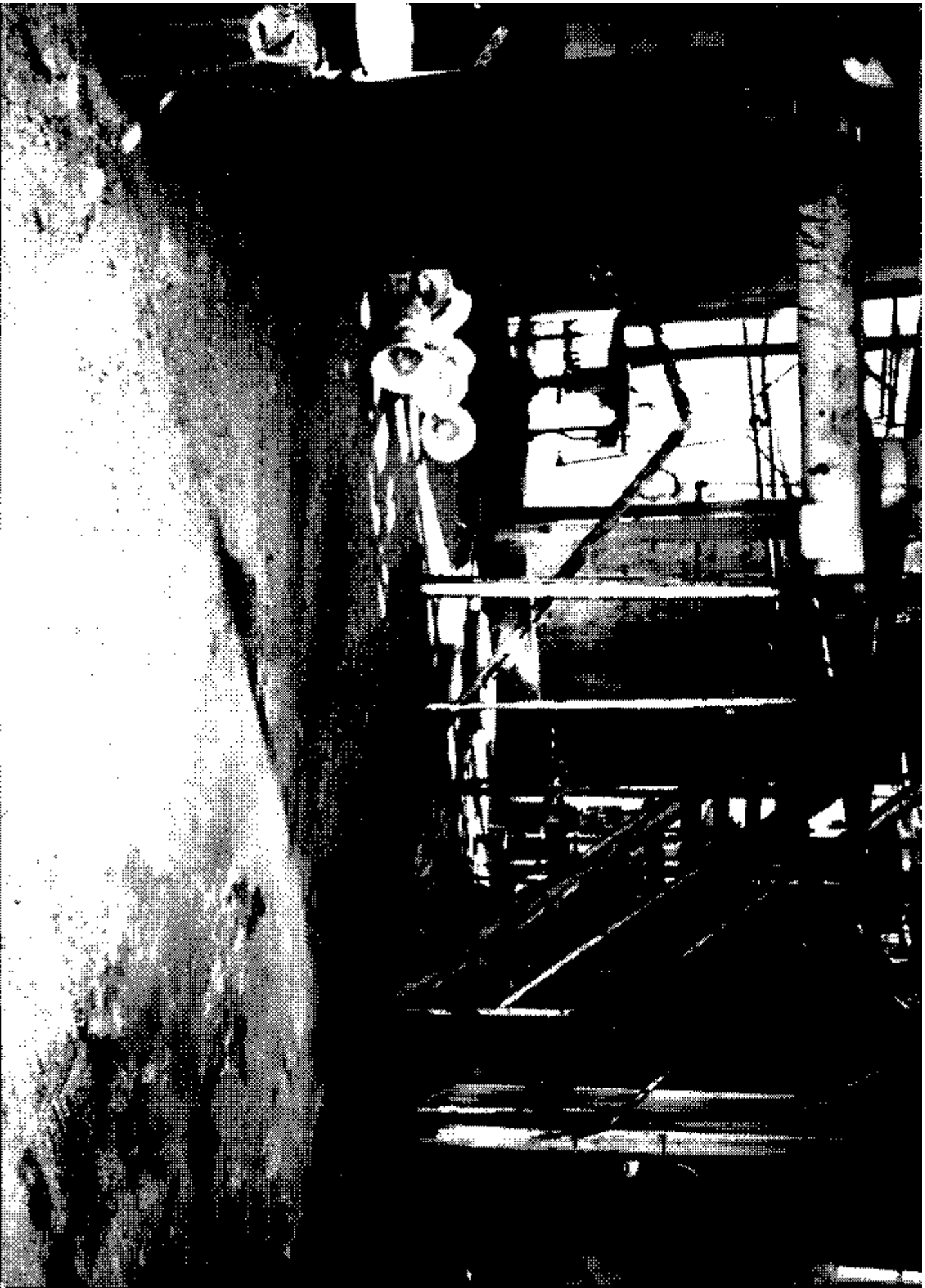
12.1 View of the Former MSMA Salt Unloading Area (SWMU 12) facing south. The waste accumulated in the area is from the dismantling activities associated with the former production area.

12.2 Close-up of the secondary containment for the Former MSMA Salt Unloading Area (SWMU 12). Note the poor condition of the unit.

14.1 View of the Former Toxaphene Production Area (SWMU 14) located in the central section of the South Plant. The view is facing northwest.

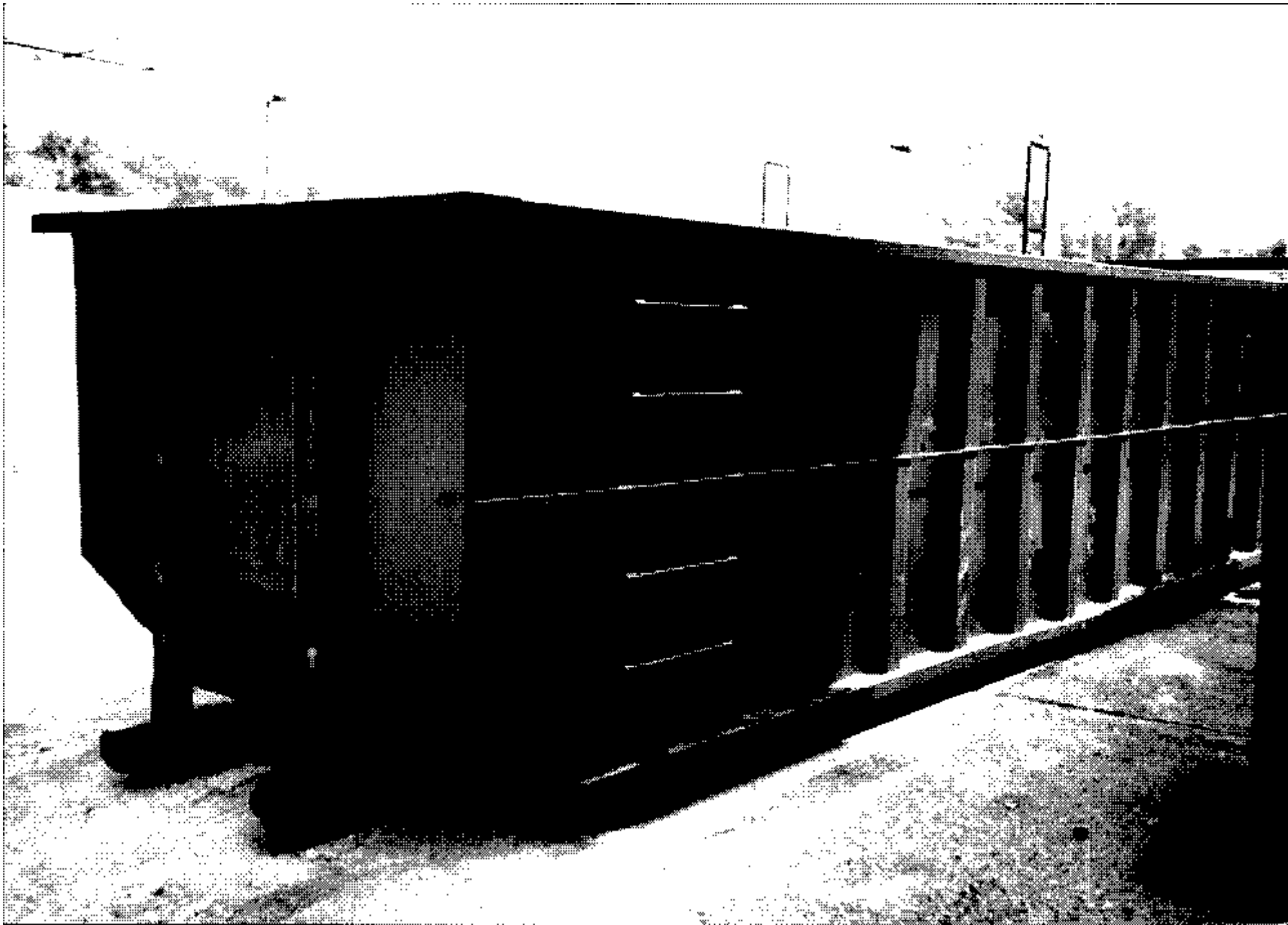


16.1 Panorama of the Former Atrazine Production Area (SWMU 16) located in the south section of the South Plant. The view is facing south and is continued to the east in photograph 16.2.



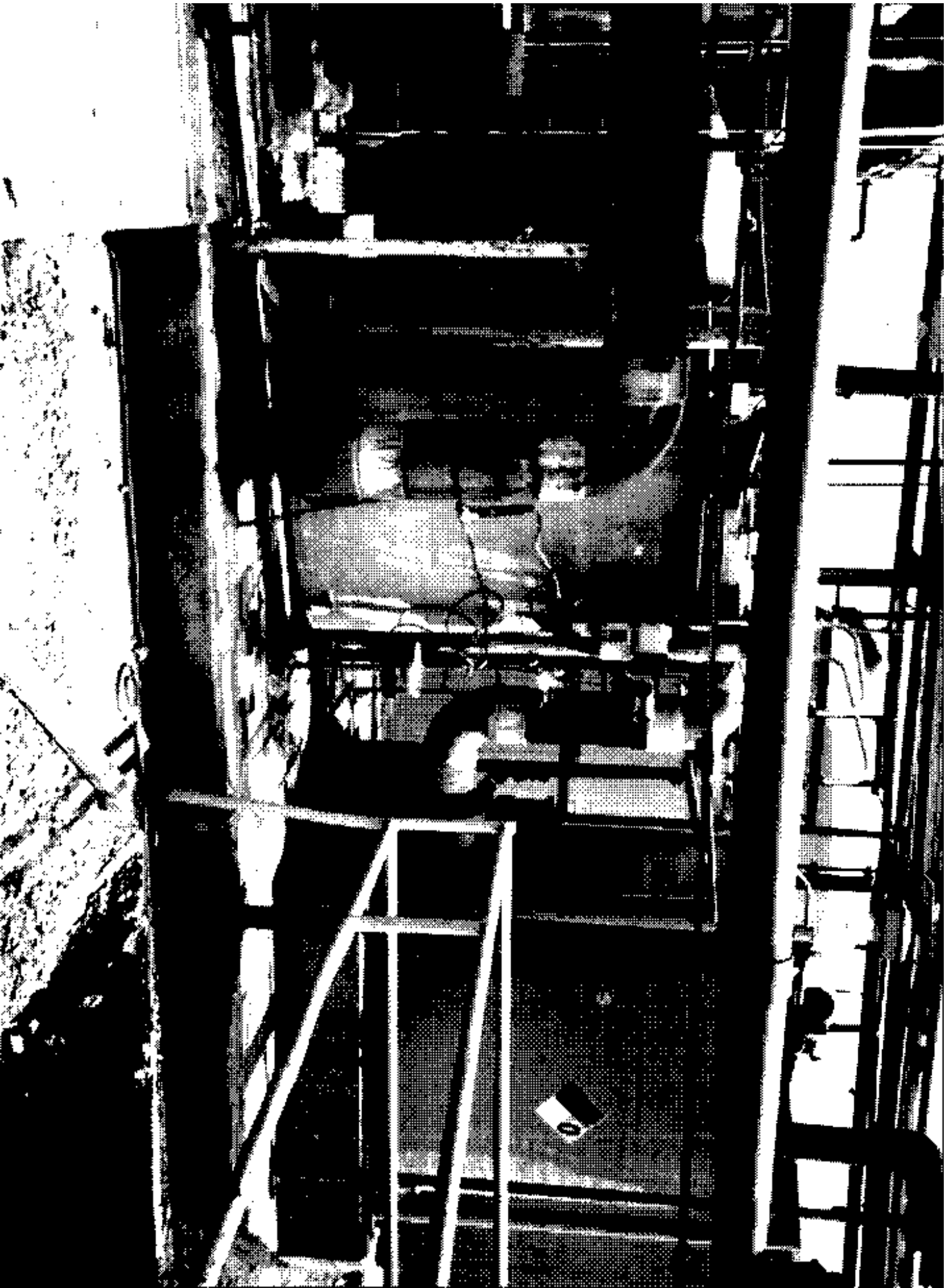
16.2 Continuation of photograph 16.1 showing the Former Atrazine Production Area (SWMU 16).

16.3 View of the Former Atrazine Production Area (SWMU 16) in the south section of the facility. Note the orange stains on the concrete floor and along the curbing. The drum reportedly contains floor sweepings from the area, possibly including atrazine.



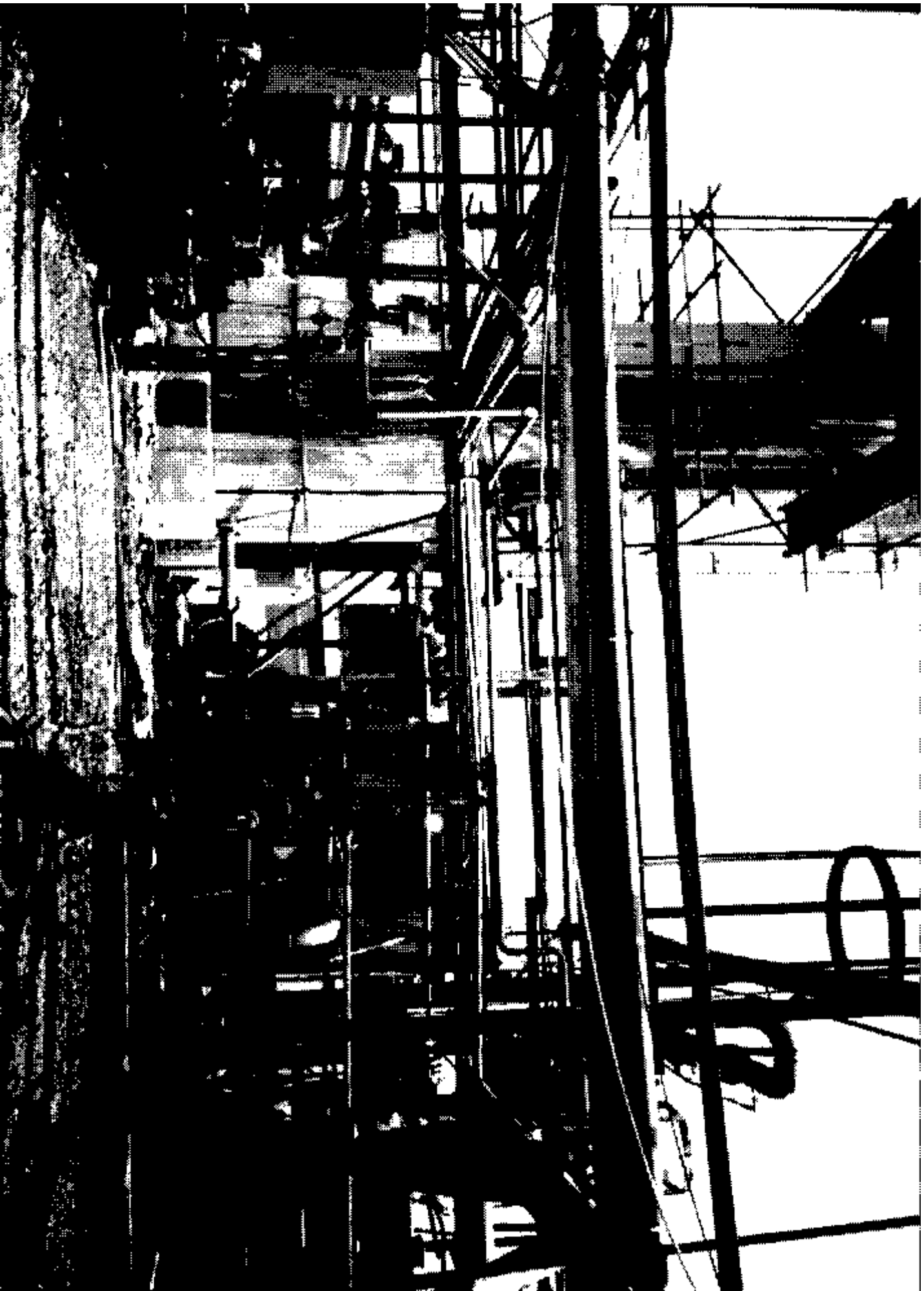
19.1 View of the Scrap Metal Dumpster (SWMU 19) located outside the Former MSMA Production Area (SWMU 11) in the central section of the South Plant. The view is facing northwest.

21.1 View of the Vacuum Truck (SWMU 21) shown parked in the vicinity of the Dinoseb Off-Loading Area (SWMU 8) in the central section of the South Plant. The view is facing southeast.



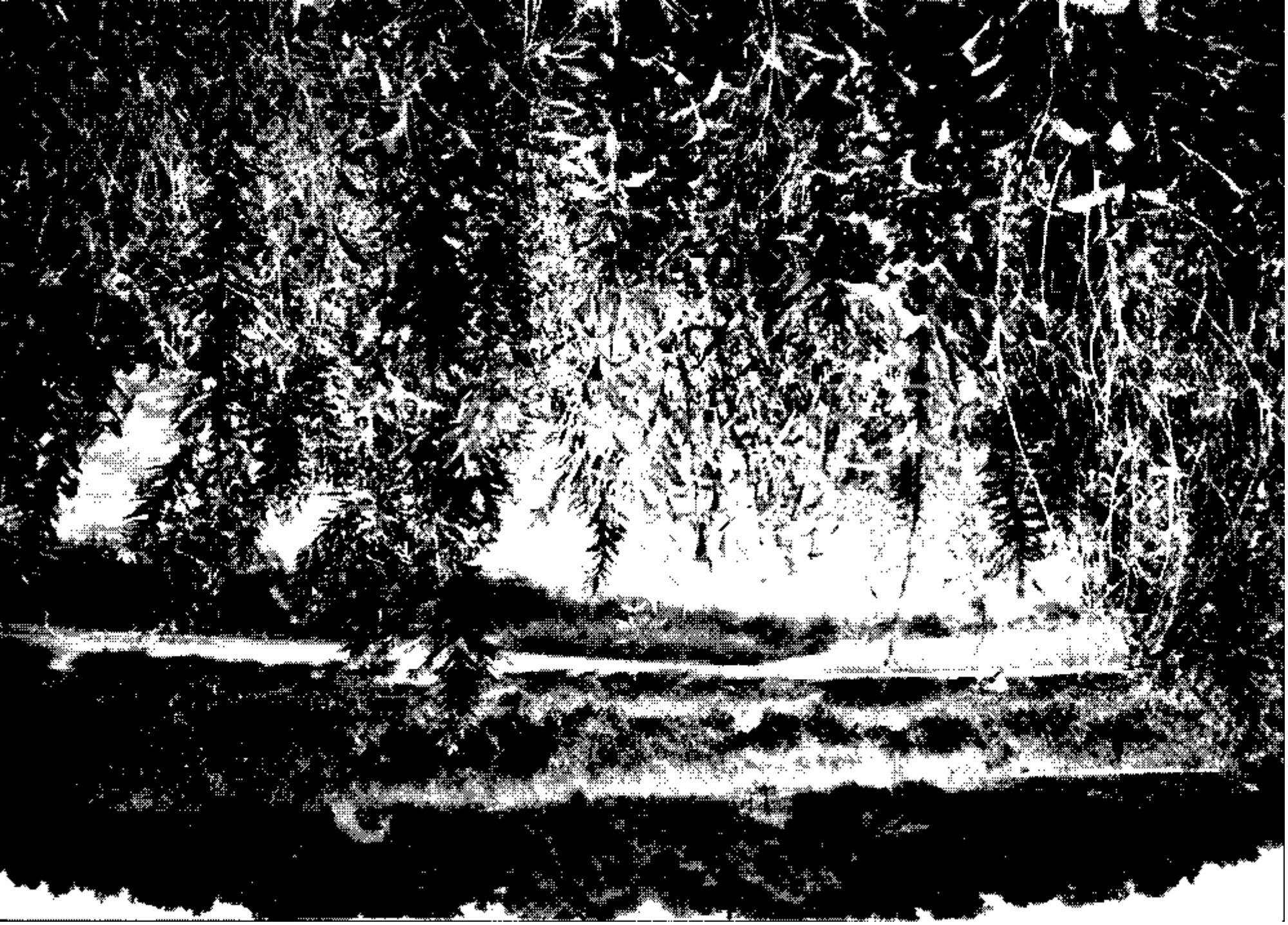
22.1 View of the neutralization tanks that are part of the North Plant Neutralization System (SWMU 22). The unit is located in the central section of the North Plant. The view is facing east. The piping seen here is part of the Wastewater Pipes (SWMU 25).

22.2 Close-up of the sump which is part of the North Plant Neutralization System (SWMU 22). The view is facing east.

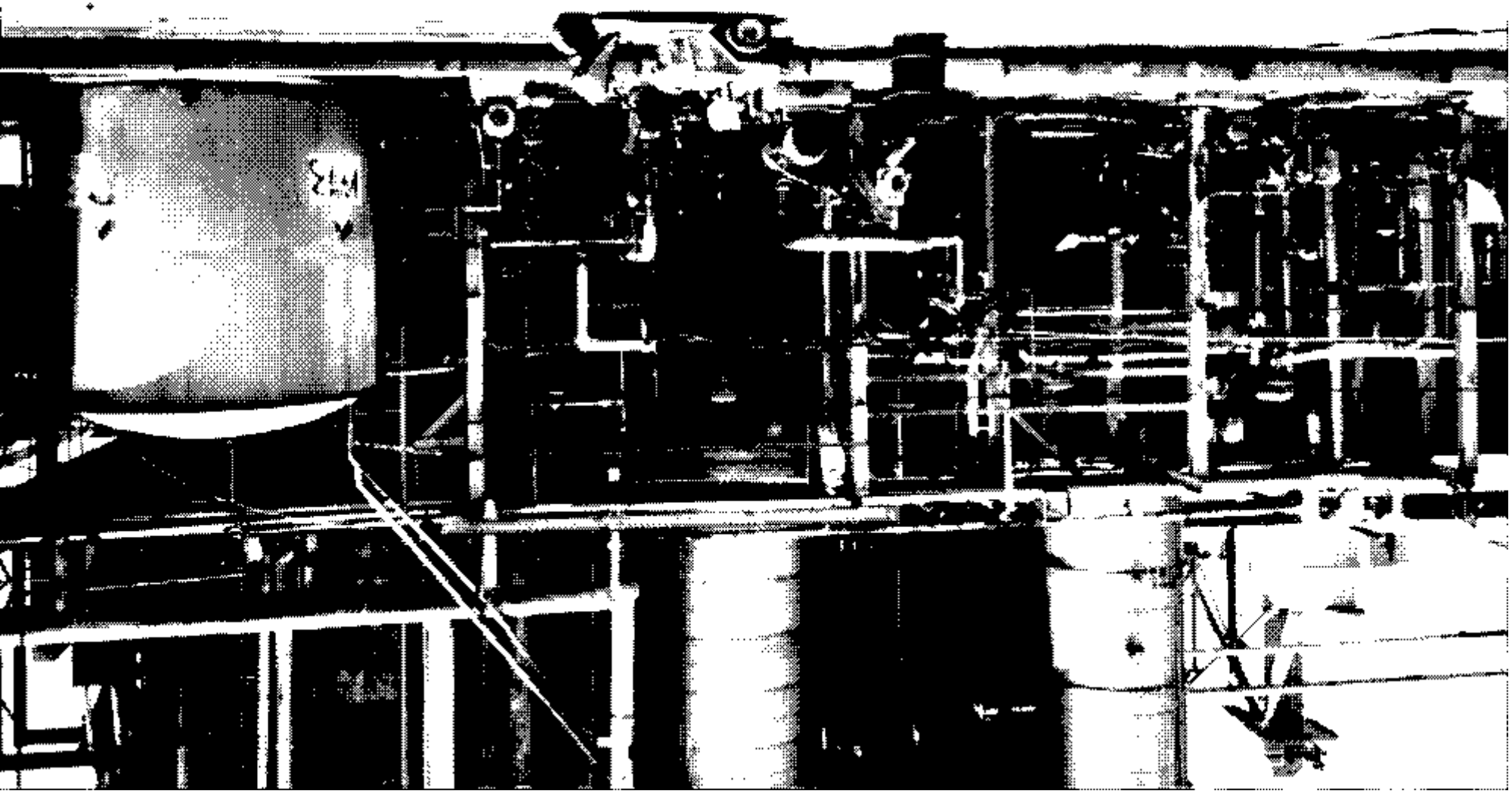


22.3 View of the central section of the North Plant showing the sump for the North Plant Neutralization System (SWMU 22) and the C-10 Scrubber (SWMU 26). The view is facing east.

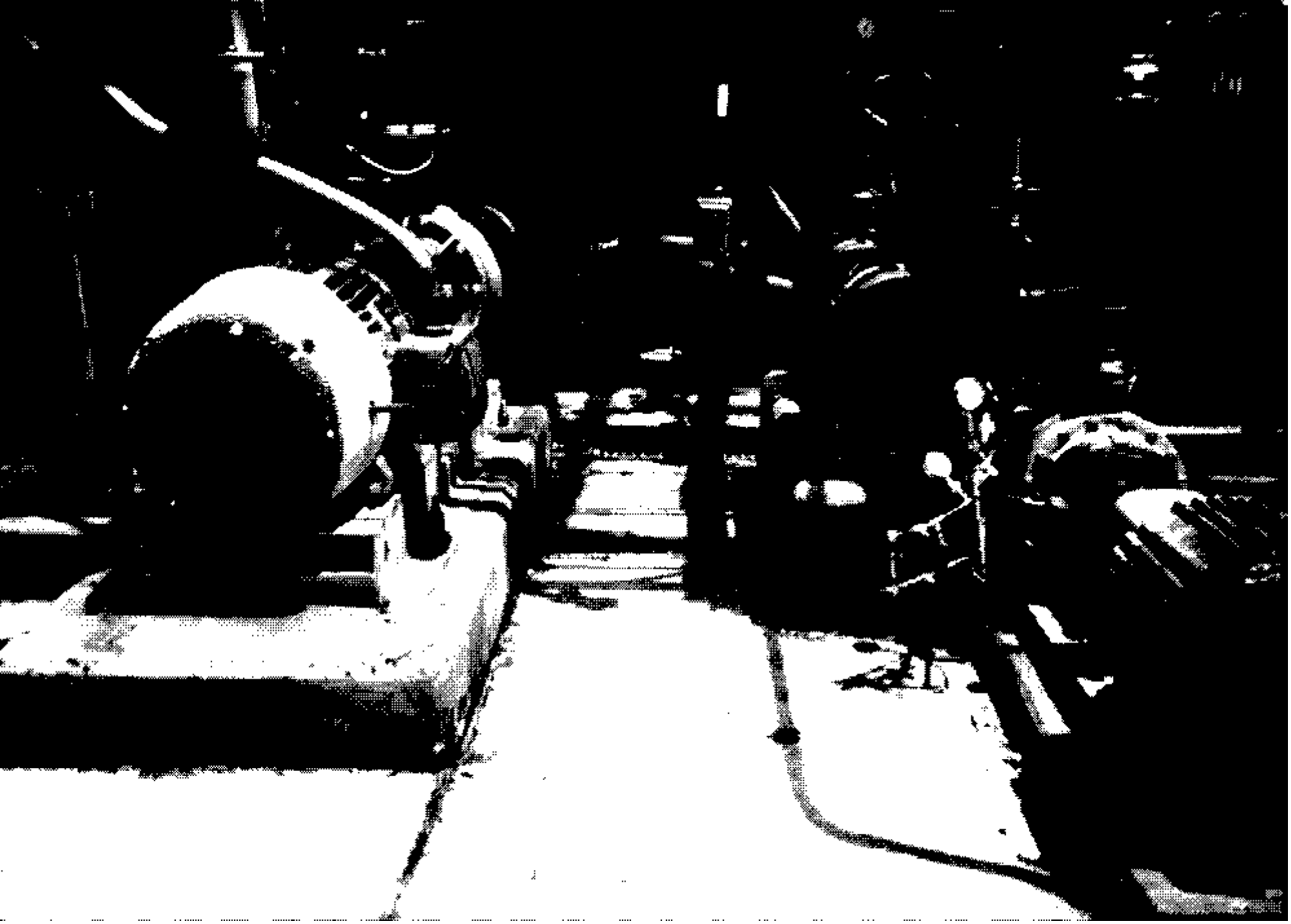
23.1 View of the Inactive North Plant Surface Impoundment (SWMU 23) located in the south section of the North Plant. The view is facing southeast. The area indicated by an arrow shows the pit that held limestone used to neutralize the wastewaters.



23.2 View of the Inactive North Plant Surface Impoundment (SWMU 23) facing east. The unit reportedly contained rainwater at the time of the VSI.



24.1 View of the North Plant Containment System (SWMU 24) and the Wastewater Pipes (SWMU 25) located in the central section of the North Plant.

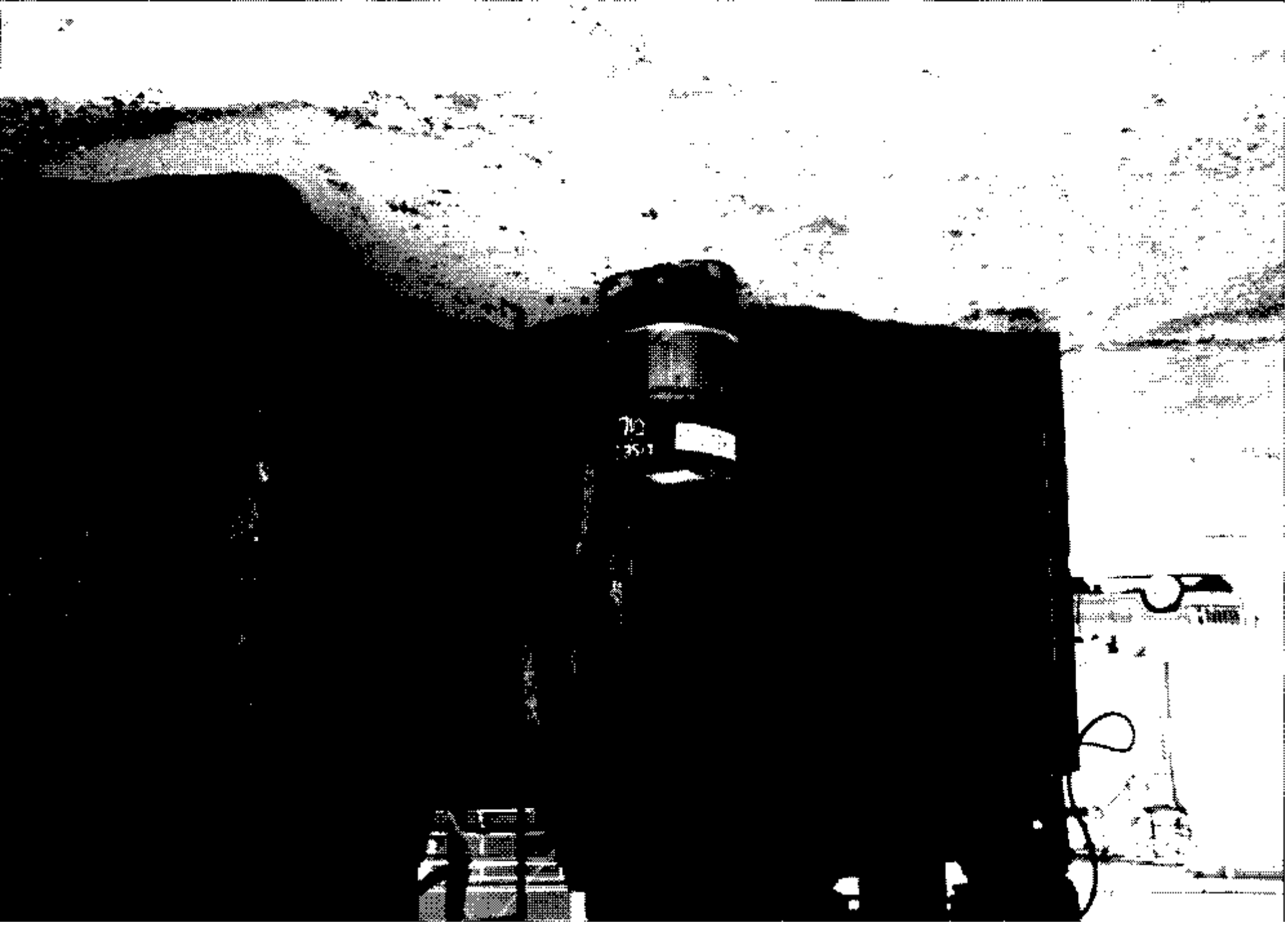


24.2 Close-up of the North Plant Containment System (SWMU 24) showing one of the trenches.

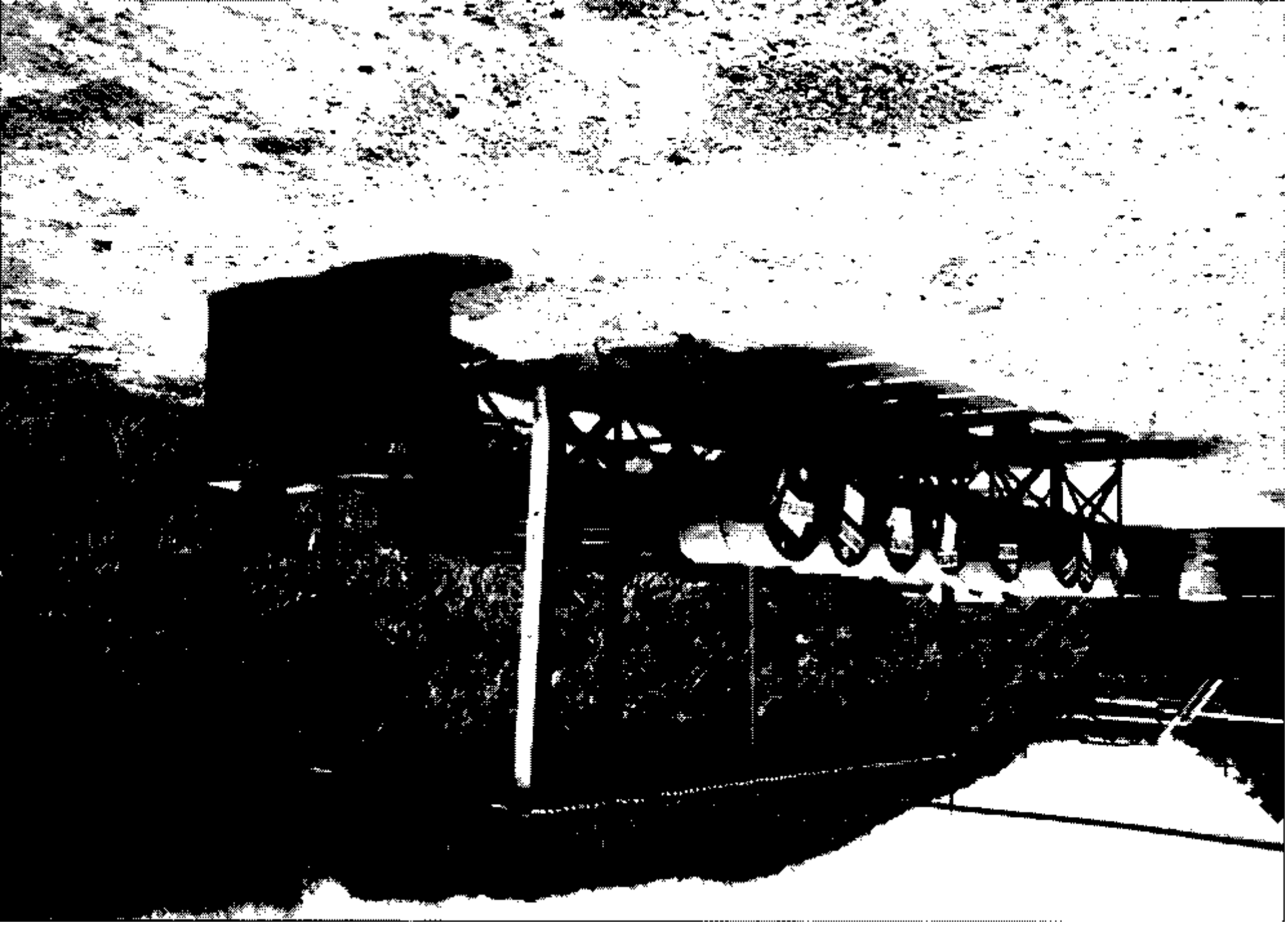
26.1 View of the C-10 Scrubber (SWMU 26) located in the central section of the North Plant. The view is facing east. Note the emissions indicated by an arrow.

27.1 View of the Cooler Scrubber (SWMU 27) located in the central section of the North Plant. The view is facing southeast.

28.1 View of the End Product Scrubber (SWMU 28) located in the central section of the North Plant. The view is facing south.



29.1 View of the Oil Collection Unit (SWMU 29) located beneath the potassium nitrate cooler in the central section of the North Plant. Note the oil stains along the wall and the thick pile of absorbent in the vicinity of the drum.



30.1 View of the Waste Oil SAA (SWMU 30) located in the south section of the North Plant. The view is facing southeast.

31.1 View of the No. 6 Fuel Oil Area (SWMU 31) located in the south section of the North Plant. The view is facing south. Note the accumulated fuel oil within the sump.

32.1 View of the C-15 Scrubber (SWMU 32) located in the central area of the North Plant, adjacent to the Crystalization Area.

