

VERTAC CHEMICAL CORPORATION

ENVIRONMENTAL MANUAL



**VERTAC CHEMICAL CORPORATION**

24th Floor • 5100 Poplar • Memphis, TN 38137 • 901-767-6851

REPLY TO: P. O. BOX 3  
VICKSBURG, MS 39180  
(601) 636-1231

VERTAC CHEMICAL CORPORATION

ENVIRONMENTAL MANUAL

Emergency response contingency plan and additions.

Treatment, storage or disposal of hazardous waste and additions.

Ground water monitoring, and additions.

DISTRIBUTION

Vertac; Memphis: R.A. Guidi  
D. Karkkainen  
G.L. Pratt

Vertac; Vicksburg: F. Ahlers  
D. Madsen  
B.J. Gunn  
R. Holdiness  
S. Keen  
R. Maraman  
P. Ryan  
File

VERTAC CHEMICAL CORPORATION

FACILITY

EMERGENCY RESPONSE CONTINGENCY PLAN

1981-1982

EMERGENCY USE INDEX

Emergency Reporting and Coordination

National Response Center (NRC)	(800)424-8802
Fire Department	*
Sheriff	*
Office of Emergency Services (OES)	*
County Coordinator	*
County Judge	*
Mayor	*
Local Police Department	*
Bureau/Department of Pollution Control	*
Department of Health	*

Emergency Pollutant Hazards Information

Chemical Transport Emergency Center (Chemtrec)	(800)424-9300
EPA Oil and Hazardous Materials Technical Assistance Data Systems (OHMTADS)*	(214)767-2666

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## PART 1

### INTRODUCTION

#### 1.1 Authority

This contingency plan was developed in compliance with 40 CFR, Part 265, Subpart D, which provides for the preparation, publication, revision, and amendment of an Emergency Response Plan.

#### 1.2 Purpose and Objectives

- a. This plan provides for a pattern of coordinated and integrated response by plant personnel to respond to any emergency, and a system of prompt notification of local and state government concerning any in-plant emergency.
- b. The objectives of this plan are to provide for efficient, coordinated, and effective action to minimize damage and injuries from fire, explosion, spills or inadvertent discharges of chemicals, including containment and removal.

This plan provides for:

- (1) Assignment of duties and responsibilities.
- (2) Establishment and identification of emergency, task forces.
- (3) A system of notification, surveillance and reporting.
- (4) The establishment of a Plant Emergency Coordinator to direct operations in carrying out this plan.
- (5) A list of resources to combat fires and spills.
- (6) Investigative procedures to determine the cause of fire, spill or discharge.
- (7) Directions on public information releases.
- (8) Instructions covering emergency coordination

## PART 2

### POLICY AND RESPONSIBILITY

#### 2.1 Regulatory Policy - (Federal Clean Water Act - Sec. 311)

- a. Congress has declared that it is the policy of the United States that there should be no discharge of oil or hazardous substance into or upon the navigable waters of the United States, adjoining shorelines, or into or upon the waters of the contiguous zone, or which may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the U.S. (including resources under the Fishery Conservation and Management Act of 1976).
- b. Any person in-charge of a vessel or an onshore or offshore facility of any kind shall, as soon as he has knowledge of any discharge of oil or hazardous substance from such vessel or facility, immediately notify the National Response Center at their toll-free number 1-800-424-8802. If for some reason reporting to this number is impractical, spills affecting inland waters of the U.S. can be reported to EPA Region VI at (214)767-2666 or on FTS 729-2666.
- c. Plant Policies - The primary thrust of this plan is to provide a coordinated plant response capability in the event of an unplanned or sudden, and usually accidental, unusual event, i.e., fire, explosion, spill or discharge of oil or hazardous waste that poses a threat, or the potential of a threat to personal health, safety and welfare. Environmental pollution control techniques shall be employed in accordance with applicable regulations and guidelines.

PART 3

PLANNING AND RESPONSE

3.1 Emergency Response Activities and Coordination

- a. For emergency response activities (plant specify)  
response management is accomplished through a single pre-designated agent, the Emergency Coordinator (EC).
- b. The predesignated ECs for all emergencies occurring within the boundaries of \_\_\_\_\_ are:
  - (1) EC-1 Primary
  - (2) EC-2 Alternate
  - (3) Etc.

3.2 Local Fire Department Notification

(Who, When, How, Where)

3.3 Local Law Enforcement Notification

(Who, When, How, Where)

3.4 Local Hospital Notification

(Who, When, How, Where)

3.5 Outside Responsibility

- a. Chemtrec
- b. U.S.C.G. (U.S. Coast Guard)
- c. C.O.E. (Corps of Engineers)
- d. Bureau/Department of Pollution Control - The Bureau of Pollution Control is responsible for coordinating, monitoring and cleanup of any large-scale release of chemicals which threatens the environment.
- e. Department of Health - The Health Department is the primary agency dealing with chemical hazards involved in pipeline breaks, train wrecks, truck wrecks, industrial accidents, etc., when health of people are involved; and will assist the Bureau/Department of Pollution Control in containing and removing hazardous material.

PART 4

COORDINATING INSTRUCTIONS

4.1 Delegation of Authority

Local delegation of authority for emergency response and subsequent cleanup activities initially may be oral or written at the discretion of the designated EC.

4.2 Notification

All emergencies\*, regardless of severity, must be reported in accordance with federal and state laws immediately to:

Office of Emergency Services County Coordinator . . .

County Sheriff or Local or Police Department . . .

National Response Center . . .

\*Routine, minor spills that can be immediately cleaned up, or do not leave plant property and does not disrupt the normal routine operations are exempt from the reporting requirement.

4.3 Multi-Incident Responses

Coordination of simultaneous responses for different emergencies, e.g., a fire/explosion and a chemical spill shall be carried out by the designated EC; however, he may delegate authority, but he will still maintain responsibility overall.

If an incident transcends plant boundaries, the designated EC will closely coordinate all activities with the local authorities.

4.4 Mutual Aid Agreement(s)

All three Vertac plants will mutually assist one another in emergencies.

4.5 Termination of Response Activities

The Emergency Coordinator (EC) has been granted the authority to determine the appropriate termination of response activities after considering the recommendation of the appropriate state and local officials.

Part 4 (Continued)

Termination should be effected when it is apparent that further effort will be non-productive or counter-productive in returning the environment to its former state.

## PART 5

### PROCEDURES FOR REVIEWING AND UPDATING THE EMERGENCY RESPONSE CONTINGENCY PLAN

#### 5.1 Responsibility

- a. This plan was developed in accordance with the State, Regional, and National Contingency Plan.
- b. The Emergency Coordinator is responsible for revising and maintaining this plan.

#### 5.2 Procedures for Review

- a. This plan will be reviewed and updated periodically and when major changes occur. Participating offices are requested to keep the Emergency Coordinator informed of all necessary or recommended changes.
- b. The predesignated Emergency Coordinator is responsible for periodically reviewing and updating this plan. He will insure that the person responsible for distribution will have sufficient copies of changes and amendments to effect appropriate distribution.

ADDITION TO SECTION 265.50

CONTINGENCY PLAN AND EMERGENCY PROCEDURES

FOR HAZARDOUS WASTE

The designated emergency coordinator is Robert F. Maraman.

The alternate emergency coordinators are

1. Sonny Keen
2. B.J. Gunn

PHONE NUMBERS

National Response Center (NRC)	800-424-8802
Fire Department	911 or 636-1121
Sheriff	636-1761
Office of Emergency Services (OES)	
County Coordinator	
County Judge	638-8026
Mayor	636-3411
Vicksburg Police Department	636-2511
Ambulance	911
Department of Health	636-4356
F. Ahlers	636-6786
R.F. Maraman	636-7711
G.D. Madsen	638-2847
S. Keen	636-0777
B.J. Gunn	636-5604
Corporate Offices (Memphis)	901-767-6851

EMERGENCY POLLUTANT HAZARDS INFORMATION

Chemical Transport Emergency Center	800-424-9300
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EPA Oil and Hazardous Materials Technical

Assistance Data Systems (OHMTADS)

214-767-2666

SPECIFIC DUTIES

1. Areas:

DNEP Waste, Hill Storage Tank, Holding Pond, South Plant, Calgon Carbon System, Solid Waste Storage Area.

2. Action: Minor Spills or Leaks

Notify R. Maraman, D. Madsen, S. Keen and the shift supervisor. Take immediate steps to contain and repair the leak. Initiate clean up measures.

3. Action: Major Spill, Fire or Explosion

Duties: Emergency Coordinator or Designee

(a) Whenever there is an imminent or actual emergency situation, the emergency coordinator (or his designee when the emergency coordinator is on call) must immediately:

(1) Activate internal facility alarms or communications, to notify all facility personnel: and

(2) Notify appropriate State or local agencies with designated response roles if their help is needed.

(b) Whenever there is a release, fire, or explosion, the emergency coordinator must immediately identify the character, exact source, amount and a real extent of any released materials. He may do this by observation or review of facility records or manifests and, if necessary, by chemical analysis.

(c) Concurrently, the emergency coordinator must assess possible hazards to human health or the environment that may result from the release, fire or explosion. This assessment must consider both direct and indirect effects of the release, fire or explosion (e.g., the effects of any toxic, irritating or asphyxiating gases that are generated, or the effects of any hazardous surface water run-offs from water or chemical agents used to control fire and heat-induced explosions).

(d) If the emergency coordinator determines that the facility has had a release, fire or explosion which could threaten human health or the environment, outside the facility, he must report his findings as follows:

(1) If his assessment indicates that evacuation of local areas may be advisable, he must immediately notify appropriate local authorities. He must be available to help appropriate officials decide whether local areas should be evacuated: and

(2) He must immediately notify either the government official designated for that geographical area (in the applicable regional contingency plan under Part 1510 of this Title), or the National Response Center (using their 24-hour toll free number 800/424-8802). The report must include:

- (i) Name and telephone number of reporter.
- (ii) Name and address of facility.
- (iii) Time and type of incident (e.g., release, fire).
- (iv) Name and quantity of material(s) involved, to the extent known.
- (v) The extent of injuries, if any; and
- (vi) The possible hazards to human health, or the environment outside the facility.

(e) During an emergency, the emergency coordinator must take all reasonable measures necessary to ensure that fires, explosions and releases do not occur, recur or spread to other hazardous waste at the facility. These measures must include, where applicable, stopping processes and operations, collecting and containing released waste, and removing or isolating containers.

(f) If the facility stops operations in response to a fire, explosion or release, the emergency coordinator must monitor for leaks, pressure build-up, gas generation, or ruptures in valves, pipes or other equipment wherever this is appropriate.

(g) Immediately after an emergency, the emergency coordinator must provide for treating, storing or disposing of recovered waste, contaminated soil or surface water, or any other material that results from a release, fire or explosion at the facility.

COMMENT: Unless the owner or operator can demonstrate, in accordance with P 261.3 (c) or (d) of this Chapter, that the recovered material is not a hazardous waste, the owner or operator becomes a generator or hazardous waste and must manage it in accordance with all applicable requirements of Parts 262, 263 and 265 of this Chapter.

(h) The emergency coordinator must ensure that, in the affected area(s) of the facility:

- (1) No waste that may be incompatible with the released material is treated, stored or disposed of until cleanup procedures are completed; and
- (2) All emergency equipment listed in the contingency plan is cleaned and fit for its intended use before operations are resumed.

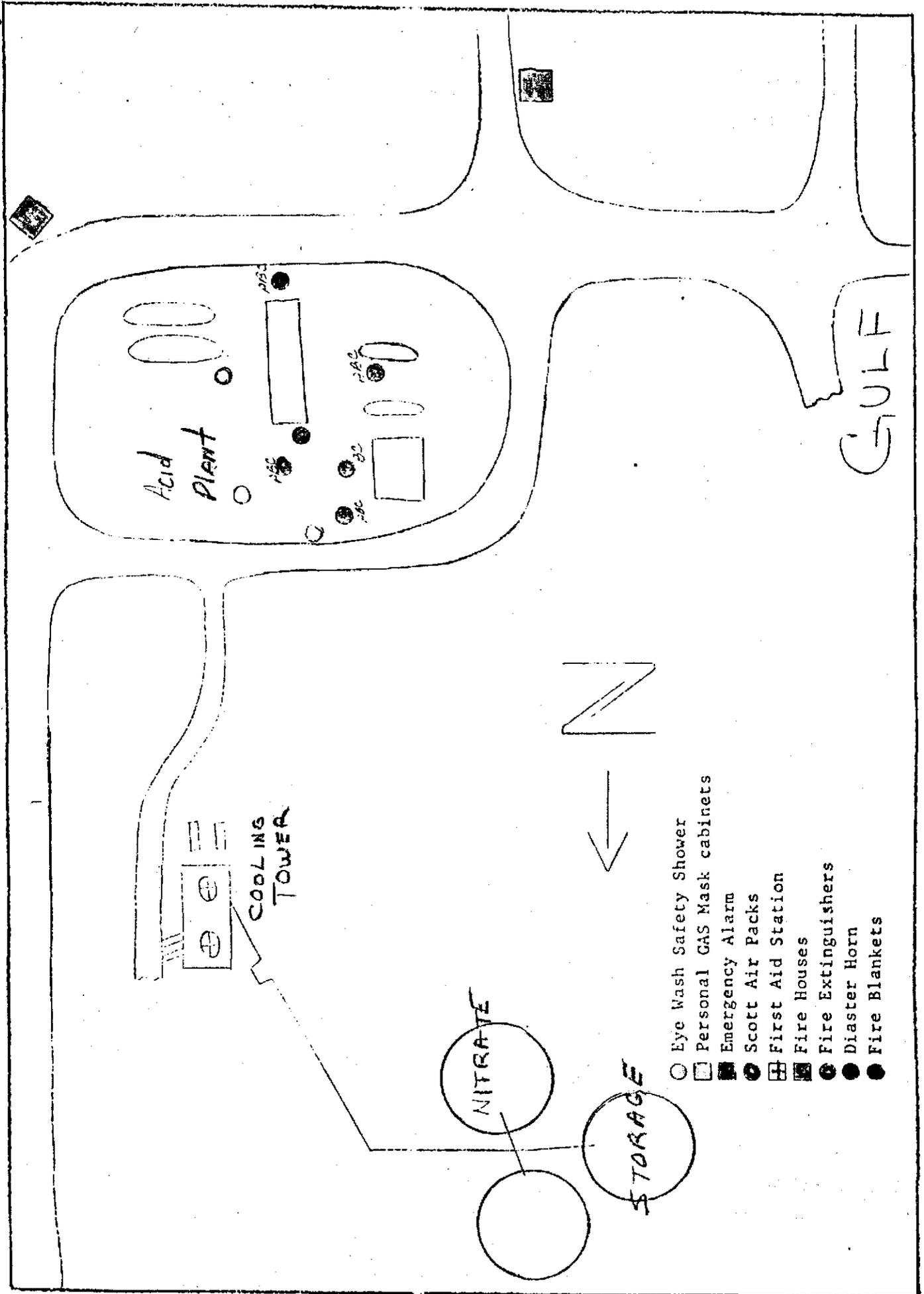
Duties: Owner or Operator

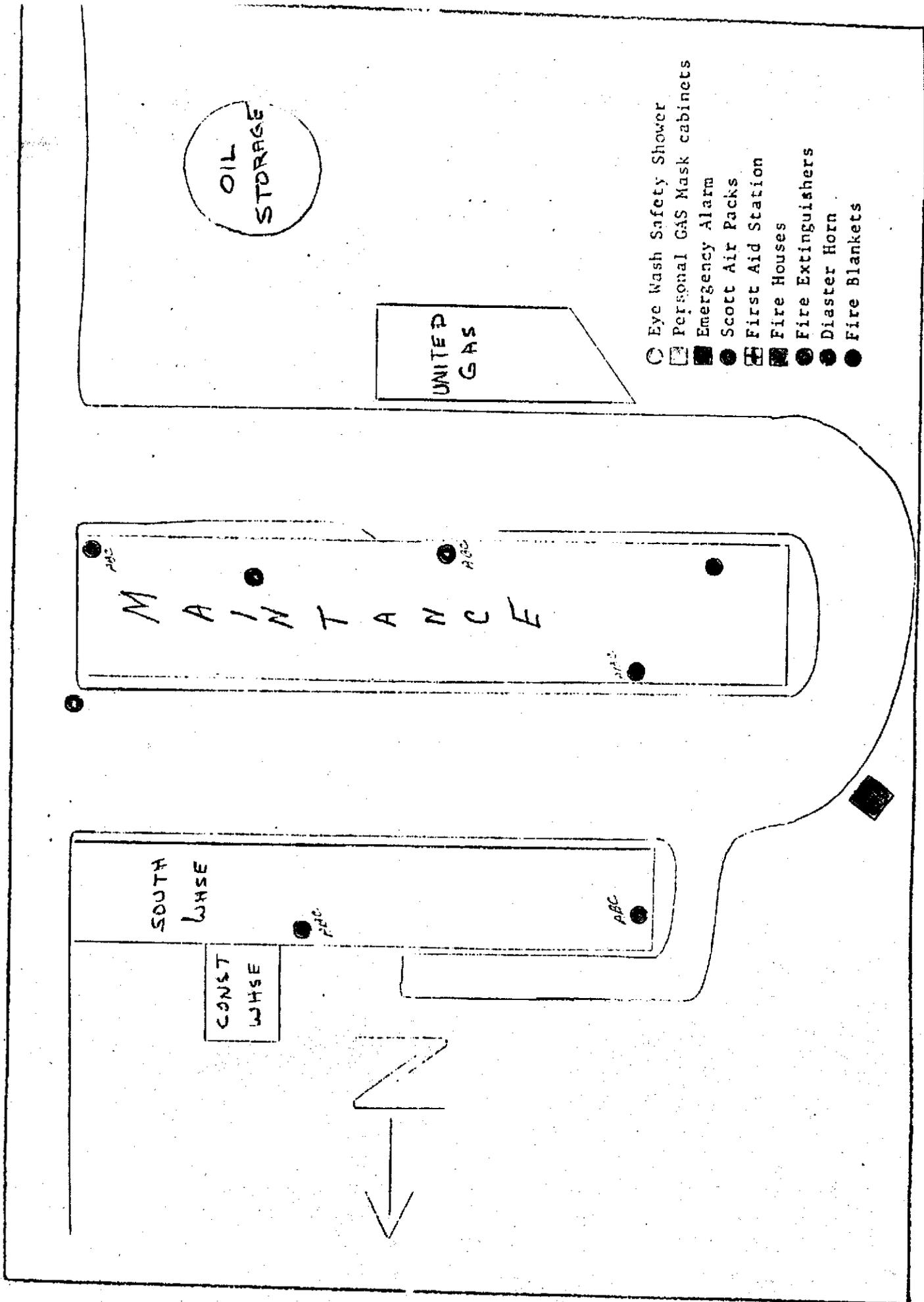
(i) The owner or operator must notify the Regional Administrator and appropriate State and local authorities, that the facility is in compliance with paragraph (h) of this Section before operations are resumed in the affected area(s) of the facility.

(j) The owner or operator must note in the operating record the time, date and details of any incident that requires implementing the contingency plan. Within 15 days after the incident, he must submit a written report on the incident to the Regional Administrator. The report must include:

- (1) Name, address and telephone number of the owner or operator.
- (2) Name, address and telephone number of the facility.
- (3) Date, time and type of incident (e.g., fire, explosion).
- (4) Name and quantity of material(s) involved.
- (5) The extent of injuries, if any.
- (6) An assessment of actual or potential hazards to human health or the environment, where this applicable: and
- (7) Estimated quantity and disposition of recovered material that resulted from the incident.

LOCATION OF EMERGENCY EQUIPMENT





- Eye Wash Safety Shower
- Personal GAS Mask cabinets
- Emergency Alarm
- Scott Air Packs
- ⊕ First Aid Station
- ▣ Fire Houses
- Fire Extinguishers
- Diaster Horn
- Fire Blankets

OIL STORAGE

UNITED GAS

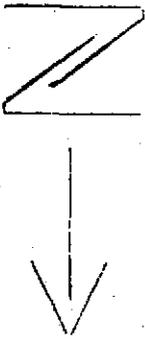
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SOUTH WHSE

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- Eye Wash Safety Shower
- Personal GAS Mask cabinets
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- Fire Extinguishers
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- Fire Blankets

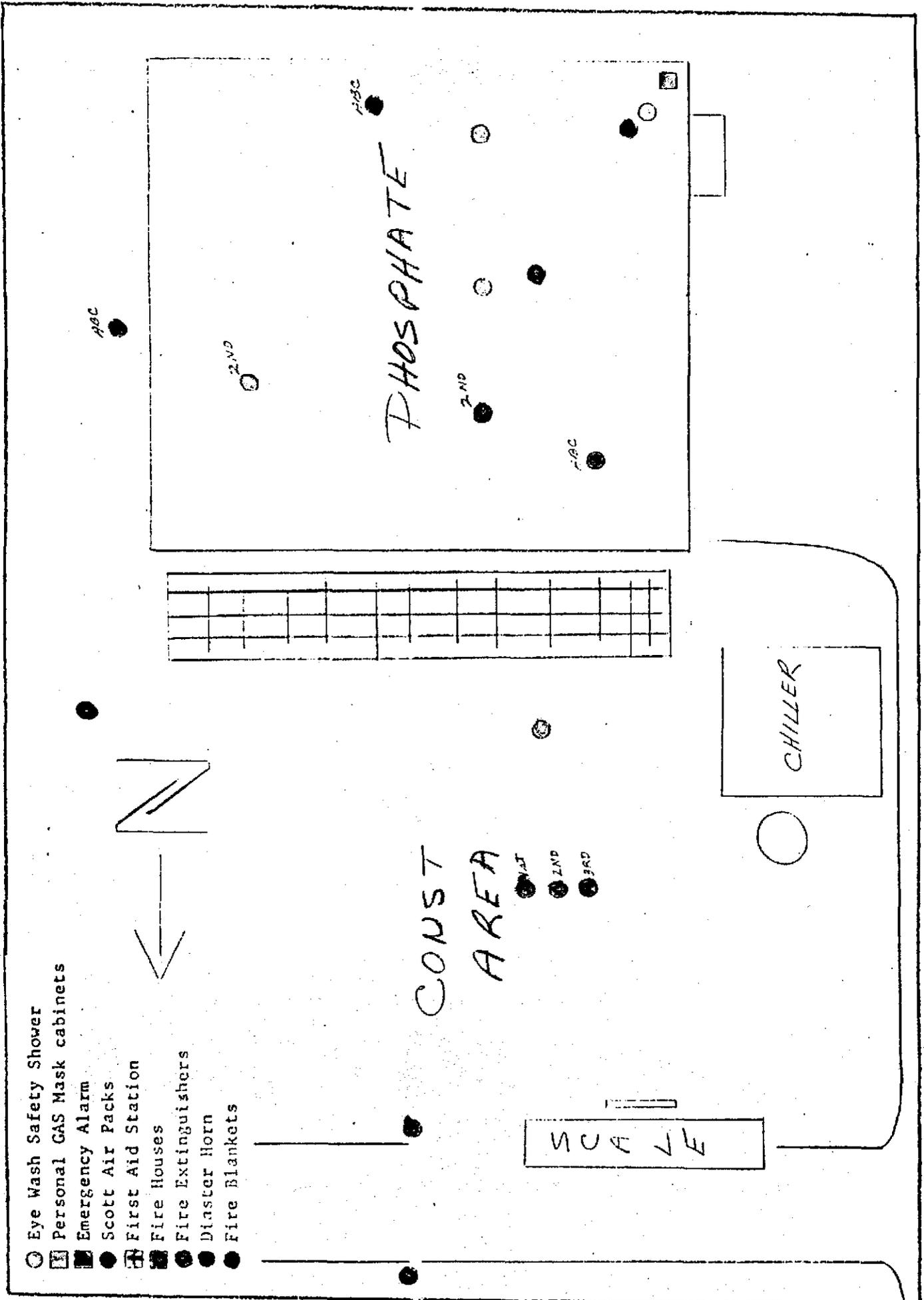
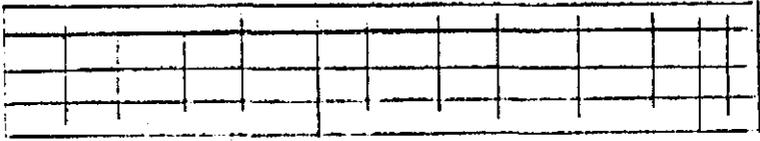
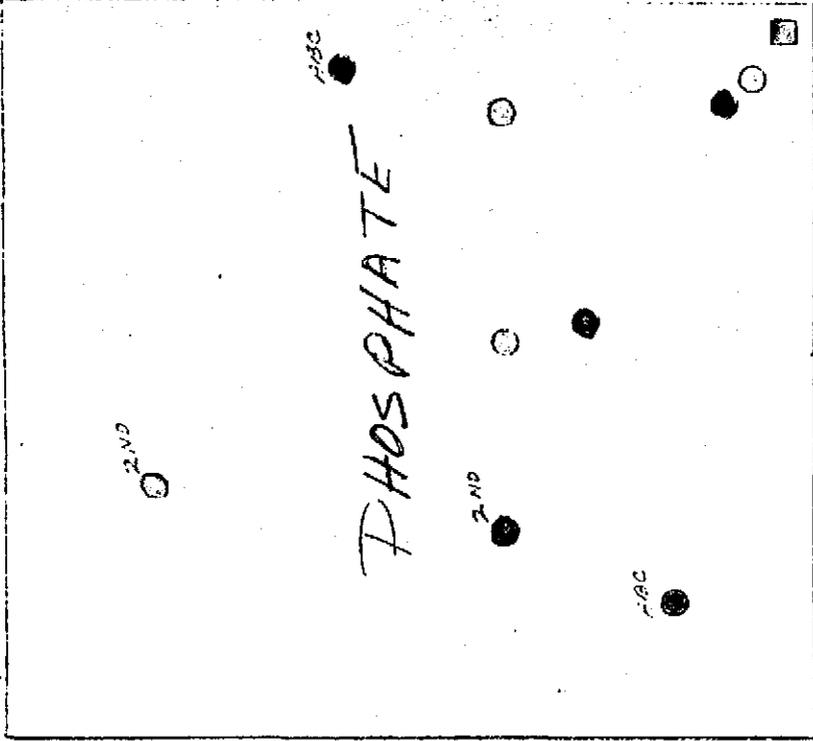


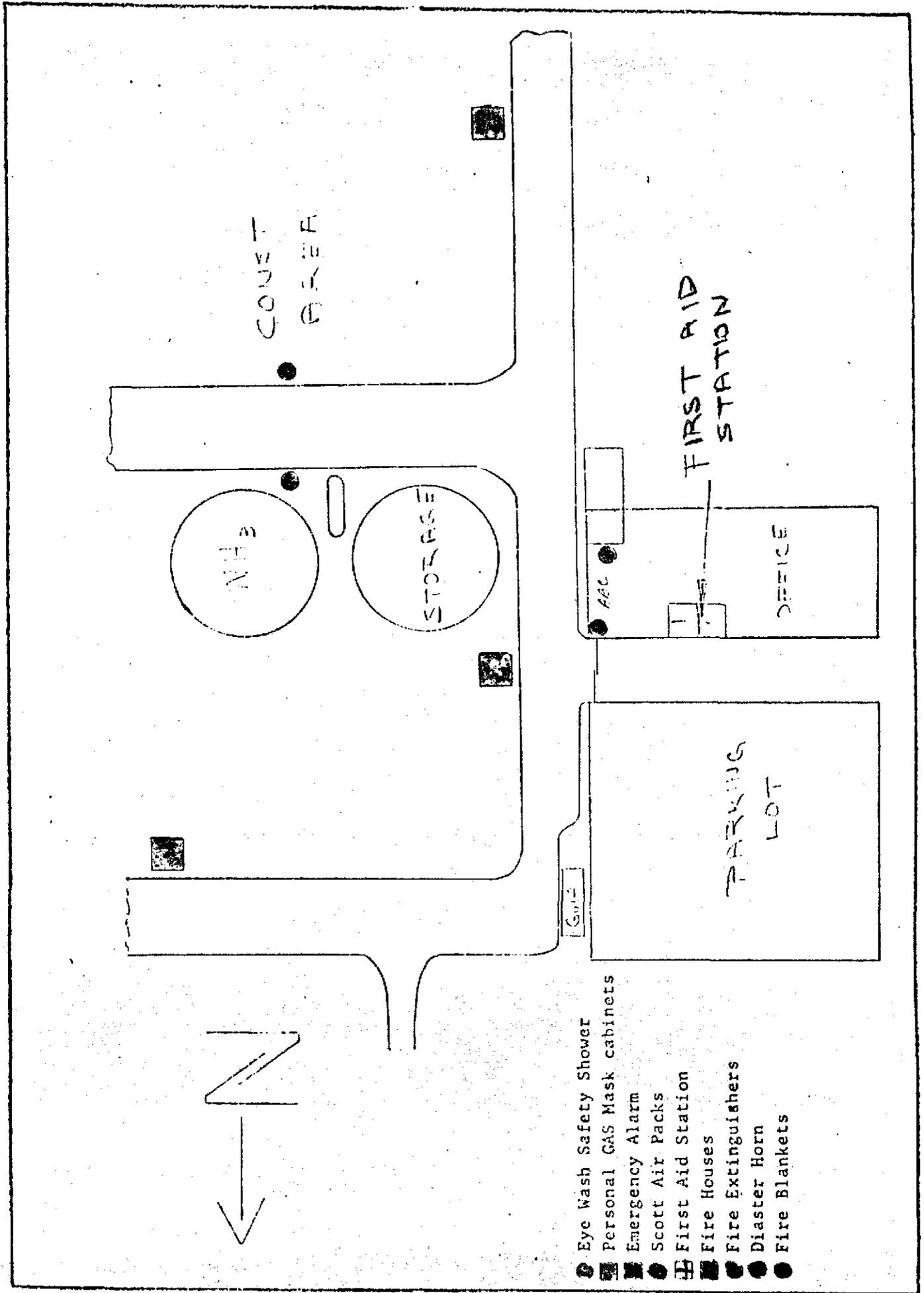
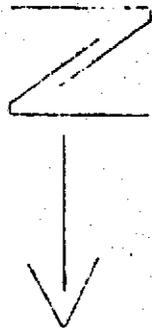
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- 2ND
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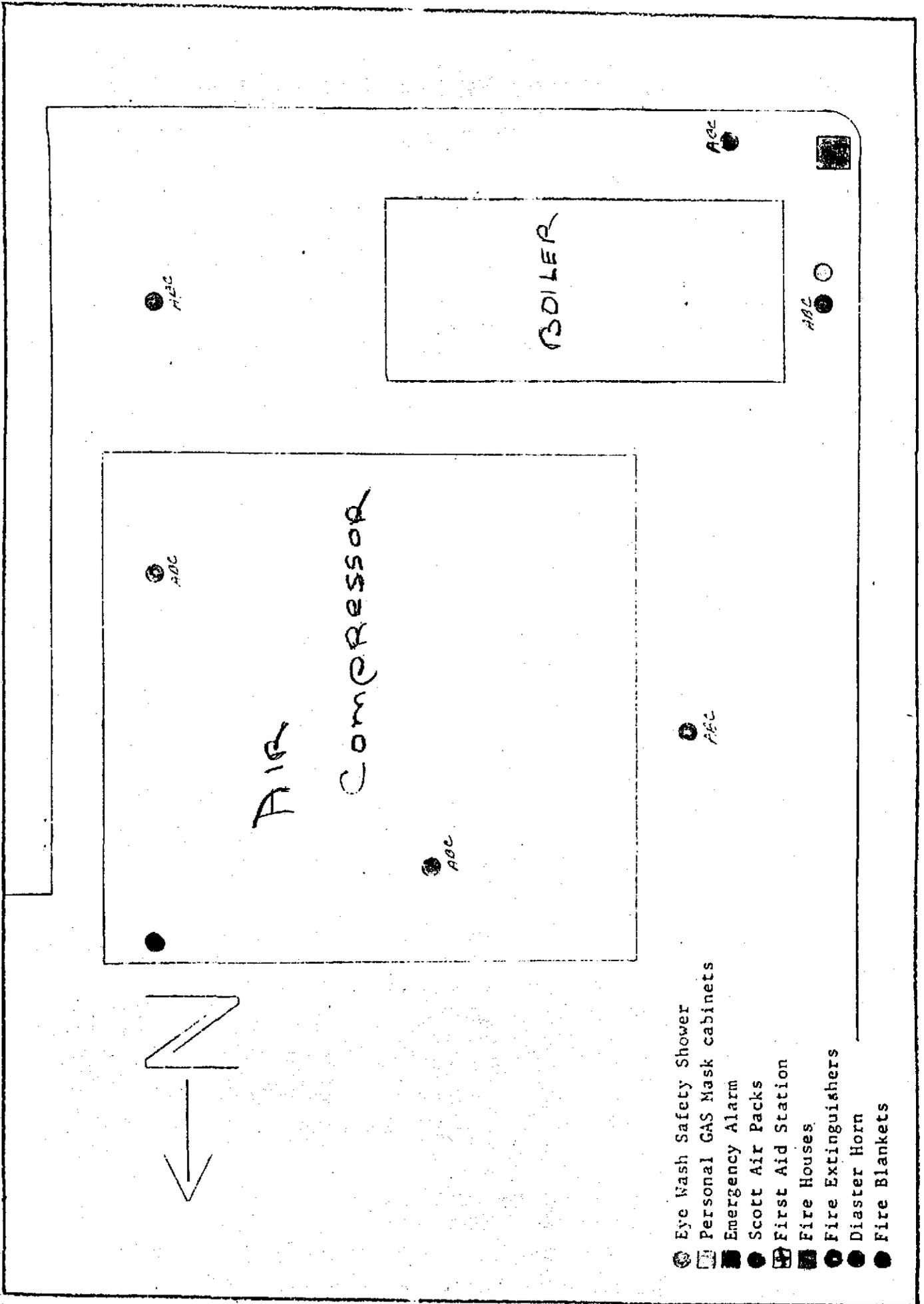
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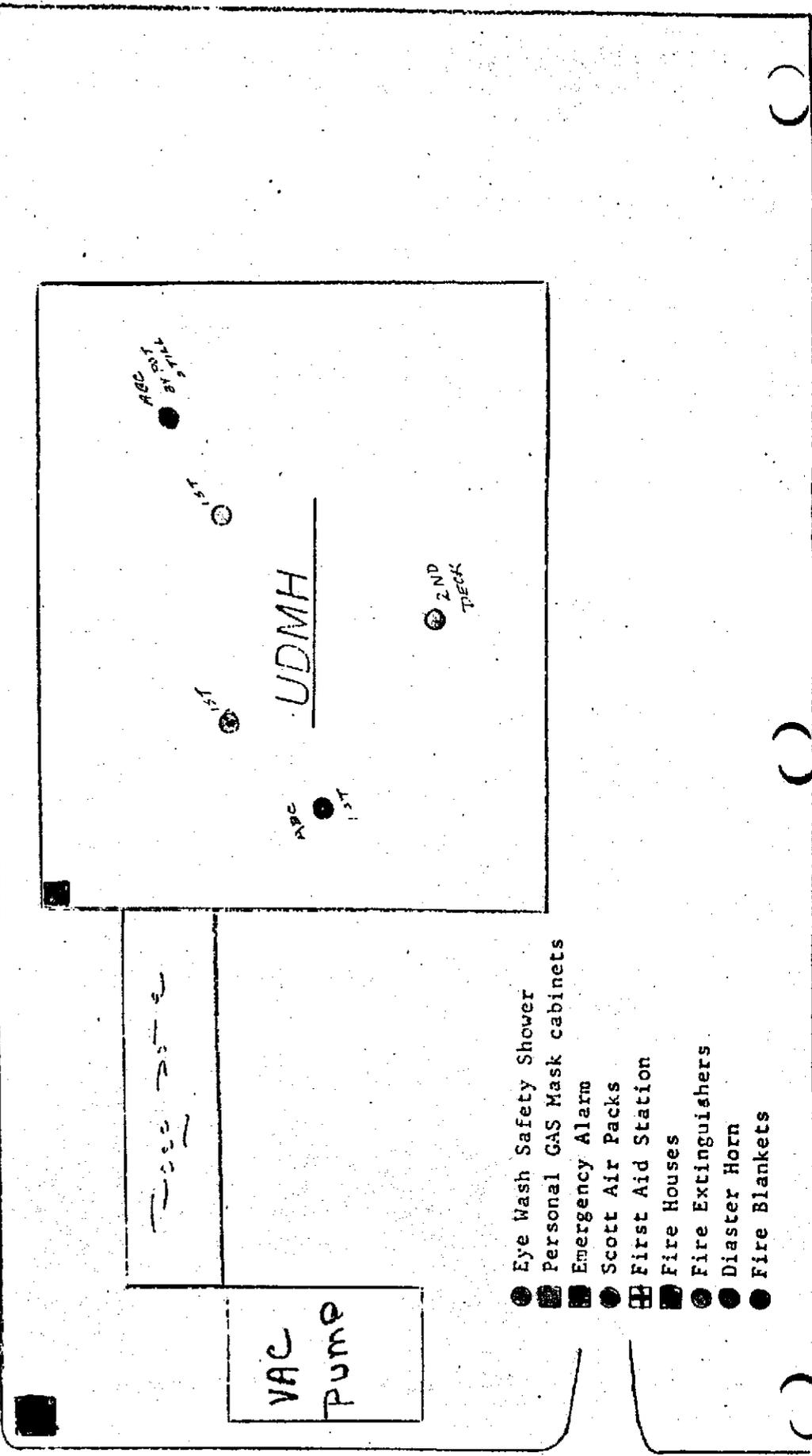




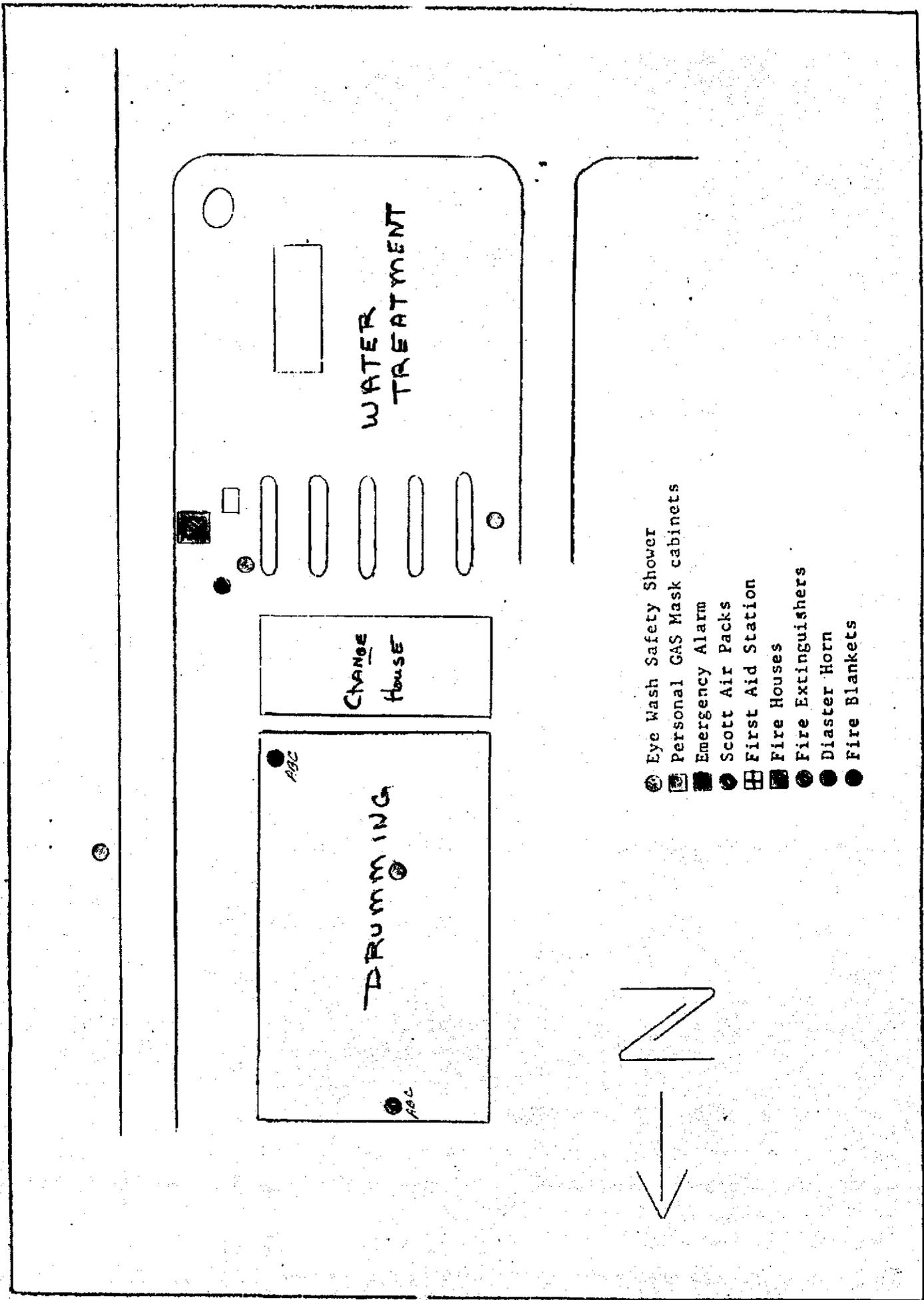
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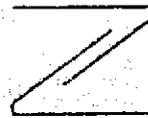




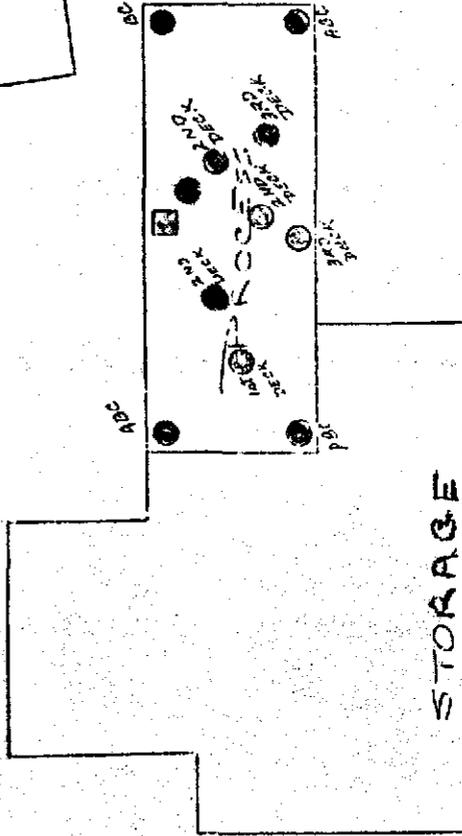
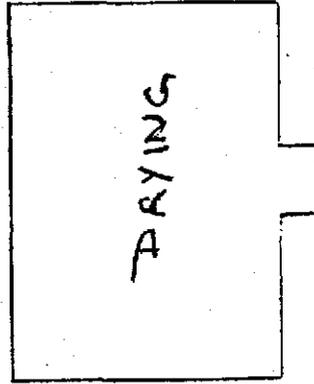
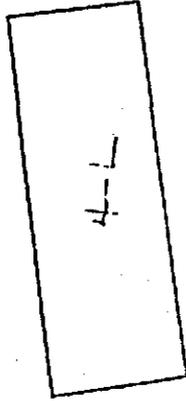
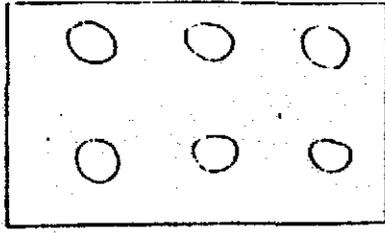
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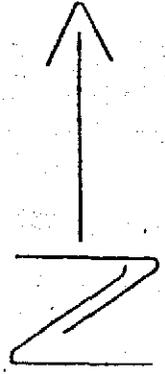
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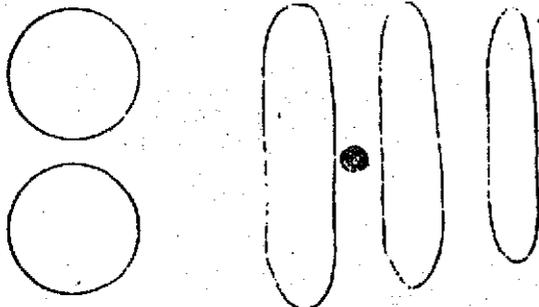
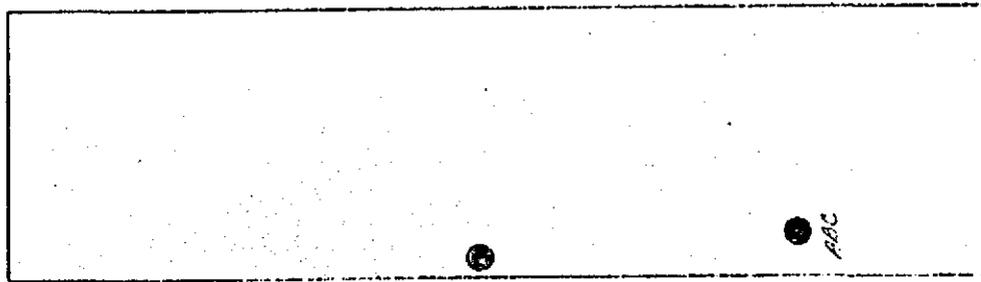
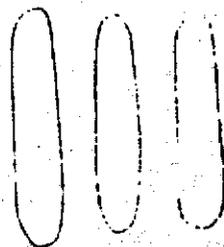
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Emergency  
Alarm



ATRAZINE



AGC

- Eye Wash Safety Shower
- Personal GAS Mask cabinets
- Emergency Alarm
- Scott Air Packs
- First Aid Station
- Fire Houses
- Fire Extinguishers
- Diaster Horn
- Fire Blankets

TAK  
LOADOUT

NITROGEN  
SOLUTION  
AREA

CHEMICAL TOXICOLOGY AND EMERGENCY CONTROL PLAN FOR VERTAC CHEMICAL CORPORATION

The Vicksburg Fire Department has been issued a copy of the Chemical Toxicology and Emergency Control Plan for Vertac Chemical Corporation, Vicksburg Plant.

Signature: Dept. Chief Jensen

Signature: Deputy Holman

10-13-81

CHEMICAL TOXICOLOGY AND EMERGENCY CONTROL PLAN FOR VERTAC CHEMICAL CORPORATION

The Mercy Regional Medical Center Emergency Room has been issued a copy of the Chemical Toxicology and Emergency Control Plan for Vertac Chemical Corporation Vicksburg Plant.

Signature: Betty Tolson RN

Signature: Raymond Hollman  
10-13-81

CHEMICAL TOXICOLOGY AND EMERGENCY CONTROL PLAN FOR VERTAC CHEMICAL CORPORATION

The Vicksburg Hospital Emergency Room has been issued a copy of the Chemical Toxicology and Emergency Control Plan for Vertac Chemical Corporation, Vicksburg Plant.

Signature: C. King RN  
Signature: Kay Halderson  
10-13-81

CHEMICAL TOXICOLOGY AND EMERGENCY CONTROL PLAN FOR VERTAC CHEMICAL CORPORATION

The Vicksburg Police Department has been issued a copy of the Chemical Toxicology and Emergency Control Plan for Vertac Chemical Corporation, Vicksburg Plant.

Signature: Herman Redick

Signature: Royce Waldman

15-13-81

CHEMICAL TOXICOLOGY AND EMERGENCY CONTROL PLAN FOR VERTAC CHEMICAL CORPORATION

The Warren County Sheriff's Department has been issued a copy of the Chemical Toxicology and Emergency Control Plan for Vertac Chemical Corporation, Vicksburg Plant.

Signature: Larry Ashley

Signature: Raymond Williams

10-13-81

*1. summary*

40 CFR PART 265

(INTERIM STATUS STANDARDS REQUIRED FOR FACILITIES ENGAGED  
IN TREATMENT, STORAGE, OR DISPOSAL OF HAZARDOUS WASTES)

THE STANDARDS AND PLANS FOR COMPLIANCE

AS THEY APPLY TO THE VICKSBURG PLANT OF VERTAC CHEMICAL CORPORATION

I. SECTION 265.13 - GENERAL WASTE ANALYSIS

A. Requirement

A detailed chemical and physical analysis of a representative sample of all hazardous wastes to be treated, stored or disposed of must be obtained. A written waste analysis plan must be developed and implemented. The plan must be kept at the facility. The plan must detail sampling and analysis methods and frequencies.

B. The Plan

For wastes discharged to an NPDES permitted privately-owned treatment facility or discharged to an NPDES permitted publicly-owned treatment works, the plan is to sample and analyze as per standard in place practice or at six-month intervals, whichever is most frequent. The method of analysis is in each case the EPA method and/or that specified in "Standard Methods of Wastewater Analysis", or if not found in either of the above, by methods developed in-house by Vertac or that company for which custom chemical manufacture is in progress.

II. SECTION 265.14 - SECURITY

A. Requirement

Alternative security devices including surveillance, fencing or barriers and controlled access must be instituted to prevent unauthorized entry to the active portion of the hazardous waste facility by humans or livestock unless physical contact with the wastes by such humans or animals will not cause injury or disturb the operations of said facility.

A. The Plan

Fences or combinations of fences and natural or artificial barriers, in conjunction with controlled roadways, are used to control entry to the active portion of the hazardous

waste facility. Signs with the legend "Danger - Unauthorized Personnel Keep Out" are posted in sufficient numbers so as to be seen from any approach to this active portion.

### III. SECTION 265.15 - INSPECTIONS

#### A. Requirement

Inspections must be performed on a schedule sufficient to detect and correct problems which may cause a release of hazardous waste to the environment. Inspections and their results must be detailed in an inspection log which must be retained for a period of three years.

#### B. The Plan

1. Drums - Will be inspected weekly for leaks if the drums will be stored ninety (90) days or longer.
2. Tanks - Automatic shutdown systems, by-pass systems, and drainage systems will be inspected daily. Monitoring gauges and instruments will be inspected daily. The level will be inspected daily. The structural and functional integrity of the tank itself and surrounding dikes and/or other means of secondary containment will be inspected weekly.
3. Surface Impoundments - There will be a daily check that a minimum freeboard level of two feet exists and a weekly inspection for structural and functional integrity.

### IV. SECTION 265.16 - PERSONNEL TRAINING

#### A. Requirement

There must be a job title and written job description for each position related to hazardous waste management. The written description must describe the training required to function in the job and ensure ability to respond to Preparedness and Prevention Plans, and Contingency and Emergency Procedure Plans. Training must be completed by May 19, 1981. Records that document initial training and annual reviews must be maintained until site closure.

#### B. The Plan

Personnel are trained in classrooms and on the job in:

1. Procedures for Using Emergency and Monitoring Equipment
2. Operating Waste Feed Cut-Off Systems

3. Communications Systems

4. Response to Emergencies

Job descriptions are attached.

V. SECTION 265.30 - PREPAREDNESS AND PREVENTION

A. Requirement

Hazardous waste facilities must be maintained and operated to minimize the possibility of fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste. As appropriate for the type of wastes handled, facilities must make emergency response arrangements with local services such as fire, police and hospital.

B. The Plan

Telephones are available to summon help; portable fire extinguishers are available or water at adequate volume and pressure to supply water hose streams is available. The nature of our hazardous waste is such that emergency response plans or familiarization of local authorities with facts specific and exclusive to hazardous wastes is not necessary or desirable. There does exist instead coordination of information and emergency responses pursuant to the entire manufacturing facility, raw materials and products, as well as wastes. The potential hazardous waste emergencies at Vicksburg is not severe. Hazardous waste spills will flow to the effluent pond. The contents of the effluent pond is treated by carbon adsorption prior to discharge.

VI. SECTION 265.50 - CONTINGENCY PLAN AND EMERGENCY PROCEDURES

A. Requirement

Designate an employee as the "emergency coordinator" to be on the premises on or call at all times; designate alternatives and list them in the order in which they should be contacted. An emergency contingency plan must be prepared; copies of the plan must be maintained at the facility and submitted to all local service organizations which may be requested to respond.

B. The Plan

The designated emergency coordinator is Richard Randolph. A list of alternatives is attached. The duties of the emergency coordinator is to carry out requirements of 40 CFR Section 265.56, 45 Federal Register 33237; a copy is attached.

VII. SECTION 265.70 - MANIFEST SYSTEM, RECORDKEEPING AND REPORTING

A. Requirement

All hazardous waste treatment, storage and disposal facilities, including those which treat wastes generated on-site, must maintain an operating record at the facility which describes the quantity and quality of all hazardous wastes received, the location of each hazardous waste within the facility, the results of waste analyses, reports of all incidents requiring implementation of the contingency plan, records of all inspections, required monitoring, testing or analytical data, and all closure and post-closure cost estimates. In addition, all hazardous waste treatment, storage and disposal facilities must submit an annual report summarizing the above-cited information.

B. The Plan

Do as required.

VIII. SECTION 265.90 - GROUNDWATER MONITORING

A. Requirement

By November 19, 1981, those operating surface impoundments or active landfills as part of hazardous waste treatment storage or disposal facilities must install and operate an extensive groundwater monitoring system.

B. The Plan

Groundwater monitoring systems capable of determining the facility's impact on the quality of groundwater in the uppermost aquifer underlying the facility will be installed.

IX. SECTION 265.110 - CLOSURE AND POST-CLOSURE

A. Requirement

Each facility must have a written closure plan which identifies the steps necessary to completely close the facility at any point during its intended life and at the planned closure time. Each facility must also have a post-closure plan which provides for thirty (30) years of post-closure care.

B. The Plan

Upon closure, the contents of the hill storage tank and the effluent pond will be run through the carbon columns at a rate such that the effluent remains within NPDES permit limitations. Upon closure, all above-ground drums of hazardous waste are to be brought to a permitted landfill.

Upon closure, all surface impoundments are to be drained and filled with absorbent clays. After a period of drying, a clay cap is added to the top. Groundwater monitoring will be continued for a period of thirty (30) years.

X. SECTION 265.140 - FINANCIAL REQUIREMENTS

A. Requirement

Each facility must have a written estimate of both the cost of closing the facility at the point at which closure would be the most expensive and the annual cost of post-closure care. These estimates must be updated as necessary to keep them current with the closure and post-closure plans. In addition, both estimates must be updated annually to adjust for inflation.

B. The Plan

Drums will be disposed at an estimated cost of \$50 per drum (1981 costs). Surface impoundments will be closed at an estimated cost of \$3 per cubic yard of volume (1981 costs). Groundwater monitoring will be maintained at an estimated cost of \$500 per well, per year (1981 costs).

Hill tank water and effluent pond water will be treated at a cost of approximately \$0.13 per gallon (1981 costs).

RDK:ew

Attachments

RCRA SECTION 265.16

JOB DESCRIPTION

VICKSBURG PLANT

I. JOB TITLE

Effluent Operator - (4) - One per shift.

II. JOB DESCRIPTION

The effluent operators have the following duties that are related to hazardous wastes:

1. Operate the Calgon carbon adsorption units.
2. Monitor and control the pH of the outlet of the effluent pond.
3. Make observations and entries on the log sheet forms, including the following:
  - a. Week inspection of hazardous waste drums being stored. Note any leakers, report the problem and note when remedial action is taken.
  - b. Daily inspection of sampling equipment, metering equipment, tank levels and freeboard level of the effluent pond.
  - c. Weekly inspection of the hill tank and the Calgon unit tanks plus dikes for structural and functional integrity.

III. TRAINING

The effluent operators receive both on the job and classroom training. The most recent classroom training was coordinated by Calgon personnel. Specific training was conducted on:

1. Basic theory or absorption.
2. Optimization of operation by periodic sampling and analysis.
3. Loading and unloading of carbon.
4. Function and purpose of instrumentation and gauges.

Effluent operators receive the same safety training as chemical operators. As such, they are trained to use emergency equipment such as fire extinguishers.

RDK:ew



SUBSIDIARY OF MERCK & CO., INC.

ACTIVATED CARBON DIVISION CALGON CORPORATION 4800 WEST 34TH ST. SUITE B-8 HOUSTON, TEXAS 77092 (713) 682-1301

January 25, 1980

Mr. Earl Mahaffey  
Vertac Chemical Company  
P. O. Box 3  
Vicksburg, Mississippi 39180

Dear Earl:

I certainly appreciate your accommodation of my need to revise the date of the upcoming operator/supervisor training session. As we discussed, Joe Allen and I will plan to be in your plant on Tuesday, February 19 to conduct training sessions at 8:00 AM and 2:30 PM.

Very truly yours,

*Rob*

Robert L. Bright, P.E.  
Customer Services

RLB/ljh

cc: Mr. George Foehringer, Director of Operations  
Mr. F. L. Ahlers, Plant Manager

APPROXIMATE LOCATION OF WARNING SIGNS

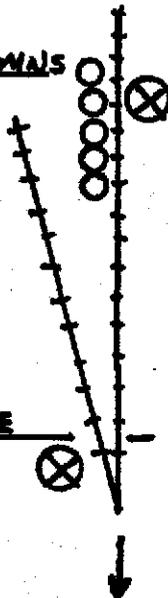
↑  
APPX NORTH

ICRR & VERTAC FENCE



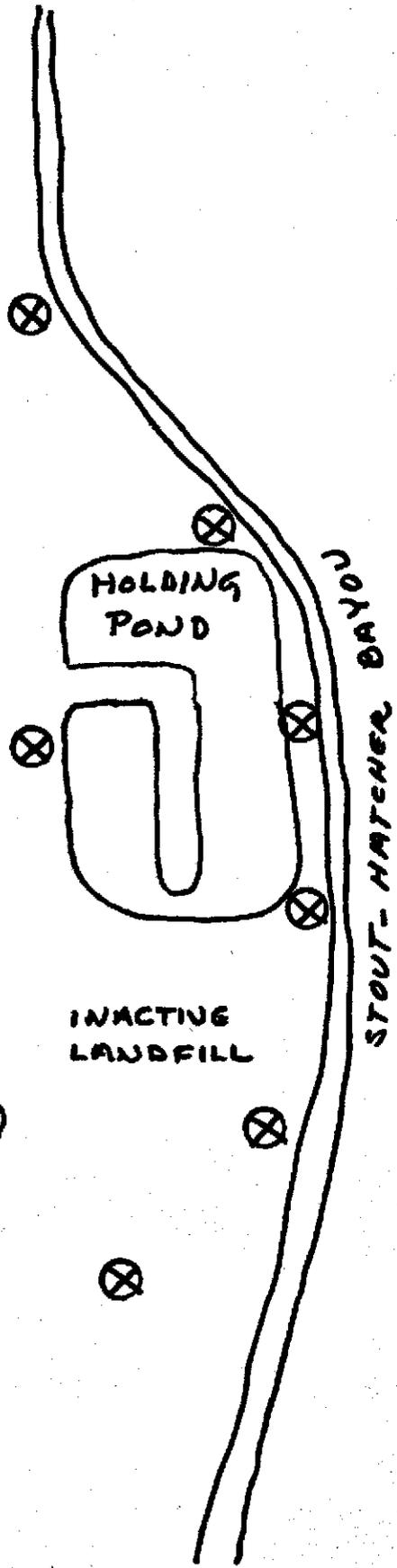
GATE

ALGON CARBON COLUMNS



GATE

⊗ = WARNING SIGNAL



HOLDING POND

INACTIVE LANDFILL

STOUT-HATCHER BAY

ADMENDMENT TO SECTION 265.13

GENERAL WASTE ANALYSIS

METHODS OF SAMPLING:

The waste water in the holding pond is sampled after passing through activated carbon beds. Automatic samplers collect 24 hour composite samples of the flow from the carbon beds, and the combined North and South flow to the Mississippi River.

The sampling frequency is twice per week.

The D.N.B.P. waste water is stored in a holding tank and the D.N.B.P. and some C.O.D. and B.O.D. are removed by passing it through activated carbon as it is fed into the holding pond.

The sample is a grab sample taken at the carbon bed exit flow.

The standard frequency is twice a year. Vertac does not limit itself to this frequency and does perform additional analyses, copies of which are on file in the environmental workbooks.

ANALYTICAL METHODS:

The following methods are currently used:

<u>Analysis</u>	<u>Method</u>
C.O.D.	Std. Methods, #508
B.O.D.	Std. Methods, #507, and 422F
Toxaphene	E.P.A. Methods, Fed. Reg. <u>38</u> NO 75 Pt. II
DNBP	In House Chromatographic and Colorimetric Methods, As Applicable

ATTACHED:

Typical analysis of D.N.B.P. Stored Waste.

Typical Analysis of Impounded Waste after activated Carbon Treatment.

Typical Hazardous Waste Inspection Sheets (Drums, Hill Tank (D.N.B.P. Waste) and Waste Pond (Impoundment)).



## INTERNAL CORRESPONDENCE

DATE: June 16, 1982

TO: Dave Madsen

FROM: R.F. Maraman

CC: See Distribution

SUBJECT: DNBW Waste, Di Sulfonated  
and Mono Sulfonated

<u>Component</u>	<u>7-31-81 Di Sulfonated Waste</u>	<u>5-12-82 Mono Sulfonated Waste</u>	<u>% Change</u>
pH	8.8	9.2	-
C.O.D.	1.344	1.453	+8%
Lbs/Gal	9.39	9.1	-3%
Total NH <sub>3</sub> Nitrogen	5.6	3.0	-46%
Total Nitrate Nitrogen	0.5	0.5	-
Total Nitrogen	6.1	3.5	-43%
NH <sub>4</sub> NO <sub>3</sub>	2.9	2.4	-17%
SO <sub>4</sub> As (NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub>	24	11.1	-54%
D.N.B.P.	300	320	+7%
Sp. Gr	1.127	1.092	-

The above reflects the changes in D.N.B.P. waste since going to the mono sulfonated process. There are significant reductions in NH<sub>3</sub>-Nitrogen, total nitrogen and SO<sub>4</sub> as (NH<sub>4</sub>)<sub>2</sub> SO<sub>4</sub> concentrations.

RFM/tsd

cc: F. Ahlers  
S. Keen  
R. Maraman  
File

Day	MGD	GPM	#507 COD	#507+ 422F BOD	#207D TSS	VCC DNRP	Feu Reg 75 Tox
<1 3/18 - 3/19							<.006
			502	353	49.2	0	<.008
3/23 - 3/24 0800 - 0800	.92	640	65.4	46.0	6.4	0	<1
			400	153	230	0	.009
<1 3/24 - 3/25 0800 - 0800	.73	510	65.4	25.0	37.6	0	1.5
3/29 - 4/4							
4/5 - 4/11							
4/13 - 4/14 0800 - 0800	.34	235	763.9 270.9	ND	10.4	0	1.5
4/19 - 4/20 0800 - 0800	.74	515	585.5 91.5	20	Carbon 22.4	<0.1	<1
4/22 - 4/23 0800 - 0800	.71	496	190.5 32.0	8	S.H. 66.8	<0.1	<1
4/27 - 4/28 0800 - 0800	.25	175	125.0 59.5	31	S.H. 58.8	0	<1
4/29 - 4/30 0800 - 0800	.52	364	668.3 153.0	30	S.H. 116	0.1	<1
5/6 - 5/7 0800 - 0800	.55	382	636.7 138.9	18	6.4	0	<1
5/11 - 5/12 0800 - 0800	.21	149	132.8 74.3	12	20.0	<0.1	<1
5/19 - 5/20 0800 - 0800	.46	318	512.9 134.4	60 <sup>79</sup>	44.0	0	1
5/20 - 5/21 0800 - 0800	.25	175	348.6 166.0	43	8.8	<0.1	1.5
5/25 - 5/26 0800 - 0800	.22	155	115.3 62.0	ND	1.0	<0.1	1.0
5/27 - 5/28 0800 - 0800	.30	207	211.6 85.2	ND	0.2	0	2.0
6/1 - 6/2 0800 - 0800	.32	226	2939.8 1084	ND	12.8	ND	ND emulsified
6/3 - 6/4 0800 - 0800	.24	167	1501.0 749	ND	16.8	<0.1	1.5



ADDITION TO SECTION 265.90, GROUND-WATER MONITORING.

Ground water is currently monitored from four wells located as follows:

Well #1. West of Vertac holding pond.

Well #2. Approximately 1/8 mile South of Atrazine Plant.

Well #3. Across Hatcher Bayou, East of the South Plant.

Well #4. North of the  $\text{KNO}_3$  Plant and South of the Administration Building.

The ground water analyses are currently performed quarterly by the Environmental Laboratories, Inc., P.O. Drawer 2309, Gulfport, MS 39503.

Sample containers and insulated shippers are supplied quarterly by Environmental Labs Inc. The sample containers will arrive containing the proper preservations.

Vertac personnel sample each well after purging of at least three times the casing volume. The samples are stored in the refrigerator overnight and then packed in ice in the insulated shippers. The shipper is bussed to Gulfport.

Environmental Labs Inc. mails the analytical results to the Vicksburg Plant. The plant mails the original to the Environmental Manager and keeps a copy on file at Vicksburg.

Copies of the hydrogeological report and well locations are on file at the Vicksburg Plant.

GROUND WATER MONITORING

Typical Analytical Reports.

Location of Monitoring Wells.

Typical Chain of Custody Record.

# ENVIRONMENTAL LABORATORIES, Inc.

P.O. Drawer 2309 / Gulfport, Mississippi 39503 / (601) 863-3036

## GROUNDWATER MONITORING

**CLIENT** Vertac, Inc.  
Memphis, Tenn.  
**FACILITY** Vicksburg Plant  
**WELL I.D.** #1

**SAMPLE NO.** 4746-A  
**SAMPLE BY** Client  
**CLIENT NO.** RCRA22-001  
**DATE** April 15, 1982  
**UPSTREAM**   
**DOWNSTREAM**

### GROUP 1

#### Inorganics

Arsenic	0.0028	mg/l
Barium	0.103	mg/l
Cadmium	< 0.0001	mg/l
Chromium	0.61	mg/l
Flouride	0.42	mg/l
Lead	0.0241	mg/l
Mercury	< 0.0008	mg/l
Nitrate	0.18	mg/l
Selenium	0.0064	mg/l
Silver	0.00576	mg/l

#### Organics

Endrin	< 0.00016	mg/l
Lindane	0.001	mg/l
Methoxychlor	< 0.001	mg/l
Toxaphene	< 0.002	mg/l
2, 4-D	< 0.002	mg/l
2, 4, 5-TP Silvex	< 0.002	mg/l

#### Radiochemistry

Gross Alpha	< 2	+	_____	pCi/l
Gross Beta	6.2	+	3.0	pCi/l
Total Radium	< 2	-	_____	pCi/l

#### Others

Turbidity	5.0	NTU
Total Coliform	2	ct/100ml

### GROUP 2

Chloride	76.0	mg/l
Iron	0.30	mg/l
Manganese	0.73	mg/l
Sodium	92.3	mg/l
Sulfate	82.4	mg/l
Phenols	0.05	mg/l

# ENVIRONMENTAL LABORATORIES, Inc.

P.O. Drawer 2309 / Gulfport, Mississippi 39503 / (601) 863-3036

## GROUNDWATER MONITORING PAGE 2

WELL I.D.           #1          

UPSTREAM   
DOWNSTREAM

### GROUP 3

	1	2	3	4	
pH	7.14				S.U.
Specific Conductance	3350				umhos/cm
Total Organic Carbon	63.49				mg/l
Total Organic Halogen	0.195				mg/l

Copies:

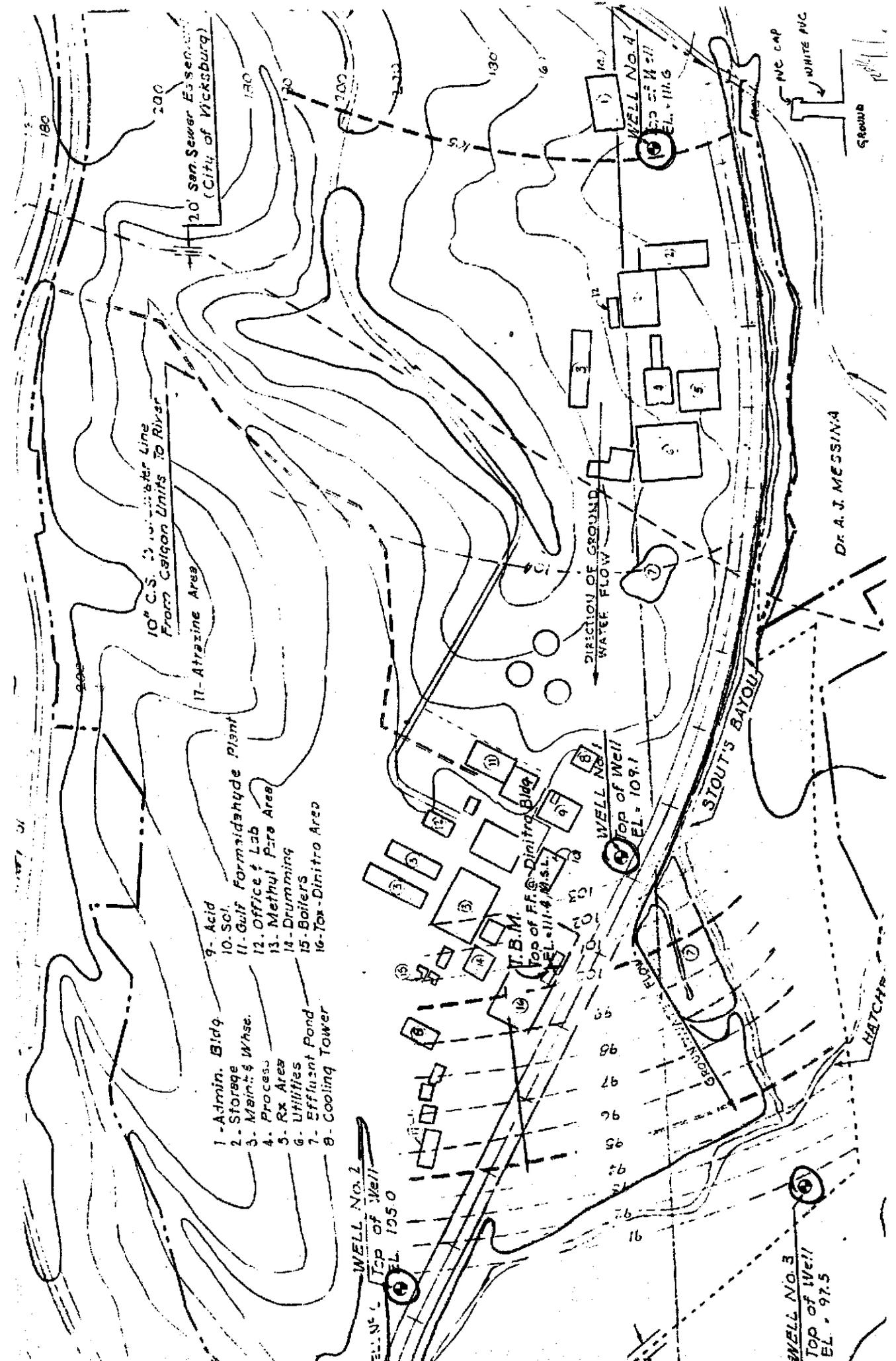
ENVIRONMENTAL LABORATORIES, INC.

Karen H. Brown

KAREN H. BROWN

Lab Director

Environmental Division



- 1 - Admin. Bldg.
- 2 - Storage
- 3 - Main. & Whse.
- 4 - Process
- 5 - Rx Area
- 6 - Utilties
- 7 - Effluent Pond
- 8 - Cooling Tower
- 9 - Acid
- 10 - Sol.
- 11 - Gulf Formisidshyde Plant
- 12 - Office & Lab
- 13 - Methyl Pare Area
- 14 - Drumming
- 15 - Boilers
- 16 - Tox-Dinitro Area

WELL No. 2  
Top of Well  
EL. 195.0

T.B.M.  
Top of F.F. @ Dinitro Bldg.  
EL. 111.4 M.S.L.

WELL No. 1  
Top of Well  
EL. 109.1

WELL No. 3  
Top of Well  
EL. 97.5

WELL No. 4  
Top of Well  
EL. 111.6

DR. A. J. MESSINA

Ground

M.C. CAP  
WHITE M.C.

180

190

200

190

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CHAIN OF CUSTODY RECORD

Field Section

Well #

1

Location of Sampling:

Beside the waste pond

Shipper's Name:

VERTAE Chemical

Shipper's Address:

Rifle Range Rd. Vicksburg, MS, 39090

Collector's Name:

David Green

Telephone #

601-636-1231

(Signature)

Date Sampled:

4-13-82

Time Sampled:

3:00 pm

Field Information:

Special Handling/Storage:

Sample stored in refrigerator overnight

Laboratory Section

Received by:

K Brown

Date:

4/15/82 @ 9:00 am

Analysis Required:

RCEA

Comments:

All samples cold - None broken

VERTAC CHEMICAL CORPORATION  
VICKSBURG FACILITY  
PART B PERMIT APPLICATION

E

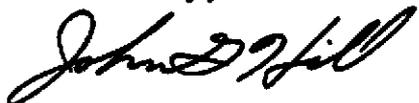
June 18, 1985

Mr. Charles Estes, P.E.  
Hazardous Waste Section  
Mississippi Department of Natural Resources  
Bureau of Pollution Control  
P.O. Box 10385  
Jackson, Mississippi 39209

Dear Mr. Estes:

Attached is the RCRA Part B Permit Application (3 copies) for the Vertac Vicksburg facility. Dick Karkkainen and/or I would be pleased to discuss any questions which arise during your review.

Sincerely,



John G. Hill  
Environmental Engineer

JGH:kjr

Attachment

VERTAC CHEMICAL CORPORATION  
RCRA PERMIT APPLICATION  
MSD 990 714 081

TABLE OF CONTENTS

<u>SECTION</u>	<u>TITLE</u>
i	Cover Letter, Table of Contents
ii	Regulatory Completeness Checklist & Cross Reference
A	Part A; General Information
B-1	Part B; General Description
B-2	Topographic Map
B-3	Floodplain Standard
B-4	Traffic Information
C	Waste Analysis Plan
D	Surface Impoundment Design
E-1	Groundwater Monitoring Data
E-2	Groundwater Monitoring Map
E-3	Groundwater Monitoring Program
F-1	Security Provisions
F-2	Inspection Program
F-3	Preventative Measures
G	Contingency Plan
H	Personnel Training Program
I-1	Closure/Post-Closure Plan
I-2	Cost Estimates and Financial Assurances
I-3	Liability Requirements
I-4	Certification

See Appendix C for  
Regulatory Completeness Checklist  
and Cross-Reference



Revised GENERAL INFORMATION Consolidated Permits Program Part A (Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER  
MSD99071408

II. POLLUTANT CHARACTERISTICS

I. EPA I.D. NUMBER

FACILITY NAME

FACILITY MAILING ADDRESS

FACILITY LOCATION

MSD990714081  
 Vertac Chemical Coporation  
 Vicksburg Facility  
 RIFLE RANGE RD  
 VICKSBURG, MS 39180

RIFLE RANGE RD  
 VICKSBURG, MS 39180

INSTRUCTIONS  
 Been provid  
 Review th  
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 (except VI  
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 authorizatio

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

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

III. NAME OF FACILITY  
 VERTAC CHEMICAL CORP. VICKSBURG, MS PLANT

IV. FACILITY CONTACT  
 A. NAME & TITLE (last, first, & title)  
 Maraman, Bob, Chief Chemist  
 B. PHONE (area code & no.)  
 601 636 1231

V. FACILITY MAILING ADDRESS  
 A. STREET OR P.O. BOX  
 P. O. BOX 3  
 B. CITY OR TOWN  
 VICKSBURG,  
 C. STATE  
 MS  
 D. ZIP CODE  
 39180

VI. FACILITY LOCATION  
 A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER  
 RIFLE RANGE ROAD  
 B. COUNTY NAME  
 WARREN

C. CITY OR TOWN  
 VICKSBURG  
 D. STATE  
 MS  
 E. ZIP CODE  
 39180  
 F. COUNTY CODE

A. FIRST 2, 8, 6, 5 (specify) Organics		B. SECOND 7, 2, 8, 1, 6 (specify) Inorganics	
C. THIRD		D. FOURTH	

**OPERATOR INFORMATION**

A. NAME  
**VERTAC CHEMICAL CORPORATION**

B. Is the name of the owner?  YES  NO

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box: if "Other", specify.)

F - FEDERAL    M - PUBLIC (other than federal or state)  
S - STATE      O - OTHER (specify)  
P - PRIVATE

P (specify)

D. PHONE (area code & no.)  
9 0 1 7 6 7 6 8

E. STREET OR P.O. BOX  
Suite 2414, 5100 POPLAR AVE.

F. CITY OR TOWN  
**MEMPHIS**

G. STATE  
**T.N.**

H. ZIP CODE  
**3, 8, 1, 3, 7**

IX. INDIAN LAND  
Is the facility located on Indian lands?  
 YES  NO

**EXISTING ENVIRONMENTAL PERMITS**

A. NPDES (Discharges to Surface Water)  
N M S 0 0 2 7 9 9 5

D. PSD (Air Emissions from Proposed Sources)  
9 P

B. UIC (Underground Injection of Fluids)  
U

E. OTHER (specify)  
2 7 8 0 - 0 0 0 4 1 (specify) Air Pollution Cont. Permit

C. RCRA (Hazardous Wastes)  
R M S D 9 9 0 7 1 4 0 8 1

E. OTHER (specify)

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

**XII. NATURE OF BUSINESS (provide a brief description)**

- PRODUCTION OF:
- (1) Pesticides (Dinitrobutyl-phenol and mono sodium methane arsenate)
  - (2) Potassium Nitrate, Chlorine, and Nitrogen Tetroxide

**XIII. CERTIFICATION (see instructions)**

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

A. NAME & OFFICIAL TITLE (type or print)  
Richard D. Karkkainen  
Director of Environment & Safety

B. SIGNATURE  
*Richard D. Karkkainen*

C. DATE SIGNED  
8/10/71

**COMMENTS FOR OFFICIAL USE ONLY**

FOR OFFICIAL USE ONLY

Table with columns: APPLICATION APPROVED, DATE RECEIVED (yr., mo., & day)

COMMENTS

I. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box A or B below (mark one box only) to indicate whether this is the first application you are submitting for your facility...

A. FIRST APPLICATION (place an "X" below and provide the appropriate date)
1. EXISTING FACILITY (See instructions for definition of "existing" facility. Complete item below.)
2. NEW FACILITY (Complete item below for new facilities.)

D. REVISED APPLICATION (place an "X" below and complete item 1 above)
1. FACILITY HAS INTERIM STATUS
2. FACILITY HAS A RCRA PERMIT

III. PROCESSES - CODES AND DESIGN CAPACITIES

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

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

Table with columns: PROCESS, PROCESS CODE, APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY, PROCESS, PROCESS CODE, APPROPRIATE MEASURE FOR DESIGN CAPACITY. Includes categories: Storage, Disposal, Treatment.

Table with columns: UNIT OF MEASURE, UNIT OF MEASURE CODE, UNIT OF MEASURE, UNIT OF MEASURE CODE, UNIT OF MEASURE. Lists units like GALLONS, LITERS, CUBIC YARDS, etc.

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

Main data table with columns: LINE NUMBER, A. PROCESS CODE, B. PROCESS DESIGN CAPACITY (1. AMOUNT, 2. UNIT OF MEASURE), FOR OFFICIAL USE ONLY, LINE NUMBER, A. PROCESS CODE, B. PROCESS DESIGN CAPACITY (1. AMOUNT, 2. UNIT OF MEASURE). Includes example rows X-1, X-2 and lines 1-4.

T04 - Treatment of wastewater using activated carbon. The activated carbon system consists of 5 beds of carbon, each bed is 20,000 gallons. Use of T04 needs some explanation: Water from the dinitrobutyl phenol process is acidic. At times that acidic water is pumped to S02 (30,000 gallons) from whence it is transported to off-site disposal by deep well injection; at that point it has an EPA hazardous waste number D002. At times the acidic water is neutralized with ammonia thus creating by product (NH<sub>4</sub>)<sub>2</sub> SO<sub>4</sub>, a weak fertilizer solution. The weak fertilizer solution is pumped to S02 (1,600,000 gallons) from whence it can be used for commercial purposes; however, most, perhaps all, is pumped through 2 beds of T04 (25,000 gallons per day) into S04 (3,000,000 gallons). S04 (3,000,000 gallons) also contains plant area rainwater run-off, spills and leaks, etc.; its EPA hazardous waste number is P020 and P123. Contents of S04 (3,000,000 gallons) are pumped through 2 beds of T04 (1,200,000 gallons per day) and is then discharged as an NPDES point discharge.

**IV. DESCRIPTION OF HAZARDOUS WASTES**

- A. EPA HAZARDOUS WASTE NUMBER** - Enter the four-digit number from 40 CFR, Subpart D for each listed hazardous waste you will handle. For non-listed hazardous wastes, enter the four-digit number(s) from 40 CFR, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.
- B. ESTIMATED ANNUAL QUANTITY** - For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non-listed waste(s) that will be handled which possess that characteristic or contaminant.
- C. UNIT OF MEASURE** - For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

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

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

**D. PROCESSES**

- 1. PROCESS CODES:** For listed hazardous waste: For each listed hazardous waste entered in column A select the code(s) from the list of process codes contained in Item III to indicate how the waste will be stored, treated, and/or disposed of at the facility. For non-listed hazardous wastes: For each characteristic or toxic contaminant entered in column A, select the code(s) from the list of process codes contained in Item III to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed hazardous wastes that possess that characteristic or toxic contaminant. Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "00" in the extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code(s).
- 2. PROCESS DESCRIPTION:** If a code is not listed for a process that will be used, describe the process in the space provided on the form.

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

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

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

LINE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES	
				1. PROCESS CODES (enter)	2. PROCESS DESCRIPTION (if a code is not entered in D(1))
X-1	K054	900	P	T03DS0	
	D002	400	P	T03DS0	
X-3	D001	100	P	T03DS0	
X-4	D002				included with above

IV. DESCRIPTION OF HAZARDOUS WASTES (continued)

U.	A. EPA HAZARD. WASTENO. (enter code)				B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	1. PROCESS CODES (enter)								2. PROCESS DESCRIPTION (if a code is not entered in D(1))	
	21	22	23	24			25	26	27	28	29	30				
1	D	0	0	2	21,000	T	S	0	2							injecti Off Site Disposal- Deep well
2	P	0	2	0												Included in above
3	P	0	2	0	1,524,000	T	S	0	2	S	0	4	T	0	4	
4	P	1	2	3												Included in above
5	K	0	3	1	3,650	T										Off site disposal-Hazard Waste Landfill (no on s treatment, storage or disposal)
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																
21																
22																
23																
24																
25																
26																

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

N	S	D	9	9	0	7	1	4	0	8	1	VIR	E
													6

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

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

**VII. FACILITY GEOGRAPHIC LOCATION**

LATITUDE (degrees, minutes, & seconds)						LONGITUDE (degrees, minutes, & seconds)					
3	2	1	8	00		90	05	31			
01	02	03	04	05	06	07	08	09	10	11	12

**VIII. FACILITY OWNER**

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

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

1. NAME OF FACILITY'S LEGAL OWNER				2. PHONE NO. (area code)			
3. STREET OR P.O. BOX				4. CITY OR TOWN		5. ST.	
6. ZIP CODE							

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

A. NAME (print or type)	B. SIGNATURE	C. DATE SIGNED
Richard D. Karkkainen		8-10-83

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

A. NAME (print or type)	B. SIGNATURE	C. DATE SIGNED



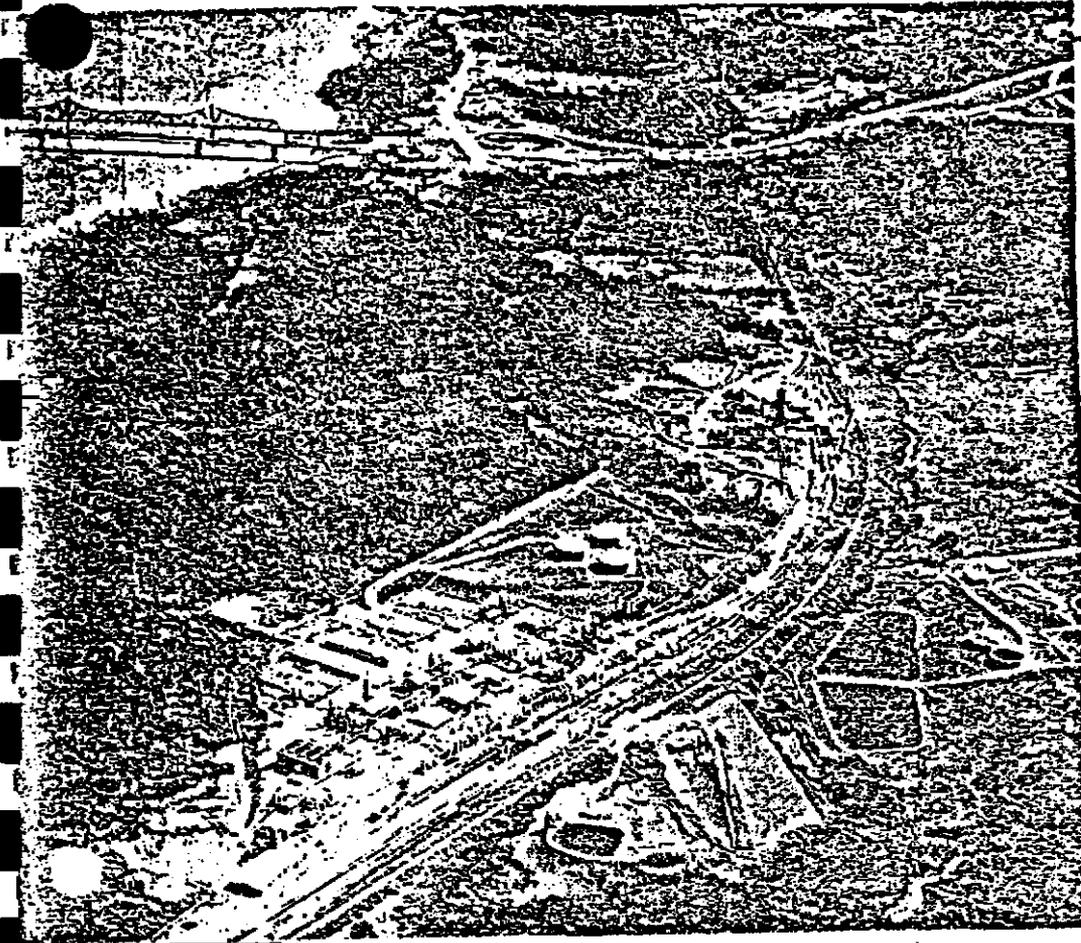


FORM 3

VERTAC CHEMICAL CORPORATION

24th Floor • 5100 Poplar • Memphis, TN 38137 • 901-767-6851

TECHNICAL  
DATA SHEET



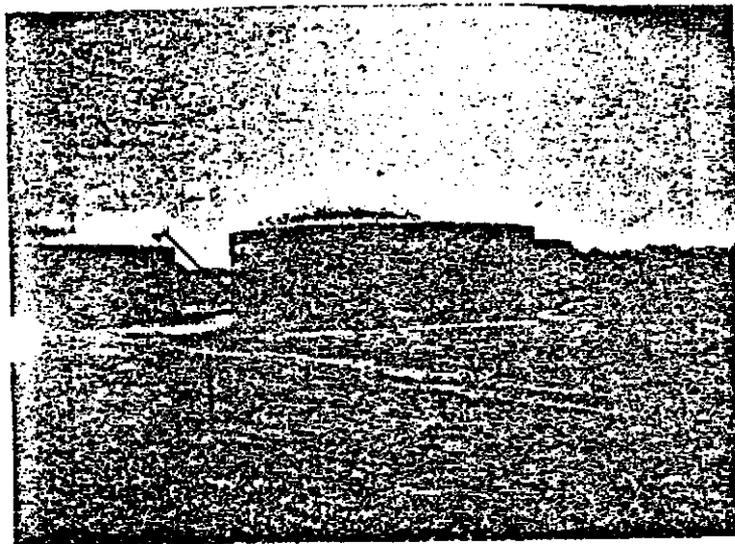
**Vicksburg, Mississippi**

Situated on a 600-acre site adjacent to the Mississippi River, the Vicksburg Plant products include nitric acid, potassium nitrate, nitrogen tetroxide, and numerous other agricultural chemicals, intermediates, and custom manufactured products.

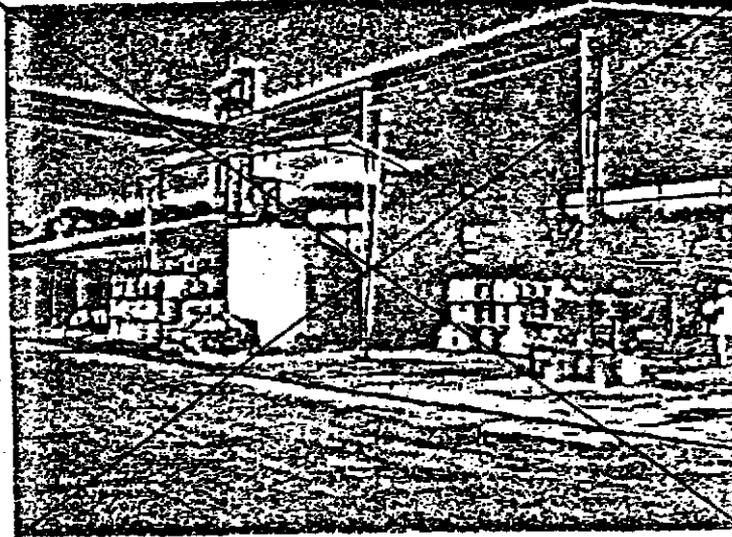
AERIAL  
PHOTOGRAPH



ACTIVATED CARBON WASTE  
TREATMENT SYSTEM 11.0.00



1,600,000 GAL WASTE WATER  
STORAGE TK. 11/2/83



DRUM STORAGE AREA 11/2/83

OMIT

rdk *[signature]* 8-10-83



3,000,000 GAL SURFACE  
IMPOUNDMENT AREA 11/2/83

Part B - Paragraph 122.25 "Contents"

This section provides a general description of the Vicksburg facility with emphasis on the hazardous waste management aspects of the facility. This description will provide the permit writer with an overview of the facility.

(a) (1) General Description

The Vicksburg facility of Vertac Chemical Corporation is located in Warren County, Mississippi along the Mississippi River immediately on the south limits of the City of Vicksburg. The address is:

Vertac Chemical Corporation, Vicksburg Facility  
P. O. Box 3  
Rifle Range Road  
Vicksburg, Mississippi 39180

The facility is a manufacturer of chemicals. The plant site is divided physically and functionally into a "north plant" and a "south plant". The north plant is primarily a manufacturer of potassium nitrate and additionally manufactures by-products chlorine and nitrogen tetroxide. Hazardous wastes are not generated in the north plant. The south plant is primarily a manufacturer of pesticides, but additionally manufactures nitric acid, which is used entirely as a raw material in the north plant.

The south plant contains these manufacturing operations:

1. Atrazine
2. Toxaphene
3. Dinitrobutyl phenol (Dinoseb)
4. Monosodium methane arsonate

The Atrazine and Toxaphene plants are shut down and there is no reasonable anticipation that production of those products will resume. The dinitrobutyl phenol and monosodium methane arsonate plants are operational.

The monosodium methane arsonate plant generates listed RCRA waste K031, a by-product salt. The by-product salt cake is directly discharged into a "roll-off sludge container". When the container is full (2-4 days) it is transported by a hazardous waste transporter to a hazardous waste landfill. The plant is designed such that there is no effluent. Additionally all spills, etc. are retained and recycled to the process.

The dinitrobutyl phenol plant produces manufacturing process wastewater that is hazardous by virtue of characteristic (D002). The waste is pumped to 1 - 3 day storage and is transported by a hazardous waste transporter to off-site disposal by

Part B (cont'd)

hazardous waste deep well injection. Any D002 spills from the storage or loading area flow to the effluent collection system and to a 3 million gallon surface impoundment. At times the manufacturing process wastewater is neutralized with ammonia and pumped to a 1.6 million gallon storage tank. The water is not a hazardous waste at this time; it is pumped through activated carbon and discharged to the 3 million gallon surface impoundment. Spills and leaks from the process area or product storage area or water from clean up of such a spill fall within P020 of RCRA paragraph 261.33. Such spills flow to the 3 million gallon surface impoundment.

Soil within plant boundaries will additionally flow as sediment particles during rain. The sediment particles will settle within the 3 million gallon surface impoundment. It is possible that some of the soil may have been contaminated by operations in the past and be categorized by P020 (dinoseb) or P123 (toxaphene)

a(19) Topographic Map

The property of the Vicksburg facility of Vertac Chemical Corporation encompasses over 600 acres; therefore, one topographic map will not contain the detail required. In order to meet application requirements the following are attached.

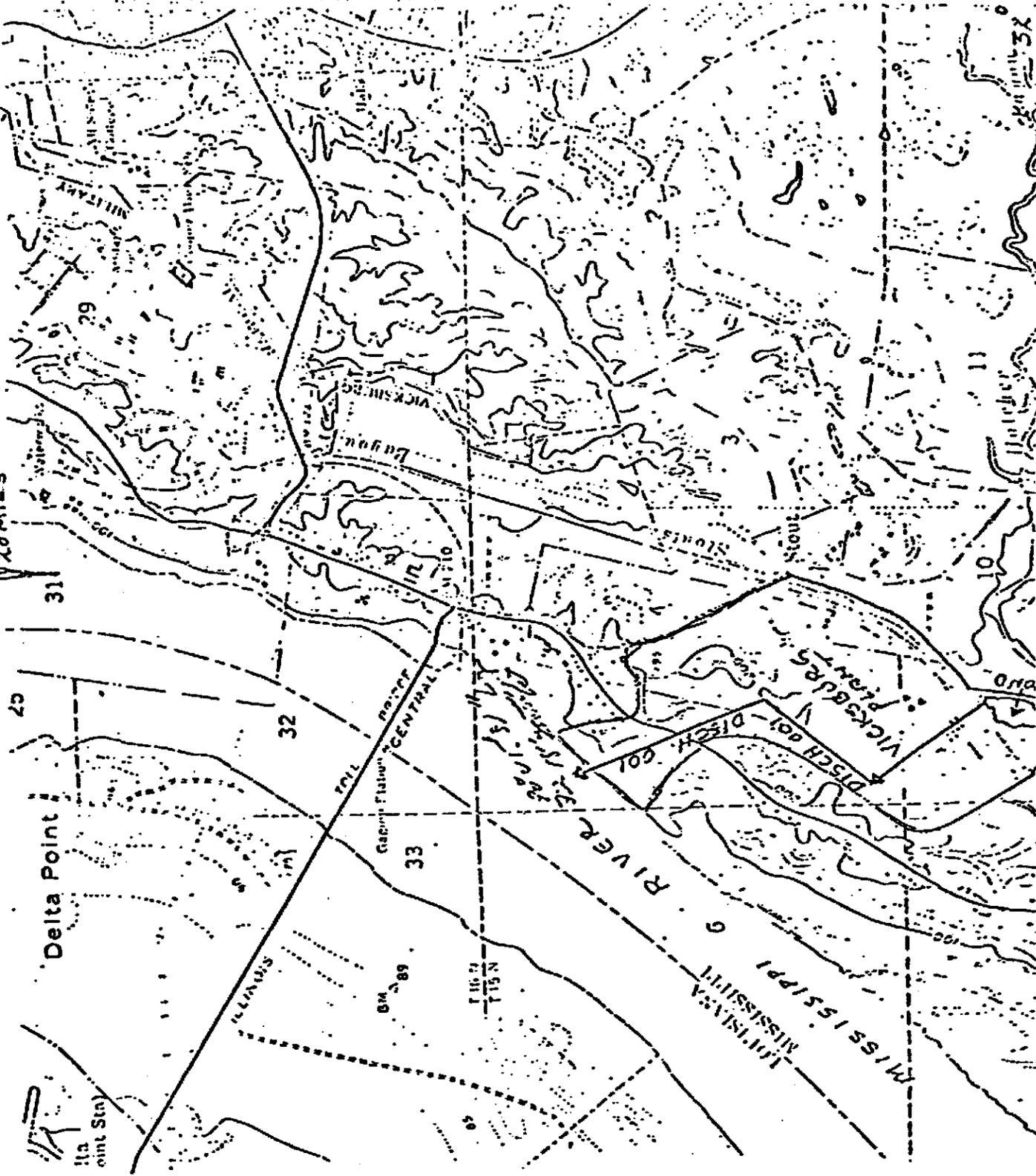
- Sketch a(19) I - City Map Vicksburg
- Sketch a(19) II - Topographic Map
- Sketch a(19) III - Topographic Map
- Sketch a(19) IV - 100 year Flood Plain Map
- Sketch a(19) V - Topography - Site Map
- Sketch a(19) VI - Topography - Surface Impoundment
- Sketch a(19) VII - Topography - Closed out Landfill
- Sketch a(19) VIII - Topography - Final Capping Plan  
Inactive Disposal Area



UTM GRID AND 1962 MAGNETIC NORTH  
DECLINATION AT CENTER OF SHEET

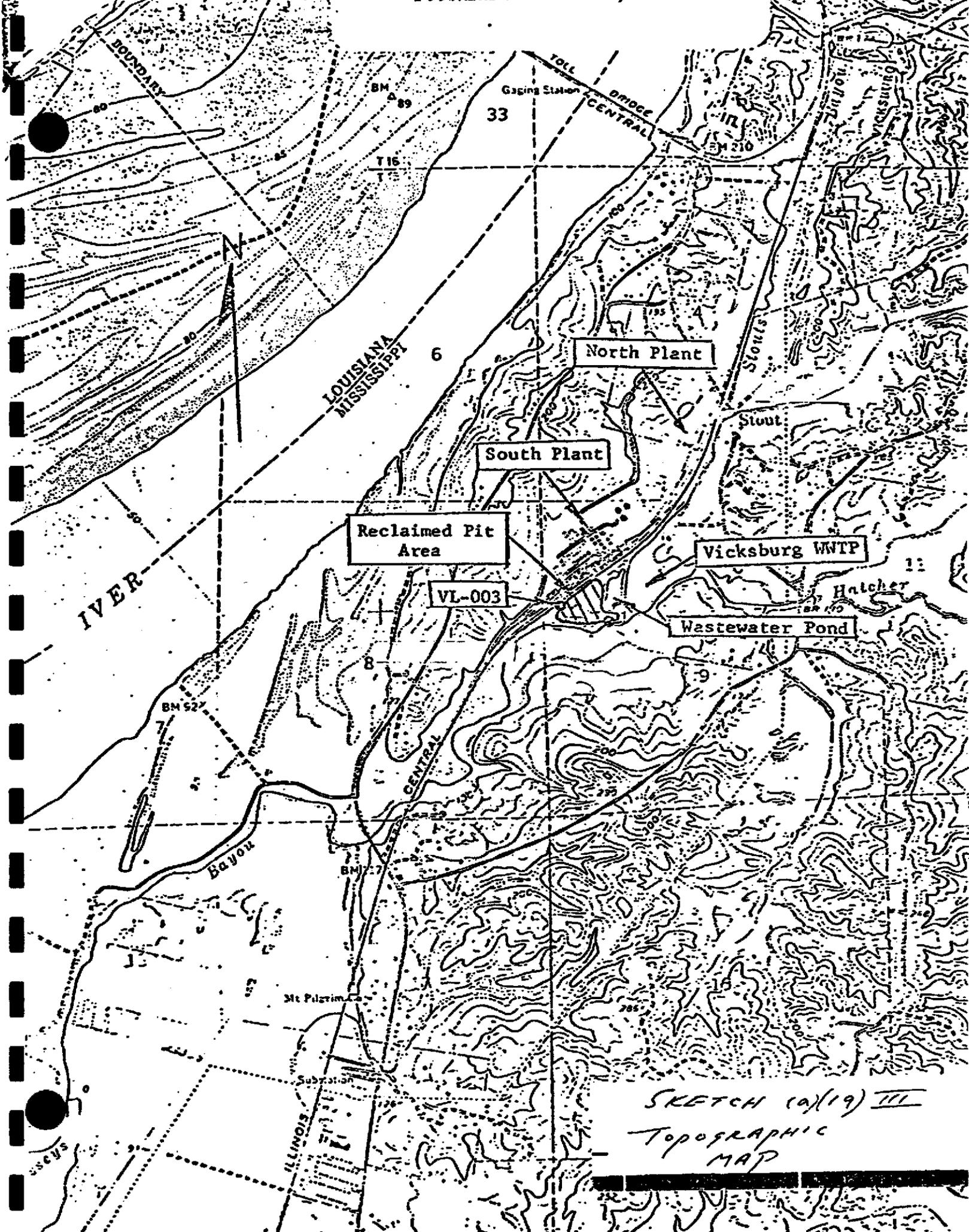
6 1/2  
11 GMS

1° 06'  
20 MILES



SKETCH  
(a)(19) II

TOPOGRAPHIC  
MAP

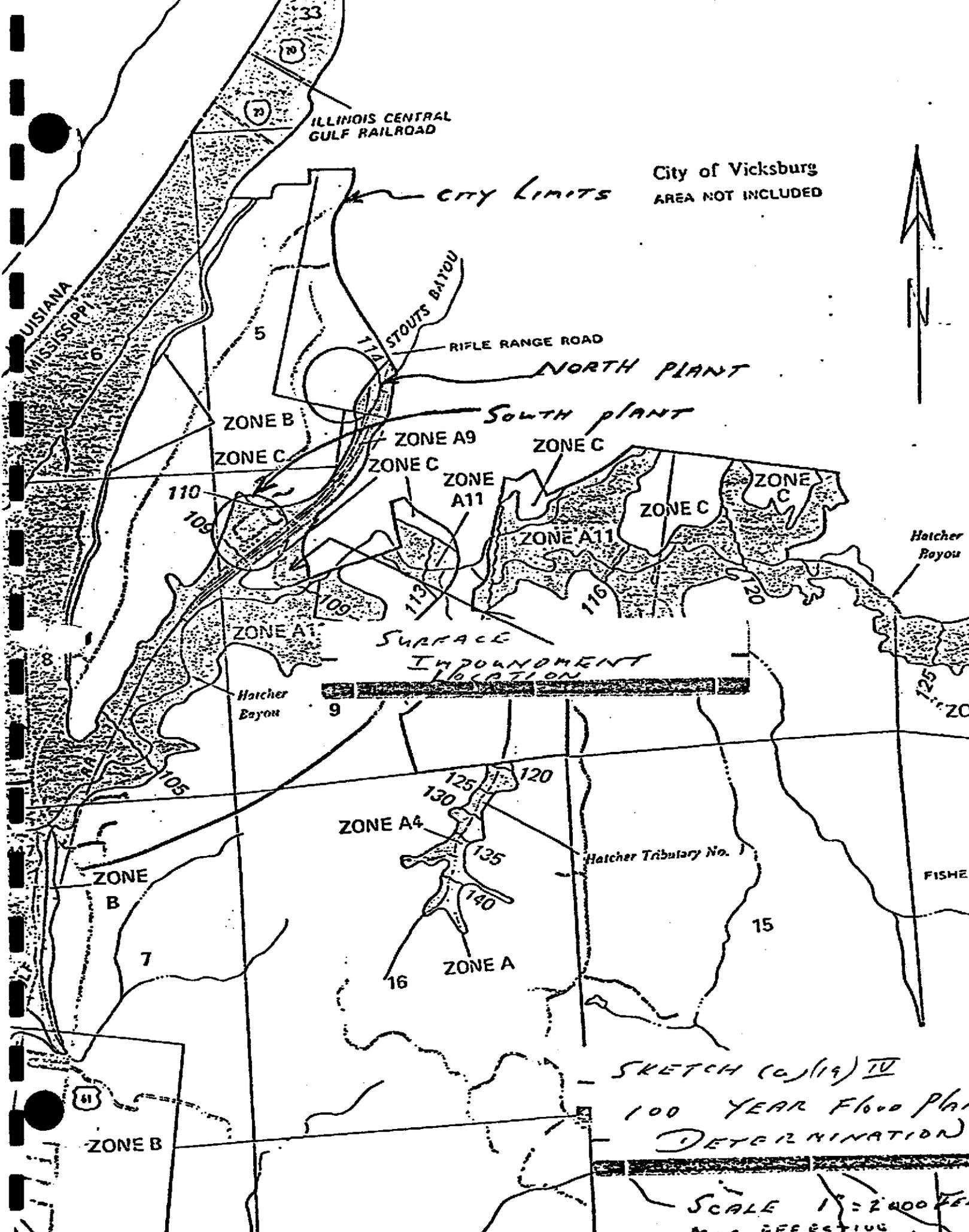


SKETCH (a)(19) III  
 TOPOGRAPHIC  
 MAP

ILLINOIS CENTRAL  
GULF RAILROAD

City of Vicksburg  
AREA NOT INCLUDED

city limits



SKETCH (C) (19) TV  
100 YEAR Flood Plain  
DETERMINATION

SCALE 1" = 2000 FEET  
MAP EFFECTIVE

LOUISIANA  
MISSISSIPPI

Hatcher  
Bayou

Hatcher  
Bayou

Hatcher Tributary No. 1

FISHER

ZONE B

ZONE A

ZONE A4

ZONE A1

ZONE A11

ZONE C

ZONE C

ZONE A11

ZONE C

ZONE A9

ZONE B

ZONE C

NORTH PLANT

South plant

RIFLE RANGE ROAD

STOUTS BAYOU

5

110

109

9

109

111

116

120

125

120

125

120

130

135

16

15

7

81

Topo Maps (1)

Topo Map 2

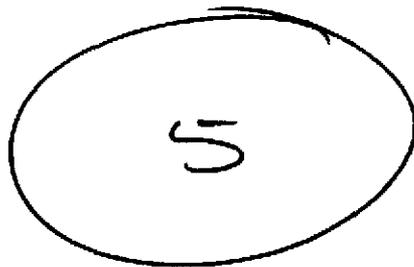
3

~~Topic~~

Grading Plan

4

Final Capping



Topo Map

Closed Dip & Int Sl

ENGINEERING REPORT FOR  
SURFACE IMPOUNDMENT DIKE IMPROVEMENTS  
VERTAC CHEMICAL CORPORATION  
VICKSBURG, MISSISSIPPI

Prepared by:

MCI/Consulting Engineers, Inc.  
P.O. Box 23010  
10628 Dutchtown Road  
Knoxville, Tennessee 37933-1010



August 8, 1983

## TABLE OF CONTENTS

- 1.0 INTRODUCTION
  - 2.0 PREVIOUS INVESTIGATIONS
  - 3.0 THRUST OF PROPOSED DESIGN
  - 4.0 RUN-ON MANAGEMENT
  - 5.0 SUMMARY OF DIKE DESIGN
    - 5.1 100-Year Flood Elevation
    - 5.2 Hydrodynamic Forces
    - 5.3 Hydrostatic Forces
    - 5.4 Seepage Out of Pond
    - 5.5 Erosion Control
  - 6.0 CONSTRUCTION
- 
- Appendix I Vitae of Key Personnel Involved in Project
  - Appendix II Laboratory and Slope Stability Data
  - Appendix III Run-on Management Data
  - Appendix IV Corps of Engineers' Certifications

## 1.0 INTRODUCTION

Contained herein is the engineering report to support the detailed construction plans for the improvements to the hazardous waste surface impoundment at Vertac Chemical Corporation, Vicksburg, Mississippi. Included with the construction drawings are a set of technical specifications for the dike construction. These specifications and design drawings are presented under separate cover.

This design has been performed by MCI/Consulting Engineers, Inc., utilizing Geologic Associates, Inc. as a geotechnical subcontractor. Vitae for key personnel involved in this project are contained in Appendix I.

## 2.0 PREVIOUS INVESTIGATIONS

After a failure of the subject dike in early 1983, MCI/Consulting Engineers, Inc. performed an investigation regarding the stability of the subject dike subsequent to the dike repair. This investigation titled "Engineering Analysis of Stability of Surface Impoundment Dike, Vertac Chemical Corporation, Vicksburg, Mississippi" was completed June 11, 1983. This report basically indicated that the mechanism of failure was excessive pore pressure which resulted from the rapid rise and fall of the adjacent creek. Accordingly, a dewatering mechanism was designed, as presented herewith, to relieve the excess pore pressure in the dike and raise the top of the dike to the 100-year flood elevation.

## 3.0 THRUST OF PROPOSED DESIGN

Based on the findings resulting from the preliminary investigation, the design of the dike improvements sought to relieve excessive pore

pressure in the dike. In addition, EPA and State of Mississippi require that the impoundment be protected from the 100-year flood and run-on from the 25-year, 24-hour storm event. The design therefore involved an analysis of both criteria, with a resulting dike elevation to meet these requirements.

#### 4.0 RUN-ON MANAGEMENT

The Vertac surface impoundment receives surface water run-on from much of the manufacturing facility. Based on an aerial and field reconnaissance, an area consisting of approximately 20.7 acres drains to the surface impoundment. Certification of this drainage area by a registered land surveyor is contained in Appendix III. In addition, approximately 3 acres of an inactive landfill located adjacent to the surface impoundment drains into the surface impoundment. Therefore, the total surface area draining to the surface impoundment is 28.3 acres, including the area encompassed by the surface impoundment itself (4.6 acres). Based on site conditions identified and in accordance with SCS hydrologic procedures, the 25 year-24 hour storm will produce a volume of 15.1 acre-feet of run-on into the pond. Utilizing the new dike design as contained in the accompanying construction plans, a storage volume of 17.1 acre-feet is available at elevation 107.0 MSL (allowing 2 feet of freeboard). This does not include the 600 gallons per minute outflow provided by the existing pumping system out of the pond. This volume is based on an average water elevation of 102.0 at the time of the storm. The average water level in the impoundment is based on

elevation readings at the time of three different topographic surveys of, or around, the impoundments. Run-on volume calculations for the completed dike are contained in Appendix III.

Run-off management is not a consideration for the facility due to the configuration of the surface impoundment. Any water which comes in contact with the interior of the dike is transmitted to the surface impoundment and is later pumped to the plant for treatment. The proposed dike design contains no overflow structures.

## 5.0 SUMMARY OF DIKE DESIGN

### 5.1 100-Year Flood Elevation

As determined by the U.S. Army Corps of Engineers, the 100-year flood elevation at the intersection of Hatcher and Stout's Bayou is 109.00 MSL. The existing top of dike elevation is approximately 105.0 MSL. The 100-year flood elevation is higher than the elevation required for controlling the run-on onto the pond. Accordingly, the top of the new dike is designed to be constructed to elevation 109.0 MSL. A certification by the U.S. Army Corps of Engineers, Vicksburg District, concerning this elevation is contained in Appendix IV. Comments from the Corps of Engineers regarding permitting of the dike improvements are contained in Appendix IV also.

### 5.2 Hydrodynamic Forces

Based on strength parameters and unit weights from laboratory data, slope stability analyses of the dike, after the subject

improvements, were performed. Effective strength parameters of both existing and proposed soil types were used in these analyses. This proposed soil information was determined by utilizing samples of soil collected at a borrow area adjacent to the Vertac facility, as located on Sheet 1 of the design plans. This hill is primarily composed of a loess material and is the closest suitable borrow area to the subject dike. In addition, in-situ data from the dike investigation (discussed in Section 2.0) was used. The stability analysis was performed with the aid of a digital computer using circular arc failure surface. The computer program used is entitled STABL and was developed during the joint highway research project HRP-79-6 by Purdue University and Indiana State Highway Commission. Analysis of the data yielded the following information regarding safety factors:

- (1) The Safety Factor for the most critical conditions defined is 1.432. This condition occurs when the impoundment is under a high water (107.0 MSL) condition and a rapid creek drawdown occurs. Deep failure is considered critical under these conditions.
- (2) The Safety Factor for normal pond elevation (102.0 MSL) is 1.564. This is for deep failure.

- (3) The Safety Factor for maximum pond elevation (107.0 MSL) for a shallow failure is 1.487.

Results of the slope stability analyses including computer plots of the failure surfaces, and laboratory data on the in-situ soil and borrow soil to be used for construction of the new dike are contained in Appendix II. Detailed information on the specifications for the soil compaction and the material to be used for the rock drains are contained in the Technical Specifications for the construction of the dike.

### 5.3 Hydrostatic Forces

The slope stability analysis of the dike considers both hydrostatic and hydrodynamic forces.

### 5.4 Seepage Out of Pond

The lower portions of the existing dike have an in-situ permeability of  $8.1 \times 10^{-6}$  cm/sec. With a minimum dike width of 18 feet (EL 107.0), seepage through this narrowest portion of the dike would require 2.1 years. This assumes saturation at EL 107.0 for this entire period of time and no decrease in dike permeability as a result of the dike improvements.

### 5.5 Erosion Protection

Velocity calculations in Stout's Bayou reveal the following velocities along the dike:

<u>Elevation (MSL)</u>	<u>Velocity (feet per second)</u>
95	2.85
100	3.9
above 100	Out of banks opposite side

To protect the dike at lower elevations, large diameter rock will be used for the toe of the rock drain. Above elevation 100.0, velocities should decrease as the creek spills out of its banks.

#### 6.0 CONSTRUCTION

Prior to beginning construction, both ponds of the surface impoundment which border Stout's Bayou will be hydraulically disconnected from the entrance pond either by dewatering the ponds or physically cutting the portion of the pond in contact with the dike off from the remainder of the pond. All liquid in these ponds will be pumped into Pond 3 to be subsequently pumped to the existing wastewater treatment system. Initially, the interior portion of the dike will be constructed first in order to provide safety against failure during the construction of the rock drain. Details for all the construction activities are contained in the project specifications.



DEPARTMENT OF THE ARMY  
VICKSBURG DISTRICT, CORPS OF ENGINEERS

P. O. BOX 60  
VICKSBURG, MISSISSIPPI 39160

July 8, 1983

REPLY TO  
ATTENTION OF:

Engineering Division  
Hydraulics

Mr. Felon Wilson  
MCI Consulting Engineers  
Post Office Box 23010  
Knoxville, Tennessee 37933

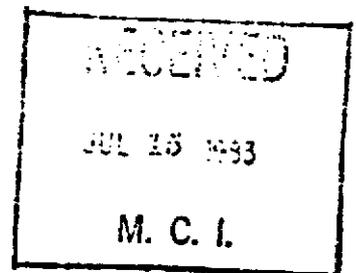
Dear Mr. Wilson:

I refer to your telephone conversation of July 6, 1983, with Charles McKinnie of Hydraulics Branch, requesting the 100-year elevation at the confluence of Stouts Bayou and Hatcher Bayou near Vicksburg, Mississippi. The 100-year elevation for this site is approximately 109.0 feet NGVD.

If we can be of further assistance, please contact this office.

Sincerely,

John E. Henley  
Chief, Engineering Division



a(11)iii

NATIONAL FLOOD INSURANCE PROGRAM

**FIRM**

**FLOOD INSURANCE RATE MAP**

COUNTY OF  
**WARREN,**  
**MISSISSIPPI**  
(UNINCORPORATED AREAS)

**PANEL 200 OF 275**

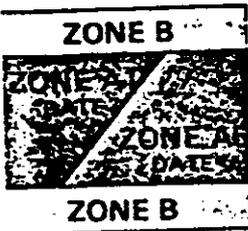
**COMMUNITY-PANEL NUMBER**  
**280198 0200 B**

**EFFECTIVE DATE:**  
**NOVEMBER 15, 1979**



**U.S. DEPARTMENT OF HOUSING  
AND URBAN DEVELOPMENT  
FEDERAL INSURANCE ADMINISTRATION**

## KEY TO MAP

<p>500-Year Flood Boundary _____</p> <p>100-Year Flood Boundary _____</p> <p>Zone Designations* With Date of Identification e.g., 12/2/74 _____</p> <p>100-Year Flood Boundary _____</p> <p>500-Year Flood Boundary _____</p> <p>Base Flood Elevation Line With Elevation In Feet** _____</p> <p>Base Flood Elevation in Feet Where Uniform Within Zone** _____</p> <p>Elevation Reference Mark _____</p> <p>River Mile _____</p>	 <p>513</p> <p>(EL 987)</p> <p>RM7x</p> <p>• M1.5</p>
---	--

\*\*Referenced to the National Geodetic Vertical Datum of 1929

### \*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

ILLINOIS CENTRAL  
GULF RAILROAD

City of Vicksburg  
AREA NOT INCLUDED

*city limits*



LOUISIANA  
MISSISSIPPI

RIFLE RANGE ROAD

*NORTH PLANT*

*South plant*

ZONE B  
ZONE C

ZONE A9

ZONE C

ZONE C

ZONE A11

ZONE C

ZONE C

ZONE A11

Hatcher Bayou

SURFACE  
IMPONDMENT  
LOCATION

Hatcher Bayou



ZONE A4

Hatcher Tributary No. 1

ZONE B

FISHER

ZONE A

SKETCH (G)(11) iix  
100 YEAR Flood Plat.  
DETERMINATION

SCALE 1" = 2000 FEET

Map EFFECTIVE  
DATE: 11/15/79

ZONE B

61

7

16

15

105

9

125

130

135

140

120

116

113

109

110

109

5

33

70

125  
120

GULF

(a)(10) Traffic Pattern

The traffic patterns for hazardous waste transport for off-site disposal is important in three areas:

1. MSMA salt cake to off-site hazardous waste landfill disposal.
2. Unneutralized DNBW waste water to off-site hazardous waste deep well disposal.
3. Spent carbon from the leased Calgon effluent system to off-site thermal regeneration.

All transport is by truck. Weights of the truck, after they are loaded, vary from 70,000 lbs. to 80,000 lbs.

All hazardous waste trucks transport from the South plant. See attached map, Sketch (a)(10). Trucks enter the property at the plant entrance. The road is an asphalt paved two lane road designed for heavy traffic. (Raw materials for the various processes in the South plant are also moved into the plant by truck.) There is ample room for truck maneuvering within the plant.

The frequency of traffic is as follows:

1. MSMA salt cake - two to four trucks per week.
2. Unneutralized DNBW waste water - a maximum of 3 trucks per day for 6 days each week.
3. Spent carbon to thermal regeneration - one truck every other week.

F - 4a Loading Operations

The unloading of DNBP process wastewater into tanktrucks for shipping off-site to deep well disposal in an area of waste management where unloading or loading could present a waste hazard if improperly attended. As described under "a(1) General Description" the DNBP process wastewater is acidic and hazardous by virtue of characteristic D002.

Spill prevention measures are incorporated by design. A loading rack and provision for top entry loading is provided. The operator can safely walk onto the top of the truck and attach the unloading hose connection and control the loading pump while observing the loading. Upon completion the liquid remaining in the unloading hose will drain by gravity into the truck, thus avoiding spillage.

Further spill control is provided by the presence of a process drain at the loading rack and tanks that drains by gravity to the surface impoundment. Contents of the surface impoundment are treated by carbon adsorption prior to discharge to the Mississippi River.

Detailed plant wide spill control is provided in a(7) The Contingency Plan and a(8)ii Run-off Prevention.

(b) (3) i List of Hazardous Wastes

The Vicksburg Facility contains these manufacturing operations that do and/or did create hazardous wastes.

1. Atrazine
2. Toxaphene
3. Dinitrobutyl phenol (Dinoseb)
4. Monosodium methane arsonate

The Atrazine and Toxaphene plants are shut down and there is no reasonable anticipation that production of those products will resume. The dinitrobutyl phenol and monosodium methane arsonate plants are operational.

The monosodium methane arsonate plant generates listed RCRA waste K031, a by-product slat. The by-product salt cake is directly discharged into a "roll-off sludge container". When the container is full (2-4 days) it is transported by a hazardous waste transporter to a hazardous waste landfill. The plant is designed such that there is no effluent. Additionally all spills, etc. are retained and recycled to the process.

The dinitrobutyl phenol plant produces manufacturing process wastewater that is hazardous by virtue of characteristic (D002). The waste is pumped to 1 - 3 day storage and is transported by a hazardous waste transporter to off-site disposal by hazardous waste deep well injection. Any D002 spills from the storage or loading area flow to the effluent collection system and to a 3 million gallon surface impoundment. At times the manufacturing process wastewater is neutralized with ammonia and pumped to a 1.6 million gallon storage tank. The water is not a hazardous waste at this time; it is pumped through activated carbon and discharged to the 3 million gallon surface impoundment. Spills and leaks from the process area or product storage area or water from clean up of such a spill fall within P020 of RCRA paragraph 261.33. Such spills flow to the 3 million gallon surface impoundment.

Soil within plant boundaries will additionally flow as sediment particles during rain. The sediment particles will settle within the 3 million gallon surface impoundment. It is possible that some of the soil may have been contaminated by operations in the past and be categorized by P020 (dinoseb) or P123 (toxaphene).

(a)(2)  
(a)(3)

PART B PARAGRAPH 122.25 (CONTENTS)

(3) A copy of the Waste Analysis Plan and Hazardous Waste Analysis as it applies to SEC. 264.13.

1. Neutralized DNBP process water storage tank (the hill tank):

A. Frequency of Analysis.

The analysis will be performed twice a year, also after a process change is made.

B. Sampling.

The method is to obtain a 500 CC min. sample volume every 4 hours during a 24 hour discharge period from the outlet valve on the line from the tank to the carbon columns. The individual samples will be mixed well and serve as the composite sample.