CDM FEDERAL PROGRAMS CORPORATION

January 17, 1992

Mr. J.R. Finney
Work Assignment Manager
U.S. Environmental Protection Agency
345 Courtland Street, NE
Atlanta, Georgia 30365

PROJECT NO: EPA Contract No. 68-W9-0004
DOCUMENT NO: TES7-R04019-EP-CQXB
SUBJECT: RCRA Facility Assessment - Interim Final Report
Cedar Chemical Corporation, EPA I.D. No. MSD990714081
Vicksburg, Mississippi
Document No. TES7-R04019-FR-CQXV-2

Dear Mr. Finney:

This letter documents the transmittal of the above referenced TES VII document as partial fulfillment of the reporting requirements for Work Assignment R04019.

If you have any comments regarding this deliverable, please contact me at (404) 952-7393, within two weeks of receipt of this letter.

Sincerely,

CDM FEDERAL PROGRAMS CORPORATION

Robert Rose
TES VII Region IV Manager

RR/ln

Attachment

cc: Jean Wright, EPA HQ TES VII Zone Project Officer
Rowena Sheffield, EPA Regional Project Officer, RCRA (w/attach.)
Constance V. Braun, FPC Program Manager
Denise Turner, A.T. Kearney
Kate Fox, S.A.I.C.
Document Control (w/attach.)
File: TES7/R04019

2030 Powers Ferry Road, Suite 490 Atlanta, GA 30339 404 952-7393

[redacted]

CDM FEDERAL PROGRAMS CORPORATION

CDM FEDERAL PROGRAMS CORPORATION

November 7, 1990

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JAN - 2 1991
Dept. of Environmental Quality
Bureau of Pollution Control

Mr. Doyle Brittain
Work Assignment Manager
U.S. Environmental Protection Agency
345 Courtland Street
Atlanta, GA 30365

PROJECT: EPA Contract No.: 68-W9-0004

DOCUMENT NO: TES7-R04019-EP-BZGD

SUBJECT: Draft RCRA RFA Report for WA R04019
Cedar Chemical Corporation, Vicksburg, MS
Document No. TES7-R04019-RT-BZGF-2

Dear Mr. Brittain:

This letter documents the transmittal of the above referenced TES VII document as partial fulfillment of the reporting requirements for work assignment R04019. Two copies are enclosed for your convenience.

If you have any questions or comments regarding this submittal, please contact Tony Isolda or myself at (404) 952-7393, within two weeks of receipt of this letter.

Sincerely,

CDM FEDERAL PROGRAMS CORPORATION

Abel B. Dunning
TES VII Region IV Manager

TI/ABD/ln

cc: Jean Wright, EPA HQ TES VII Zone Project Officer
Rowena Sheffield, EPA Regional Project Officer, RCRA Region IV w/encl
Toby Cook, MDNR
Fran Hallahan, SAIC
Jim Levin, A.T. Kearney
Constance V. Braun, FPC Program Manager
Document Control (2)
File TES7/R04019

DRAFT RFA REPORT

CEDAR CHEMICAL CORPORATION
VICKSBURG, MS

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Waste Programs Enforcement
Washington, D.C. 20460

Work Assignment No.	: R04019
EPA Region	: IV
Site No.	: MSD990714081
Contract No.	: 68-W9-0004
CDM Federal Programs Corporation Document No.	: TES7-R04019-RT-BZGF-2
Prepared by	: A.T. Kearney
Work Assignment Project Manager	: Tony Isolda
Telephone Number	: (404) 952-7393
Primary Contact	: Doyle Brittain
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Date Prepared	: November 7, 1990

D R A F T

E N F O R C E M E N T C O N F I D E N T I A L

TABLE OF CONTENTS

I. EXECUTIVE SUMMARY 1

II. INTRODUCTION 9
A. File Search and VSI 9
B. Facility History 10
C. Regulatory History 14
D. Process Description 25
E. Waste Management 28
F. Environmental and Demographic Setting 29
1. Meteorology 29
2. Floodplain and Surface Waters 30
3. Soils and Geology 30
4. Groundwater 31

III. SWMU DESCRIPTIONS 34

IV. SUMMARY 84

V. SUGGESTED SAMPLING STRATEGY 90

VI. REFERENCES 92

APPENDIX A: VSI Log Books 113

APPENDIX B: VSI Photograph Log 114

ENFORCEMENT
CONFIDENTIAL

LIST OF TABLES

TABLE I-1 4
TABLE II-1 20
TABLE IV-1 85
TABLE IV-2 86
TABLE IV-3 87
TABLE IV-4 88
TABLE IV-5 89
TABLE V-1 90

ENFORCEMENT
CONFIDENTIAL

LIST OF FIGURES

FIGURE II-1	Facility Location Map	11
FIGURE II-2	Cedar Chemical Corporation Vicksburg Facility	12
FIGURE II-3	Monitoring Well Locations	33
FIGURE III-1	South Plant SWMU Map	35
FIGURE III-2	Area Specific SWMU Map	65
FIGURE III-3	North Plant SWMU Map	66

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I. EXECUTIVE SUMMARY

The 1984 Hazardous and Solid Waste Amendments (HSWA) to the Resource Conservation and Recovery Act (RCRA) authorized EPA to require corrective action for releases of hazardous waste and/or hazardous constituents from Solid Waste Management Units (SWMUs) and other Areas of Concern (AOCs) at all operating, closed or closing RCRA-regulated facilities. The intention of this authority is to address previously unregulated releases to air, surface water, soil and groundwater. The generation of subsurface gas is also addressed. The first phase of the corrective action program, as established by EPA, is development of a RCRA Facility Assessment (RFA). The RFA is a structured investigative process which includes a Preliminary Review (PR) of all available relevant documents, a Visual Site Inspection (VSI) and, if appropriate, a Sampling Visit (SV).

This RFA addresses the Cedar Chemical Corporation (CCC) facility near Vicksburg, Mississippi. It is based on a PR of U.S. EPA Region IV and the Mississippi Department of Natural Resources (MSDNR) files and a VSI of the facility. The PR was conducted during May and June 1990, and the VSI was conducted on July 31, 1990. The purpose of the RFA is to identify SWMUs and AOCs located at the facility, and to evaluate their potential for release of hazardous constituents to the environmental media. The environmental media considered are air, surface water, soil and groundwater, along with the potential for subsurface gas generation. In addition to SWMUs, AOCs are also identified. AOCs may be potential sources of release of hazardous constituents to the environment which do not necessarily involve wastes.

The Cedar Chemical Corporation facility is a chemical production plant located near Vicksburg, Mississippi. The CCC facility is separated into two sections known as the North Plant and the South Plant. The North Plant is involved in fertilizer manufacturing activities and produces potassium nitrate, chlorine, and nitrogen tetroxide. The South Plant formerly produced many pesticides and other organic compounds, including Dinoseb, Toxaphene and Atrazine, but is currently only producing nitric acid for consumption at the North Plant.

The CCC facility has had two recorded releases. On March 7, 1978, a 10,000-gallon storage tank of methyl parathion exploded at the South Plant, resulting in the explosion of three to four hundred 55 gallon drums, the burning of the storage structure, and the burning of a sodium-nitro-phenol warehouse. No environmental effects were noted in the subsequent inspections conducted by the MSDNR. The second release occurred on February 5, 1983 when the dike on the east side of the South Plant Surface Impoundment (SWMU 3b) breached, releasing approximately 700,000

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gallons of wastewater into Stouts Bayou. Again, no environmental effects were observed by the MSDNR.

Waste management practices at CCC focus primarily on the containment and treatment of process wastewaters and stormwater runoff. In the North Plant, the process wastewaters are contained, transported and treated *before* being released under NPDES Permit No. MS0027995. Treatment consists of neutralizing the acidic wastewaters in the North Plant Neutralization System (SWMU 22). Prior to the installation of this system in 1988, the wastewaters were neutralized with lime in the now inactive North Plant Surface Impoundment (SWMU 23). The wastewaters treated at the North Plant originate from both the process areas and from the scrubbers which are used to treat the off-gases generated in fertilizer production. Stormwater runoff which is not contained by the North Plant Containment System (SWMU 24), flows via the North Plant Drainage Ditches (SWMU 33) into Stouts Bayou which flows south along the eastern border of the facility. The North Plant also collects waste oils for recycling.

In the South Plant, process wastewaters and stormwater runoff are collected and channeled to the South Plant Surface Impoundments (SWMU 3). The wastewaters are then treated by a Calgon Adsorption System (SWMU 4) before being released to surface waters. Any stormwater runoff which is not channeled to the impoundments flows into the South Plant Drainage Ditches (SWMU 13). The drainage ditch running along the western border of the facility also receives the NPDES permitted discharges from both the North and South Plants. The ditch flows west through a large wetland into Hennessey's Bayou.

The facility discarded both hazardous and nonhazardous solid wastes in the Inactive Landfill (SWMU 2). The unlined landfill went through a non-RCRA type closure in the early 1980's. Solid wastes generated at the South Plant since the closure of this unit are either drummed for disposal offsite or temporarily discarded in the Junkyard and Waste Piles (SWMU 34), which are cleared out periodically. At the time of the VSI, a large Scrap Metal Dumpster (SWMU 19) was also present in the South Plant. The dumpster was used for the collection of large debris generated from the dismantling of the former production areas.

After three submissions of Part B Permit Applications, CCC was formally denied a RCRA Permit in July 1986. CCC then decided to contest the ruling by claiming that their South Plant Surface Impoundments (SWMU 3) should not be RCRA-regulated. The Mississippi Commission on Natural Resources upheld Cedar's position by declaring the Dinoseb and Toxaphene losses found in the impoundment to be exempt from RCRA regulation by the "de minimus" exclusion of the mixture rule in 40 CFR Part 261.3.

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The U.S. EPA did not agree with this decision, however, the facility has a RCRA-regulated storage unit (the Drum Storage Area, SWMU 1) which is subject to regulatory and statutory requirements including corrective action requirements.

In October 1989, the EPA completed an Endangerment Assessment of the Cedar Chemical, Vicksburg facility. The Assessment included a Determination of Release from a Sampling Investigation conducted in February 1989 and from previous inspections of the facility. The investigations had found contaminants in soil and groundwater samples. The 1989 investigation found that soil samples taken from various locations at the South Plant showed concentrations of Dinoseb ranging from 15 µg/kg to 380,000 µg/kg. In the same investigation, two monitoring wells detected cyanide in the groundwater, ranging from 0.14 mg/kg to 58.0 mg/kg. Sampling of the monitoring wells also detected Atrazine, Cyanazine and Propazine in the groundwater.

As a result of the Endangerment Assessment, a RCRA Facility Assessment was requested to investigate the SWMUs and AOCs located at the facility. A total of 21 SWMUs were identified at the South Plant, 12 SWMUs at the North Plant, and one SWMU (the Junkyard and Waste Piles - SWMU 34) which was located primarily outside the South Plant and throughout both Plants. No AOCs were identified. Phase II Sampling is suggested for the following units:

- Carbon Adsorption System (SWMU 4)
- South Plant Drainage System (SWMU 5)
- South Plant Drainage Ditches (SWMU 13)
- Former Blue Tank (SWMU 18)
- Railroad Car Unloading Station (SWMU 20)
- Waste Oil SAA (SWMU 30)
- Junkyard and Waste Piles (SWMU 34).

Due to the amount of contamination found throughout the facility, an RFI is suggested for the following units:

- Drum Storage Area (SWMU 1)
- Inactive Landfill Area (SWMU 2)
- South Plant Surface Impoundments (SWMU 3)
- Former Dinoseb Production Area (SWMU 7)
- Dinoseb Off-Loading Area (SWMU 8)
- Dinoseb Drumming Area and Drains (SWMU 9)
- Former MSMA Production Area (SWMU 11)
- Former Toxaphene Production Area (SWMU 14)
- Former Methyl Parathion Production Area (SWMU 15)
- Former Atrazine Production Area (SWMU 16)
- Returned Product Storage Area (SWMU 17).

Refer to the Executive Summary Table, Table I-1, page 4, for a synopsis of the facility SWMUs.

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TABLE I-1
CEDAR CHEMICAL CORPORATION
SWMU/AOC ASSESSMENT SUMMARY

SWMU/AOC	TYPE OF UNIT	YEARS IN OPERATION	WASTES MANAGED	POLLUTANT MIGRATION PATHWAYS[6]	EVIDENCE OF RELEASES	EXPOSURE POTENTIAL[1]	NEED FOR INTERIM MEASURES	RECOMMENDATION		
								RFI	NO FURTHER ACTION	FURTHER ASSESSMENT
1. Drum Storage Area	Less-than-90 Day Storage Area	1980 to present	MSMA by-product salts, and solid wastes from the production of Dinoseb, Toxaphene, Atrazine, and MSMA	GW, S SW	YES	H M	--	X		
2. Inactive Landfill	Unlined Landfill	1972 to November 1980	Dinoseb formulation drums; debris from the methyl parathion fire; drums of hydrolyzed cyanuric acid, spent activated carbon, dimethyl urea, isopropyl amine, sodium nitrophenol liners, empty bromine bottles, phosphorous trichloride and sulfochloride, and dimethyl phosphorous sulfochloride; plus Dinoseb-contaminated soils and wastewater	GW, SW, S SS	YES	H M	--	X		
3. South Plant Surface Impoundments	Unlined Retention Ponds	1955 to present	Wastewaters containing Toxaphene, Dinoseb, MSMA, Atrazine and methyl parathion	GW, SW, S	YES	H	--	X		
4. Carbon Adsorption System	Neutralizing System	Mid-1970's to present	Wastewaters containing Toxaphene, Dinoseb, MSMA, Atrazine and methyl parathion	GW, SW, S	YES	M	--			X[2,4]
5. South Plant Drainage System	Drainage System	Varies from 1950's to present	Nitric acid process water, and stormwater containing Toxaphene, Dinoseb, MSMA, Atrazine and methyl parathion	GW, SW, S	YES	U	--			X[5]

1 H designates a moderate, and H designates a high, and U designates Unknown exposure potential; see SWMU description for substantiation
2 RFA Phase II sampling suggested
3 No Further Action is contingent upon an integrity investigation of the unit
4 Releases to surface waters are regulated via NPDES Permit No. MS0027995
5 An evaluation of the sewer system utilizing dye tests should be performed
6 GW designates Groundwater, SW designates Surface Water, S designates Soil, A designates Air, and SS designates Subsurface Gas
7 The unit was constructed over the former location of SWMU 15 and has therefore been recommended for an RFI
8 Releases to air are regulated via MS Air Permit No. 2780-00041

TABLE 1-1
CEDAR CHEMICAL CORPORATION
SWMU/AOC ASSESSMENT SUMMARY

SWMU/AOC	TYPE OF UNIT	YEARS IN OPERATION	WASTES MANAGED	POLLUTANT MIGRATION PATHWAYS[6]	EVIDENCE OF RELEASES	EXPOSURE POTENTIAL[1]	NEED FOR INTERIM MEASURES	RECOMMENDATION		
								RFI	NO FURTHER ACTION	FURTHER ASSESSMENT
6. South Plant Hill Tank	Storage Tank	Early 1960's to 1989	Neutralized wastewater containing Dinoseb	--	NO	--	--		X	
7. Former Dinoseb Production Area	Inactive Production Area	1973 to December 1986	Spills of Dinoseb, DEHPA, and EHN	GW, S	YES	H	--	X		
8. Dinoseb Off-Loading Area	Inactive Loading/ Unloading Area	1973 to December 1986	Dinoseb spillage	GW, S	YES	H	--	X		
9. Dinoseb Drumming Area and Drains	Inactive Product Drumming Area	1973 to December 1986	Dinoseb spillage	GW, S	YES	H	--	X		
10. Dinoseb Stock Storage Area	Storage Area	1973 to present	Dinoseb stock	--	NO	--	--		X	
11. Former MSMA Production Area	Inactive Production Area	January 1983 to present	MSMA production spillage, including methanol, MSMA by-product salts and arsenic; demolition debris suspected of contamination from MSMA	GW, S	YES	U	--	X[7]		
12. Former MSMA Salt Unloading Area	Waste Unloading Area and Dumpsters	January 1983 to July 1984	MSMA by-product salts and wastewaters which may contain traces of arsenic	--	NO	--	--		X	

1 M designates a moderate, and H designates a high, and U designates Unknown exposure potential; see SWMU description for substantiation
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TABLE I-1
CEDAR CHEMICAL CORPORATION
SWMU/AOC ASSESSMENT SUMMARY

SWMU/AOC	TYPE OF UNIT	YEARS IN OPERATION	WASTES MANAGED	POLLUTANT MIGRATION PATHWAYS[6]	EVIDENCE OF RELEASES	EXPOSURE POTENTIAL[1]	NEED FOR INTERIM MEASURES	RECOMMENDATION		
								RFI	NO FURTHER ACTION	FURTHER ASSESSMENT
13. South Plant Drainage Ditches	Drainage Ditches	Approx. 1954 to present	Stormwater runoff from the South Plant which may have contained Atrazine, Dinoseb, Toxaphene, arsenic or MSMA	GW, SW, S	YES	H	--			X[2]
14. Former Toxaphene Production Area	Inactive Production Area	1973 to 1982	*Toxaphene*, DEHPA and EHN production spillage	GW, S	YES	H	--	X		
15. Former Methyl Parathion Production Area	Inactive Production Area	Mid-1970's	Methyl parathion spillage	GW, S	YES	H	--	X		
16. Former Atrazine Production Area	Inactive Production Area	1973 to 1979	Atrazine production spillage	GW, SW, S	YES	H	--	X		
17. Returned Product Storage Area	Temporary Staging Area	1973 to present	Drums of returned Dinoseb product	GW, SW, S	YES	H	--	X		
18. Former *Blue Tank*	Storage *Tank*	1983 to approx. 1986	Unneutralized Dinoseb process wastewater	GW, S	YES	H	--			X[2]
19. Scrap Metal Dumpster	Open-topped Rolloff Container	Mid-1980's to present	Scrap material from the dismantling of the MSMA production area	--	NO	--	--		X	

[1] H designates a moderate, and H designates a high, and U designates Unknown exposure potential; see SWMU description for substantiation
[2] RFA Phase II sampling suggested
[3] No Further Action is contingent upon an integrity investigation of the unit
[4] Releases to surface waters are regulated via NPDES Permit No. MS0027995
[5] An evaluation of the sewer system utilizing dye tests should be performed
[6] GW designates Groundwater, SW designates Surface Water, S designates Soil, A designates Air, and SS designates Subsurface Gas
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[8] Releases to air are regulated via MS Air Permit No. 2780-00041

TABLE I-1
CEDAR CHEMICAL CORPORATION
SWMU/AOC ASSESSMENT SUMMARY

SWMU/AOC	TYPE OF UNIT	YEARS IN OPERATION	WASTES MANAGED	POLLUTANT MIGRATION PATHWAYS [6]	EVIDENCE OF RELEASES	EXPOSURE POTENTIAL [1]	NEED FOR INTERIM MEASURES	RECOMMENDATION		
								RFI	NO FURTHER ACTION	FURTHER ASSESSMENT
20. Railroad Car Unloading Station	Loading/ Unloading Station	Approx. 1955 to present	Spillage of raw materials and products, including Dinoseb, Toxaphene, MSMA, Atrazine and methyl parathion	GW, S	NO	U	--			X[2]
21. Vacuum Truck	Tank Truck	Mid-1980's to present	Wastewater contaminated with Dinoseb, Toxaphene, MSMA, arsenic, Atrazine and methyl parathion	--	NO	--	--		X	
22. North Plant Neutralization System	Treatment Unit with In-ground Sumps	December 1988 to present	All wastewater from the North Plant, including drainage from hoses, safety showers, and stormwater runoff	SW	NO	U	--		X[4]	
23. Inactive North Plant Surface Impoundment	Equalization/ Neutralization Pond	1962 to present	Acidic effluent from the North Plant, including process water from the production of potassium nitrate, nitrogen tetroxide, and chlorine	SW	NO	U	--		X[4]	
24. North Plant Containment System	Spillage and Runoff Collection System	Varies from Mid-1970's to present	Acidic wastewaters from fertilizer manufacturing operations	--	NO	--	--		X	
25. Wastewater Pipes	Pipes	1960's to present	Acidic and alkaline wastewater	--	NO	--	--		X	
26. C-10 Scrubber	Air Pollution Control Device	1980 to present	Fertilizer production off-gases, such as chlorine and NO2; acidic wastewater	A	NO	U	--		X[8]	

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TABLE I-1
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								RFI	NO FURTHER ACTION	FURTHER ASSESSMENT
27. Cooler Scrubber	Air Pollution Control Device	1980 to present	Fertilizer production off-gases, such as chlorine and NO2; acidic wastewater	A	NO	U	--		X[8]	
28. End Product Scrubber	Air Pollution Control Device	1980 to present	Air containing fertilizer particles such as potassium and nitrogen	A	NO	U	--		X[8]	
29. Oil Collection Unit	Collection Unit	1985 to present	Waste oils	GW, S, SS	NO	U	--		X[3]	
30. Waste Oil SAA	Outdoor Drum Staging Area	1985 to present	Waste oils	GW, S	YES	H	--			X[2]
31. No. 6 Fuel Oil Area	Former Heating Oil Containment Structure	1960's to 1970's	Waste fuel oils	GW, S, SS	NO	U	--		X[3]	
32. C-15 Scrubber	Air Pollution Control Device	Approx. 1980 to present	Fertilizer production, off-gases, and particulate matter	A	NO	U	--		X[8]	
33. North Plant Drainage Ditches	Drainage Ditches	Approx. 1960 to present	Stormwater runoff from the North Plant	--	NO	--	--		X	
34. Junkyard and Waste Piles	Temporary Disposal Areas	Approx. 1954 to present	Pesticide contaminated debris; refuse from North and South Plant facilities	GW, SW, S	YES	H	--			X[2]

1 H designates a moderate, and H designates a high, and U designates Unknown exposure potential; see SWMU description for substantiation
2 RFA Phase II sampling suggested
3 No Further Action is contingent upon an integrity investigation of the unit
4 Releases to surface waters are regulated via NPDES Permit No. MS0027995
5 An evaluation of the sewer system utilizing dye tests should be performed
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7 The unit was constructed over the former location of SWMU 15 and has therefore been recommended for an RFI
8 Releases to air are regulated via MS Air Permit No. 2780-00041

II. INTRODUCTION

The 1984 Hazardous and Solid Waste Amendments (HSWA) to the Resource Conservation and Recovery Act (RCRA) authorized EPA to require corrective action for releases of hazardous wastes and/or 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 and groundwater. The generation of subsurface gas is also addressed. The first phase of the corrective action program, as established by EPA, is development of a RCRA Facility Assessment (RFA). The RFA includes a Preliminary Review (PR) of all available relevant documents, a Visual Site Inspection (VSI) and, if appropriate, a Sampling Visit (SV).

This Chapter provides a summary of the file search and VSI, a description of facility history, regulatory history, process operations, waste management practices and the environmental and demographic setting. The SWMUs and AOCs are described in Chapter III. Tables categorizing the units are presented in Chapter IV. Chapter V suggests a sampling strategy for those units requiring Phase II sampling. The references used in this report are listed in Chapter VI. Appendix A is the VSI log book and Appendix B presents the photographs documenting the physical condition of the SWMUs at the time of the VSI.

A. File Search and VSI

This RFA report is based on a review of file material available at EPA Regional and State Offices, and on observations made during the VSI. The file review was conducted during May 1990 and included a review of RCRA, CERCLA, Clean Air and NPDES files available at EPA Region IV, Atlanta, Georgia, and the Mississippi Department of Natural Resources (MSDNR), Jackson, Mississippi. The VSI was conducted on July 31, 1990 at the Cedar Chemical Corporation facility near Vicksburg, Mississippi.

The Kearney VSI team arrived at the Cedar Chemical facility at approximately 9:00 a.m. on July 31, 1990. The Team was greeted by facility representatives, Mr. Steven Boswell and Mr. Dave Madsen.

The VSI introductory meeting began at approximately 9:30 a.m. Attending the meeting were:

J. Evans	A.T. Kearney
R. Behl	A.T. Kearney
S. Boswell	Cedar Chemical Corporation
D. Madsen	Cedar Chemical Corporation

During the meeting, all raw materials and waste streams were discussed. The facility's history and operations were also discussed. Facility representatives provided layout drawings of the two plants and a hydrogeologic report characterizing the groundwater conditions at the facility.

The introductory meeting adjourned at approximately 10:30 a.m. At this time, the Team was joined by Mr. Toby Cook of the Mississippi Department of Natural Resources. Mr. Boswell and Mr. Cook accompanied the VSI Team on a tour of the facility. The team viewed the SWMUs located in the South Plant area during the morning session (SWMUs 1 through 21). The temperature was approximately 90°F; skies were clear. The VSI Team adjourned for lunch at approximately 12:30 p.m.

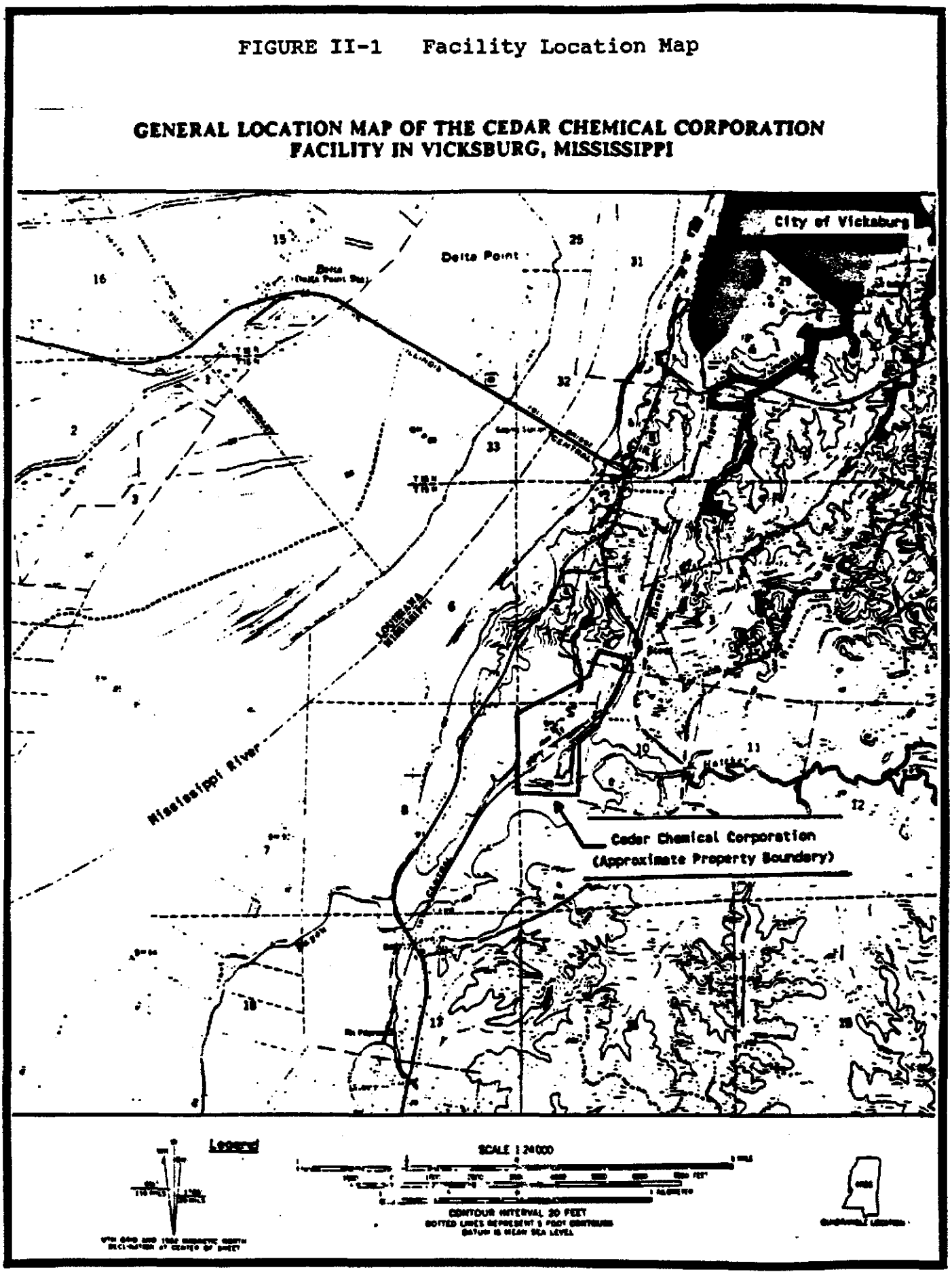
The VSI resumed at 1:30 p.m. to view the North Plant (SWMUs 22 through 32). Following the tour, the VSI Team met with Mr. Boswell and Mr. Cook for a closeout meeting. Mr. Boswell of Cedar Chemical Corporation took photographs of the facility, along with J. Evans of the VSI Team, until his camera malfunctioned. At the request of the facility, it was agreed that Cedar Chemical Corporation would be provided copies of photographs taken by the VSI Team through the EPA WAM. The VSI team left the facility at approximately 4:30 p.m.

B. Facility History

Cedar Chemical Corporation owns a chemical production facility located near Vicksburg, Mississippi. The CCC facility is separated into two sections known as the North Plant and the South Plant. The North Plant currently produces potassium nitrate, chlorine, and nitrogen tetroxide (References 11, 257). The South Plant formerly produced many pesticides and other organic compounds but is currently only producing nitric acid for consumption at the North Plant (References 11, 133, 257).

The CCC facility is outlined on the USGS map of Vicksburg West, Mississippi (Figure II-1, page 11). It encompasses about 600 acres of land, of which only about 20 percent is utilized by the North and South Plants. The facility is located southwest of Vicksburg City, with a majority of the land between U.S. Highway 61 and Business U.S. Highway 61 (Figure II-2, page 12). The northwest point of the property extends as far as the Mississippi River bank. The North and South Plants are located along the Illinois Central Railroad, bounded on the east by Stouts Bayou and on the south by Hennessey's Bayou. The facility coordinates are latitude 32° 18', longitude 90° 05' (References 5, 133).

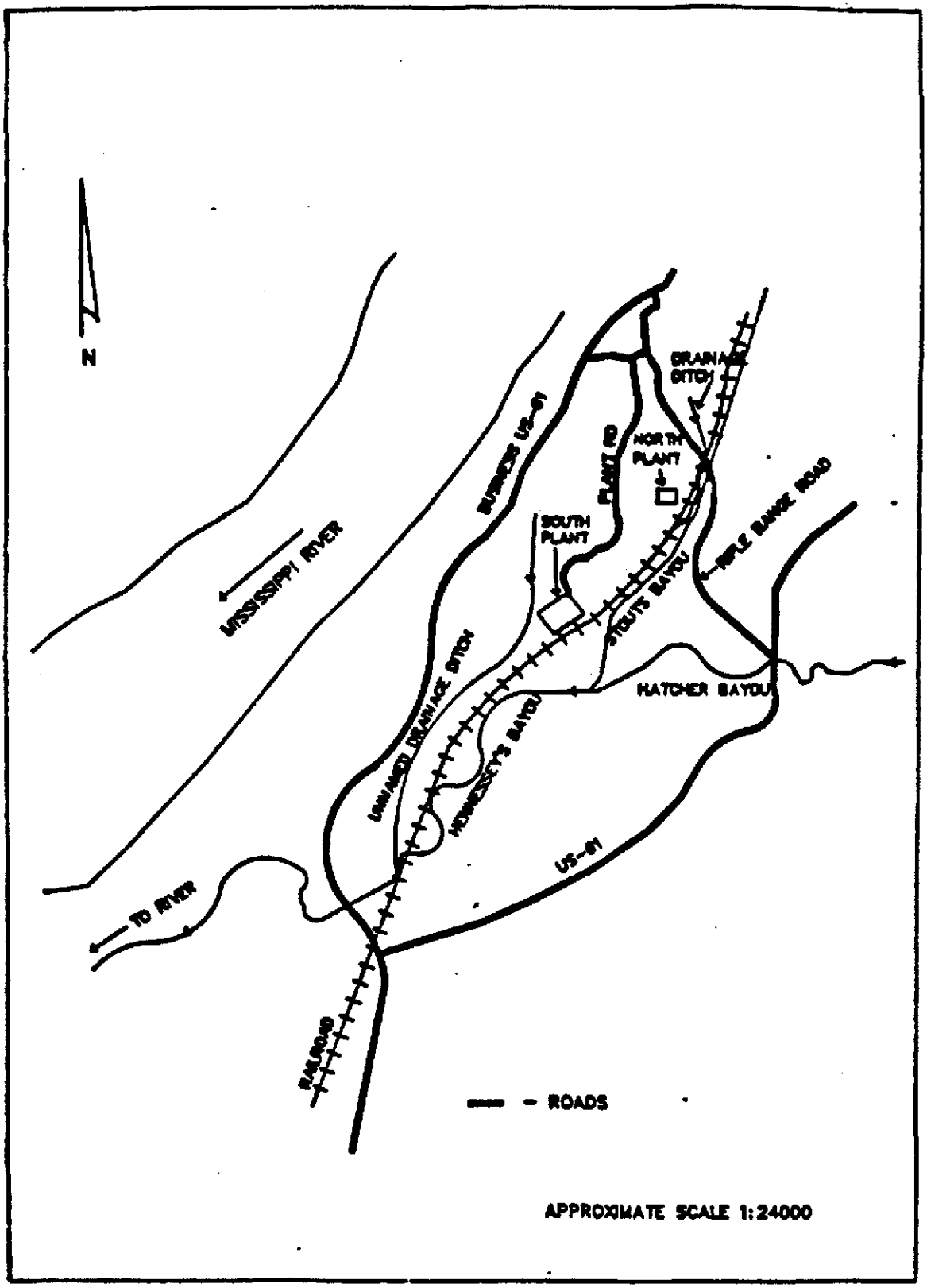
FIGURE II-1 Facility Location Map



Reproduced from U.S. Department of Interior, Geological Survey, 1962. Topographic map, Vicksburg West Quandrangle, Mississippi-Louisiana. (From Reference 33)

FIGURE II-2

Cedar Chemical Corporation Vicksburg Facility



Reproduced from U.S. Environmental Protection Agency, February, 1987. RCRA Environmental Investigation, Cedar Chemical Company, Vicksburg, Mississippi.

(Reference 5)

The CCC facility is bordered by light industry on the south, light residential areas spanning from north to southwest, and rural areas spanning from northeast to south (References 133, 257). The closest residence is approximately a quarter of a mile from the plant (Reference 133). The facility is approximately three miles from the nearest densely populated area; however, a school is located within one mile of the facility and a hospital within two miles (Reference 183, 257). Prior to use by the chemical companies, the land on which the facility is located was primarily farm land (Reference 257).

The CCC facility originally started under two separate ownerships. The South Plant began operations in approximately 1954 as Spencer Chemical Company. In 1964, Spencer was purchased by Gulf Oil. The North Plant was established in 1961 by Southwest Potash. In 1972, the two plants were purchased and merged by the Vicksburg Chemical Company (Reference 257). Vicksburg was bought out by Vertac Chemical Corporation (VCC) in 1975. VCC was taken over by the holding company, Dyticon, Inc., in 1978 (Reference 133). The facility underwent a structural reorganization in 1986, when it became known as Cedar Chemical Corporation (CCC), a sister company to VCC (References 27, 107). This corresponded to the purchase of the business from Dyticon, Inc. by Fermenta A.B. of Sweden. The business again changed ownership in 1988 when Trans Resources bought portions of CCC, including the Vicksburg Chemical Division (Reference 257). A small portion of the South Plant is not owned by CCC. It is referred to as the Perkins Company or Former Gulf Formaldehyde Plant and is owned by Borden (Reference 5, 257).

When the South Plant began as Spencer, the main products were nitric acid, ammonia, unspecified fertilizers and ammonium nitrate. The main products from the original North Plant were potassium nitrate and chlorine. In 1973, the Vicksburg Chemical Company started the production of the pesticides Atrazine, Toxaphene and Dinoseb at the South Plant. Vertac Chemical Corporation (VCC) continued producing Atrazine until approximately 1979 and produced Toxaphene until 1982. Dinoseb was produced until CCC took control in 1986 (Reference 17, 257). The Toxaphene facility was also used by VCC for the production of diethylhexyl phosphoric acid (DEHPA) and 2-ethyl-hexyl nitrate (EHN). DEHPA was produced in six-week runs in 1978, 1984 and 1985 (References 132, 154). EHN was produced for approximately two months in 1984 (Reference 142). Methyl parathion was also produced at the South Plant until approximately 1978 when the facility had a large explosion and fire (References 255, 257). In 1983, VCC converted the former methyl parathion facility into a facility for the production of the arsenic herbicide monosodium methanarsonate (MSMA). This facility was also capable of producing disodium methanarsonate (DSMA) and sodium cacodylate. MSMA production continued until some time in 1984 (References 213, 214, 257). The South Plant has also been recorded as

producing dimethyl urea, isopropyl amine, dinitro-ortho-cresol, Cyanazine, UNIHIB, and the intermediates, sulfonated ortho-sec-butyl phenol (OSBP) and diethylhexyl phosphochloridate (References 5, 17).