C. Selection of parameters and rationale.

<u>Parameter</u>	<u>Rationale</u>
pH	Corrosivity, Tank Integrity
COD, PPM	Degree of Treatability
Sp. Gr.	Obtain weight for records.
Lbs/Gal	Obtain weight for records.
Total NH <sub>3</sub> -N, %	Chemical Characteristic
Total NO <sub>3</sub> -N, %	Chemical Characteristic
Total SO <sub>4</sub> , %	Chemical Characteristic
DNBP, PPM	Hazardous Ingredient

TYPICAL ANALYSIS

<u>Parameter</u>		<u>Test Method</u>
pH	9.2	pH Meter
COD, PPM	14,530	Potassium Dichromate Reduction
Sp. Gr.	1.092	Hydrometer at 20°C
Lbs/Gal	9.1	Calculated

<u>Parameter</u>		<u>Test Method</u>
Tot. NH <sub>3</sub> -N, %	3.0	Distillation from Basic Solution
Tot. NO <sub>3</sub> -N, %	0.5	Chromotropic Acid Method
DNBP, PPM	320	In House Chromatographic Method

2. DNBP Plant Waste Water Process Tank:

A. Frequency of Analysis.

The analysis will be performed twice annually, also when there is a process change.

B. Sampling.

A 500 CC min. sample of the process waste water from each individual batch as it is discharged to the process storage tank during a 24 hour period. The individual samples will be mixed well and serve as the composite sample.

C. Selection of Parameters and Rationale.

<u>Parameter</u>	<u>Rationale</u>
COD, PPM	Degree of Treatability
Sp. Gr.	For Weight Records
Lbs/Gal	For Weight Records
HNO <sub>3</sub> , %	Process Hazard
H <sub>2</sub> SO <sub>4</sub> , %	Process Hazard
DNBP, PPM	Hazardous Ingredient

D.

TYPICAL ANALYSIS

<u>Parameter</u>		<u>Test Method</u>
COD, PPM	14,530	Potassium Dichromate Reduction
Sp. Gr.	1.060	Hydrometer at 20°C
Lbs/Gal	8.8	Calculated
HNO <sub>3</sub> , %	1.9	In House Method
H <sub>2</sub> SO <sub>4</sub> , %	8.2	In House Method
DNBP, PPM	310	In House Chromatographic Method

3. 90 Day Hazardous Waste Storage Area:

A. Frequency of Analysis.

Upon entering the storage area.

B. Sampling.

A 100 ml sample from every 5th drum, mixed well to serve as a composite sample. If less than 5 drums are placed in storage an aliquot will be taken from each drum sufficient to total 1 liter (1000 mls).

If the waste consists of paper, trash, work clothing, ect., a representative one (1) gallon sample shall be taken.

C. Selection of Parameters and Rationale.

The parameter will depend upon the type of waste and will be selected from the following categories:

<u>Parameter</u>	<u>Rationale</u>
a. (DNBP Waste)	
DNBP, PPM	Hazardous Ingredient
Flash Point	Fire or Explosion
*b. (Toxaphene Waste)	
Toxaphene, PPB or PPM	Hazardous Ingredient
Flash Point	Fire or Explosion
c. (MSMA Waste)	
MSMA †	Hazardous Ingredient
TRI Valent AS, †	Hazardous Ingredient
*d. (Atrazine Waste)	
Atrazine, † or PPM .	Hazardous Ingredient
e. (Other)	
Hazardous Ingredient and/or Flash Point to be determined by nature of the waste.	
f. All of the above will vary and typical analysis can't be listed at this writing.	

\* The Atrazine and Toxaphene plants are not operating. There are no plans to start either plant in the foreseeable future.

4. Containment Pond:

A. Frequency of Analysis.

A minimum of 2 times per year. Some or all of the parameters may be analyzed more often.

B. Sampling.

A one (1) liter sample taken at the inlet of the activated carbon vessels.

C. Selection of Parameters and Rationale.

<u>Parameter</u>	<u>Rationale</u>
pH	Degree of Treatability
COD, PPM	Degree of Treatability
BOD, PPM	Degree of Treatability
DNBP, PPM	Hazardous Ingredient
Toxaphene, PPB	Hazardous Ingredient
Tot. NO <sub>3</sub> -N, PPM	Charactoristic

D.

TYPICAL ANALYSIS

<u>Parameter</u>		<u>Test Method</u>
pH	8.7	pH Meter
COD, PPM	356	Dichromate Reduction
BOD, PPM	48	Std. Methods, Water and Waste Water
DNBP, PPM	11.3	In House Chromatographic Method
Toxaphene, PPB	< 5 PPB	Fed. Reg. 75
Tot. NO <sub>3</sub> -N	345	Chromatropic Acid Method

**TECHNICAL SPECIFICATIONS  
SURFACE IMPOUNDMENT DIKE IMPROVEMENTS  
VERTAC CHEMICAL CORPORATION  
VICKSBURG, MISSISSIPPI**

**Prepared by:**

**MCI/Consulting Engineers, Inc.  
P.O. Box 23010  
10628 Dutchtown Road  
Knoxville, Tennessee 37933-1010**

**August 8, 1983**

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Technical Specifications

Dike Stabilization

Vertac Chemical Company  
Vicksburg, Mississippi

SECTION I

1. SCOPE OF WORK

The work concerned by this project includes performing all site work including clearing and grubbing, grading work, and subsurface drainage structures and incidental work as shown by the Drawings and as hereinafter specified.

2. DEFINITIONS

Owner: Vertac Chemical Company

Engineer: MCI/Consulting Engineers, Inc. or designated representative.

3. CONSTRUCTION LAYOUT

The contractor shall be responsible for all surveying and construction layout. The contractor shall set grade stakes, batter boards or other appropriate monuments as required to facilitate construction.

Specifications for  
Clearing and Grubbing

SECTION II

1. SCOPE OF WORK

This specification covers the clearing and grubbing associated with site preparation and related works and disposal of all brush, timber and debris and all incidental work related thereto.

2. LIMITS OF THE WORK

All trees, stumps, vegetation, topsoil and other deleterious materials must be removed from all areas of the site which require excavation, filling or grading. Topsoil shall be removed to the depth necessary to remove all roots and organic matter.

3. DISPOSAL OF MATERIALS

All timber, brush and other organic materials from clearing operations shall be disposed of on-site. The area for disposal will be adjacent to the project, but not in a drainageway.

Specifications for  
Grading

SECTION III

1. SCOPE OF WORK

The work covered in this section consists of furnishing all plant, labor and equipment and performing all operations in connection with the required excavation and placing all fills, including compaction, in accordance with the contract drawings and these specifications.

2. CLASSIFICATION

A. Excavation

All excavation shall be considered as unclassified. Subsurface exploratory data are available for review to assist the contractor in assessing the difficulty in achieving all excavations and in evaluating the work in general. However, the contractor is hereby notified that subsurface data furnished by the Owner is for general information only and the contractor is solely responsible for assessing the conditions.

3. DRAINAGE STRUCTURES

Drainage structures including ditches and inlets shall conform to the alignment, grades and details shown by the Plans.

4. GENERAL PROVISIONS

A. Lines and Grades: The fills shall be constructed to the lines and grades indicated on the drawings. Grading shall be finished with a tolerance of 0.1 foot of the grades indicated.

B. Conduct of the Work: The contractor shall maintain the site in a well-drained satisfactory condition at all times until final completion and acceptance of all work under the contract. Any approved fill material which is rendered unsuitable after being placed in the embankment and before final acceptance of the work shall be replaced by the contractor in a satisfactory manner at no additional cost to the Owner.

Throughout construction it is essential that the site be maintained in a well-drained condition. Water should not be allowed to pond or be impounded in any area, and drainage shall be controlled in a manner which will insure the quality of the work.

C. Density Tests: The grading operation will be continuously monitored by the engineer designated by the Owner or their representative hereinafter called the Engineer. During the construction of any fill, density and other tests will be conducted which may cause delays in the contractor's placing and compaction operations. The contractor shall coordinate his work with the operations of the Engineer.

5. MATERIALS

A. General: Fill shall consist of earth or rock. Materials to be stockpiled or wasted are to be specifically designated as such. Materials containing brush, roots, sod, or other deleterious materials will not be considered suitable. The suitability of the materials and their deposition shall be subject to the approval of the Engineer. Considerable drying of materials excavated within the existing dike will probably be required to allow proper compaction.

6. FILL

A. General: The suitability of all materials placed in the fill will be determined by the Engineer.

B. Definitions: The term "Fill" as used in these specifications is defined as the earth to be imported or excavated on the site and deposited in layers and compacted by rolling and/or tamping. Earth fill is considered to be organic-free soil derived from on-site excavations, or approved borrow areas.

7. PREPARATION FOR FILL PLACEMENT

A. General: All areas to have fill placed upon them will be examined by the Engineer after stripping, and any soft or otherwise deleterious materials will be removed prior to placement. No fill material shall be placed until the subgrade has been examined and approved by the Engineer.

B. Proofrolling: After stripping and prior to fill placement those areas which will have fill placed upon them shall be proofrolled with heavy, pneumatic-tired construction equipment. Any soft, unstable or otherwise unacceptable zones detected thereby, as determined by the Engineer, shall be undercut to firm soil, stabilized by compaction or otherwise

repaired as deemed necessary by the Engineer. It is the intent of these specifications to provide a uniformly stable surface on which to place fill.

8. PLACEMENT

- A. General: No fill shall be placed in any area until such areas have been inspected and approved. The gradation and distribution of materials throughout the compacted fill section shall be such that the fill will be free from lenses, pockets, streaks, layers of material differing substantially in texture or gradation from surrounding material of the same class. Successive loads of materials shall be dumped at locations on the fill as directed or approved by the Engineer. No fill shall be placed upon a frozen surface, nor shall snow, ice, or frozen earth be incorporated in the fill. Unless otherwise directed, all earth fill materials shall be kept crowned with temporary slopes of at least 2% until completed.
- B. Compaction: Fill shall be constructed of approved materials and shall be placed in lifts to the lines and grades on the drawings and staked in the field.

Where the fill is predominately earth, it will be placed in uniform layers no greater than eight inches in thickness. Successive layers shall be compacted to at least 95% of its maximum density according to ASTM D 698 (standard Proctor). Compaction shall be accomplished by sheepsfoot rollers, power rollers or other equipment approved by the Engineer.

Rock fill shall be placed in lifts approximately equal in thickness to the maximum particle size contained therein, but in no case greater than twelve inches. This material shall be

compacted using heavy rollers or tracked equipment until judged stable by the Engineer.

- C. Compaction Equipment: Compaction equipment shall conform to standards of the industry and shall be used as prescribed. The Contractor will furnish and have on the job the various types of compaction and grading equipment which may be required to properly consolidate the various types of materials incorporated in the fill, or which are otherwise required to prepare the site.
- D. Spreading: After dumping, the material shall be spread by bulldozer or grader in approximate horizontal layers over the fill areas. Concentration of oversize material will not be permitted. If, in the opinion of the geotechnical engineer, any individual stone or stones interfere with proper and smooth compaction, they shall be removed from the lift. During the dumping and spreading processes, the contractor shall maintain at all times a force of men adequate to remove all roots and debris from all fill materials. The entire surface of any fill under construction shall be maintained in such condition that construction equipment can travel over it. Ruts in the surface of any layer shall be filled satisfactorily before compacting.

9. MOISTURE CONTROL

The materials in each layer of the fill shall contain the amount of moisture necessary to obtain the desired compaction as determined by the Engineer. Material that is too wet when placed in the fill shall be spread over the fill surface and permitted to dry, assisted by discing or harrowing, if applicable, until the moisture content is reduced to an amount within tolerable limits. When the material is too dry, the contractor will be required to sprinkle

each layer of fill. Discing, or other approved methods, will be required to work the moisture into the material until a uniform distribution of moisture is obtained. Water applied on a layer of fill shall be accurately controlled in amounts so that free water will not appear on the surface during or subsequent to rolling. Should too much water be added to any part of the fill so that the material is too wet to obtain the desired compaction, the rolling and all work on that section of the fill shall be delayed until the moisture content of the material is reduced to an amount with the specified limits. If, in the opinion of the Engineer, the top or contact surface of a partial fill section becomes too wet or too dry to permit suitable bond between these surfaces and the additional fill to be placed thereon, the contractor shall loosen the wet or dried material by scarifying or discing to such depths as may be directed, shall dampen or dry the loosened material to an acceptable moisture content, and shall then compact this layer in accordance with the applicable requirements to densities comparable to the underlying fill.

Drainage and Rockfill

SECTION IV

1. SCOPE

The work covered by this section consists of furnishing all plant, labor, equipment, and performing all operations in connection with the construction and placing of the subsurface drains and rock toe in accordance with the Drawings and these specifications.

2. TOE DRAIN

Toe drains shall be installed at the base of the slope as shown by the drawing. The rock shall be reasonably well graded with a maximum rock dimension of 12 inches. The rock shall contain no greater than 5% material passing a #200 sieve and shall have at least 50% of the particles (by weight) greater than 6 inches. The rock shall be placed in lifts not to exceed one foot and shall be composed of durable limestone that does not slake in water. Filter fabric (Supac 5-P or equivalent) shall be placed beneath the rock as shown on the drawings.

3. CHIMNEY DRAIN

Chimney drains shall be installed on the appropriately prepared slope as shown on the drawings. The rock shall conform to ASTM D 448, Size Number 357 or an alternate rock approved by MCI/Consulting Engineers, Inc. The rock shall be placed in lifts not exceeding eight inches and shall be composed of durable limestone that does not slake in water, or a washed, clean river gravel approved by MCI/Consulting Engineers, Inc. Filter fabric (Supac 5-P or equivalent) shall be placed around the rock fill as shown on the drawings and shall be overlapped a minimum of two feet at all locations where joints are necessary.

Vegetation

SECTION V

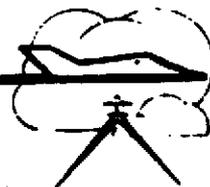
1. Permanent vegetation will be placed on all exposed or bare areas in accordance with the following sections.
  - A. Soil Improvement: Evenly apply 150 pounds of agricultural limestone per 1000 square feet. Apply 10 pounds of 10-10-10 analysis fertilizer or equivalent per 1000 square feet.
  - B. Seeding: Evenly apply 2 pounds of Rye Grass per 1000 square feet and 1/4 pound Common Bermuda per 1000 square feet. The lime, fertilizer, and seed may be applied separately by hand or with mechanical equipment, or they may be applied simultaneously by using a hydraulic seeder. Other seed as necessary to establish a year-round grass stand shall be applied.
  - C. Protective Cover: To provide protective cover and conserve moisture during the establishment of vegetative cover, an erosion control fabric such as Hold-Gro or equivalent will be installed according to manufacturer's recommended procedures.

# MAPTECH, INC. SURVEYING • MAPPING

P O BOX 5300A

JACKSON, MISSISSIPPI 39216

(601) 969-6673



July 1, 1983

MCI/Consulting Engineers, Inc.  
Post Office Box 23154  
McBride Lane  
Knoxville, Tennessee 37922

Attention: Mr. Felon R. Wilson, P. E.

RE: Vertac Chemical Corporation  
(Our Ref. 8378)

Dear Mr. Wilson:

In accordance with your request, we determined the drainage area for the ponds at the subject plant. We used photography obtained in 1982 plus some on site investigation to determine the limits. The site investigation involved looking at drop inlets, direction of drainage pipes and direction of flow in ditches. The acreage was calculated by use of a planimeter. The drainage area equals 20.7 acres.

Should you have any questions, please call.

Yours very truly,

MAPTECH, INC.

A handwritten signature in cursive script, appearing to read "S. G. Posey".

Sam G. Posey  
Registered Land Surveyor

SGP:tz



25-Year, 24-Hour Storm Volume  
Calculations

Bottomland - Adler Soil - C

Composite Curve Number:

	<u>Area</u>	<u>CN</u>
Inactive Disposal Area	3.0	87
Plant Site	20.7	87
Pond Area	<u>4.6</u>	<u>100</u>
	28.3	89

$$CN = \frac{1000}{10+S}$$

$$89 = \frac{1000}{10+S}$$

$$10+S = \frac{1000}{89}$$

$$S = 1.24$$

25 Yr. - 24 Hr. Precip. = 7.74 in.

$$Q = \frac{(p-0.2S)^2}{p+0.8S}$$

$$Q = \frac{(7.74 - (0.2)(1.24))^2}{7.74 + (0.8)(1.24)} = 6.42"$$

Storage Volume Required

$$V = (6.42") \frac{1 \text{ ft}}{12"} (28.3 \text{ acres}) (43560 \text{ ft}^2/\text{ac})$$

$$= 659,520 \text{ ft}^3 = 15.1 \text{ ac. ft.}$$

## SURFACE IMPOUNDMENT STORAGE CALCULATIONS

### Pond 1 (Northwestern)

<u>E1</u>	<u>in<sup>2</sup></u>	<u>Avg in<sup>2</sup></u>	<u>Avg ft<sup>2</sup></u>			<u>ft<sup>3</sup></u>
99.5	0					
		2.71	4336	x	0.5	2168
100	5.42					
		9.70	15520	x	1.0	15520
101	13.98					
		22.39	35824	x	1.0	35824
102	30.8					
		35.18	56288	x	1.0	56288
103	39.56					
		40.35	64560	x	1.0	64560
104	41.14					
		41.47	66352	x	1.0	66352
105	41.8					

Pond 2 (Southeastern)

<u>E1</u>	<u>in<sup>2</sup></u>	<u>Avg in<sup>2</sup></u>	<u>Avg ft<sup>2</sup></u>			<u>ft<sup>3</sup></u>
97.3	0					
		3.70	5920	x	0.7	4144
98	7.4					
		10.85	17360	x	1.0	17360
99	14.3					
		17.30	27680	x	1.0	27680
100	20.3					
		23.47	37544	x	1.0	37544
101	26.63					
		30.7	49064	x	2.0	98128
103	34.7					
		36.2	57920	x	2.0	115840
105	37.7					

Pond 3 (Northeastern)

<u>E1</u>	<u>in<sup>2</sup></u>	<u>Avg in<sup>2</sup></u>	<u>Avg ft<sup>2</sup></u>			<u>ft<sup>3</sup></u>
97.6	0	1.90	3040	x	0.4	1216
98	3.8	4.72	7552	x	1.0	7552
99	5.64	7.17	11472	x	1.0	11472
100	8.7	8.35	13360	x	1.0	13360
101	8.0	9.35	14960	x	2.0	29920
103	10.7	14.45	23120	x	2.0	46240
105	18.2					

Composite Ponds

105	97.7	107.35	171760	x	4.0	687040
109	117.0					

Composite Volumes

<u>E1</u>	<u>ft<sup>3</sup></u>	<u>Cumulative ft<sup>3</sup></u>	<u>Ac-ft</u>
98	5360	5360	0.12
99	24912	30272	0.69
100	41320	71592	1.64
101	66424	138016	3.17
103	220160	358176	8.2
105	292992	651168	14.9
109	687040	1,338,208	30.7

Water Elevation:

January 5, 1983	101.68
May 9, 1983	101.67
June 15, 1983	<u>102.5</u>
Average =	101.95

Assume water surface at EL 102.0 MSL

Available volume at EL 107 = 22.8 Ac-ft - 5.69 = 17.1 Ac-ft  
25 yr-24 hr storm volume = 15.1 Ac-ft

Assuming an outflow of 600 gpm, available volume at EL 107 = 19.75 Ac-ft

Groundwater Monitoring  
Summary of Data Acquisition Programs

Several programs have been initiated in the past few years in order to determine the source and extent of any potential groundwater contamination at Vertac Chemical's Vicksburg facility. Some contradictory results have been reported, particularly in reference to the groundwater gradient at Monitoring Well No. One (MW-1). However further field work has confirmed that MW-1 is located upgradient from the surface impoundment. A composite figure follows which further illustrates this point.

As a result, certain key conclusions can be drawn:

1. The surface impoundment located near the confluence of Stouts and Hatcher Bayous is not contributing to groundwater contamination.
2. The source of the contamination detected in MW-1 is either the inactive disposal area located to the southwest of the surface impoundment, or the plant processing area located to the northwest of MW-1.
3. The point of compliance for the surface impoundment is monitoring well five.

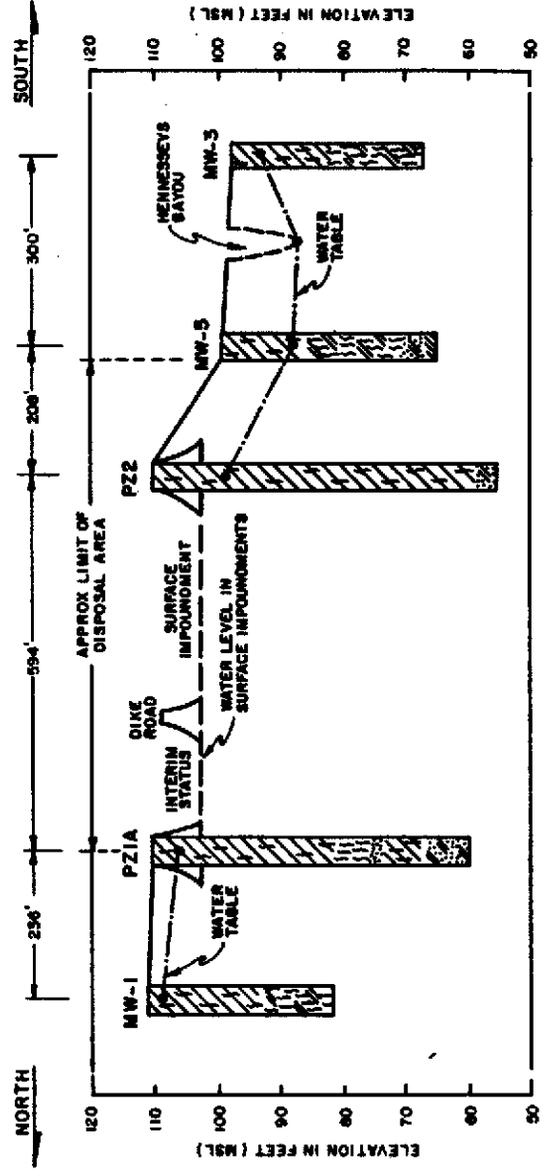
Data supporting these conclusions is contained within Appendix One to this RCRA application entitled "Supplementary Ground Water Data.

As a result of the above findings, neither a compliance monitoring program, nor a corrective action program is required for the surface impoundment. However, the issue of the contamination detected in MW-1 remains, and the following action is proposed.

The first step is to institute a compliance monitoring plan, the details of which are contained in Section E-3. Certain portions of this plan have already been initiated. If, as a result of this plan, DNEP or any other Appendix VIII constituent is identified in the ground water, Vertac will institute a corrective action program to remediate the problem. A schedule for implementation of this corrective action program is presented in Section E-3.

DRAWN BY DMS  
 CHECKED BY  
 6-16-85 APPROVED BY  
 DRAWING NUMBER HE1034-B

	MW-1	PZ-1A	PZ-2	MW-5	MW-3
DEPTH TO WATER	3.75'	6.25'	14.0'	12.0'	5.75'
PVC STICK-UP	1.48'	2.00'	1.90'	0.80'	.89'
GROUND ELEVATION	111.56'	111.03'	110.55'	98.70'	98.44'
WATER ELEVATION	108.26'	108.76'	98.45'	98.30'	92.89'



SECTION B-9

**FIGURE EI-1**  
**GROUNDWATER ELEVATIONS**  
**VICKSBURG PLANT**  
 PREPARED FOR  
**VERTAC CHEMICAL CORP.**  
**VICKSBURG, MS.**



**Project No. 846545**

**March, 1985**



## **Interim Report**

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# **Groundwater Assessment Program**

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**Vertac Chemical Corporation**  
**Vicksburg, Miss.**

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IT CORPORATION

March 15, 1985

Project No. 846535

Richard D. Karkkainen  
Vertac Chemical Company  
5100 Poplar Street  
Memphis, Tennessee 38137

Letter of Transmittal  
Interim Report  
Ground Water Assessment Program

Dear Mr. Karkkainen:

Please find enclosed two (2) copies of our Interim Report on the Ground Water Assessment Program at the Vertac-Vicksburg Plant. The activities described in this report primarily cover Task A of the Ground Water Assessment Program Outline which was agreed to by the State of Mississippi.

Generally, the following activities describe our work to date:

- o Review of Existing Data;
- o Design and Implementation of Water Level Monitoring Field Program;
- o Preparation of the Interim Report

The field activities which occurred during the period of December 3 through December 8, 1984 included the following:

- o Installation of four two inch water level piezometers;
- o Installation of four stream level staff gauges;
- o Soil sampling during the installation of the four piezometers;
- o Well development of four piezometers; and,
- o Water level measurements in all new piezometers and existing monitor wells.

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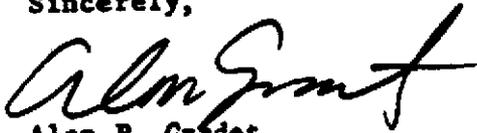
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Since their installation in December, three of the staff gauges have been rendered unusable by climatic conditions. If the need arises we will replace these PVC gauges with heavier steel pipe.

The attached report also includes our technical interpretations of the water level and soil data. In summary, these data indicate some mounding of shallow ground water under the Inactive Disposal Area but no mounding under the Interim Status Impoundments.

We hope this report is suitable for presentation to representatives of the Mississippi Department of Natural Resources. If you have any questions please contact me at (713) 784-2800.

Sincerely,



Alan P. Gradet  
Project Manager

gd:APG

cc: John Hill, Vertac-Vicksburg

## Executive Summary

A field program has been initiated at the Vertac Chemical Plant in Vicksburg, Mississippi as part of an ongoing ground water assessment program. This part of the assessment involved characterization of subsurface soil and hydrogeologic conditions.

Four new 2" water level monitoring piezometers have been installed at the plant, primarily in the vicinity of the Inactive Disposal Area and Interim Status Surface Impoundment. Soil samples collected during installation of the piezometers have been characterized (visual classification, particle size) and were used in combination with previous data to prepare soil stratigraphic cross-sections.

Water level measurements have been collected from the four new piezometers and the existing on-site monitor wells.

These data have been used to characterize the direction of the shallow ground water flow across this area. Anomalies in gradient and direction have been correlated to natural and man-made topographic features.

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## 1.0 INTRODUCTION

This report is being presented as an interim report of the Ground Water Assessment Plan for the Vertac Vicksburg facility as approved by the Mississippi Department of Natural Resources (letter to Dick Karkkainen from Charles Estes, October 3, 1984). This particular report predominantly completes Task A of the approved plan which has been described, as follows:

### TASK A HYDROGEOLOGIC CONDITIONS

Purpose: Establish the rate and extent of potential contaminant migration.

- A.1 Soil Stratigraphy
- A.2 Existing Hydrogeologic Data
- A.3 Description of Hydrogeologic Conditions
- A.4 Water Level Monitoring Program

Parts of Task A were completed prior to this report and those items were submitted in a letter report (letter to Dick Karkkainen from Alan Gradet, November 8, 1984 copy attached as Appendix A). The items presented in that report directly applicable to the Task A scope of work are:

- o A set of preliminary stratigraphic cross-sections (Task A.1);
- o A brief review of the existing hydrogeologic data (Task A.2); and
- o The proposed locations of four new water level recording piezometers and four stream water level measuring staff gauges.

During the phase of the Task A work described in this report we have completed the field work associated with the installation of piezometers and staff gauges as well as collecting two sets of water level measurements as per the assessment plan. The new data has been used to update the previously submitted information relative to the stratigraphic cross-sections and the hydrogeologic conditions. Finally, a new aerial

photograph of the site has allowed us to refine the site plan and more accurately display the spatial relationships between the plant, closed landfill, impoundments, monitor wells, piezometers and adjacent natural surface waters.

## 2.0 FIELD PROGRAM

### 2.1 INTRODUCTION

The proposed locations of the four piezometers and four staff gauges were originally presented in the November letter report (see Figure E in Appendix A). During the course of installation, the location of two of the piezometers and one staff gauge was changed because of severe access problems. These changes were:

- o The original location of PZ-1 was changed because of the severe slope between the eastern edge of the Inactive Disposal Area and the impoundments. As shown in Figure 1 of this report PZ-1 was moved to the northern end of the impoundment system and renumbered PZ-1A.
- o The original location of PZ-3 was changed because of the severe slope between the northern edge of the Inactive Disposal Area and the railroad. As shown in Figure 1 of this report the location was moved to the northeast access road to the Inactive Disposal Area and renumbered PZ-1.
- o The staff gauge designated SG-4 is actually located in Pond B as displayed on Figure 1. The original site plan did not differentiate between the three impoundments.

The original intent of the piezometer locations was to identify anomalies in the general direction of ground water flow as previously determined. Specifically, it was necessary to identify any ground water mounding which might alter normal ground water flow directions in the vicinity of either the Inactive Disposal Area or the impoundments. The new locations were selected in order to provide data addressing the same spatial and elevation interpretations.

## 2.2 FIELD ACTIVITIES

### Drilling - Sampling

No major problems were encountered while drilling and installing the four piezometers. The drilling procedure was to auger down until the natural water table was reached or borehole collapse became a problem. Augering depths were from 15 to 25 feet below ground surface and the natural water table was not encountered. When augering became difficult, a rotary wash drilling technique was utilized until the final borehole depth was achieved. The final depth was determined by the location of the "marl". The marl occurred at depths from 49 to 56 feet below ground surface. Samples were collected to describe the soils encountered while drilling. Sample intervals were selected based on observed material characteristics so that samples of apparently different soil horizons were collected.

### Piezometer Installation

The four piezometers installed were made of 2" P.V.C. (Schedule 40) material. Well screen slot size was 0.010 inches. PZ-1, PZ-1A, and PZ-2 have 15' of well screen while PZ-4 had 10' of screen. Number 2 sand was set around the well screen from the bottom of the hole to 2-5 feet above the top of the screen to provide a filter pack. However, in PZ-4 the sand was raised to 21 feet above the screen. During the drilling phase of PZ-4 water was encountered at 4 feet below the ground surface and augering was therefore an impossibility. The sand was raised 21 feet above the screen in order to capture the near surface ground water. A three foot layer of bentonite was placed above the sand to provide a fast setting seal to vertical migration within the borehole annulus. Grout was placed above the bentonite layer to one foot below ground surface. A one foot bentonite cap was placed above the grout to prevent any possible vertical migration downward from ground surface runoff. A concrete foundation box was placed above the one foot bentonite cap to protect the piezometer from possible damage. Average

PVC stick-up above the ground surface is two feet. Piezometer locations are shown on Figure 1.

#### Piezometer Development

The four piezometers were developed using a small air compressor. Each piezometer was developed on an average of one to two hours until the "fines" in the water produced from the well were considerably reduced.

#### Staff Gauges

All four staff gauges were installed according to the proposed location (see Figure 1). Staff gauge No. 4 was placed next to the intake structure in Pond B about eight feet from the dike-road. Staff gauge No. 3 was placed two to three feet out from the edge of Hennessey's Bayou because the water was too deep.

#### Staff Gauge Installation

The four staff gauges are made of 2" PVC schedule 40 material. A section of PVC was driven into the bayou bottom as far as possible. Then another section of PVC was connected with a coupling to the base PVC. The top section of PVC had strips of duct tape placed 3" apart starting from the top and spaced to the bottom. In addition, each staff gauge was perforated to facilitate water flow.

#### Update of Staff Gauges

SG-1, SG-2, and SG-3 have been destroyed by surging water between the time of installation and the date of this report. To resolve this problem we suggest that future staff gauges be constructed of steel pipe. This can be done with several 5' sections connected with threaded steel couplings. The bottom section will be driven as far as possible and then joined to another section with a coupling. These sections will be marked with duct tape 3" apart starting from the top.

### Location of Piezometers

PZ-1 was placed in the northeast corner of the Inactive Disposal Area because of substantial overgrowth and uneven ground between the "mound" and Pond A. Ground water was not encountered in the upper 25 feet of soil in boring PZ-1. PZ-1A was placed on the north side of the dike road between Ponds A and B to provide additional water level data between the Inactive Disposal Area and MW-1 and due to access problems further west at the original location of PZ-3. PZ-2 was placed on the south side of the dike road on the south side of Pond C. It was placed here due to the access problems to the north of MW-5 caused by the sidewall slope of the Inactive Disposal Area. PZ-4 was placed according to its original planned location with no access problems.

### Existing Monitor Wells

Monitor Wells No. 5,6, and 8 are 2" inside diameter (I.D.) wells while Monitor Wells No. 1,2, and 4 are 4" (I.D.) wells. MW-7 completed near grade couldn't be located for the December measurements by its placement on the map due to substantial overgrowth, mud, and water. MW-3 was not measured in December because of high water in Hennessey's Bayou.

### Existing Ponds

The "Interim Status Surface Impoundment" has been sub-divided by two dike-roads into three separate ponds labeled A,B, and C. Pond A is fed by a discharge pipe from the plant. In turn, Ponds A and B are joined by an intake-discharge structure. Pond C is joined to Pond A by a 10 foot cutaway section of the dike road. These two ponds are only joined when the water level rises above EL. 103 MSL.

### 3.0 DATA ANALYSIS

#### 3.1 SITE STRATIGRAPHY

The site stratigraphy was developed in three cross-sections from the borings drilled as part of this project and the available boring logs from previous studies. Figures 2 and 3 present the three cross-sections. The shallow stratigraphy at the site can be characterized by the following general horizons:

- o A silty clay (fill) extends from the land surface to a depth of 6 to 7 feet.
- o A silty clay-clayey silt to silt at depths ranging from 7 to 48 feet below ground surface.
- o The third horizon is primarily a "marl" of undetermined thickness starting at a depth of 38 to 49 feet. Above this zone is a thin layer of sandy clay to clayey sand averaging 4 to 8 feet thick.

Pleistocene loess underlies the ground surface at the Vertac plant and vicinity. Loess is a depositional product of eolian, or wind blown, transport of silty sediments. The loess in the Vicksburg area is, typically, homogeneous, massive silt with variable clay content. Underlying the loess is a sandy clay and marl which constitutes the Bryam member of the Vicksburg Formation. The bed-rock, which underlies this region, consists of the Glendon limestone of the Vicksburg formation and under the limestone is the Jackson formation. This report is only concerned with the loess and the sandy clay/marl zones.

#### 3.2 SOIL SAMPLES

Three soil samples taken during the installation of PZ-1 at depths of 18.5'-19.0', 28.5'-29.0', and 38.5'-39.0' were selected for hydrometer and grain size laboratory testing. The purpose of these tests was to confirm the subsurface geologic conditions related to the possible

location of water bearing zones versus aquitards. The results of the grain size testing are shown on Table 1.

The laboratory tests reveal a predominately silt layer throughout the entire zone above the confining marl. There is a small percentage of clay present within the silt. Although characterized as a silt, this layer could be called a clayey-silt zone. This condition suggests that the ground water beneath the site is bounded by a lower confining layer (marl) and an upper clayey loess acting as only a semi-confining layer.

### 3.3 WATER LEVEL MEASUREMENTS

Two sets of water level measurements were made (December 1984 and February 1985) using both the existing monitor wells and the recently installed piezometers. The results of the measurement program are in Table 2 and Table 3. Potentiometric contour maps are presented displayed graphically in Figures 4a and 4b. Generally, the shallow ground water moves in a north to south direction as previously determined; however, the results of this program provide additional detail concerning ground water flow in the vicinity of the Interim Status Surface Impoundment and the Inactive Disposal Area.

Mounding is apparent in the vicinity of both PZ-4 and PZ-1. Both features can be associated with attendant topographic highs. In the case of PZ-4 a natural ridge line extending west to east is judged the cause of the localized mounding (see Figure 5). In the case of PZ-1, the local topographic feature is the above-grade Inactive Disposal Area. The consistently high water levels associated with PZ-1 are judged to be caused by mounding within the Inactive Disposal Area.

Finally, as shown in Figures 4a and 4b the local surface water bodies (Stout's Bayou, Hennessey's Bayou) directly affect gradient and flow direction in the shallow ground water.

## 4.0 CONCLUSIONS

### 4.1 SUBSURFACE SOIL CONDITIONS

The initial characterization of subsurface soil conditions (see data presented in Appendix A) is reasonably accurate. The shallow loess material which overlies the marl can be characterized as clayey silt and silty clay. The specific particle size and classification data on the special soil samples from boring PZ-1 do not identify any stratigraphic changes with depth; however, this could be due to artificial disturbance of the surface soils or very localized conditions. The fact that there is no apparent ground water mound under the Interim Status Surface Impoundments strongly suggests a silty clay layer (see Figures 2 and 3) which retards or prevents vertical migration of leachate.

### 4.2 HYDROGEOLOGIC CONDITIONS

The gradient and flow direction of the ground water contained within the loess above the marl are affected by natural and man-made topographic features. As shown in Figures 6a and 6b, Stout's Bayou and Hennessey's Bayou definitely cause localized increases in gradient. The elevation differential between the stream bottoms (80-90' FT MSL) and the ground water levels (90-100 FT MSL) will tend to draw down the water table in the vicinity of the bayous.

The elevated water levels consistently recorded in PZ-1 have been interpreted as a localized mound under the Inactive Disposal Area. For health and safety reasons, no piezometers have been installed directly into the landfill and PZ-1 is believed to be located on the edge of the identified mound. The interpretation of this feature as it effects ground water contours is displayed on Figures 6a and 6b. These data show that MW-1 is, in fact, down gradient of PZ-1 and any leachate mound associated with the Inactive Disposal Area. However, in order to effect ground water quality in MW-1, the leachate plume would have to move perpendicular to the gradient or experience significant lateral dispersion along its flowpath.

**TABLE 1**  
**SOIL SAMPLES**  
**CLASSIFICATION AND PARTICLE SIZE ANALYSES**  
**(FROM BORING PZ-1)**

SAMPLE NO.	<u>ST-1</u>	<u>ST-2</u>	<u>ST-3</u>
DEPTH, FT	18.5-19.0	28.5-29.0	38.5-39.0
DESCRIPTION	TAN SILT	GRAY SILT	LIGHT TAN SILT
SAND, %	0	0	0
CLAY-SILT, % (Fines)	100	100	100

TABLE 2  
 WATER LEVEL DATA<sup>(1)</sup>  
 DECEMBER, 1984  
 VERTAC CHEMICAL CORPORATION  
 VICKSBURG, MISSISSIPPI

	PZ-1	PZ-1A	PZ-2	PZ-4	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	SG-3	SG-4
DEPTH TO WATER <sup>(2)</sup>	8.48	5.97'	14.70'	4.50'	3.12'	6.69'	-(3)	4.55'	13.63'	8.10'	-(3)	6.08'	-	-
PVC STICK-UP	2.10'	2.00'	1.90'	1.90'	1.46'	0.64'	-(3)	2.42'	0.60'	0.10'	-(3)	1.00'	-	-
GROUND ELEVATION	116.64'	111.03'	110.55'	112.34'	111.55'	107.57'	-(3)	112.28'	99.70'	98.68'	-(3)	109.83'	83.97'	-
WATER ELEVATION	110.26'	107.06'	97.75'	109.74'	109.89'	101.53'	-(3)	110.15'	86.67'	90.68'	-(3)	104.75'	89.15'	106.12'

(1) Water level measurements recorded on December 8, 1984.

(2) Depth to water from top of PVC.

(3) MW-3 and MW-7 could not be located in the field.

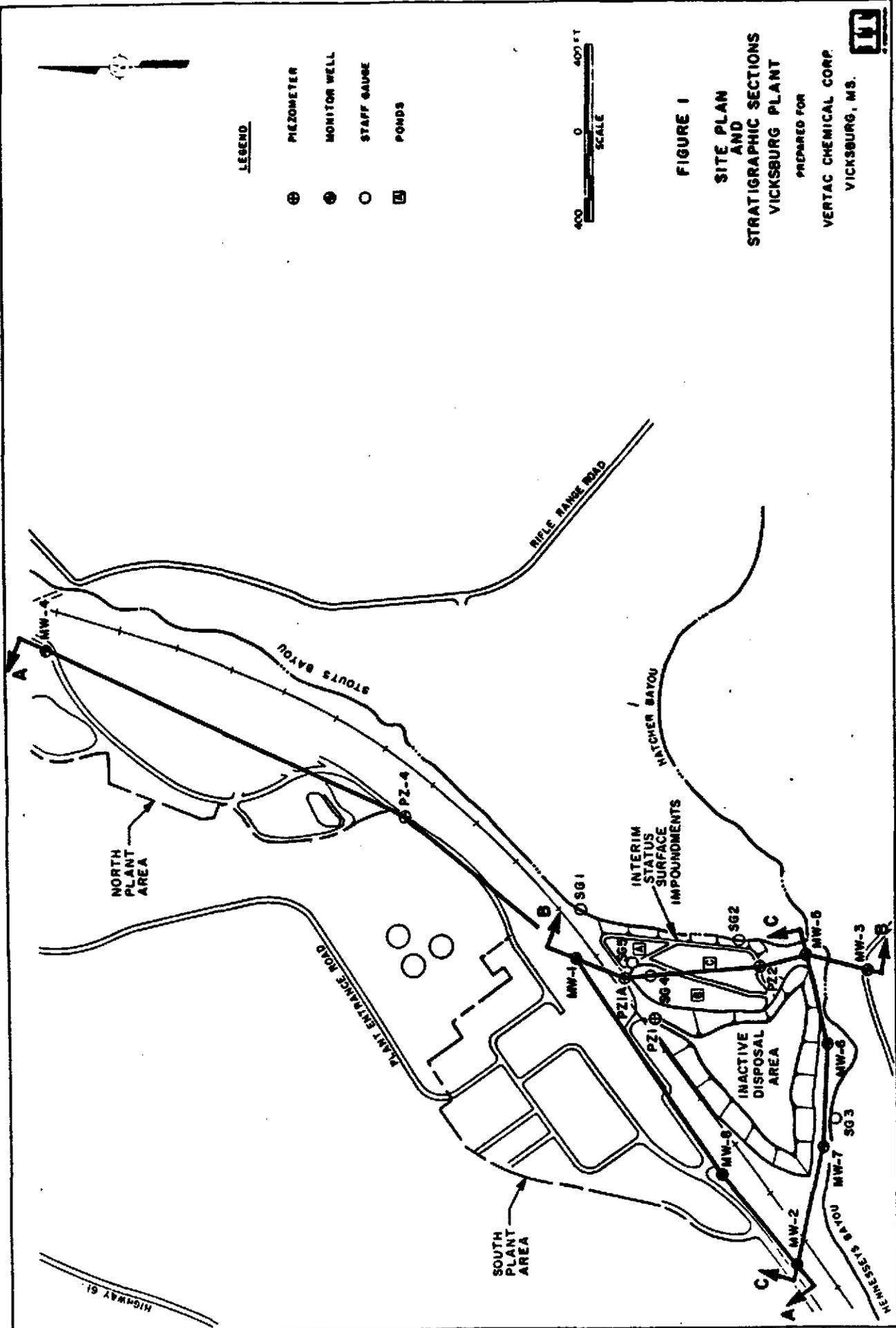
Note: SG-1 and SG-2 were destroyed several weeks after placement.

TABLE 3  
 WATER LEVEL DATA<sup>(1)</sup>  
 FEBRUARY, 1985  
 VERTAC CHEMICAL CORPORATION  
 VICKSBURG, MISSISSIPPI

	PZ-1	PZ-1A	PZ-2	PZ-4	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	SG-1	SG-2	SG-3
DEPTH TO WATER <sup>(2)</sup>	7.5'	6.25'	14.0'	3.91'	3.75'	7.08'	5.75'	4.83'	12.0'	8.91'	2.95'	6.16'	-	-	-
PVC STICK-UP	2.10'	2.00'	1.90'	1.90'	1.46'	0.64'	.89'	2.42'	0.60'	0.10'	.20'	1.00'	-	-	-
GROUND ELEVATION	116.64'	111.03'	110.55'	112.34'	111.55'	107.57'	98.44'	112.28'	99.70'	98.68'	99.13'	109.83'	87.56' <sup>(3)</sup>	85.86' <sup>(3)</sup>	83.97' <sup>(3)</sup>
WATER ELEVATION	111.24'	106.78'	98.45'	110.33'	109.26'	101.13'	92.69'	109.87'	88.30'	89.87'	96.38'	104.67'	88.17'	86.66'	87.07'

- (1) Water level measurements recorded on February 18, 1985.  
 (2) Depth to water from top of PVC.  
 (3) Elevation of bayou bottom where staff gauges were placed.

Note: SG-3 was destroyed since 12/84.



**LEGEND**

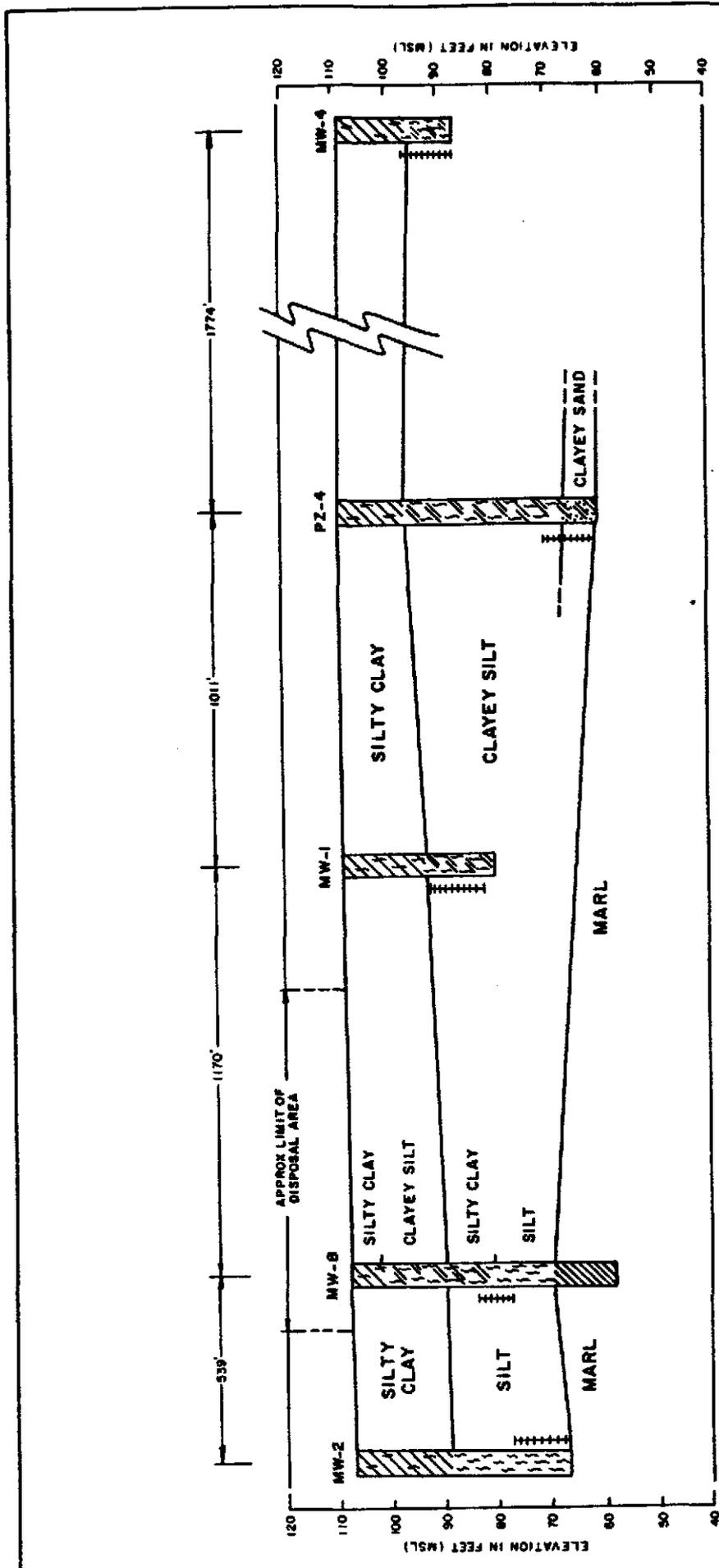
- ⊕ PIZOMETER
- ⊙ MONITOR WELL
- STAFF GAUGE
- PONDS



**FIGURE 1**  
**SITE PLAN AND**  
**STRATIGRAPHIC SECTIONS**  
**VICKSBURG PLANT**  
 PREPARED FOR  
**VERTAC CHEMICAL CORP.**  
**VICKSBURG, MS.**



DRAWN BY	2/22/85	APPROVED BY	
DRS		CHECKED BY	
DRAWING NUMBER 846545			

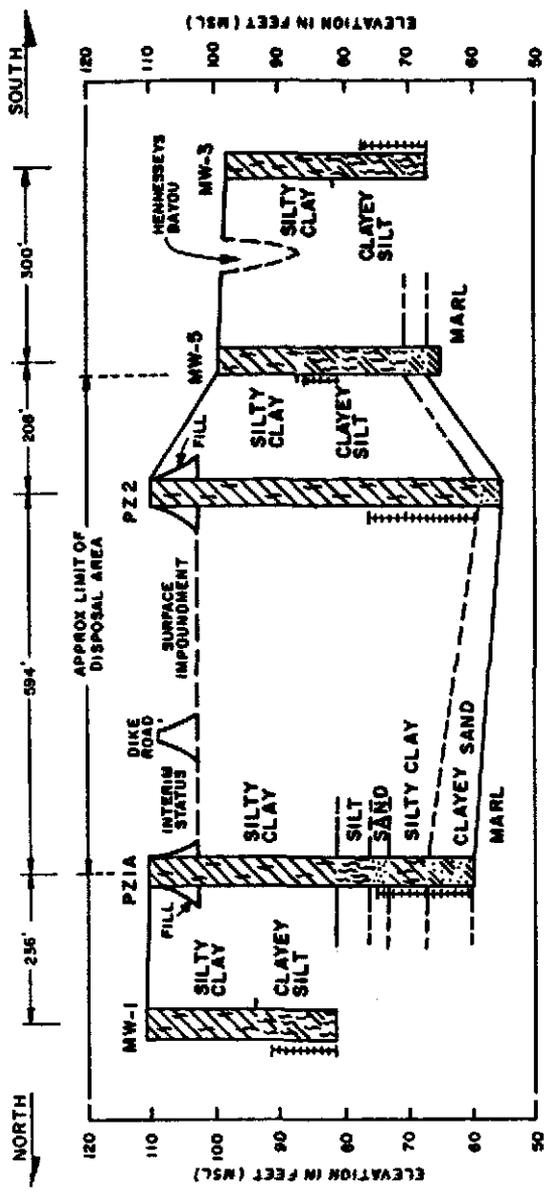


**SECTION A-A**

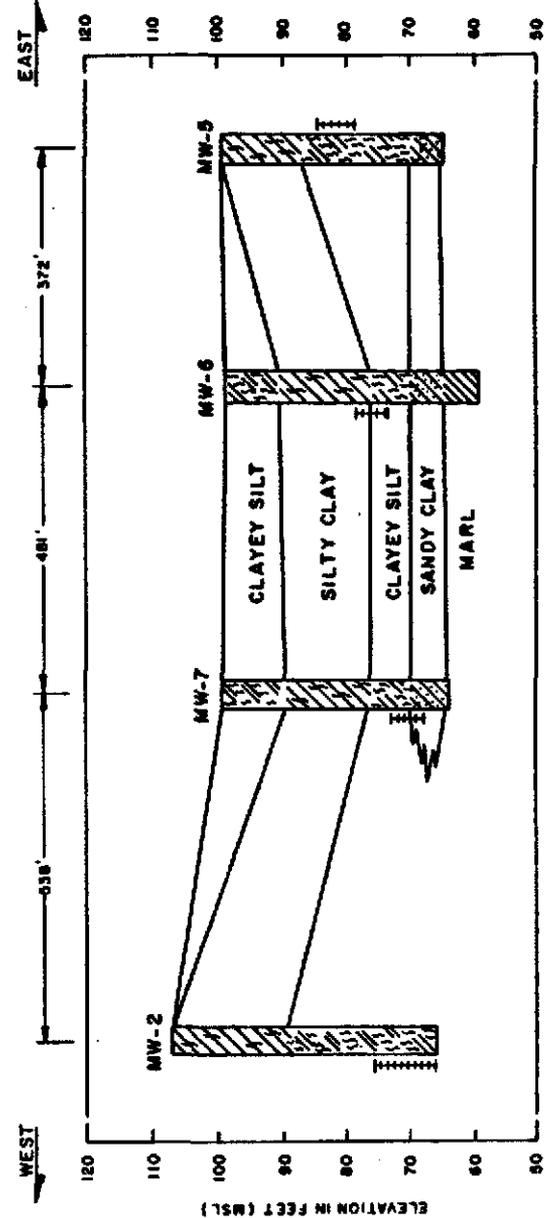
**FIGURE 2**  
**SECTION A-A**  
**VICKSBURG PLANT**  
 PREPARED FOR  
**VERTAC CHEMICAL CORP.**  
**VICKSBURG, MS.**



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APPROVED BY	
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SECTION B-B



SECTION C-C

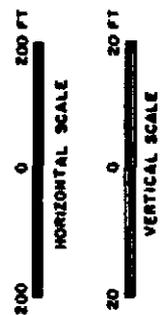
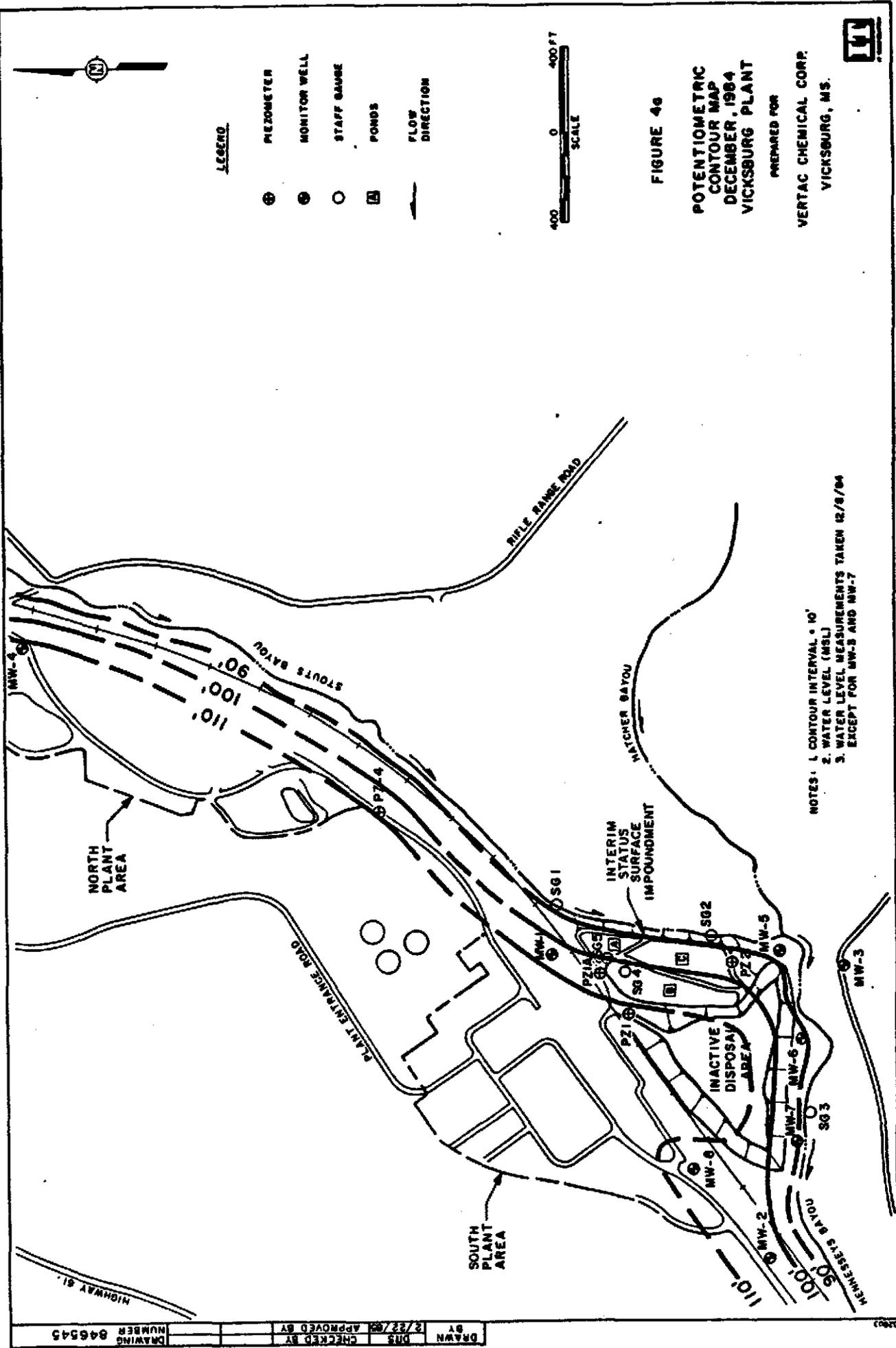


FIGURE 3  
SECTION B-B & C-C  
VICKSBURG PLANT  
PREPARED FOR  
VERTAC CHEMICAL CORP.  
VICKSBURG, MS



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CHECKED BY [ ]  
DATE 2/7/83  
APPROVED BY [ ]



**LEGEND**

- ⊕ PEZOMETER
- ⊙ MONITOR WELL
- STAFF GAUGE
- POND
- FLOW DIRECTION



**FIGURE 40**

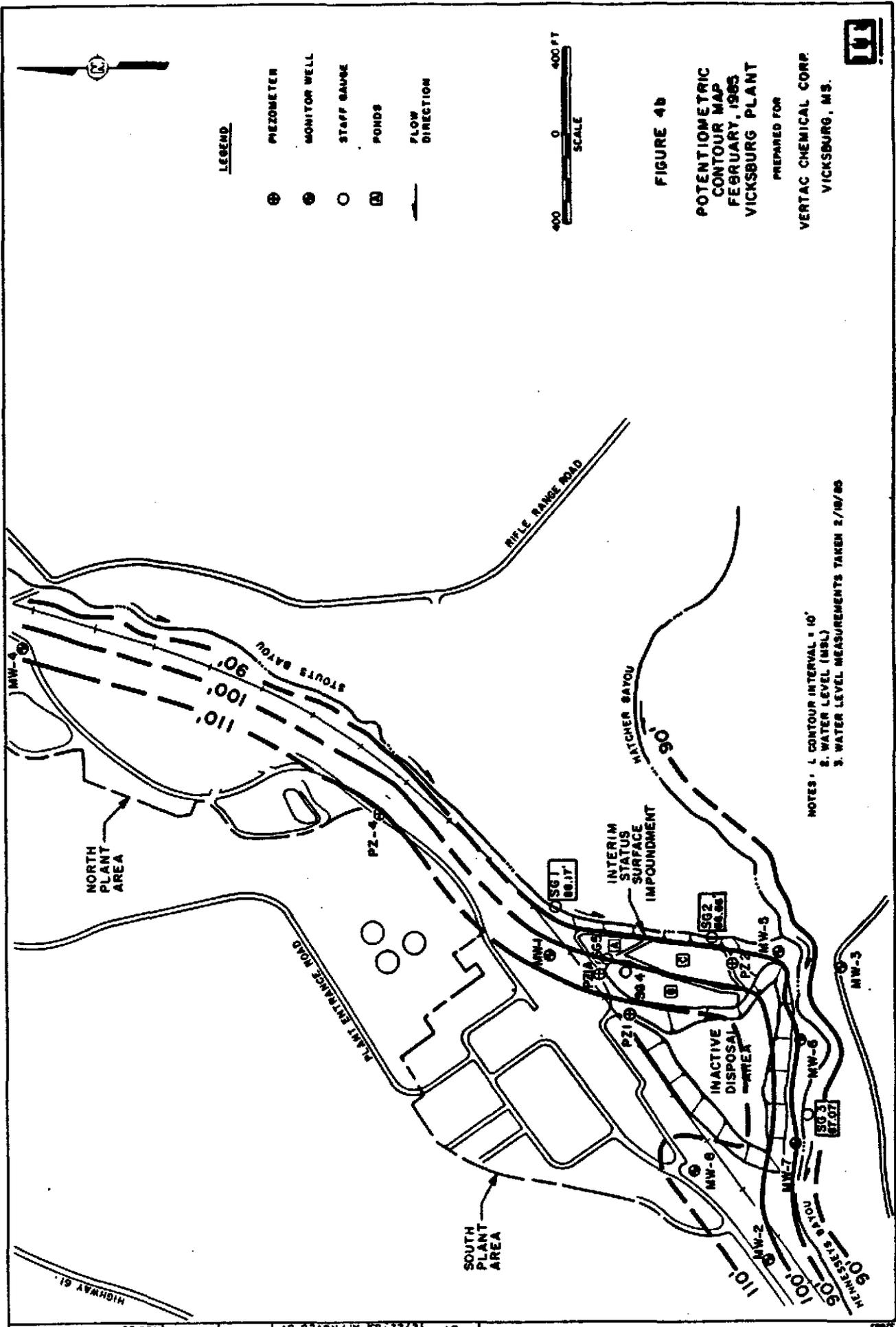
**POTENTIOMETRIC  
CONTOUR MAP  
DECEMBER, 1984  
VICKSBURG PLANT**

PREPARED FOR  
**VERTAC CHEMICAL CORP.  
VICKSBURG, MS.**



**NOTES:**  
1. CONTOUR INTERVAL = 10'  
2. WATER LEVEL (MSL)  
3. WATER LEVEL MEASUREMENTS TAKEN 12/9/84  
EXCEPT FOR MW-5 AND MW-7

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**LEGEND**

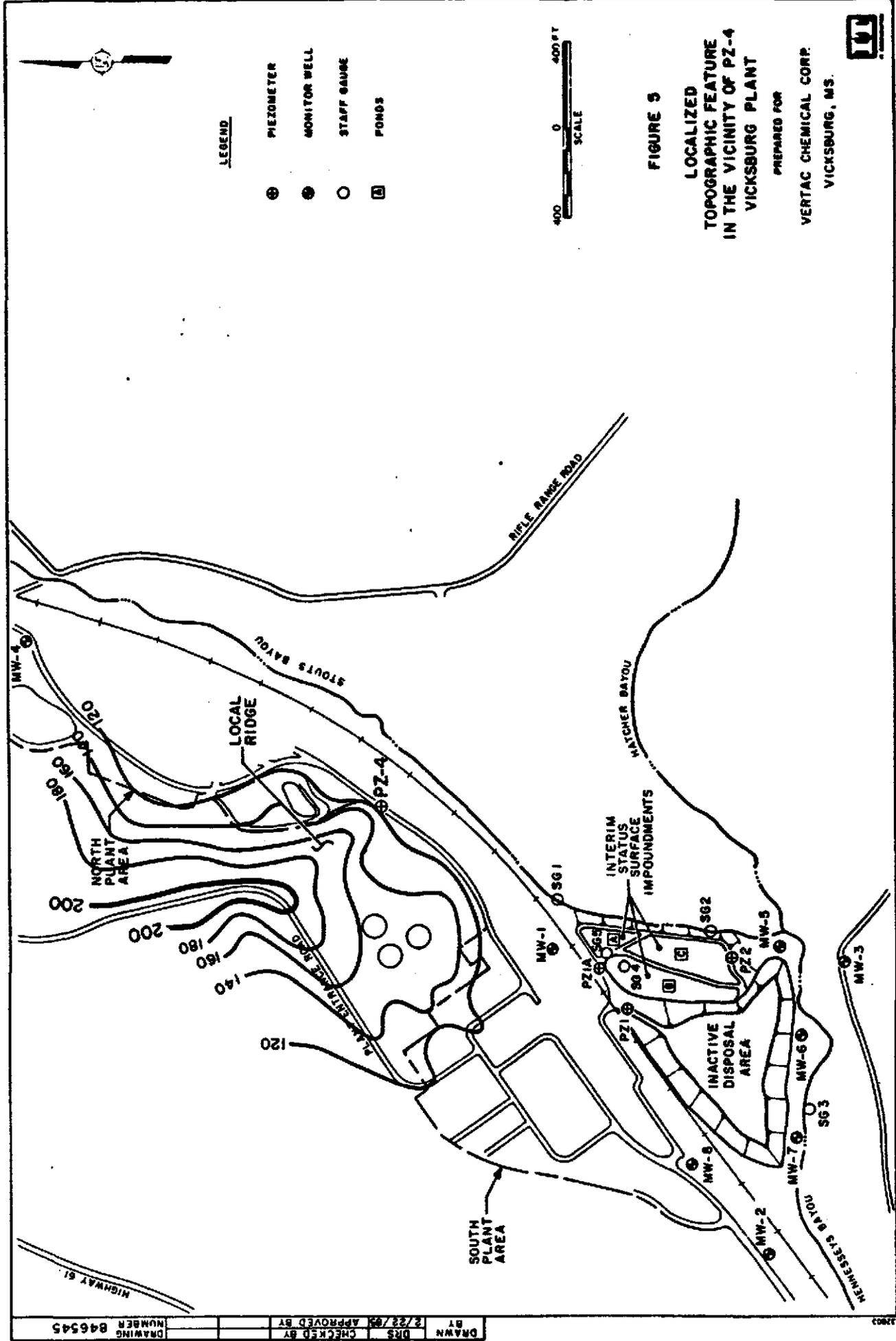
- ⊕ PIEZOMETER
- ⊙ MONITOR WELL
- STAFF GAUGE
- PONDS
- FLOW DIRECTION



**FIGURE 4b**  
**POTENTIOMETRIC  
 CONTOUR MAP**  
**FEBRUARY, 1985**  
**VICKSBURG PLANT**  
 PREPARED FOR  
**VERTAC CHEMICAL CORP.**  
**VICKSBURG, MS.**

NOTES: 1. CONTOUR INTERVAL = 10'  
 2. WATER LEVEL (MSL)  
 3. WATER LEVEL MEASUREMENTS TAKEN 2/19/85

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 DRS CHECKED BY  
 8/22/85 APPROVED BY



**LEGEND**

- ⊙ PIEZOMETER
- ⊖ MONITOR WELL
- STAFF GAUGE
- POND

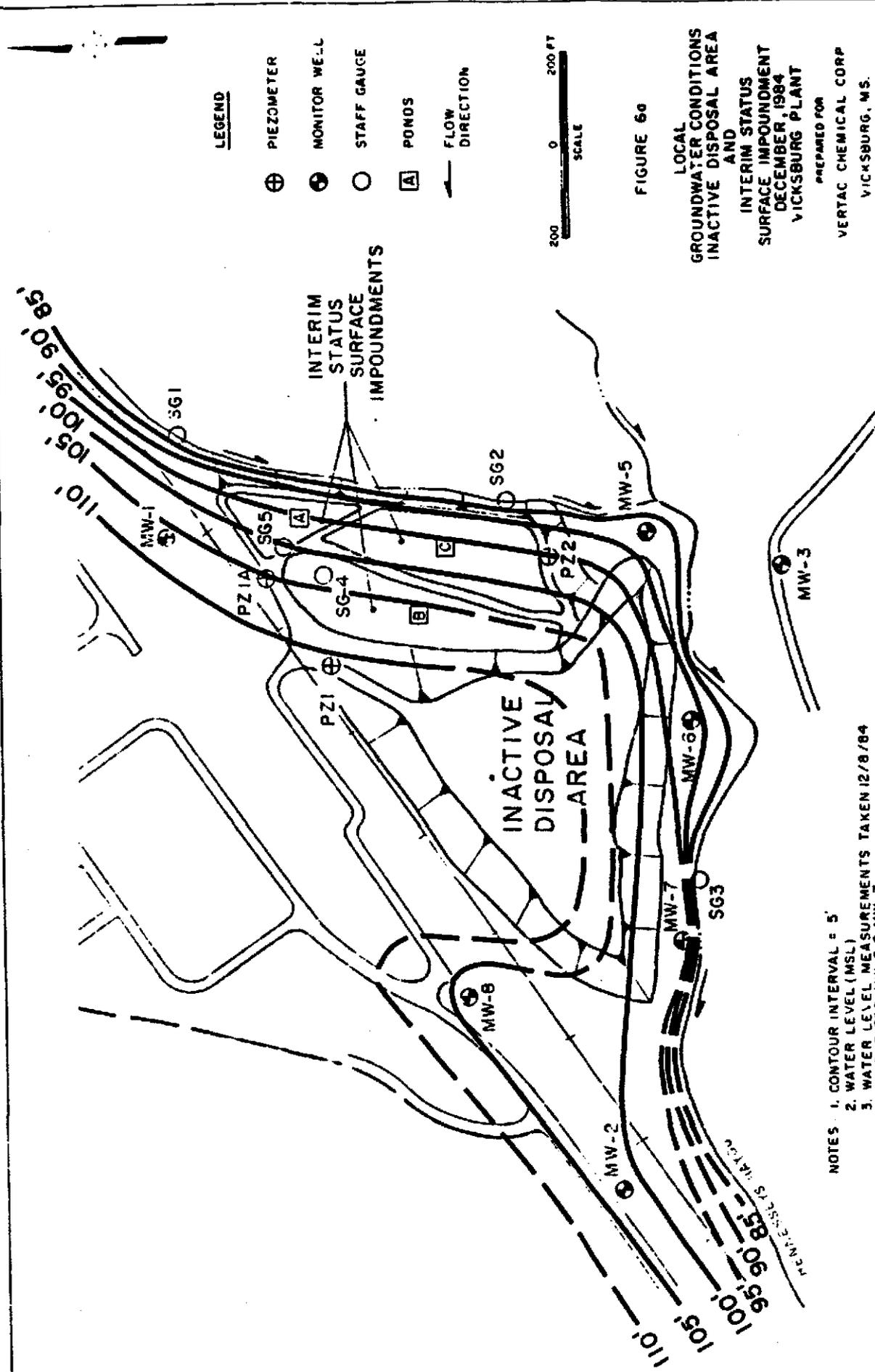


**FIGURE 3**  
**LOCALIZED**  
**TOPOGRAPHIC FEATURE**  
**IN THE VICINITY OF PZ-4**  
**VICKSBURG PLANT**  
 PREPARED FOR  
 VERTAC CHEMICAL CORP.  
 VICKSBURG, MS.



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DRAWING NUMBER	846545				





- LEGEND**
- ⊕ PIEZOMETER
  - ⊗ MONITOR WELL
  - STAFF GAUGE
  - POND
  - FLOW DIRECTION



FIGURE 60

LOCAL  
GROUNDWATER CONDITIONS  
INACTIVE DISPOSAL AREA  
AND  
INTERIM STATUS  
SURFACE IMPOUNDMENT  
DECEMBER, 1984  
VICKSBURG PLANT  
PREPARED FOR  
VERTAC CHEMICAL CORP  
VICKSBURG, MS.



- NOTES
1. CONTOUR INTERVAL = 5'
  2. WATER LEVEL (MSL)
  3. WATER LEVEL MEASUREMENTS TAKEN 12/8/84 EXCEPT FOR MW-3 & MW-7

Alan



IT CORPORATION

November 8, 1984

Mr. R. D. Karkkainen  
Director-Environment & Safety  
Vertac Chemical Corporatin  
5100 Poplar, 24th Floor  
Memphis, TN 38137

Project No. 846545

VICKSBURG GROUNDWATER ASSESSMENT

Dear Dick:

In accordance with your letter of October 5, 1984, we have completed several of the required work tasks as outlined in the Groundwater Assessment Plan. More specifically we have completed the following items:

1. Stratigraphic Cross-Sections (Figures B,C, and D). We have prepared three cross-sections using the existing boring data. The soil boring logs prepared by both previous contractors were used for this task. It should be noted that the change from silty clay to clayey silt is subtle and more detailed information from the new piezometers will better define this interface. The stratigraphic sections attached to this letter also show the well screening interval and the water levels recorded on March 4, 1983. Please note that wells #1-#4 were installed by one contractor while wells #5-#8 were installed by another contractor.
2. Existing Hydrogeologic Data. The compilation of water level measurements (made on March 4, 1983) is included on the attached stratigraphic logs. These data and their presentation also suggest that MW-1 is an upgradient well relative to the impoundment and the inactive disposal area. You might note that there is a significant distance between MW-1 and MW-5 (section B-B). If there is a gradient change in the vicinity of the Interim Status Impoundment, the additional piezometers proposed for that area should detect an elevated in water level.

We have also reviewed the data contained in the contractors' reports concerning soil permeability. We feel that their calculations are appropriate given the

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geologic conditions at the site; however, there are inconsistencies based on different interpretations of soil stratigraphy. In addition, groundwater flow velocity will be affected if hydraulic gradient changes are present across the site. Data from the new piezometers should resolve these inconsistencies.

3. Monthly water level measurements. We are proposing that four new piezometers be installed at the locations shown in Figure E. We are also proposing that three stream level gauging stations and one pond level station be established as shown in Figure E. When the piezometers are installed, an elevation survey should be performed to establish benchmark elevations for the new piezometers, to check the elevations of the existing wells and establish the levels for the four staff gauges. The first set of water level measurements can then be taken at all stations (eight (8) monitor wells, four (4) piezometers, four (4) staff gauges).
4. Appendix VIII Constituents. Also attached is a memo summarizing my discussions with analytical laboratories capable of testing for Appendix VIII constituents. We can use this as a basis for selecting the appropriate lab and for identifying target parameters.
5. Well Samples. This task should be completed as soon as a lab is selected. The lab should be required to provide sample kits (bottles, coolers, preservative). The actual sampling could be done by either John Hill or IT. We do recommend that a detailed sampling procedure be documented and followed.

Following completion of items 3, 4 and 5 we will be in a much better position to evaluate the outcome of the groundwater assessment. If you have any questions, please contact me at (713) 784-2800.

Sincerely,



Alan Gradet  
Project Manager

APG:gd

Attachment



INCORPORATION

# Memorandum

To R. D. Karkkainen, Vertac Chemical

Date

November 6, 1984

From A. P. Gradet, IT-Houston *AG*

Project No. 846545

Subject

GROUNDWATER TESTING FOR APPENDIX VIII  
CONSTITUENTS - VICKSBURG PLANT

Several analytical laboratories have been contacted concerning test protocols and projected costs for the analysis of Appendix VIII constituents in groundwater. None of the facilities contacted has implemented the Hierarchical Analysis Protocol (HAP) proposed by EPA on October 1, 1984. Based on the information gathered, three other approaches are potentially feasible at this time.

1. MODIFIED SCREENING ANALYSIS FOR ALL APPENDIX VIII CONSTITUENTS

The protocols used for testing groundwater for all Appendix VIII constituents do include some screening procedures. For example, Appendix VIII includes 51 metals and metal compounds. Under this method only the total metal concentrations will be quantified as an indicator of the possible concentrations of the 51 metal compounds. Similarly, one analysis for total cyanides will be used to indicate concentrations of the fourteen cyanide compounds.

This procedure would not include analyses for the 23 compounds which are unstable in water or for which there are no analytical methods. Analysis for dioxin (2,3,7,8-TCDD) and formaldehyde is included. The estimated cost is \$4060.00 per sample.

2. MODIFIED APPENDIX VIII

This protocol is based on a procedure recently prepared for the petroleum industry. In this case, twenty-four specific Appendix VIII constituents were identified as being of importance in addition to those constituents which are also Priority Pollutants. The significance of the priority pollutants is that most analytical laboratories with GC/MS capability are set up to efficiently analyze water samples for priority pollutants. The cost is normally on the order of \$1000.00.

In this case it would be necessary to identify compounds of interest beyond the standard priority pollutant list. An additional fee of \$20.00 per parameter would be charged. The anticipated total cost would be on the order of \$2000-3000 based on identifying 50 to 100 additional parameters. Costs could be controlled by using classes of compounds (i.e. dichlorobenzenes for all possible isomers) and total methods as indicators of similar compounds; however, the qualitative selection process must still be performed.

### 3. DIRECT TESTING FOR ALL APPENDIX VIII CONSTITUENTS

No laboratories have been contacted to estimate the cost for direct testing because the above two techniques are available and direct testing would be economically unacceptable (expect costs on the order of \$5000-10,000 per sample).

Either of the first two methods will probably be acceptable to the state of Mississippi and the Region IV, EPA. Once a technique is selected a brief review of the proposed screening procedure with the appropriate state personnel is probably advisable.

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NO. [ ]/ [ ]/ [ ] APPROVED BY [ ]  
DRAWING NUMBER 846845-0

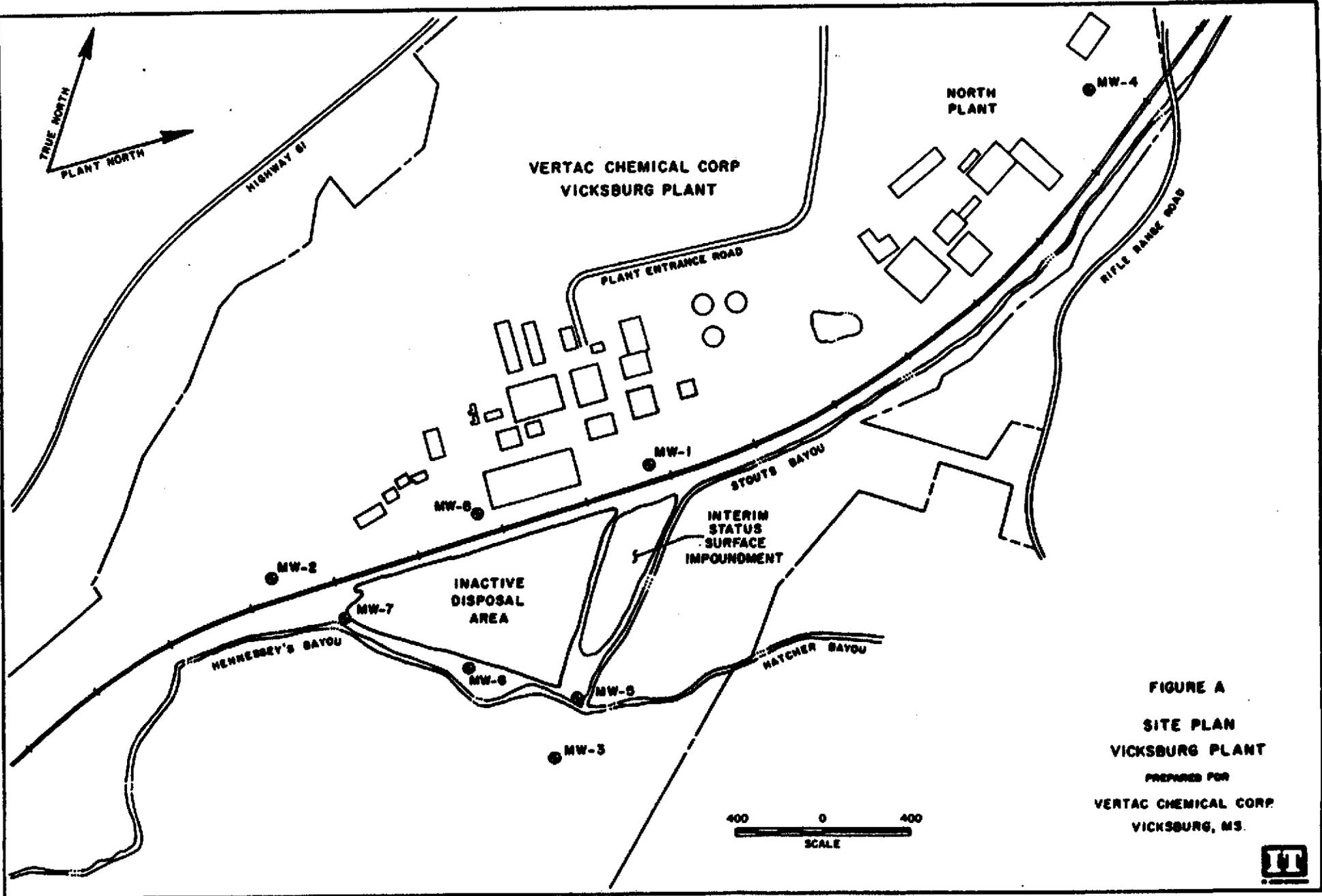


FIGURE A  
SITE PLAN  
VICKSBURG PLANT  
PREPARED FOR  
VERTAC CHEMICAL CORP  
VICKSBURG, MS.



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DATE 10/18/84 APPROVED BY [ ]

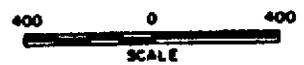
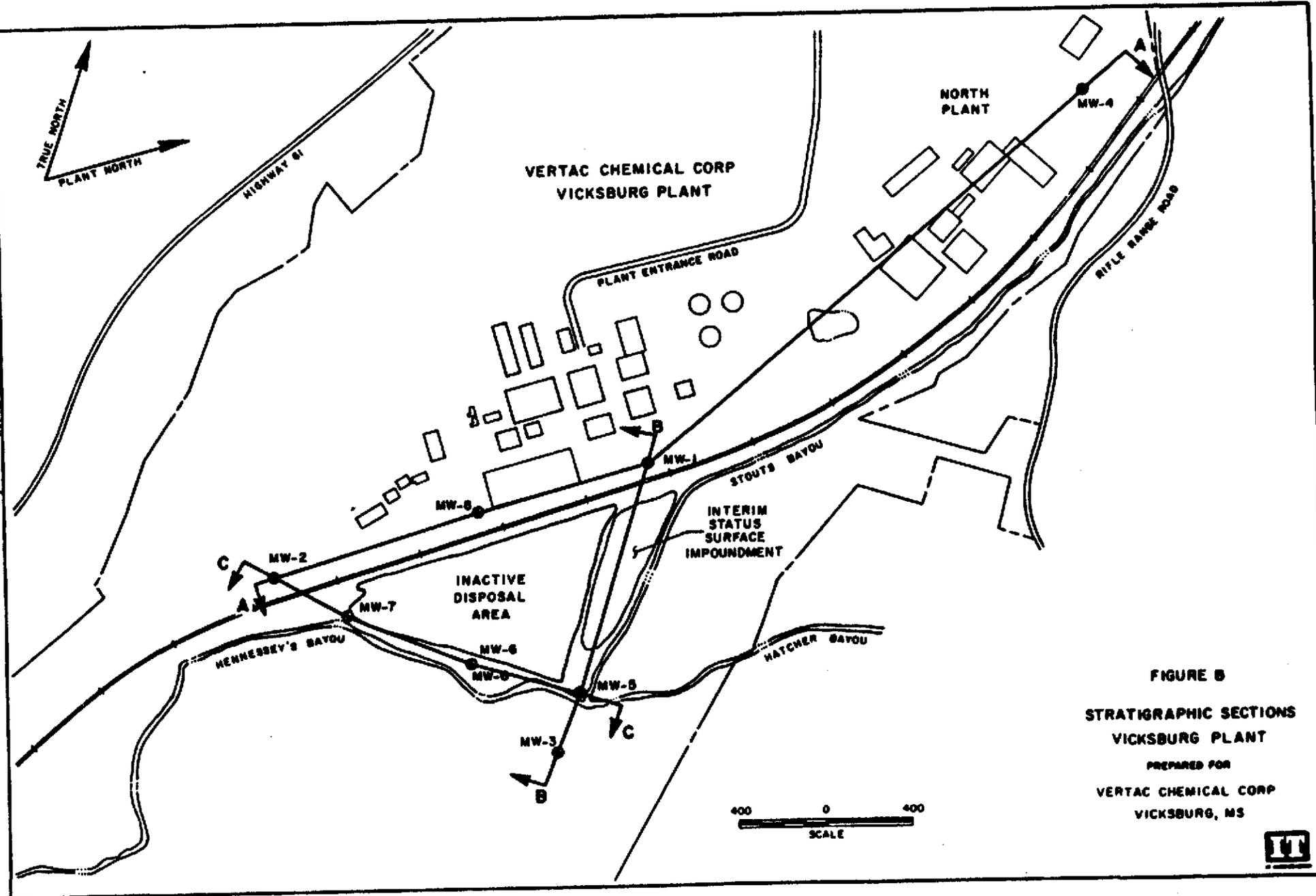
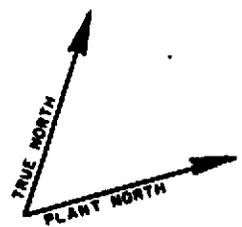
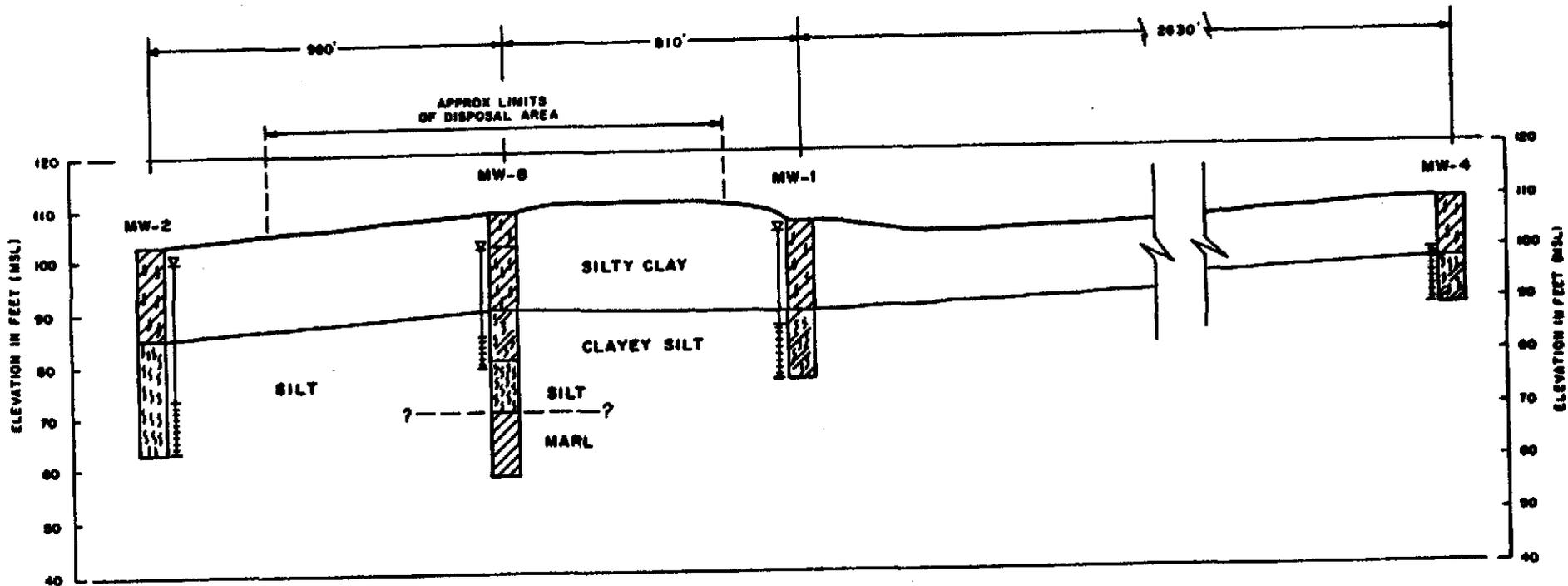


FIGURE B  
STRATIGRAPHIC SECTIONS  
VICKSBURG PLANT  
PREPARED FOR  
VERTAC CHEMICAL CORP  
VICKSBURG, MS



DRAWN BY [ ] CHECKED BY [ ] APPROVED BY [ ]  
 DRAWING NUMBER 846545-B



**SECTION A-A**



NOTES: 1. WATER LEVELS ARE THOSE REPORTED FOR MARCH 4, 1963.

2. STRATIGRAPHY SHOWN IS INTERPRETATION OF EXISTING BORING LOGS. SUBTLE VARIATIONS IN REPORTED SILT CONTENT ARE SHOWN.

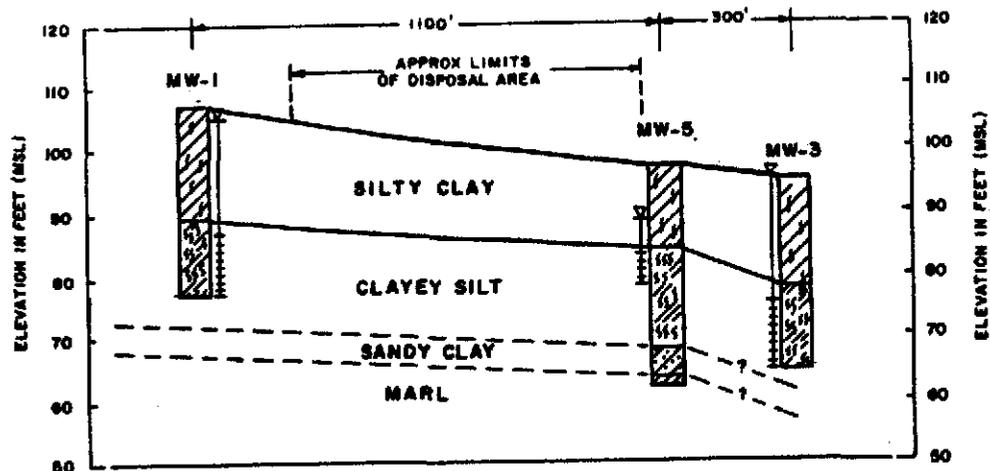
**FIGURE C**

**SECTIONS A-A  
 VICKSBURG PLANT**

PREPARED FOR  
**VERTAC CHEMICAL CORP.  
 VICKSBURG, MS.**



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 CHECKED BY: [ ]  
 DATE: 10/22/82  
 APPROVED BY: [ ]  
 DRAWING NUMBER: 846545-B



NOTES: 1. WATER LEVELS ARE THOSE REPORTED FOR MARCH 4, 1983.  
 2. STRATIGRAPHY SHOWN IS INTERPRETATION OF EXISTING BORING LOGS. SUBTLE VARIATIONS IN REPORTED SILT CONTENT ARE SHOWN.

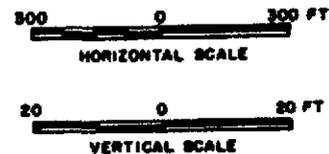
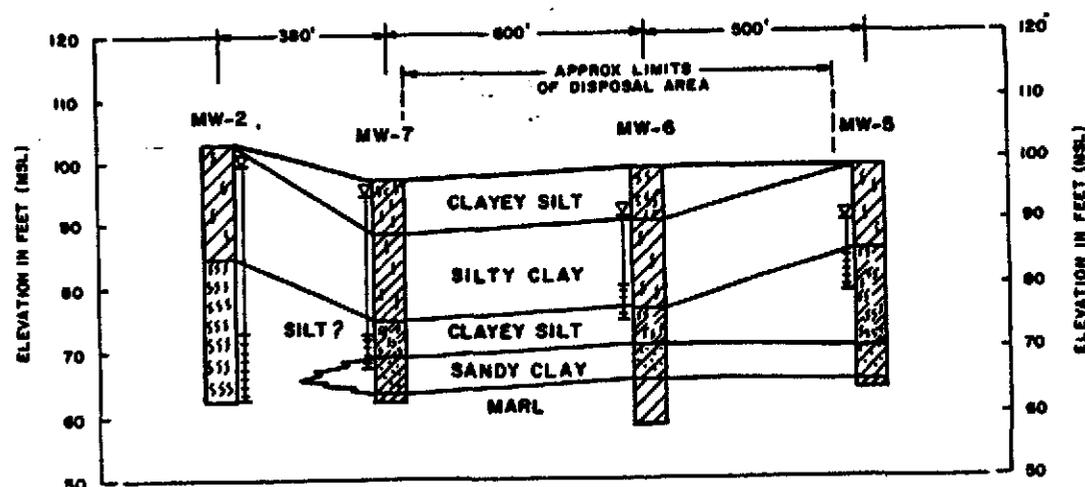
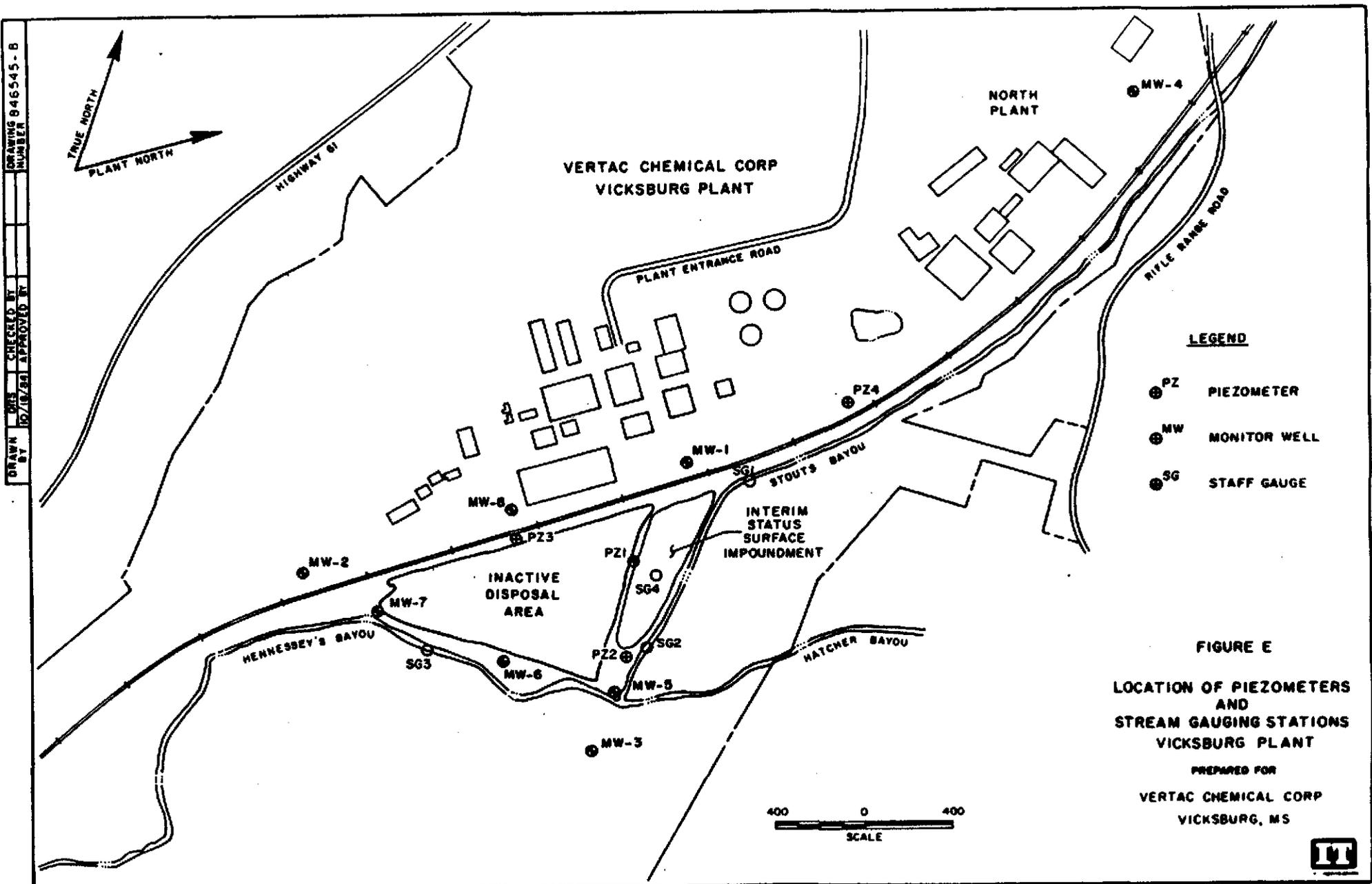


FIGURE D  
 SECTIONS B-B & C-C  
 VICKSBURG PLANT  
 PREPARED FOR  
 VERTAC CHEMICAL CORP.  
 VICKSBURG, MS.



DRAWN BY [ ] CHECKED BY [ ]  
 NUMBER [ ] APPROVED BY [ ]



- LEGEND**
- ⊙ PZ PIEZOMETER
  - ⊙ MW MONITOR WELL
  - ⊙ SG STAFF GAUGE

**FIGURE E**  
**LOCATION OF PIEZOMETERS AND  
 AND  
 STREAM GAUGING STATIONS  
 VICKSBURG PLANT**  
 PREPARED FOR  
**VERTAC CHEMICAL CORP  
 VICKSBURG, MS**

400 0 400  
 SCALE





**Professional Service Industries, Inc.**  
National Soil Services Division

IT Corporation  
2925 Briarpark, Suite 400  
Houston, Texas 77042

Report No. 286-45209  
December 28, 1984

Attention: Mr. John Daniels

**HYDROMETER AND GRAIN SIZE ANALYSIS  
VERTAC CHEMICAL**

Gentlemen:

We are pleased to submit the results of the testing specified above. This testing was authorized by your Purchase Order No. H084-156 dated December 18, 1984.

Three copies of the gradation curves are being transmitted herewith.

We trust that the results will assist in the completion of your project. We appreciate the opportunity to perform this testing. Please call upon us if you have any questions.

Very truly yours,

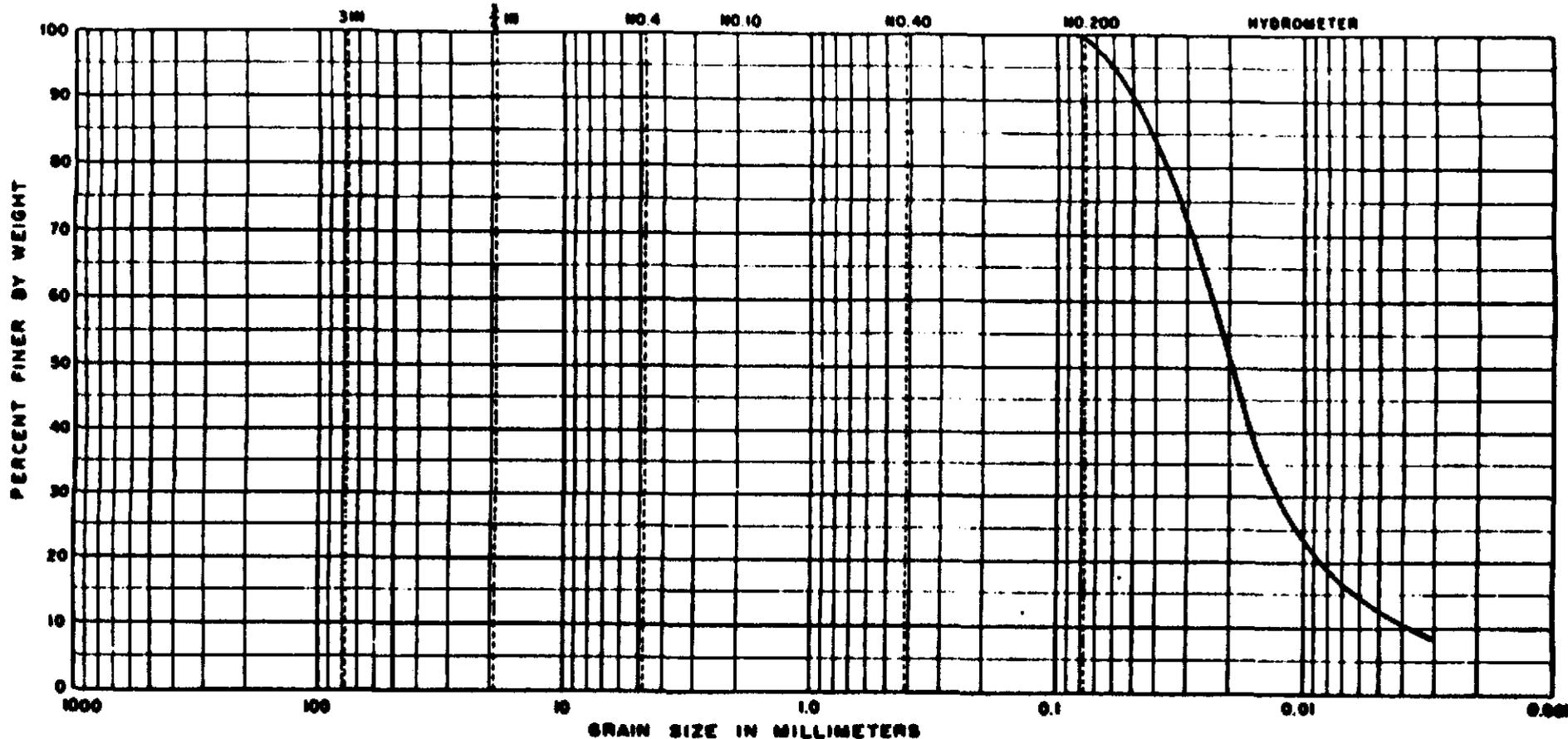
NATIONAL SOIL SERVICES DIVISION

A handwritten signature in cursive script that reads "Ron H. Pitts".

Ron H. Pitts, P.E.,  
Project Engineer

RHP:ig  
Copies submitted: 3

U. S. STANDARD SIEVE SIZE



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE	ELEV-DEPTH	CLASSIFICATION	NAT. WC	LL	PL	PI

Boring No: PZ-1  
 Sample No: ST-1  
 Depth, Ft: 18.5 - 19.0  
 Description: Tan silt

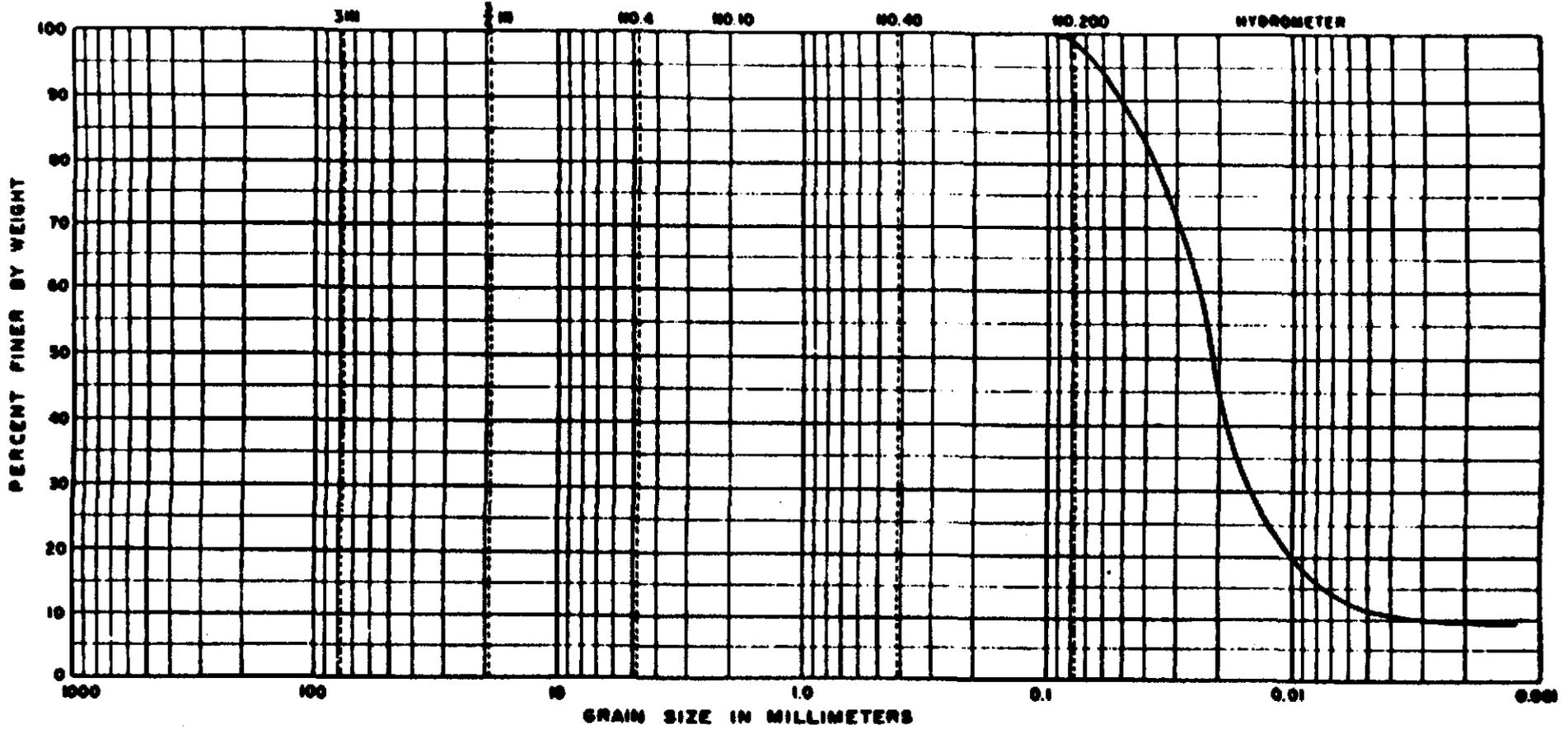
GRADATION CURVES

PLATE 1

NATIONAL SOIL SERVICES  
 CONSULTING ENGINEERS

NATIONAL BUREAU OF STANDARDS  
 CONSTRUCTION INDUSTRY

U. S. STANDARD SIEVE SIZE



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

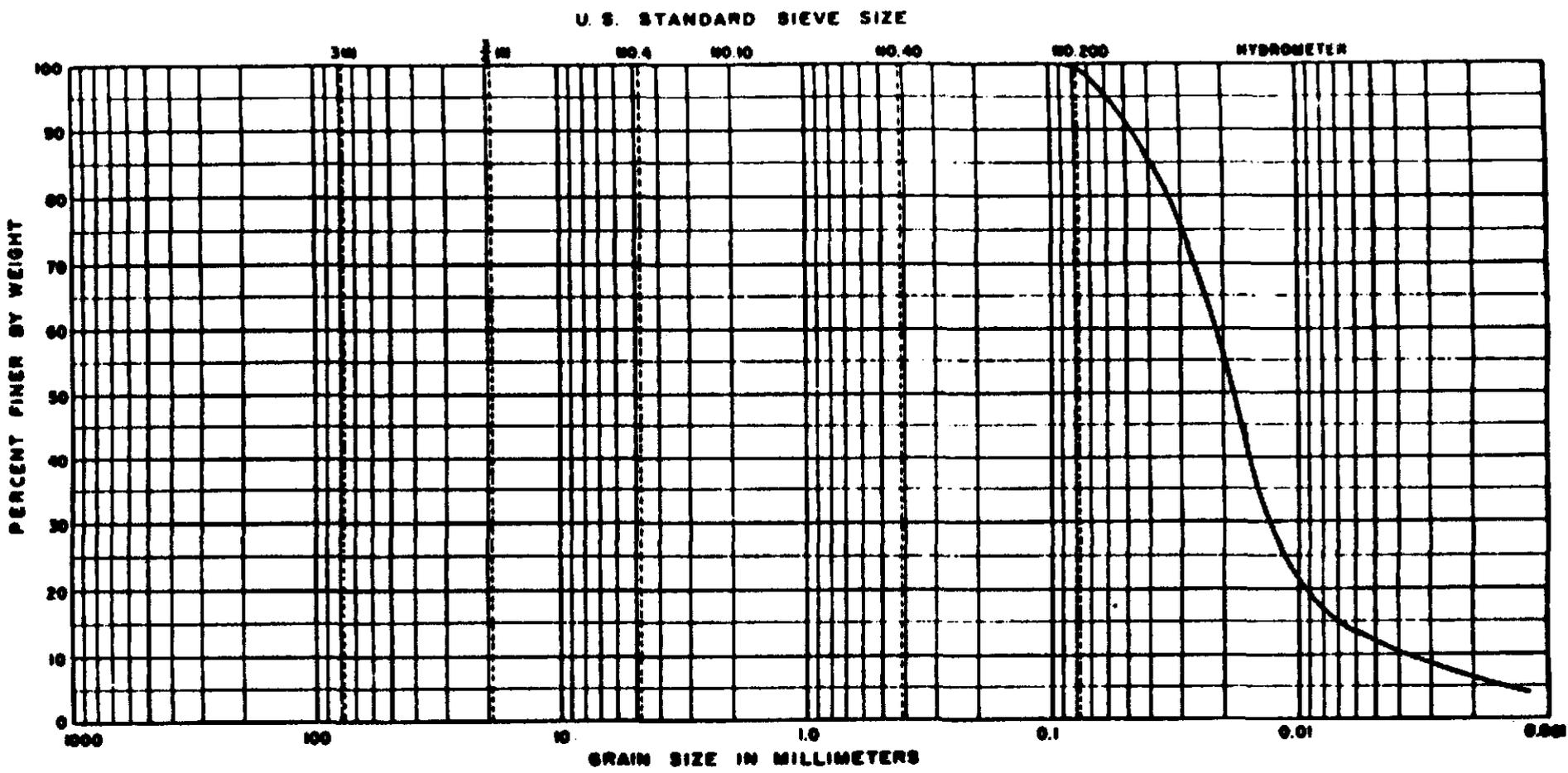
SAMPLE	ELEV-DEPN	CLASSIFICATION	NAT. WC	LL	PL	PI

Boring No: PZ-1  
 Sample No: ST-2  
 Depth, Ft: 28.5 - 29.0  
 Description: Gray silt

GRADATION CURVES

PLATE 2

NATIONAL SOIL SERVICE  
CONSTRUCTION DIVISION



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE	ELEV/DEPTH	CLASSIFICATION	NAT. WC	LL	PL	PI

Boring No: PZ-1  
 Sample No: ST-3  
 Depth, Ft: 38.5 - 39.0  
 Description: Light tan silt

**GRADATION CURVES**



## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 846545	PROJECT NAME: VERTAC Chemical		
BORING NUMBER: PZ-1	COORDINATES:		DATE: 12/5/84
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 12/5/84
ENGINEER/GEOLOGIST: JDD	Depth	Date/Time	DATE COMPLETED: 12/5/84
DRILLING METHODS: Auger & Rotary Wash			PAGE 1 OF 2

DEPTH ( FT )	SAMPLE TYPE & NO.	PROFILE	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0			Brown, Silty clay w/sl. gravel & sl. organics			Moist
5			Fill			
10			Light gray-brown, Silt			
15			Mottled Red area @ 12.0'			
15			More gray color @ 15.0'			
20	ST-1		Mottled black area @ 17.0' & more brown color w/grey			
20			Tan		.75	Sample 18.5'-19.0', Moist
20			Gray 20.5'-48.0', Shell frag.'s 20.0'-28.0'			
25						
25	ST-2				1.25	Sample 28.5'-29.0', shell frag.'s, mois

**NOTES:** Used 6" Auger from 0'-25.0'. Rotary wash from 25.0'-54.0'. NO natural ground water was encountered. Cave-in occurred between 6.0'-8.0' where fill meets natural ground while augering to 25.0'.



# VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 846545	PROJECT NAME: VERTAC Chemical		DATE: 12/5/84
BORING NUMBER: PZ-1	COORDINATES:		DATE STARTED: 12/5/84
ELEVATION:	GWL: Depth	Date/Time	DATE COMPLETED: 12/5/84
ENGINEER/GEOLOGIST: JDD	Depth	Date/Time	PAGE 2 OF 2
DRILLING METHODS: Auger & Rotary Wash			

DEPTH (FT)	SAMPLE TYPE & NO.	PROFILE	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
30			SILT			
35						
40	ST-3				1.25	Sample 38.5'-39.0', shell frag's., Mois
45						
50	ST-4		Greenish-gray, clayey-sand, w/sl. Brown mottled areas	SC	2.50	Sample 49.0'-49.5', Moist
			Hit Marl @ 52.0'			
	SB-1		Greenish-gray, calcareous clay w/sand and gravel (marl)			Blows 17-12-18
55			Bottom of boring @ 54.0'			

NOTES:



# VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 846545		PROJECT NAME: VERTAC Chemical		
BORING NUMBER: PZ-1A		COORDINATES:		DATE: 12/6/84
ELEVATION:		GWL: Depth	Date/Time	DATE STARTED: 12/6/84
ENGINEER/GEOLOGIST: JDD		Depth	Date/Time	DATE COMPLETED: 12/6/84
DRILLING METHODS: Auger & Rotary Wash				PAGE 1 OF 2

DEPTH ( FT )	SAMPLE TYPE & NO.	PROFILE	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSP)	REMARKS
0			Brown, Silty clay, Gravel			Moist
5			Gray & chem. odor 4.0'-8.0'			
			FILL			
10			Brown color @ 8.0'			
15			SILTY CLAY	CL		
20						
25						
30						

**NOTES:** Used 6" Auger from 0'-18.0'. Rotary wash from 18.0'-52.0'. Water seeping in below 7.0' causing cave-in.



# VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 846545	PROJECT NAME: VERTAC Chemical	
BORING NUMBER: PZ-1A	COORDINATES:	DATE: 12/6/84
ELEVATION:	GWL: Depth      Date/Time	DATE STARTED: 12/6/84
ENGINEER/GEOLOGIST: JDD	Depth      Date/Time	DATE COMPLETED: 12/6/84
DRILLING METHODS: Auger & Rotary Wash		PAGE 2      OF 2

DEPTH ( FT )	SAMPLE TYPE & NO.	PROFILE	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
30			SILT			
35			Greenish-gray, med. to coarse sand, w/gravel 35.0'-38.0'	SP		
40			Gray, Silty clay	CL		
45	ST-1		Greenish-gray, clayey-sand, w/brown mottled areas, calc.	SC	2.25	Sample 44.0'-44.5'
50			Marl @ 50.5'			
55			Bottom of boring @ 52.0'			

NOTES:



# VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 846545		PROJECT NAME: VERTAC Chemical	
BORING NUMBER: PZ-2		COORDINATES:	
ELEVATION:		GWL: Depth	Date/Time
ENGINEER/GEOLOGIST: JDD		Depth	Date/Time
DRILLING METHODS: Auger & Rotary Wash		DATE: 12/7/84	
		DATE STARTED: 12/7/84	
		DATE COMPLETED: 12/7/84	
		PAGE 1 OF 2	

DEPTH ( FT )	SAMPLE TYPE & NO.	PROFILE	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0			Brown, silt, w/sl. clay, organics			Moist
5			FILL			
10						
15			Shell frag.'s @ 15.0'			
20			SILT, w/SL. CLAY			
25						
30						

**NOTES:** Used 6" Auger from 0'-23'. Rotary wash from 23'-56'. Around 35' down, we noticed water leaking out of slope about 12' down off the side. Therefore, losing water 12'-15' down the hole horizontally.



# VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 846545	PROJECT NAME: VERTAC Chemical	
BORING NUMBER: PZ-2	COORDINATES:	DATE: 12/7/84
ELEVATION:	GWL: Depth      Date/Time	DATE STARTED: 12/7/84
ENGINEER/GEOLOGIST: JDD	Depth      Date/Time	DATE COMPLETED: 12/7/84
DRILLING METHODS: Auger & Rotary Wash		PAGE 2      OF 2

DEPTH ( FT )	SAMPLE TYPE & NO.	PROFILE	DESCRIPTION	UCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
30			Wood cuttings 32.0'-38.0'			
35			SILT, w/SL. CLAY			
40			Wood cuttings @ 44.0'			
45						
50	ST-1		Grey, SL. calc.		1.25	Sample 48.5'-49.0', very moist
55			Hit marl @ 56.0'			
			Bottom of boring @ 56.0'			
60						

NOTES:



# VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 846545		PROJECT NAME: VERTAC Chemical	
BORING NUMBER: PZ-4		COORDINATES:	
ELEVATION:		GWL: Depth	Date/Time
ENGINEER/GEOLOGIST: JDD		Depth	Date/Time
DRILLING METHODS: Auger & Rotary Wash		PAGE 1	OF 2

DEPTH ( FT )	SAMPLE TYPE & NO.	PROFILE	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (TSF)	REMARKS
0			Gravel mixed w/shells 4.0'-5.0'			
5			Brown, Silty-clay, w/gravel	CL		
10						
15			Gray-tan color 12'-18'			
			Clayey-Silt	ML		
20	ST-1		Dark gray, organics		.75	Sample 19.5'-20.0', moist, Light grey si seams
25						
30						

**NOTES:** Used 6" auger from 0'-15'. Rotary wash from 15'-49'. Lost water between 4.0'-5' and therefore used 6' of surface casing to block it off while drilling.



# VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 846545	PROJECT NAME: VERTAC Chemical		
BORING NUMBER: PZ-4	COORDINATES:		DATE: 12/7/84
ELEVATION:	GWL: Depth	Date/Time	DATE STARTED: 12/7/84
ENGINEER/GEOLOGIST: JDD	Depth	Date/Time	DATE COMPLETED: 12/7/84
DRILLING METHODS: Auger & Rotary Wash			PAGE 2 OF 2

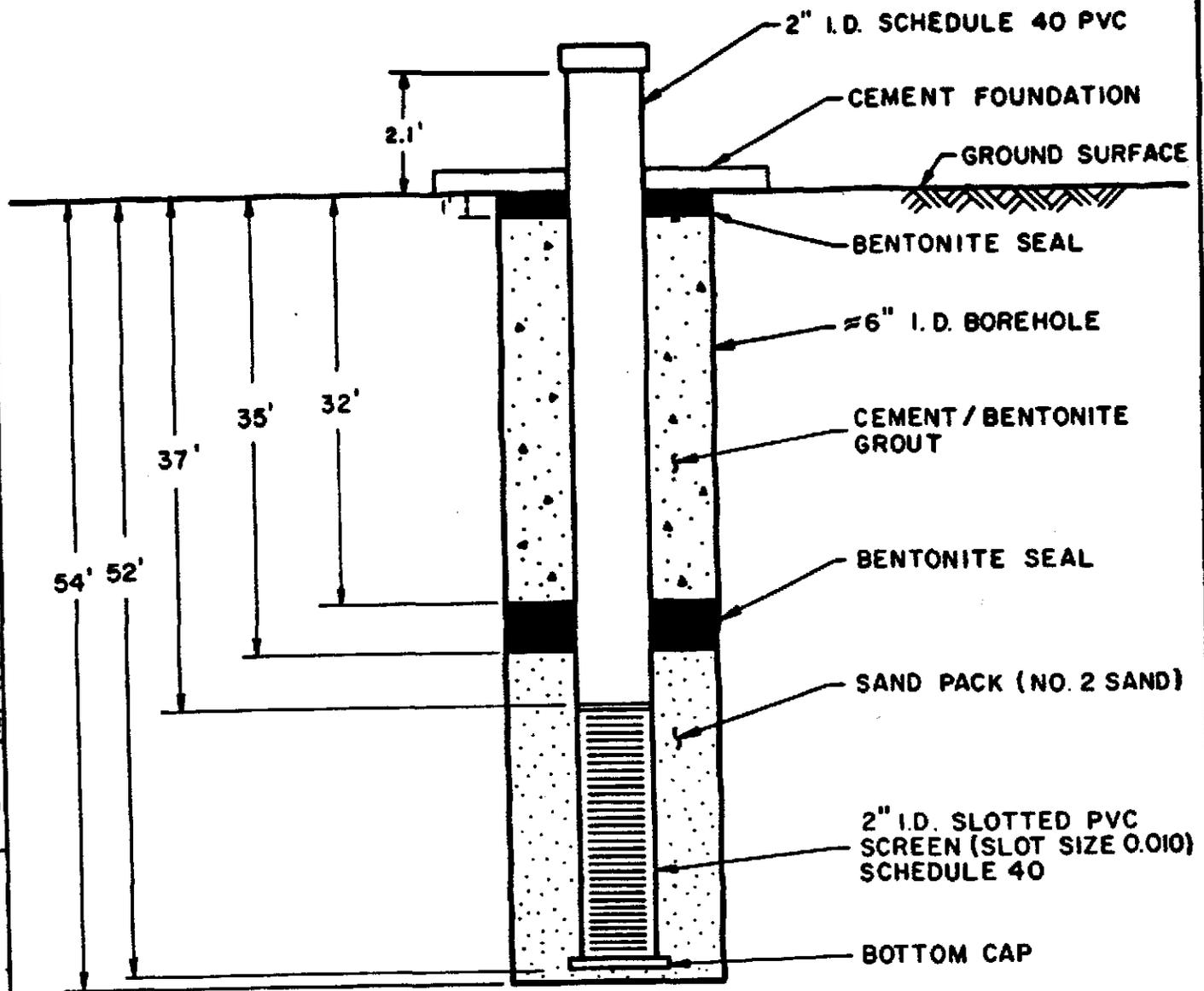
DEPTH ( FT )	SAMPLE TYPE & NO.	PROFILE	DESCRIPTION	USCS SYMBOL	MEASURED CONSISTENCY (YSP)	REMARKS
30			Wood & grass cuttings @ 30.0'			
35			Light gray, silt w/clay @ 37.0'			
45	ST-2		Gray, clayey-sand, very calc., brown mottled areas	SC	1.5	Sample 44.0'-44.5'
			Hit marl @ 49.0'			
50			Bottom of boring @ 49.0'			

NOTES:

DRAWING NUMBER 846545 - A

DRS CHECKED BY 12/10/84 APPROVED BY

DRAWN BY



DATE INSTALLED: 12/5/84  
ELEVATION, TOP OF CASING: 118.74'

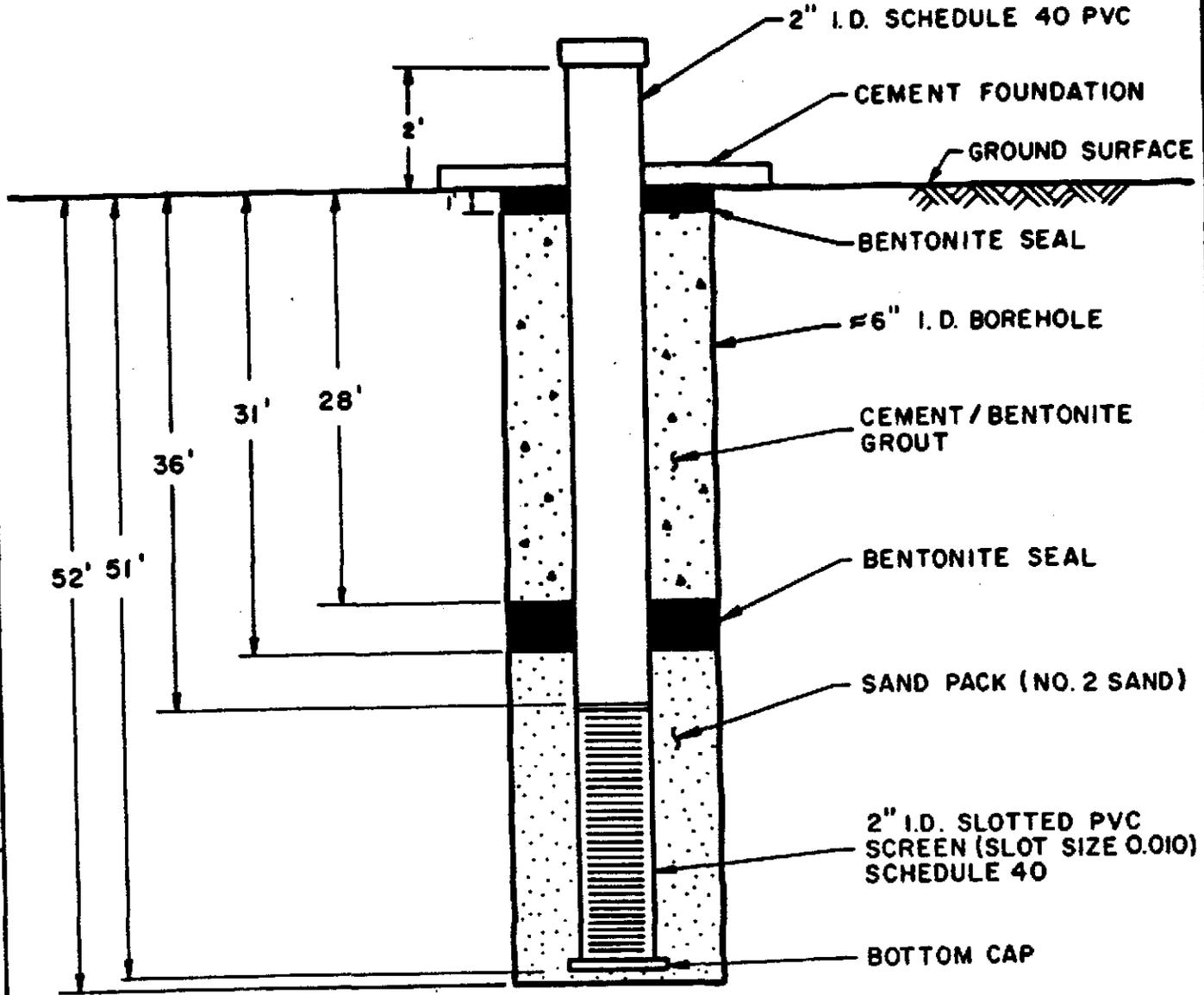
FIGURE  
PIEZOMETER PZ-1  
CONSTRUCTION DETAILS  
PREPARED FOR  
VERTAC CHEMICAL CORP  
VICKSBURG, MS.