The only chemicals being produced at the time of the VSI were nitric acid in the South Plant, and potassium nitrate, chlorine and nitrogen tetroxide in the North Plant (Reference 257). The nitric acid in the South Plant is produced in a facility which was built in accordance with New Source Performance Standards (NSPS) in 1986. The former nitric acid facility reportedly had problems with emissions from an ineffective catalytic reducer (Reference 260).

The CCC facility has had two recorded releases, both prior to Cedar Chemical acquiring the facility. On March 7, 1978, a 10,000-gallon storage tank of methyl parathion exploded, triggering the explosion of three to four hundred 55-gallon drums, the burning of the storage structure, and the burning of a sodium-nitro-phenol warehouse. No environmental effects were noted in subsequent inspections conducted by the MSDNR (Reference 255). On February 5, 1983, the dike on the east side of the South Plant Surface Impoundment (SWMU 3b) failed, releasing approximately 700,000 gallons of wastewater into Stouts Bayou. Again, no environmental effects were noted by the MSDNR (Reference 200).

C. Regulatory History

Pursuant to Section 3005 of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Section 6930, Cedar Chemical Corporation, as Vertac Chemical Corporation (VCC), submitted Part A of its hazardous waste permit application on November 18, 1980, thus gaining interim status. On this application VCC registered as a TSD in the business of producing potassium nitrate and pesticides - dinobutyl phenol (Dinoseb) and Toxaphene (Reference 252). The Notification of Hazardous Waste Activity had been submitted previously on June 23, 1980 (Reference 5). A revised Part A permit application was submitted to U.S. EPA Region IV in September 1981 (References 239, 240). VCC submitted its Part B Permit Application, along with another modified Part A, on August 10, 1983. The modifications to the company's Part A referred to the listing of units and waste streams at the facility (Reference 183). The Part B permit application was found to be deficient with respect to closure, post-closure and groundwater monitoring plans (Reference 160). After five revisions, CCC submitted another Part B application on June 18, 1985 (References 128, 133, 148, 150). Once again the application was found to be deficient in the areas of closure and post-closure plans, contingency plans, and groundwater monitoring plans (Reference 111).

On July 31, 1986, CCC was formally denied a RCRA permit. CCC was required to submit a closure/post-closure plan or to amend the one in the application to meet the specifications of the Mississippi Hazardous Waste Management Regulations (MHWMR) Part 265 within 15 days (Reference 95).

CCC has had numerous contacts with the MSDNR regarding compliance with the MHWMR, along with numerous inspections of the facility (Table II-1, page 20). Beginning in 1980, VCC received Commission Order No. 520-80 requiring compliance with NPDES Permit No. MS0027995 (References 251, 252). In 1982, VCC received Commission Order No. 599-82 in an effort to accelerate actions to reduce releases from VCC's Inactive Landfill (SWMU 2) and South Plant Surface Impoundments (SWMU 3) (Reference 209). VCC received Commission Order No. 611-83 on June 8, 1983, in response to the rupturing of a dike in the South Plant Surface Impoundment (SWMU 3b) in January 1983 (Reference 184). In 1984, Commission Order No. 717-84 was issued requiring VCC to submit a revised Part B permit application and groundwater monitoring plan (Reference 159). After submission of the revised Part B in June 1985, Commission Order No. 948-85 was issued defining the items still needing revision and the January 10, 1986 deadline (References 109, 11, 133). The CCC submittal of January 1986 was again found to be deficient. A list of recommendations was sent to CCC on July 2, 1986, along with the request for a show-cause meeting on July 8th (Reference 100). In the meeting, MSDNR discussed with CCC their RCRA history and the current violations. A hearing was scheduled for July 22, 1986 before the Mississippi Commission on Natural Resources regarding a penalty for the violations and a compliance schedule (Reference 97, 99).

CCC responded by filing a Motion to Dismiss based on the theory that the South Plant Surface Impoundments (SWMU 3) should not be RCRA-regulated and thus should not be governed by the Mississippi Commission on Natural Resources (Reference 98). The hearing before the Commission was delayed until August 26th at CCC's request. Commission Order No. 1046-86 was issued in response to the hearing. The Order defined the penalty and compliance schedule which would apply to CCC if they failed to demonstrate that the South Plant Surface Impoundments (SWMU 3) should not be RCRA-regulated at the hearing scheduled for September 16, 1986 (Reference 92).

CCC's position regarding the declassification of the surface impoundment was based on the "de minimus" exclusion from the "mixture rule" in 40 CFR Part 261.3. This exclusion includes any losses from normal manufacturing operations of the product (Reference 89). The argument that the MSDNR brought forth was that releases from the Returned Product and Drum Storage Areas (SWMU's 17 & 1), which are not part of the manufacturing operations, could end up in the impoundment. CCC contested this by demonstrating that the drainage system from these areas had

been segregated from the system entering the South Plant Surface Impoundments (SWMU 3). Furthermore, since November 1985, any losses of Dinoseb from production had been collected and either recycled or disposed of offsite. These points were brought forward at the Commission meeting on September 16, 1986, but no verdict was given (References 85, 113).

The MSDNR and EPA requested to expand the hearing to determine if the South Plant Surface Impoundments (SWMU 3) could be under RCRA jurisdiction by some other basis, specifically the containment of past wastes associated with the production of Toxaphene. These wastes included untreated process wastewater from the production of Toxaphene (K098), and the wastewater sludge created from the same (K041). CCC contested this theory by claiming that their Toxaphene process was different from the one used by EPA to set the standards, and therefore, the wastewater created was different (References 80, 85). EPA did not agree that CCC's response regarding Toxaphene production should warrant their exclusion from the hazardous waste listing. EPA therefore decided to pursue the RCRA-regulation of the impoundment (Reference 77).

CCC contested that if RCRA-regulation of the South Plant Surface Impoundments (SWMU 3) was to be challenged on a different basis, then it should be asserted at a new hearing (Reference 78). On December 17, 1986, the Commission ruled in favor of CCC by placing into effect Order of Dismissal No.1153-86 (Reference 75).

On May 27, 1987, the hearing before the Commission regarding final determination of RCRA jurisdiction was conducted (Reference 59). The MSDNR and EPA's case was based on the definitions in the listing documents. That is that the wastewater from the HCl scrubber is included in the definition of wastewater from the production of Toxaphene, regardless of Toxaphene content (References 58, 60). EPA suggested that if CCC's wastes were not correctly defined then the appropriate procedure would be to go through a "delisting" of the waste (Reference 63).

CCC's case was based on findings that the sediment in the South Plant Surface Impoundments (SWMU 3) upon analysis did not demonstrate the characteristic of EP toxicity for Toxaphene, that only de minimus losses of the actual Toxaphene product were collected in the impoundment through the South Plant Drainage System (SWMU 5), and that the wastewater generated by the HCl scrubber/muriatic acid recovery system also was not found to contain detectable levels of Toxaphene (References 56,57,72). On August 5, 1987, the Commission ruled in favor of CCC by issuing Order of Dismissal No.1253-87, incorporating Order No.1153-86 and vacating Order No.1046-86. Toxaphene losses were declared exempt by the "de minimus" exclusion in 40 CFR Part 261.3, just as Dinoseb losses had been (Reference 54).

EPA was not in agreement with the Commission's verdict. The Agency considered the actions inappropriate for an authorized state (Reference 52). In EPA's opinion, CCC had lost interim status back in November of 1985 by failing to certify compliance with financial requirements of 40 CFR Part 265 (Reference 49). In addition, CCC had not completed its groundwater monitoring program. Without the groundwater monitoring program completed properly, it was impossible to determine the full extent of contamination (Reference 46). The amount of Dinoseb found throughout the facility could not, in the opinion of the EPA, be due to minor leaks from normal handling procedures, as is necessary for de minimus exclusion (Reference 49).

EPA insisted that the Drum Storage Area (SWMU 1), having been found mismanaged in numerous inspections (Refer to Table II-1, page 20), could not be considered a less than 90-day storage unit and therefore should not be in operation without interim status or a permit (Reference 50). EPA had decided in July to await actions taken by the Commission before overfiling (Reference 96). Since the storage violations cited against CCC in August 1986 had not been resolved, Commission Order No. 1162-87 was issued on January 28, 1987 against CCC (Reference 71). CCC's mismanagement of the Drum Storage Area (SWMU 1) was the basis for two more Orders issued by the Commission: Order No. 1217-87 was issued with a monetary fine on April 22, 1987; Order No. 1316-88, along with another monetary fine, was issued on February 10, 1988 (References 44, 62).

When CCC became aware of EPA's position on the regulatory status case, a meeting was requested to discuss options. On December 17, 1987, representatives from CCC, MSDNR, and EPA met to discuss the regulatory status issue. It was explained to CCC that EPA did not agree with the Commission's verdict or with the idea that the South Plant Surface Impoundments (SWMU 3) were an environmental asset, and that EPA believed that it needed to be contained or closed. CCC proposed to contain the South Plant Surface Impoundments (SWMU 3) by consolidating the sediment into a Solid Waste Consolidation Area (SWCA) (SWMU 3d), solidifying it, and capping it in such a way as to continue to be able to use the rest of the impoundment for the treatment of nonhazardous waste streams. However, CCC did not want to go forward with this plan unless they were certain that the EPA would consent to it. CCC was prepared to complete the plan according to RCRA standards to be sure that EPA would not try to obstruct use of the surface impoundment after containment of the existing sediment (References 35,36,37). Both MSDNR and EPA withheld making comments until a formal closure plan could be submitted. Since the Commission had ruled that the South Plant Surface Impoundment (SWMU 3) was not RCRA-regulated, the plans could not be formally brought before the Permit Board for approval. However, the MSDNR did agree to provide RCRA-guided comments on the technical aspects of the plan, once submitted (Reference 34).

CCC submitted formal closure plans to the MSDNR on August 4, 1988 (Reference 27). The MSDNR suggested some modifications to the plan for meeting RCRA requirements, but again stated that these were not certifying RCRA compliance. CCC planned to go forward with the modified plans unless EPA voiced an objection (Reference 21). On January 27, 1989, CCC reported to the MSDNR that the contract had been confirmed and that the contractor had moved on site to begin closure (Reference 18).

On March 29, 1988, the EPA referred the South Plant Surface Impoundment (SWMU 3) regulatory status case to the Department of Justice. This was considered to be a direct referral by the Office of Enforcement and Compliance Monitoring (OECM). Additional review by the OECM and the Office of the General Counsel raised the question of EPA's ability to overfile after the state had taken action. EPA referred to Section 3008(a) of RCRA which gives EPA the authority to overfile when RCRA has been misinterpreted by the state (Reference 23).

In June of 1988 the U.S. EPA Region IV drafted an Administrative Order for CCC based upon their administrative compliance history. The Order called for Interim Measures to secure the facility from releasing any health or environmental threats; for a RCRA Facility Investigation to be performed to determine the full extent of contamination; and for a Corrective Measures Study to evaluate the best solution for containment and/or clean-up of the facility (Reference 33).

From a Sampling Investigation performed in February 1989 and from previous inspections of the facility, the Director of Waste Management, Region IV, issued a Determination of Release for CCC on October 13, 1989. From this determination it was further asserted that corrective actions must be taken to protect the environment. By October 30, 1989 an Endangerment Assessment was completed regarding contamination at CCC, with the exception of dioxin testing. Dioxin testing of the Inactive Landfill (SWMU 2) was scheduled later, and if necessary, the risk assessment will be revised with the results (Reference 5).

CCC (as VCC) first obtained its NPDES Permit No. MS0027995 prior to 1980 (Reference 252). The Permit was renewed on December 1, 1981, to expire in June 1986 (Reference 233). VCC's permit included three outfalls. Outfall 001 was defined with limits of 1.4 kg/day-daily average for Dinoseb, 68 kg/day-daily average for total suspended solids, and 0.05 kg/day-daily average for Toxaphene. Outfall 002 had a limit of 2727 kg/day-daily average for nitrate and Outfall 003 had a limit of 2868 kg/day-daily average for nitrate (Reference 102).

On March 1, 1985, the MSDNR requested a meeting with VCC to discuss chronic noncompliance of NPDES limits with respect to Ph,

Dinoseb levels, and nitrate-nitrogen levels. The meeting was held on March 22, 1985. On April 29, 1985, VCC submitted a report explaining that new pH control valves were to be installed, that some of the Dinoseb excursions were related to the Ph problem (since a high Ph causes decreased carbon-adsorption), that the other Dinoseb releases were due to premature carbon breakthrough, and that the nitrate-nitrogen excursions were related to process problems which had already been corrected (Reference 130). Another problem arose with VCC's NPDES permit excursions in June 1985. Due to heavy rainfall, the South Plant Surface Impoundment (SWMU 3) was bypassed on three different occasions to avoid breaching the dike. VCC did not notify the MSDNR within the 72-hour limit and had not submitted a plan to avoid recurrence. VCC's actions were viewed as too hasty to the MSDNR; thus VCC requested a meeting to decide upon guidelines for future situations of similar nature (Reference 123). On September 6, 1985, the MSDNR met with VCC specifically to set up the new guidelines for bypassing the impoundment. These were defined as: 1) when the contents of the dike reach within 6 inches of overflow; and 2) when threat of human life is apparent (Reference 118).

VCC's NPDES permit came up for renewal in April 1986. The permit was reissued without any changes to effluent limits for Outfalls 001, 002 and 003 (Reference 102). VCC had requested, on March 10, 1986, for permission to use an alternative method of process wastewater disposal. The proposed method utilized the low-concentration Dinoseb wastewater (210 mg/l) as a marginal fertilizer for agricultural fields. The MSDNR requested guidance from the EPA in regulating or approving such a proposal. The proposal was accepted and incorporated into the NPDES permit as Outfall 004 (References 102, 104).

On July 5, 1989, CCC reapplied for their NPDES permit. Having ceased producing organic chemicals, there was no longer wastewater from the production of Dinoseb. Thus, Outfall 004 was not included in this application. Only nitric acid, potassium nitrate, chlorine and nitrogen tetroxide were listed as presently being produced at CCC (Reference 11).

In 1980, VCC, in order to obtain an Air Emissions Permit, had to submit an emissions survey and install additional facilities to reduce and hopefully eliminate air releases - about which the Air Division had received many complaints (References 252, 253). The facility's Permit covered air emissions from the production of nitric acid, potassium nitrate, Toxaphene, Atrazine and Dinoseb (Reference 249). A comprehensive list of compliance inspections at the CCC facility is presented in Table II-1.

TABLE II-1

FACILITY INSPECTIONS AT CEDAR CHEMICAL CORPORATION
VICKSBURG FACILITY
(PAGE 1 OF 5)

DATE	TYPE OF INSPECTION	PERFORMED BY	SWMU-RELATED FINDINGS	REFERENCE NUMBER
Jul 27, 1981	RCRA Compliance	EPA	Open and leaking drums in Drum Storage Area (SWMU 1) and Returned-Product Storage Area (SWMU 17).	236, 237
Oct 6, 1981	Follow-Up RCRA	MSDNR	Storage Areas cleaned up, one deteriorating drum still not contained (SWMUs 1, 17).	236, 237
Oct 28, 1981	Hazardous Waste Site Investigation	EPA	Inactive Landfill (SWMU 2) only partially covered with grass; yellow ground stains visible in many areas. Yellow stains visible throughout South Plant processing areas. All surface runoff from Inactive Landfill (SWMU 2) did not enter the South Plant Surface Impoundment (SWMU 3): (1) East corner - runoff drained south into Hennessey Bayou; heavy erosion damage noted. (2) Western edge - runoff soaking into ground before reaching Hennessey Bayou; also showed severe erosion.	228
Sep 17, 1982	NPDES Compliance	MSDNR	Yellow stains around Inactive Landfill (SWMU 2) Runoff from Inactive Landfill (SWMU 2) entering Runoff Drainage Ditch (SWMU 33).	215
Feb 8, 1983	Release Investigation	MSDNR	Dike break on east side of South Plant Surface Impoundment (SWMU 3) released ~ 700,000 gallons of wastewater into Stouts/Hennessey Bayou.	200
Oct 3, 1983	Compliance Evaluation	MSDNR	Work had begun on capping the Inactive Landfill (SWMU 2). Condition of South Plant Surface Impoundment (SWMU 3) dike deteriorated - work was to have begun already. 25 drums in Former MSMA Production Area (SWMU 11) were not within containment or under a roof.	179

TABLE 11-1

FACILITY INSPECTIONS AT CEDAR CHEMICAL CORPORATION
VICKSBURG FACILITY
(PAGE 2 OF 5)

DATE	TYPE OF INSPECTION	PERFORMED BY	SWMU-RELATED FINDINGS	REFERENCE NUMBER
Oct 11, 1983	Remedial Actions	MSDNR	Inactive Landfill (SWMU 2) capped - high hill area lowered and clean soil brought in, ditch west of landfill had not been capped. Work on South Plant Surface Impoundment (SWMU 3) dike had begun.	174
Oct 31, 1983	Compliance Evaluation	MSDNR	South Plant Surface Impoundment (SWMU 3) dike improvements on-going.	171
Nov 17, 1983	Compliance Evaluation	MSDNR	Grading and capping of Inactive Landfill (SWMU 2) did not extend as far as plans had been approved - western ditch along railroad track had filled with sediment and was supposed to be capped. South Plant Surface Impoundment (SWMU 3) dike construction completed; seeding of both areas finished.	168
Sep 20, 1984	NPDES Compliance Inspection	MSDNR	C-10 Scrubber (SWMU 26) had a break in the curbing allowing a small amount of wastewater to leave the area. A leak was observed in the dike around the DEHPA Facility, (Former Toxaphene Production Area - SWMU 14), with some liquid pooled outside the dike. Dike of South Plant Surface Impoundment (SWMU 3) was showing some erosion. Vegetative growth on Inactive Landfill and South Plant Surface Impoundment was not taking (SWMUs 2, 3).	146

TABLE II-1

FACILITY INSPECTIONS AT CEDAR CHEMICAL CORPORATION
VICKSBURG FACILITY
(PAGE 3 OF 5)

DATE	TYPE OF INSPECTION	PERFORMED BY	SWMU-RELATED FINDINGS	REFERENCE NUMBER
Dec 14, 1984	Compliance Evaluation	MSDNR	Grassing of Inactive Landfill and South Plant Surface Impoundment areas to prevent erosion appeared to be helping (SWMUs 2, 3).	140
Jul 22, 1985	NPDES Compliance	MSDNR	Dike of Inactive North Plant Surface Impoundment (SWMU 23) was very weak at one end.	122
Nov 22, 1985	Interim Status Compliance	MSDNR	Eastern corner of South Plant Surface Impoundment (SWMU 3) showed evidence of a recent release - yellow stains were observed on the dike and dead vegetation was noticed along the natural drainage path to the Bayou. Drum Storage Area (SWMU 1) in disarray. Plant process areas had numerous small spills on the ground. Deteriorated asbestos pipe insulation noticed in many areas.	110
Aug 7, 1986	RCRA Generator and Closure Inspection	EPA	Land adjacent to the road had eroded into the South Plant Surface Impoundment (SWMU 3) Drum Storage Area (SWMU 1) contained many leaking drums; some containers were stored on broken pallets and it was obvious that many drums had been stored for longer than 90 days. Large spills were observed on the ground in the Drum Storage and Returned-Product Storage Areas (SWMUs 1, 17) and floor drains and sumps were overflowing with waste-contaminated water. Yellow and black stains were noticed on the ground throughout the facility.	86

TABLE 11-1

FACILITY INSPECTIONS AT CEDAR CHEMICAL CORPORATION
VICKSBURG FACILITY
(PAGE 4 OF 5)

DATE	TYPE OF INSPECTION	PERFORMED BY	SWMU-RELATED FINDINGS	REFERENCE NUMBER
Aug 12, 1986	Generator	MSDNR	Drum Storage Area (SWMU 1) contained many deteriorated and leaking drums and was cluttered with much unnecessary equipment. Evidence of frequent spills was noticed in the Drum Storage Area and Returned-Product Storage Areas (SWMUs 1, 17).	93 ✓ ✓
Jan 13, 1987	Sampling Reconnaissance	MSDNR	Former Dinoseb Production Area (SWMU 7) was flooded with approximately four inches of liquid. Yellow floor stains noted in Returned-Product Storage Area (SWMU 17).	73
Feb 19, 1987	RCRA Interim Status Compliance and NPDES Compliance Sampling	EPA	Former Dinoseb Production Area (SWMU 7) was observed with two inches of standing yellowish liquid present. At two points, the liquid was going over the berm and into a catch basin outside the area (South Plant Drainage System - SWMU 5). Drum Storage Area (SWMU 1) had leaking, corroded and open drums present. Evidence of erosion was noted on various locations of the South Plant Surface Impoundment (SWMU 3). Two locations adjacent to the South Plant Surface Impoundment (SWMU 3) had standing liquid - possibly indicating seepage. A water cut on the southwest side of the South Plant Surface Impoundment (SWMU 3) was the source of unknown liquid entering the Impoundment. The Inactive Landfill (SWMU 2) had ponding on its surface and showed evidence of erosion.	65, 70 ✓

TABLE II-1

FACILITY INSPECTIONS AT CEDAR CHEMICAL CORPORATION
VICKSBURG FACILITY
(PAGE 5 OF 5)

DATE	TYPE OF INSPECTION	PERFORMED BY	SWMU RELATED FINDINGS	REFERENCE NUMBER
Nov 17, 1987	RCRA Interim Status and Comprehensive GW Monitoring	EPA MSDNR	Drums in Drum Storage Area (SWMU 1) were in decent condition, but a few were noticed without proper labeling. The facility has attempted to clean the floor in the Returned-Product Storage Area (SWMU 17) by sweeping, scraping and chipping the cement. They've also tried reacting the Dinoseb with hydrogen peroxide and a ferrous ion catalyst to remove the stains.	46, 48
Feb 1, 1989	RCRA Compliance Evaluation and Sampling Investigation	MSDNR EPA	Drum Storage Area (SWMU 1) in good condition, however inspection reports were not accurate.	12, 17

D. Process Description

The CCC facility consists of two separate manufacturing plants built in the early 1950s under different corporate ownerships. These plants shared a common boundary and were later acquired by Vertac Corporation in 1975, thereby becoming one operating facility (Reference 5, 12, 46). At the time of the VSI, the facility operated under the name of Cedar Chemical Corporation. The two separate plants are referred to as the North and South Plants (Reference 257).

The North Plant is used to manufacture potassium nitrate and potassium nitrate by-products such as chlorine gas, nitrogen tetroxide, and traces of bromine. The South Plant manufactures nitric acid for sale and for use by the North Plant. The South Plant was used to manufacture various agricultural chemicals under Vertac Corporation management during the mid-1970s to mid-1980s. The agricultural chemicals that were produced at the South Plant included Atrazine, Cyanazine, 2-sec-butyl-4,6-dinitrophenyl (DNBP/Dinoseb), methyl parathion, Toxaphene, and monosodium metharsenate (MSMA) (References 5, 12, 17, 46).

Potassium nitrate is produced by combining potassium chloride and nitric acid. This reaction also forms chlorine and nitrogen tetroxide. The potassium nitrate is crystallized, centrifuged, dried, prilled, and then bagged or bulk stored in warehouses located at the North Plant. The potassium nitrate plant operates at approximately 16.7 tons per hour. The plant operates 24 hours per day, seven days per week (References 2, 13, 14).

Nitric acid is produced by combining ammonia, air, and water. Ammonia and air are passed through a platinum gauze catalyst allowing the ammonia to burn to produce the oxide. Nitrogen dioxide is produced as the gases are cooled and condensed. The nitrogen dioxide is then dissolved in water at an adsorption tower to form nitric acid. The nitric acid plant operates at a rate of 260 tons per day (References 2, 13, 259).

Facility representatives could not provide information pertaining to the past pesticide manufacturing activities conducted at the South Plant. The following process descriptions were prepared by using the available reference material as well as information provided in the Farm Chemicals Handbook, the British Crop Protection Council's Pesticide Manual, the Pesticide Manufacturing and Toxic Materials Control Encyclopedia, and the Herbicide Handbook of the Weed Science Society of America (Reference 259).

Dinoseb (2-(1-methylpropyl)-4,6-dinitrophenol) was produced at the South Plant from 1973 to December 1986. Dinoseb is produced by reacting 6-alkylphenol with concentrated sulfuric acid until the phenol is converted into a sulfonic acid derivative. The

derivative is then dissolved in water. Nitric acid is added to the solution and agitated to convert the sulfonic acid derivative to the dinitrophenol compound. Following the addition of nitric acid, the mixture is stirred, cooled and the dinitro derivative is separated by either filtration, extraction with solvent, or decantation. According to facility representatives, the chelating agent ethylenediaminetriacetic acid (EDTA/versene) was also used in the production of Dinoseb (Reference 257, 259). The Vertac Corporation produced a phenol form and an ammonium salt form of Dinoseb. However it could not be determined from the available file material whether one or both forms were produced at the Vicksburg facility. Dinoseb was banned by EPA due to significant risks of developmental toxicity. Remaining stocks retained by the facility were stored in drums at a warehouse in the facility's South Plant at the time of the VSI (Reference 5).

Toxaphene was produced at the facility's South Plant from 1973 to 1982. Wastes associated with this process are untreated process wastewater (K098) and wastewater treatment sludge (K041). Toxaphene is produced by combining camphene (a terpene produced from pine stumps) and chlorine. According to testimony from a Mississippi Order of Dismissal, the facility purchased "pure" camphene for the process rather than producing camphene (Reference 27). The chlorination reaction used for the production of Toxaphene was conducted in a liquid phase utilizing approximately five parts carbon tetrachloride per part of camphene, with ultraviolet light as a catalyst. The carbon tetrachloride was removed from the reaction by distillation following the removal of excess chlorine and HCl. Emulsifiable concentrate formulations of Toxaphene normally used mixed xylenes as carriers (Reference 259). Muriatic acid was reportedly a by-product of the Toxaphene process (Reference 17).

Monosodium metharsenate (MSMA) was produced at the facility's South Plant during 1983 and 1984. Wastes associated with this process are the by-product salts (K031). MSMA is produced utilizing arsenic trioxide, caustic, and methyl chloride. The facility had plans to produce disodium metharsenate (DSMA) and sodium cacodylate (Caco) after the MSMA process was underway. DSMA is used at higher application rates and is less soluble than MSMA and therefore is not as widely used as MSMA. It is not clear from the available file material whether these additional products were produced at the Vicksburg facility. The 1987 Farm Chemicals Handbook lists Vertac as a basic producer of both Caco and DSMA (Reference 259). MSMA is produced by combining arsenic trioxide with caustic to produce sodium arsenite. The facility initially used sodium arsenite solution rather than arsenic trioxide due to OSHA regulations (e.g., requiring a separate building and a dust collection system for emptying the drums of arsenic trioxide) (Reference 217).

Sodium arsenite, when reacted with methyl chloride, produces DSMA. Safety requirements to minimize trace levels of arsenic include the incorporation of sodium hypochlorite to oxidize the trivalent arsenic to pentavalent arsenic. The DSMA may be separated from the salt and sold as product or be used as an intermediate for the production of MSMA. Sulfuric acid is added to the DSMA to produce MSMA. This also produces waste salt and sodium sulfate. MSMA is recovered by centrifuging. The underflow salt cake is a waste. The overflow is further evaporated and cooled to precipitate the salts which are pumped as a slurry and returned to the centrifuge. The slurry underflow consisting of sodium sulfate and sodium chloride salts is disposed of as a waste. The overflow is MSMA. According to the available file material, 35,000 pounds of slurry were produced per day (Reference 217).

Caco is produced by combining MSMA with sulfur dioxide, caustic, and methyl chloride, in a manner similar to the MSMA process. Waste salts from the Caco process include sodium chloride, sodium sulfite, and sodium sulfate (Reference 213, 217).

Atrazine (6-chloro-N-ethyl-N'-(1-methylethyl)-1,3,5-triazine-2,4-diamine) is produced by combining cyanuric chloride with equivalent amounts of ethylamine followed by equivalent amounts of isopropylamine. The addition of isopropylamine is conducted in the presence of an acid-binding agent. Waste emissions containing hydrogen cyanide, HCl, and cyanuric acid were treated via an alkali scrubber. If dusts were produced, emissions of dusts were treated via filters or wet scrubbers. The process also produced wastewater in addition to the scrubber water (Reference 259). Some of the production vessels at the Atrazine production area contained a methanol-water coolant. There was no information pertaining to the Cyanazine process in the available file material. However, these two herbicides are similar in activity and composition (Reference 259).

Methyl Parathion is produced by combining O,O-dimethyl phosphorothionochloridate and sodium p-nitrophenoxide as an exothermic reaction at 80°C to 100°C or lower temperatures such as from -10°C to +10°C. The reaction is carried out at atmospheric pressure with reaction times ranging from approximately five hours at the high temperature and up to 18 hours at the lower temperature (Reference 259). Copper may be used as a catalyst or the reaction may be conducted in copper vessels. Potassium bromide may also be used as a cocatalyst. Other catalysts cited for the methyl parathion reaction include triethyl amine, tributyl amine, N-ethyl morpholine, and hexamethylene tetramine (Reference 259). Solvents used in this reaction may include benzene, alcohol, or chlorobenzene. According to the Pesticide Manufacturing and Toxic Materials Control Encyclopedia, the reaction product is an oily filtrate. The filtrate is separated into an oily and aqueous layer. The

oily layer may be then washed with dilute sodium carbonate solution, then with water, then steam distilled in order to remove trimethyl thiophosphate. The material is cooled, then dried under vacuum, yielding the product (Reference 259).

E. Waste Management

Waste management practices at CCC focus primarily on the containment and treatment of the process wastewaters and stormwater runoff. Solid wastes generated at the facility are either drummed and stored in the Drum Storage Area (SWMU 1), prior to offsite disposal, or discarded in the Junkyard and Wastes Piles (SWMU 34). Air emissions are treated by various scrubbers at the facility.

In the North Plant, 0.26 million gallons per day of acidic wastewater are generated from potassium nitrate production. The acidic wastewater is generated at the End Product Scrubber (SWMU 28), the Cooler Scrubber (SWMU 27) and the production areas. Wastewater generated in the production areas is collected by the North Plant Containment System (SWMU 24) and treated at the North Plant Neutralization System (SWMU 22) prior to discharge to the Mississippi River under NPDES Permit No. 0027995. Off-gases from the potassium nitrate production areas are treated by the C-10 and C-15 Scrubbers (SWMUs 26 and 32). Alkaline wastewater generated by the C-10 Scrubber (SWMU 26) is discharged to the North Plant Neutralization System (SWMU 22) to aid in the neutralization of the acidic wastewater received by that unit. The Inactive North Plant Surface Impoundment (SWMU 23) was formerly used to treat the North Plant wastewaters. This unlined unit used lime to neutralize the wastewater before being replaced by the North Plant Neutralization System (SWMU 22) (Reference 257). Wastewater generated at the North Plant is transported between the units via the Wastewater Pipes (SWMU 25) (Reference 257). Stormwater runoff which is not collected by the North Plant Containment System (SWMU 24) flows into the North Plant Drainage Ditches (SWMU 33). The drainage ditches merge and flow under the railroad tracks into Stouts Bayou (References 5, 261).

Another waste management practice at the North Plant is the collection of waste oils for disposal offsite. Two waste management units were identified for this purpose: the Oil Collection Unit (SWMU 29), and the Waste Oil SAA (SWMU 30). Waste oils have also collected in a sump located in the No. 6 Fuel Oil Area (SWMU 31) (References 257, 258).

The South Plant generates 0.07 million gallons per day of acidic wastewater. The process wastewater and stormwater is discharged to the South Plant Surface Impoundments (SWMU 3a, 3b, and 3c). The combined wastewaters and stormwaters are discharged offsite

after treatment in the Carbon Adsorption System (SWMU 4). The wastewater and stormwater are transferred between various units throughout the South Plant via the South Plant Drainage System (SWMU 5). Wastewater is collected at various sumps located in the former pesticide production areas. The contents of the sumps are removed via the Vacuum Truck (SWMU 21) and also treated at the Carbon Adsorption System (SWMU 4). Any stormwater runoff from the South Plant, especially from around the Former Atrazine Production Area (SWMU 16), which is not collected by the South Plant Drainage System (SWMU 5) flows into the South Plant Drainage Ditches (SWMU 13). The South Plant Hill Tank and Former Blue Tank (SWMUs 6 and 18) were previously used to contain Dinoseb wastewater prior to treatment or discharge (References 5, 257).

The pesticide production areas at the South Plant include the Former Dinoseb Production Area (SWMU 7), the Former MSMA Production Area (SWMU 11), the Former Toxaphene Production Area (SWMU 14), the Former Methyl Parathion Production Area (SWMU 15), and the Former Atrazine Production Area (SWMU 16). Other units which may have received spillage from pesticide production include the Dinoseb Off-Loading Area (SWMU 8), the Dinoseb Drumming Area and Drains (SWMU 9), the Dinoseb Stock Storage Area (SWMU 10), the Former MSMA Salt Unloading Area (SWMU 12), and the Returned Product Storage Area (SWMU 17). The Railroad Car Unloading Station (SWMU 20) has potentially received spillage of not only the pesticide products, but also the raw materials. At the time of the VSI, a Scrap Metal Dumpster (SWMU 19) was located near the Former MSMA Production Area (SWMU 11) for the disposal of large debris from the dismantling of that area (References 5, 257).

The facility utilized an Inactive Landfill (SWMU 2) in the South Plant for the disposal of pesticides and pesticide-related materials during the 1970s. The unlined unit was subject to non-RCRA-type closure activities in the early 1980s (Reference 257). Runoff from this area is meant to flow to the South Plant Surface Impoundments (SWMU 3), but on occasion has been observed entering the South Plant Drainage Ditches (SWMU 13).

F. Environmental and Demographic Setting

1. Meteorology

Cedar Chemical Corporation is located on the western border of Warren County Mississippi, approximately forty miles west of the state capital, Jackson. Warren County lies along the Mississippi River on the western border of Mississippi (Reference 256).

The climate in Warren County ranges from hot and humid in the summer to mildly cold and humid in the winter. The summer

temperatures average at or above 90° F. Winter temperatures generally stay around 50° F. Winds are generally light, gaining strength in the winter. Rainfall is generally heavy throughout the year, lessening in Autumn. The yearly average rainfall is approximately 50 inches and snow is rare (Reference 256).

2. Floodplain and Surface Waters

Two distinct physiographic regions meet in Warren County. These are the alluvial plains associated with the Mississippi River and its tributaries, and the loess hills. The Cedar Chemical facility is located directly on the border of these two regions. East of the facility are small flood plains and the western area consists mainly of steep hills and bluffs (Reference 256). The facility ranges from 80 to 150 feet above mean sea level (Reference 5).

The Cedar Chemical facility is bordered on the east by Stouts Bayou. This bayou flows south and joins with Hatcher Bayou at the southeast corner of the South Plant Surface Impoundment (SWMU 3) to form Hennessey's Bayou. Hennessey's Bayou flows west along the southwesterly border of the facility and eventually discharges into the Mississippi River. Surface drainage at the North Plant is easterly into Stouts Bayou. In the South Plant, the surface drainage is predominant in the southwesterly direction into the major South Plant Drainage Ditch (SWMU 13). The drainage ditch flows through a wetlands area into Hennessey's Bayou. Hennessey's Bayou flows south for approximately four miles into the Mississippi River. Portions of the CCC facility are within the floodplains of these bayous and are flooded during heavy rainfall events. The surface waters become contaminated from the contaminated soils which are washed into the bayous during flooding (References 5, 225, 256, 261).

3. Soils and Geology

Approximately 60 percent of Warren County and all of the Cedar Chemical facility lie in an area that has been mapped as having Memphis-Natchez-Adler association soils. The Memphis and Memphis-Natchez soils encompass a majority of the land to the west of the facility and the land between the plants and the inactive landfill area. Both the Memphis and Natchez soils were formed in loess. The Memphis soils are found along the narrow ridgetops and the higher areas of the slopes. Natchez soils are predominant along the lower and middle areas of the slopes. Both soil types accept water slowly but have a high capacity once the water has permeated. Both soils are well-drained and erosion is moderate. The Memphis soils have a silty clay loam subsoil, while the Natchez subsoil consists of silt loam. The Memphis Natchez soils are 0.25-1.5 feet thick and are underlain by 10-20 feet of silt or silty loam. These soils have a hydraulic conductivity of 0.8-2.5 inches per hour (Reference 256).

The south plant of the facility lies on silty land. This land is very similar to the Memphis-Natchez silt loams, only it has been greatly altered by man. The land has been cut and filled to allow for building sites. The terrain is generally rolling hills with moderate to steep slopes. The soil maintains the same characteristics as the Memphis-Natchez soils (Reference 256).

The north plant is split between Memphis-Natchez silt loams and Adler silt loam. The Memphis-Natchez silt loams in the plant area are severely eroded and the surface layer consists mainly of the upper subsoil layer. The other half of the north plant lies on Adler silt loam. The Adler silt loam also makes up the majority of the land east of the facility, including the South Plant Surface Impoundment (SWMU 3). Adler soils are moderately well drained and have a high water capacity. Adler soils are 4-6 feet thick and have a hydraulic conductivity of 0.8-2.5 inches per hour (Reference 256.) Specifically, boring logs indicate that the plant is underlain by a silty clay fill to a depth of about 10 feet and silty clay pleistocene loess from 10-50 feet below the surface. The loess is underlain by marl at a depth of approximately 50 feet (Reference 46).

4. Groundwater

The plant is underlain by a confined aquifer occurring between depths of 10 and 50 feet showing mildly artesian conditions. The aquifer is made up of pleistocene loess (silt) and is overlaid by a clayey cap at a depth of 10 feet and underlain by an impermeable marl at a depth of 50 feet. The aquifer has a hydraulic conductivity range of 1.93-5.5 gpd/ft^2 and a transmissivity range of 40-200 gpd/ft. The groundwater beneath the facility could be classified as Class IIB, a potential source of drinking water (References 5, 12).

Groundwater gradients in the facility area are low (Reference 12). Shallow groundwater moves in a north to south direction. Stouts Bayou and Hennessey's Bayou influence the groundwater flow direction and gradient. Groundwater mounding from either natural topographic effects or artificially induced recharge may exist beneath the inactive disposal site and the surface impoundment (Reference 46). Groundwater velocities in the aquifer range from 0.01-0.18 ft/d (Reference 12). The groundwater may receive contaminants via the infiltration of surface water through the contaminated unsaturated zone (Reference 5).

Sixteen groundwater monitoring wells are in place at the plant (Figure II-3, page 33) (Reference 12). Dinoseb and Atrazine have been detected in at least six of the monitoring wells, and arsenic in at least four. Dinoseb has been documented at 1130 µg/l in MW-1, and Atrazine in MW-8 at 191 mg/l. Other pesticides and inorganic elements have also been detected in the groundwater

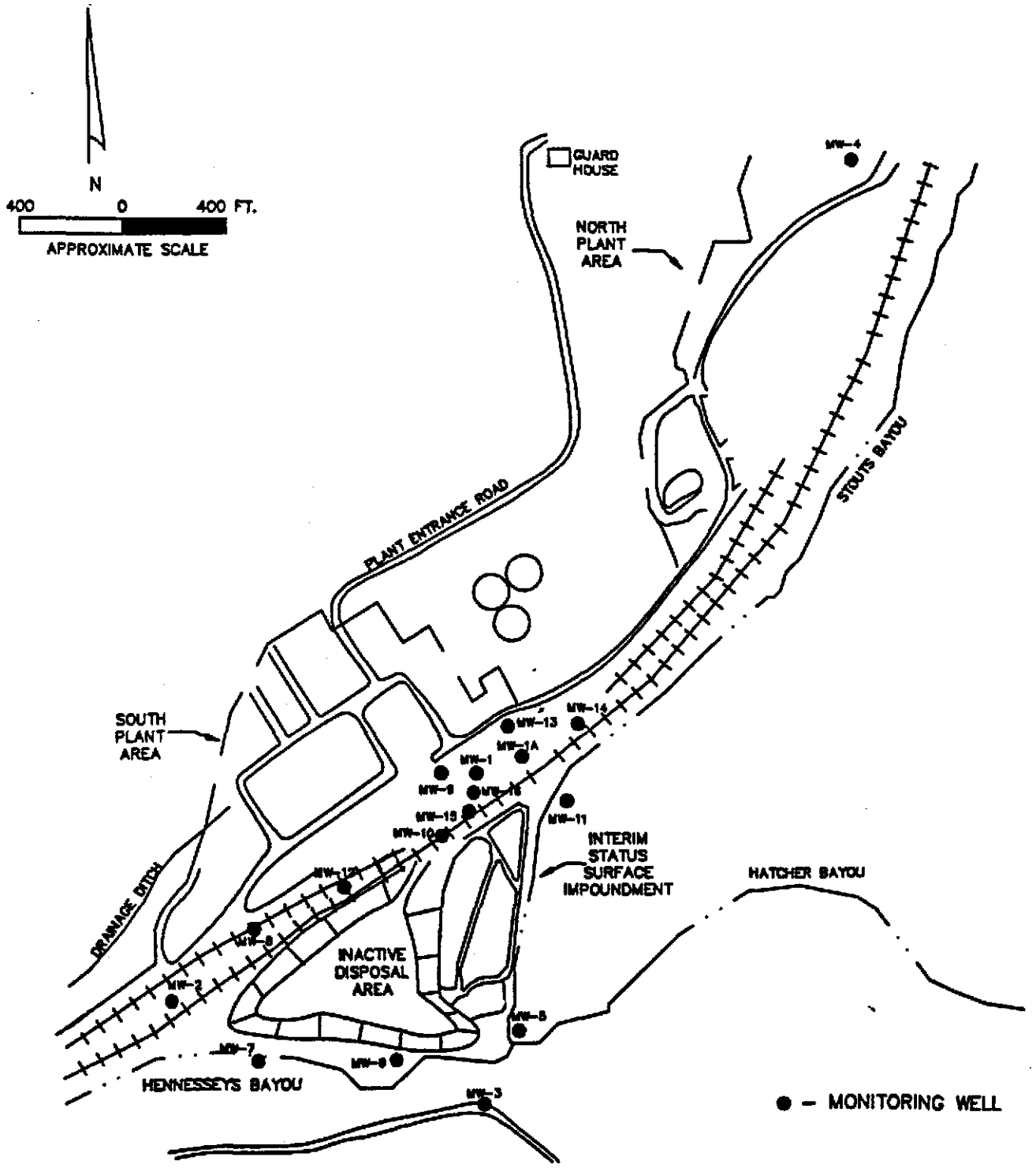
at the facility. The contaminated groundwater can discharge to either Stouts or Hennessey's Bayous (Reference 5).

There are five public or private wells within a three-mile radius of the facility (Reference 27).

FIGURE II-3

Monitoring Well Locations

(Reference 12)



III. SWMU DESCRIPTIONS

This section presents SWMU Data Sheets completed to provide descriptions and release assessments of the Solid Waste Management Units (SWMUs) identified during the PR and VSI of the Cedar Chemical Corporation in Vicksburg, Mississippi.

Prior to the individual SWMU Sheets are SWMU location maps for the South Plant (Figure III-1, Page 35) and the North Plant (Figure III-2, page 65). The SWMUs are presented on these Figures by number as identified in the following descriptions.

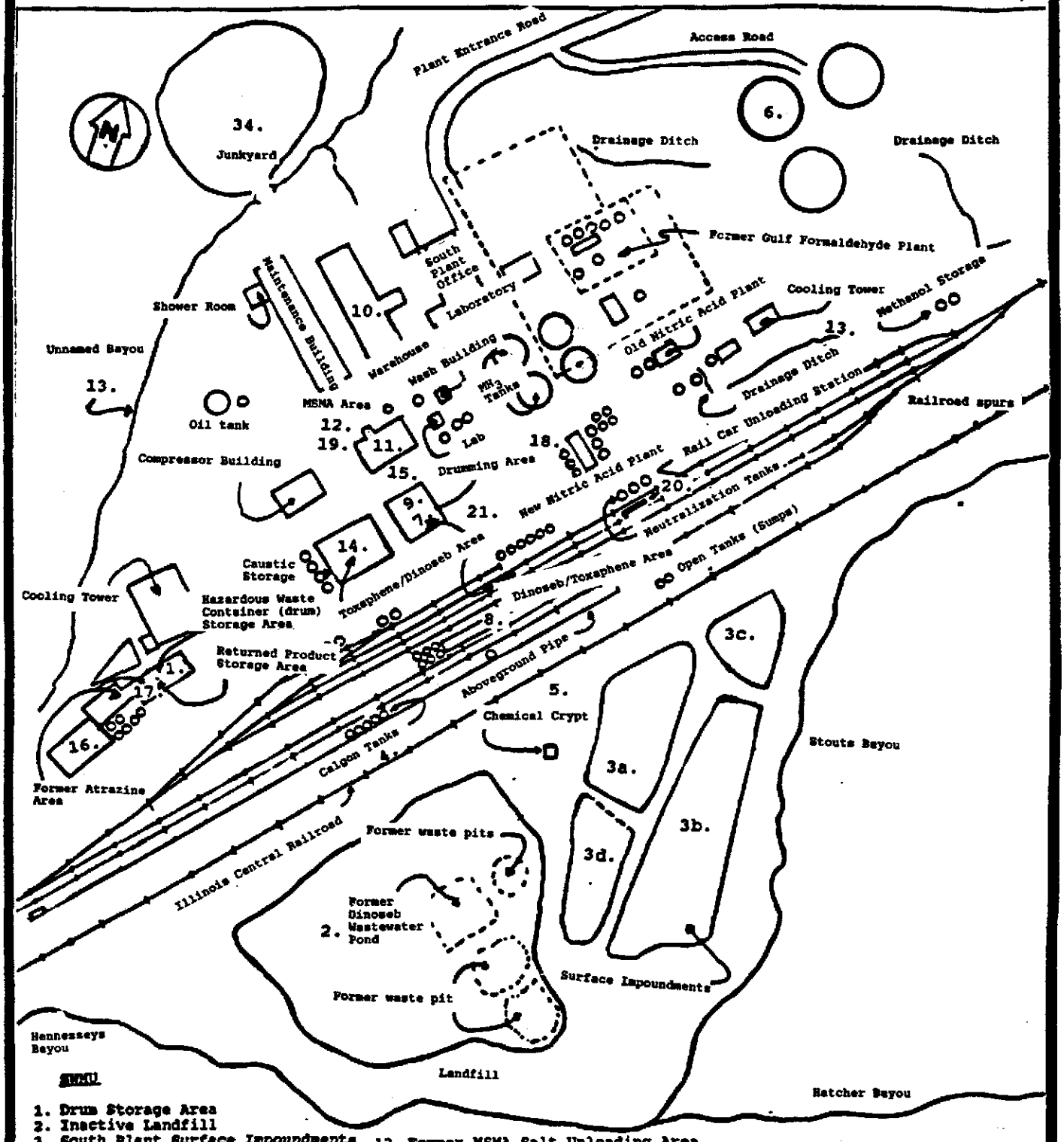
In the SWMU Data Sheets, the following designations are used to assess the unit's potential for release to the environment via the various pathways:

L (Low)	minimal potential for release
M (Medium)	moderate potential for release
H (High)	evidence suggests that release(s) have occurred
U (Unknown)	no information is available

FIGURE III-1

South Plant SWMU Map

(Reference 33)



1. Drum Storage Area
2. Inactive Landfill
3. South Plant Surface Impoundments
4. Carbon Adsorption System
5. South Plant Drainage System
6. South Plant Hill Tank
7. Former Dinoseb Production Area
8. Dinoseb Off-Loading Area
9. Dinoseb Drumming Area and Drains
10. Dinoseb Stock Storage Area
11. Former MSMA Production Area
12. Former MSMA Salt Unloading Area
13. South Plant Drainage Ditches
14. Former Toxaphene Production Area
15. Former Methyl Parathion Production Area
16. Former Atrazine Production Area
17. Returned Product Storage Area
18. Former Blue Tank
19. Scrap Metal Dumpster
20. Railroad Car Unloading Station
21. Vacuum Truck
34. Junkyard and Waste Piles

Approx. scale:
167 feet = 1 inch

SWMU locations not to scale

SWMU NUMBER: 1 **PHOTO NUMBER:** 1.1, 1.2

NAME: Drum Storage Area

TYPE OF UNIT: Less-than-90 day storage area

PERIOD OF OPERATION: 1980 to present

PHYSICAL DESCRIPTION AND CONDITION: The unit is located in the vicinity of the Former Atrazine Production Area (SWMU 16) in the south section of the South Plant. The unit was formerly used to store drums of hazardous waste generated at the various pesticide production areas in the South Plant. At the time of the VSI, the unit was utilized for staging drums of floor scrapings and similar hazardous wastes generated from the activities associated with dismantling the former pesticide production areas. The capacity of the unit is approximately 1,000 55-gallon drums and covers an area 80 feet by 80 feet. The unit is constructed of concrete and was covered by a tin roof. The roof was reportedly blown down during a storm during the spring of 1990. Secondary containment consists of six-inch tall concrete curbs on the unit's south, west, and north sides. Runoff from the pad was collected via a concrete sump approximately 30 inches in diameter and two feet deep. The sump previously discharged to the South Plant Surface Impoundments (SWMU 3a, 3b, 3c). The drain from the sump was plugged with concrete in February 1987 and the contents of the sump are presently removed via the Vacuum Truck (SWMU 21). The floor of the unit appeared pitted and stained yellow with Dinoseb. The concrete around the sump appeared pitted and was covered with a white chalky material that appeared to be Atrazine. The major South Plant Drainage Ditch (SWMU 13) is situated west of the unit.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit formerly managed by-product salts from production of MSMA, and solid wastes associated with Dinoseb, Toxaphene and Atrazine production. Currently, the unit is used to stage waste floor scrapings containing MSMA. However, no drums were observed at this unit at the time of the VSI.

RELEASE PATHWAYS: Air (L) Surface Water (M) Soil (H)
Groundwater (H) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): The VSI team observed the area to be cracked, pitted, and stained yellow. The unit has a history of drum mismanagement including leaking drums and the storage of wastes in drums that were in poor condition (See Table II-1). Analysis of soil samples collected from an area immediately northwest of the unit during February 1987 indicated 550 mg/kg arsenic, 130 mg/kg zinc, 5000 µg/kg Atrazine, and 3,700 µg/kg Toxaphene.

RECOMMENDATIONS:
No Further Action ( )
RFA Phase II Sampling ( )
RFI Necessary (X)

REFERENCE(S): 5, 12, 17, 26, 28, 48, 65, 73, 85, 86, 93, 133 138, 183, 226, 239, 241, 244, 257, 258, 260

COMMENTS: Two other areas were reportedly used in the South Plant for the temporary staging of drums. One of these areas was located between the drumming building and the New Nitric Acid Plant, with no secondary containment of the area. The other staging area could not be located by facility representatives. Information concerning the contents of the drums staged in these areas could not be provided at the time of the VSI. The facility should determine the location and contents of these drum storage areas so that their potential for release can be determined.

SWMU NUMBER: 2

PHOTO NUMBER: 2.1, 2.2, 2.3, 2.4, 2.5, 4.1

NAME: Inactive Landfill

TYPE OF UNIT: Unlined landfill

PERIOD OF OPERATION: 1972 to November 1980

PHYSICAL DESCRIPTION AND CONDITION: The unit is located in the vicinity of the South Plant Impoundments (SWMU 3a, 3b, 3c) in the southeast section of the South Plant. The unit consisted of a disposal area used to contain discarded drums and five unlined pits. A large number of drums were reportedly removed from the unit in early 1980 and transferred off-site to a hazardous waste landfill. The unit was subject to a non-RCRA-type closure consisting of clay capping and vegetative cover. The landfill covers approximately two to three acres. The unit is bounded on the northeast by the South Plant Surface Impoundments (SWMU 3a, 3b, 3c) which are in the vicinity of the confluence of Stout's and Hatcher's Bayou. The unit was covered in grass and weeds at the time of the VSI. The slope between the landfill and the surface impoundment was covered with a geotextile fabric. The cover was reportedly used to prevent soil erosion from the landfill interfering with the retrofitting activities being conducted at the impoundment. Three monitoring wells are in place to monitor the landfill area.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: According to a 1989 U.S. EPA endangerment assessment for the facility, the unit received 4000 empty Dinoseb formulation drums; residue and debris from the methyl parathion fire; 172 drums of hydrolyzed cyanuric acid from the production of Atrazine; 17 drums of spent activated carbon; 25 drums of dimethyl urea and isopropyl amine; 31 drums of sodium nitrophenol liners and empty bromine bottles; 80 drums of phosphorous trichloride, phosphorous sulfochloride, and dimethyl phosphorous sulfochloride.

Three pits at the landfill received sediment from the South Plant Surface Impoundments (SWMU 3) consisting of soil and Dinoseb. One pit received 200,000 gallons of Dinoseb wastewater. Another pit was used to neutralize empty Dinoseb drums with HCl.

RELEASE PATHWAYS: Air (L) Surface Water (H) Soil (H)
Groundwater (H) Subsurface Gas (M)

HISTORY AND/OR EVIDENCE OF RELEASE(S): There is documented groundwater contamination resulting from past waste management practices at this unit.

RECOMMENDATIONS: No Further Action ( )
RFA Phase II Sampling ( )
RFI Necessary (X)

REFERENCE(S): 5, 9, 133, 136, 138, 140, 162, 163, 167, 168, 170, 173, 174, 179, 183, 202, 203, 204, 206, 209, 215, 218, 224, 228, 239, 244, 254, 257, 258.

COMMENTS: Capping of the area was the subject of Commission Order No. 599-82, issued November 10, 1982.

SWMU NUMBER: 3

PHOTO NUMBER: 3.1, 3.2, 3.3, 3.4, 3.5, 2.5

NAME: South Plant Surface Impoundments

TYPE OF UNIT: Unlined retention ponds

PERIOD OF OPERATION: 1955 to present.

PHYSICAL DESCRIPTION AND CONDITION: The unit is located in the immediate vicinity of the Inactive Landfill (SWMU 2) in the southeast section of the South Plant. The unit is bounded to the east by Stout's Bayou. Beyond Stout's Bayou is the City of Vicksburg POTW. The unit was undergoing retrofitting activities at the time of the VSI. The impoundments receive stormwater from the South Plant; wastewater from the North Plant that does not meet the facility's NPDES discharge requirements; and backwash from the Carbon Adsorption System (SWMU 4). In the past, the unit consisted of three unlined surface impoundments (SWMU 3a, 3b, and 3c) with combined capacities of 3,500,000 to 6,000,000 gallons. With the closure activities, another area has been established, the Solid Waste Consolidation Area (SWMU 3d). At the time of the VSI, wastewater was expected to flow from Impoundment C to Impoundment B, and through Impoundment A after the completion of the retrofitting activities. The three impoundments encompassed approximately 3.9 acres.

Prior to the retrofitting activities, each impoundment was 10 to 15 feet deep including sludge. The impoundment embankments are constructed of soil (loess, common to the area) and are vegetated with grass for erosion prevention. The south border of the unit is adjacent to Hennessey's Bayou and the eastern border parallels Stout's Bayou. The sludges from Impoundment A were solidified with lime kiln dust and disposed of in the Solid Waste Consolidation Area (SWCA) within the area previously covered by Impoundment A. The SWCA consists of a double-lined landfill. Sludges from the other two impoundments will also be disposed of in the SWCA (SWMU 3d).

South Plant Impoundment A (SWMU 3a) is situated between Impoundment B (SWMU 3b) and the Inactive Landfill (SWMU 2). Impoundment A previously received wastewater from the South Plant. At the time of the VSI the impoundment was being retrofitted with a 60 mm liner and was not receiving any wastewater. The liner reportedly had leaks which were expected

to be repaired by the installation contractor. Pipes were observed in place for use when Impoundment A (SWMU 3a) became operational. Impoundment A was rectangular in shape with dimensions of 600 feet by 150 feet and the impoundment encompassed approximately 2.1 acres. With SWCA (SWMU 3d) taking approximately half of the previous area, Impoundment A was last estimated as being 300 feet by 165 feet. The SWCA (SWMU 3d) was described by a facility representative as being somewhat triangular in shape, with a base of approximately 300 feet and a hypotenuse of approximately 360 feet. As of October 1990, retrofitting of Impoundment A was complete and closure procedures had been started on Impoundment B.

South Plant Impoundment B (SWMU 3b) is situated between Impoundment A and Stout's Bayou. Impoundment B receives secondary wastewater through a pump. At the time of the VSI, soil discoloration and scum were observed along the pond's edge. The pond is rectangular in shape with dimensions of 450 feet by 150 feet and encompasses about 1.5 acres.

South Plant Impoundment C (SWMU 3c) is situated northwest of the Impoundments A and B. At the time of the VSI, Impoundment C received all wastewater and stormwater runoff from the South Plant. Impoundments A and C were connected by a 10-foot cut-away section of the dividing dike-road at the time of the VSI. The impoundments are expected to be connected by pipes in the future. Impoundment C is triangular, encompassing approximately 0.3 acres. The impoundment is scheduled to be lined after Impoundment B is completed. Impoundment C also receives backwash from the Carbon Adsorption System (SWMU 4) and any effluent from the North Plant Neutralization System (SWMU 22) which does not meet the pH range (pH 6-9) for discharge. The VSI team observed an oil-like sheen on the water surface in the vicinity of one of the pipes discharging to the impoundment, and soils stained with what appeared to be Dinoseb along the southern edge.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit receives stormwater containing "de minimus" quantities of Dinoseb and acidic wastewater from the fertilizer manufacturing operations. In the past, the unit received wastewaters containing Toxaphene, Dinoseb, Atrazine, MSMA, and methyl parathion.

RELEASE PATHWAYS: Air (L) Surface Water (H) Soil (H)
Groundwater (H) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): There is documented soil contamination resulting from past waste management practices conducted at this unit. Up to 13,000 mg/l Dinoseb and up to 2,320 mg/kg Toxaphene were detected in sediment samples taken from the impoundment during 1986.

RECOMMENDATIONS:
No Further Action ( )
RFA Phase II Sampling ( )
RFI Necessary (X)

REFERENCE(S): 5, 48, 49, 65, 72, 73, 80, 85, 86, 77, 88, 89, 91, 110, 113, 118, 123, 133, 136, 138, 140, 141, 145, 146, 162, 163, 167, 168, 172, 173, 174, 176, 180, 183, 184, 185, 187, 189, 191, 193, 199, 200, 211, 228, 239, 241, 244, 257, 258, 260.

COMMENTS: None

SWMU NUMBER: 4 **PHOTO NUMBER:** 4.1, 4.2, 4.3, 8.1

NAME: Carbon Adsorption System

TYPE OF UNIT: Neutralizing System

PERIOD OF OPERATION: Mid-1970's to present.

PHYSICAL DESCRIPTION AND CONDITION: This unit is located along the railroad tracks in the south section of the South Plant. The system consists of six vertical tanks containing approximately 20,000 pounds each of activated carbon and two wastewater holding tanks (river tanks). The wastewater is contained by the two above-ground vertical river tanks prior to treatment in the carbon adsorption tanks. These tanks are constructed of carbon steel with capacities of approximately 12,000 to 15,000 gallons. The tanks receive wastewater collected by the Vacuum Truck (SWMU 21) and combined stormwater and wastewater contained by the South Plant Surface Impoundments (SWMU 3a, 3b and 3c). The river tanks discharge into the carbon adsorption tanks. The adsorption tanks are connected in series and are designed to remove pesticides from the wastewater. Wastewater flows from the top to the bottom of each tank. The adsorption unit has a treatment capacity of 1,200,000 gallons per day.

At the time of the VSI, the system was set up as two units, each unit consisting of two tanks in series. An additional tank is used for standby and another is used as back-up. One unit in series is used for treating the wastewater collected by the Vacuum Truck (SWMU 21) which is discharged to the unit via a sump within the secondary containment. The other unit in series treats the liquid effluent from the South Plant Surface Impoundments (SWMU 3a, 3b, and 3c). Both units discharge the treated wastewaters off-site via NPDES-permitted Outfall #001 which flows to the Mississippi River. Backwash water from the unit is returned to the surface impoundment and the spent carbon is transferred off-site for regeneration. Secondary containment for the unit consists of a concrete pad approximately 100 feet long, 20 feet wide, with containment curbs approximately one foot tall. The sump, utilized during the Vacuum Truck (SWMU 21) unloading operations, is approximately four feet long, four feet wide, and three feet deep. The concrete pad was stained yellow with what appeared to be Dinoseb. The concrete around the sump appeared stained and eroded.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: In the past the unit received wastewater containing Dinoseb, Atrazine, methyl parathion, MSMA and Toxaphene. At the time of the VSI, the unit received stormwater containing "de minimus" amounts of Dinoseb as well as wastewater (containing Dinoseb, Atrazine, Toxaphene, MSMA, and methyl parathion) collected from sumps by the Vacuum Truck (SWMU 21).

RELEASE PATHWAYS: Air (L) Surface Water (M) Soil (M)
Groundwater (M) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): Although releases to surface water are regulated via NPDES permit, there have been several excursions consisting of releases of untreated wastewater.

RECOMMENDATIONS: No Further Action ( )
RFA Phase II Sampling (X)
RFI Necessary ( )

REFERENCE(S): 5, 83, 113, 123, 130, 133, 139, 183, 219, 223, 226, 228, 239, 244, 257, 258.

COMMENTS: None

SWMU NUMBER: 5 **PHOTO NUMBER:** 5.1

NAME: South Plant Drainage System

TYPE OF UNIT: Drainage system

PERIOD OF OPERATION: The unit consists of drains, sumps, trenches, and pipes of varying ages dating from the 1950's to present.

PHYSICAL DESCRIPTION AND CONDITION: This unit is located throughout the South Plant. The unit is designed to transfer stormwater and process water to the South Plant Surface Impoundments (SWMU 3a, 3b, and 3c) and offsite. The drainage system receives process and stormwater from the processing area, product loading and unloading areas, the drumming building, and the nitric acid production area. The pipes are made of varying materials of construction with diameters ranging from four to 24 inches. The materials of construction include cast iron, carbon steel, vitrified clay, reinforced concrete, fiberglass reinforced plastic, and PVC. Sumps and trenches are also of varying dimensions, but are primarily constructed of concrete. Most wastewaters received by this unit were formerly discharged to the South Plant Surface Impoundments (SWMU 3), although some areas discharged to the major South Plant Drainage Ditch (SWMU 13). Facility representatives reported that around November 1985 all areas related to the handling of Dinoseb were sealed off from the surface impoundments. At the time of the VSI, it was difficult to determine the drainage pathways since the piping is located underground. Wastewater collected in the sealed-off areas is reportedly removed by the Vacuum Truck (SWMU 21).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit receives and transfers nitric acid process water, and stormwater containing Dinoseb, Atrazine, MSMA, methyl parathion, and Toxaphene.

RELEASE PATHWAYS: Air (L) Surface Water (U) Soil (U)
Groundwater (U) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): The Endangerment Assessment prepared by EPA has documented Dinoseb in sediment and liquid samples from this unit. In addition, an evaluation conducted by facility consultants (Environmental Protection Systems, Inc.), indicated that pipes in the nitric acid line leaked.

RECOMMENDATIONS:
No Further Action ( )
RFA Phase II Sampling (*)
RFI Necessary ( )

REFERENCE(S): 5, 257, 258, 261

COMMENTS: * Integrity testing of the South Plant sewers and surface water drainage (similar to the one by Environmental Protection Systems, Inc. in March 1986) should be performed to determine the release potential of this system.

SWMU NUMBER: 6 **PHOTO NUMBER:** 6.1

NAME: South Plant Hill Tank

TYPE OF UNIT: Storage Tank

PERIOD OF OPERATION: Early 1960's to 1989

PHYSICAL DESCRIPTION AND CONDITION: The unit was located on a hill between the South and North Plants. The unit was a carbon steel tank with a capacity of 1,600,000 gallons. The units dimensions were 300 feet by 300 feet. The tank was used to store neutralized wastewater from Dinoseb production before disposal offsite or release under NPDES permit through the Carbon Adsorption System (SWMU 4). The tank was formerly used to store NH_4NO_3 solution. Two other tanks were situated in the immediate vicinity of the unit and utilized for nitric acid storage. In 1989 the tank was sold as scrap metal after the stored wastewater was discharged to the Carbon Adsorption System (SWMU 4). The VSI team observed the former location of the unit which consisted of the soil berm and the concrete pads.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit received neutralized wastewater containing Dinoseb.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE: No evidence of release was observed during the VSI or identified in the available file material.

RECOMMENDATIONS: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCE(S): 5, 65, 86, 133, 138, 176, 183, 187, 196, 226, 239, 241, 244, 257, 258.

COMMENTS: The unit was originally declared as a treatment unit on the facility's 1980 Part A application, and later changed to storage classification on the 1983 application.

SWMU NUMBER: 7 **PHOTO NUMBER:** 7.1

NAME: Former Dinoseb Production Area

TYPE OF UNIT: Inactive production area

PERIOD OF OPERATION: 1973 to December 1986

PHYSICAL DESCRIPTION AND CONDITION: The unit is located between the MSMA facility and the railroad tracks in the central section of the South Plant. The unit consists of sumps, trenches, production vessels, and a storage tank associated with the Dinoseb production operations. The production area is approximately 40 feet long and 25 feet wide. The exact nature of the operations could not be provided by facility representatives. The VSI team observed what appeared to be yellow Dinoseb stains outside the production facility on the surrounding gravel-covered area.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: This area contains spills from the production of Dinoseb, along with DEHPA and EHN which were also produced in this area.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (H)
Groundwater (H) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): The VSI team observed yellow stained areas outside the production area. Previous NPDES and RCRA compliance inspection personnel also noted spills in the vicinity of the former unit (See Table II-1). Analysis of soil sampling collected immediately north of the unit during February 1987 indicated 640,000 µg/kg Dinoseb.

RECOMMENDATIONS:
No Further Action ( )
RFA Phase II Sampling ( )
RFI Necessary (X)

REFERENCE(S): 5, 65, 73, 132, 146, 154, 257, 258, 259.

COMMENTS: None.

SWMU NUMBER: 8 **PHOTO NUMBER:** 8.1, 8.2, 8.3

NAME: Dinoseb Off-Loading Area

TYPE OF UNIT: Inactive loading/unloading area

PERIOD OF OPERATION: 1973 to December 1986

PHYSICAL DESCRIPTION AND CONDITION: The unit is located in the central section of the South Plant. The unit consists of a concrete pad and a sump situated in the southwest corner of the pad. The pad was used to contain spillage associated with the truck loading/unloading operations at the Dinoseb Drumming Area and Drains (SWMU 9). The contents of the sump are periodically emptied by the Vacuum Truck (SWMU 21) for treatment at the Carbon Adsorption Unit (SWMU 4). The pad is approximately 25 feet long and 15 feet wide. The sump is approximately two feet long, 1.5 feet wide, and approximately two feet deep. The concrete curbs, concrete pad, and the concrete surrounding the sump appeared stained (yellow) and in poor condition. The liquid contained by the sump had a yellow-brown scum floating on the surface that appeared to be Dinoseb.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit received Dinoseb spillage.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (H)
Groundwater (H) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): An endangerment study prepared by EPA identified the unit as a potential area of release due to Dinoseb traces found in the groundwater. The inspection showed a possibility of Dinoseb wastes being present in the sump. It could not be determined if the Dinoseb-like material observed in the sump at the time of the VSI was due to contaminated groundwater seeping into the sump or whether the unit contained collected rainfall contaminated with Dinoseb.

RECOMMENDATIONS: No Further Action ( )
RFA Phase II Sampling ( )
RFI Necessary (X)

REFERENCE(S): 5, 65, 70, 73, 257, 258.

COMMENTS: None

SWMU NUMBER: 9 **PHOTO NUMBER:** 9.1

NAME: Dinoseb Drumming Area and Drains

TYPE OF UNIT: Inactive product drumming area

PERIOD OF OPERATION: 1973 to December 1986

PHYSICAL DESCRIPTION AND CONDITION: This unit is located inside a warehouse in the central section of the South Plant in the vicinity of the Dinoseb Off-Loading Area (SWMU 8). The VSI team observed a trench situated inside a warehouse that was approximately 30 feet long, one foot wide, and one foot deep. The trench is connected to a sump approximately three feet long, two feet wide, and two feet deep. The drain and sump collection system were formerly routed to the South Plant Surface Impoundments (SWMU 3a, 3b, and 3c). According to facility representatives, the unit was sealed off from the South Plant Drainage System (SWMU 5) before November 1985. The sump and drain have reportedly been emptied by the Vacuum Truck (SWMU 21) since 1985. The VSI team observed yellow stains that appeared to be Dinoseb on the floor, on either side of the trench.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit received Dinoseb spillage.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (H)
Groundwater (H) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): An endangerment study prepared by EPA identified the unit as a potential area of release due to Dinoseb found in groundwater and soil. Soil samples from the immediate vicinity of the unit showed Dinoseb at 640,000 µg/kg and 12,000 µg/kg.

RECOMMENDATIONS:
No Further Action ( )
RFA Phase II Sampling ( )
RFI Necessary (X)

REFERENCE(S): 5, 257, 258.

COMMENTS: None

SWMU NUMBER: 10 **PHOTO NUMBER:** 10.1

NAME: Dinoseb Stock Storage Area

TYPE OF UNIT: Storage area

PERIOD OF OPERATION: 1973 to present

PHYSICAL DESCRIPTION AND CONDITION: The unit is located inside a warehouse in the central section of the South Plant. The unit consists of an area approximately 20 feet by 30 feet within the warehouse used to stage Dinoseb drums and containers until the EPA determines the method of disposal for the Dinoseb product. The drums were underlain by concrete that appeared in good condition.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit manages the facility's existing Dinoseb stock.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): No evidence of release was observed during the VSI or identified in the available file material.

RECOMMENDATIONS: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCE(S): 257, 258.

COMMENTS: None

SWMU NUMBER: 11 **PHOTO NUMBER:** 11.1, 11.2

NAME: Former MSMA Production Area

TYPE OF UNIT: Inactive production area

PERIOD OF OPERATION: January 1983 to Present

PHYSICAL DESCRIPTION AND CONDITION: The unit is located in the central section of the South Plant. The unit consists of trenches, sumps, production trenches and product storage tanks which are partially covered by roofing. The unit was being dismantled at the time of the VSI. According to facility representatives, rainwater and spillage collected in the trenches were contained in a 10,000-gallon steel tank and recycled through the process, or treated in a 6,000-gallon carbon steel tank, drummed and disposed of offsite. The wastewater was disposed of offsite through deep-well injection. The tanks had been dismantled by the time of the VSI. The debris not contaminated with MSMA was stored in the Former MSMA Salt Unloading Area (SWMU 12) before being disposed of off-site. Floor sweepings and other debris suspected of being contaminated with MSMA, were being collected in three 55-gallon drums located within this area. The drums were to be transferred to the Drum Storage Area (SWMU 1) when full. This unit was constructed over the remains of the Former Methyl Parathion Production Area (SWMU 15).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit formerly received rainwater collected within the containment area and spillage related to the production of MSMA including methanol, by-product salts and arsenic. At the time of the VSI, the area contained demolition debris which was possibly contaminated with MSMA.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (U)
Groundwater (U) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): No evidence of release was observed during the VSI. The 1989 Endangerment Assessment documented soil contamination with levels of arsenic up to 550 mg/kg. The soil sample used for analysis, however, was not collected in the immediate vicinity of the unit.

RECOMMENDATIONS: No Further Action ( )
RFA Phase II Sampling ( )
RFI Necessary (X)

REFERENCE(S): 5, 179, 257, 258, 214, 217, 259.

COMMENTS: This unit was constructed over the Former Methyl Parathion Production Area (SWMU 15). Since the EPA Endangerment Assessment has documented methyl parathion in soil and groundwater samples from this vicinity, the area has been recommended for an RFI.

SWMU NUMBER: 12 **PHOTO NUMBER:** 12.1, 12.2, 11.2

NAME: Former MSMA Salt Unloading Area

TYPE OF UNIT: Waste unloading area and dumpsters

PERIOD OF OPERATION: January 1983 to July 1984.

PHYSICAL DESCRIPTION AND CONDITION: The unit is located adjacent to the Former MSMA Production Area (SWMU 11). The unit was used to off-load MSMA salts generated by the MSMA production area. The MSMA by-product salts were discharged from a centrifuge into polyethylene lined roll-off sludge dumpsters. Full containers were transferred off-site to a ChemWaste landfill located in Alabama. The area consisted of two unloading bays approximately 15 feet long and 10 feet wide underlain by concrete that appeared in good condition and partially covered by roofing. The bays were situated adjacent to the building. Secondary containment was provided by concrete curbs approximately four inches tall that appeared in poor condition. Currently the area is being used for the containment of the wastes produced from the dismantling activities of the production area. The scraps are being tested for arsenic content to determine whether they can be sold as scrap metal or if they must be disposed of as hazardous wastes.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: Managed by-product salts from the production of MSMA (contains K031, arsenic as a constituent) and wastewaters which may include traces of arsenic. At the time of the VSI debris from the dismantling operations were staged at this unit.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): An inspection conducted on September 28, 1983 observed about 25 drums of MSMA waste located in a noncontained area. No spillage was identified in the available file material as a result of these activities.

RECOMMENDATIONS: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCE(S): 5, 80, 119, 136, 138, 178, 179, 211, 213, 214, 217, 257, 258.

COMMENTS: None

SWMU NUMBER: 13 **PHOTO NUMBER:** No Photograph

NAME: South Plant Drainage Ditches

TYPE OF UNIT: Drainage Ditches

PERIOD OF OPERATION: Approximately 1954 to present

PHYSICAL DESCRIPTION AND CONDITION: A few minor drainage ditches and one major drainage ditch are located at the South Plant. The minor ditches are located primarily in the northern area of the South Plant and do not appear to discharge to surface waters. The major drainage ditch flows along the western border of the South Plant (this is referred to as an unnamed bayou on the SWMU map). This major drainage ditch receives runoff from the South Plant and the NPDES permitted discharges. The ditch flows south through a large wetland into Hennessey's Bayou, which in turn flows into the Mississippi River.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The drainage ditches receive stormwater runoff from the South Plant and the neutralized wastewater from the North Plant. The South Plant runoff may contain residues from the production and handling of Atrazine, Dinoseb, MSMA and Toxaphene. The major drainage ditch has received drainage from the Former Atrazine Production Area (SWMU 16) and the Returned Product and Drum Storage Areas (SWMUs 17 and 1).