DRAWING NOT TO SCALE



DRAWING NUMBER  
846545 - A

DRAWN BY  
DGS  
12/10/84  
CHECKED BY  
APPROVED BY



DATE INSTALLED: 12/6/84  
ELEVATION, TOP OF CASING: 113.03

FIGURE  
PIEZOMETER PZ-1A  
CONSTRUCTION DETAILS  
PREPARED FOR  
VERTAC CHEMICAL CORP.  
VICKSBURG, MS.

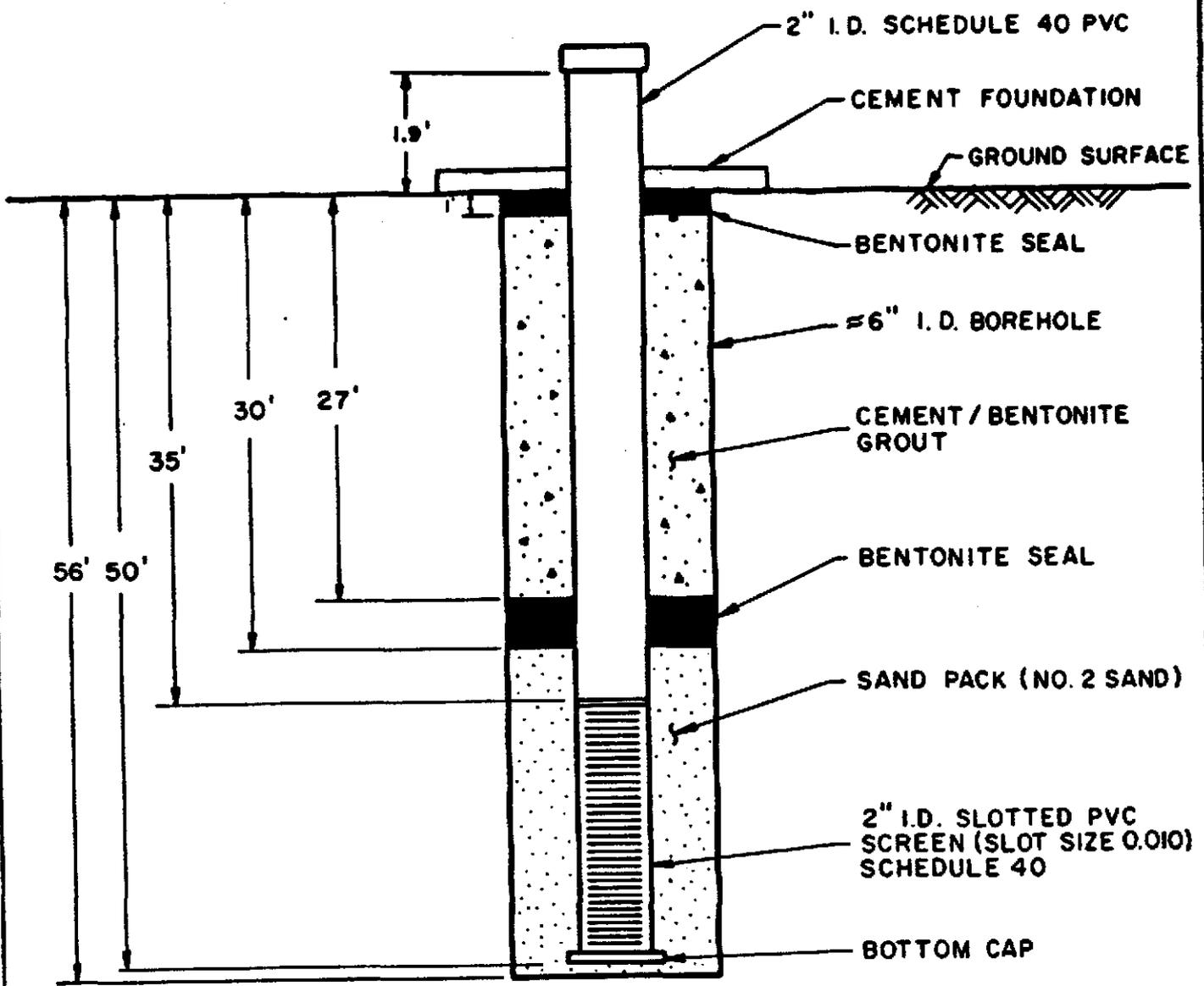
DRAWING NOT TO SCALE



DRAWING NUMBER  
846345 - A

CHECKED BY  
DRS  
12/10/84  
APPROVED BY

DRAWN BY



DATE INSTALLED: 12/7/84  
ELEVATION, TOP OF CASING: 112.45'

FIGURE  
PIEZOMETER PZ-2  
CONSTRUCTION DETAILS  
PREPARED FOR  
VERTAC CHEMICAL CORP.  
VICKSBURG, MS.

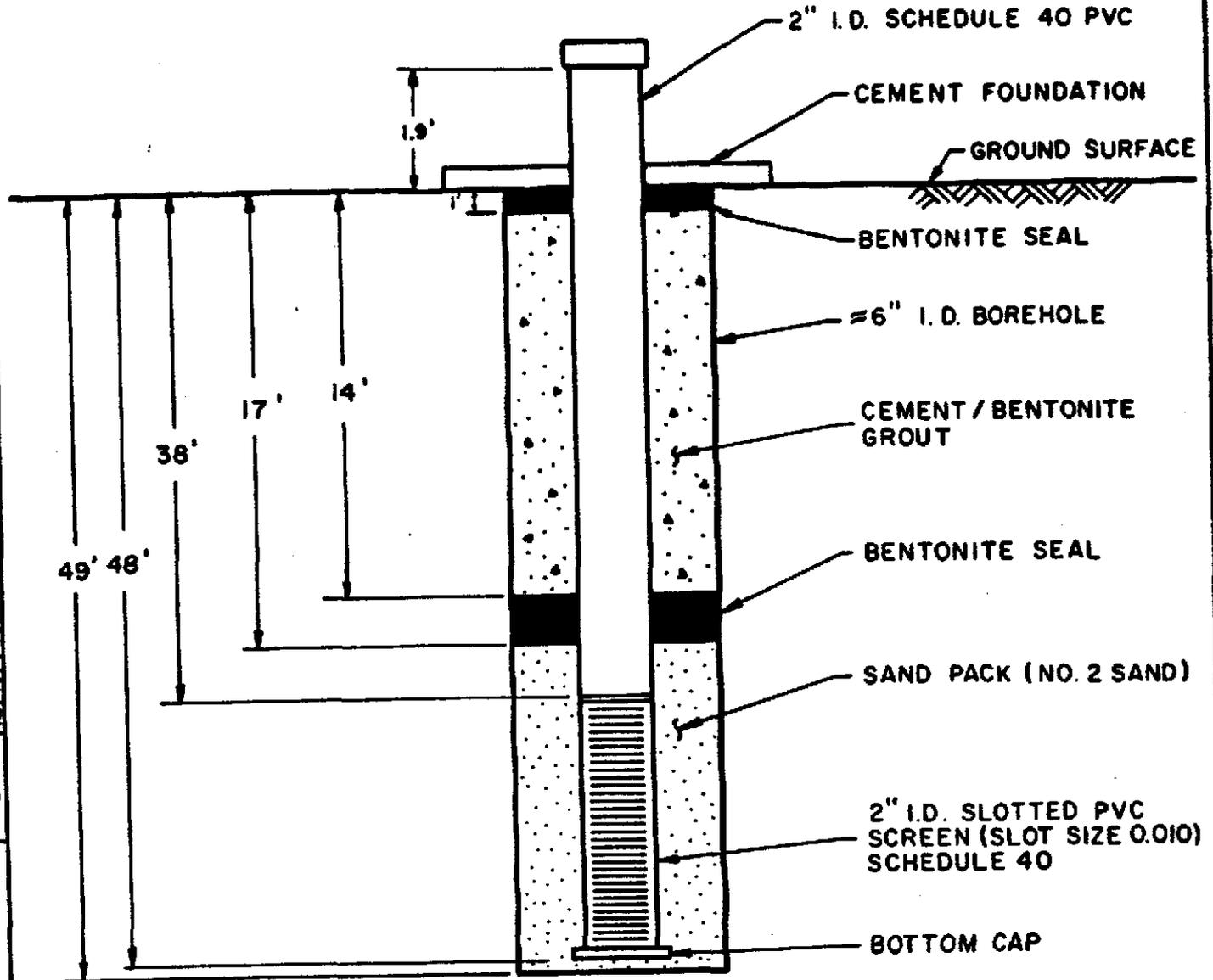
DRAWING NOT TO SCALE



DRAWING NUMBER  
B46545 - A

CHECKED BY  
DGS  
12/10/84 APPROVED BY

DRAWN BY



DATE INSTALLED: 12/7/84  
ELEVATION, TOP OF CASING: 114.24'

FIGURE  
PIEZOMETER PZ-4  
CONSTRUCTION DETAILS  
PREPARED FOR  
VERTAC CHEMICAL CORP.  
VICKSBURG, MS.

DRAWING NOT TO SCALE



PROJECT Monitoring Wells  
 Vertac Chemical Corp.  
 Vicksburg, Mississippi

DRILLING RIG  
 B-40

JOB. NO.  
 872

BORING NO. B-1  
 SHEET 1 OF 1

GROUND SURFACE ELEVATION 107.1  
 MSL

BORING LOCATION  
 See Plan

BORING TYPE  
 3 1/4" Hollow Auger  
 2" Split Spoon

GROUND WATER LEVEL  
 13' at drilling  
 9' at completion

DATE 29 September 1981  
 WEATHER Clear, warm  
 DRILLER Bill Barnes  
 INSPECTOR John Walton  
 BORING TERMINATED AT 30'

Sample No.	Sample Depth ft. From ___ To	Stand. Penet. Test Blow/ft.	Water Cont. %	SAMPLE DESCRIPTION AND REMARKS
1	3.5-5.0	14	25	Stiff brown silty CLAY
2	8.5-10.0	6	23	Firm brown silty CLAY
3	13.5-15.0	8	27	Firm brown silty CLAY
4	18.5-20.0	3	31	Soft brown silty CLAY, with gray silt marbeling
	23.5-25.0	8	27	Firm brown silty CLAY, with gray silt marbeling
6	28.5-30.0	4	28	Soft brown silty CLAY

<b>PROJECT</b> Monitoring Wells Vertac Chemical Corp. Vicksburg, Mississippi	<b>DRILLING RIG</b> B-40	<b>JOB. NO.</b> 872	<b>BORING NO.</b> B-2 <b>SHEET</b> 1 OF 1
<b>GROUND SURFACE ELEVATION</b> 103.0 MUM MSL	<b>BORING LOCATION</b> SEE PLAN		
<b>BORING TYPE</b> 3 1/4" Hollow Auger 2" Spilt Spoon	<b>GROUND WATER LEVEL</b> 26' at drilling	<b>DATE</b> 29 September 1981 <b>WEATHER</b> clear and warm <b>DRILLER</b> Bill Barnes <b>INSPECTOR</b> Terry Primm <b>BORING TERMINATED AT</b> 40'	

Sample No.	Sample Depth ft. From ___ To	Stand. Penet. Test Blow/ft	Water Cont. %	SAMPLE DESCRIPTION AND REMARKS
1	3.5-5.0	7	25	Firm tan silty CLAY
2	8.5-10.0	7	24	Firm tan silty CLAY
3	13.5-15.0	6	24	Firm tan silty CLAY
4	18.5-20.0	6	25	Firm gray silt
5	23.5-25.0	6	23	Firm gray silt
6	28.5-30.0	8	23	Firm gray silt
7	33.5-35.0	7	23	Firm gray silt
8	38.5-40.0	8	32	Firm gray silt

**DISC**

**LOG OF BORING**

PROJECT Monitoring Wells  
Vertac Chemical Corp.  
Vicksburg, Mississippi

DRILLING RIG  
B-40

JOB. NO.  
872

BORING NO. B-3  
 SHEET 1 OF 1

GROUND SURFACE ELEVATION 95.5  
 DATUM MSL

BORING LOCATION  
SEE PLAN

BORING TYPE  
3 1/4" Hollow Auger  
2" Split Spoon

GROUND WATER LEVEL  
20' at drilling

DATE 30 September 1981  
 WEATHER clear and warm  
 DRILLER Bill Barnes  
 INSPECTOR Terry Primm  
 BORING TERMINATED AT 30'

Sample No.	Sample Depth ft. From ___ To	Stand. Penet. Test Blow/ft	Water Cont. %	SAMPLE DESCRIPTION AND REMARKS
1	3.5-5.0	5	24	Firm brown silty CLAY
2	8.5-10.0	8	20	Firm brown silty CLAY
3	13.5-15.0	2	33	Soft brown silty CLAY
4	18.5-20.0	5	31	Firm brown silty CLAY, w/gray silt marbeling
5	23.5-25.0	3	29	Soft brown silty CLAY, w/gray silt marbeling
6	28.5-30.0	7	28	Firm brown silty CLAY, w/gray silt marbeling

PROJECT Monitoring Wells  
Vertac Chemical Corp.  
Vicksburg, Mississippi

DRILLING RIG  
B-40

JOB. NO.  
872

BORING NO. B-3A  
 SHEET 1 OF 1

GROUND SURFACE ELEVATION 95.5  
 MSL

BORING LOCATION  
See Plan

BORING TYPE

3 1/4" Hollow Auger  
2" Split Spoon

GROUND WATER LEVEL  
20' at drilling

DATE 30 September 1981  
 WEATHER Clear & Warm  
 DRILLER Bill Barnes  
 INSPECTOR Terry Primm  
 BORING TERMINATED AT 30'

Sample No.	Sample Depth ft. From ___ To	Stand. Penet. Test Blow/ft	Water Cont. %	SAMPLE DESCRIPTION AND REMARKS
ST-1	5.0-7.0	--	25	Brown Silty CLAY
ST-2	8.0-10.0	--	23	Brown Silty CLAY
ST-3	18.0-20.0	--	32	Brown Silty CLAY w/gray silt marbeling

NOTE: ST = Shelby Tube

**DISC****LOG OF BORING**

PROJECT Monitoring Wells  
 Vertac Chemical Corp.  
 Vicksburg, Mississippi

DRILLING RIG  
B-40

JOB. NO.  
872

BORING NO. B-4  
 SHEET 1 OF 1

GROUND SURFACE ELEVATION 109.6  
 DATUM MSL

BORING LOCATION  
 SEE PLAN

BORING TYPE  
 3 1/4" Hollow Auger  
 2" Split Spoon

GROUND WATER LEVEL  
9' at drilling

DATE 01 October 1981  
 WEATHER clear and warm  
 DRILLER Bill Barnes  
 INSPECTOR Terry Primm  
 BORING TERMINATED AT 20

Sample No.	Sample Depth ft. From ___ To	Stand. Penet. Test Blow/ft.	Water Cont. %	SAMPLE DESCRIPTION AND REMARKS
1	3.5-5.0	5	25	Firm tan silty CLAY w/gray silt marbeling
2	8.5-10.0	10	25	Stiff brown silty CLAY w/gray silt marbeling
3	13.5-15.0	11	27	Stiff dark brown silty CLAY w/gray silt marbeling
	18.5-20.0	9	26	Stiff dark brown silty CLAY w/gray silt marbeling





**MCI/CONSULTING ENGINEERS, INC.**  
 4301 Highway 60 East  
 Suite 224  
 Nashville, Tennessee 37215  
 Telephone (615) 383-4807

Corporate Headquarters  
 Nashville, Tennessee  
 Branch Offices  
 Knoxville, Tennessee  
 Aurora, Colorado

**DRILLER'S LOG**

SHORT REPORT OF DRILLING OPERATIONS AT <b>VCC, Vicksburg, MS</b>		DATE <b>3-1-83</b>
WELL LOCATION <b>See Site Sketch Map</b>		WELL NO. <b>6</b>
SURFACE ELEVATION <b>98.0' (MSL)</b>		TOP OF WELL
DEPTH AT BEGINNING OF SHIFT		BOTTOM OF WELL
FOOTAGE FORTHWELL		DRILLER <b>C. Nelson, WBA</b>
FOOTAGE SAMPLED		HELPER
FOOTAGE CORRECTION		DRILLED FOR
DEPTH AT END OF SHIFT		LOGGED BY: <b>GDM</b>

**SAMPLING RECORD**

DATE	FROM	TO	TEST RESULTS	DESCRIPTION AND REMARKS
	0.0	0.5		Topsoil
1	5.0	6.0		Brown clayey SILT, v. moist
2	10.0	11.0		Brown v. silty CLAY, moist
				Saturated returns at 14.5'
				Brown v. silty CLAY, lam. lignite, wet.
3	15.0	16.0		Brown silty, clay with gray mottles
4	20.0	21.0		Stratum change at 22.0' - by driller
				Gray sl. clay SILT, saturated
5	25.0	26.0		Hard drilling at 28.0'
				Greenish gray sandy CLAY
6	30.0	31.0		Greenish gray MARL
7	35.0	36.0		Greenish gray MARL
8	39.0	40.0		

NOTES: (1) Monitoring Well #6 in additional borings, 5' southwest of test boring at 24.5'  
 (2) Top of casing elev. = 98.6' (MSL)  
 Bottom of casing elev. = 73.6' (MSL)





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Aurora, Colorado

## DRILLER'S LOG

DATE OF DRILLING OPERATIONS AT		VCC, Vicksburg, MS	WELL NO.	
WELL LOCATION		See Site Sketch Map	DATE	3-2-83
SURFACE ELEVATION		108.6 (msl)	WELL NO.	8
DEPTH AT BEGINNING OF LOG			TOP FEET	
FOOTAGE FURNISHED			BOTTOM OF HOLE	
FOOTAGE SAMPLED			DRILLER C. NELSON - HBA	
FOOTAGE CODED			HELPER	
DEPTH AT END OF LOG			DRILLER NO.	

### SAMPLING RECORD LOGGED BY: GDN

LOG NO.	FROM	TO	SPT BLows	DESCRIPTION AND REMARKS
	0.0	0.5		Topsoil
1	5.0	6.0		Brown silty CLAY
2	10.0	11.0		Brown clayey SILT, with lt. brown mottles, moist
3	15.0	16.0		Brown clayey SILT
				Stratum change at 18.0' - by driller
4	20.0	21.0		Gray silty CLAY, with small roots, wet
5	25.0	26.0		Gray silty CLAY, saturated
				Water rising at 29.0'
6	30.0	31.0		Gray SILT, saturated
7	35.0	36.0		Gray SILT, saturated
				Hard drilling at 38.5'
8	39.0	40.0		Brownish orange MARL, hard
	40.0	49.5		Pushed split spoon refused at 49.5'

NOTES: (1) Monitoring Well #8 set in additional borings, 8' east of test boring, at 29' on 3-3-83  
 (2) Top of casing elev. = 109.7' (msl)  
 Bottom of casing elev. = 79.7' (msl)

(c) (5)

FINAL REPORT  
MONITORING WELL INSTALLATION PROGRAM  
VERTAC CHEMICAL CORPORATION  
March 21, 1983

Submitted to:  
Vertac Chemical Corporation  
Memphis, Tennessee

Prepared By:  
MCI/Consulting Engineers, Inc.  
4301 Hillsboro Road  
Suite 224  
Nashville, Tennessee 37215

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## INTRODUCTION

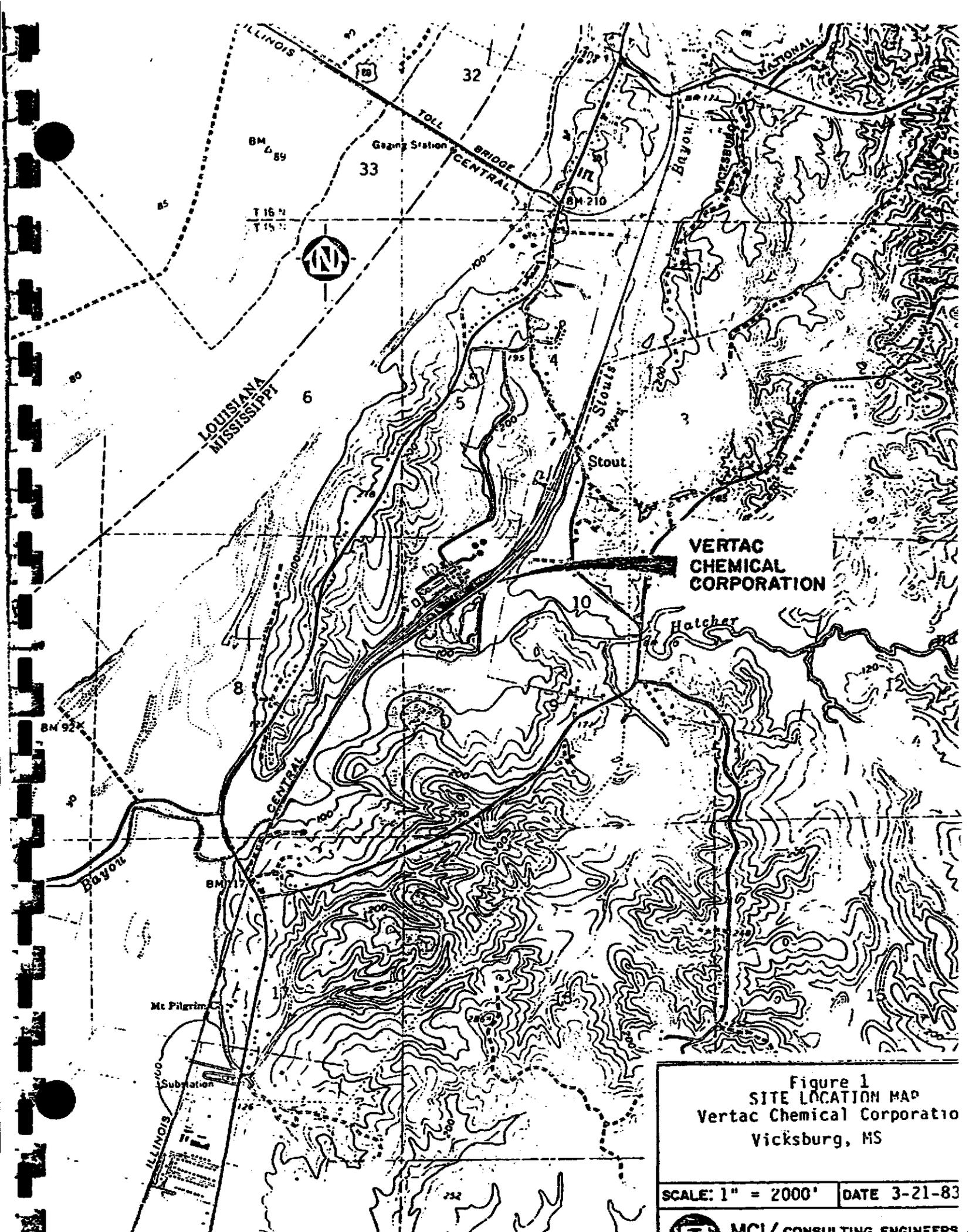
Presented herein is a summary of the activities undertaken by MCI/Consulting Engineers, Inc., (MCI) in conjunction with a monitoring well installation program at the Vertac Chemical Corporation manufacturing facility in Vicksburg, Mississippi. Of primary concern in this project were the location and installation of monitoring wells to monitor ground water quality downgradient from an inactive disposal site and an active hazardous waste surface impoundment. The surface impoundment is an Interim Status storage facility permitted under the Resource Conservation and Recovery Act (RCRA). Figure 1 is a site location map of the Vertac plant.

## PURPOSE AND SCOPE

### General

Subsurface investigation and subsequent installation of ground water monitoring wells in a theoretically potentiometric downgradient direction from the closed disposal site and the surface impoundment were of primary importance to this project, due to concern that previously installed monitoring wells did not adequately provide monitoring of downgradient ground water quality. Therefore, the project sought to review available, existing data and acquire new field data to ascertain adequate monitoring for contaminants potentially migrating from the site via the groundwater route.

The ground water flow directions that provided the basis for the MCI subsurface exploration and monitoring well locations were derived from monitoring wells installed during a previous investigation conducted by Developers, International Services Corporation (DISC). In conjunction with the installation and development of the MCI wells, water level elevations were obtained from the MCI wells and three of the DISC wells to develop an updated, general potentiometric surface map for the ground water.



**VERTAC  
CHEMICAL  
CORPORATION**

Figure 1  
SITE LOCATION MAP  
Vertac Chemical Corporation  
Vicksburg, MS

SCALE: 1" = 2000'      DATE 3-21-83

 MCI CONSULTING ENGINEERS

Four ground water monitoring wells were installed in this project. Three wells were placed east of the site between the site and Hennesseys Bayou, an assumed hydrologic divide. The fourth well was installed west of the site between two of the existing monitoring wells. Precautions were taken to assure the analytical integrity of the project wells. In addition, the project wells were sufficiently developed to remove the effects of drilling.

#### Site Specific Methodology

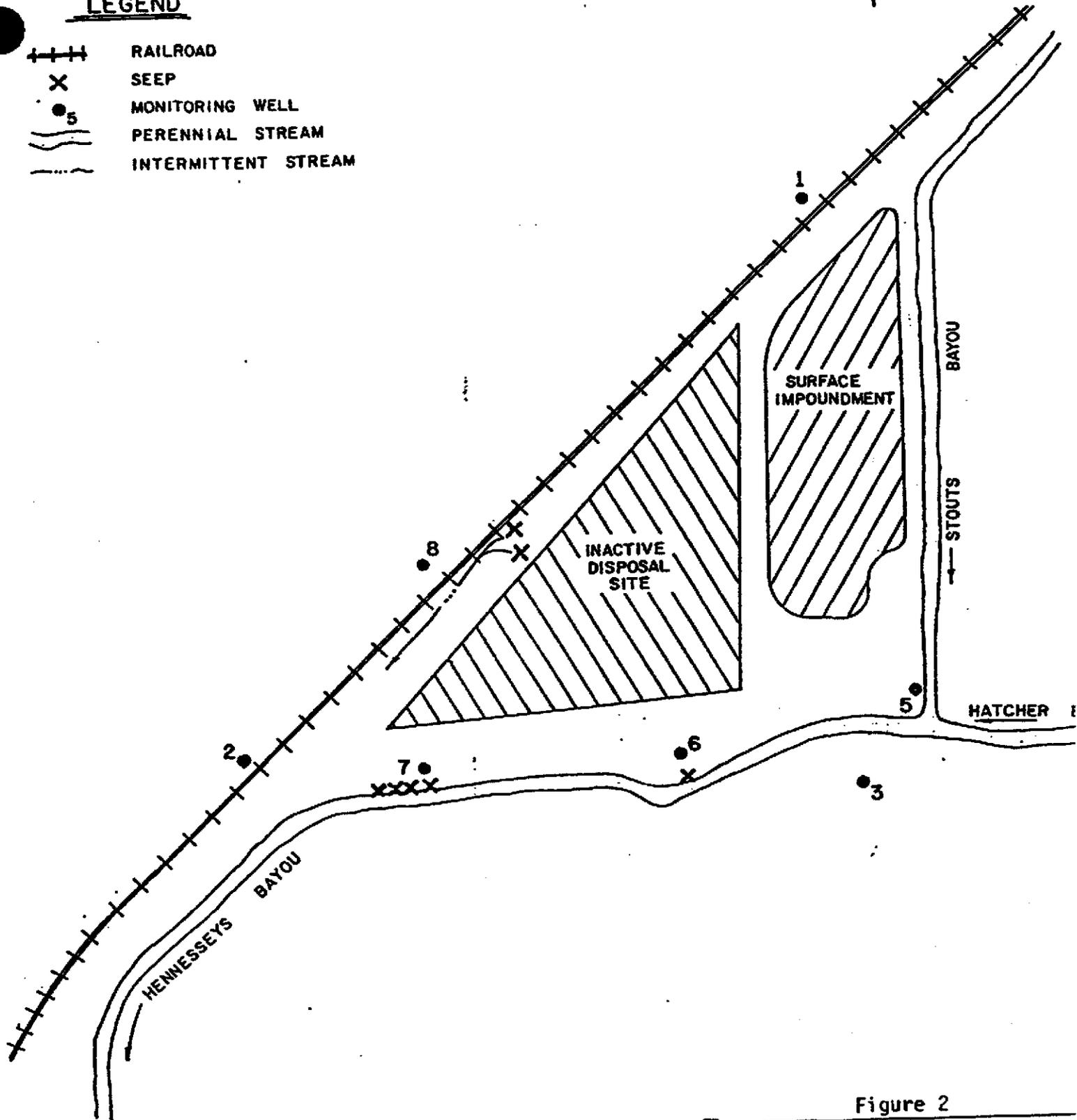
During the week of February 28 through March 4, 1983, a series of four test borings were drilled to define subsurface conditions in relation to shallow ground water flow in the vicinity of the site. Subsequent to drilling each test boring, two-inch (I.D.), polyvinyl chloride (PVC) monitoring wells were installed either in the test boring or in an adjacent additional boring. Figure 2 shows the relative locations of the MCI monitoring wells and test borings and three of the wells installed prior to this project.

Hall, Brazille, and Associates, of Memphis, Tennessee, provided the field drilling and sampling services for the project. Split-spoon samples of the subsurface were obtained at an interval of every five feet of depth in each of the test borings.

Precautions were taken during well installation to prevent extraneous contamination of each monitoring well. The borings were advanced without drilling fluids to exclude contamination from this source. Riser and screen sections with threaded joints were used to preclude organic contamination from solvent glue. The well materials were rinsed with isopropyl alcohol and sealed in protective plastic by the manufacturer prior to shipment to Vicksburg. At each monitoring well

**LEGEND**

- ⊢⊢⊢ RAILROAD
- X SEEP
- MONITORING WELL
- PERENNIAL STREAM
- - - - - INTERMITTENT STREAM



NOTE: ELEVATION DATUM IS MEAN SEA LEVEL

Figure 2

Well Location Sketch Map Vertac Chemical Corporation Vicksburg, MS 82-529	
SCALE: No scale	DATE 3-21-83
MCI / CONSULTING ENGINEERS.	

location, the protective plastic was removed immediately prior to installation from only the materials needed for that well. Packaged, clean, concrete sand was used for the sand pack interval around the well screens. The annulus above the sand pack of each well was sealed with a combination of soil-cement and grout to preclude contact of surface water with the intake area.

### GEOLOGIC CONDITIONS

#### General Geology

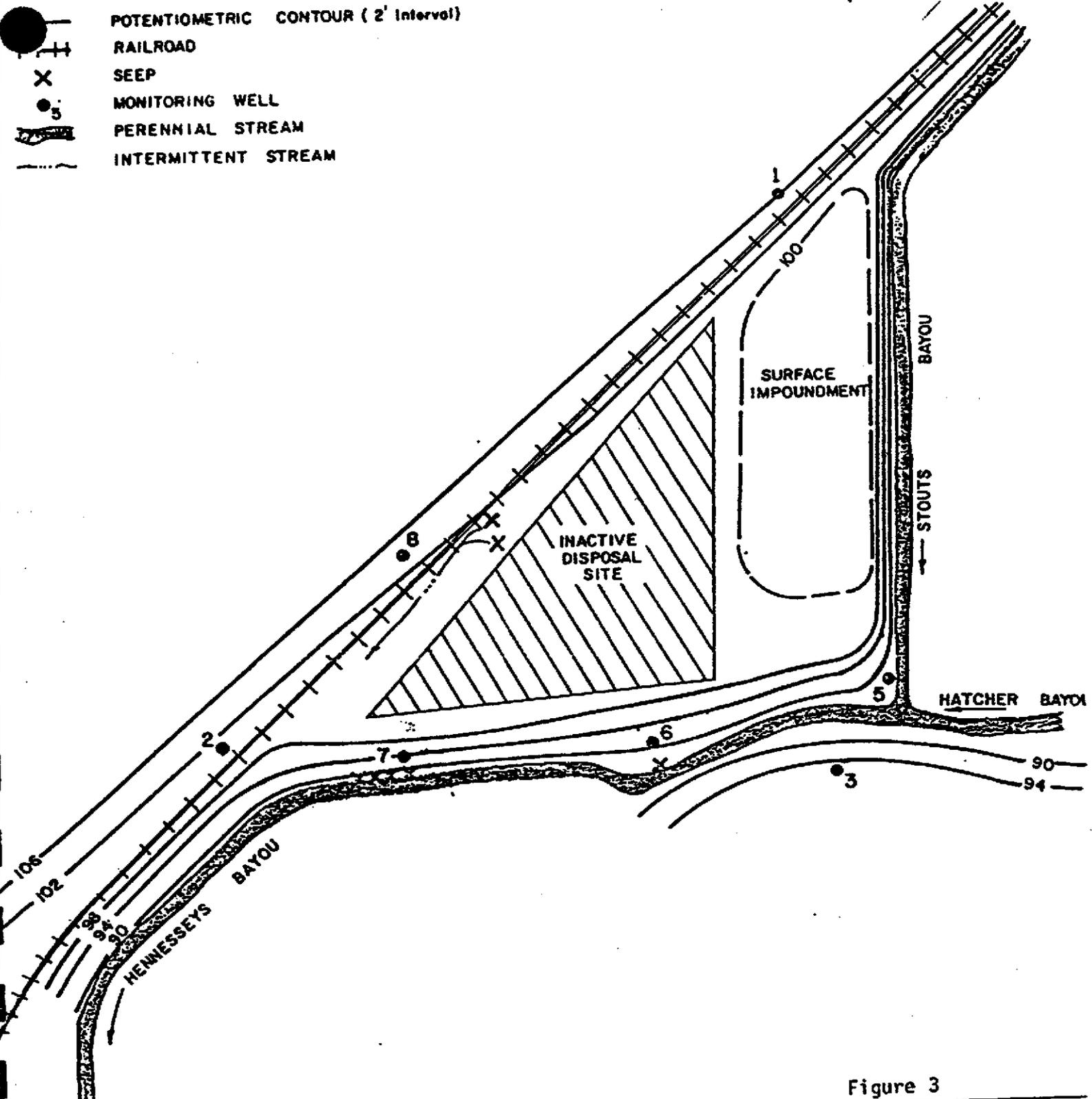
The Vicksburg area lies on the eastern flank, near the axis, of the Mississippi Embayment. The Mississippi Embayment is a large, regional, structural trough that contains generally unconsolidated sediments of Cretaceous to Quaternary Age. These sediments thicken toward the axis of the Embayment and the Gulf of Mexico.

Pleistocene loess underlies the ground surface of the Vertac plant and vicinity. Loess is a depositional product of eolian, or wind-borne, transport of silty sediments. The loess in the Vicksburg area is, typically, homogeneous, massive silt with variable clay content. Loess has, in general, a relatively higher vertical permeability in comparison to its horizontal permeability.

Review of the published literature concerning the Vicksburg area (Mellen, 1941, p. 38) suggests the loess is underlain by the Oligocene Vicksburg Formation. This formation in the Vertac plant vicinity is reported by Mellen to be "alternating beds of fossiliferous sandy marl, clay marl, montmorillonitic clay, and thin beds of limestone and coquina ...".

**LEGEND**

- POTENTIOMETRIC CONTOUR (4' interval)
- POTENTIOMETRIC CONTOUR (2' interval)
- RAILROAD
- SEEP
- MONITORING WELL
- PERENNIAL STREAM
- INTERMITTENT STREAM



NOTE: ELEVATION DATUM IS MEAN SEA LEVEL

Figure 3

General Potentiometric Surface  
 March 4, 1983  
 Vertac Chemical Corporation  
 Vicksburg, MS  
 82-520

SCALE:

DATE

AT&MCI / CONSULTING ENGINEERS, INC.

### Subsurface Conditions

In general, the subsurface conditions encountered at depth during the four test boring investigations are similar. The ground surface is underlain by variable loess thickness overlying stiff to hard sandy clay and marl. The variability of the loess thickness is a probable result of erosion. The thickness is less in the floodplain of Hennesseys Bayou, while thicker in the topographically higher areas near the plant and railroad.

Two distinct zones of loess were encountered in each test boring. The upper zone consists of approximately twenty feet of silty clay and clayey silt with variable moisture content. A second zone of saturated silt underlies the upper zone. This lower zone in the loess appears to be transmitting shallow ground water.

The loess-marl contact was encountered at the same approximate elevation (70± feet) across the site. The contact is marked by a lithologic change from the relatively homogeneous, saturated loess to a hard clay with variable sand and fossil fragment content. A seam of sand with small gravel is associated with this initial clayey layer. These upper clayey and sandy sediments overlie hard marl.

Boring logs for the four test holes are found in Appendix I.

## HYDROLOGIC CONDITIONS

### Potentiometric Surface

Saturated conditions were encountered during drilling in the loess at variable depths from the ground surface. After completion of the monitoring wells, the water levels were observed to have risen several feet from their level during drilling. This suggests an artesian condition exists for the ground water beneath the site with the upper clayier loess acting as an upper semi-confining layer and the marl as a lower confining layer.

Ground water elevations in the four new monitoring wells and three of the existing monitoring wells were determined as part of the field activities. These ground water elevations are found in Table 1 on the following page. A generalized potentiometric surface map derived from the elevation measurements is shown in Figure 3. This potentiometric map shows a general potentiometric gradient toward Stouts Bayou and Hennesseys Bayou. The lack of ground water elevation data points on the higher topographic and side-slope areas of the inactive disposal site render a precise determination of the potentiometric surface unattainable. Data from these general areas would be necessary to define ground water mounding associated with this area.

### Aquifer Transmissivity

Subsequent to installation, each new monitoring well was developed to remove formation sediments and the effects of drilling from the intake area around the well screens. Bailing, surging, and slugging were the development techniques used in this project.

TABLE 1  
GROUND WATER ELEVATIONS  
March 4, 1983

<u>MONITORING WELL</u>	<u>WATER ELEVATION *</u>
1	106.0'
2	100.5'
3	95.3'
5	89.6'
6	90.6'
7	94.5'
8	102.7'

\* Above mean sea level

The wells were developed as adequately as possible during the field activities. However, owing to the fine-grained nature of the zone of saturation, inflow of suspended silt through the intake area of the well screen will probably continue. Consequently, care should be exercised in the evacuation and sampling of the wells to prevent unrepresentative turbidity in ground water quality samples.

After development, a limited, recovery aquifer test was conducted on Well 7. Aquifer tests yield information on aquifer characteristics by contrasting time and drawdown/recovery of water levels in a well during/after pumping. During this test, Well 7 was bailed dry at approximately 0.3 gallons per minute. Then, the recovery of the water level in the well was measured for 140 minutes. The results of this test are shown as a Hvorslev recovery curve in Appendix II. Also, as calculated in Appendix II, the hydraulic conductivity is  $7.2 \times 10^{-2}$  ft/day or  $2.5 \times 10^{-5}$  cm/sec. Consequently, the aquifer transmissivity at Well 7 is calculated to be 15.3 gallons per day per foot.

### CONCLUSIONS

After review of the information and data contained in this report, MCI concludes the following:

1. A shallow, semi-confined, aquifer probably exists in the subject area. Vertical flow within the aquifer appears to be restricted at depth by a sandy clay and clayey marl lower confining layer. The saturated zone is located within a lower silty portion of the loess thickness at the site. The upper portion of the loess thickness is clayier and appears to act as a leaky, upper, semi-confining layer.

2. Ground water mounding from either natural topographic effects or artificially induced recharge, may exist beneath the inactive disposal site and the surface impoundment. However, lack of ground water elevation data associated with the above areas prevents conclusive mounding determination.
3. Review of the ground water elevation data obtained during the field activities indicates Wells 5, 6, and 7 are located in a downgradient position from the inactive disposal site and the surface impoundment. Well 8 is located in an upgradient position. *7/29/8*
4. The transmissivity of the shallow aquifer is calculated to be 15.3 gallons per day per foot. This value is the result of a Hvorslev method analysis of a limited, recovery aquifer test. A transmissivity on this order is relatively low which is the expected nature of a silty aquifer.
5. Owing to the fine grained nature of the sediments composing the saturated zone, even extensive well development will probably not prevent silt suspended in the ground water from entering the intake area of the well screens. As a consequence, care should be exercised in evacuation and sampling of the ground water to prevent unrepresentative turbidity of ground water quality samples.

#### RECOMMENDATIONS

Based on the conclusions stated above, MCI makes the following recommendations:

1. When Vertac initiates a ground water sampling program, MCI recommends sampling of Wells 5, 6, 7, and 8. The locations and

depths of these wells are more representative of the downgradient/upgradient aquifer conditions than those of the previously installed wells. In addition, the analytical integrity of the MCI wells is documented by the precautions taken to install analytically representative wells.

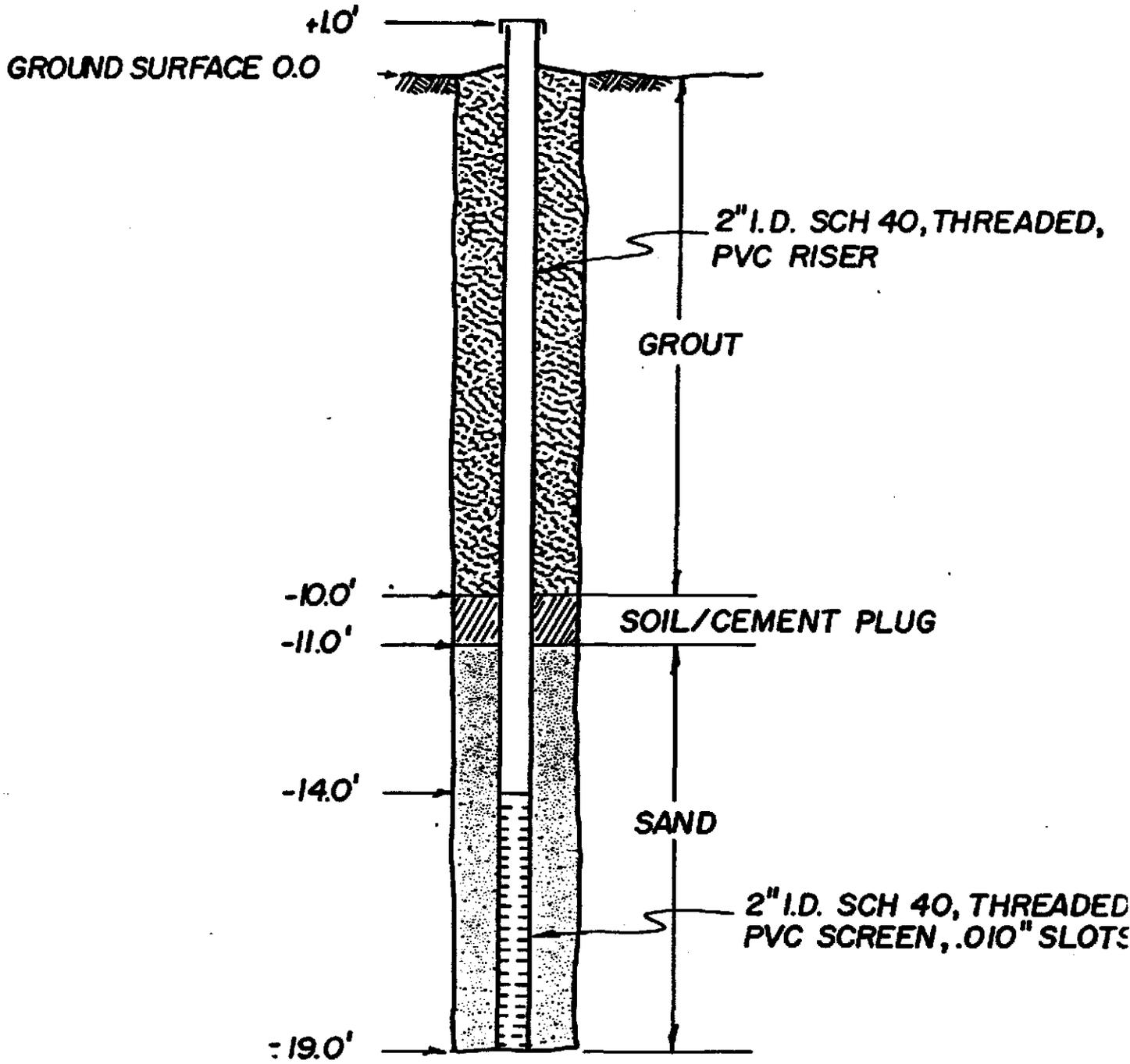
2. In sampling these wells strict sampling procedures and protocols should be designed and implemented.
3. Determinations of water elevations are recommended on a routine basis prior to and after the grading and capping plan for the inactive disposal site is implemented. If there is ground water mounding beneath the inactive disposal site, the downgradient water elevations may decline through time with reduced recharge after the cap is in place.

C(5) Plans and Engineering Report

35-d

Attached are engineering drawings describing the installation of wells 5, 6, 7, and 8 including the location of the well screen. The drawings were prepared by MCI/Consulting Engineers, Inc. and should be considered a supplement to their engineering report.

TOP OF CASING ELEV., 99.6'(msl)



MONITORING WELL No. 5  
AS COMPLETED  
VERTAC CHEMICAL CORP.  
VICKSBURG, MS.  
NO SCALE 12/2/83

GROUND SURFACE

+0.6'

0.0

-17.4'

-18.4'

-19.4'

-24.4'

2" I.D. SCH 40, THREADED,  
PVC RISER

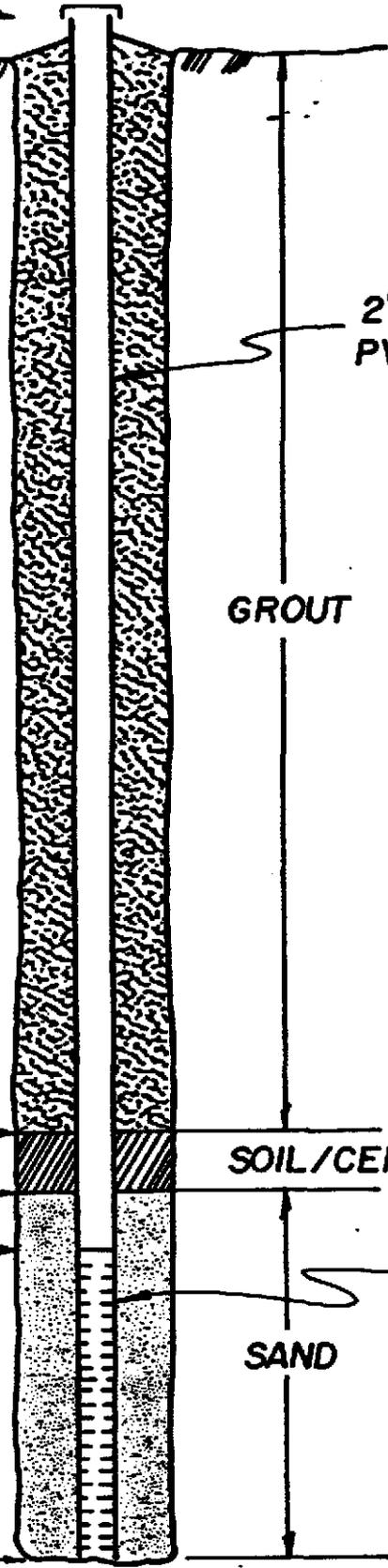
GROUT

SOIL/CEMENT PLUG

2" I.D. SCH 40, THREADED,  
PVC SCREEN, .010" SLOTS

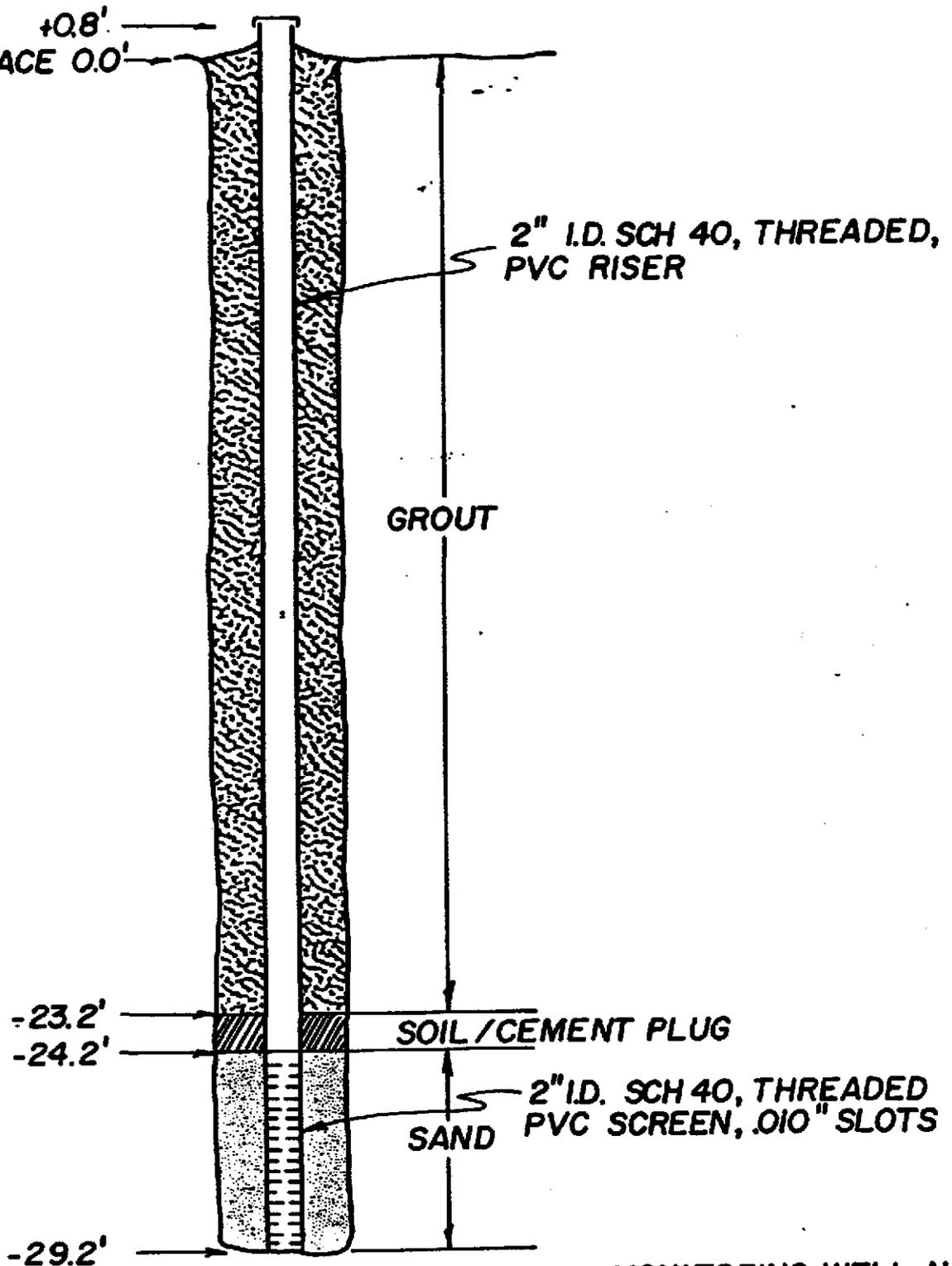
SAND

MONITORING WELL No. 6  
AS COMPLETED  
VERTAC CHEMICAL CORP.  
VICKSBURG, MS.  
NO SCALE 12/2/83



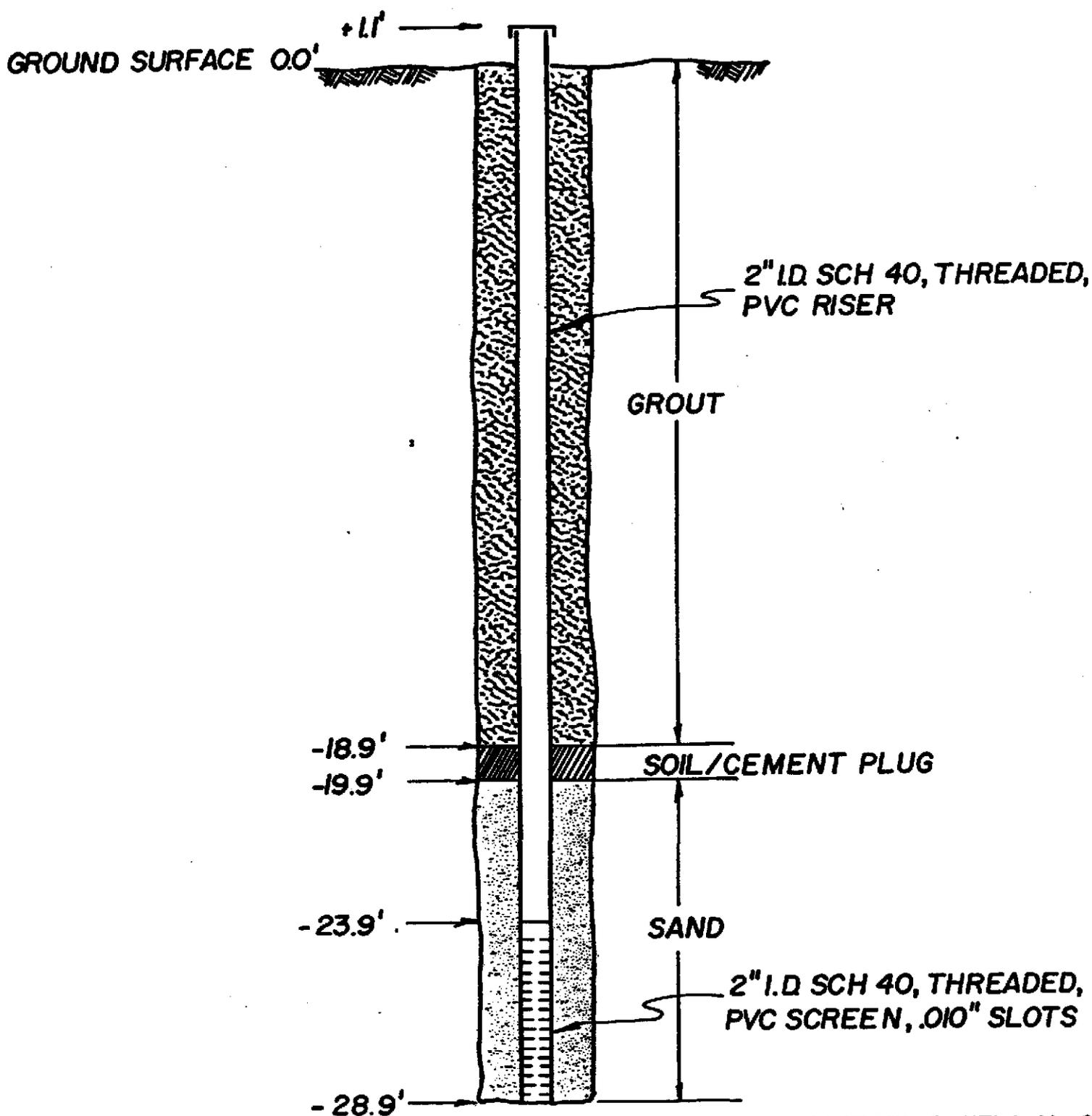
TOP OF CASING ELEV., 97.5' (msl)

+0.8' →  
GROUND SURFACE 0.0' →



MONITORING WELL No. 7  
AS COMPLETED  
VERTAC CHEMICAL CORP  
VICKSBURG, MS.  
NO SCALE 12/2/83

TOP OF CASING ELEV., 109.7'(msl)



MONITORING WELL No. 6  
AS COMPLETED  
VERTAC CHEMICAL COR  
VICKSBURG, MS.  
NO SCALE 12/2/83

C(6) Detection Monitoring Program - Additional Information  
35-e -Addition of site specific parameters

The groundwater sampling schedule through 1983 and a summary statistical status through 1983 is attached.

Samples were taken in November, 1983 for wells 1, 2, 5, 6, 7, and 8. Wells 2, 5, 6, and 7 adequately describe the compliance point. Analyses have not been completed as of 12-16-83. We requested these analyses:

"2" = groundwater quality parameters

"3" = indicator parameters in quadruplicate - pH, specific conductance, TOC, TOH

"4" = site specific parameters:  
Dinitrobutyl Phenol - EPA method 625  
Benzoic Acid - EPA method 625  
Toxaphene - EPA method 608  
Atrazine - EPA method 608  
Total Phenols - Standard methods

It is proposed that in 1984 a monitoring program be followed that is consistent with the desires of the Bureau of Pollution Control. The following is proposed:

Frequency	Semi-annual
Analytical parameters	"3" = indicator parameters (quadruplicate analyses).  "4" = site specific parameters: Dinitrobutyl phenol, Benzoic Acid, Toxaphene, Atrazine, and Total Phenols (non-replicate analyses)

Samples from compliance point wells - 2, 5, 6, and 7.

Readings of groundwater elevation - the compliance point wells and wells 1, 4, and 8.

Groundwater Monitoring Summary Statistical Status  
Through 1983

Parameter:

Status:

1 = drinking water parameter

Complete. All wells meet drinking water standards.

2 = groundwater quality parameters

All wells have a minimum of three quarterly analyses.

3 = indicator parameter

a. Six quadruplicate samples of the upstream well (4) have been taken to determine the initial background mean and variances.

b. Two quadruplicate samples of wells 1 and 2 have been taken.

c. One quadruplicate sample of wells 1, 2, 5, 6, 7 and 8 has been taken.

d. One non-replicate sample of 1,2,3,5,6, 7 and 8 has been taken.

4 = site specific parameters

One non-replicate sample of wells 1,2,5,6, 7 and 8 has been taken.

**Groundwater Monitoring  
Sampling Schedule  
Through 1983**

Well Number	Analysis Parameters:	Sampling Date:
4 (upstream)	1,2,3 (quadruplicate)	12-81, 4-82, 10-82, 1-83 6-83, 7-83
1,2 and 3	1,2,3	12-81, 4-82, 10-82, 1-83
1 and 2	2, 3 (quadruplicate)	6-83
5,6,7 and 8	1,2,3	6-83, 7-83
1,2,5,6,7 and 8	2,3 (quadruplicate), 4	11-83

**Notes:**

- 1 = drinking water parameters
- 2 = groundwater quality parameters
- 3 = indicator parameters
- 4 = site specific parameters:  
Dinitrobutyl phenol, Benzoic Acid, Toxaphene, Atrazine, Total Phenols

**ENVIRONMENTAL  
LABORATORIES, Inc.**

P.O. Drawer 2309 / Gulfport, Mississippi 39503 / (601) 863-3036

DESCRIPTION OF SAMPLE COLLECTION,  
SAMPLE PRESERVATION, ANALYTICAL PROCEDURES  
AND  
CHAIN OF CUSTODY CONTROL

prepared for

Vertac Chemical Corporation  
Vicksburg, Mississippi

December, 1983

## WATER

### SAMPLE COLLECTION

To obtain a representative sample of ground water it is desirable that the well be pumped or bailed until the well is thoroughly flushed of standing water and contains fresh water from the aquifer. We commonly pump the well until four to six bore volumes have been removed. Pumping and sample collection is accomplished by an ISCO model 1580 sampler. New tubing is used with each project and the tubing and container is rinsed with dilute acid solution and D.I. water between sample locations. The samples are then placed in properly prepared containers, sealed, and transported to the laboratory as quickly as possible.