RELEASE PATHWAYS: Air (L) Surface Water (H) Soil (H)
Groundwater (H) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): Soil samples taken in the vicinity of the South Plant's major drainage ditch behind the Former Atrazine Production Area (SWMU 16), showed contamination of arsenic (550 mg/kg), Atrazine (5000 µg/kg), Cyanazine (240 µg/kg) and Toxaphene (3700 µg/kg).

RECOMMENDATIONS: No Further Action ( )
RFA Phase II Sampling (X)
RFI Necessary ( )

REFERENCE(S): 5, 33, 257, 261

COMMENTS: None

SWMU NUMBER: 14 **PHOTO NUMBER:** 14.1

NAME: Former Toxaphene Production Area

TYPE OF UNIT: Inactive production area

PERIOD OF OPERATION: 1973 to 1982

PHYSICAL DESCRIPTION AND CONDITION: The unit is located in the central section of the South Plant adjacent to the Former Dinoseb Production Area (SWMU 7). The area is unsheltered and consists of trenches, sumps, production vessels and product storage tanks associated with the Toxaphene production operations. The production area is approximately 80 feet long and 25 feet wide. The exact nature of the operations conducted at the unit could not be provided by facility personnel.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: This unit received rainwater collected within the containment area and spillage from the production of Toxaphene, DEHPA, and EHN.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (H)
Groundwater (H) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): The 1989 EPA Endangerment Assessment included analyses of soil samples collected immediately southeast of the unit which indicated 12,000 µg/kg Dinoseb, 47,000 µg/kg Toxaphene, and 94 mg/kg zinc.

RECOMMENDATIONS:
No Further Action ( )
RFA Phase II Sampling ( )
RFI Necessary (X)

REFERENCE(S): 5, 257, 258, 259.

COMMENTS: None

SWMU NUMBER: 15 **PHOTO NUMBER:** 11.1, 11.2, 12.1, 12.2

NAME: Former Methyl Parathion Production Area

PERIOD OF OPERATION: Mid 1970's

PHYSICAL DESCRIPTION AND CONDITION: The former production area was located at the same site as the Former MSMA Production Area (SWMU 11) in the central section of the South Plant. The unit consisted of trenches, sumps, production tanks and vessels associated with the methyl parathion operations. The production facility was destroyed by fire in the mid 1970's. The debris associated with that event was disposed of in the Inactive Landfill (SWMU 2). Analysis of sediment samples collected from the South Plant Surface Impoundments (SWMU 3) indicate up to 400 mg/kg methyl parathion.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit received spillage associated with the production of methyl parathion.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (H)
Groundwater (H) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): Details of the fire were not provided by facility representatives. Analysis of soil samples collected in the vicinity of the south end of the South Plant and groundwater monitoring well 10 during February 1989 indicate 1300 µg/kg and greater than 800* µg/kg respectively of methyl parathion (*due to the poor copy quality of the reference material the exact quantity could not be reported).

RECOMMENDATIONS: No Further Action ( )
RFA Phase II Sampling ( )
RFI Necessary (X)

REFERENCE(S): 5, 257, 258, 259.

COMMENTS: None

SWMU NUMBER: 16 **PHOTO NUMBER:** 16.1, 16.2, 17.1, 1.1

NAME: Former Atrazine Production Area

TYPE OF UNIT: Inactive production area

PERIOD OF OPERATION: 1973 to 1979

PHYSICAL DESCRIPTION AND CONDITION: This area is located adjacent to the Drum Storage Area (SWMU 1) and the Returned-Product Storage Area (SWMU 17) in the south section of the South Plant. The unit consisted of trenches, sumps, production vessels, and tanks associated with the Atrazine production operations. The production area is approximately 100 feet long and 25 feet wide with a roof and concrete floor. The exact nature of the operations conducted at the unit could not be provided by facility personnel. The major South Plant Drainage Ditch (SWMU 13) is located immediately west of the unit.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit received spillage associated with the Atrazine production operations.

RELEASE PATHWAYS:

Air	(L)	Surface Water	(H)	Soil	(H)
Groundwater	(H)	Subsurface Gas	(L)		

HISTORY AND/OR EVIDENCE OF RELEASE(S): The VSI team observed an Atrazine-like odor in the immediate vicinity of the unit. Analysis of soil samples collected immediately west of the unit during February 1987 indicated 5000 µg/kg Atrazine.

RECOMMENDATIONS:

No Further Action ( )
RFA Phase II Sampling ( )
RFI Necessary (X)

REFERENCE(S): 5, 257, 258, 259.

COMMENTS: None

SWMU NUMBER: 17 **PHOTO NUMBER:** 1.1, 1.2

NAME: Returned Product Storage Area

TYPE OF UNIT: Temporary staging area

PERIOD OF OPERATION: 1973 to present

PHYSICAL DESCRIPTION AND CONDITION: The unit is located adjacent to the Drum Storage Area (SWMU 1) in the south section of the South Plant. The unit was an area used to store returned pesticide products. It was reportedly located on a concrete slab floor with a metal roof, and shared a sump with the Drum Storage Area (SWMU 1). According to an EPA Endangerment Assessment, this unit was, at times, indistinguishable from the Drum Storage Area (SWMU 1). The unit and the Drum Storage Area (SWMU 1) have a history of drum mismanagement. At the time of the VSI, the unit was no longer in use. The major South Plant Drainage Ditch (SWMU 13) is located immediately west of the unit.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit formerly received drums of returned Dinoseb product and blends.

RELEASE PATHWAYS:

Air	(L)	Surface Water	(H)	Soil	(H)
Groundwater	(H)	Subsurface Gas	(L)		

HISTORY AND/OR EVIDENCE OF RELEASE(S): This unit has been cited in many inspections for deteriorated and leaking drums (Refer to Table II-1). Analysis of soil samples collected from the immediate vicinity of the unit during February 1987, indicated 5,000 µg/kg Atrazine, 3,700 µg/kg Toxaphene, 550 mg/kg arsenic, and 130 mg/kg zinc.

RECOMMENDATIONS:

No Further Action ( )
RFA Phase II Sampling ( )
RFI Necessary (X)

REFERENCE(S): 5, 46, 48, 86, 93, 236, 237, 257, 258, 260

COMMENTS: None

SWMU NUMBER: 18 **PHOTO NUMBER:** 5.1

NAME: Former Blue Tank

TYPE OF UNIT: Storage Tank

PERIOD OF OPERATION: 1983 to approximately 1986

PHYSICAL DESCRIPTION AND CONDITION: The unit was located north of the Former Dinoseb Production Area (SWMU 7) and adjacent to the Nitric Acid Production Area in the South Plant. The unit was used as a holding tank for untreated Dinoseb wastewater in order to reduce the quantity of wastewater discharged to the Carbon Adsorption System (SWMU 4) from the South Plant Hill Tank (SWMU 6). Untreated Dinoseb wastewater was stored in the tank prior to off-site deep well injection. The tank was reportedly leased to the facility from the deep well injection contractor. The original tank was fiberglass and had a capacity of 16,000 gallons. According to the available file material, the tank leaked after two failed repair attempts. The fiberglass tank was replaced by a stainless steel tank which was formerly a facility product tank. It could not be determined whether the fiberglass tank was used after the repair incidents in 1983 or whether the facility continued to use the stainless steel tank. The facility representatives could not provide exact details pertaining to the operation of the unit.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The tank received unneutralized Dinoseb process wastewater prior to off-site deep-well injection.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (H)
Groundwater (H) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): The unit has a history of leaking. The VSI team observed a gravel covered area at the reported location of the former unit.

RECOMMENDATIONS: No Further Action ( )
RFA Phase II Sampling (X)
RFI Necessary ( )

REFERENCE(S): 138, 183, 196, 257, 258.

COMMENTS: None

SWMU NUMBER: 19 **PHOTO NUMBER:** 19.1

NAME: Scrap Metal Dumpster

TYPE OF UNIT: Open-topped rolloff container

PERIOD OF OPERATION: Mid-1980's to present

PHYSICAL DESCRIPTION AND CONDITION: The unit is located on concrete pavement outside the Former MSMA Production Area (SWMU 11) in the central section of the South Plant. The unit is used to store non-hazardous demolition debris associated with the dismantling operations of the Former MSMA Production Area (SWMU 11). The wastes are transferred off site to an industrial landfill for scrap metal recycling. The dumpster is skid mounted and is approximately 18 feet long, eight feet wide, and six feet tall.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: This unit contains scrap material from the dismantling of the MSMA production area.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): No evidence of release was observed during the VSI or identified in the available file material.

RECOMMENDATIONS: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCE(S): 257, 258.

COMMENTS: None

SWMU NUMBER: 20 **PHOTO NUMBER:** No Photograph

NAME: Railroad Car Unloading Station

TYPE OF UNIT: Loading/Unloading Station

PERIOD OF OPERATION: Approximately 1955 to present

PHYSICAL DESCRIPTION AND CONDITION: As shown in Figure III-2, the unit is located in the central section of the South Plant, east of the New Nitric Acid Plant. The unit consists of the primary area for the loading/unloading of materials for the various operations conducted at the South Plant. No secondary containment was evident at the time of the VSI. The operational details of the unit were not specified in the available file material or by the facility representative. Stormwater runoff from the unit either enters the South Plant Drainage Ditches (SWMU 13) or the South Plant Drainage System (SWMU 5).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit has received spillage from the loading/unloading operations conducted there. The spillage may include Dinoseb, Toxaphene, Atrazine, MSMA, or some of the various raw materials used in the production of these pesticides.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (U)
Groundwater (U) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): Groundwater sampling in the vicinity of the unit has found Dinoseb and Atrazine at concentrations of 1,200 µg/l and 80 µg/l, respectively.

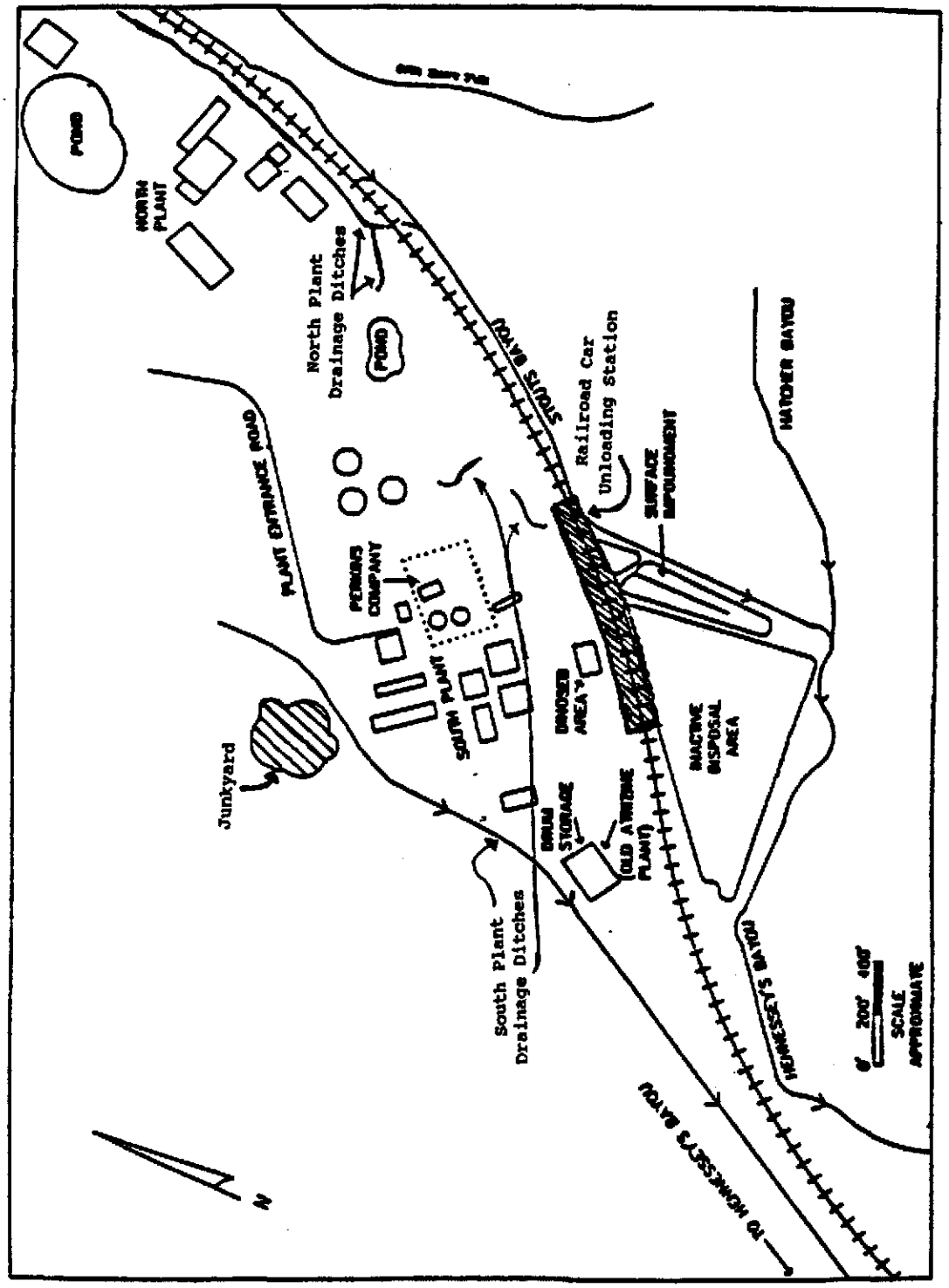
RECOMMENDATIONS: No Further Action ( )
RFA Phase II Sampling (X)
RFI Necessary ( )

REFERENCE(S): 5, 33, 260

COMMENTS: Phase II Sampling should be performed in this area to determine if this unit could have contributed to the contaminants found in the groundwater.

FIGURE III-2

Area Specific SWMU Map



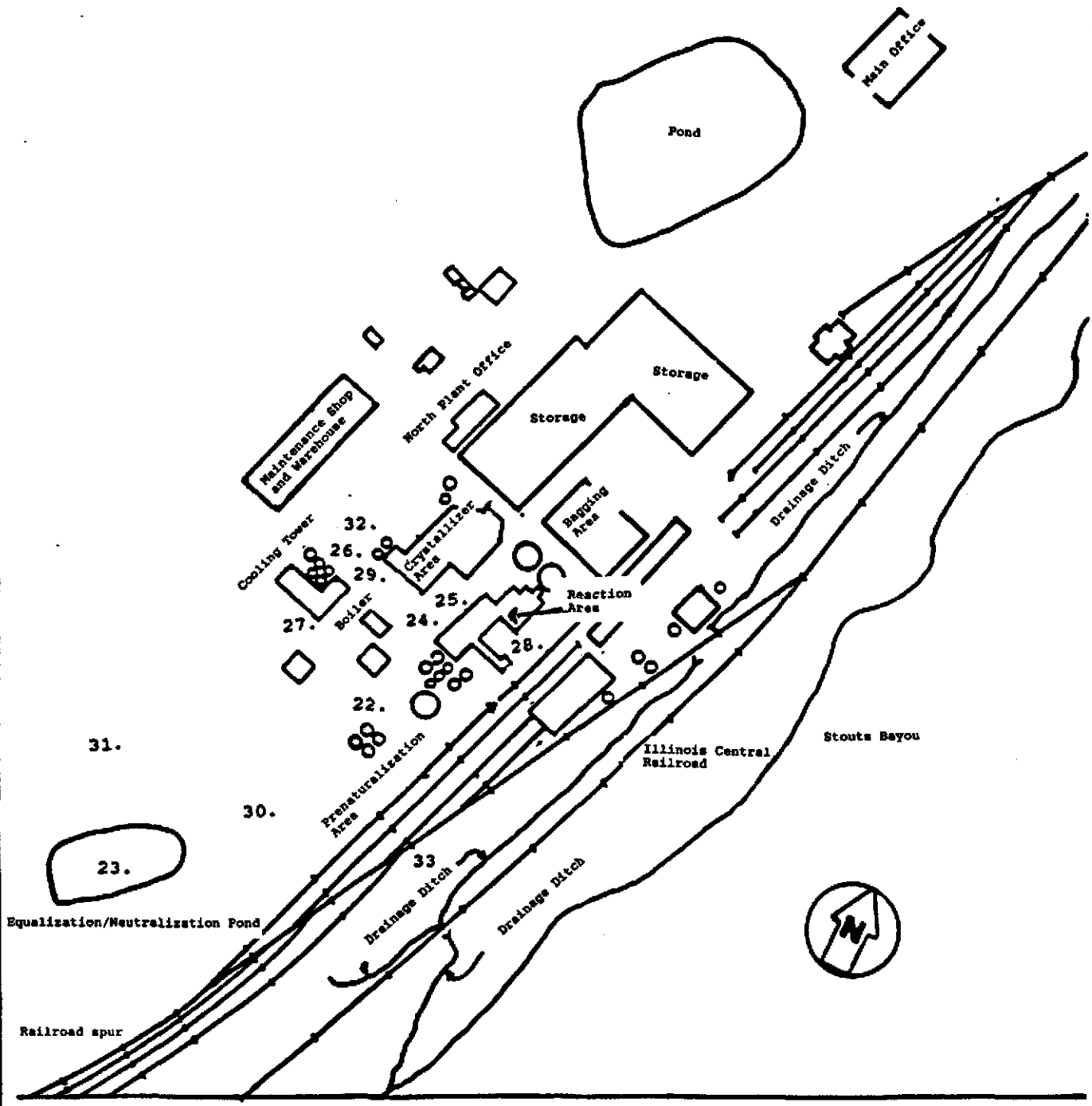
Reproduced from U.S. Environmental Protection Agency, February 1987, RCRA Environmental Investigation, Cedar Chemical Company, Vicksburg, Mississippi.

(Reference 5)

FIGURE III-3

North Plant SWMU Map

(Reference 33)



SWMU

22. North Plant Neutralization System
23. Inactive North Plant Surface Impoundment
24. North Plant Containment System
25. Wastewater Pipes
26. C-10 Scrubber
27. Cooler Scrubber
28. End Product Scrubber
29. Oil Collection Unit
30. Waste Oil SAA
31. No. 6 Fuel Oil Area
32. C-15 Scrubber
33. North Plant Drainage Ditches

SWMU NUMBER: 21 **PHOTO NUMBER:** 21.1

NAME: Vacuum Truck

TYPE OF UNIT: Tank truck

PERIOD OF OPERATION: Mid-1980's to Present

PHYSICAL DESCRIPTION AND CONDITION: The unit consists of a stainless steel tank with an approximate capacity of 500 gallons mounted on a medium sized truck. The truck is equipped with a pump and hoses used to collect wastewater from the sumps located at the Drum Storage Area (SWMU 1), the Dinoseb Off-Loading Area (SWMU 8) and the numerous sumps associated with the South Plant Drainage System (SWMU 5). The contents of the truck are emptied into the Carbon Adsorption System (SWMU 4). At the time of the VSI the truck was parked in the vicinity of the Dinoseb Off-Loading Area (SWMU 8), in the central section of the South Plant.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit manages wastewater contaminated with Dinoseb, Toxaphene, MSMA, arsenic, Atrazine, and methyl parathion.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): No evidence of release was observed during the VSI or identified in the available file material.

RECOMMENDATIONS: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCE(S): 257, 258.

COMMENTS: None

SWMU NUMBER: 22 **PHOTO NUMBER:** 22.1, 22.2, 22.3

NAME: North Plant Neutralization System

TYPE OF UNIT: Treatment Unit with In-Ground Sumps

PERIOD OF OPERATION: December 1988 to present

PHYSICAL DESCRIPTION AND CONDITION: The unit is primarily located in the south-central section of the North Plant, with three pump tanks located in the northern area of the South Plant. The unit is a neutralization system designed to treat acidic wastewaters generated by, and stormwater from, the fertilizer production areas. The unit neutralizes wastewater utilizing sodium hydroxide. The system consists of two neutralization tanks constructed of fiberglass reinforced plastic and a sump constructed of concrete. Piping interconnects the sump and neutralization tanks with the South Plant pump tanks for wastewater discharge. The unit receives wastewater from the North Plant Containment System (SWMU 24), the C-10 Scrubber (SWMU 26), the Cooler Scrubber (SWMU 27), and the End Product Scrubber (SWMU 28) via the Wastewater Pipes (SWMU 25). The tank capacities are approximately 500 gallons each and the tanks are elevated above the gravel-covered surface by concrete pads approximately one foot tall. The in-ground concrete sump is approximately ten feet long, six feet wide, and five feet deep. The sump is covered with a fiberglass grate and contained by concrete curbing. The unit neutralizes wastewater from the North Plant then discharges it to the Mississippi River through NPDES-permitted Outfall #002 or via the pump tanks at the South Plant to Outfall #003.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: This unit manages all wastewater from the North Plant, including drainage from safety showers, hoses, and stormwater runoff.

RELEASE PATHWAYS: Air (L) Surface Water (*) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): No evidence of release was observed during the VSI or identified in the available file material.

RECOMMENDATIONS:
No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCE(S): 5, 33, 257, 258, 260

COMMENTS: *Releases to surface water are regulated via NPDES Permit No. MS0027995.

SWMU NUMBER: 23 **PHOTO NUMBER:** 23.1, 23.2

NAME: Inactive North Plant Surface Impoundment

TYPE OF UNIT: Equalization/Neutralization Pond

PERIOD OF OPERATION: 1962 to present.

PHYSICAL DESCRIPTION AND CONDITION: This unit is an unlined impoundment located between the North and South Plants. It was formerly used for Ph control of wastewater from the North Plant. The pH was controlled using limestone held in a pit adjacent to the impoundment. Since the commissioning of the North Plant Neutralization System (SWMU 22), the wastewater is no longer routed through the impoundment. At the time of the VSI, the pond contained liquid which the facility representatives asserted was rainwater.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The pond was used to neutralize the acidic effluent from the North Plant including process water from the production of potassium nitrate, nitrogen tetroxide, and chlorine; rainwater; and boiler and cooling tower blowdowns from the potassium nitrate plant.

RELEASE PATHWAYS: Air (L) Surface Water (*) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): No evidence of release was observed during the VSI. The facility has had problems in the past, around 1985, with nitrate-nitrogen excursions of the NPDES Permit limitations. The excursions were controlled by procedural changes. Refer to Chapter II, Regulatory History Section, for more details.

RECOMMENDATIONS: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCE(S): 5, 48, 86, 138, 183, 228, 257, 258.

COMMENTS: *Releases to surface water are regulated via NPDES Permit #MS0027995.

SWMU NUMBER: 24 **PHOTO NUMBER:** 24.1, 24.2

NAME: North Plant Containment System

TYPE OF UNIT: Spillage and runoff collection system

PERIOD OF OPERATION: Varying ages from the mid-1970's to present.

PHYSICAL DESCRIPTION AND CONDITION: The unit is located throughout the fertilizer production areas in the central section of the North Plant. The unit consists of concrete pads, curbs, and trenches designed to collect minor spillage and runoff from unsheltered concrete pads situated beneath the production areas. The trenches are connected to the North Plant Neutralization System (SWMU 22) via the Wastewater Pipes (SWMU 25). There are approximately 300 linear feet of trenches within the containment system.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit manages acidic wastewater from the fertilizer manufacturing operations.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): No evidence of release was observed during the VSI or identified in the available file material.

RECOMMENDATIONS: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCE(S): 257, 258.

COMMENTS: None

SWMU NUMBER: 25 **PHOTO NUMBER:** 22.1, 24.1

NAME: Wastewater Pipes

TYPE OF UNIT: Pipes of varying ages and materials of construction.

PERIOD OF OPERATION: 1960's to present

PHYSICAL DESCRIPTION AND CONDITION: The unit consists of pipes of varying dimensions and materials of construction located throughout the North Plant. The pipes are used to transfer acidic wastewaters from the North Plant Containment System (SWMU 24), the C-10 Scrubber (SWMU 26), the Cooler Scrubber (SWMU 27), and the End Product Scrubber (SWMU 28) to the North Plant Neutralization System (SWMU 22) and then offsite through an NPDES-permitted outfall. The pipes are constructed of carbon steel and PVC and are located above and below ground.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit transfers wastewater, acidic and alkaline, to the North Plant Neutralization System (SWMU 22).

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): No evidence of release was observed during the VSI or identified in the available file material.

RECOMMENDATIONS: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCE(S): 257, 258, 261

COMMENTS: None

SWMU NUMBER: 26 **PHOTO NUMBER:** 26.1, 22.3

NAME: C-10 Scrubber

TYPE OF UNIT: Air pollution control device

PERIOD OF OPERATION: 1980 to present

PHYSICAL DESCRIPTION AND CONDITION: The unit is located in the central section of the North Plant in the vicinity of the North Plant Neutralization System (SWMU 22). The unit is used to scrub chlorine off-gases generated by the fertilizer production operations. The unit consists of two scrubbing columns approximately 25 feet tall and four feet in diameter. The columns are constructed of reinforced concrete. One column is used at a time; the other column is used as a back-up unit. The scrubbers utilize sodium hydroxide. The scrubber water containing sodium hydroxide is discharged to and utilized by the North Plant Neutralization System (SWMU 22). Air emissions are regulated by conditions specified in MS Air Permit No. 2780-00041.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit receives fertilizer production off-gases such as chlorine and NO_2. Scrubber liquid is recycled until it reaches 2% or less at which time it is discharged to the North Plant Neutralization System (SWMU 22) via the Wastewater Pipes (SWMU 25).

RELEASE PATHWAYS: Air (*) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): The VSI team observed a brown emission (NO_2) discharging from the scrubber. According to facility representatives, the emissions were the result of the operations associated with rebuilding one of the scrubbers. An NPDES compliance inspection in September 1984 documented a break in the curbing around this unit with some wastewater escaping (Refer to Table II-1).

RECOMMENDATIONS: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCE(S): 257, 258, 2, 119, 146.

COMMENTS: * Releases to air are regulated via MS Air Permit No. 2780-00041.

SWMU NUMBER: 27 **PHOTO NUMBER:** 27.1

NAME: Cooler Scrubber

TYPE OF UNIT: Air pollution control device

PERIOD OF OPERATION: 1980 to present

PHYSICAL DESCRIPTION AND CONDITION: The unit is situated between the dryer and cooler at the crystallization area in the central section of the North Plant. The unit is used to scrub the off-gases generated by cooling the fertilizer after it is dried. The off-gases are scrubbed with water which is discharged to the North Plant Neutralization System (SWMU 22) via the Wastewater Pipes (SWMU 25). The scrubber is approximately 15 feet long and is constructed of carbon steel.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit scrubs the off-gases generated by cooling the fertilizer, thus producing acidic wastewater which is discharged to the Wastewater Pipes (SWMU 25).

RELEASE PATHWAYS: Air (*) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): No evidence of release was observed during the VSI or identified in the available file material.

RECOMMENDATIONS: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCE(S): 1, 257, 258.

COMMENTS: * Releases to air are regulated via MS Air permit 2780-00041

SWMU NUMBER: 28 **PHOTO NUMBER:** 28.1

NAME: End Product Scrubber

TYPE OF UNIT: Air pollution control device

PERIOD OF OPERATION: 1980 to present

PHYSICAL DESCRIPTION AND CONDITION: This unit is located in the east section of the North Plant. The unit is used to scrub fertilizer particles generated during the fertilizer bagging operations. The unit utilizes water which is discharged to the North Plant Neutralization System (SWMU 22) via the Wastewater Pipes (SWMU 25). The unit is a small venturi type scrubber constructed of carbon steel. The scrubber receives air containing fertilizer particles via duct pipes approximately one foot in diameter.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit receives air containing fertilizer particles such as potassium and nitrogen. The water used by the scrubber is discharged to the North Plant Neutralization System (SWMU 22) via the Wastewater Pipes (SWMU 25).

RELEASE PATHWAYS: Air (*) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): No evidence of release was observed during the VSI or identified in the available file material.

RECOMMENDATIONS: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCE(S): 1, 257, 258.

COMMENTS: *Releases to air are regulated via MS Air Permit No. 2780-00041.

SWMU NUMBER: 29 **PHOTO NUMBER:** 29.1

NAME: Oil Collection Unit

TYPE OF UNIT: Collection Unit

PERIOD OF OPERATION: 1985 to present

PHYSICAL DESCRIPTION AND CONDITION: The unit is located beneath the potassium nitrate cooler in the central section of the North Plant. The unit is used to collect waste oil drippage from the potassium nitrate cooling cylinder. The collection unit consists of a metal pipe approximately five feet long which connects an oil funnel-type collector to a 55-gallon drum. The oil discharges through the pipe via gravity. Oil stains were observed along the walls adjacent to the pipe and drum. The unit is underlain by concrete. The condition of the concrete could not be observed due to a thick pile of absorbent used to cover the area surrounding the drum.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit receives waste oils.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (*)
Groundwater (*) Subsurface Gas (*)

HISTORY AND/OR EVIDENCE OF RELEASE(S): Oil stains were observed along the walls adjacent to the pipe and drum during the VSI.

RECOMMENDATIONS: No Further Action (*)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCE(S): 1, 257, 258.

COMMENTS: * The potential for release to soil and groundwater is dependent on the integrity of the concrete underlying the area. The unit's integrity should be determined. If the integrity is impaired Phase II sampling is suggested.

SWMU NUMBER: 30 **PHOTO NUMBER:** 30.1

NAME: Waste Oil Satellite Accumulation Area

TYPE OF UNIT: Outdoor drum staging area

PERIOD OF OPERATION: 1985 to present

PHYSICAL DESCRIPTION AND CONDITION: The unit is located in the south section of the North Plant downgradient from the Inactive North Plant Surface Impoundment (SWMU 23). The unit consists of an unlined, gravel covered area used to stage drums of waste lubricant oils prior to off-site recycling. The area is situated in the vicinity of a lubricant storage area which consists of a concrete slab partially covered by a metal roof. The VSI Team observed dark stains in the immediate vicinity of the waste oil staging area and the lubricant storage area.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit receives waste oils.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (H)
Groundwater (H) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): Dark stains were observed on the gravel cover surrounding and in the immediate vicinity of the unit. No evidence of release was identified in the available file material.

RECOMMENDATIONS: No Further Action ( )
RFA Phase II Sampling (X)
RFI Necessary ( )

REFERENCE(S): 257, 258.

COMMENTS: None

SWMU NUMBER: 31 **PHOTO NUMBER:** 31.1

NAME: No. 6 Fuel Oil Area

TYPE OF UNIT: Former heating oil containment structure

PERIOD OF OPERATION: 1960's to 1970's

PHYSICAL DESCRIPTION AND CONDITION: This unit is located in the south section of the North Plant. The unit consists of an earthen dike surrounding two above-ground storage tanks, an above-ground sump to collect spillage during loading and unloading activities and the associated metal pipes. The tanks have a capacity of approximately 15,000 gallons and are situated upgradient from the sump. The dike area was drained via a metal pipe that discharged in the immediate vicinity of the sump. The metal pipes were used to transfer product between the unloading area and the tanks. The metal pipes are approximately 50 feet long. Two additional below-ground metal pipes were used to transfer No. 6 fuel oil to the boilers located in the North Plant. The concrete sump is ten feet long, four feet wide, and has walls that are three feet high.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: This unit manages spills and leaks associated with handling No. 6 fuel oils.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (*)
Groundwater (*) Subsurface Gas (*)

HISTORY AND/OR EVIDENCE OF RELEASE(S): The VSI team observed a residual layer of No. 6 fuel oil inside the concrete sump.

RECOMMENDATIONS: No Further Action (*)
RFA Phase II Sampling ( )
RFI Necessary ( )

REFERENCE(S): 257, 258.

COMMENTS: * The residual fuel in the sump should be removed and disposed of and the integrity of the sump and pipes should be determined. The potential for release to soil and groundwater is dependent upon the integrity of the sump containment structure and pipes. If the integrity of this unit is impaired, Phase II Sampling is suggested.

SWMU NUMBER: 32 **PHOTO NUMBER:** 32.1

NAME: C-15 Scrubber

TYPE OF UNIT: Air pollution control device

PERIOD OF OPERATION: Approximately 1980 to present

PHYSICAL DESCRIPTION AND CONDITION: The unit is located in the central area of the North Plant, adjacent to the Crystallization Area. The unit consists of a rectifier scrubber/sieve tower utilized in the production of potassium nitrate. The scrubbing liquid is water which is recycled through the process.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The unit receives fertilizer production off-gasses, such as chlorine and NO_2, and particulate matter.

RELEASE PATHWAYS: Air (*) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): No evidence of release of hazardous constituents was identified in the available file material or observed during the VSI.

RECOMMENDATIONS:

No Further Action	(X)
RFA Phase II Sampling	( )
RFI Necessary	( )

REFERENCES: 1, 2, 257, 258

COMMENTS: *Releases to air are regulated via MS Air Permit No. 2780-00041.

SWMU NUMBER: 33 **PHOTO NUMBER:** No Photograh

NAME: North Plant Drainage Ditches

TYPE OF UNIT: Drainage ditches

PERIOD OF OPERATION: Approximately 1960 to present

PHYSICAL DESCRIPTION AND CONDITION: An unlined drainage ditch runs along the railroad tracks, across from and parallel to Stouts Bayou. The location of this unit is shown in Figure III-2 (See Page 65). The ditch receives drainage from the northern portion of the North Plant. A smaller branch which receives drainage from the North Plant, joins the drainage ditch at the southern end of the North Plant and flows under the tracks and into Stouts Bayou.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: The drainage ditches receive stormwater runoff from the North Plant which is not contained by the various drainage systems.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): No evidence of release of hazardous constituents was observed in the available file material or during the VSI.

RECOMMENDATIONS:

No Further Action	(X)
RFA Phase II Sampling	( )
RFI Necessary	( )

REFERENCES: 5, 33, 257

COMMENTS: None

SWMU NUMBER: 34 **PHOTO NUMBER:** No Photograph

NAME: Junkyard and Waste Piles

TYPE OF UNIT: Temporary disposal areas

PERIOD OF OPERATION: Approximately 1954 to present

PHYSICAL DESCRIPTION AND CONDITION: The main junkyard is located on the western border of the South Plant, adjacent to the major South Plant Drainage Ditch (SWMU 13). Other waste piles have been observed throughout both the North and South Plants. The operations concerning the units is unclear from the available file material. A facility representative has stated that the area is used for temporary disposal of old equipment, paint, or other scrap materials. The former piles have reportedly been removed for recycling.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED: These units have received debris from the various operations at the facility including old equipment and paint. From the analysis of a soil sample taken from the junkyard, it appears that pesticide-contaminated wastes may have been disposed of in the area.

RELEASE PATHWAYS: Air (L) Surface Water (H) Soil (H)
Groundwater (H) Subsurface Gas (L)

HISTORY AND/OR EVIDENCE OF RELEASE(S): A RCRA Environmental Investigation of February 1987 found the soil from the junkyard to be contaminated with Atrazine (5400 µg/kg) Cyanazine (approximately 30 µg/kg), Aroclor-1254 (710 µg/kg) and Propazine (approximately 3000 µg/kg).

RECOMMENDATIONS:

No Further Action	( )
RFA Phase II Sampling	(X)
RFI Necessary	( )

REFERENCES: 5, 33, 260

COMMENTS: Since the data in the 1987 investigation was taken from only one soil sample, more data should be generated before recommending an RFI.

IV. SUMMARY

Chapter IV consists of five tables which list the Solid Waste Management Units (SWMUs) identified during the VSI conducted on July 31, 1990 and categorize them according to the findings and recommendations developed in the SWMU Data Sheets in Chapter III. Table IV-1 lists all SWMUs identified during the VSI. Table IV-2 is a listing of the SWMUs assessed as requiring no further action. Table IV-3 lists the RCRA-regulated units. Table IV-4 lists the SWMUs that are determined to require Phase II sampling, and Table IV-5 is the list of SWMUs assessed as requiring an RFI. The sampling strategy for SWMUs requiring Phase II sampling is presented in Chapter V.

TABLE IV-1

CEDAR CHEMICAL CORPORATION VICKSBURG FACILITY

List of all Solid Waste Management Units (SWMUs)

SWMU Number	SWMU Name
	South Plant
1.	Drum Storage Area
2.	Inactive Landfill
3.	South Plant Surface Impoundments
4.	Carbon Adsorption System
5.	South Plant Drainage System
6.	South Plant Hill Tank
7.	Former Dinoseb Production Area
8.	Dinoseb Off-Loading Area
9.	Dinoseb Drumming Area and Drains
10.	Dinoseb Stock Storage Area
11.	Former MSMA Production Area
12.	Former MSMA Salt Unloading Area
13.	South Plant Drainage Ditches
14.	Former Toxaphene Production Area
15.	Former Methyl Parathion Production Area
16.	Former Atrazine Production Area
17.	Returned Product Storage Area
18.	Former Blue Tank
19.	Scrap Metal Dumpster
20.	Railroad Car Unloading Station
21.	Vacuum Truck
	North Plant
22.	North Plant Neutralization System
23.	Inactive North Plant Surface Impoundment
24.	North Plant Containment System
25.	Wastewater Pipes
26.	C-10 Scrubber
27.	Cooler Scrubber
28.	End Product Scrubber
29.	Oil Collection Unit
30.	Waste Oil SAA
31.	No. 6 Fuel Oil Area
32.	C-15 Scrubber
33.	North Plant Drainage Ditches
	Both Plants
34.	Junkyard and Waste Piles

TABLE IV-2

CEDAR CHEMICAL CORPORATION VICKSBURG FACILITY

List of SWMUs Requiring No Further Action

SWMU Number	SWMU Name
	South Plant
6.	South Plant Hill Tank
10.	Dinoseb Stock Storage Area
12.	Former MSMA Salt Unloading Area
19.	Scrap Metal Dumpster
21.	Vacuum Truck
	North Plant
22.	North Plant Neutralization System
23.	Inactive North Plant Surface Impoundment
24.	North Plant Containment System
25.	Wastewater Pipes
26.	C-10 Scrubber
27.	Cooler Scrubber
28.	End Product Scrubber
29.	Oil Collection Unit*
31.	No. 6 Fuel Oil Area*
32.	C-15 Scrubber
33.	North Plant Drainage Ditches

*The no further action assessment of these units is contingent upon an integrity investigation showing that the provisions for waste containment to prevent releases are effective.