### SAMPLE CONTAINERS

Sample bottles are prepared in the laboratory according to procedures outlined in Table 1. A label is then attached to each bottle for the field crew to complete when the sample bottle is filled. This label contains the following information:

Sample Number Name	Date Sample Description
-----------------------	----------------------------

### SAMPLE PRESERVATION

To prevent or retard the degradation/modification of the samples during transportation and storage, the samples will be preserved according to:

Table I, Methods for Chemical Analysis of Water and Waste, EPA-600/4-79-020, 1979, EMSL, Cincinnati, Ohio 45268.

Standard Methods for the Examination of Water and Wastewater, 15th Edition, American Public Health Association, 1015 Eighteenth Street, NW, Washington, DC 20036, 1980.

In addition to chemical preservatives listed in the references above, all samples will be iced down and transported in heavy styrofoam containers as soon as possible.

### CHAIN OF CUSTODY

Chain of Custody forms accompany each set of sample bottles per well. Information on this sheet is completed by the field crew during sampling. Upon sample return to the laboratory, the Chain of Custody sheet is completed by laboratory personnel. When analysis is complete, Chain of Custody records will accompany the reports to the client. A copy of the Chain of Custody record that we commonly use follows as Table 2.

TABLE 1

SAMPLE BOTTLE PREPARATION

Recommended Procedure for The Cleaning of Sample Containers is below:  
Clean glass bottles and clean glass vials.

Wash bottles with hot, soapy water.

Rinse with copious amounts of tap water and then with three rinses of DI water.

Rinse with nanograde acetone.

Allow container to air dry.

Place in 200°C oven for one hour.

Allow to cool and cap with teflon lined caps.

Plastic bottles:

Wash bottles with hot, soapy water.

Rinse with 5% nitric acid.

Rinse with copious amounts of DI water.

Allow to drain and then air dry.

Teflon liners:

Wash with hot, soapy water.

Rinse with DI water.

Rinse with nanograde acetone.

Allow to air dry.

Place liners in clean caps.

Heat to 40°C for two hours.

Place on clean bottles.

Foil liners:

If teflon liners are not available or practical, foil liners may be used instead.

TABLE 2

CHAIN OF CUSTODY RECORD

Well # \_\_\_\_\_

Field Section

Location of Sampling: \_\_\_\_\_

Shipper's Name: \_\_\_\_\_

Shipper's Address: \_\_\_\_\_

Collector's Name: \_\_\_\_\_ Telephone # \_\_\_\_\_

(Signature)

Date Sampled: \_\_\_\_\_

Time Sampled: \_\_\_\_\_

Field Information:

Special Handling/Storage

Laboratory Section

Received by: \_\_\_\_\_

Date: \_\_\_\_\_

Analysis Required: \_\_\_\_\_

Comments:

### SAMPLE PREPARATION

Water samples will require no special preparation or filtration unless specifically called for in the procedure. It is possible, however, that some "clean-up" may be required on GC, GC/MS work.

### ANALYTICAL INSTRUMENTATION

In an effort to provide high quality analytical services, ELI continues to expand and up-date its equipment and capabilities. A list of instrumentation, manufacturers name, model number and age is provided below for the record.

Dohrmann, Model DC-80, Automated Total Organic Carbon Analyzer, 1981.

Dohrmann, Model DX-20, Total Organic Halogen Analyzer, 1981.

Varian Instruments, Model 1475 Atomic Absorption Spectrophotometer. This instrument includes the CRA-90 Carbon Rod Atomizer and the Model 65 Vapor Generation Accessory, 1981.

Bausch and Lomb Spectronic 20 Spectrophotometer (2), 1973.

Canberra, Model 2200 Low Level Alpha/Beta Counting Systems (2), 1981, 1982.

Yellow Springs Instrument Company, Model 31, Conductivity Bridge, 1974.

Mettler, Model h-30 Electronic Balance (2), 1973.

Yellow Springs Instrument Company, Model 51A, Dissolved Oxygen Meter, 1973.

Hach Instruments, Model 1860 A, Turbidimeter, 1973.

Corning, Model 10, Expandable pH Meter, 1978.

Hewlett-Packard HP5993B GC/MS System with a 32,000 compound search library. This library includes the EPA, NBS, and NIOSH Computer Libraries, 1981.

Hewlett-Packard HP5830A GC with auto sampler, electron capture and flame ionization detectors, 1979.

Hewlett-Packard HP5880A GC with dual electron capture detectors, flame ionization detector and nitrogen/phosphorus detector, 1982.

### ANALYTICAL PROCEDURES

Water samples will be prepared and analyzed according to methodologies outlined in Table 3. However, individual parameters are detailed below.

pH is analyzed directly by the Corning, Model 10 pH meter. Commercial Buffer standards of 4.0, 7.0, and 10.0 are used to standardize the instrument before use. This instrument is also equipped with a temperature compensating probe. Accuracy to 0.01 Standard Units can be obtained.

Specific Conductivity is analyzed using the Yellow Springs Instrument, Model 31 Conductivity Bridge. Sodium Chloride Standards and Blanks are run daily. Detection to 10  $\mu$ hos/cm can be achieved.

Total Organic Carbon is analyzed using the Dohrmann DC-80 according to manufacturer instructions. The instrument is calibrated daily with Standards of potassium acid phthalate to assure system operations. Duplicates are run routinely. Detection limits of 0.01 mg/l can be achieved.

Total Organic Halogen analyses are performed according to EPA Method 450.1 "Total Organic Halides". 2,4,6-trichlorophenol is used to standardize the instrument and sodium chloride is used to assure proper cell operation. Standards and Blanks are run with every tenth sample. All samples are analyzed in duplicate unless otherwise requested. Routine detection of 0.01 mg/l is met.

Chlorides are analyzed by mercuric nitrate titration procedure as found in Standard Methods. Duplicate, blanks, and standards are run per batch of samples. Detection limit of 1 mg/l can be met.

Metals (Fe, Mn, Na, Sb, Ba, Be, Cd, Cr, Cu, Pb, Mg, Ni, Se, Ag, Tl, V, Zn, B, Co, Mo, Sn, Ti, As, Hg, Se): These metals will be aspirated directly into the Varian 1475 AA, or injected into the carbon rod furnace. As, Hg, Se, will be analyzed by hydride generation and cold vapor techniques. Prior to analysis, three standard solutions are prepared of the ion of interest and are run on the instrument. Calibration curves are performed within the instrument and suspect data is relayed to the operator via the display panel. Direct readout of ion concentration in the sample is displayed on the readout panel, however, a strip chart recorder is also used to provide a hard copy of data. Detection Limits meeting the Safe Drinking Water Act can be achieved.

Phenols are separated from the sample matrix by distillation. Phenols in the distillate are then complexed with 4-aminoantipyrine and measured colorimetrically. A calibration curve is prepared from the results of the analysis of at least three phenol standards and a blank. These curves are the plots of instrument response versus concentration. Typically, the plot will be linear. The standards concentrations should be evenly distributed throughout the range of the method. All standards and associated solutions will be prepared on the day that the samples are analyzed. A routine detection limit of 0.05 mg/l can be achieved.

Sulfate is analyzed by a gravimetric procedure found in Standard Methods. Because gravimetric procedures can result in errors more readily than other procedures, great care must be taken in accurately drying, cooling, weighing in each step of this procedure. One known standard and one ERA Standard analyzed as an unknown along with a blank are performed with each batch of samples analyzed for the day. Routine detection limits of 1.0 mg/l can be met.

Nitrate is analyzed by a procedure as found in Standard Methods. Chromotropic acid forms a yellow product in the presence of nitrate and can be determined colorimetrically. Sample concentration is determined by comparing sample absorbance with a standard curve, prepared using three standards and a blank. Duplicates are run on 10% of the samples. This procedure allows a routine detection limit of 0.05 mg/l.

Fluoride is analyzed by distillation followed by colorimetric determination with SPADNS reagent as outlined in Standard Methods. Sample Fluoride concentration is determined by comparison to a standard curve for fluoride using three standards and a blank. Blanks and duplicates are run per batch of samples. A detection limit of 0.5 mg/l can be obtained.

Radiochemistry Analyses are performed according to methodologies outlined in Prescribed Procedures for Measurement of Radioactivity in Drinking Water, EPA-600/4-80-032, August, 1980, and Radiochemical Analytical Procedures for Analysis of Environmental Samples, USEPA Office of Research and Development, Environmental Monitoring and Support Laboratory, Las Vegas, Nevada.

The instruments used in performing Gross Alpha, Gross Beta and Total Radium analysis are two Canberra 2200 Low Level Alpha/Beta Counting Systems. These are thin-window, gas-flow proportional counters, the instrument of choice for Alpha/Beta Counting, and detect a background of less than two counts per minute (<2CPM).

Instrument calibration standards of  $AM^{241}$ ,  $Sr^{90}$ , and  $C^{14}$  are from private sources and traceable to NBS.

Plateaus for Alpha and Beta Counting are plotted every four weeks or when the counting gas is changed, whichever comes first. Plateau charts with all pertinent instrument settings are maintained in a log book.

Instrument backgrounds are run weekly for minimum of three 100-minute runs and are charted to detect overall system operation.

Samples are prepared according to aforementioned procedures and deposited onto 2" diameter stainless steel planchets for counting. Each sample is counted for a minimum of three 100-minute runs. The arithmetic mean of the runs is then taken and used in the calculations to arrive at pCi/l determination. The minimum detectable concentration for individual analyses is based on counting statistics and sample volume. The MDC is defined as the activity which is equal to the 95% confidence level counting error. The MDC routinely runs <2 pCi/l.

Radium 226 is analyzed by radon emanation technique as preferred. The sample is prepared according to the above procedures and allowed to ingrow for Radon 222 for a period of 2-4 weeks. The Radon 222 gas is then deposited into a lucas cell and placed into a scintillation counter. Background checks are run on cells immediately prior to use and standards are run to verify recoveries.

ELI participates in the Cross-Checks program initiated by EPA/Las Vegas for these radiochemistry procedures. All Quality Control Procedures were adopted from the Handbook for Analytical Quality Control in Radio-analytical Laboratories, EPA-600/7-77-088, August, 1977, and with the guidance by direct contact with EPA/Las Vegas.

Total Coliform is analyzed by membrane filter technique and incubated  $35^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$ . The media used is specific for total coliform growth and is purchased in ampoul form from the manufacturer. A control is run per batch of samples. Incubator temperature is rigidly maintained and all charts for sterilizing of glassware are maintained.

Turbidity - Samples are analyzed using the Hach 1860A Turbidimeter. Standard solutions of latex are used to calibrate the instrument prior to use. These standards are calibrated against formazin which is the primary standard turbidity material used by Hach Company. Detection limits to 1 NTU can be obtained.

Herbicides/Pesticides - Analytical methods for SDWA pesticides and herbicides are outlined in Manual of Analytical Methods for the Analysis of Pesticides in Humans and Environmental Samples, USEPA, June, 1980.

On all GC/MS analyses, internal and surrogate standards will be used, when appropriate. During each day of GC/MS operations and autotune program will be checked and either decafluorotriphenyl phosphine (DFTPP) or bromofluorobenzene (BFB) will run a GC/MS system performance test.

Routine detection limits well below the Safe Drinking Water Act are as follows:

Endrin	<0.00008	mg/l
Lindane	<0.0005	mg/l
Methoxychlor	<0.001	mg/l
Toxaphene	<0.003	mg/l
2,4-D	<0.002	mg/l
2,4,5-TP Silvex	<0.002	mg/l

TABLE 3

ANALYTICAL METHODS

The analytical methods to be used during this project can be found in the following publications:

Standards Methods for the Examination of Water and Wastewater, 15th Ed., American Public Health Association, 1015 Eighteenth Street, N.W., Washington, D.C., 20036, 1980.

Manual of Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79/020, USEPA, Office of Technology Transfer, Cincinnati, Ohio 45268, 1979.

Prescribed Procedures for Measurement of Radioactivity in Drinking Water, EPA 600/4-80-032, August, 1980.

Radiochemical Analytical Procedures for Analysis of Environmental Samples, USEPA, Environmental Monitoring and Support Laboratory, Las Vegas, Nevada.

Procedures for Handling and Chemical Analysis of Sediment and Water Samples, USEPA/CE 81-1, May, 1981, USAE Waterways Experiment Station, Vicksburg, Mississippi.

"Total Organic Halides" EPA Method 450.1, USEPA, Environmental Monitoring & Support Laboratory, Cincinnati, Ohio, N.W. 1980.

Handbook for Analytical Quality Control in Radioanalytical Laboratories, EPA-600/17-77-088, USEPA, Office of Research and Development, Office of Energy, Minerals and Industry, Washington, D.C., August, 1977.

Manual of Analytical Methods for the Analysis of Pesticides in Humans and Environmental Samples, EPA-600/8-80-038, USEPA, Health Effects Research Laboratory, June, 1980.

Handbook for Sampling and Sample Preservation of Water and Wastewater, EPA-600/4-82-029, USEPA, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio, September, 1982.



**ENVIRONMENTAL  
LABORATORIES, Inc.**

P.O. Drawer 2309 / Gulfport, Mississippi 39503 / (601) 863-3036

**QUALITY CONTROL PLAN**

1      PURPOSE

- 1.1    The purpose of this quality control plan is to establish and maintain laboratory practices to ensure the scientific reliability and compatibility of laboratory data generated by ELI.
  
- 1.2    In general the Handbook for Analytical Quality Control in Water and Wastewater Laboratories, EPA-600/4-79-019, USEPA, Office of Technology Transfer, Cincinnati, Ohio 45268, 1979, is used as the Quality Control Manual, for ELI.
  
- 1.3    A quality control program has two primary functions - to monitor the reliability of the results and to control the variables that indicate that reproducible data are being obtained and that the methods employed are actually measuring what is in the sample. These systematic checks apply to all types of analyses (Wet Chemistry, AA, GC, TOC, TOX). To control the quality of the data during a study; reagent blanks, and method blanks will be analyzed when appropriate. Spiked samples will document that the procedures utilized are actually recovering what is in the sample.
  
- 1.4    ELI participates in EPA and ERA (private company) crosschecks programs of blind samples to assure compliance with Quality Assurance Procedures.

2      QUALITY CONTROL OBJECTIVES

- 2.1    The primary objective of this quality control plan is to assure that all data collected for this project meets or exceeds the requirements as outlined in the Request for Proposal.
  
- 2.2    To accomplish this task, the following specific objectives will be sought:
  - 2.2.1    Estimate the level of quality of each analytical system without requiring excessive precision, accuracy, and sensitivity.
  
  - 2.2.2    Assist in the early recognition of deficiencies which might affect the quality of the data.
  
  - 2.2.3    Enable the laboratory to take such action as is necessary to ensure the validity of laboratory data.
  
  - 2.2.4    Enhance the utility of all data considered in the decision-making process by requiring sufficient documentation to express the limitations on the quality of data.

3      SAMPLING

3.1    General

3.1.1    Environmental Laboratories will be responsible for all sampling procedures and field work when required by client.

3.1.2    Sample bottles delivered to field location will be prepared according to cleaning procedures listed in Section 5.

3.1.3    These bottles will have a blank label affixed to them and are to be completed by the field crew personnel.

3.1.4    Environmental Laboratories personnel will be responsible for maintaining the integrity of the samples.

3.1.5    Chain of Custody Forms will accompany sample bottles to field location and the personnel shall complete these forms placing them with the sample coolers. When the final reports are mailed, Chain of Custody Forms will be returned to the client. These forms will include the following information:

- 3.1.5.1    Station Location
- 3.1.5.2    Sample Identification
- 3.1.5.3    Collector's Name
- 3.1.5.4    Time of Collection
- 3.1.5.5    Remarks or Comments

## 4 SAMPLE BOTTLE PREPARATION

### Recommended Procedure for The Cleaning of Sample Containers

- 4.1 As a preliminary to the procedures that will be used for the preservation and storage of water samples, some mention should be made as to the steps to be taken to insure that the probability of the containers themselves contaminating the samples are minimized. The procedures for cleaning the glass and plastic sample containers and their caps are as follows:
- 4.2 Clean glass bottles and clean glass vials.
- 4.1.1 Wash bottles with hot, soapy water.
- 4.2.2 Rinse with copious amounts of tap water and then with three rinses of DI water.
- 4.2.3 Rinse with nanograde acetone.
- 4.2.4 Allow container to air dry.
- 4.2.5 Place in 200°C oven for one hour.
- 4.2.6 Allow to cool and cap with teflon lined caps.
- 4.3 Plastic bottles:
- 4.3.1 Wash bottles with hot, soapy water.
- 4.3.2 Rinse with 5% nitric acid.
- 4.3.3 Rinse with copious amounts of DI water.
- 4.3.4 Allow to drain and then air dry.
- 4.4 Teflon liners:
- 4.4.1 Wash with hot, soapy water.
- 4.4.2 Rinse with DI water.
- 4.4.3 Rinse with nanograde acetone.
- 4.4.4 Allow to air dry.
- 4.4.5 Place liners in clean caps.
- 4.4.6 Heat to 40°C for two hours.
- 4.4.7 Place on clean bottles.

4.5 Foil liners:

4.5.1 If teflon liners are not available or practical, foil liners may be used instead.

5      SAMPLE PRESERVATION

5.1 To prevent or retard the degradation/modification of the samples during transportation and storage, the samples will be preserved according to:

5.1.1 Table I, Methods for Chemical Analysis of Water and Waste, EPA-600/4-79-020, 1979, EMSL, Cincinnati, Ohio 45268.

5.1.2 Federal Register, 3 December, 1979.

5.1.3 Standard Methods for the Examination of Water and Wastewater, 15th Edition, American Public Health Association, 1015 Eighteenth Street, NW, Washington, DC 20036, 1980.

5.2 In addition to chemical preservatives listed in the references above, all samples will be iced down and transported in heavy styrofoam containers as soon as possible.

6      SAMPLE RECEIPT AND LOG IN

- 6.1    Environmental Laboratories will be responsible for the management of the samples in the field when required by the client.
- 6.2    On arrival of the samples at ELI, the Chain of Custody Forms will be completed and signed.
- 6.3    On arrival at the laboratory, the samples will be logged into a bound laboratory log book. The information in this log book will include:
  - 6.3.1    The date of arrival of samples at the laboratory.
  - 6.3.2    Laboratory identification number.

7      SAMPLE PREPARATION

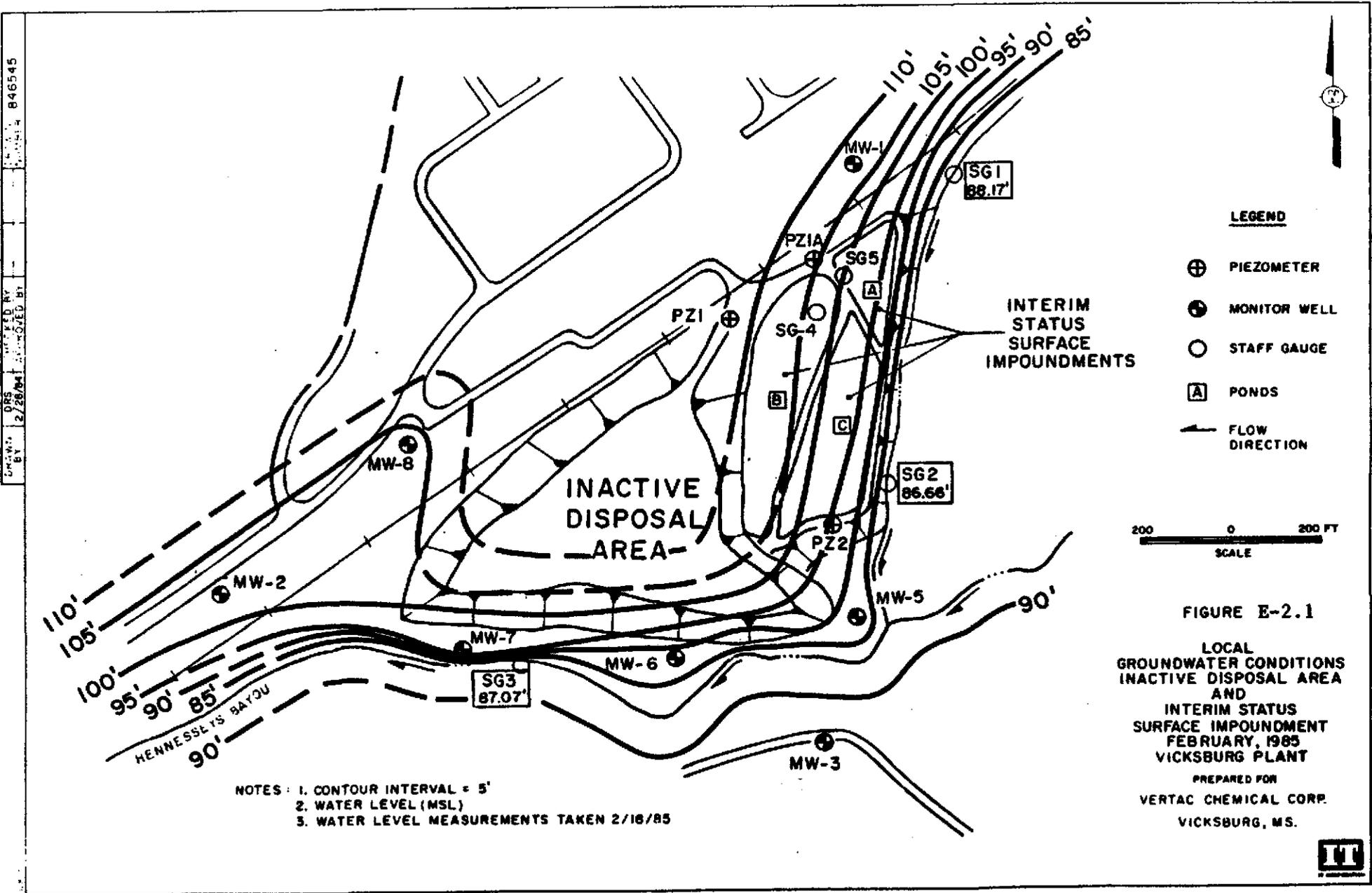
- 7.1 Water samples will require no special preparation or filtration unless specifically called for in the procedure. It is possible, however, that some "clean-up" may be required on GC, GC/MS work.
- 7.2 Soil and Sediment Samples will be prepared according to procedures outlined in Procedures for Handling and Chemical Analysis of Sediment and Water Samples, USEPA/CE 81-1, May, 1981, USAE Waterways Experiment Station, Vicksburg, Mississippi.

## 8 ANALYTICAL METHODS

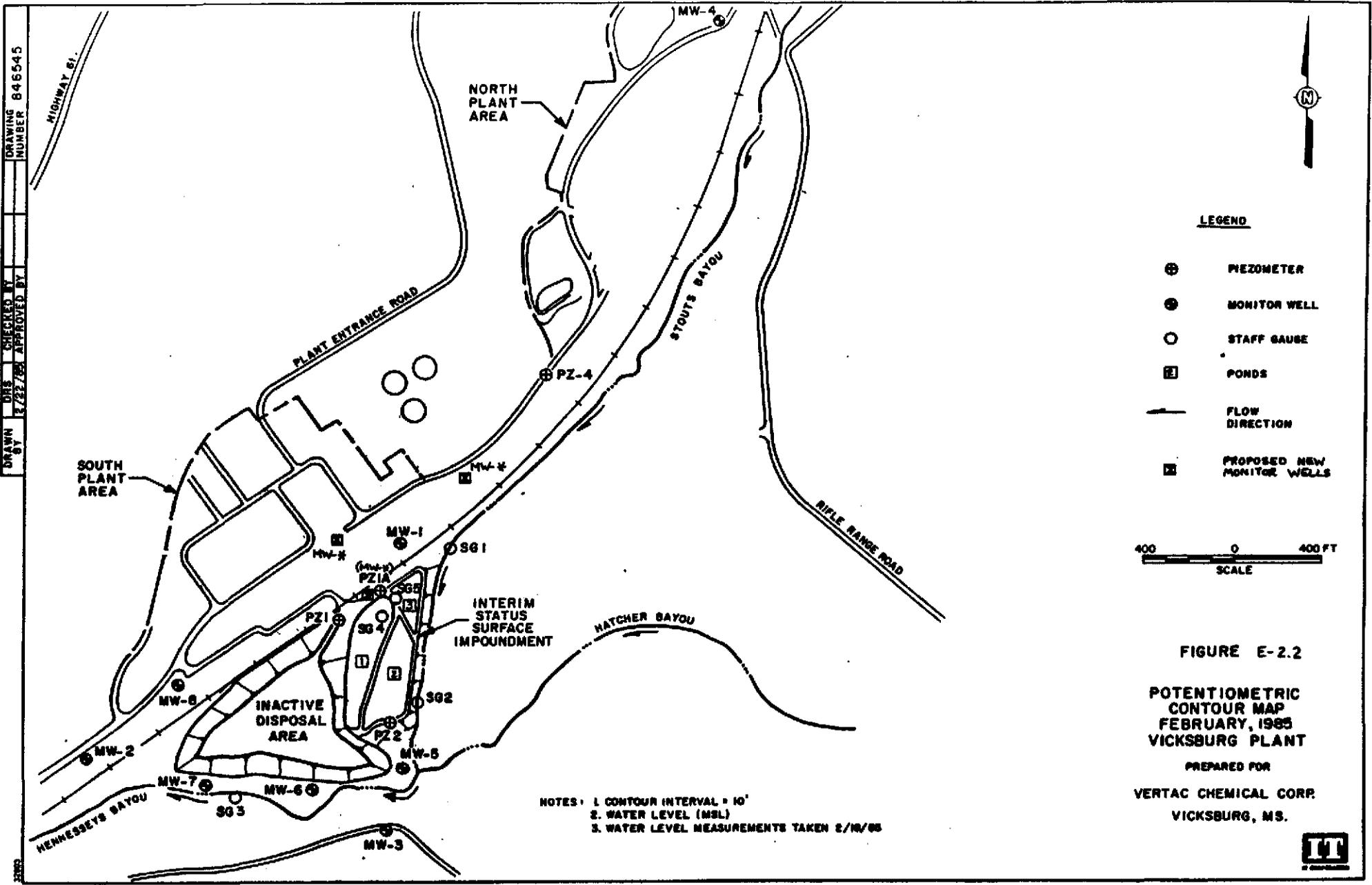
- 8.1 The analytical methods to be used during this project can be found in the following publications:
- 8.1.1 Standard Methods for the Examination of Water and Wastewater, 15th Ed., American Public Health Association, 1015 Eighteenth Street, N.W., Washington, D.C., 20036, 1980.
  - 8.1.2 Manual of Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79/020, USEPA, Office of Technology Transfer, Cincinnati, Ohio, 45268, 1979.
  - 8.1.3 Prescribed Procedures for Measurement of Radioactivity in Drinking Water, EPA 600/4-80-032, August, 1980.
  - 8.1.4 Radiochemical Analytical Procedures for Analysis of Environmental Samples, USEPA, Environmental Monitoring and Support Laboratory, Las Vegas, Nevada.
  - 8.1.5 Methods 601-625, Federal Register, 3 December, 1979, Vol. 44.
  - 8.1.6 Procedures for Handling and Chemical Analysis of Sediment and Water Samples, USEPA/CE 81-1, May, 1981, USAE Waterways Experiment Station, Vicksburg, Mississippi.
  - 8.1.7 Procedural Guide for Designation Surveys of Ocean Dredged Materials Disposal Sites. Technical Report EL-81-1, January, 1981, USAE Waterways Experiment Station, Vicksburg, Mississippi.
  - 8.1.8 Method for the Extraction and Analysis of Priority Pollutants in Sediment and Soil. Unpublished document dated November, 1981. US Environmental Protection Agency, Region IV, Atlanta, Georgia (available from CO).
  - 8.1.9 "Total Organic Halides", EPA Method 450.1, USEPA, Environmental Monitoring & Support Laboratory, Cincinnati, Ohio, N.W. 1980.
  - 8.1.10 Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, USEPA, SW-846, 1980.

- 9.1 All equipment to be calibrated under this procedure shall have an assigned record number permanently affixed.
- 9.2 A label will be affixed to each instrument showing: description, manufacturer, model number, serial number, date of last calibration, by whom calibrated, and due date of next calibration. Calibration reports and compensations or correction figures shall be maintained in the instruments maintenance and calibration file.
- 9.3 A written stepwise calibration procedure will also be found in this file.
- 9.4 Instruments past due for calibration shall be immediately removed from service either physically, or if this is impracticable, by tagging.
- 9.5 Instruments will be calibrated on each day in which analyses are conducted. This will be accomplished using "calibration standards" prepared by mixing the species to be analyzed into the solvent that is introduced into the instrument as dictated by the analytical method. The concentration of the calibration standards will be chosen so as to cover the working range of the instrument.
- 9.6 Identification of a compound by mass spectrometry will be provided. Hard copies of the reference and the sample spectra will be included in the technical report to the client.

OBSERVED BY: 2/16/85  
 CHECKED BY: 2/16/85  
 DRAWN BY: 2/16/85  
 PROJECT NO.: 846545



DRAWN BY: [ ]  
 CHECKED BY: [ ]  
 DATE: [ ]  
 APPROVED BY: [ ]  
 DRAWING NUMBER: 846545



**LEGEND**

- ⊕ PIEZOMETER
- MONITOR WELL
- STAFF GAUGE
- PONDS
- FLOW DIRECTION
- PROPOSED NEW MONITOR WELLS

400 0 400 FT  
 SCALE

**FIGURE E-2.2**

**POTENTIOMETRIC  
 CONTOUR MAP  
 FEBRUARY, 1985  
 VICKSBURG PLANT**

PREPARED FOR  
**VERTAC CHEMICAL CORP.**  
**VICKSBURG, MS.**

NOTES: 1. CONTOUR INTERVAL = 10'  
 2. WATER LEVEL (MSL)  
 3. WATER LEVEL MEASUREMENTS TAKEN 2/16/85



### GROUNDWATER MONITORING PROGRAM

A two-phase groundwater monitoring program, comprising compliance monitoring and corrective action is proposed in order to remediate the DNBP contamination detected at MW-1.

### COMPLIANCE MONITORING PLAN

The compliance monitoring plan was previously outlined in the Groundwater Assessment Program interim report prepared by IT Corporation for Vertac Chemical in March, 1985. Several aspects of this plan have been completed, or are currently in progress.

The description of the various wastes handled at this facility has been completed and is contained in Section B-1 of this application.

The characterization of the groundwater contamination is currently underway. Each of the monitoring wells at Vertac has been sampled, and the samples sent to an independent laboratory for analyses. The analyses will test each sample for the presence of Appendix VIII constituents, and determine the concentrations of each contaminant present. The proposed contaminant concentration limit is the level of detectability. For DNBP this is 0.5 ppm. This analytical work is to be finished by July 15, 1985.

### CORRECTIVE ACTION PLAN

If DNBP or any other Appendix VIII constituent is identified by the compliance monitoring plan, Vertac will implement a corrective action plan. The details of this plan and a proposed schedule are summarized below:

<u>Action</u>	<u>Start Date</u>	<u>End Date</u>
1. Identify sources of contamination	July 15, 1985	Oct. 15, 1985
2. Identify extent of contamination	July 15, 1985	Oct. 15, 1985
3. Characterize aquifer based on data collected by previous studies	July 15, 1985	Dec. 15, 1985
4. Identify alternatives	Dec. 15, 1985	Feb. 1, 1986

- |  |               |               |
|--|---------------|---------------|
| 5. Perform feasibility study   | Jan. 15, 1986 | Mar. 15, 1986 |
| 6. Select approach for corrective action program (includes 30 days for State approval after submittal of selected alternative) | Mar. 15, 1986 | June 15, 1986 |
| 7. Design and implement corrective action program  | June 15, 1986 |               |

The critical factors in the schedule delineated above are (1) completion of field work during summer of 1985, and (2) State approval of selected corrective action program in a timely manner.

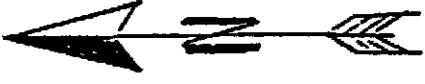
(a)(4) Security Procedures

F - 1a

The security of the production areas and the hazardous waste portions of the facility is provided by fences, combination of fences and natural barriers and controlled roadways.

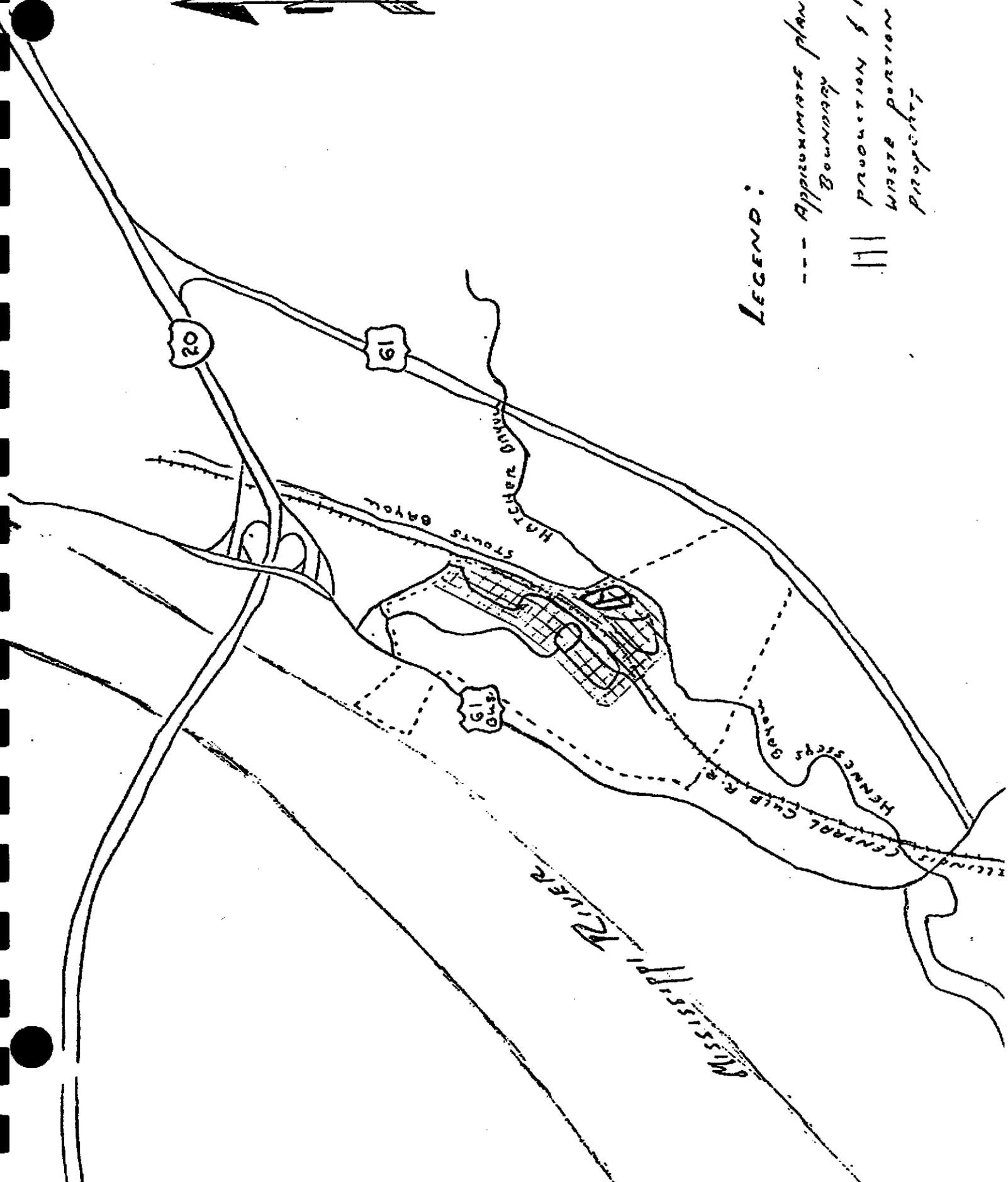
Refer to the attached sketch a-4. The neighboring area is generally bounded by State highways 61 and 61-Business and Interstate 20. The production and hazardous waste portions of the Vertac property are located within a valley, the surrounding highways are on the overlooking peaks. Access to the production and hazardous waste portion of Vertac property is secured as follows:

1. Access on the eastern one-half is secured by the presence of Hennessey's Bayou, Hatcher Bayou, and Stouts Bayou. Banks of the streams are steep and 10 to 15 feet in depth, stream widths are similarly 10 to 15 feet.
2. Access on the western one-half is secured by the presence of bluffs that drop steeply approximately 40 feet into the valley.
3. There are two roadways into the facility, one roadway into the north plant and one roadway into the south plant (see attached site plan). Both roadways are controlled by locked gates and area fences. The fences and gates are 6 foot high chain link of steel construction. The gate at the north plant is kept locked. A guard is stationed at the gate in the south plant during the day shift to admit traffic and approved plant visitors. During off shifts the gate at the south plant is kept locked. Access during off shifts is provided by using a phone at the gate to reach the shift supervisor who will then open the gate to approved traffic.
4. Signs with the legend "Danger - Unauthorized Personnel Keep Out" are posed atop the closed out inactive landfill, atop the berms of the surface impoundment, and alongside the railroad right-of-way. The signs are legible from a distance of 25 feet.



LEGEND:

- Approximate plant property boundary
- ||| Production & hazardous waste portion of property

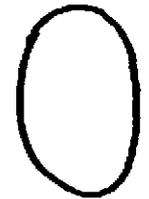


LOCATION OF WARNING SIGNS

27 NO. 10 SHEETS 3 SQUARE  
27 NO. 100 SHEETS 3 SQUARE  
27 NO. 200 SHEETS 3 SQUARE  
27 NO. 300 SHEETS 3 SQUARE  
27 NO. 400 SHEETS 3 SQUARE  
27 NO. 500 SHEETS 3 SQUARE  
27 NO. 600 SHEETS 3 SQUARE  
27 NO. 700 SHEETS 3 SQUARE  
27 NO. 800 SHEETS 3 SQUARE  
27 NO. 900 SHEETS 3 SQUARE  
27 NO. 1000 SHEETS 3 SQUARE

FENCE

STOUTS BAYOU



CITY POND

⊕ = SIGNS POSTED, DANGER,  
UNAUTHORIZED PERSONNEL KEEP OUT

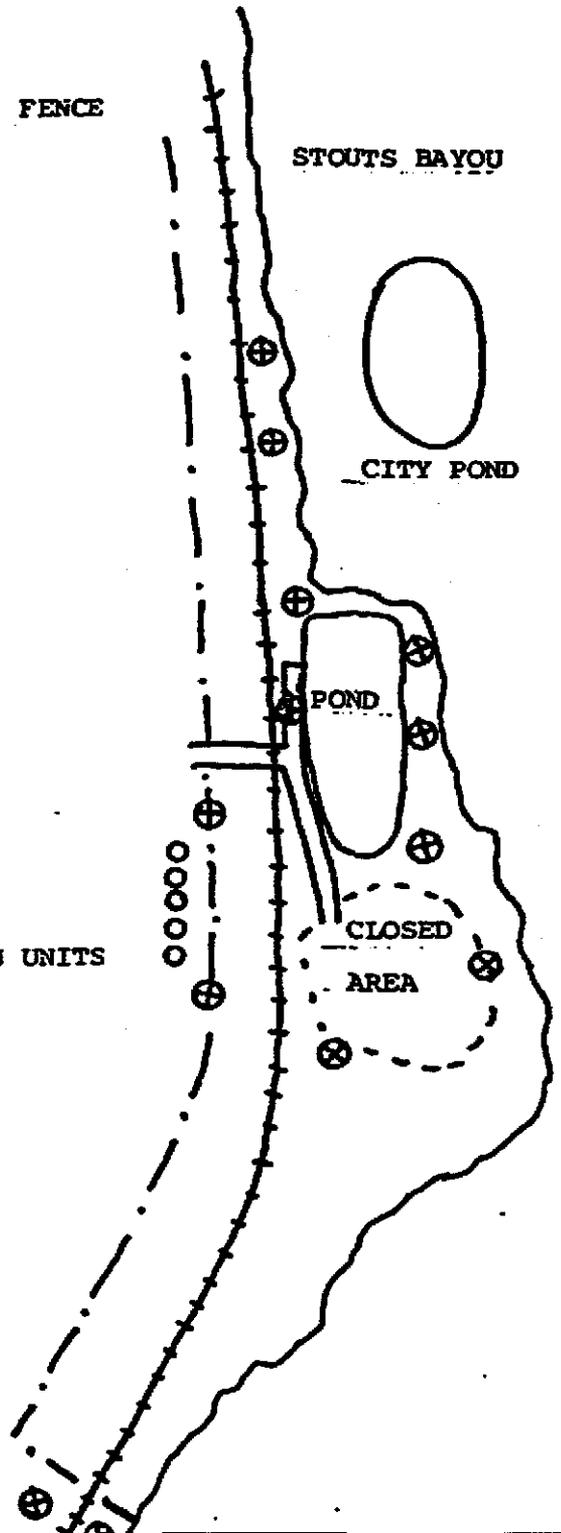


POND

CLOSED  
AREA

CALGON UNITS

SOUTH GATE



a(5)

F - 2

Surface Impoundment  
Inspection Checklist

Week of:

	Day/Signature							Remarks (continue on back)
	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	
<b>Impoundment:</b> Inspect and record level to ensure water level does not exceed 2 feet	Check the following DAILY and record discrepancies & maintenance							
<b>Pumps:</b> Observe valve and pipefittings for leaks  Check pump suction for accumulated trash  Check for excessive noise or vibration								
<b>Examine the dikes</b> for signs of erosion, cracking, wet spots, or other signs of leaking.  Check creek for for accumulated debris.  Examine downhill berm for signs of erosion.								
	Check the following WEEKLY and record discrepancies & maintenance							
	Check the following MONTHLY and record discrepancies & Maintenance							

a(7) Contingency Plan - Additional Information

F-3a(3) Emergency equipment for spill control

Spill control is provided by the fact that gravity drainage within the plant is to the surface impoundment. The only exception is those areas that are completely self contained where spills are returned to the process. Nevertheless, it is desirable and prudent to have safety and emergency equipment available to control spills at the source. The following is a tabulation of that equipment:

Equipment:	Frequency of Inspection:
Two major dirt moving contractors (Buford Construction and Miller Construction) are available in Vicksburg on short notice with bulldozers, backhoes, scrapers, trucks, portable sump pumps, portable sludge pumps, cranes, sandbags, rip-rap, generators and emergency lighting systems. Both contractors are extremely familiar with the plant and plant personnel.	As needed.
Dirt borrow areas are available on-site.	As needed.
55-gallon used steel drums.	
Emergency showers and eyewash	Monthly
Face shields, goggles, and eye-glasses with side shields	Monthly
Chemical cartridge escape respirators with cartridges for organic vapors and acid gases	Monthly
Chest-mounted gas mask canisters; full face	Monthly
Self contained breathing apparatus	Monthly
Fire extinguishers	Monthly
Emergency horn	As needed
Fire blankets	Monthly

**Equipment:**

**Frequency of Inspection:**

Telephone system

As needed

First aid equipment and supplies

Monthly

Protective clothing (uniforms,  
rubber boots, gloves)

As needed

Shower room

Monthly

a(8) Description of Procedures, Structures or Equipment for Hazardous Waste Management Facilities to:

- i Prevent unloading hazards
- ii Prevent runoff of waste
- iii Prevent contamination of water supplies
- iv Mitigate effects of equipment failure
- v Minimize personnel exposure

G-4d

G-4e

G-4f

G-4h

G-5

G-6

i Unloading Hazard Prevention

There are two areas of waste management where unloading or loading could present a waste hazard if improperly attended. These are the unloading of DNBW process wastewater into tanktrucks for shipping off-site to deep well disposal and unloading of salt cake from the centrifuge of the MSMA process into roll-off sludge containers for shipping off site to hazardous waste landfill disposal.

As described under "a(1) General Description" the DNBW process wastewater is acidic and hazardous by virtue of characteristic D002. Loading of the water into tanktrucks from 1 to 3 day storage is safely accomplished at an unloading rack with top entry into the dome of the truck. The truck is parked on level ground.

By-product salt from the monosodium methane arsonate plant is a listed RCRA waste (K031). The salt discharges from a centrifuge through a chute directly into a polyethylene liner placed inside the roll-off sludge container. The roll-off sludge container is parked on a level concrete diked area with a slight ramp to move the container on and off. The entire area is roofed. Two containers are always in place, as one is removed for transit off-site to hazardous waste disposal, a replacement is slipped into place.

ii Run-Off Prevention

Run-off prevention from process areas onto the ground is designed so as to avoid creation of hazardous wastes. Process areas are diked and roofed. Drains in the process areas, with the exception of the MSMA plant, are tied into a piped system which drains by gravity to the surface impoundment. The MSMA plant is totally contained and spills, rainwater falling within process areas, and process water are returned to the process; that is, there is no effluent from the MSMA plant.

Areas around storage tanks also drain into the piped system which drains by gravity to the surface impoundment.

Spill control is provided by the fact that gravity drainage within the plant is to the surface impoundment. The only exception is those areas that are completely self contained where spills are returned to the process. By virtue of plant layout and design, the strategy on run-off is to contain the run-off in the surface impoundment. Contents of the surface impoundment are treated by carbon adsorption prior to discharge to the Mississippi River. Nevertheless, it is desirable and prudent to have safety and emergency equipment available to control spills at the source.

In the event of a spill the Emergency Coordinator will assess the magnitude and potential seriousness of the spill or release. If the accident is determined to lie within the company's emergency response capabilities, the Emergency Coordinator will contact and deploy the necessary in plant personnel. If the accident is beyond plant capabilities, the Emergency Coordinator will contact the appropriate agencies. Detailed response are described in a(7) The Contingency Plan. Coordination arrangements with appropriate agencies are noted by their acknowledgement of receipt of our contingency plan and their intent to respond when needed.

As described in the Contingency plan, in the event of a major emergency involving a chemical spill, the following general procedures will be used for rapid and safe response and control of the situation. If an employee discovers a chemical spill or process upset resulting in a vapor release, he or she will immediately report it to the area supervisor.

The area supervisor will contact the designated Emergency Coordinator at the time of the incident. When contacted, the designated Emergency Coordinator will obtain information pertaining to the following:

1. The material spilled or released.
2. Location of the release or spillage of hazardous material.
3. An estimate of quantity released and the rate at which it is being released.
4. The direction in which the spill or vapor or smoke release is heading.
5. Any injuries involved.
6. Fire and/or explosion or possibility of these events.
7. The area and materials involved and the intensity of the fire or explosion.

In the event of a leak or spill in a tank, all feed lines to the tank will be closed.

If a chemical spill is not contained within a dike or sump area, an area of isolation will be established around the spill. The size of the area will generally depend on the size of the spill and the materials involved. If the spill is large and involves a tank or a pipeline rupture, an initial isolation of at least 100 feet in all directions to allow cleanup and repair and to prevent exposure. When any spill occurs, only those persons involved in overseeing or performing emergency operations will be allowed within the designated hazard area. If possible the area will be roped or otherwise blocked off.

If the spill results in the formation of a toxic vapor cloud and its release, further evacuation will be forced. An area at least 500 feet wide and 1000 feet long will be evacuated downwind if volatile materials are spilled.

If the control and cleanup of a spill, release, or fire is within the capabilities of company personnel and local response teams, the Mississippi Department of Natural Resources or the National Response Center will not be notified unless on the following occurs:

1. The spill will not be contained within the surface impoundment and the quantity of hazardous material spilled is equal to or greater than the reportable quantity specified under 40 CFR Part 117.
2. The spill involves other hazardous materials not listed but used at the plant if they pose an actual or potential hazard of life or property. As called for in regulations developed under the Comprehensive Environmental Liability and Compensation Act of 1980 our practice is to report a spill of a pound or more of any hazardous material for which a reportable quantity has not been established and which is listed under the Solid Waste Disposal Act, Clean Air Act, Clean Water Act, or TSCA. We also follow the same practice for any substances not listed in the Acts noted above but which can be classified as a hazardous waste under RCRA.

The following guidelines will be used in case of an accidental episode involving waste materials. These are general guidelines, and circumstances may dictate some alterations to these procedures.

Most waste spills and leaks are easily contained within dikes and sumps or areas of isolation. Small spills occurring in a

diked area are flushed with plenty of water, to the sump or drain to the surface impoundment provided for that area. If necessary, a rented portable sump pump is used to pump the diluted waste material into 55-gallon drums.

For all large spills or serious leaks the following guidelines will be followed as closely as possible:

1. If a leak develops or a spill occurs from a waste storage tank, pipeline pump, etc., the person discovering the discharge will leave the immediate area and contact the Emergency Coordinator. The Emergency Coordinator will obtain the following information:

- a. Person(s) injured and seriousness of injury.
- b. Location of the spill or leak, material involved, and source (tank, pipeline, etc.).
- c. The approximate amount spilled, an estimate of the liquid and/or gas discharge rate, and the direction the liquid flow or gaseous cloud is moving.
- d. Whether or not a fire is involved.

2. If a leak develops in the surface impoundment the Emergency Coordinator will:

- a. Shut down all processes creating waste that is discharged into the impoundment.
- b. Shut off flow into the section of the impoundment that is leaking. (The impoundment is divided into three sections interconnected by drainage pipe.)
- c. Begin repairs.

3. If necessary, the Emergency Coordinator will:

- a. Initiate evacuation of the hazard area. For small spills or leaks, isolate at least 50 feet in all directions. For large spills, initially isolate at least 100 feet in all directions and keep all persons upwind of spill.
- b. Obtain medical attention for any injured persons. It may be helpful to instruct the caller in initial first aid procedures. Then call the hospital.

- c. Call the fire department if a fire is involved that cannot be extinguished by plant personnel. Fight small fires with dry chemicals, CO<sub>2</sub>, or foam, and large fires with water spray, fog, or foam. Keep heat-exposed containers cooled with water spray and remove them from the fire if possible. IF A RISING SOUND COMES FROM A VENTING DEVICE OR THE TANK BEGINS TO DISCOLOR, WITHDRAW FROM THE AREA IMMEDIATELY.
  - d. Dispatch emergency personnel to the fire to take the appropriate action.
  - e. Contact the proper authorities.
4. Cleanup personnel will:
- a. Make sure all unnecessary persons are removed from the hazard area.
  - b. Put on protective clothing and equipment.
  - c. If the flammable waste is involved, remove all ignition sources, and use spark and explosion proof equipment and clothing in containment and cleanup.
  - d. If possible try to stop a leak. Special materials will be kept on hand for temporary repairs.
  - e. Remove all surrounding materials that could be especially reactive with materials in the waste. Determine the major components in the waste at the time of the spill.
  - f. Contain, divert, and clean up a spill if it has not been contained by a dike or sump. Most spills contained within the dike or sump can be pumped back into the appropriate storage tank or drum.
  - g. Place all containment and cleanup materials in drums for proper disposal. Some items, such as absorbent rags or booms may have to be cut up.
  - h. Place all recovered liquid wastes and contaminated soil in drums for removal to an approved disposal site.

In order to prevent the recurrence or spread of fires, explosions or releases include stopping processes and operations, collecting and containing released waste, and recovering or isolating containers.

## Storage and Treatment of Released Material (40 CFR 264.56 (g) )

Immediately after an emergency, the emergency coordinator will make arrangements for treatment, storage or disposal of recovered waste, contaminated soil, surface water or any other contaminated material accumulated during the cleanup described above.

A listing of emergency equipment is made in the contingency plan and is repeated below:

Equipment:	Frequency of Inspection:
Two major dirt moving contractors (Buford Construction and Miller Construction) are available in Vicksburg on short notice with bulldozers, backhoes, scrapers, trucks, portable sump pumps, portable sludge pumps, cranes, sandbags, rip-rap, generators and emergency lighting systems. Both contractors are extremely familiar with the plant and plant personnel.	As needed
Dirt borrow areas are available on site.	As needed
55-gallon used steel drums	
Emergency showers and eyewash	Monthly
Face shields, goggles, and eye-glasses with side shields	Monthly
Chemical cartridge escape respirators with cartridges for organic vapors and acid gases	Monthly
Chest-mounted gas mask cannisters; full face	Monthly
Self contained breathing apparatus	Monthly
Fire extinguishers	Monthly
Emergency horn	As needed
Fire blankets	Monthly
Telephone system	As needed

Equipment:	Frequency of Inspection:
First aid equipment and supplies	Monthly
Protective clothing (uniforms, rubber boots, gloves)	As needed
Shower room	Monthly

After and emergency event, all emergency equipment listed above will be cleaned so that it is fit for use or it will be discarded and replaced. Before operations are resumed, an inspection of all safety equipment will be conducted.

### iii Water Supply Protection

The previous paragraphs on run-off protection describe the system to protect surface waters. Further discussion on the integrity of the surface impoundment is included in a(11) iii and b(3)ii.

The groundwater is monitored by seven monitoring wells. A sketch of the well location is attached. Further information is included in "c".

### iv Equipment Failure

Equipment failure is, of course, minimized by good plant wide maintenance procedures. Any failure resulting in spills or leaks will be caught in the surface impoundment, if they are not retained at the point of failure. It then becomes significantly important to minimize potential for failure at the surface impoundment.

At the surface impoundment there are three pumps in parallel to pump contents to the carbon adsorption system. Failure in one pump can be tolerated as long as repairs are not delayed. Failure of the impoundment itself can not be tolerated. Surface impoundment integrity is discussed in a(11) iii and b(3)ii.

### v Personnel Safety

The wastes within the Vicksburg facility present less of a degree of hazard than raw materials and products, nonetheless, the same safety precautions are taken. When handling wastes minimum safetygear consists of protective gloves, eye protection, and head protection.

The initial response to any emergency will be to protect human health and safety, and then the environment. Identification, containment, treatment, and disposal assessment will be the secondary response.

G - 7 Evacuation Plan

There is no hazardous waste incident that would cause need for an evacuation plan at the Vicksburg facility.

(a) (9)

**Precautions to Prevent Reaction or  
Ignition of Wastes**

Not applicable

a(7)

VERTAC CHEMICAL CORPORATION

VICKSBURG FACILITY

EMERGENCY RESPONSE CONTINGENCY PLAN

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## PART 1

### INTRODUCTION

#### 1.1 Authority

This contingency plan was developed in compliance with 40 CFR, Part 264, Subpart D, which provides for the preparation, publication, revision, and amendment of an Emergency Response Plan.

#### 1.2 Purpose and Objectives

- a. This plan provides for a pattern of coordinated and integrated response by plant personnel to respond to any emergency, and a system of prompt notification of local and state government concerning any in-plant emergency.
- b. The objectives of this plan are to provide for efficient, coordinated, and effective action to minimize damage and injuries from fire, explosion, spills or inadvertent discharges of chemicals, including containment and removal.

This plan provides for:

- (1) Assignment of duties and responsibilities.
- (2) Establishment and identification of emergency, task forces.
- (3) A system of notification, surveillance and reporting.
- (4) The establishment of a Plant Emergency Coordinator to direct operations in carrying out this plan.
- (5) A list of resources to combat fires and spills.
- (6) Investigative procedures to determine the cause of fire, spill or discharge.
- (7) Directions on public information releases.
- (8) Instructions covering emergency coordination.

## PART 2

### POLICY AND RESPONSIBILITY

#### 2.1 Regulatory Policy - (Federal Clean Water Act - Sec. 311)

- a. Congress has declared that it is the policy of the United States that there should be no discharge of oil or hazardous substance into or upon the navigable waters of the United States, adjoining shorelines, or into or upon the waters of the contiguous zone, or which may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the U. S. (including resources under the Fishery Conservation and Management Act of 1976).
- b. Any person in-charge of a vessel or an onshore or offshore facility of any kind shall, as soon as he has knowledge of any discharge of oil or hazardous substance from such vessel or facility, immediately notify the National Response Center at their toll-free number 1-800-424-8802.
- c. Plant Policies - The primary thrust of this plan is to provide a coordinated plant response capability in the event of an unplanned or sudden, and usually accidental, unusual event, i.e., fire, explosion, spill or discharge of oil or hazardous waste that poses a threat, or the potential of a threat to personal health, safety and welfare. Environmental pollution control techniques shall be employed in accordance with applicable regulations and guidelines.

PART 3

PLANNING AND RESPONSE

3.1 Emergency Response Activities and Coordination

- a. For emergency response activities, response management at the Vicksburg facility is accomplished through a single predesigned agent, the Emergency Coordinator (EC).
- b. The predesignated ECs for all emergencies occurring within the boundaries of the Vicksburg facility are:

- (1) EC-1 R. F. Maraman  
(2) EC-2 S. Keen  
(3) EC-3 B. J. Gunn

- c. The specific duties of the emergency coordinator are as follows:

Minor Spills or Leaks (Easily contained and not really an Emergency)

Notify the emergency coordinator and the shift supervisor. Take immediate steps to contain and repair the leak. Initiate clean up measures.

Major Spill, Fire or Explosion

Notify the emergency coordinator.

- (a) Whenever there is an imminent or actual emergency situation, the emergency coordinator (or his designee when the emergency coordinator is on call) must immediately:

(1) Activate internal facility alarms or communications to notify all facility personnel; and

(2) Notify appropriate State or local agencies with designated response rolls if their help is needed. The order of notification is to notify local authorities and emergency teams and lastly, State and Federal authorities.

- (b) Whenever there is a release, fire, or explosion, the emergency coordinator must immediately identify the character, exact source, amount and a real extent of any released materials. He will most probably do this by observation since he is intimately familiar with raw material at the plant. He may also consult material safety data sheets or submit samples for analysis by the lab. The lab will analyze for the particular product or raw material suspected to be spilled.

(c) Concurrently, the emergency coordinator must assess possible hazards to human health or the environment that may result from the release, fire or explosion. This assessment must consider both direct and indirect effects of the release, fire or explosion (e.g., the effects of any toxic, irritating or asphyxiating gases that are generated, or the effects of any hazardous surface water run-offs from water or chemical agents used to control fire and heat-induced explosions).

(d) If the emergency coordinator determines that the facility has had a release, fire or explosion which could threaten human health or the environment, outside the facility, he must report his findings as follows:

(1) If his assessment indicates that evacuation of local areas may be advisable, he must immediately notify appropriate local authorities. He must be available to help appropriate officials decide whether local areas should be evacuated: and

(2) He must immediately notify the National Response Center (using their 24-hour toll free number 800/424-8802). The report must include:

- (i) Name and telephone number of reporter.
- (ii) Name and address of facility.
- (iii) Time and type of incident (e.g., release, fire).
- (iv) Name and quantity of material(s) involved, to the extent known.
- (v) The extent of injuries, if any; and
- (vi) The possible hazards to human health, or the environment outside the facility.

(e) During an emergency, the emergency coordinator must take all reasonable measures necessary to ensure that fires, explosions and releases do not occur, recur or spread to other hazardous waste at the facility. These measures must include, where applicable, stopping processes and operations collecting and containing release waste, and removing or isolating containers.

(f) If the facility stops operations in response to a fire, explosion or release, the emergency coordinator must monitor for leaks, pressure build-up, gas generation, or ruptures in valves, pipes or other equipment wherever this is appropriate.

(g) Immediately after an emergency, the emergency coordinator must provide for treating, storing or disposing of recovered waste, contaminated soil or surface water, or any other material that results from a release, fire or explosion at the facility.

COMMENT: Unless the owner or operator can demonstrate that the recovered material is not a hazardous waste, the owner or operator becomes a generator of hazardous waste and must manage it in accordance with all applicable requirements.

(h) The emergency coordinator must ensure that, in the affected area(s) of the facility:

(1) No waste that may be incompatible with the released material is treated, stored or disposed of until cleanup procedures are completed: and

(2) All emergency equipment listed in the contingency plan is cleaned and fit for its intended use before operations are resumed.

(i) The emergency coordinator must ensure that the owner or operator notifies the Regional Administrator and appropriate State and local authorities, that the facility is in compliance with a paragraph (h) of this Section before operations are resumed in the affected area(s) of the facility.

(j) The emergency coordinator must ensure that the owner or operator notes in the operating record the time, date and details of any incident that requires implementing the contingency plan. Within 15 days after the incident, the owner or operator must submit a written report on the incident to the Regional Administrator. The report must include:

- (1) Name, address and telephone number of the owner or operator.
- (2) Name, Address and telephone number of the facility.
- (3) Date, time and type of incident (e.g., fire, explosion).
- (4) Name and quantity of material(s) involved.
- (5) The extent of injuries, if any.
- (6) An assessment of actual or potential hazards to human health or the environment, where this applicable: and
- (7) Estimated quantity and disposition of recovered material that resulted from the incident.