TABLE IV-3

CEDAR CHEMICAL CORPORATION VICKSBURG FACILITY

List of SWMUs that are RCRA-Regulated Units

SWMU Number	SWMU Name
1.	Drum Storage Area

TABLE IV-4

CEDAR CHEMICAL CORPORATION VICKSBURG FACILITY

List of SWMUs Requiring RFA Phase II Sampling

SWMU Number	SWMU Name
	South Plant
4.	Carbon Adsorption System
5.	South Plant Drainage System
13.	South Plant Drainage Ditches
18.	Former Blue Tank
20.	Railroad Car Unloading Station
	North Plant
30.	Waste Oil SAA
	Both Plants
34.	Junkyard and Waste Piles

TABLE IV-5

CEDAR CHEMICAL CORPORATION VICKSBURG FACILITY

List of SWMUs Requiring an RFI

SWMU Number	SWMU Name
	South Plant
1.	Drum Storage Area
2.	Inactive Landfill
3.	South Plant Surface Impoundments
7.	Former Dinoseb Production Area
8.	Dinoseb Off-Loading Area
9.	Dinoseb Drumming Area and Drains
11.	Former MSMA Production Area
14.	Former Toxaphene Production Area
15.	Former Methyl Parathion Production Area
16.	Former Atrazine Production Area
17.	Returned Product Storage Area
	North Plant
	None

V. SUGGESTED SAMPLING STRATEGY

TABLE V-1

UNIT NO.	UNIT NAME	OPERATIONAL DATES	SUGGESTED SAMPLING	EVIDENCE OF RELEASES (YES/NO)
4.	Carbon Adsorption System	Mid-1970's to present	Soil samples should be taken along the drainage channel from this unit to a depth of 0" to 6". Samples should also be taken of the discharge liquid. Analyses should be performed for arsenic, Dinoseb, and Toxaphene.	Yes
5.	South Plant Drainage System	Mid-1950's to present	An evaluation of the drainage system pathways should be performed using dye tests. Any leaks or areas of questionable discharge should be sampled for analysis. Soil and groundwater samples should be analyzed for Dinoseb, Toxaphene, arsenic and Atrazine.	Yes
13.	South Plant Drainage Ditches	Approx. 1954 to present	The major drainage ditch running along the western border of the South Plant should be sampled. Soil samples should be taken approximately every 15 feet along the ditch. Liquid samples should be taken at every influent point and below the Former Atrazine Production Area (SWMU 16). The samples should be analyzed for Atrazine, arsenic, Toxaphene, and Dinoseb. Samples taken from near the Junkyard (SWMU 34) should also be tested for Aroclor-1254. A groundwater sample from MW-2 should also be taken for analysis.	Yes

V. SUGGESTED SAMPLING STRATEGY

TABLE V-1

UNIT NO.	UNIT NAME	OPERATIONAL DATES	SUGGESTED SAMPLING	EVIDENCE OF RELEASES (YES/NO)
18.	Former Blue Tank	1983 to 1986	Conduct soil sampling in the area of the former unit at depths of 0" to 12". Samples should be analyzed for Dinoseb.	Yes
20.	Railroad Car Unloading Station	Mid-1950's to present	The area should be sampled using a grid approach. Soil samples should be collected at depths of 0" to 6". Analysis should be performed for arsenic, Dinoseb, Toxaphene, and Atrazine.	No
30.	Waste Oil SAA	1985 to present	Soil samples should be taken from the area, especially any areas with noticeable staining. The samples should be taken at depths of 0" to 12". The samples, along with at least two composite samples, should be analyzed for Appendix IX metals and semi-volatiles.	Yes
34.	Junkyard and Waste Piles	Approx. 1954 to present	The area should be sampled using a grid approach. Soil samples should be taken at depths of 0" to 6" and analyzed for arsenic, Dinoseb, Toxaphene, Atrazine, and Aroclor-1254.	Yes

VI. REFERENCES

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2. Mississippi Department of Natural Resources (MSDNR), Bureau of Pollution Control, Adam Smith, Inspection Report Re: Cedar Chemical Corporation, February 26, 1990.

3. Correspondence between Cedar Chemical Corporation, Steven T. Boswell, and MSDNR, Bureau of Pollution Control, Kenneth A. Lafleur, Re: Request and Authorization for one-time discharge from re-drumming process, January-February, February 21, 1990.

4. Cedar Chemical Corporation (CCC), Steven T. Boswell, Correspondence to MSDNR, Bureau of Pollution Control, Adam Smith, Re: Release of Nitrosyl Chloride on January 4, 1990, January 5, 1990.

5. United States Environmental Protection Agency, (U.S. EPA), Region IV Endangerment Assessment, including Determination of Release, Re: CCC, EPA ID# MSD990714081, October 30, 1989.

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7. Contingency Plan, Prepared by IT Corporation, for Cedar Chemical Corporation, June 1989.

8. Correspondence between U.S. EPA, Region IV and Apperson, Crump, Duzane & Maxwell, Allen T. Malone, representing CCC, Re: Repeated requests for information pursuant to Section 104 of CERCLA and Section 3007 of RCRA, September 1, 1989.

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10. CCC, Steven T. Boswell, Correspondence to MSDNR, Bureau of Pollution Control, Toby Cook, Re: South Pond Retrofit Status Report, July 13, 1989.

11. NPDES Permit Application for CCC, July 5, 1989.

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17. RCRA Inspection Report on CCC, Prepared by MSDNR, Environmental Engineer, Toby M. Cook, February 1, 1989.

18. Memorandum from Toby Cook to CCC File, Re: Meeting with CCC on January 27, 1989, January 30, 1989.

19. CCC, Steven T. Boswell, Correspondence to MSDNR, Bureau of Pollution Control, Steve Spengler, Re: South Pond Closure and Retrofit Post-Closure Activities, December 21, 1988.

20. Notification For Underground Storage Tanks, for CCC, December 21, 1988.

21. Apperson, Crump, Duzane & Maxwell, Allen T. Malone, representing CCC, Correspondence to U.S. EPA Region IV, Waste Management Division, Patrick M. Tobin, Re: RCRA Regulation of Surface Impoundment at Vicksburg Chemical Company (D.B.A. CCC), October 24, 1988.

22. MSDNR, Bureau of Pollution Control, Hazardous Waste Division, Stephen Spengler, Correspondence to CCC, Steven Boswell, Re: Closure/Retrofit Plan of Surface Impoundment System, October 18, 1988.

23. Civil Referral, Re: CCC, EPA ID# MSD990714081, October 1988.

24. International Technology Corporation, Michael J. Richardson, Correspondence to MSDNR, Bureau of Pollution Control, Jack McCord, Re: Responses to questions of Closure/Retrofit Plan for Surface Impoundment at Vicksburg Chemical Division (CCC), August 30, 1988.

25. Memorandum from Jack McCord to Vicksburg Chemical File (CCC), Re: Closure Plan for Surface Impoundment, August 22, 1988.

26. Correspondence between CCC, Steven T, Boswell, and MSDNR,

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28. Memorandum from Jack McCord, Through Steve Spengler, To CCC File, Re: Status of Work Being Done at Vicksburg Chemical, July 15, 1988.

29. CCC, Steven T. Boswell, Correspondence to MSDNR, Division of Hazardous Waste, Re: Surface Impoundment Closure Plan Delay, July 5, 1988.

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33. U.S. EPA, Region IV, Draft Administrative Order, Re: CCC D.B.A. Vicksburg Chemical Corporation, June 20, 1988.

34. MSDNR, BPC, Hazardous Waste Branch, Sam Mabry, Correspondence to Allen T. Malone, Re: CCC Closure Plans, June 20, 1988.

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228. U.S. EPA, Environmental Services Division, Hazardous Waste Site Investigation Report, Vertac Chemical Corporation, Conducted October 28, 1981, Docket No. 003, January 26, 1982.

229. Vertac, R.F. Maraman, Correspondence to MSDNR, Industrial Wastewater Control Section, Bill Barnett, Re: Quarterly Bioassay, January 5, 1982.

230. Vertac, R.F. Maraman, Correspondence to MSDNR, Steve Spengler, Re: Vertac DNBP Waste water to City of Vicksburg Sewage Treatment System, December 16, 1981.

231. City of Vicksburg, Ray Heffner, Correspondence to Vertac, Fred Ahlers, Re: DNBP Waste Treatment, December 7, 1981.

232. Memorandum from Steve Spengler to Vertac file Re: Vertac Meeting with City of Vicksburg, November 16, 1981.

233. NPDES Permit No. MS0027995, Issued to Vertac, December 2, 1981.

234. Vertac, R.F. Maraman, Correspondence to MSDNR, Compliance Monitoring Section, Carl Chaplin, Re: Responses to Performan

ce Audit Inspection, NPDES Permit No.MS0027995, November 30, 1981.

235. Vertac, R.F. Maraman, Correspondence to MSDNR, Industrial Wastewater Control Section, Bill Barnett, Re: Quarterly Bioassay, October 22, 1981.

236. U.S. EPA, Region IV, Compliance Branch, Andrew G. Kromis, Correspondence to MSDNR, David Lee, Re: Vertac/Interim Status Standards Violations, October 19, 1981.

237. Correspondence from MSDNR, Division of Solid Waste Management, David Lee, to Vertac, R.F. Maraman, and Sam Mabry, Re: Follow-up Inspection, October 12, 1981.

238. Vertac, Dick Karkkainen, Correspondence to MSDNR, Division of Solid Waste Management, David Lee, Re: Modification of Effluent Pond Closure & Post-Closure Plans, October 13, 1981.

239. Vertac, R.F. Maraman, Correspondence to U.S. EPA, Region IV, RCRA Activities, Aron Williams, Re: Hazardous Waste Permit EPA ID# MSD990714081, September 10, 1981.

240. Vertac, Dick Karkkainen, Correspondence to U.S. EPA, Region IV, RCRA Activities, Paul Keith, Re: Application for Hazardous Waste Permit, September 3, 1981.

241. Vertac, R.F. Maraman, Correspondence to MSDNR, Solid Waste Division, David Lee, Re: Closure Plan, Contingency Plan, and Waste Facility Training Program, August 11, 1981.

242. Correspondence between, MSDNR, Industrial Wastewater Control Section, Bill Barnett, and Vertac, Re: NPDES Permit No. MS0027995, August, August 6, 1981.

243. Vertac, R.F. Maraman, Correspondence to MSDNR, Industrial Wastewater Control Section, Bill Barnett, Re: Quarterly Bioassay, July 22, 1981.

244. Application for Permit to Discharge Wastewater, Submitted by Vertac, June 26, 1981.

245. Vertac, R.F. Maraman, Correspondence to MSDNR, Industrial Wastewater Control Section, Bill Barnett, Re: Quarterly Bioassay, June 2, 1981.

246. EPA Site Inspection Report, Vertac Chemical Corporation, by Jeff Hundley, June 2, 1981.

247. Correspondence between MSDNR, Air Emissions Section, Jerry Banks, and Tully Hall, Re: Chlorine Emissions from Vertac,

February-April, April 13, 1981.

248. Vertac, R.F. Maraman, Correspondence to MSDNR, Industrial Wastewater Section, J. Wesley Griffith, Re: NPDES Permit No. MS0027995, March 4, 1981.

249. MSDNR, Air Emissions Section, Jerry B. Banks, Correspondence to Vertac, Re: Operating Permit, January 26, 1981.

250. U.S. EPA, Region IV, Ecology Branch, M.R. Weldon, Correspondence to Vertac, Richard Randolph, Re: Compliance Biomonitoring Study, January 7, 1981.

251. U.S. EPA, Region IV, Enforcement Division, Anne L. Asbell, Correspondence to MSDNR, Bill Barnett, Re: Vertac compliance to Commission Order No. 520-80, January 7, 1981.

252. Application for Hazardous Waste Permit, Submitted by Vertac, November 18, 1980.

253. Correspondence between MSDNR, Air Emissions Section, Jerry Banks, and Tully Hall, Re: Chlorine Emissions from Vertac, September, September 22, 1980.

254. Vicksburg Chemical Company, Jerry W. McAdams, Correspondence to Mississippi State Board of Health, Division of Solid Waste, Jim Hardage, Re: Waste Material from March 7th Incident, March 30, 1978.

255. Memorandum from Steve West to Vicksburg Chemical Company File, Re: Explosion & Fire on March 7, 1978, March 9, 1978.

256. Soil Survey, Warren County Mississippi, U.S. Department of Agriculture, Soil Conservation Service, 1961.

257. VSI Field Notes, Cedar Chemical Corporation, July 31, 1990.

258. VSI Photographic Log, Cedar Chemical Corporation, July 31, 1990.

259. The Pesticide Manual, published by The British Crop Protection Council, Eighth Edition; Pesticide Manufacturing and Toxic Materials Control Encyclopedia, by Noyes Data Corporation, 1980; and, Herbicide Handbook of the Weed Science Society of America, Sixth Edition, 1989.

260. Record of phone calls from A.T. Kearney, Inc., Carole Nardiello, to CCC, Steven Boswell, October 12, 1990.

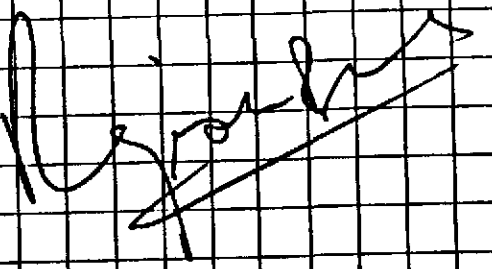
261. Environmental Protection Systems, Inc., "A Plant Evaluation and Investigation of Surface Water Drainage Systems for Vertac Chemical Corporation, (North Plant)", December 1985,

and "A Plant Evaluation and Investigation of Process Area Sewers and Surface Water Drainage for VCC - South Plant", March 1986.

262. Record of phone calls from A.T. Kearney, Denise Turner, to EPA Region IV, Jeanine Gettle, October 30, 1990.

Cedar Chemical Corp.

7/31/90



1953 → facility been there
since 1953
Spencer Chemical
↓
occupied the South Plant
manufactured –
HNO_3 & Ammonium
fertilizer solution & NH_3

Spencer until 1964.
in 1964 Gulf Oil bought Spencer
Gulf oil till 1972.

In 1961 SW Potash
put in the North Plant
made KNO_3 & Cl_2.

were SW Potash till 1972

in 1972 Vicksburg Chem bought both plants

1972 - 1978 - Vicksburg Chemical

in 1978 it became Vertac Chemical

1978 - 1986 - Vertac Chem.

in 1986 it became Vicksburg Chem. Div. of Cedar

Cedar bought by Fermenta A B in 1986

in 1988 Trans Resources bought portion of Cedar

Area farm land prior to 1953.

1973 → first made dinoseb

to made till Dec 1986

Atrazine manf. from] 1973 – 1979

Toxaphene manf. from] 1973 ? – 1982
not sure

MSMAA manf. from] – 1983 – 1984

made HNO_3 for dinoseb
manf. at plant. Bought H_2SO_4
& bought ortho secondary butyl
phenol ~~use~~ for dinoseb
manf.

Presently at Plant.

Two or 3 grades of KNO_3
made for fertilizer & glass
manf.

NH_3 & KCl are raw materials
for HNO_3 manufacture.

South Plant Hill →
inactive landfill had several ponds to which discharge from dinosaur production took place.

The area was subject to closure in 1979/1980. The ponds were emptied & dirt filled.
Removed material & sent to BFI landfill in Louisiana in early 1980s.

Hill Tank → There were 3 tanks each 1.6 x 10⁶ gallons capacity initially. NH_4NO_3 solution tanks during Spencer chemicals.

Two tanks were converted as warehouses for parts.

The third was used to store

dinoseb neutralized Waste water.

Blue Tank - acted as a booster tank for dinoseb waste water

Carbon Neomplim units

6 units

1 Standby
1 empty
2 for surface runoff
2 for contaminated water

MSMA Drain Water tank

used for rain water storage → sent for deep well injection off site

Land Use

light residential

Plant is 640 acres in size

to NW → light commercial (motel/restaurants).

W & SW → rural residential.

S → light industrial/industrial

SE → rural

E → city WW treatment plant adjacent to creek (Stout's Bayou)

NE → rural to light residential.

2/3 miles to denser population areas.

WW handling

waste oil sent off site for recycling (about twice a year)

Waiting for EPA to get stored dinosaur (banned waste)

---

9. Sponds A, B & C used to catch stormwater runoff.

Flow is from

C → B → A

Any WW not meeting pH levels of 6-9 from the North Plant for NPDES discharge gets divided to these ponds.

18. → leak in the lines installed. The contractor expected to fix them.

20. 3 ¢ underground fuel storage tanks removed in Dec 1988

P.C. fluids in the
transformers, Grenoble

South Mill Plant Tank

1.6 million gallon
tanks

sold for scrap in 1989.

Water collecting was
brought back to the
plant. A Bell pond after
I thru carbon adsorption
unit.

MSMA salt cake bay

Loading area
2 bays.

Salt cake from centrifuge unloaded into lined container & disposed off on-offsite landfill (Chem Waste Alabama)

Stopped operations in 1984

Plant being dismantled

Area being tested for arsenic to determine if floor dismantled area can be sold or leasable disposed off [illegible]

HW [illegible] (floor sweepings etc) [illegible] removed →

to clean storage area.

1. FIW Storage area

[illegible] storage area
[illegible] contaminated
[illegible]

— [illegible]
[illegible]
— floor is pitted.

Atrazine Satellite Waste
Storage Area

— Floor sweeping contaminated
with Atrazine

Calgon Carbon Adsorption Unit

been there since 1970's

treats discharge from the pond.

Water accumulated by vacuum truck from various places in the plant such as sumps etc

2 in series for vacuum truck collected WW

2 in series for runoff

1 standby
1 empty.

flow top down.

discharges to outfall #1.

Spent carbon ~~sat~~ fished up by Calgon for regeneration.

River Tanks — (2)

Holding tanks for circulating / recirculating through Carbon

~~River~~

Ponds / Trucks → River Tanks

↓

Carbon Adsorption Units

↓

outfall #1.

Containment for the 6 carbon Adsorption & 2 river tanks

leaks/water collected discharged to a sump.

pumped out into the river tanks

Toxaphene Plant & Dinoseb Plant

next to each other

yellowish color ~~material~~ of soil due to dinoseb contamination.

Surface impoundment A, B & C being retrofitted with 6 X 10⁶ gallons

double lined 60 mm HDPE

Storm water run off.

One surface impoundment being lined.

The two other ponds will be lined later

covered (abandoned)
Capped landfill

3 monitoring wells

NORTH PLANT.

Neutralization Tank -

WW from drains in the plant - (safety showers, hoses run off)

discharge to the river outfall #2.
via a sump.
(operating since Dec 1988)

C-10 Scrubbers - (2 scrubbers one being rebuilt)

scrubbing out with NaOH & NaOCl (Cl2 gas from process vent)

this also used in the neutralization tanks.

Fuel Oil Tanks -

Three

- there have been out of use for over 15 years)

The loading area was last used in 1978-79

- Heavy sludge contamination in the loading area containment

Equilization pond -

was used for pH control

unlined

Waste water came into a limestone box, the pH ~~control~~ was raised & discharge stored in the equilization pond.

North Plant Scrubber

~~used for drying KNO_3~~

~~with natural gas~~

HNO_3 vapor is scrubbed by water

Old stripper for baghouse.

Below Venturi Scrubber

Venturi Scrubber (green)

Used for scrubbing dust gases generated from drying the product.

Waste water discharged to plant effluent conveyance system & then to treatment.

Bag house —

used for screening KNO_3 dust & resulting from KNO_3 pellets

KNO_3 reclaimed

Satellite storage area

used lubricating oil drums

- picked up by a recycling company

Final product storage area

~~for~~ →

area used for storage of lubricating oils

#1 – South plant ponds (approx 150 gpm)

#2 – North plant (approx 250 gpm)

#3 – Combined 1 & 2 outfall flow

↓

discharges to the Mississippi river.

Combined flow – 400 gpm (approx)

~~Dino~~

Toluene & Versene Tanks

These chemicals were used in the manufacture of dinosels

EDTA & diethanol amine & water

Dinoseb storage area

Dinoseb drums stored here (banned product) until an org wants to dispose them is found

- Since Spencer Chemical 1953
- acquired South plant
  Nitric Acid
  Ammonium + Ammonia
  Fertilizers + Ammon Nitrate.
- 1964 Gulf Oil bought Spencer.
  until 1972

- 1961 Southwest Potash put in
  with Plant
  Southwest Potash Co.
  K Nitrate + Chloride
- (until 1972
  In 1972 Vicksburg Chemical bought
  both Plants. Until 1978
  became
  1978 Vertac Chemical
  until
  1986 Vicksburg Chemical of
  Cedar
  Fermenta AB Swedish Co.

  1989 Trans Resources bought
  portions of Cedar including
  both plants.

As far as facility is aware
No activity prior to 1953.

Dinoseb in 1973
until Dec 1986

Atrazine 1973 - 79/78

Toxaphene @ 1982

MSMA 83 + 84

Dinoseb - nitric acid &
Dinoseb
sulfuric acid bought
Ortho see butanol

Potassium Nitrite make -

by Ammonia + Potassium chloride

@ 190 employees 24 hrs

Fuel Storage Tanks Removed in 1988 under State Supervision.

SOUTH PLANT HILL

Inactive Landfill had ponds for neutralizing dinoseb waters. Area was subject to closure type activity filled w/soil

Large # of drums in early 1980 removed went to reported BFI Landfills in Louisiana.

Hill Tank

- Form 1.6 mill gal Tank under Spencer were Ammonium Nitrate Tanks.
- Two tanks became warehouses
- Held Neutralized dinoseb wastewater. spent Nitrate acid

Carbon Treated based on cost

Deep well.

(3)

Ask employees about blue tank
may have received
dinoseb wastewater.
may have been a boost
Tank

Carbon units are in series
pumped to 001.
RO + contaminated dinoseb
FO

MSMA send off for Deepwell
rainwater
Accumulation.

CMU area was Tox.

Methyl parathion plan was dismantled
78 - 83 explosion in 1978
ended + fire.
see if records.

MSMA was build over methyl
parathion

North of area light residential

Plant owned 640 Acres.

Northwest light commercial
+ Intersection of
WAShington + P20

West + SW Residential
light resident/rural

South light Industrial
Missippi Power
Petrolium Rural

Southeast Rural

east is city WWTP
Stouts bayou.

N/east Rural to light residential.

2 - 3 miles for any
dense population.

- Potassium Nitrate to NPDES pH control,

- Waste oil off site to Reclaimer 2x/year.

- Dinoseb Stock waiting for EPA to come & get it. Need to view stock.

- A New Nitric Acid plant constructed in 1986 replaced old one

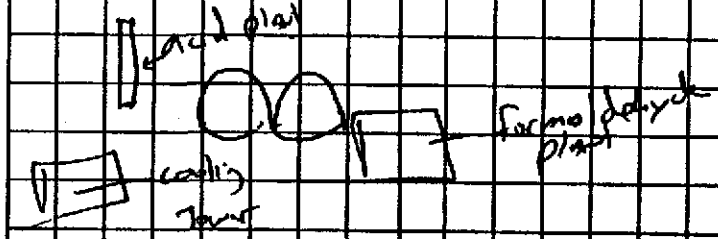
GW Quarterly Sampling
State Order - 87

S.I. Closure has leak

VS 1 Meeting
9-10

Roll 1

#1 #2 Hill Tank (may be South Hill)
facing south
- early 1989 dismantled
- scrap dealer off site.



RO off toward plant
end up at Ponds A,B,C
through carbon treatment.

Transformers in vicinity had
PCBs

MSMA SALT CAKE Loading/Un.

#3 overview facing south

#4 close-up facing NE

SCRAP METAL CONTAINER
off-site

#5 SCRAP METAL CONTAINER NEXT TO MSMA SALT CAKE UNLOADING AREA facing NORTH

#6 #7 SATELLITE ACCUMULATION AREA in MSMA BIDG
floor sweepings from clean-up of MSMA BIDG

#8 HAZARDOUS WASTE STORAGE AREA facing north
head roof damage in storm in may.

#9 Sump For Haz Waste Storage Area Pump For Sump Vacuum Truck to ADSORBERS

concrete lined trench

#10, 11 overview of Atrazine Plant facing SE
this unit is next to the Hazardous Waste Storage Area.
Washwaters went south pond.

#12 ATRAZINE SAA
VIEW INSIDE ATRAZINE PRODUCTION BLDG showing SAA for floor sweepings

#13 Overview of Calgon Unit

CALGON SYSTEM utilizing
Activated carbon
1970s receives discharge
from ponds water
accumulated by Vacuum Trucks
out of sumps etc.

2 in series one for pond
one set for the
VACUUM TRUCKS.
Granulated Activated charcoal
top down >
monitor output
if takes too long
River Tanks hold prior and
after use to circulate or
Recirculate waters

#14 ABSORBERS facing SE

#15 Close up of sump
carbon steel tanks
calgon picks up

Transferred via slurry

#16 overview of Toxaphene plant and the Dinoseb plant located beyond the red-marked steel beam

#17 View of Dinoseb Area
yellowish color is dinoseb

#18 + 19 Retrofitted Pond

20 SMALL POND

21 ~~[illegible]~~ medium Pond

22 close-up small pond

23 - 26 LANDFILL
has 3 wells

27 Geotextile cover between Landfill and Ponds.

1:15 PM Returned from lunch

NORTH PLANT

Neutralization ~~Plan~~ Tanks

North Side > safety showers Runoff to River via NPDES
Receives water from

1 - 28th Neutralization Tanks
Sump

#29 Tanks

Scrub
Chlorine
Caustic from scrubbers (sodium chloride)
used to neutralized
Runoff water.

30 # SCRUBBERS

pipes - overhead PVC pipes

31 Emissions

in air permit
vents off process

cooling water w/ nitrates
pH adjustment in
cooling tower.

#32 #6 fuel oil sump.

Potassium Nitrate Column.

33 + 34 OLD NEUTRALIZATION
POND

showing neutralization box
+
pond
old pre-treatment

#35 Crystalization Area
for Potassium Nitrate

KNO_3
nitric acid
crystalized in nitric acid

#36 Trench in crystallization Area

#37 Scrubber
C-15

#38 Used oil drum + Pipe

ROLL 2

#1 Used oil drum + Pipe

#2 Hopper Area

#3 Scrubber for cooling off gasses
Cooler Scrubber.
uses returned scrubber water to process

C-15 — for dryer
smaller cooler scrubber

baghouse goes back to product ave.

use water for ENP product off-load Area.
drawn through water
water to Neut Area
KNO_3

4 End product Scrubber

5-6 Run off areas ~ North plot

7 Lub oil Rack + waste oil SAA

8 OUTFALL

9 VACUUM TRUCK

10 VERSAC TANKS + OFF load Area
EDTA
Diethet Amine

11-14 Dimosels Stacks
+
Loading Area

15 Blue Tank

Will Send facility a copy -

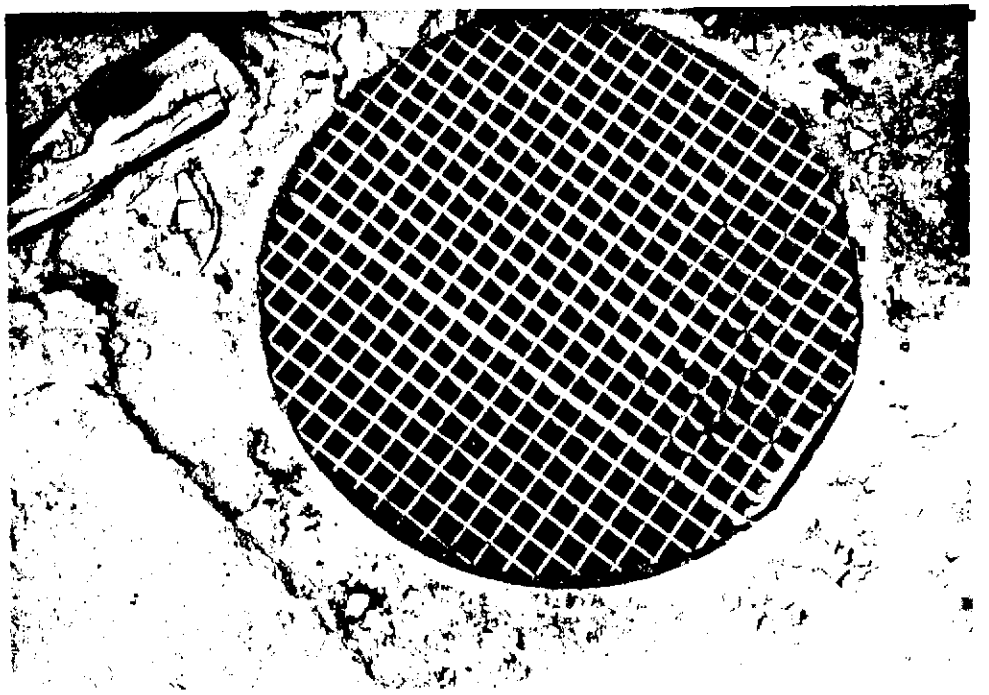
Final VSI @ 3:00

NOT

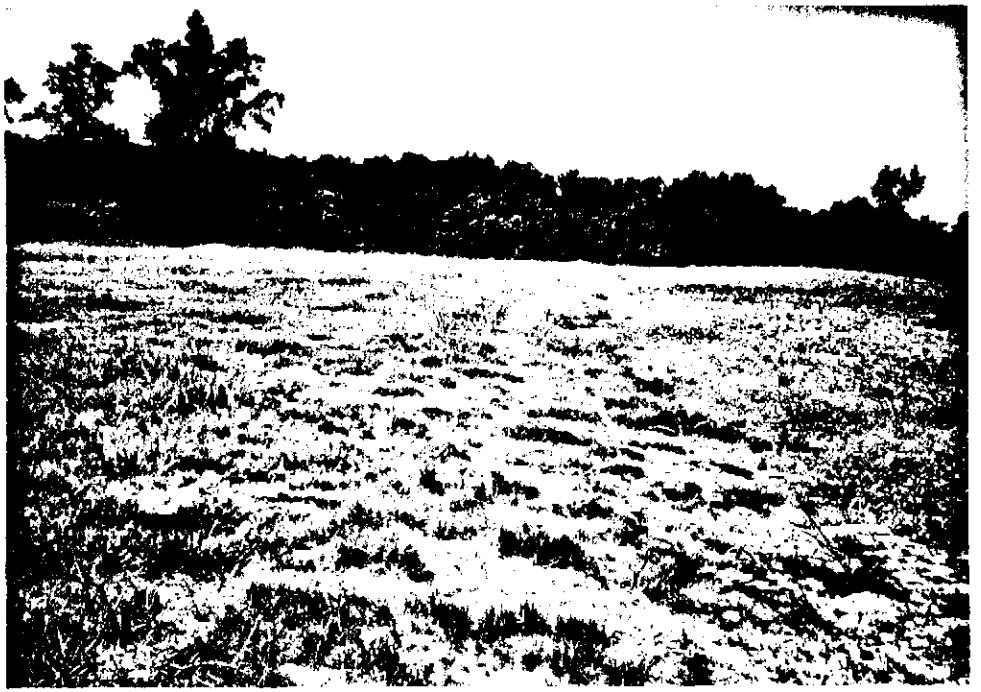
APPENDIX B: VSI Photograph Log

APPENDIX B: VSI Photograph Log

1.1 Overview of the Drum Storage Area (SWMU 1) located in the vicinity of the Former Atrazine Production Area (SWMU 16) in the south section of the South Plant. The view is facing northwest. Note the dinoseb stains (yellow color) on the concrete. Many reports describe the Returned Product Storage Area (SWMU 17) as being indistinguishable from the Drum Storage Area (SWMU 1).



1.2 Close-up of the sump which received runoff from both the Drum Storage Area (SWMU 1) and the Returned Product Storage Area (SWMU 17). The contents of the sump are periodically emptied via the Vacuum Truck (SWMU 21). Note the poor condition of the concrete surrounding the sump and the white chalky substance that appeared to be atrazine. There was a strong atrazine like odor noted in the vicinity of the unit.



2.1 View of the Inactive Landfill (SWMU 2) located in the southeast section of the South Plant. The view is facing southeast. The photograph is a part of a panorama which is continued in subsequent photographs 2.2 through 2.3.

2.2 Continuation of Photograph 2.1 showing the Inactive Landfill (SWMU 2) facing south (right) to east (left).

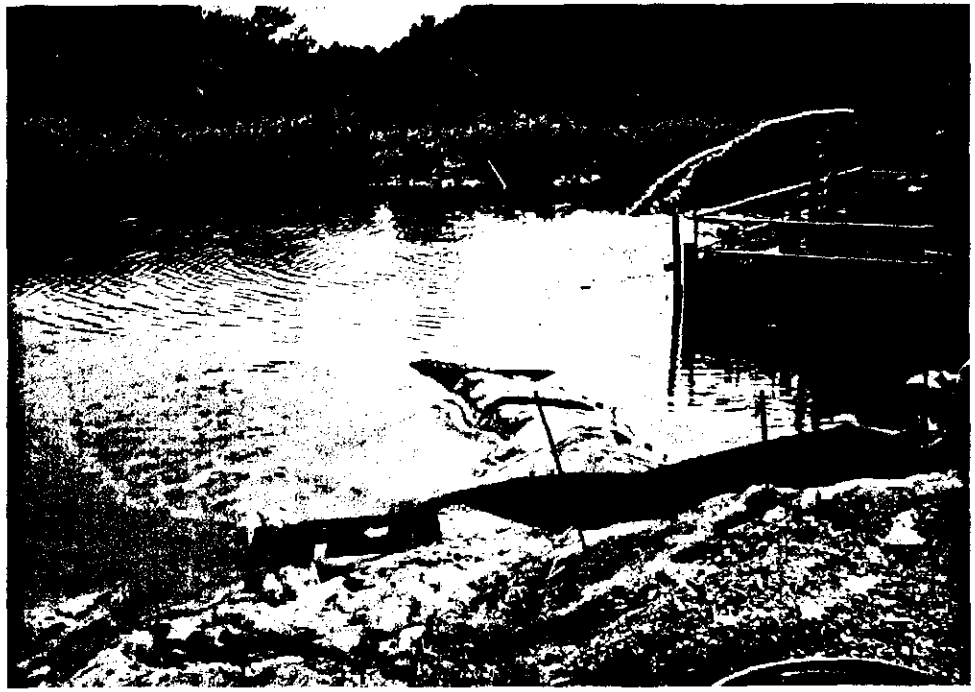
2.3 Continuation of Photograph 2.2 showing the Inactive Landfill (SWMU 2) facing east (right) to northeast (left).

2.4 View of the Inactive Landfill (SWMU 2) facing north. The structure in the background is the City of Vicksburg water treatment plant.

2.5 View of the east section of the South Plant showing the slope of the hill between the Inactive Landfill (SWMU 2) and the South Plant Surface Impoundments (SWMU 3). The landfill is located at the top of the hill to the right of the photograph and the impoundments are located to the left of the photograph. The slope of the hillside is covered with a geotextile fabric in order to prevent soil erosion from interrupting the retrofitting activities being conducted at the impoundments. The view is facing east.

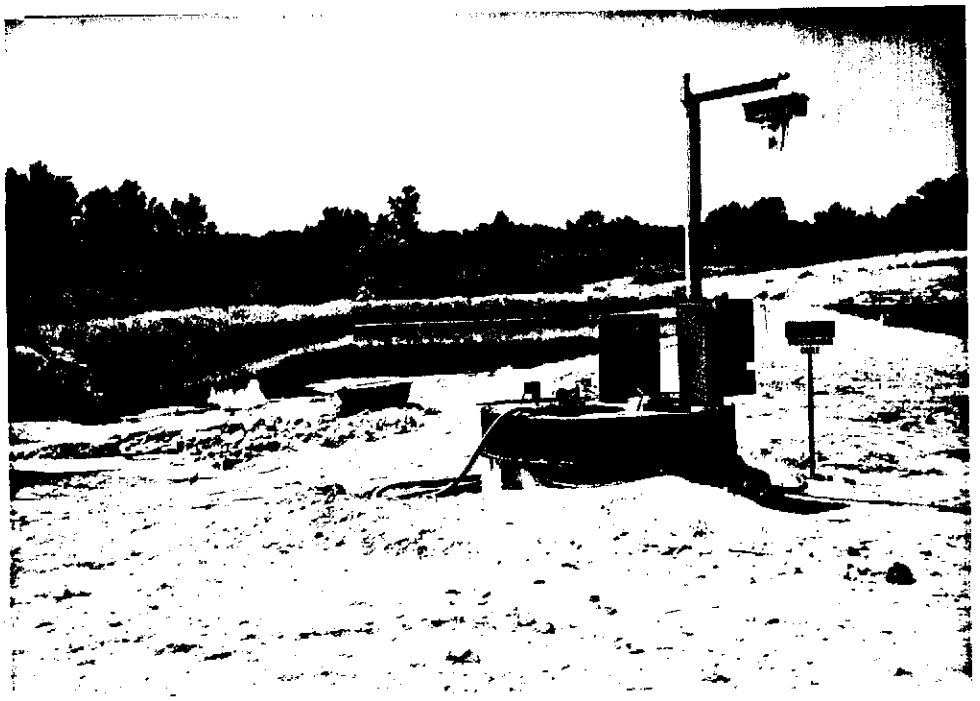
3.1 View of the South Plant Surface Impoundments (SWMU 3) showing the retrofitting activities being conducted at the Impoundment A (SWMU 3a). The view is facing northeast. The photograph is part of a panorama which is continued in photograph 3.2. Impoundment C (SWMU 3c) is located in the upper-left corner of the photograph indicated by the water discharging from the Lift Station.

3.2 Continuation of photograph 3.1 showing the South Plant Surface Impoundment A (SWMU 3a). The view is facing east.



3.3 View of South Plant Surface Impoundment C (SWMU 3c) facing northeast. Note the sheen on the water surface in the vicinity of the pipe in the lower left-hand corner of the photograph.

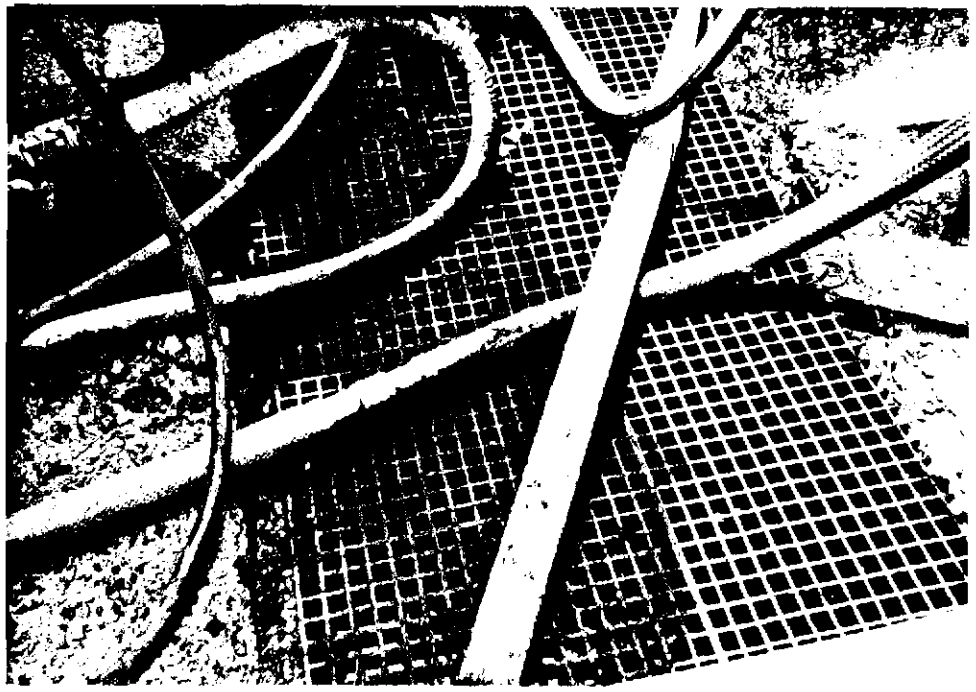
3.4 Close-up of the south edge of the South Plant Surface Impoundment C (SWMU 3c) showing soil stained with dinoseb.



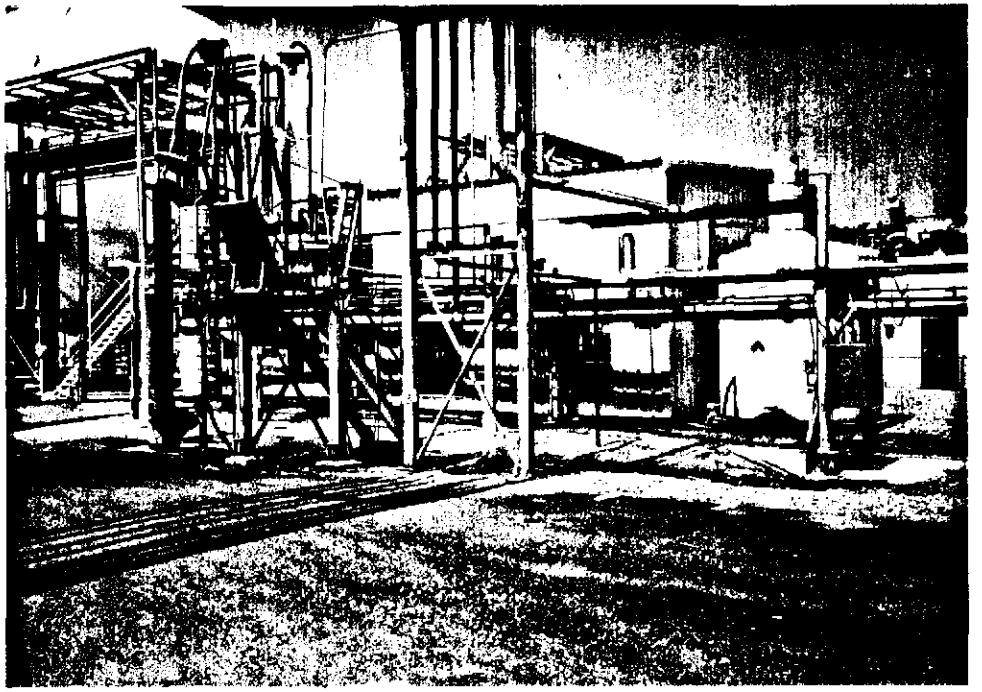
3.5 View of South Plant Surface Impoundment B (SWMU 3b) facing southeast. Part of the Solid Waste Consolidation Area (SWMU 3d) can be seen in the upper right hand corner of the photograph.

4.1 Overview of the South Plant facing southeast showing the Carbon Adsorption System (SWMU 4). The Carbon Adsorption System (SWMU 4) is the series of tanks situated beyond the railcars. A portion of the Dinoseb Off-loading Area (SWMU 8) is shown in the lower-left corner of the photograph and the Inactive Landfill (SWMU 2) is shown in the upper-left corner of the photograph.

4.2 View of the Carbon Adsorption System (SWMU 4) facing south. The tank shown in the photograph is one of the carbon columns. Note the yellow stains on the concrete pad.

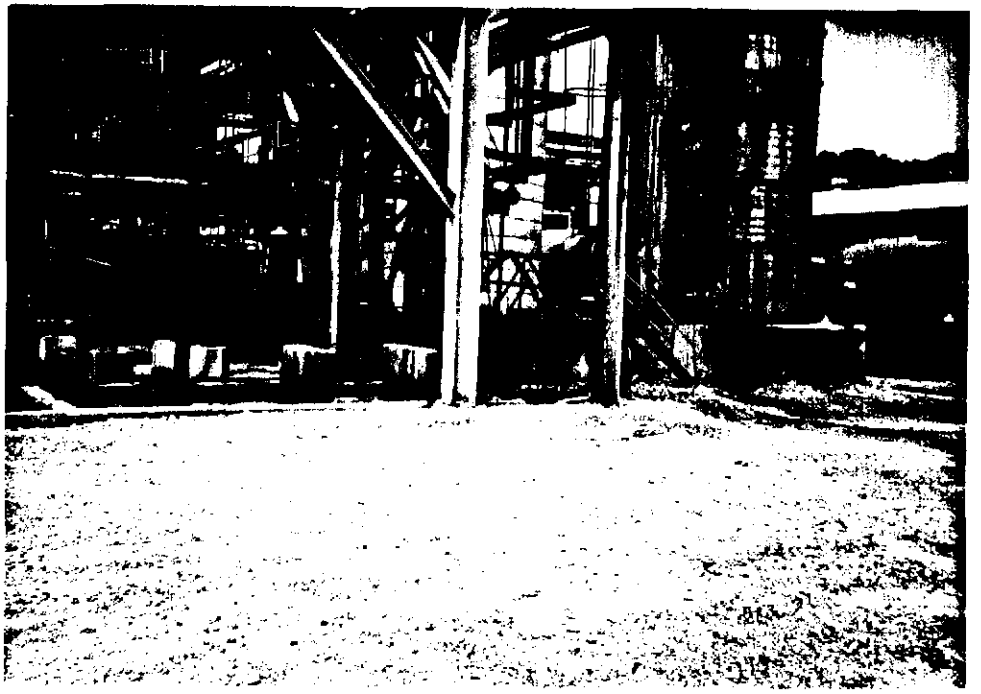


4.3 Close-up of the sump for the Carbon Adsorption System (SWMU 4) which is used for receiving collected wastewater from the Vacuum Truck (SWMU 21). Note the eroded condition of the concrete.

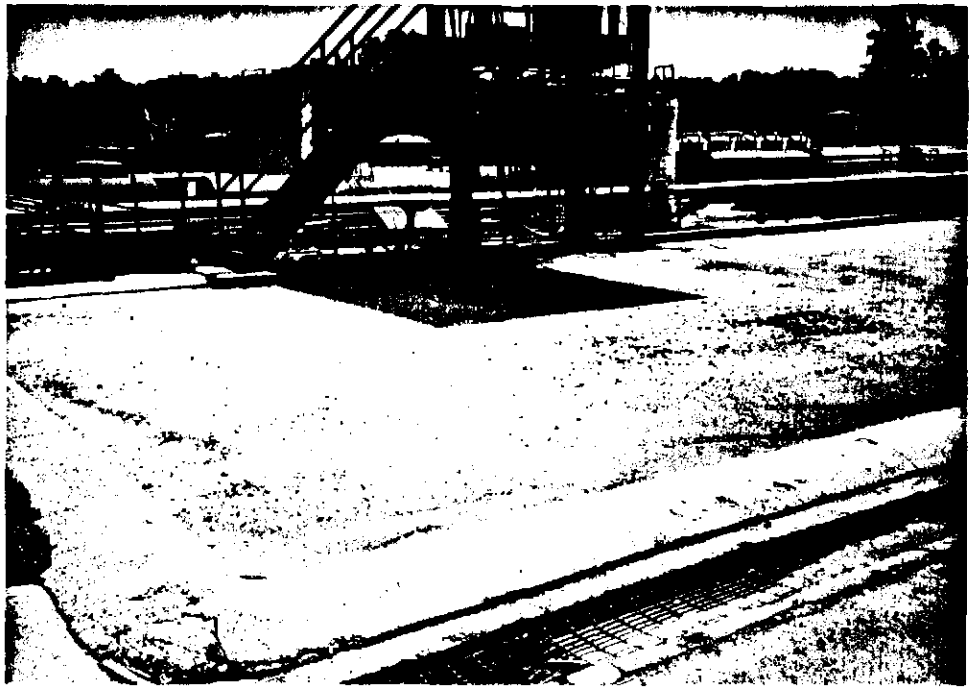


5.1 View of the central section of the South Plant showing a portion of the Nitric Acid Production Area and one of the ditches that are part of the South Plant Drainage System (SWMU 5). The Former Blue Tank (SWMU 18) was reportedly situated at this location. The view is facing northwest.

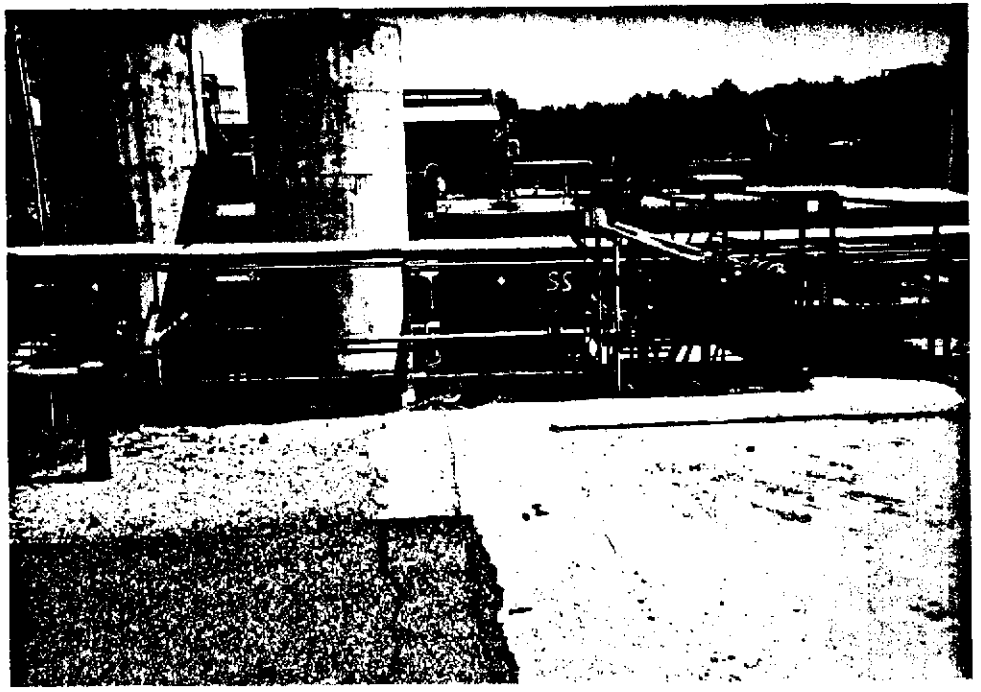
6.1 Overview of the northwest section of the South Plant showing the former location of the South Plant Hill Tank (SWMU 6). The South Plant Hill Tank (SWMU 6) was reportedly located in the left center of the photograph. A loading station was situated in the vicinity of the tree shown in the left-center of the photograph. The view is facing southeast. Note the brown vegetation around the area.



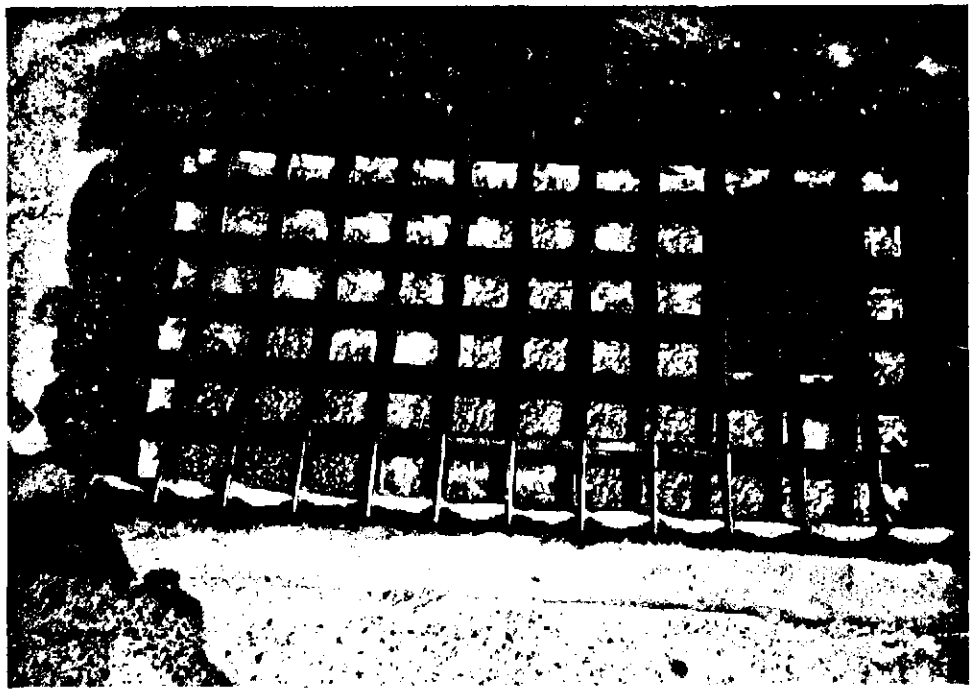
7.1 View of the Former Dinoseb Production Area (SWMU 7) located in the central section of the South Plant. The view is facing northwest. Note the yellow stains on the concrete and surrounding gravel-covered area.



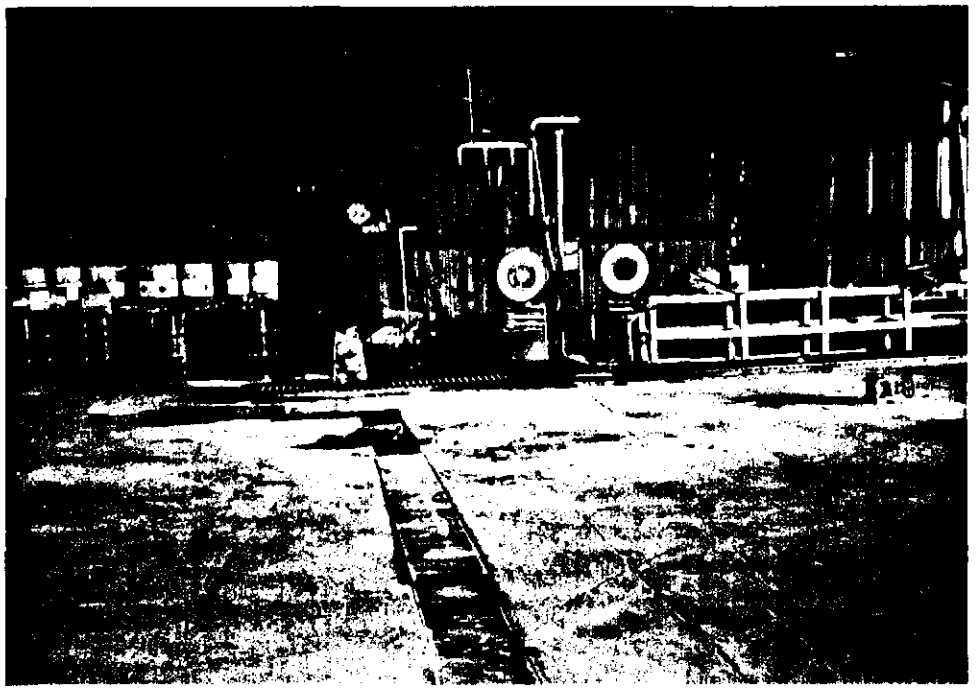
8.1 View of the Dinoseb Off-Loading Area (SWMU 8) located in the central section of the South Plant. The view is facing southeast. Note the poor condition of the concrete curb shown in the lower-left corner of the photograph. The Carbon Adsorption System (SWMU 4) can be seen in the upper right hand corner of the photograph.



8.2 View of the Dinoseb Off-Loading Area (SWMU 8) showing the former storage tanks. The tank on the left previously contained toluene and the small brown tank on the right contained versene. Facility representatives could not provide information pertaining to the contents of the tank in the center.

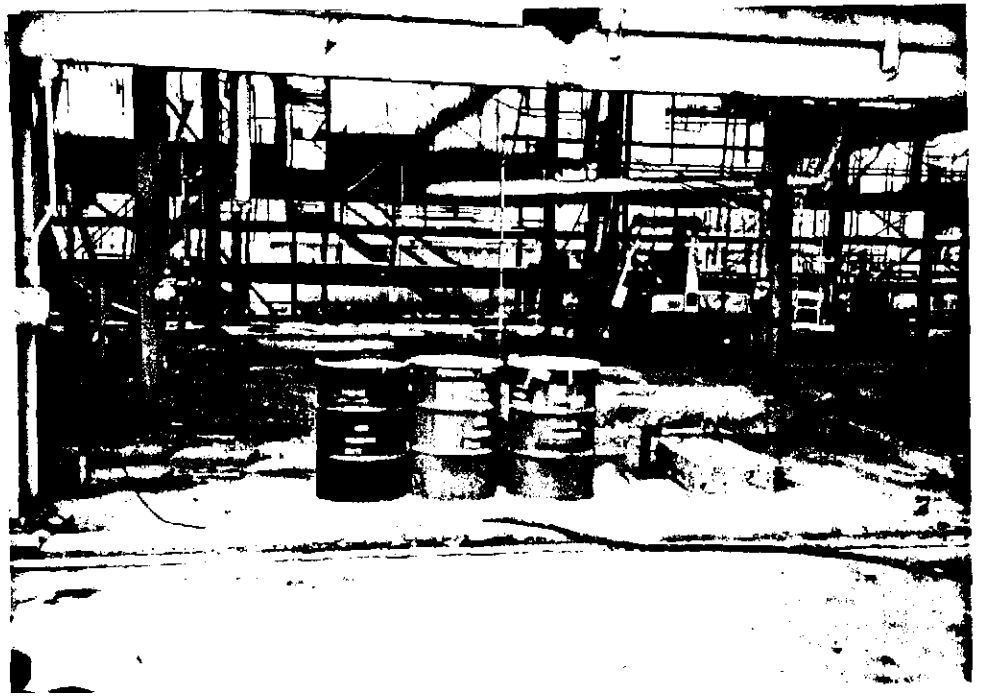


8.3 Close-up of the sump in the Dinoseb Off-Loading Area (SWMU 8) located in the southwest corner of the pad. Note the poor condition of the concrete and the yellow-brown dinoseb scum floating on the surface of the water within the sump. The contents of the sump are periodically emptied via the Vacuum Truck (SWMU 21).



9.1 View of the Dinoseb Drumming Area and Drains (SWMU 9) located in the vicinity of the Dinoseb Off-Loading Area (SWMU 8) in the central section of the South Plant. The drums shown in the left-center of the photograph are empty.

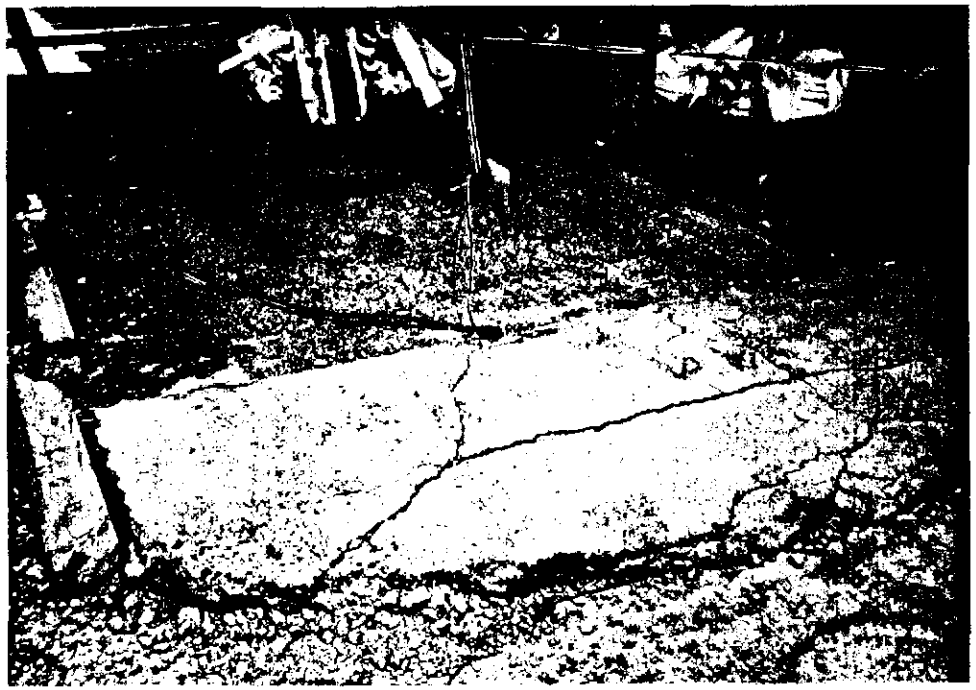
10.1 View of the Dinoseb Stock Storage Area (SWMU 10) located inside a warehouse in the central section of the South Plant.



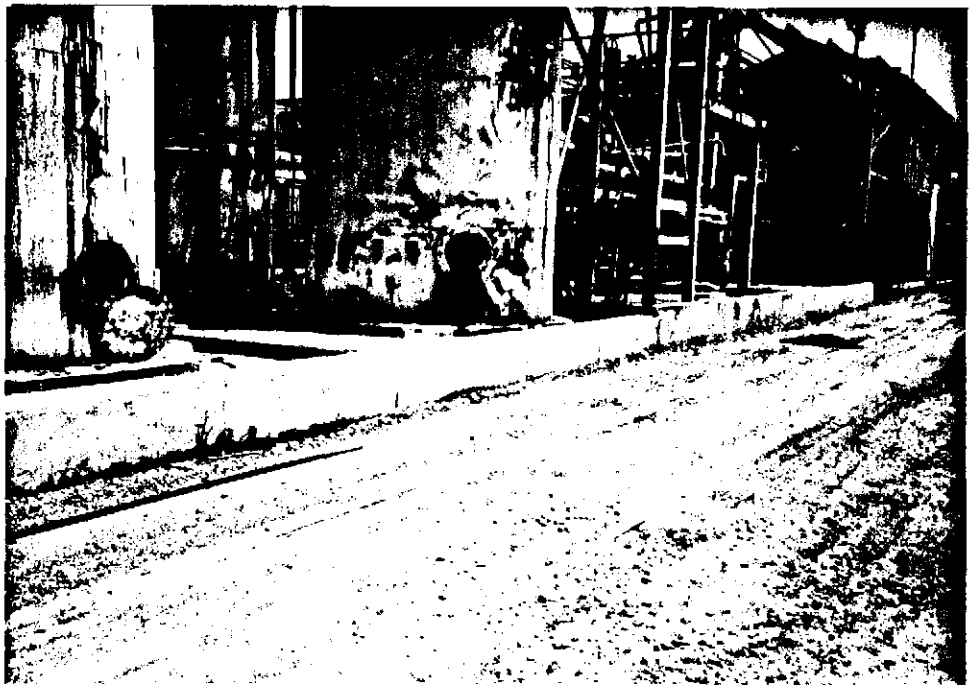
11.1 View of the Former MSMA Production Area (SWMU 11) located in the central section of the South Plant. The view is facing east. The three drums contain floor sweeping from the former production area that may contain hazardous constituents. This area was also the location of the Former Methyl Parathion Production Area (SWMU 15).

11.2 View of the Former MSMA Production Area (SWMU 11) showing some process area drains. A portion of the Former MSMA Salt Unloading Area (SWMU 12) is shown in the lower-right corner of the photograph.

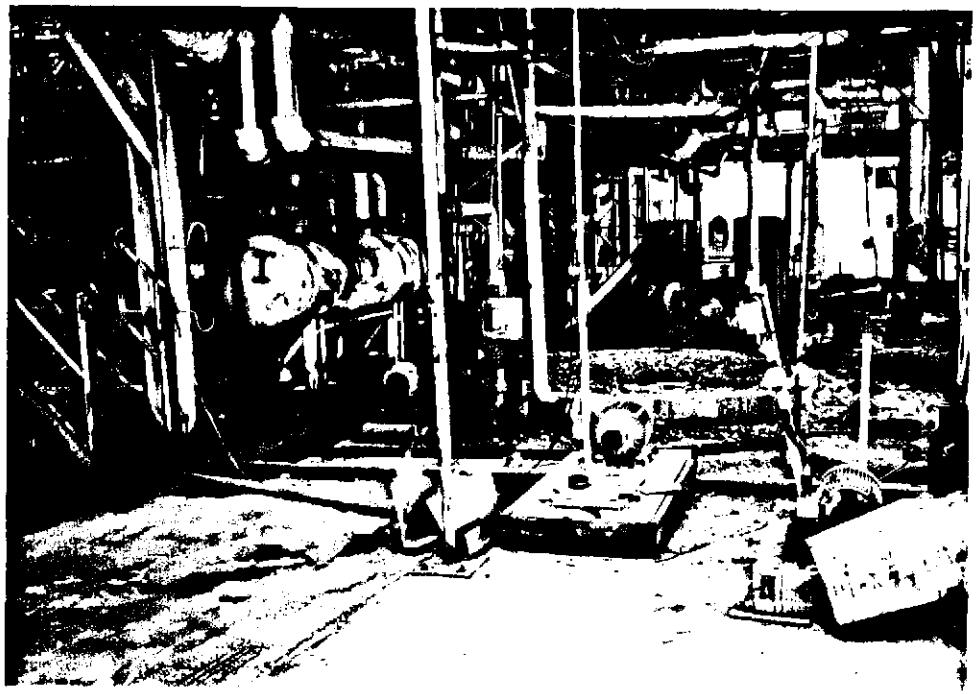
12.1 View of the Former MSMA Salt Unloading Area (SWMU 12) facing south. The waste accumulated in the area is from the dismantling activities associated with the former production area.



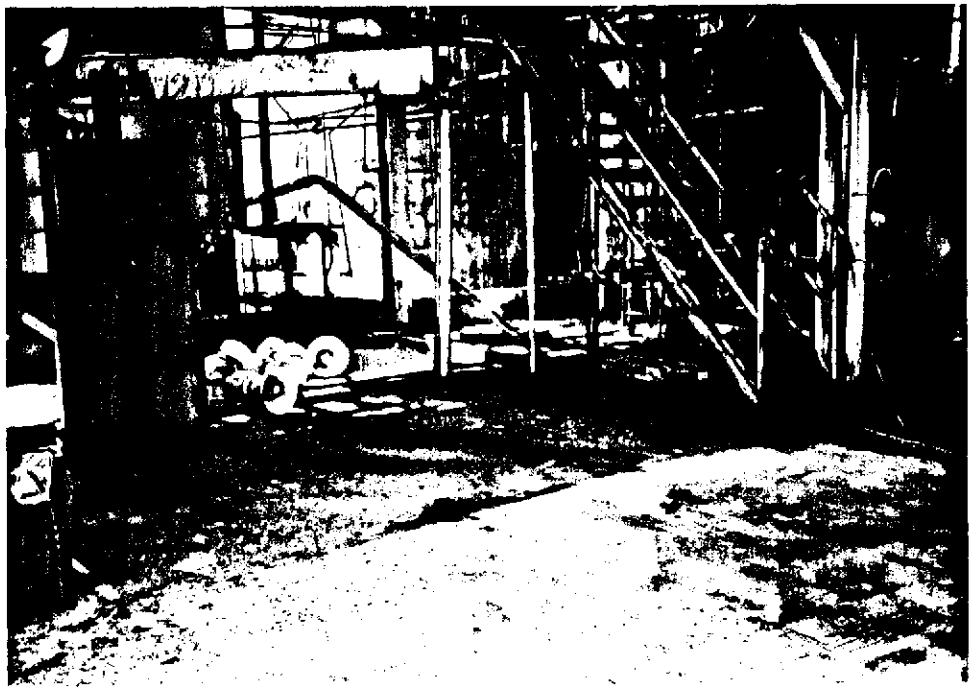
12.2 Close-up of the secondary containment for the Former MSMA Salt Unloading Area (SWMU 12). Note the poor condition of the unit.



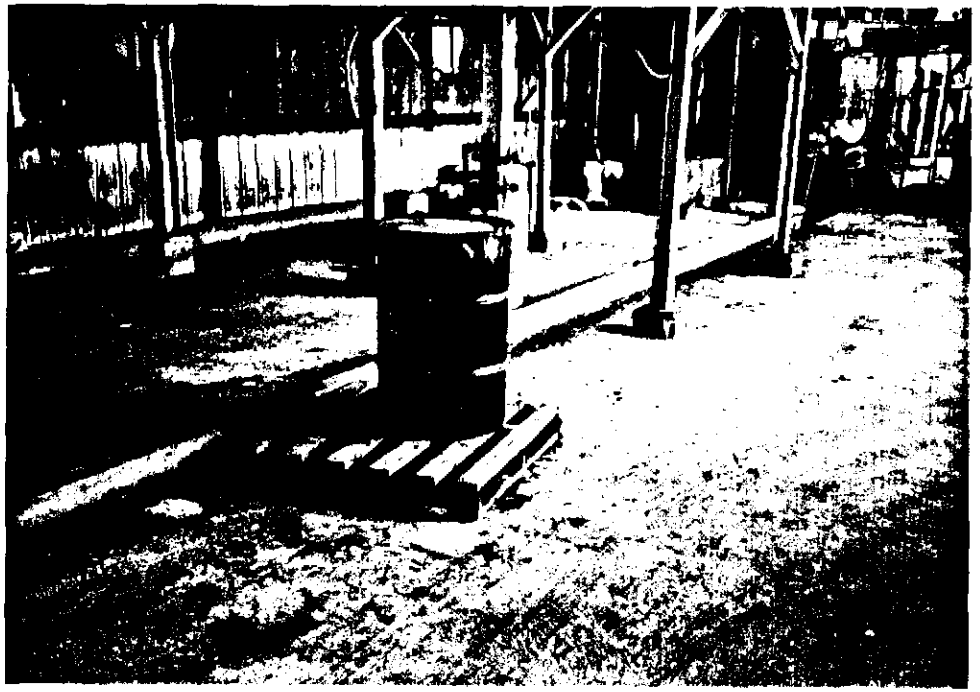
14.1 View of the Former Toxaphene Production Area (SWMU 14) located in the central section of the South Plant. The view is facing northwest.



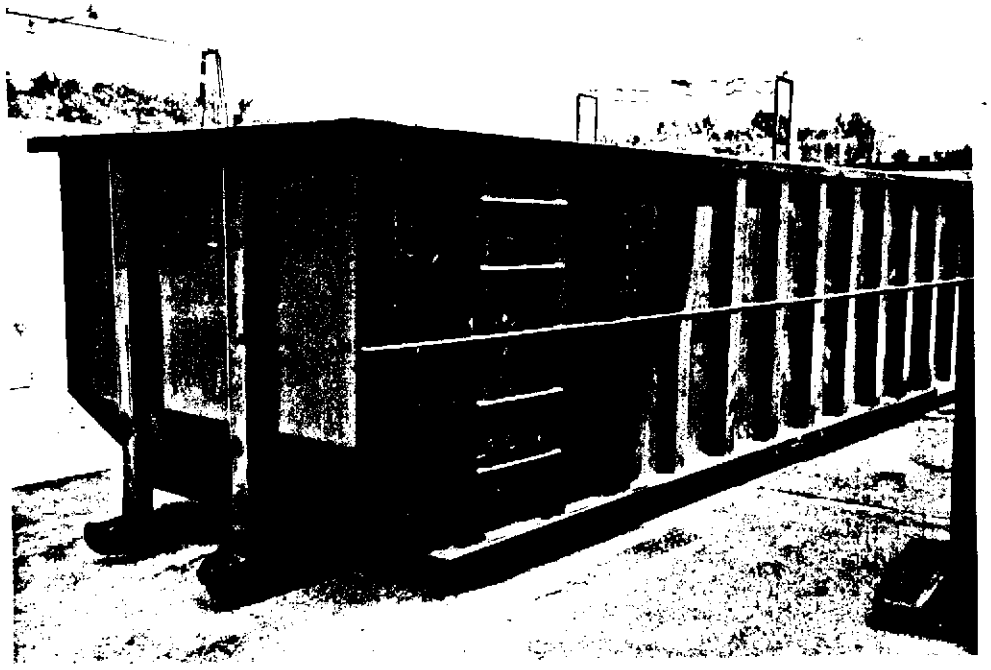
16.1 Panorama of the Former Atrazine Production Area (SWMU 16) located in the south section of the South Plant. The view is facing south and is continued to the east in photograph 16.2.



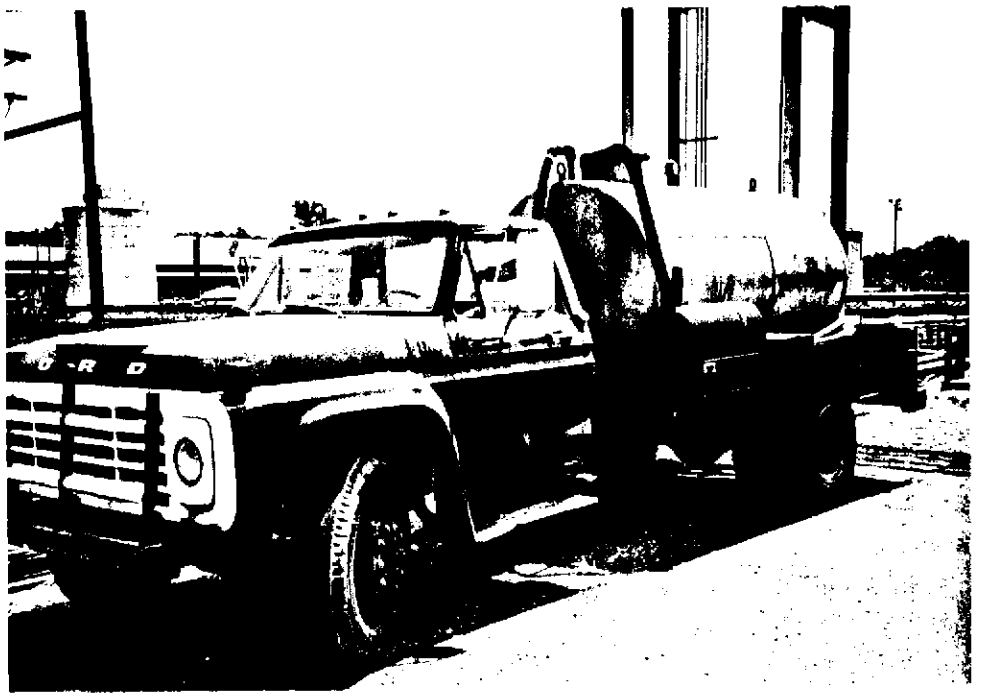
16.2 Continuation of photograph 16.1 showing the Former Atrazine Production Area (SWMU 16).