3.2 Local Fire Department Notification

The local fire department is an appropriate agency to be notified in the event of a major fire or explosion or major spill of flammable material as noted under the specific duties of the emergency coordinator. The fire department can be reached by dialing 911 or 636-1121.

3.3 Local Law Enforcement Notification

The Vicksburg Police Department at 636-2511 and the Sheriff at 636-1761 are appropriate agencies to be notified in the event of major fire or explosion or a major spill with reasonable probability of transit of chemicals in sufficient quantities beyond the boundary lines so as to be able to alert the public to avoid potential contact.

3.4 Local Hospital Notification

The local hospital is an appropriate agency to be contacted in the event of a major incident that has caused bodily harm or a major incident with sufficient chemical exposure to require blood testing, physical exams, etc.

3.5 Outside Responsibility and/or Assistance

a. Chemtrec at 800/424-9300. The Chemical Transport Emergency Center is a 24 hour a day service with access to industry-wide expertise on hazardous material handling of any chemical commercially available

b. Bureau of Pollution Control - The bureau of Pollution Control is responsible for coordinating, monitoring and cleanup of any large-scale release of chemicals which threatens the environment. The Bureau of Pollution Control is also the primary agency dealing with chemical hazards involved in pipeline breaks, train wrecks, truck wrecks, industrial accidents, etc., when health or people are involved.

EMERGENCY USE INDEX

Emergency Reporting and Coordination

National Response Center (NRC)	(800) 424-8802
Fire Department	911 or 636-1121
Ambulance	911
Sheriff	636-1761
Office of Emergency Services (OES)	1-961-5340
County Judge	638-8026
Mayor	636-3411
Vicksburg Police Department	636-2511
Bureau of Pollution Control	1-961-5099
Department of Health	636-4356
Vertac Corporate Offices	(901) 767-6851

Emergency Pollutant Hazards Information

Chemical Transport Emergency Center (Chemtrec)	(800) 424-9300
Assistance Data Systems (OHMTADS)	(214) 767-2666

Emergency Coordinators

R. F. Maraman	636-7711
S. Keen	636-0777
B. J. Gunn	636-5604
F. L. Ahlers	636-6786
G. D. Madsen	638-2847

## PART 4

### COORDINATING INSTRUCTIONS

#### 4.1 Delegation of Authority

Local delegation of authority for emergency response and subsequent cleanup activities initially may be oral or written at the discretion of the designated EC.

#### 4.2 Notification

All emergencies\* must be reported in accordance with federal and state laws. (Procedures are set forth in the specific duties of the emergency coordinator. See subpart 3.1 of Part 3 "Planning and Response Organization".)

\*Routine, minor spills that can be immediately cleaned up, or do not leave plant property and do not disrupt the normal routine operations are exempt from the reporting requirement.

#### 4.3 Multi-Incident Responses

Coordination of simultaneous responses for different emergencies, e.g., a fire/explosion and a chemical spill shall be carried out by the designated EC; however, he may delegate authority, but he will still maintain responsibility overall.

If an incident transcends plant boundaries, the designated EC will closely coordinate all activities with the local authorities.

#### 4.4 Mutual Aid Agreement(s)

All three Vertac plants will mutually assist one another in emergencies. Coordination will be provided through the corporate office at 901/767-6851.

#### 4.5 Termination of Response Activities

The Emergency Coordinator (EC) has been granted the authority to determine the appropriate termination of response activities after considering the recommendation of the appropriate state and local officials.

Termination should be effected when it is apparent that further effort will be non-productive or counter-productive in returning the environment to its former state.

PART 5

PROCEDURES FOR REVIEWING AND UPDATING THE  
EMERGENCY RESPONSE CONTINGENCY PLAN

5.1 Responsibility

- a. This plan was developed in accordance with the State, Regional, and National Contingency Plan.
- b. The Emergency Coordinator is responsible for revising and maintaining this plan.

5.2 Procedures for Review

- a. This plan will be reviewed and updated periodically and when major changes occur. Participating offices are requested to keep the Emergency Coordinator informed of all necessary or recommended changes.
- b. The predesignated Emergency Coordinator is responsible for periodically reviewing and updating this plan. He will insure that the person responsible for distribution will have sufficient copies of changes and amendments to effect appropriate distribution.

Appendix I - Distribution

Vertac Corporate Office  
Vertac Vicksburg Facility  
Vicksburg Fire Department\*  
Mercy Regional Medical Center Emergency Room\*  
Vicksburg Hospital Emergency Room\*  
Vicksburg Police Department\*  
Warren County Sheriff's Department\*

\*Acknowledgement of receipt is attached.

CHEMICAL TOXICOLOGY AND EMERGENCY CONTROL PLAN FOR VERTAC CHEMICAL CORPORATION

The Vicksburg Fire Department has been issued a copy of the Chemical Toxicology and Emergency Control Plan for Vertac Chemical Corporation, Vicksburg Plant.

Signature: \_\_\_\_\_

Signature: \_\_\_\_\_

10-13-81

CHEMICAL TOXICOLOGY AND EMERGENCY CONTROL PLAN FOR VERTAC CHEMICAL CORPORATION

The Mercy Regional Medical Center Emergency Room has been issued a copy of the Chemical Toxicology and Emergency Control Plan for Vertac Chemical Corporation Vicksburg Plant.

Signature: Betty Folsom, RN

Signature: Ray Hollins  
10-13-81

CHEMICAL TOXICOLOGY AND EMERGENCY CONTROL PLAN FOR VERTAC CHEMICAL CORPORATION

The Vicksburg Hospital Emergency Room has been issued a copy of the Chemical Toxicology and Emergency Control Plan for Vertac Chemical Corporation, Vicksburg Plant.

Signature: C. King RN.

Signature: Keyon Hollman

10-13-81

CHEMICAL TOXICOLOGY AND EMERGENCY CONTROL PLAN FOR VERTAC CHEMICAL CORPORATION

The Vicksburg Police Department has been issued a copy of the Chemical Toxicology and Emergency Control Plan for Vertac Chemical Corporation, Vicksburg Plant.

Signature: Herman Redick

Signature: Robert Waldman

19-13-81

CHEMICAL TOXICOLOGY AND EMERGENCY CONTROL PLAN FOR VERTAC CHEMICAL CORPORAT

The Warren County Sheriff's Department has been issued a copy of the Chemic  
Toxicology and Emergency Control Plan for Vertac Chemical Corporation, Vick  
Plant.

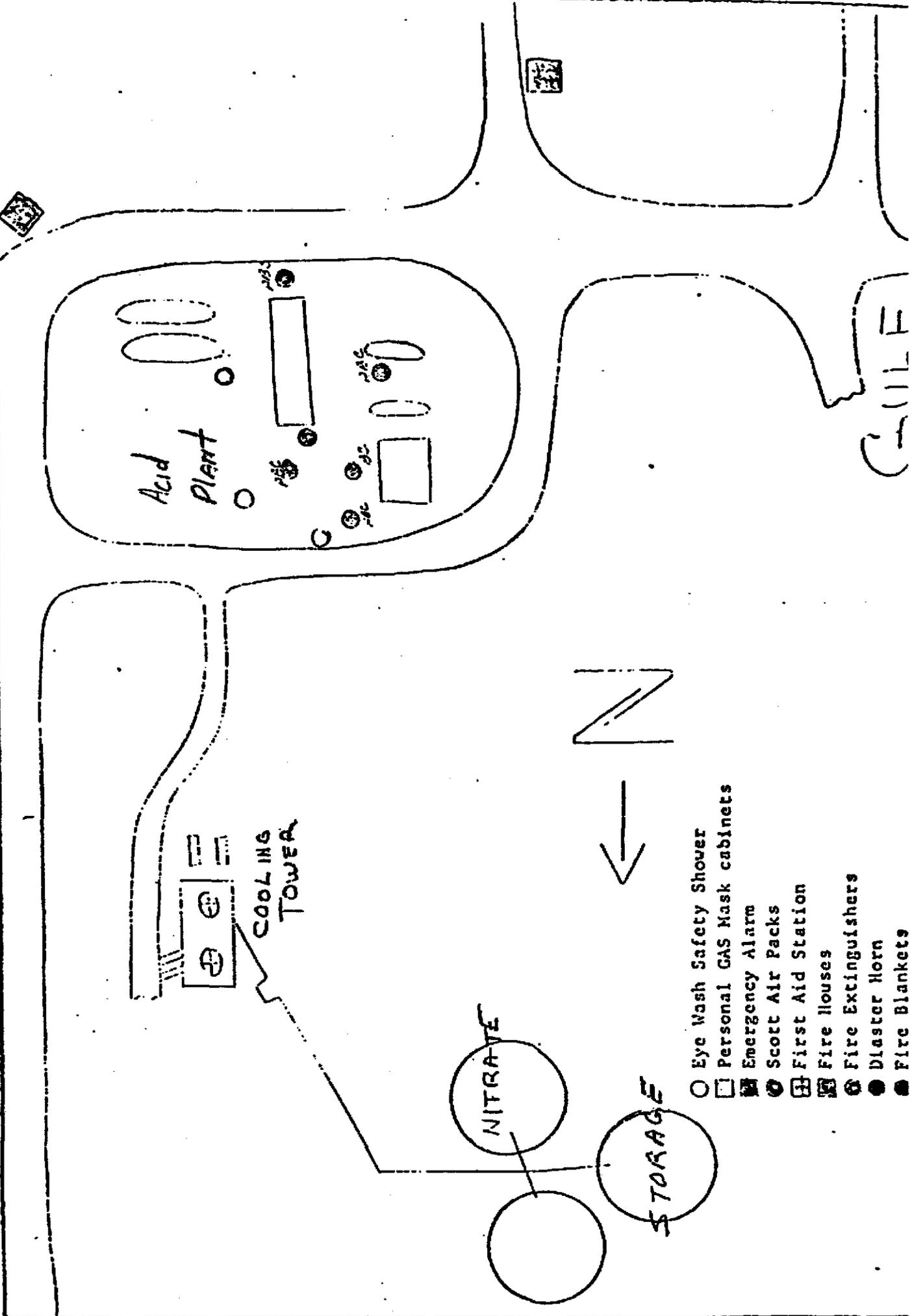
Signature: Larry Ashley

Signature: Robert Williams

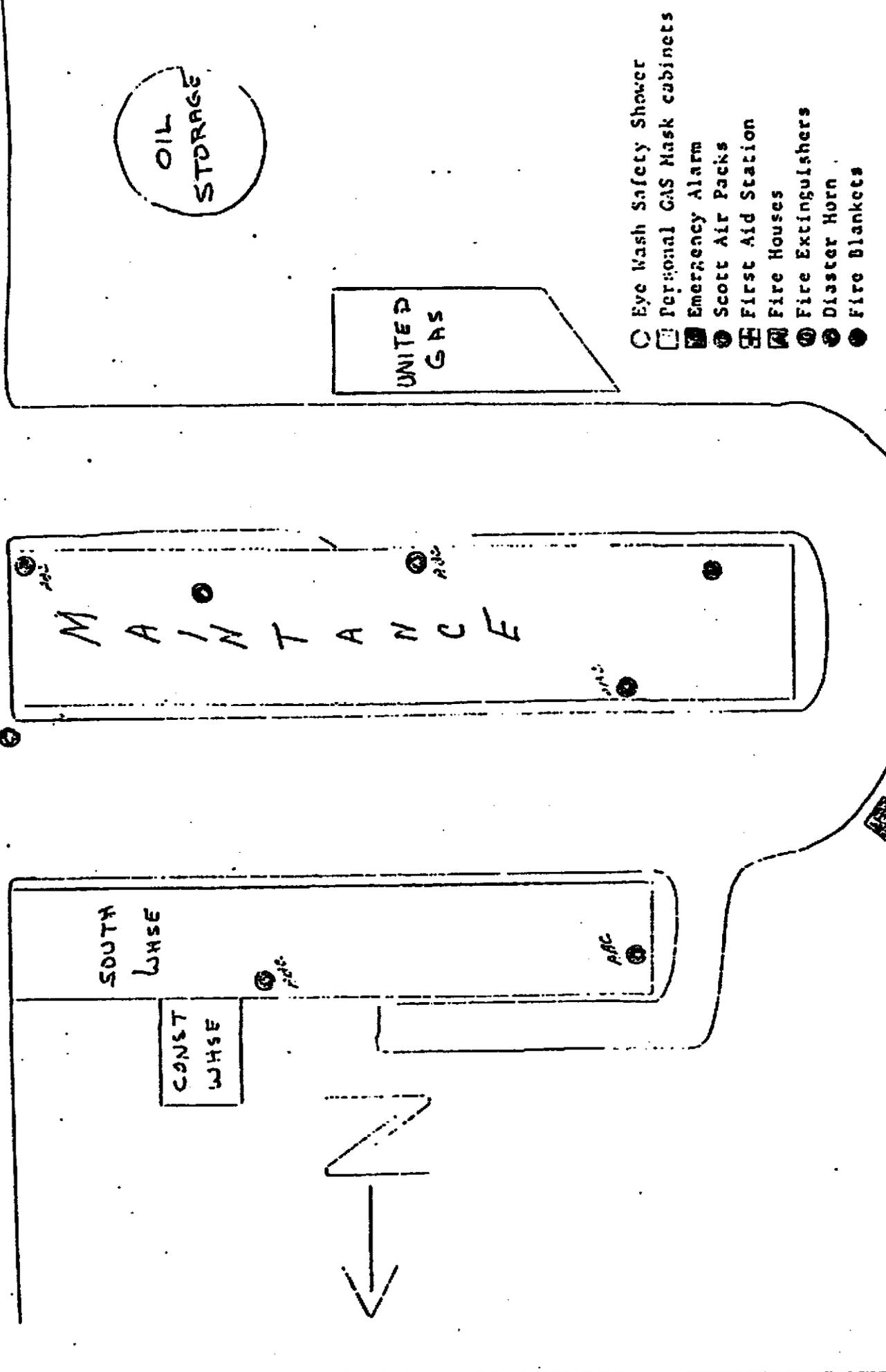
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**Appendix II - List of Emergency Equipment Available Onsite  
and Plat Map Showing Location of Emergency  
Equipment**

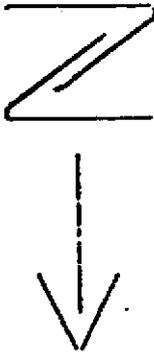
LOCATION OF EMERGENCY EQUIPMENT



- Eye Wash Safety Shower
- Personal GAS Mask cabinets
- Emergency Alarm
- ⊙ Scott Air Packs
- ⊠ First Aid Station
- ⊡ Fire Houses
- ⊢ Fire Extinguishers
- Plaster Horn
- Fire Blankets



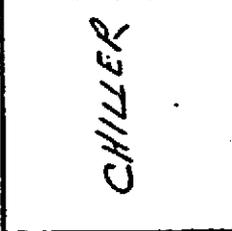
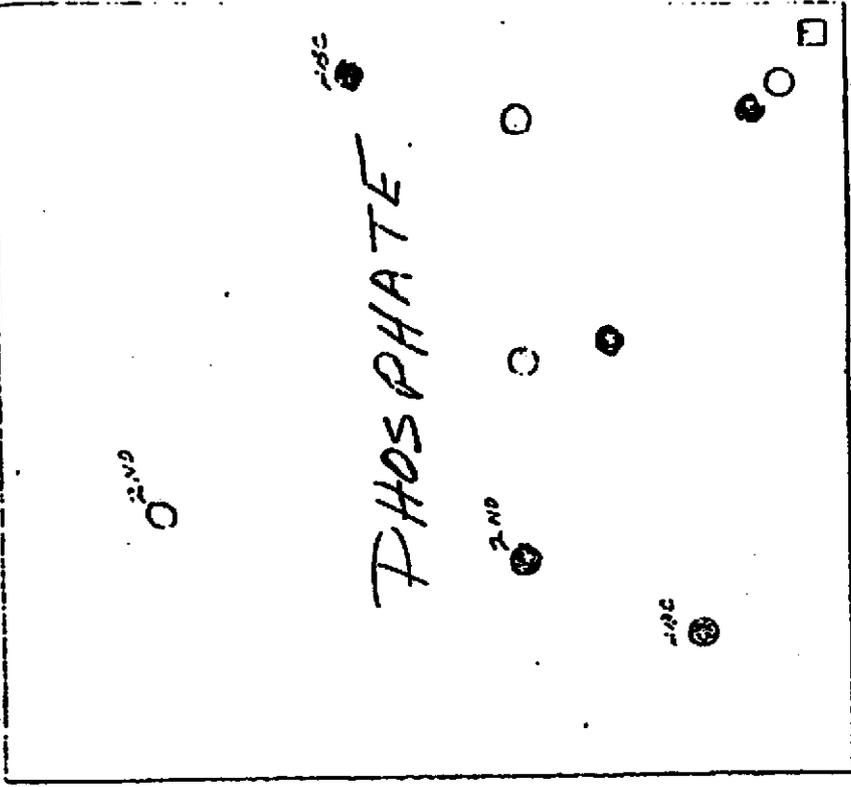
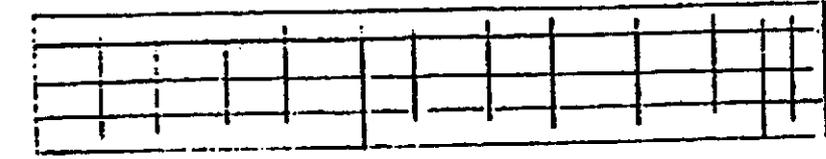
- Eye Wash Safety Shower
- Personal GAS Mask cabinets
- ☒ Emergency Alarm
- Scott Air Packs
- ☒ First Aid Station
- ☒ Fire Houses
- Fire Extinguishers
- Disaster Horn
- Fire Blankets

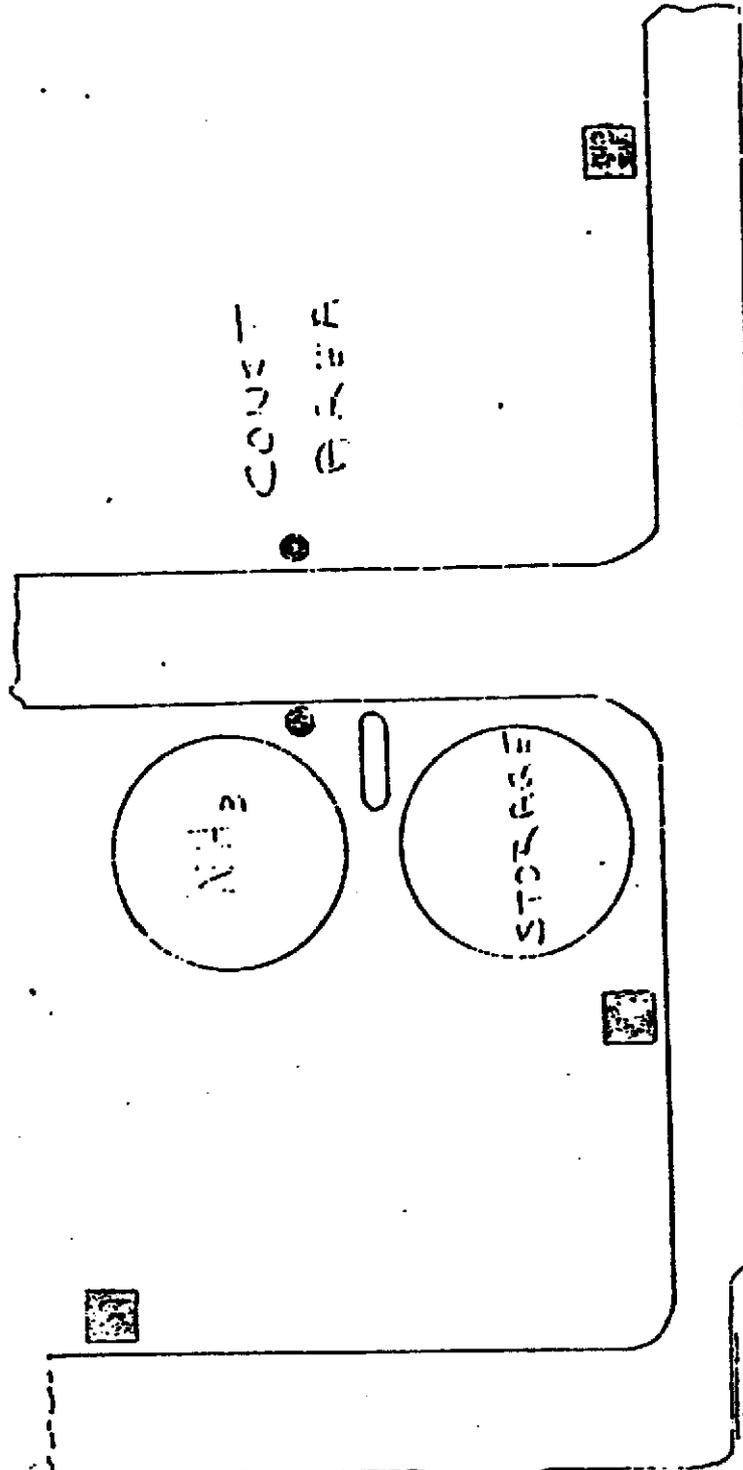
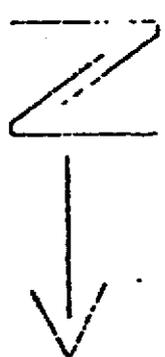


CONST  
AREA

- ① 1ST
- ② 2ND
- ③ 3RD

NOVA VE





- ① Eye Wash Safety Shower
- ☐ Personal GAS Mask cabinets
- ☒ Emergency Alarm
- Scott Air Packs
- ☒ First Aid Station
- ☒ Fire Houses
- ☒ Fire Extinguishers
- Disaster Horn
- Fire Blankets

FIRST AID STATION

OFFICE

PARKING LOT

CONVERT AREA

NH<sub>3</sub>

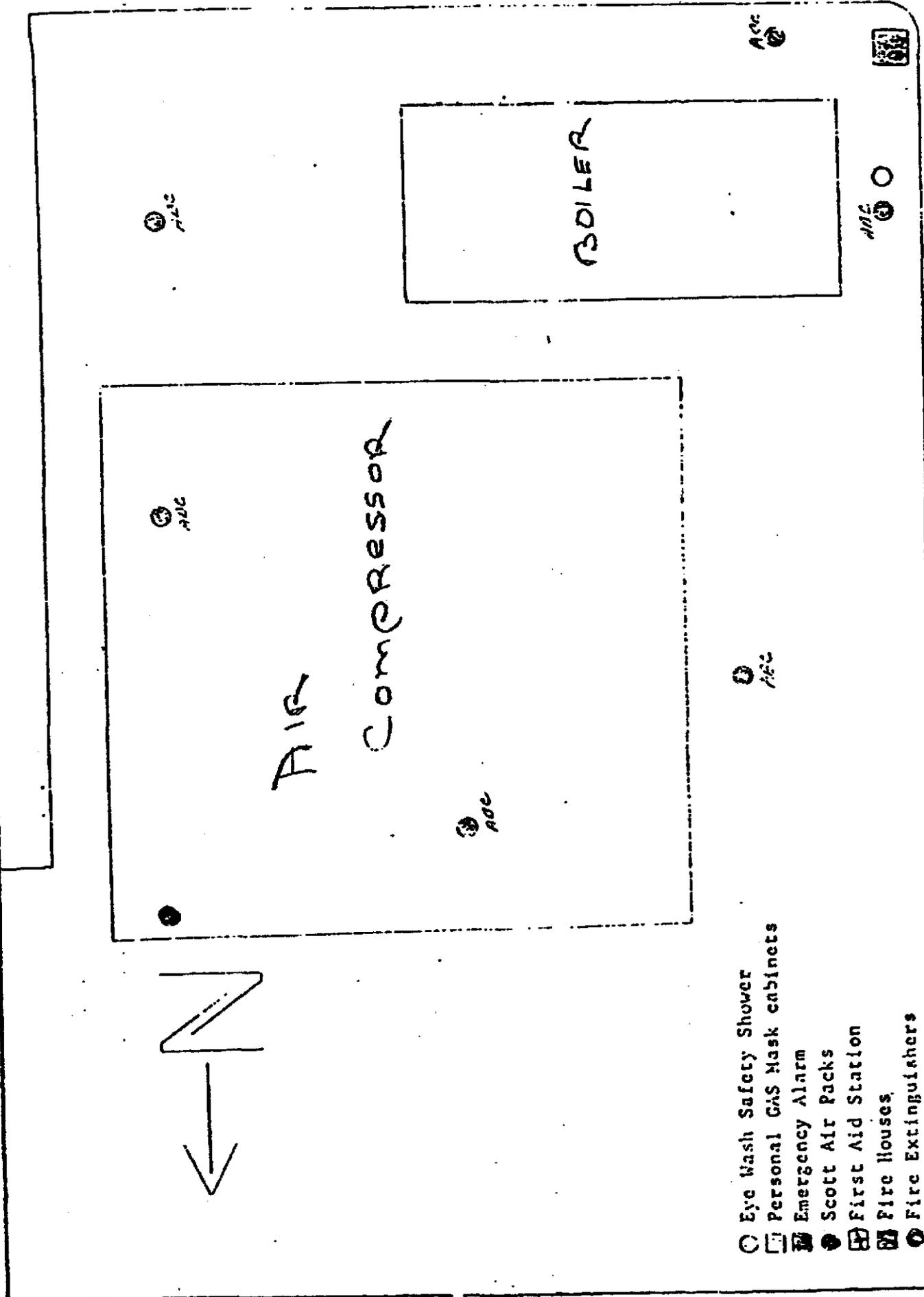
STORAGE

GAS

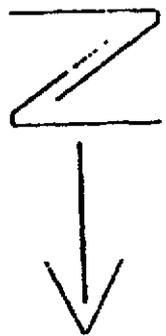
GAS

GAS

GAS



- Eye Wash Safety Shower
- Personal Gas Mask cabinets
- ⊞ Emergency Alarm
- Scott Air Packs
- ⊞ First Aid Station
- ⊞ Fire Houses
- Fire Extinguishers



AIR  
COMPRESSOR

BOILER

AOC

AOC

AOC

AOC

AOC

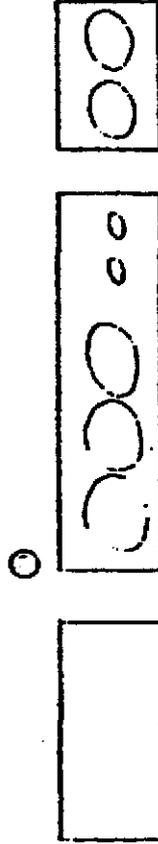
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REAGENT  
CHEMICALS

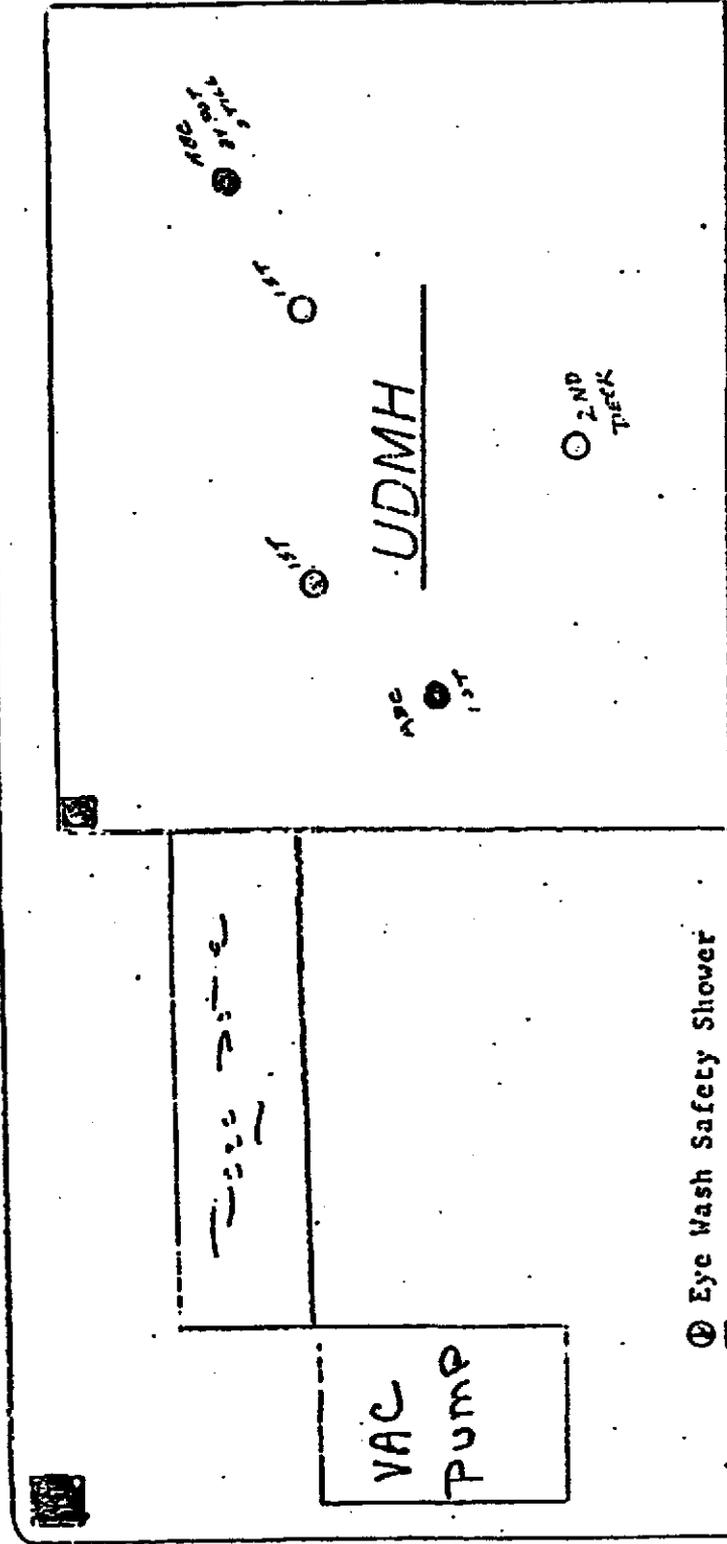
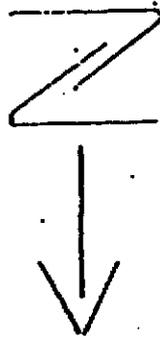
TOX STORAGE

DURF  
PLANT

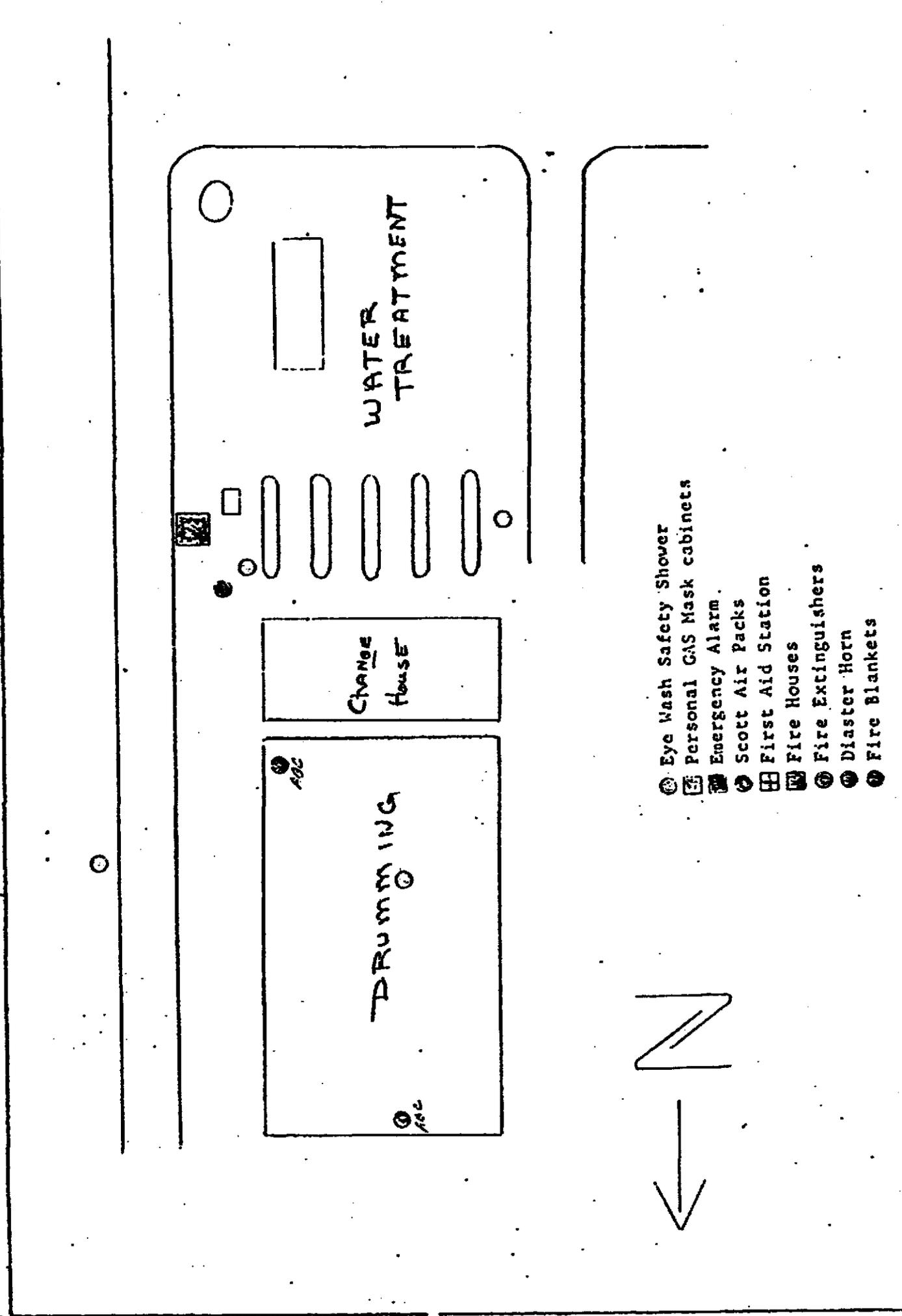


STORAGE DUREP - TOX

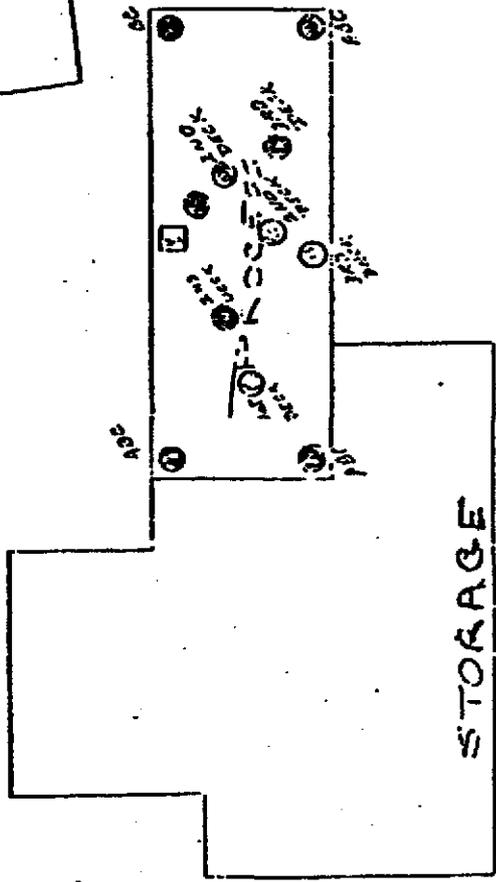
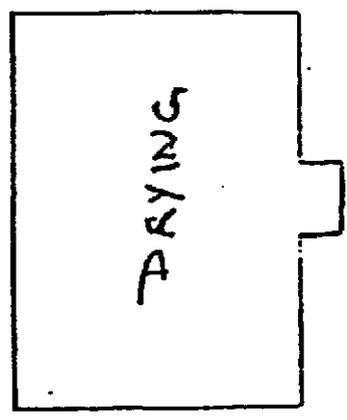
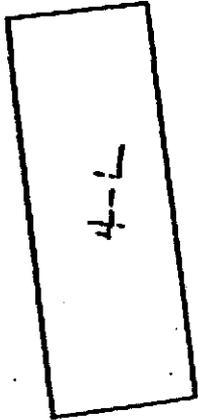
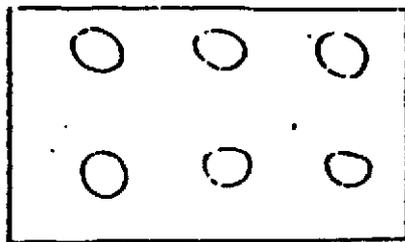
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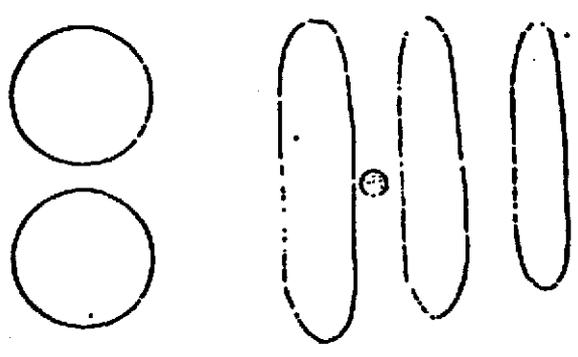
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- ☒ Personal GAS Mask cabinets
- ☒ Emergency Alarm
- ⊕ Scott Air Packs
- ☒ First Aid Station
- ☒ Fire Houses
- ⊕ Fire Extinguishers
- ⊙ Plaster Horn
- ⊙ Fire Blankets



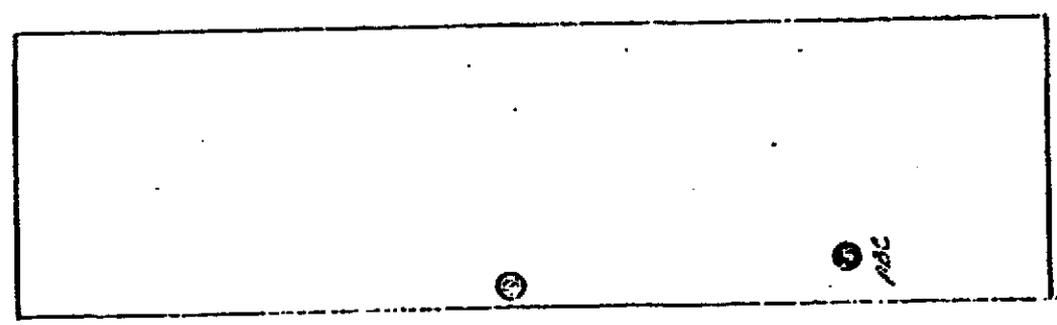
Emergency  
Exit



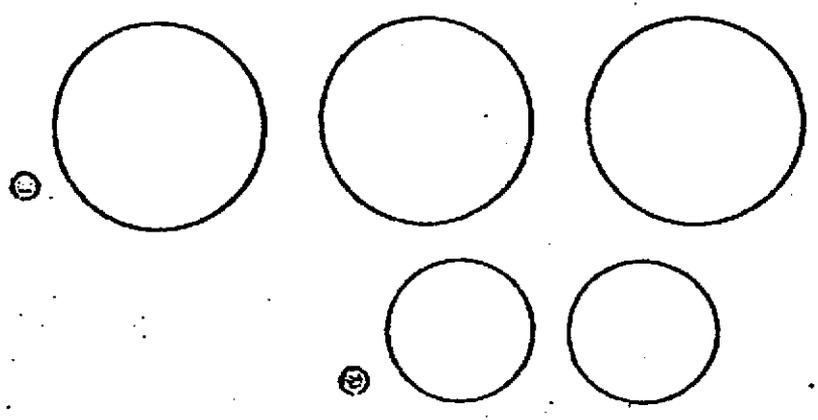
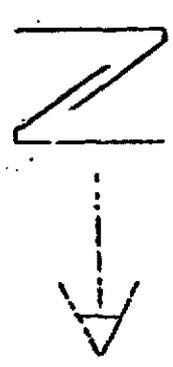
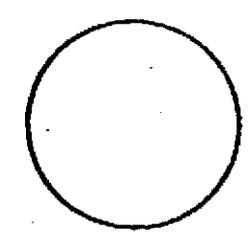
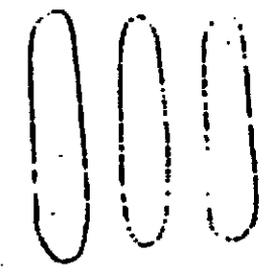
- ① Eye Wash Safety Shower
- ② Personal GAS Mask cabinets
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- ④ Scott Air Packs
- ⑤ First Aid Station
- ⑥ Fire Houses
- ⑦ Fire Extinguishers
- ⑧ Disaster Horn
- ⑨ Fire Blankets



AGC



AGC



NITROGEN  
SOLUTION  
DPPA

a(7) Contingency Plan - Additional Information

F-3a(1) Internal Communications - Emergency Horn

Signal:	Instruction*:
One long blast	Operational emergency
Two short blasts three times	Fire
Three short blasts two times	All clear

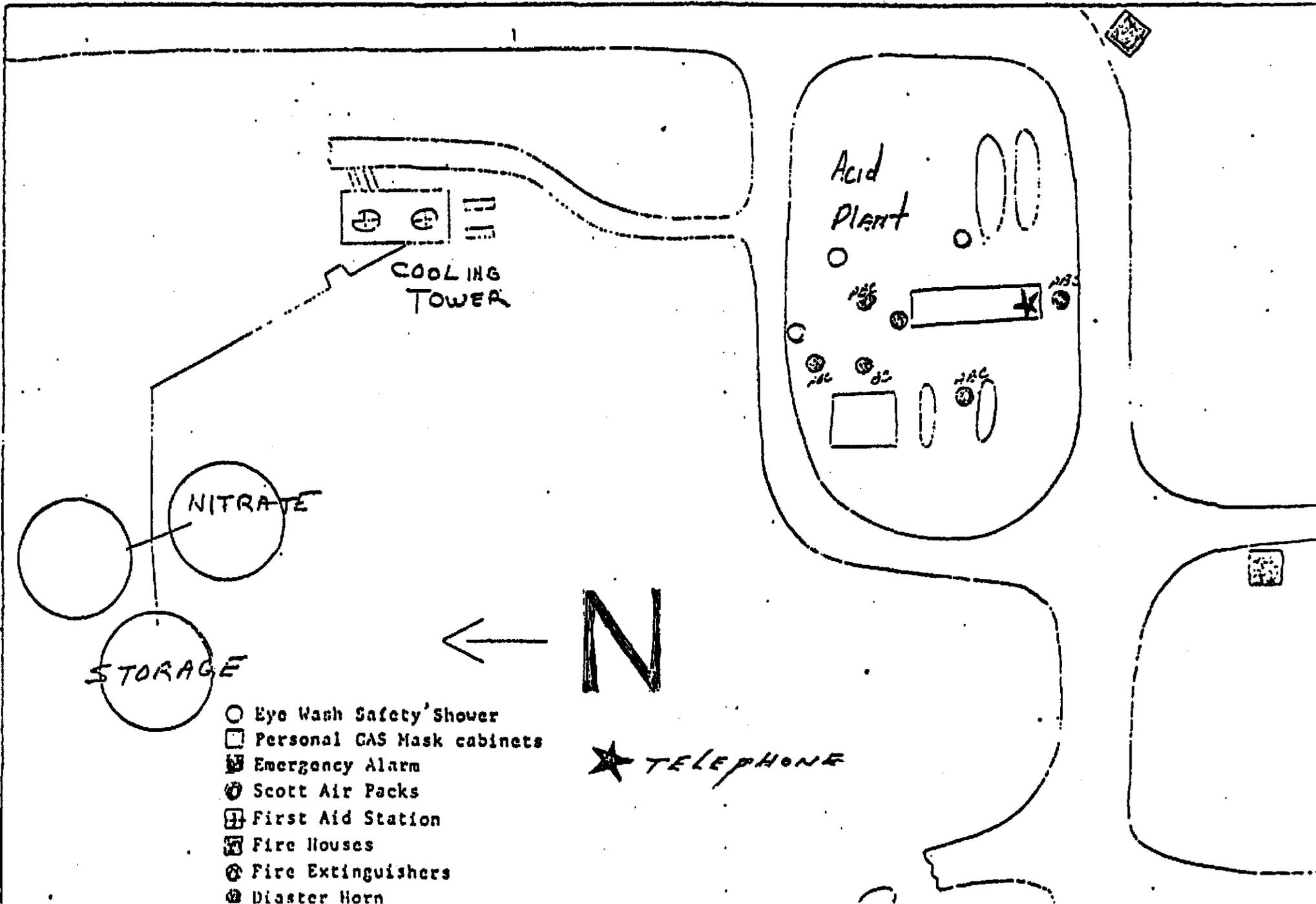
\* more detailed plant instructions are attached

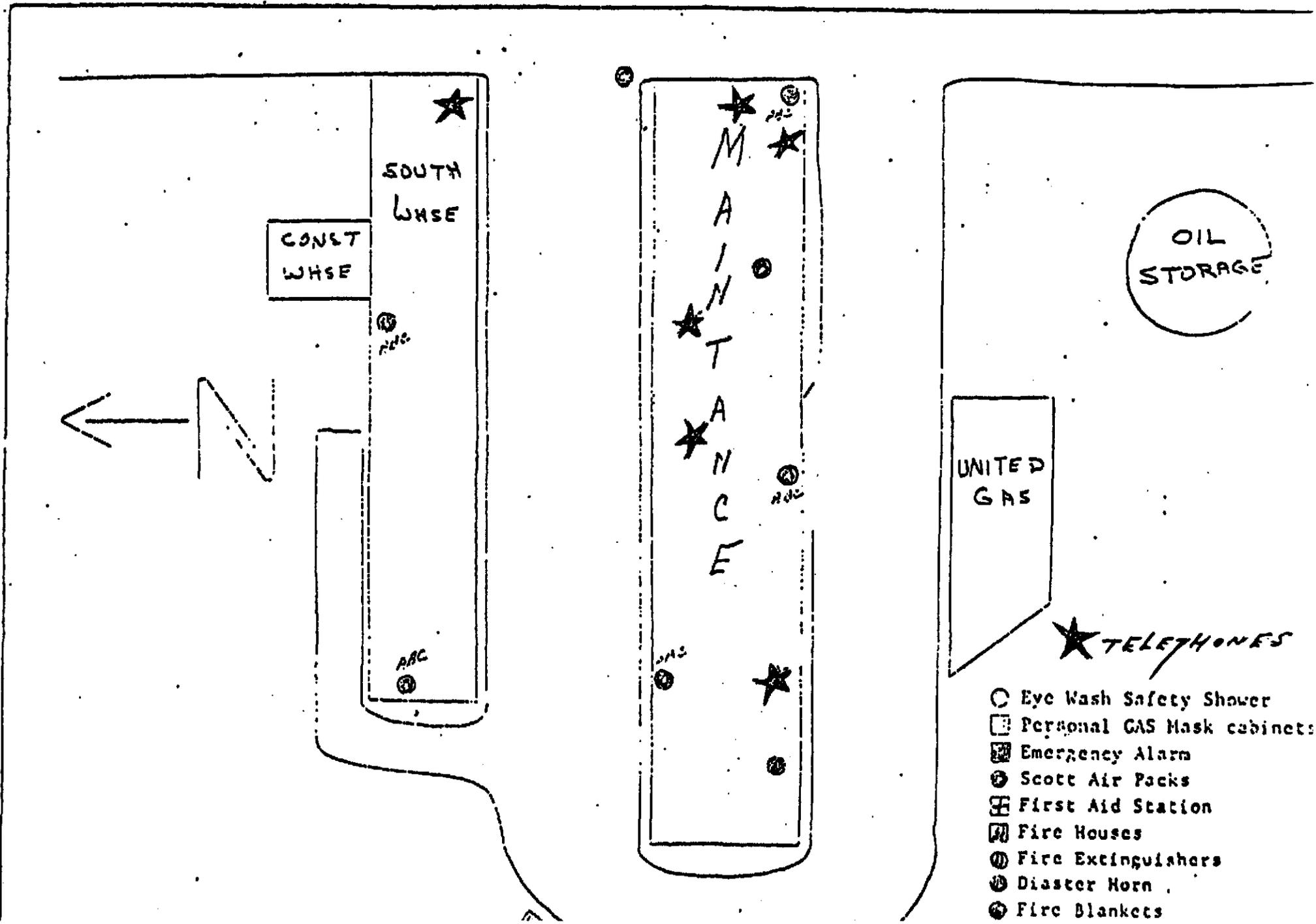
a(7) Contingency Plan - Additional Information

F-3a(2) External Communications

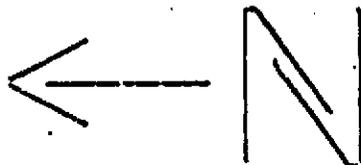
Locations of phones are now included on the emergency equipment maps, copies of which are attached.

LOCATION OF EMERGENCY EQUIPMENT





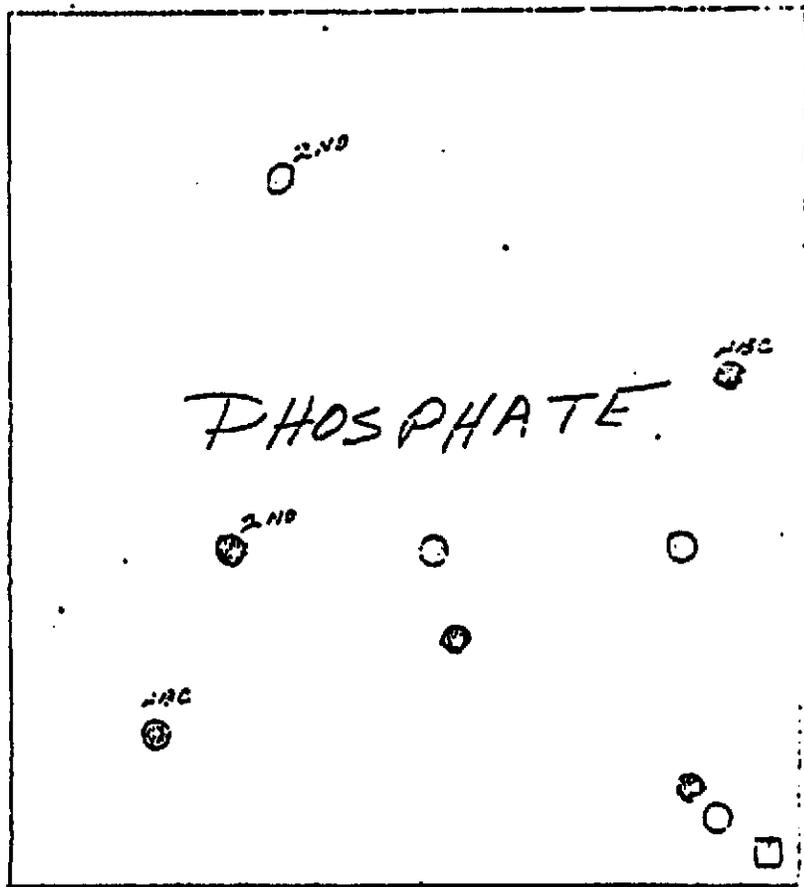
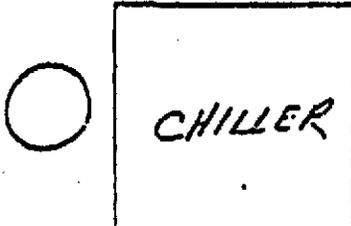
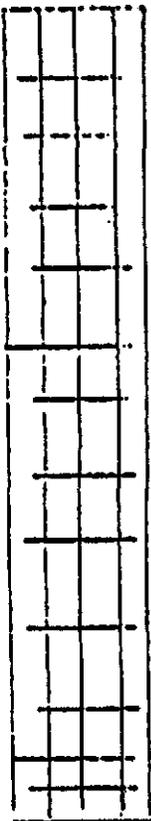
- Eye Wash Safety Shower
- Personal GAS Mask cabinets
- ☒ Emergency Alarm
- Scott Air Packs
- ☒ First Aid Station
- ☒ Fire Hoses
- ☒ Fire Extinguishers
- ☒ Disaster Horn
- ☒ Fire Blankets



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E

- ① 1ST
- ② 2ND
- ③ 3RD



HAC

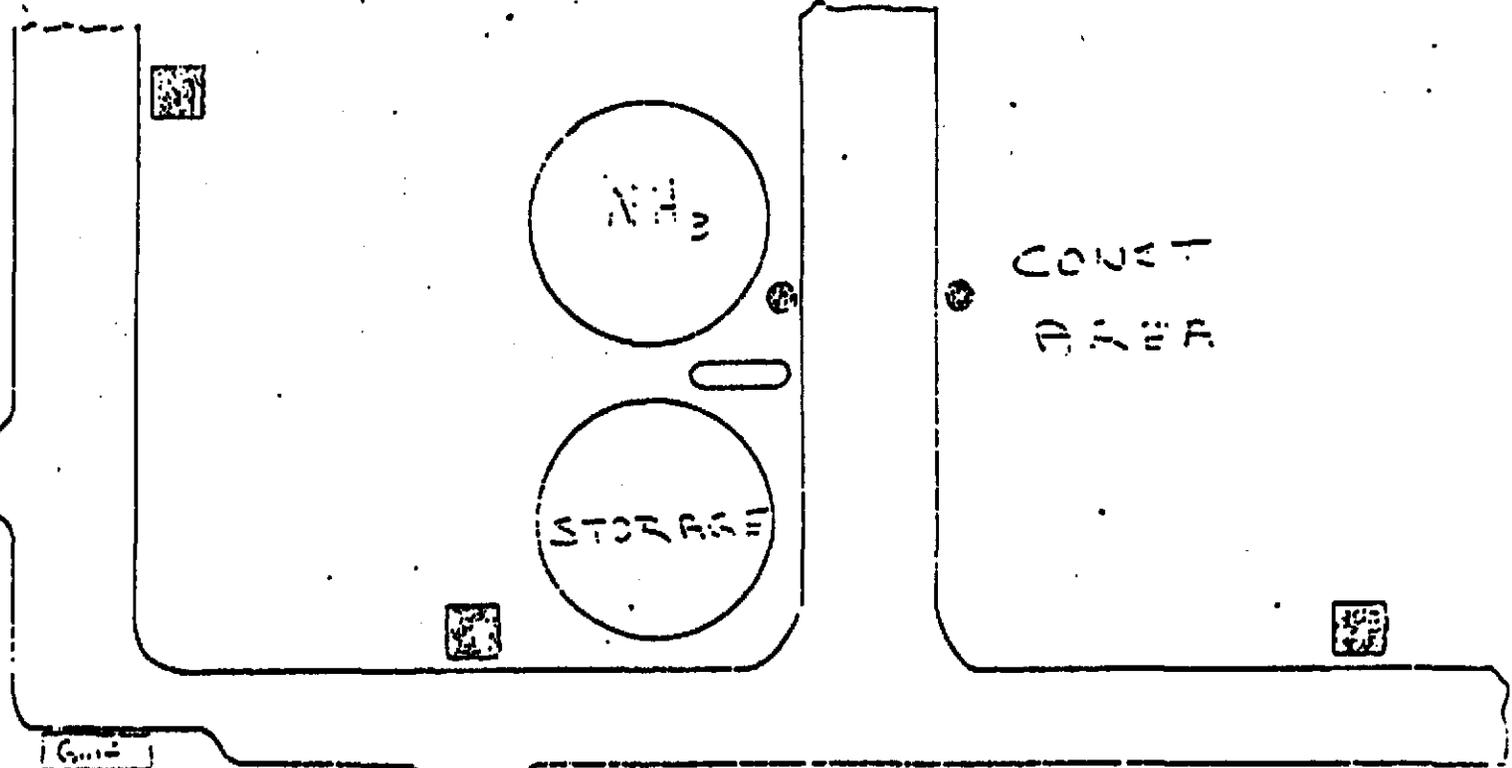
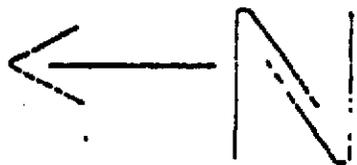
2ND

PHOSPHATE

2ND

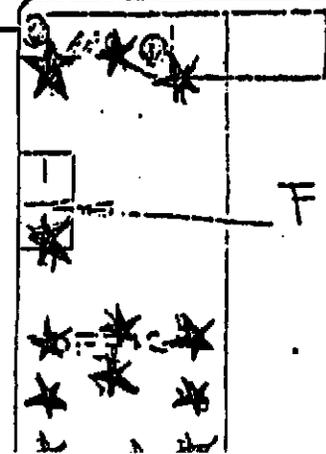
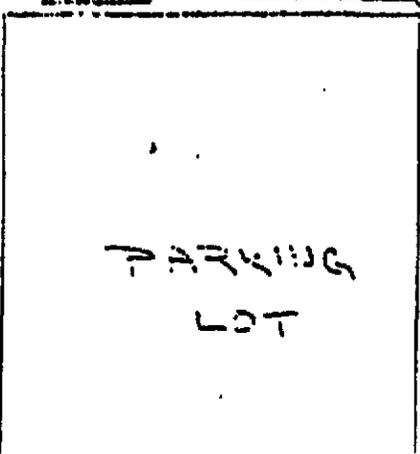
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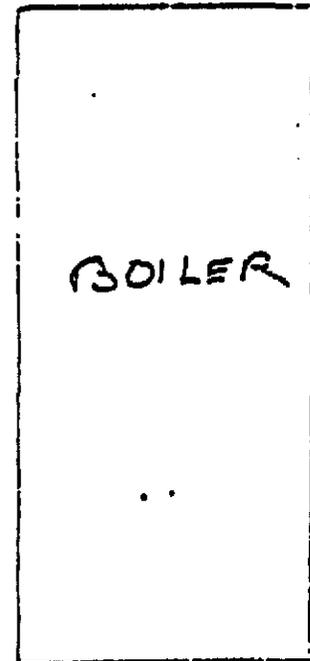
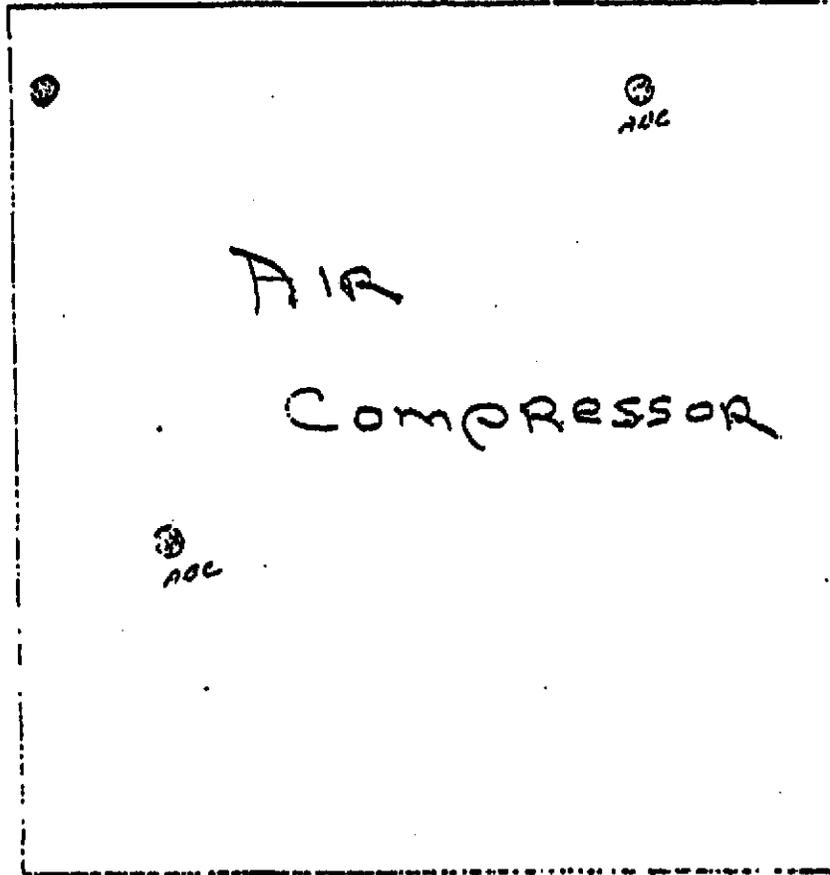
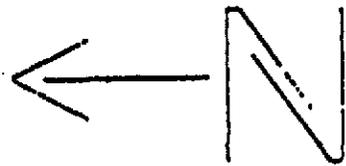


- ⊙ Eye Wash Safety Shower
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- ⊞ First Aid Station
- ⊞ Fire Houses
- ⊞ Fire Extinguishers
- ⊙ Diaster Horn
- ⊙ Fire Blankets