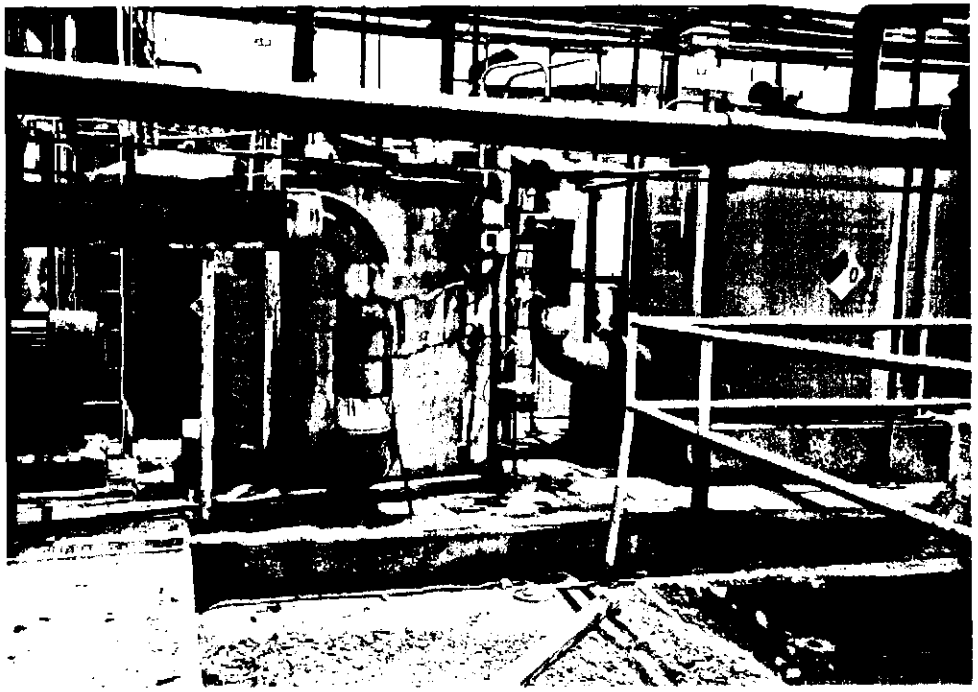
16.3 View of the Former Atrazine Production Area (SWMU 16) in the south section of the facility. Note the orange stains on the concrete floor and along the curbing. The drum reportedly contains floor sweepings from the area, possibly including atrazine.



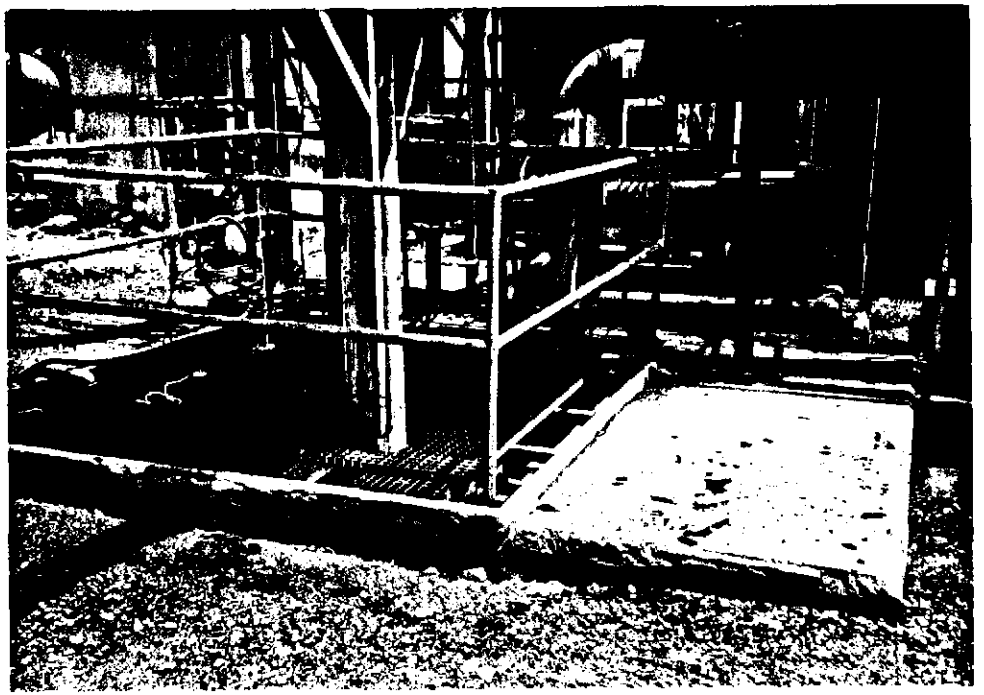
19.1 View of the Scrap Metal Dumpster (SWMU 19) located outside the Former MSMA Production Area (SWMU 11) in the central section of the South Plant. The view is facing northwest.



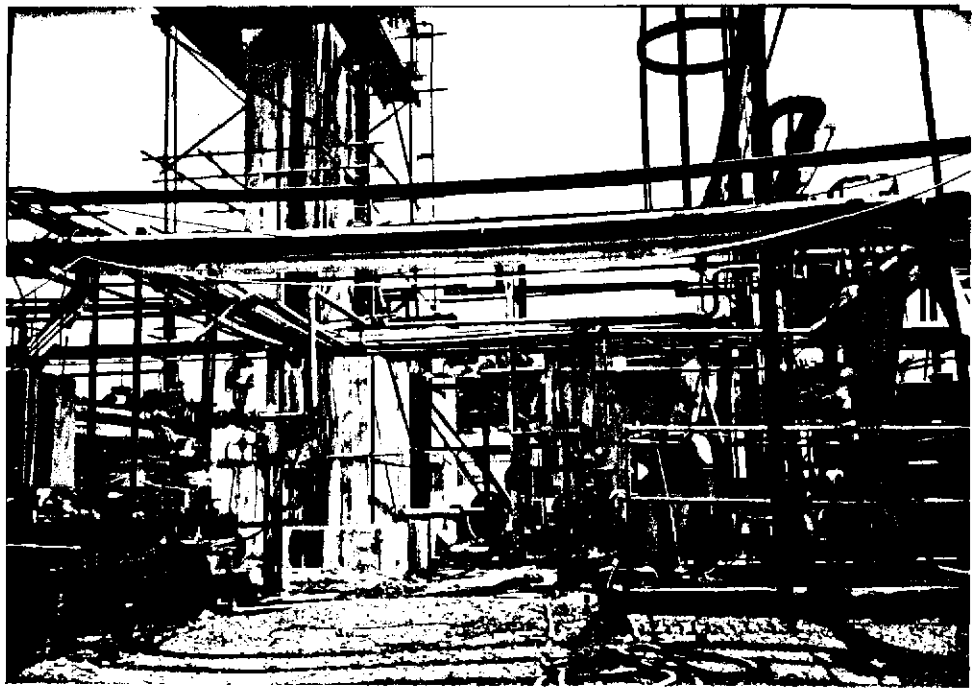
21.1 View of the Vacuum Truck (SWMU 21) shown parked in the vicinity of the Dinoseb Off-Loading Area (SWMU 8) in the central section of the South Plant. The view is facing southeast.



22.1 View of the neutralization tanks that are part of the North Plant Neutralization System (SWMU 22). The unit is located in the central section of the North Plant. The view is facing east. The piping seen here is part of the Wastewater Pipes (SWMU 25).



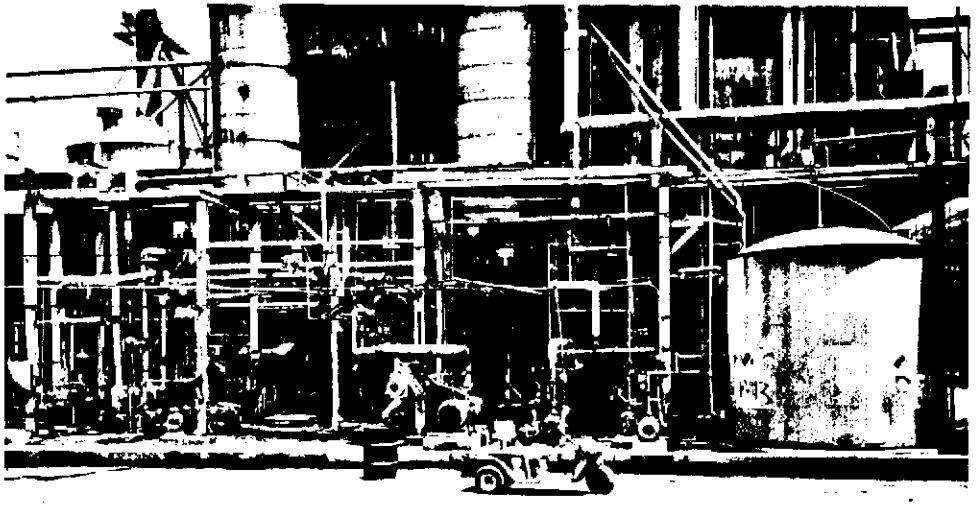
22.2 Close-up of the sump which is part of the North Plant Neutralization System (SWMU 22). The view is facing east.



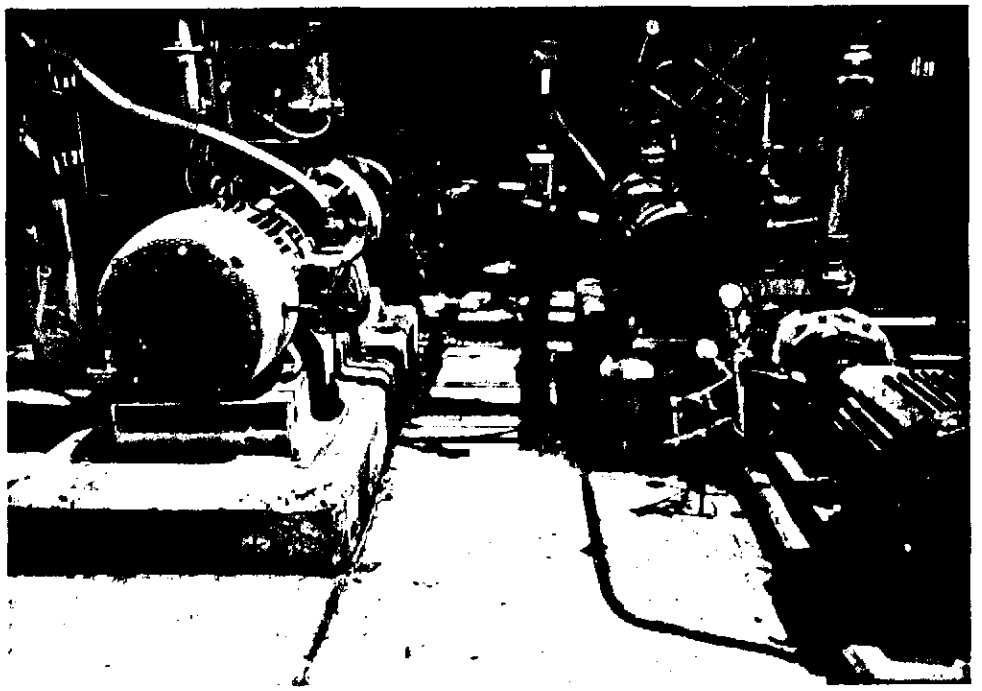
22.3 View of the central section of the North Plant showing the sump for the North Plant Neutralization System (SWMU 22) and the C-10 Scrubber (SWMU 26). The view is facing east.

23.1 View of the Inactive North Plant Surface Impoundment (SWMU 23) located in the south section of the North Plant. The view is facing southeast. The area indicated by an arrow shows the pit that held limestone used to neutralize the wastewaters.

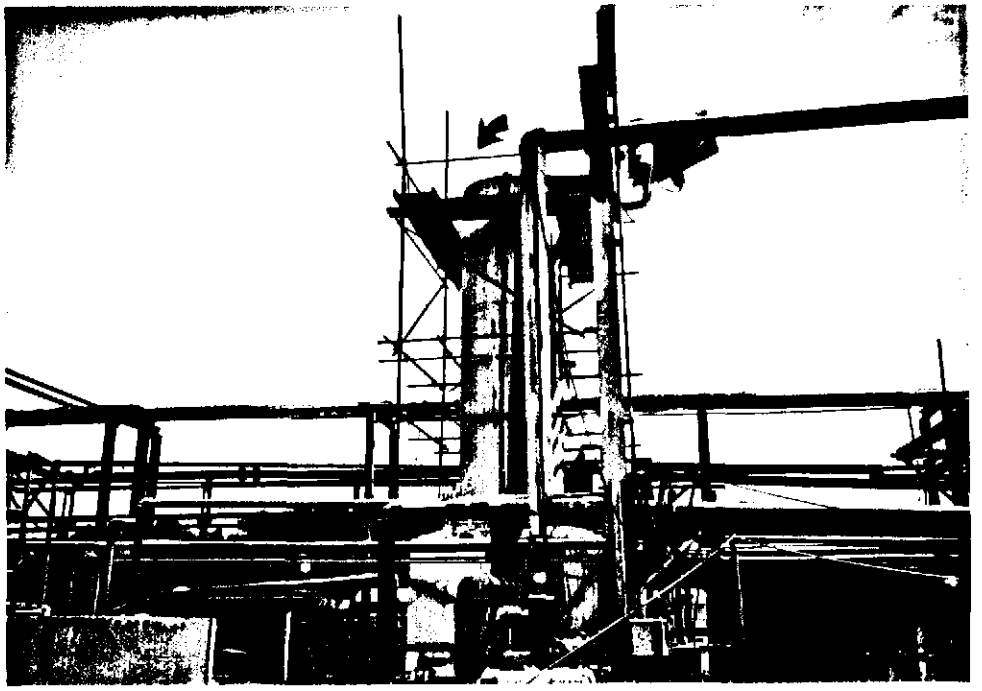
23.2 View of the Inactive North Plant Surface Impoundment (SWMU 23) facing east. The unit reportedly contained rainwater at the time of the VSI.



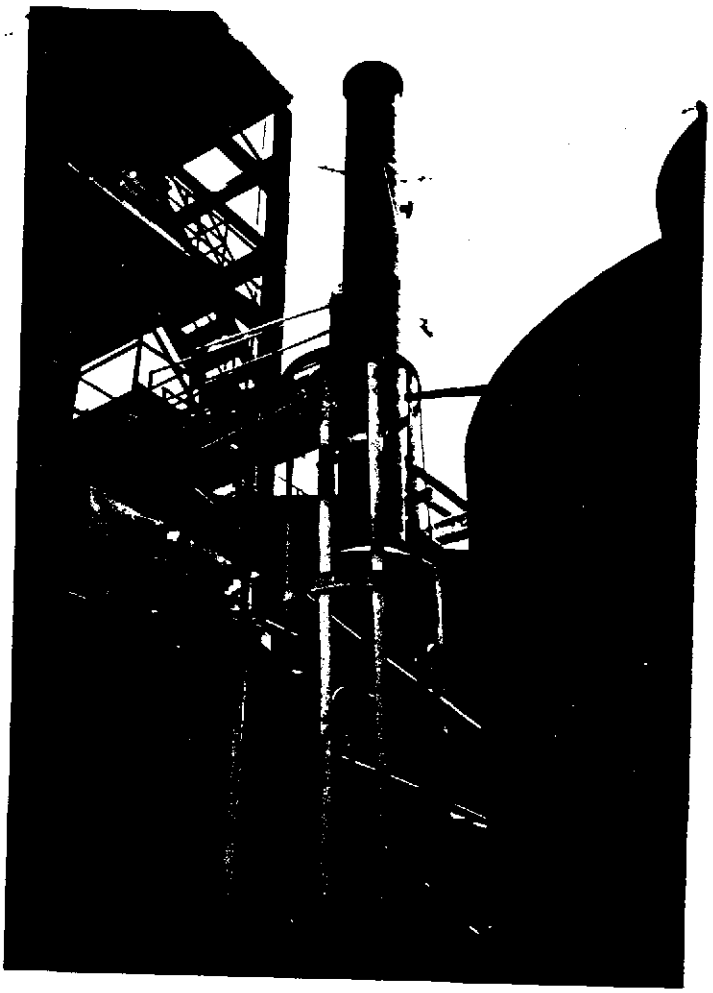
24.1 View of the North Plant Containment System (SWMU 24) and the Wastewater Pipes (SWMU 25) located in the central section of the North Plant.



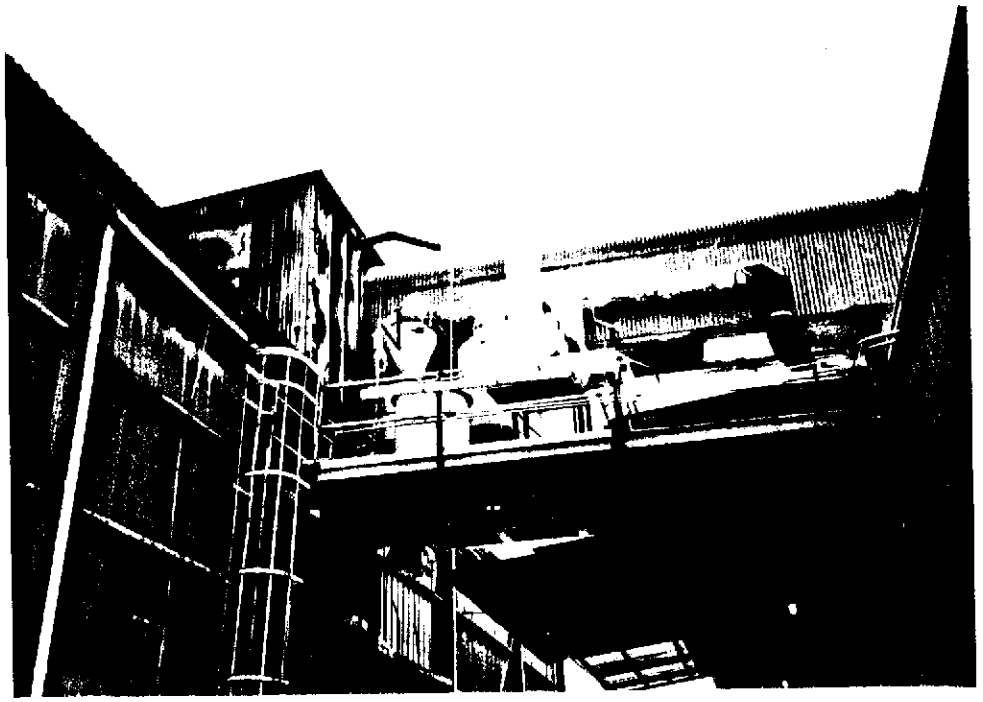
24.2 Close-up of the North Plant Containment System (SWMU 24) showing one of the trenches.



26.1 View of the C-10 Scrubber (SWMU 26) located in the central section of the North Plant. The view is facing east. Note the emissions indicated by an arrow.

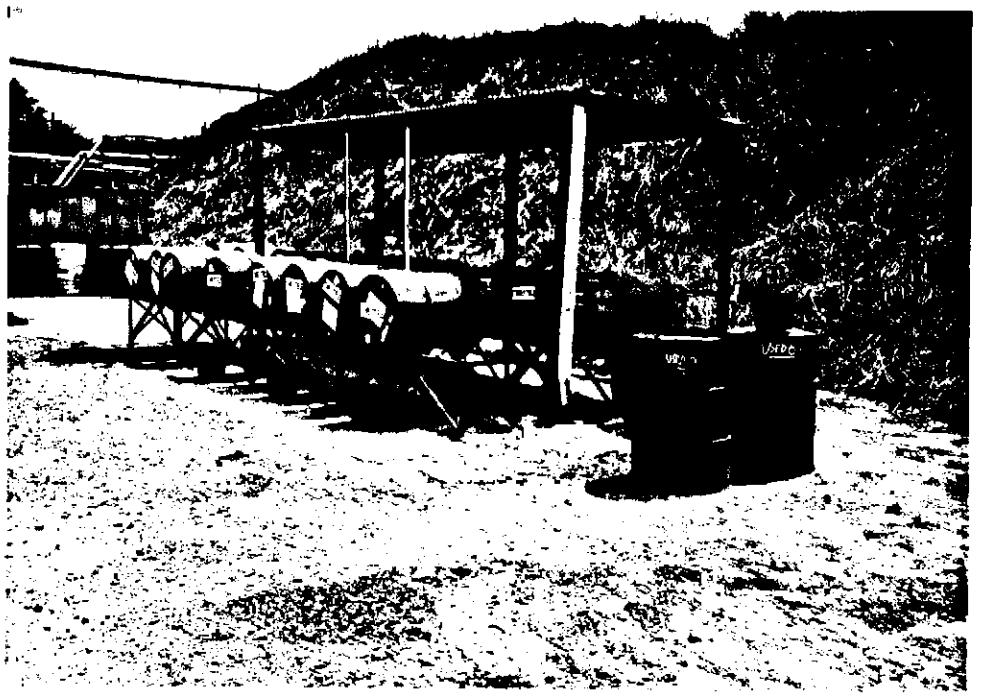


27.1 View of the Cooler Scrubber (SWMU 27) located in the central section of the North Plant. The view is facing southeast.

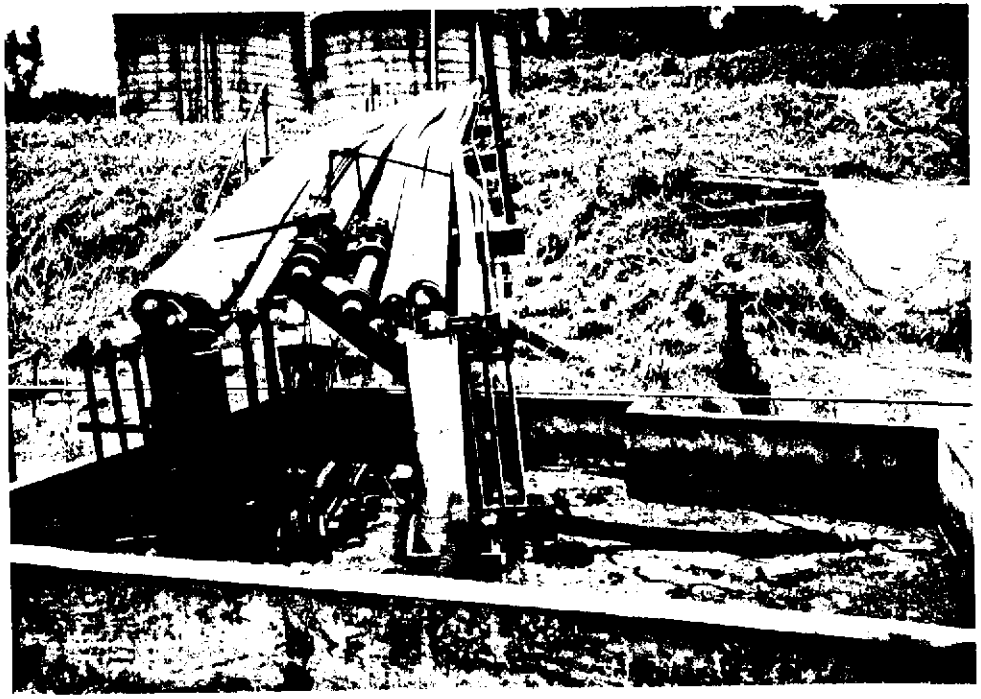


28.1 View of the End Product Scrubber (SWMU 28) located in the central section of the North Plant. The view is facing south.

29.1 View of the Oil Collection Unit (SWMU 29) located beneath the potassium nitrate cooler in the central section of the North Plant. Note the oil stains along the wall and the thick pile of absorbent in the vicinity of the drum.

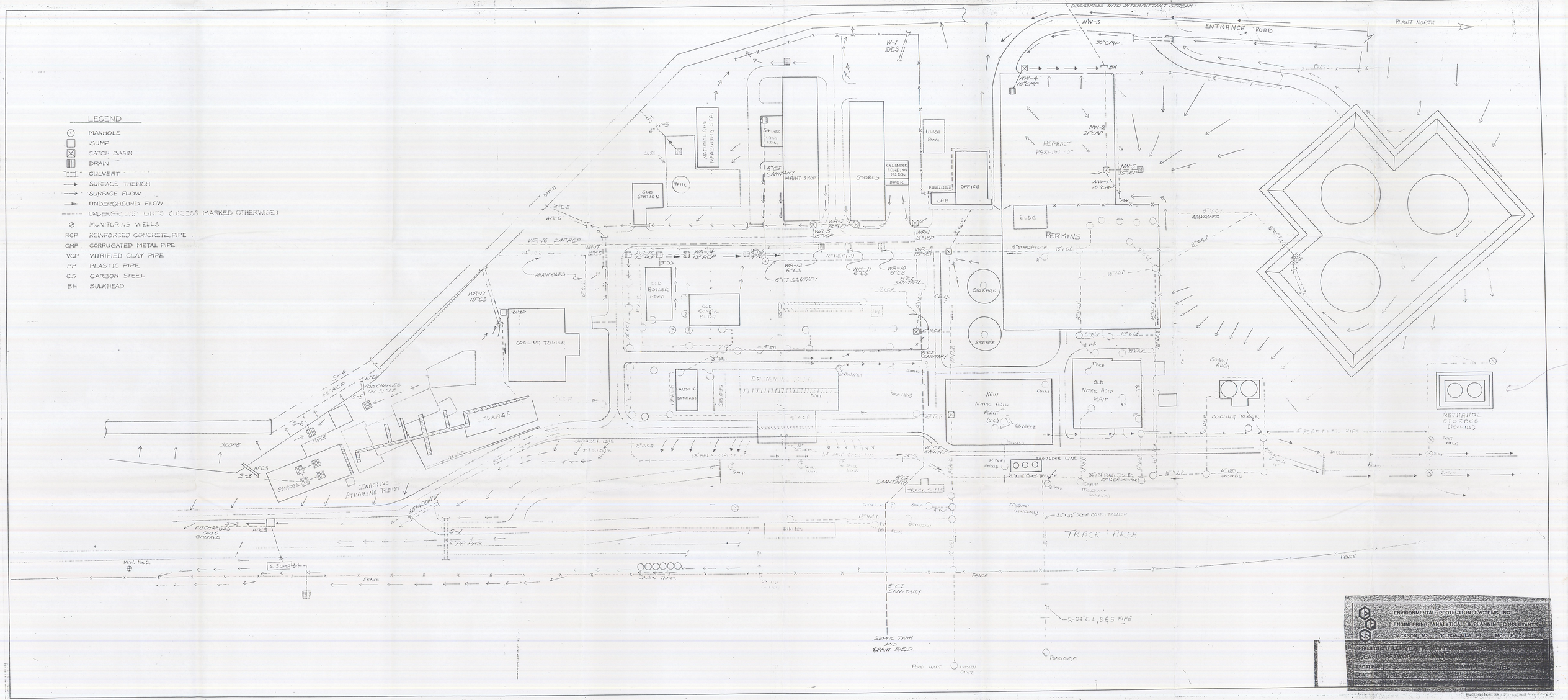


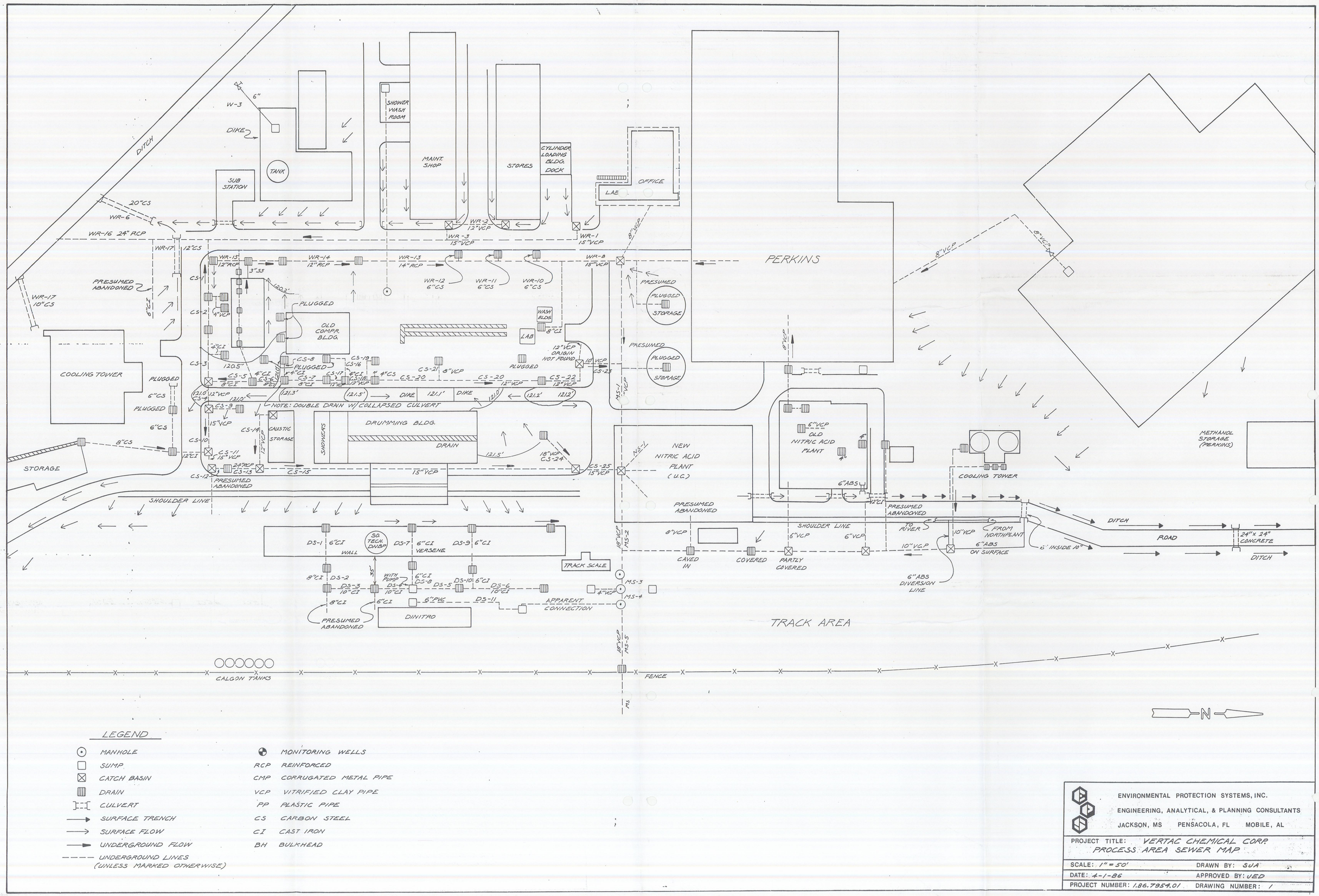
30.1 View of the Waste Oil SAA (SWMU 30) located in the south section of the North Plant. The view is facing southeast.



31.1 View of the No. 6 Fuel Oil Area (SWMU 31) located in the south section of the North Plant. The view is facing south. Note the accumulated fuel oil within the sump.

32.1 View of the C-15 Scrubber (SWMU 32) located in the central area of the North Plant, adjacent to the Crystalization Area.


LEGEND
MANHOLE
SUMP
CATCH BASIN
DRAIN
CULVERT
SURFACE TRENCH
SURFACE FLOW
UNDERGROUND FLOW
UNDERGROUND LINES (UNLESS MARKED OTHERWISE)
MONITORING WELLS
RCP REINFORCED CONCRETE PIPE
CMP CORRUGATED METAL PIPE
VCP VITRIFIED CLAY PIPE
PP PLASTIC PIPE
CS CARBON STEEL
BH BULKHEAD
DISCHARGES INTO INTERMITTANT STREAM
NW-3
ENTRANCE ROAD
PLANT NORTH
30" CMP
NW-4 18" CMP
NW-2 21" CMP
NW-5 15" CMP
NW-1 18" CMP
ASPHALT PARKING LOT
FENCE
BH
W-1 10" CS
NITRIGLYCERIN NEUTRALIZING STA.
SAMPLE ROOM
6" CI SANITARY
MAINT. SHOP
STORES
CYLINDER LOADING BLDG.
DOCK
LUNCH ROOM
OFFICE
LAB
SUB STATION
TANK
WR-6
WR-16 24" RCP
WR-17 12" CS
WR-2 12" CS
WR-3 15" RCP
WR-1 15" RCP
WR-4 12" RCP
WR-12 6" CS
WR-11 6" CS
WR-10 6" CS
6" CI SANITARY
OLD BOILER HSE.
OLD CONC. P. SL.
COOLING TOWER
STORAGE
STORAGE
BLDG
PERKINS
8" VCP ABANDONED
15" VCP
18" STAINLESS
SOGGY AREA
OLD NITRIC ACID PLANT
NEW NITRIC ACID PLANT (1-42)
COVERED
CAUSTIC STORAGE
DRAINAGE DITCH
SHOWERS
SCRUBBER
BOILER
CONDENSOR
TRENCH TO SEWER
SUMP
SCALE
SLOPE
10" CS
S-4
42" RCP
S-5
S-6
S-3
DISCHARGES ON SLOPE
INJECTIVE AIR/BRINE PLANT
ABANDONED
DISCHARGES INTO GROUND
S-2
S-1
6" FM FRP
M.W. No. 2
S.S. MH
CRUDE TANKS
SEPTIC TANK AND LEACH FIELD
2-24" C.I. B&S PIPE
ROAD CUT
TRACK AREA
METHANOL STORAGE (REVERS)
6" PERFORATED PIPE
INLET
MH
SLOPE
DITCH
ROAD
SCALE 1" = 100'
DATE
WATER
SEWER
ENVIRONMENTAL PROTECTION SYSTEMS, INC.
ENGINEERING, ANALYTICAL & PLANNING CONSULTANTS
JACKSON, MS. PENSACOLA, FL. MOBILE, AL.



DITCH
W-3
6"
DIKE
TANK
SUB STATION
SHOWER WASH ROOM
MAINT. SHOP
STORES
CYLINDER LOADING BLDG. DOCK
OFFICE
LAB
PERKINS
20"CS
WR-6
WR-16 24" RCP
WR-17
12"CS
WR-17 10"CS
PRESUMED ABANDONED
WR-15 12"RCP
WR-14 12"RCP
WR-13 14"RCP
WR-12 6"CS
WR-11 6"CS
WR-10 6"CS
WR-8 15"VCP
WR-2 12"VCP
WR-3 15"VCP
WR-1 15"VCP
PLUGGED
OLD COMPR. BLDG.
WASH BLDG.
LAB
PRESUMED
PLUGGED
STORAGE
COOLING TOWER
PLUGGED
6"CS
8"CS
STORAGE
NOTE: DOUBLE DRAIN W/ COLLAPSED CULVERT
DIKE
DRUMMING BLDG.
DRAIN
SHOWERS
CAUSTIC STORAGE
PRESUMED ABANDONED
SHOULDER LINE
NEW NITRIC ACID PLANT (U.C.)
OLD NITRIC ACID PLANT
COOLING TOWER
METHANOL STORAGE (PERKINS)
DITCH
ROAD
24" x 24" CONCRETE
DITCH
FROM NORTHPLANT
6" ABS ON SURFACE
6" INSIDE 10"
6" ABS DIVERSION LINE
TO RIVER
CAVED IN
COVERED
PARTLY COVERED
DS-1 6"CI
SO. TECH. DNBP
DS-7 6"CI
VERSENE
DS-9 6"CI
WALL
TRACK SCALE
DS-2
DS-3 10"CI
WITH PUMP
DS-4 10"CI
DS-5
DS-10 6"CI
DS-6 10"CI
DS-11
APPARENT CONNECTION
DINITRO
PRESUMED ABANDONED
TRACK AREA
CALGON TANKS
FENCE
N
LEGEND
MANHOLE
SUMP
CATCH BASIN
DRAIN
CULVERT
SURFACE TRENCH
SURFACE FLOW
UNDERGROUND FLOW
UNDERGROUND LINES (UNLESS MARKED OTHERWISE)
MONITORING WELLS
RCP REINFORCED
CMP CORRUGATED METAL PIPE
VCP VITRIFIED CLAY PIPE
PP PLASTIC PIPE
CS CARBON STEEL
CI CAST IRON
BH BULKHEAD
ENVIRONMENTAL PROTECTION SYSTEMS, INC.
ENGINEERING, ANALYTICAL, & PLANNING CONSULTANTS
JACKSON, MS PENSACOLA, FL MOBILE, AL
PROJECT TITLE: VERTAC CHEMICAL CORP. PROCESS AREA SEWER MAP
SCALE: 1" = 50'
DRAWN BY: SJA
DATE: 4-1-86
APPROVED BY: JED
PROJECT NUMBER: 1.86.7954.01
DRAWING NUMBER: 1