★ Telephones



FIRST AID STATION

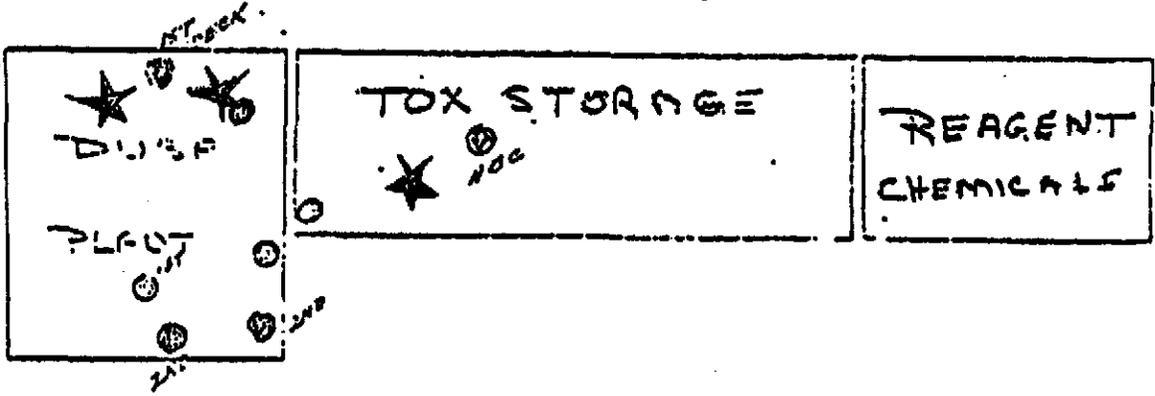


- Eye Wash Safety Shower
- Personal GAS Mask cabinets
- ⊠ Emergency Alarm
- ⊙ Scott Air Packs
- ⊞ First Aid Station
- ⊞ Fire Houses

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AOC

AOC  
○ ○

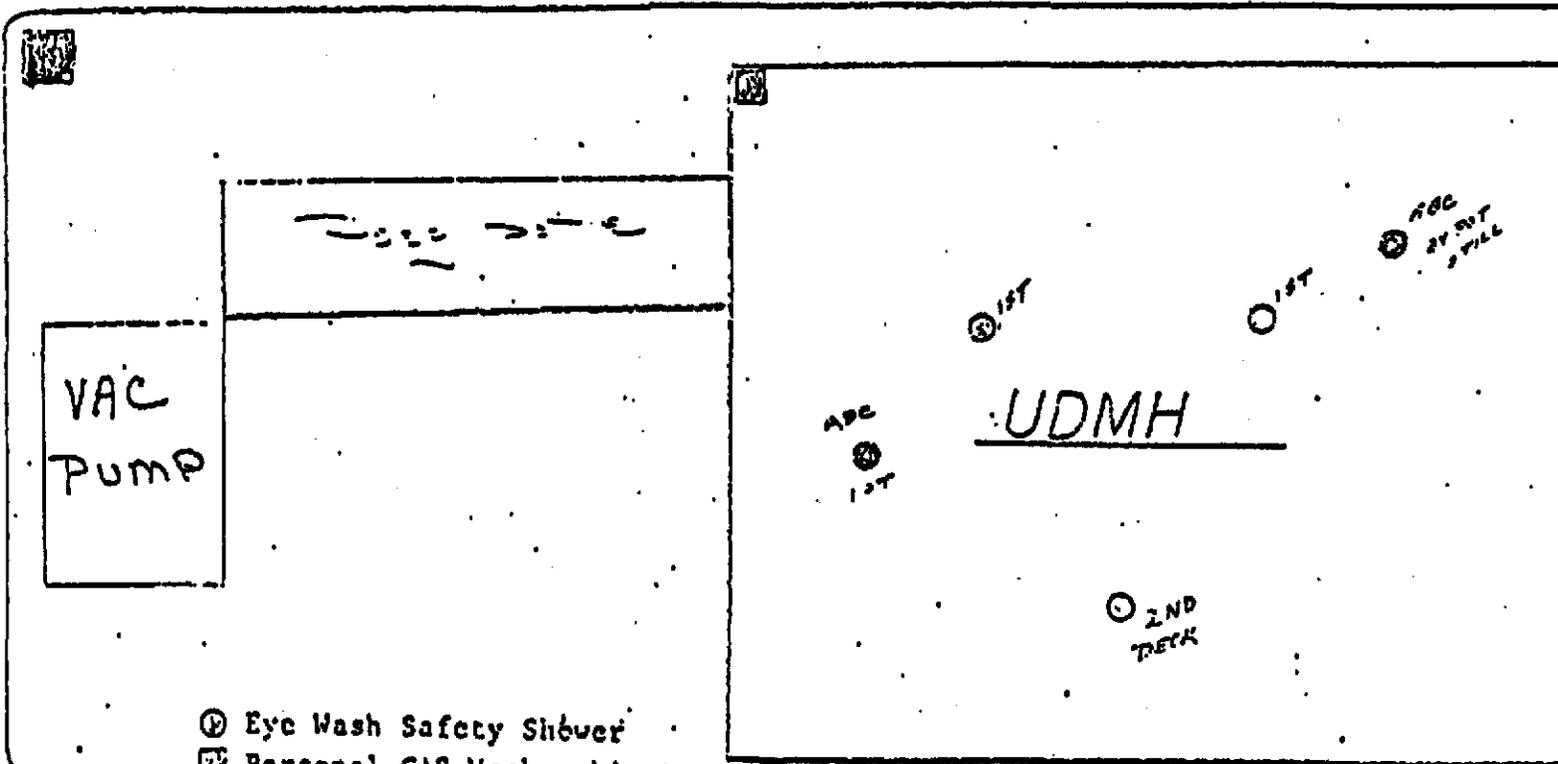
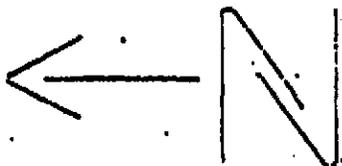
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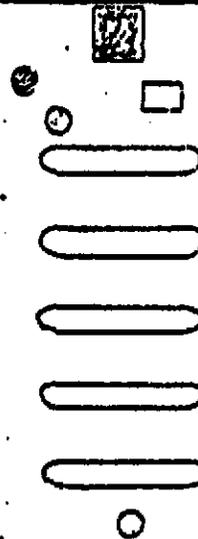
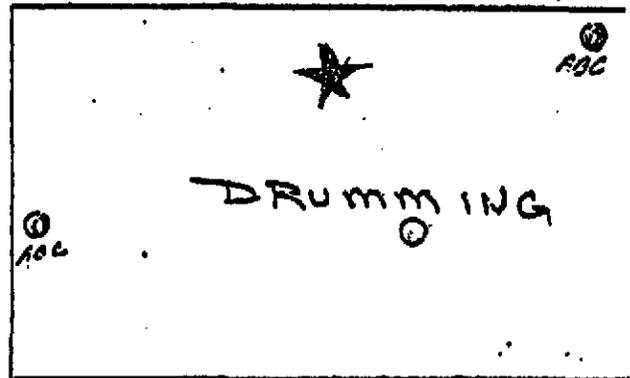
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- ⊞ Emergency Alarm
- ⊙ Scott Air Packs
- ⊞ First Aid Station
- ⊞ Fire Houses
- ⊙ Fire Extinguishers

★ TELEPHONES

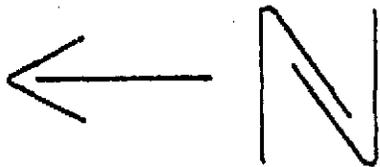
STORAGE JUMP - TOX



- ⊙ Eye Wash Safety Shower
- ⊠ Personal GAS Mask cabinets
- ⊠ Emergency Alarm
- ⊙ Scott Air Packs
- ⊠ First Aid Station
- ⊠ Fire Houses
- ⊙ Fire Extinguishers
- ⊙ Diaster Horn



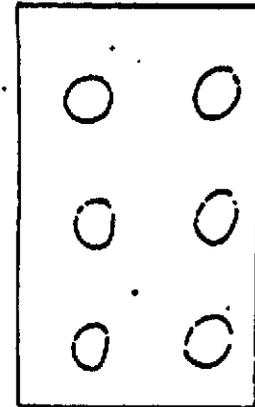
WATER  
TREATMENT



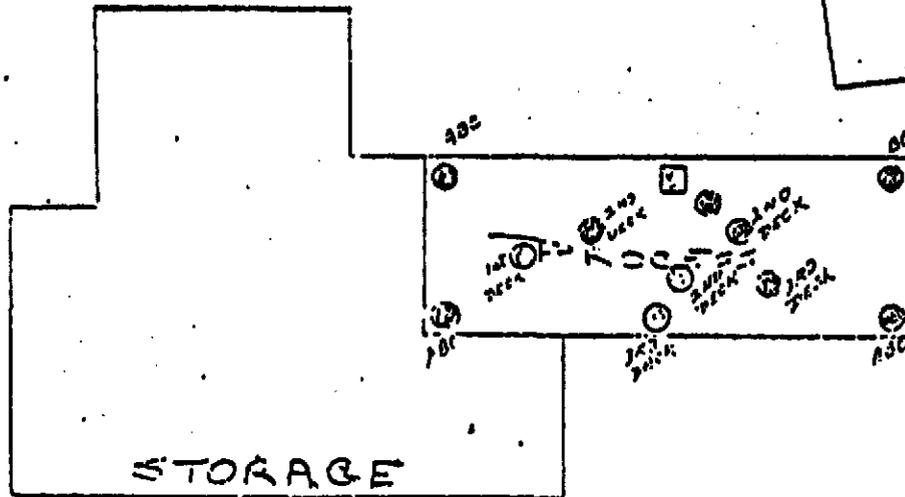
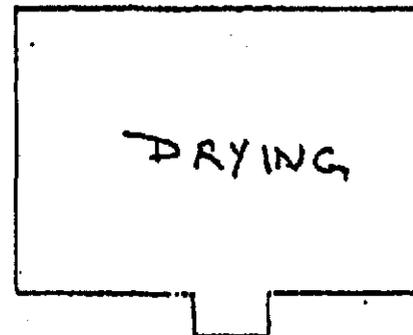
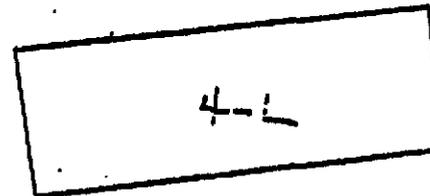
- ① Eye Wash Safety Shower
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★ TELEPHONES

- ⊕ Eye Wash Safety Shower
- ☒ Personal GAS Mask cabinets
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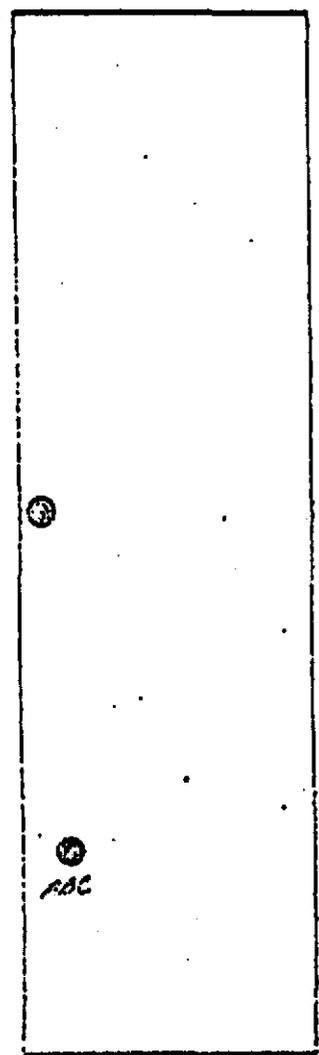
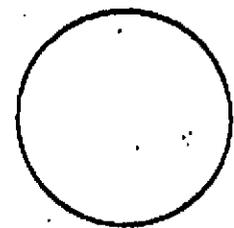
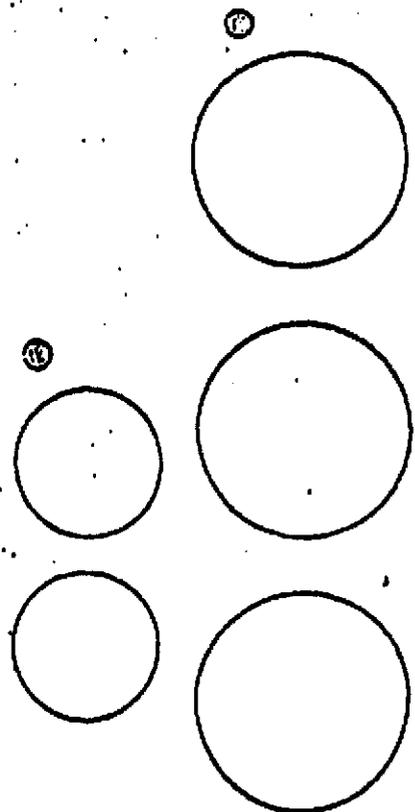
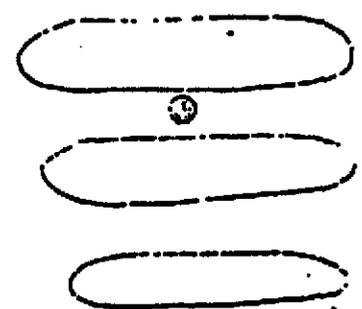
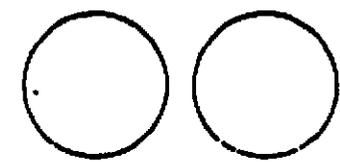
COOLING  
TOWER



TRK  
LOADOUT



A → N



ABC

ABC

NITROGEN  
SOLUTION

- ⊕ Eye Wash Safety Shower
- ⊕ Personal GAS Mask cabinets
- ⊕ Emergency Alarm
- ⊕ Scott Air Packs
- ⊕ First Aid Station
- ⊕ Fire Houses
- ⊕ Fire Extinguishers
- ⊕ Diaster Horn
- ⊕ Fire Blankets

a(7) Contingency Plan - Additional Information

G-2 Emergency Coordinator

The following is a list of predesignated emergency coordinators for the Vicksburg facility. The coordinators have the necessary and appropriate authority and knowledge to assess the hazards and implement the plan. They will, as situations dictate, obtain the advice of others. All are employed by the facility. The phone number of the facility is 601/636-1231.

R. F. Maraman 207 Buena Vista	636-7711
S. Keen Redwood	636-0777
B. J. Gunn 201 Willow Run	636-5604
G. D. Madsen 905 Chocktaw Drive	638-2847
F. Ahlers 13 Lakewood Road	636-6786

PART B

Sec. 3(d) (1.) (2) (3)

H-1 INTRODUCTORY TRAINING

Prior experience in other plants and more than 5 years' experience at the Vicksburg plant is considered to be "on the job training" to comply with the requirements of H-1. Introductory training is consistent with duties.

H-1a JOB TITLE AND DUTIES

Title Plant Manager. (F. L. Ahlers)

Duties (as relate to hazardous waste management).

General overall responsibility for hazardous waste management at the Vicksburg plant.

Job Description: Manages the overall operation of the Vicksburg facility.

H-1b TRAINING CONTENT, FREQUENCIES AND TECHNIQUES

1. Training (introductory) See H-2, above.
2. Training (continued)

Review various timely information distributed by the manager of environmental affairs or the effluent coordinator.

H-1d RELEVANCE OF TRAINING TO JOB DESCRIPTION

Keeps the plant manager updated on environmental affairs and plant compliance.

H-1e TRAINING FOR EMERGENCY RESPONSE

Will attend the training session on the contingency plan. Sections H-1e (1), H-1e (2), H-1e (3), H-1e (4), H-1e (5), and H-1e (6) apply to this position at the management and corporate and public information levels.

H-2 IMPLEMENTATION OF TRAINING PROGRAM

Implementation and documentation records will be initiated by 2-15-1984 and reviewed on an annual basis.

PART B

3. (d) (1.) (2) (3)

H-1 INTRODUCTORY TRAINING

More than 5 years experience at the Vicksburg facility in positions with hazardous waste management responsibilities is considered to be "on the job training" to comply with the requirements of H-1. The normal introductory training is consistent with the duties.

H-2a JOB TITLE AND DUTIES

Title Production Manager (S. Keen)

Duties: (as relate to hazardous waste management).

1. Direct the activities of the production supervisor assigned to hazardous waste activities.
2. Cooperate with the environmental coordinator in all areas of hazardous waste.
3. Act as emergency coordinator in the absence of the environmental coordinator or plant supervisor.
4. Report to the plant manager in all areas of hazardous waste.

Job Description Manages the production department.

H-2b TRAINING CONTENT, FREQUENCIES AND TECHNIQUES

1. Training (introductory) See H-1 above.
2. Training (continued).

Attend the effluent operator training session, with particular emphasis on the contingency plan.

Review various timely information distributed by the manager of environmental affairs, the plant manager, and the environmental coordinator.

H-1d RELEVANCE OF TRAINING TO JOB DESCRIPTION

The job of production manager should include a familiarity with the activities of all employees engaged in hazardous waste activities pertaining to sections H-1e through H-1e (6).

H-1e TRAINING FOR EMERGENCY RESPONSE

Will attend the training session on the contingency plan. The employee has a copy of the plan for interim study. Sections H-1e through H-1e (6) apply to this position on a plant level.

H-2 IMPLEMENTATION OF TRAINING PROGRAM

Implementation and documentation records will be initiated by 2-15-84 and reviewed on an annual basis.

PART B

Sec. 3(d) (1.) (2) (3)

H-1 INTRODUCTORY TRAINING

More than 5 years' experience at the Vicksburg plant is considered to be "on the job training" to comply with the requirements of H-1. The introductory training is consistent with the duties.

H-1a JOB TITLE AND DUTIES

Title Production Supervisor (B. J. Gunn)

Duties The following duties relate to hazardous waste activities:

1. Report to the Production Manager in all areas of hazardous waste.
2. Cooperate with the Environmental Coordinator in all areas of hazardous waste.
3. Supervise the effluent operators in all areas of hazardous waste.
4. Conduct or assist in the personnel training program.
5. Act as Emergency Coordinator in the absence of the Environmental Coordinator.
6. Assist in emergency action required when the contingency plan is activated.
7. Train or direct the training of new operators in the personnel training program.
8. Direct operation and repair of the activated carbon units. Cooperate with the Environmental Coordinator in this area.

Job Description Supervises the effluent operators.

H-1b TRAINING CONTENT, FREQUENCIES AND TECHNIQUE

Introductory Training

1. Familiarization with the personnel training program.
2. Familiarization with the contingency plan.
3. Familiarization with the location and operation of all hazardous waste areas.

Continuing Training

1. Attend Federal and State environmental seminars on hazardous waste.
2. Study the information distributed by the Environmental Coordinator.

H-1d RELEVANCE OF TRAINING TO JOB DESCRIPTION

The nature of the position is to supervise in the hazardous waste area.

H-1d RELEVANCE OF TRAINING TO JOB DESCRIPTION (continued)

and to act as an alternate environmental coordinator in an emergency.

H-1e TRAINING FOR EMERGENCY RESPONSE

Will attend the training session on the contingency plan. Sections H-1e (1) through H-1e (6) apply to this position on a plant level.

H-2 IMPLEMENTATION OF TRAINING PROGRAM

Implementation and documentation records will be initiated by 2-15-84 and reviewed on an annual basis.

PART B

Sec. 3(d) (1.) (2) (3)

H 1 INTRODUCTORY TRAINING

Five years prior experience as the Production Manager and Technical Manager at the Vicksburg facility is considered to be "on the job training" to comply with the requirements of H-1. Introductory training is considered to be "on the job training" to comply with the requirements of H-1. Introductory training is consistent with the duties.

H-1a JOB TITLE AND DUTIES

Title Technical Manager (G. D. Madsen)

Duties (as relate to hazardous waste management).

1. Direct the activities of the environmental coordinator.
2. Report to the Plant Manager in all areas of hazardous waste management.

Job Description

Management and control of hazardous waste activities through the environment coordinator.

H-1b TRAINING CONTENT, FREQUENCIES AND TECHNIQUES

1. Training (introductory) See H-1 above.
2. Training, continued.

Review various timely information distributed by the manager of environmental affairs, the plant manager, and the environmental coordinator.

Attend the effluent operator training session, including the contingency pl.

H-1d RELEVANCE OF TRAINING TO JOB DESCRIPTION

The job of Technical Manager should include a familiarity with the activities of all employees engaged in hazardous waste activities pertaining to sections H-1e (1) through H-1e (6). The plant manager may, under certain conditions, require assistance in meeting these sectional requirements.

H-1e TRAINING FOR EMERGENCY RESPONSE

Will attend the training session on the contingency plan. Sections H-1e (1) through H-1e (6) apply to this position on a plant level.

H-2 IMPLEMENTATION OF TRAINING PROGRAM

Implementation and documentation records will be initiated by 2-15-84 and reviewed on an annual basis.

PART B

Sec. 3(d) (1.) (2) (3)

H-1 INTRODUCTORY TRAINING

A minimum of two years' experience in hazardous waste management as environmental coordinator for the Vertac, Vicksburg facility is considered to be "on the job training" to comply with the requirements of H-1. Introductory training is consistent with the duties.

H-1a JOB TITLE AND DUTIES

Title Environmental Coordinator (R. F. Maraman)

Duties (as they relate to hazardous waste management).

1. Coordinate the environmental activities between the Vertac Vicksburg plant and the manager of environmental engineering, the various Federal and State environmental agencies, and the plant personnel engaged in all phases of environmental activity.
2. Prepare or direct the preparation of all permit-related reports to the various Federal and State environmental agencies.
3. Advise the Vicksburg plant management and supervisory personnel in environmental areas.
4. Prepare or direct the preparation of work orders necessary to maintain environmental equipment and associated areas such as containment ponds, hazardous waste storage vessels, air monitoring equipment.
5. Prepare or direct the preparation of various Federal and State permits.
6. Supervise the activities of the air and water effluent analysts.
7. Prepare or direct the preparation of work orders necessary to maintain the laboratory effluent analytical equipment.
8. Prepare or direct the preparation and filing of hazardous waste manifests.
9. Act as the emergency coordinator in emergency situations.
10. Originate plans to deal with new legislation.
11. Report to the technical director in all environmental areas.

Job Description

Coordinate hazardous waste activities. See above, Duties - 1 which is also a very accurate job description.

H-2b TRAINING CONTENT, FREQUENCIES AND TECHNIQUES

1. Training (introductory). See H-1 above.
2. Training (continued)

Attend various federal or state sponsored environmental seminars.

H-2b TRAINING CONTENT, FREQUENCIES AND TECHNIQUES (continued)

Subscribe to and study one or more hazardous waste magazines published at least on a monthly basis.

Subscribe to the Federal Register, study and distribute sections dealing with hazardous waste.

H-1d RELEVANCE OF TRAINING TO JOB DESCRIPTION

Overall familiarity with hazardous waste activities and developments insures adequate coordination.

H-1e TRAINING FOR EMERGENCY RESPONSE

The employee assisted in developing the emergency response and was the emergency coordinator in one emergency.

The employee will teach the plan to the other employees.

H-2 IMPLEMENTATION OF TRAINING PROGRAM

Implementation and documentation records will be initiated by 2-15-84 and reviewed on an annual basis.

PART B

Sec. 3(d) (1.) (2) (3)

H-1 INTRODUCTORY TRAINING

A minimum of 4 years' experience in hazardous substance analysis and waste manifests is considered to be "on the job training" to comply with the requirements of H-1. The normal introductory training is consistent with the duties.

H-1a JOB TITLE AND DUTIES

Title (2) Chemist, Lynn Gunnison  
David Green

Duties (as they relate to hazardous waste management).

Perform analyses to determine the presence and concentrations of arsenic, toxaphene, dinitrobutylphenol specifically, and other present and future related analyses.

Fill out hazardous waste manifests for the states of Alabama, Kentucky, Louisiana, and Texas, or to additional states that may be added in the future.

Job Description

1. Hazardous waste analysis.
2. Handling hazardous waste manifests.

H-2b TRAINING CONTENT, FREQUENCIES AND TECHNIQUES

1. Training (introductory) See H-1 above.
2. Training (continued).

Become familiar with new methods of analysis as introduced (usually by E.P.) and use as required for the given analysis.

Receive and study any changes in hazardous waste manifests.

H-1d RELEVANCE OF TRAINING TO JOB DESCRIPTION

Keeps the employee abreast of new techniques to improve quality of analyses

The contingency plan and sections H-1e (1) through H-1e (6) do not apply to this position.

H-2 IMPLEMENTATION OF TRAINING PROGRAM

Implementation and documentation records will be initiated by 2-15-84 and reviewed on an annual basis.

PART B

Sec. 3(d) (1.) (2) (3)

H-1 INTRODUCTORY TRAINING

From 3 to 5 years' service in the Vicksburg facility as effluent operators is considered to be "on the job training" to comply with the requirements of H-1.

H-1a JOB TITLE AND DUTIES.

Title Effluent Operator

Duties

1. Inspection, operating, and reporting duties in the following hazardous was areas:

- A. Containment pond.
- B. Activated carbon filters.
- C. Perform contingency plan duties in case of an emergency.

Names of Employees

1. Tommy Crutchfield
2. Eddie Cook
3. James Vinson
4. David Cotton

Job Description

Effluent operator.

H-2b TRAINING CONTENT, FREQUENCIES AND TECHNIQUES

1. Training (introductory) for new employees.

The training consists of a lecture session, a hands on period, and a training period with an experienced operator in the following:

Waste Site, The Containment Pond.

1. Description of waste and associated hazards.
2. Location of pond.
3. Explanation of flow to and from the pond.
4. Location of process lines, pumps, valves to and from pond.
5. Proper and safe operation of valves and pumps to and from the pond.
6. Inlet water to the pond and sources of the same.
7. Hazards of inlet water.
8. Location and operation of samplers and integrators.

H-2b

Waste Site, The Containment Pond. (continued)

9. Pond level management.
10. pH control.

Inspection Program for the Containment Pond

Critical Inspection Items

1. Dike inspection, conditions which might lead to leaks or rupture.
2. Grass mowing and upkeep
3. Pond level.
4. Condition of warning signs.
5. Conditions which might lead to fire or explosion.

Review of Emergency Response Contingency Plan includes H-1a (1) through H-1e (6) where applicable.

1. Supervisor to whom to report.
2. General duties, an overall view of the plan.
3. Specific duties for prevention of leaks or rupture.
4. Specific duties in the event of a release.
5. Emergency equipment, care and use.
6. Specific duties in the event of a fire or explosion, communications, fire alarms.
7. Emergency shutdown operation.

Waste Site Activated Carbon Columns

1. Description of waste and associated hazards.
2. Flows from pond to columns.
3. Flows from columns to discharge line.
4. Arrangement and operation of pipes, valves, and associated equipment.
5. Backwashing.
6. Draining.
7. Transfer of spent carbon.

H-1e (continued)

Waste Site Activated Carbon Columns (continued)

8. Receipt of new carbon.
9. Inspection for leaks.
10. Inspection for malfunctions.
11. Conditions that might lead to fire or explosion.

Training, Continued

1. Attend the Calgon Corporation's training session on the operation of the Calgon activated carbon system.
2. Attend personnel training programs developed for any new process.
3. Attend weekly safety meetings.
4. Attend review sessions.

H-1e TRAINING FOR EMERGENCY RESPONSE

Noted under section H-1b. Sections H-1e (1) through H-1e (6) apply to this position at the plant level.

H-2 IMPLEMENTATION AND DOCUMENTATION

Implementation and documentation records will be initiated by 2-15-84 and reviewed on an annual basis.

## Closure Plan

### Basis for Closure

The surface impoundment at Vertac's Vicksburg, Mississippi facility is divided into three separate ponds (see Figure 1). Currently, raw influent is directed to pond number one (P-1). This pond normally overflows to pond number three (P-3) for settling and evaporation. In periods of heavy precipitation, P-1 will overflow to pond number two (P-2).

The entire surface impoundment encompassing ponds P-1, P-2, and P-3 is to be closed as an interim-status landfill according to the requirements of 40 CFR 264.228 (a)(2) prior to November, 1988. The sediments currently residing in these ponds, currently estimated at 7,800 cubic yards total, constitute the maximum inventory of waste to be disposed of under the terms of this permit application.

### Closure Procedure

It will be necessary to stabilize the sediment in each of the ponds to a load bearing capacity prior to placement of the clay cap (see Table I-1.1 for details of final compaction densities). Stabilization of the sediment is done primarily to increase its load bearing capacity. However, an important secondary purpose is to bind the sediment into a solidified mass which will inhibit leaching of contaminants to the surrounding soils.

The sediment in each of the ponds will be stabilized separately, beginning with P-3, continuing on to P-2, and ending with P-1. The same general procedure will be used to stabilize each of the ponds.

Prior to the start of closure activities, samples of the sediment, base, and sidewall materials will be taken from each pond. These samples will be analyzed for selected Appendix VIII constituents to determine the amount of contamination present. Until this is done, the amount and type of stabilizing compounds can only be estimated.

After sufficient samples have been taken and analyzed, the free liquids in each pond, beginning with P-3, will be pumped out to Vertac's wastewater treatment plant and discharged through the NPDES outfall. Free liquids will not be removed prior to sampling in order to allow the use of a boat to facilitate the sampling procedure.

Once all free liquids have been removed, contaminated materials from the sediment base and sidewalls will be stabilized to the specified load bearing capacity sufficient to support the equipment to be used to construct the clay cap.

Stabilization is accomplished by blending the sludgy sediment with a stabilizing compound such as fly ash, kiln dust and/or cement. The actual procedure involves spreading fly ash over the sediment, mixing with a "low ground pressure" (LGP) dozer, and allowing the mixture to hydrate and stabilize. The mixture will "cure" to a concrete-like consistency which will support earth-moving equipment, and will inhibit leaching of contaminants to surrounding soils.

The next step is to construct a cap of low-permeability clay over the entire surface impoundment. Minimum specifications for this clay are listed in Table I-1.2 This cap will be a minimum of two feet thick, and has a permeability much less than that of the impoundment base soil ( $1.0 \times 10^{-7}$  cm/sec vs  $2.5 \times 10^{-5}$  cm/sec). Proper installation of this cap will prevent rainwater from soaking down thru the stabilized sediment, thereby eliminating the "bathtub" effect to further inhibit leaching.

Once the cap has been constructed, and further contact with contaminated sediments is prevented, the equipment must be decontaminated. This is accomplished by spraying the equipment with a caustic wash solution, followed by a high pressure rinse to remove any residual contamination. All wash water and residues will be collected and routed to wastewater treatment and the NPDES outfall. At least twelve inches of topsoil capable of supporting vegetative growth will be spread over the clay cap. Both the clay and the topsoil will be graded to a slope of approximately 2% towards Stouts Bayou to facilitate drainage, but not enough to cause erosion.

Finally, the site will be fertilized and seeded with an indigenous grass such as Bermuda to establish vegetative growth. Maintaining vegetative growth over a landfill site is a proven method of minimizing cracking and erosion.

See Figures 2 and 3 for further details of finished cap. After installation of the closure cap has been completed and heavy construction activities have ceased, security fencing can be erected. The security fencing will consist of a six foot high chain link fence topped with three strands of barbed wire completely encircling the surface impoundment. Access will be via a locked gate located on the northwest side adjacent to the railroad tracks. Signs legible from 25 feet with the legend "Danger-Unauthorized Personnel Keep Out" will be posted at the gate and at intervals about the perimeter fencing.

At the completion of the activities detailed above a "Closure Completion Report" will be prepared to serve as a permanent record of the closure activities. This report will contain a copy of the Part B Permit including details of closure procedures, plus:

- o Locations and analyses of all samples.
- o Copies of all supplemental reports and drawings.

- o A letter of certification, stating that closure has been accomplished according to a plan approved by the State of Mississippi and EPA, signed by a Professional Engineer registered in the State of Mississippi.
- o Deed recordation of the closed surface impoundment as a RCRA hazardous waste facility with an appropriate cover system complying with federal and state guidelines.
- o Documentation that a survey plat indicating the metes and bounds as well as location and dimensions of the surface impoundment, along with a record of the type, location, and quantity of hazardous waste within the closed surface impoundment has been submitted to the appropriate local land use authority and to the Regional Administrator of EPA.

This closure plan is to be implemented on or before August 19, 1988.

## Post Closure Plan

Post-closure care is integral to the integrity of the site. A trust fund will be established to ensure said care even should Vertac cease operations at this facility.

Weekly inspections will be made to ensure the integrity of the final cover. At the same time the integrity of the fencing can be checked. The primary focus of this inspection will be the detection of cracks and/or standing water, which would be indicative of undue settling of the cover. If necessary, fresh topsoil will be brought in to alleviate these situations. In addition, an elevation survey of the cap will be made once a year to confirm the continuity of the cap and to further guard against settling.

The vegetative cover will consist of hardy grasses indigenous to the area in order to minimize maintenance. The site will be mowed weekly during the growing season. If required, a tractor-drawn watering trailer will be used during dry periods to prevent vegetative die-off.

The final elevation of the site will be within the 100 year floodplain, however the levee surrounding the site will be above the 100 year floodplain. Drain pipes will be installed extending through the levee to allow rainwater to run off the site to the bayou. These drain pipes will be provided with slide gates so that the site can be isolated from the bayou in the event of a flood.

A compliance monitoring program for ground water sampling will be established to help insure the integrity of the site. See Section E-3 of this application for details. The monitoring wells integral to this program are to be maintained periodically, and reworked every five years or more often as required.

The Plant Manager will be responsible for maintaining at the plant site a file which contains the updated Closure and Post-Closure Plans, the Closure Completion Report, and all data collected during post-closure activities. The Plant Manager will also be responsible for communicating any update of the post-closure plan to the other plan holders.

DRAWN BY

DRS  
6-12-85

CHECKED BY  
APPROVED BY

DRAWING NUMBER 846267-A

32803

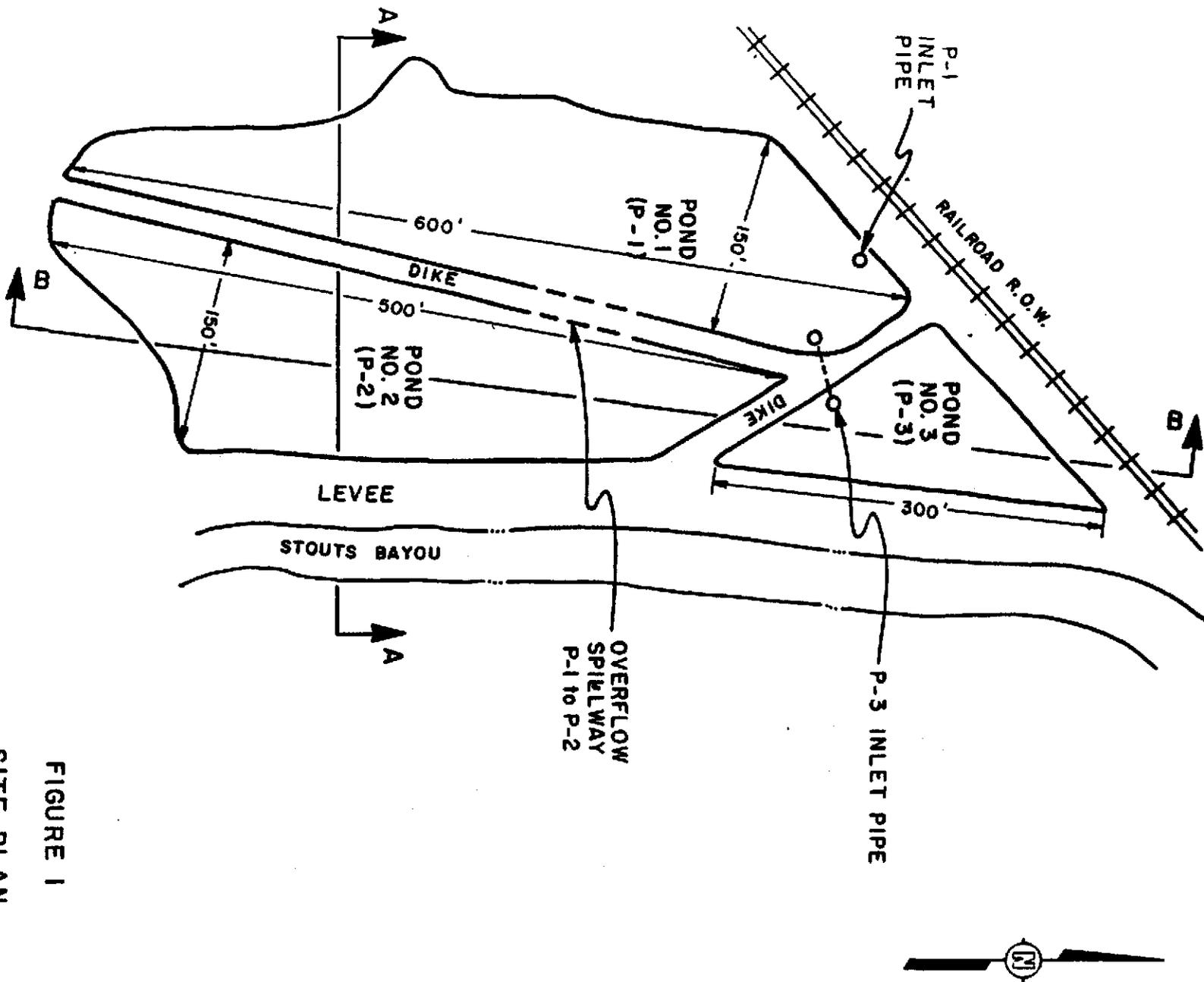


FIGURE 1

SITE PLAN  
SURFACE IMPOUNDMENT

PREPARED FOR

VERTAC CHEMICAL CORP.  
VICKSBURG, MS.

DRAWING NUMBER  
HE1034-B

DOS. CHECKED BY  
S.B. 03 APPROVED BY

DRAWN BY

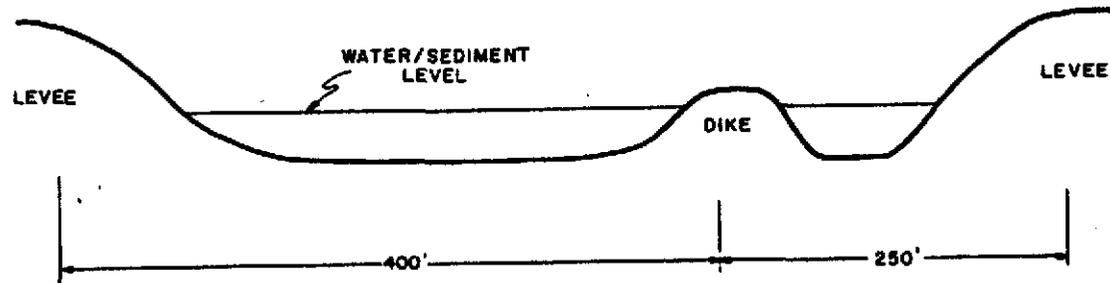
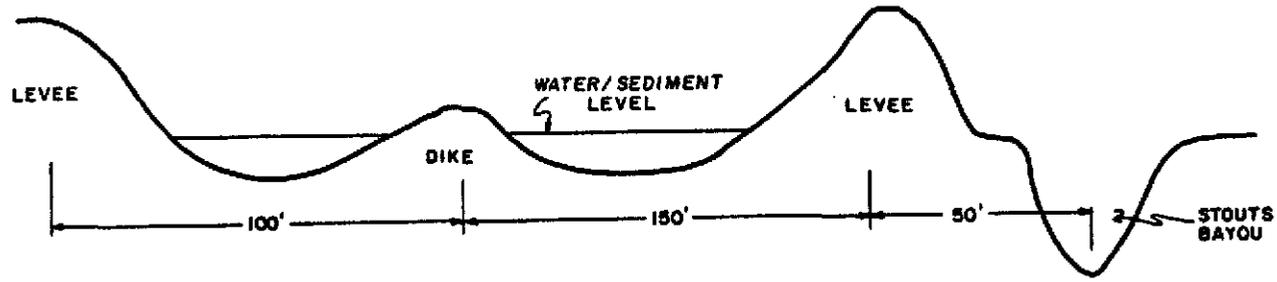


FIGURE 2  
EXISTING ELEVATIONS  
SECTION A-A & B-B  
VICKSBURG PLANT  
PREPARED FOR  
VERTAC CHEMICAL CORP.  
VICKSBURG, MS.



DRAWING NUMBER HE1034-B

DRAWN BY ORS CHECKED BY 6-8-85 APPROVED BY

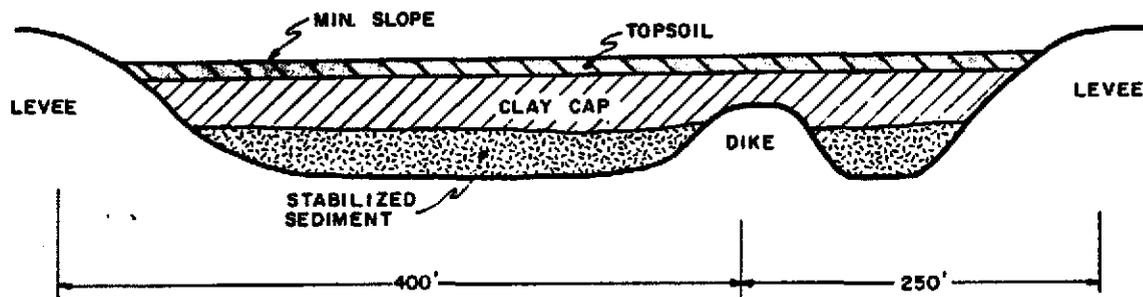
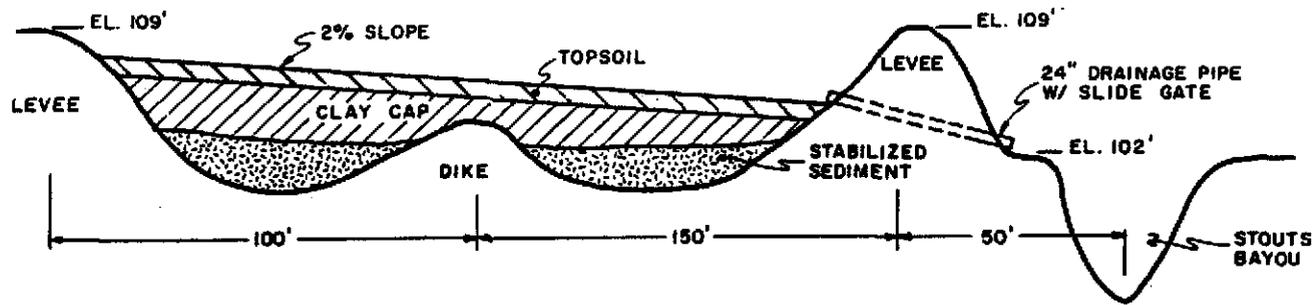


FIGURE 3  
EXISTING ELEVATIONS  
AFTER CLOSURE  
SECTION A-A & B-B  
VICKSBURG PLANT  
PREPARED FOR  
VERTAC CHEMICAL CORP.  
VICKSBURG, MS.



**TABLE I-1.1  
SEDIMENT DATA**

Pond Number	1	2	3
Material Description	Dark brown clayey sludge with numerous sand pockets and seams	Light brown clayey sludge	Dark brown clayey sludge with numerous sand pockets and seams
Initial Moisture Content	79.4	70.7	76.6
Fly Ash Added, %	40	45	40
Density After Solidification, PCF	119.0	118.6	119.7
Moisture Content After Solidification, %	17.9	25.2	14.1
Sheer Strength After Solidification, TSF	1.25	0.75	1.1
Remarks	Became essentially non-plastic with addition of fly-ash	-	Became essentially non-plastic with addition of fly ash

\* Determine by Harvard Minature Mold

**TABLE I-1.2**  
**CLOSURE CAP CLAY**  
**MINIMUM SPECIFICATIONS**

	<u>Closure Clay</u>	<u>Existing Pond Base Soils</u>
Permeability*, cm/sec	$<1 \times 10^{-7}$	$2.5 \times 10^{-5}$
% Passing no. 200 sieve	>30	100
Liquid limit, % by weight	>30	25
Plasticity index	>15	-

\* Laboratory permeability is to be determined with water and with an appropriate waste-contaminated liquid which is derived from the wastes which are expected to be placed in the landfill. If a liquid phase of the waste is present, it should be used as the waste-contaminated liquid. Otherwise, a representative leachate of the wastes would be the waste-contaminated permeating liquid in the test. If in-place soil barriers are to be relied upon field permeability tests are necessary.

## Closure Schedule

<u>Day Number</u>	<u>Activity</u>
0	Free liquids will have been removed and underlaying base materials will have been completed before commencement of closure activities.
1-7	Stop influent to P-3. Remove influent pipe and pump house. Stabilize sediment in P-3.
8	Stop influent to P-2 by removing overflow weir from P-1.
9-22	Stabilize sediment in P-2.
23-25	Remove influent piping to P-1.
26-39	Stabilize sediment in P-1.
40-67	Construct two-foot clay cap, one-foot top soil cover, and hydromulch to establish vegetative growth. Decontaminate equipment.
68-74	Install drainage pipes thru levee adjacent to Stouts Bayou.
75-81	Erect fencing, inspect work, and complete clean-up.

## CLOSURE COST ESTIMATE

Basis: Closure Schedule Contained in Section I-1

<u>ITEM</u>	<u>UNIT RATE</u>	<u>COST</u>
Labor	\$377/Hour	\$ 382,000
Equipment	\$237/Hour	240,000
Materials		
Stabilization	\$30/Ton	120,000
Clay Cap	\$8/Cu.Yd.	144,000
Topsoil	\$10/Cu.Yd.	78,000
Drainage	\$100/Lin.Ft.	18,000
Decontamination	\$200/Day	1,000
Vegetation	\$0.05/Sq.Ft.	9,000
Fencing	\$7.50/Lin.Ft.	<u>16,000</u>
	Total Closure Cost:	\$1,008,000

POST CLOSURE COST ESTIMATE

<u>ITEM</u>	<u>FREQUENCY</u>	<u>PERIODIC COST</u>	<u>30-YEAR COST</u>
Water Table Monitoring	1/Month	\$800	\$9,600
Background Sampling for Appendix VIII Constituents (8 Wells)	Once	\$1,000	\$1,000
Background Analysis for Appendix VIII Constituents (8 Wells)	Once	\$28,000	\$28,000
Detection Sampling for Appendix VIII Constituents (1 Well)	1/Year	\$100	\$3,000
Detection Analysis for Appendix VIII Constituents (1 Well)	1/Year	\$3,500	\$105,000
Site Maintenance	Weekly	\$50	\$69,600
Well Rework	1/5 Years	\$750	\$4,500
Elevation Survey	1/Year	\$750	<u>\$ 22,500</u>
		<b>TOTAL POST CLOSURE COST:</b>	<b>\$243,200</b>



VERTAC CHEMICAL CORPORATION

24th Floor • 5100 Poplar • Memphis, TN 38137 • 901-767-6851

TELEX 53

July 5, 1983

Mr. William G. Beanland  
Wheless, Beanland, Shappley  
& Bailess  
P. O. Box 991  
Vicksburg, Mississippi 39180

Dear Bill:

Enclosed is a check in the amount of \$5,250 representing the installment due for our Vicksburg Plant Closure/Post-Closure Trust as per A. T. Malone's letter dated June 27, 1983. Please forward the check to the appropriate trust officer at First National.

Please contact me if you have any questions.

Sincerely yours,

  
John C. Bumpers  
Vice President-Finance/Admin.  
and Secretary

JCB:ap

Enclosure

cc: Mr. R. D. Karkkainen ✓  
Mr. A. T. Malone

(a) 15

TRUST AGREEMENT

THIS AGREEMENT, entered into as of the 6th day of October, 1982, by and between VERTAC CHEMICAL CORPORATION, a Delaware corporation (the "Grantor"), and FIRST NATIONAL BANK, Vicksburg, Mississippi (the "Trustee").

WHEREAS, the Mississippi Department of Natural Resources ("MS.DNR"), an agency of the State of Mississippi, has established certain regulations applicable to the Grantor, requiring that an owner or operator of a hazardous waste management facility shall provide assurance that funds will be available when needed for closure and/or post-closure care of the facility,

WHEREAS, the Grantor has elected to establish a trust to provide all or part of such financial assurance for the facilities identified herein,

WHEREAS, the Grantor, acting through its duly authorized officers, has selected the Trustee to be the trustee under this Agreement, and the Trustee is willing to act as trustee,

NOW, THEREFORE, the Grantor and the Trustee agree as follows:

Section 1. Definitions. As used in this Agreement:

(a) The term "Grantor" means the owner or operator who enters into this Agreement and any successors or assigns of the Grantor.

(b) The term "Trustee" means the Trustee who enters into this Agreement and any successor Trustee.

Section 2. Identification of Facilities and Cost Estimates. This Agreement pertains to the facilities and cost estimates identified on attached Schedule A.

Section 3. Establishment of Fund. The Grantor and the Trustee hereby establish a trust fund (the "Fund") for the benefit of MS.DNR. The Grantor and the Trustee intend that no third party have access to the Fund except as herein provided. The Fund is established initially as consisting of the property, which is acceptable to the Trustee, described in Schedule B attached hereto. Such property and any other property subsequently transferred to the Trustee is referred to as the Fund, together with all earnings and profits thereon, less any payments or distributions made by the Trustee pursuant to this Agreement. The Fund shall be held by the Trustee, IN TRUST, as hereinafter provided. The Trustee shall not be responsible nor shall it undertake any responsibility for the amount or adequacy of, nor any duty to collect from the Grantor, any payments necessary to discharge any liabilities of the Grantor established by MS.DNR.

Section 4. Payment for Closure and Post-Closure Care. The Trustee shall make payments from the Fund as the Executive Director of MS.DNR shall direct, in writing, to provide for the payment of the costs of closure and/or post-closure care of the facilities covered by this Agreement. The Trustee shall reimburse the Grantor or other persons as specified by the Executive Director of MS.DNR from the Fund for closure and post-closure expenditures in such amounts as said Executive Director shall direct in writing. In addition, the Trustee shall refund to the

Grantor such amounts as said Executive Director specifies in writing. Upon refund, such funds shall no longer constitute part of the Fund as defined herein.

Section 5. Payments Comprising the Fund. Payments made to the Trustee for the Fund shall consist of cash or securities acceptable to the Trustee.

Section 6. Trustee Management. The Trustee shall invest and reinvest the principal and income of the Fund and keep the Fund invested as a single fund, without distinction between principal and income, in accordance with general investment policies and guidelines which the Grantor may communicate in writing to the Trustee from time to time, subject, however, to the provisions of this Section. In investing, reinvesting, exchanging, selling, and managing the Fund, the Trustee shall discharge his duties with respect to the trust fund solely in the interest of the beneficiary and with the care, skill, prudence, and diligence under the circumstances then prevailing which persons of prudence, acting in a like capacity and familiar with such matters, would use in the conduct of an enterprise of a like character and with like aims; except that:

(i) Securities or other obligations of the Grantor, or any other owner or operator of the facilities, or any of their affiliates as defined in the Investment Company Act of 1940, as amended, 15 U.S.C. 80a-2.(a), shall not be acquired or held, unless they are securities or other obligations of the Federal or a State government;

(ii) The Trustee is authorized to invest the Fund in time or demand deposits of the Trustee, to the extent insured by an agency of the Federal or State government; and

(iii) The Trustee is authorized to hold cash awaiting investment or distribution uninvested for a reasonable time and without liability for the payment of interest thereon.

Section 7. Commingling and Investment. The Trustee is expressly authorized in its discretion:

(a) To transfer from time to time any or all of the assets of the Fund to any common, commingled, or collective trust fund created by the Trustee in which the Fund is eligible to participate, subject to all of the provisions thereof, to be commingled with the assets of other trusts participating therein; and

(b) To purchase shares in any investment company registered under the Investment Company Act of 1940, 15 U.S.C. 80a-1 et seq., including one which may be created, managed, underwritten, or to which investment advice is rendered or the shares of which are sold by the Trustee. The Trustee may vote such shares in its discretion.

Section 8. Express Powers of Trustee. Without in any way limiting the powers and discretions conferred upon the Trustee by the other provisions of this Agreement or by law, the Trustee is expressly authorized and empowered:

(a) To sell, exchange, convey, transfer, or otherwise dispose of any property held by it, by public or private sale. No person dealing with the Trustee shall be bound to see to the

application of the purchase money or to inquire into the validity or expediency of any such sale or other disposition;

(b) To make, execute, acknowledge, and deliver any and all documents of transfer and conveyance and any and all other instruments that may be necessary or appropriate to carry out the powers herein granted;

(c) To register any securities held in the Fund in its own name or in the name of a nominee and to hold any security in bearer form or in book entry, or to combine certificates representing such securities with certificates of the same issue held by the Trustee in other fiduciary capacities, or to deposit or arrange for the deposit of such securities in a qualified central depository even though, when so deposited, such securities may be merged and held in bulk in the name of the nominee of such depository with other securities deposited therein by another person, or to deposit or arrange for the deposit of any securities issued by the United States Government, or any agency or instrumentality thereof, with a Federal Reserve bank, but the books and records of the Trustee shall at all times show that all such securities are part of the Fund;

(d) To deposit any cash in the Fund in interest-bearing accounts maintained or savings certificates issued by the Trustee, in its separate corporate capacity, or in any other banking institution affiliated with the Trustee, to the extent insured by an agency of the Federal or State government; and

(e) To compromise or otherwise adjust all claims in favor of or against the Fund.

Section 9. Taxes and Expenses. All taxes of any kind that may be assessed or levied against or in respect of the Fund and all brokerage commissions incurred by the Fund shall be paid from the Fund. All other expenses incurred by the Trustee in connection with the administration of this Trust, including fees for legal services rendered to the Trustee, the compensation of the Trustee to the extent not paid directly by the Grantor, and all other proper charges and disbursements of the Trustee shall be paid from the Fund.

Section 10. Annual Valuation. The Trustee shall annually, at least 30 days prior to the anniversary date of establishment of the Fund, furnish to the Grantor and to the Executive Director of MS.DNR a statement confirming the value of the Trust. Any securities in the Fund shall be valued at market value as of no more than 60 days prior to the anniversary date of establishment of the Fund. The failure of the Grantor to object in writing to the Trustee within 90 days after the statement has been furnished to the Grantor and said Executive Director shall constitute a conclusively binding assent by the Grantor, barring the Grantor from asserting any claim or liability against the Trustee with respect to matters disclosed in the statement.

Section 11. Advice of Counsel. The Trustee may from time to time consult with counsel, who may be counsel to the Grantor, with respect to any question arising as to the construction of this Agreement or any action to be taken hereunder. The Trustee shall be fully protected, to the extent permitted by law, in acting upon the advice of counsel.

Section 12. Trustee Compensation. The Trustee shall be entitled to reasonable compensation for its services as agreed upon in writing from time to time with the Grantor.

Section 13. Successor Trustee. The Trustee may resign or the Grantor may replace the Trustee, but such resignation or replacement shall not be effective until the Grantor has appointed a successor trustee and this successor accepts the appointment. The successor trustee shall have the same powers and duties as those conferred upon the Trustee hereunder. Upon the successor trustee's acceptance of the appointment, the Trustee shall assign, transfer, and pay over to the successor trustee the funds and properties then constituting the Fund. If for any reason the Grantor cannot or does not act in the event of the resignation of the Trustee, the Trustee may apply to a court of competent jurisdiction for the appointment of successor trustee or for instructions. The successor trustee shall specify the date on which it assumes administration of the trust in a writing sent to the Grantor, the Executive Director of MS.DNR, and the present Trustee by certified mail 10 days before such change becomes effective. Any expenses incurred by the Trustee as a result of any of the acts contemplated by this Section shall be paid as provided in Section 9.

Section 14. Instructions to the Trustee. All orders, requests, and instructions by the Grantor to the Trustee shall be in writing, signed by such persons as are designated in the attached Exhibit A or such other designees as the Grantor may designate by amendment to Exhibit A. The Trustee shall be fully

protected in acting without inquiry in accordance with the Grantor's orders, requests, and instructions. All orders, requests, and instructions by the Executive Director of MS.DNR to the Trustee shall be in writing, signed by the said Executive Director or his designee, and the Trustee shall act and shall be fully protected in acting in accordance with such orders, requests, and instructions. The Trustee shall have the right to assume, in the absence of written notice to the contrary, that no event constituting a change or a termination of the authority of any person to act on behalf of the Grantor or MS.DNR hereunder has occurred. The Trustee shall have no duty to act in the absence of such orders, requests, and instructions from the Grantor and/or MS.DNR, except as provided herein.

Section 15. Notice of Nonpayment. The Trustee shall notify the Grantor and the Executive Director of MS.DNR, by certified mail within 10 days following the expiration of the 30-day period after the anniversary of the establishment of the Trust, if no payment is received from the Grantor during that period. After the pay-in period is completed, the Trustee shall not be required to send a notice of nonpayment.

Section 16. Amendment of Agreement. This Agreement may be amended by an instrument in writing executed by the Grantor, the Trustee, and the Executive Director of MS.DNR, or by the Trustee and the Executive Director of MS.DNR, if the Grantor ceases to exist.

Section 17. Irrevocability and Termination. Subject to the right of the parties to amend this Agreement as provided

in Section 16, this Trust shall be irrevocable and shall continue until terminated at the written agreement of the Grantor, the Trustee, and the Executive Director of MS.DNR, or by the Trustee and the said Executive Director, if the Grantor ceases to exist. Upon termination of the Trust, all remaining trust property, less final trust administration expenses, shall be delivered to the Grantor.

Section 18. Immunity and Indemnification. The Trustee shall not incur personal liability of any nature in connection with any act or omission, made in good faith, in the administration of this Trust, or in carrying out any directions by the Grantor or the Executive Director of MS.DNR issued in accordance with this Agreement. The Trustee shall be indemnified and saved harmless by the Grantor or from the Trust Fund, or both, from and against any personal liability to which the Trustee may be subjected by reason of any act or conduct in its official capacity, including all expenses reasonably incurred in its defense in the event the Grantor fails to provide such defense.

Section 19. Choice of Law. This Agreement shall be administered, construed, and enforced according to the laws of the State of Mississippi.

Section 20. Interpretation. As used in this Agreement, words in the singular include the plural and words in the plural include the singular. The descriptive headings for each Section of this Agreement shall not affect the interpretation or the legal efficacy of this Agreement.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed by their respective officers duly authorized

and their corporate seals to be hereunto affixed and attested as of the date first above written: The parties below certify that the wording of this Agreement is identical to the wording specified in the Mississippi Hazardous Waste Regulations, Rule 264.151(a)(1), as such regulations were constituted on the date hereof.

ATTEST:

By: *Johnny J. Lewis*  
Title: *Asst. Secy*

VERTAC CHEMICAL CORPORATION

By: *John C. Bumpers*  
Title: *V. Pres*

GRANTOR



ATTEST:

By: *Burrin Ows*  
Title: *Asst. Secy*

FIRST NATIONAL BANK, Vicksburg,  
Mississippi

By: *[Signature]*  
Title: *Asst. Secy*

TRUSTEE



STATE OF TENNESSEE  
COUNTY OF SHELBY

Before me, a Notary Public in and for said State and County, duly commissioned and qualified, personally appeared John C. Bumpers, with whom I am personally acquainted and who, upon oath, acknowledged himself to be the Vice President and Secretary of Vertac Chemical Corporation, the within named bargainor, a corporation, and that he, as such Vice President and Secretary, being authorized so to do, executed the foregoing instrument for the purposes therein contained by signing the name of the corporation by himself as such Vice President and Secretary.

WITNESS my hand and Notarial Seal at office this 28  
day of June, 1983.

*[Signature]*  
Notary Public

My Commission Expires:

My Commission Expires 12-3-85

STATE OF MISSISSIPPI  
COUNTY OF WARREN

Before me, a Notary Public in and for said State and County, duly commissioned and qualified, personally appeared Jack Sellmitt, with whom I am personally acquainted and who, upon oath, acknowledged himself to be the Senior Trust Officer Vice President of First National Bank, Vicksburg, Mississippi, the within named bargainor, a corporation, and that he, as such Officer, being authorized so to do, executed the foregoing instrument for the purposes therein contained by signing the name of the corporation by himself as such Officer.

WITNESS my hand and Notarial Seal at office this 30<sup>th</sup>  
day of June, 1983.

*[Signature]*  
Notary Public

My Commission Expires:

July 16, 1985

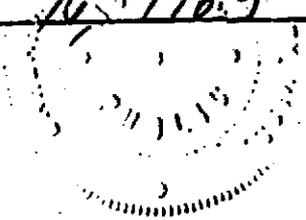


EXHIBIT A

Facilities and Cost Estimates

Vertac Chemical Corporation  
Vicksburg Plant  
P. O. Box 3  
Vicksburg, Mississippi 39180

EPA ID# MSD 990714081

Closure  
Post-Closure

\$ 30,000.00  
\$ 75,000.00

EXHIBIT B

The Fund shall be established by the initial deposit hereunder by Grantor in the sum of Five Thousand Two Hundred Fifty Dollars (\$5,250.00), plus interest thereon, as a result of the termination of a previously existing Trust Agreement between the Grantor and First National Bank, Vicksburg, Mississippi, containing substantially identical terms as the foregoing Trust Agreement, said Trust Agreement having been terminated incident to the formation of the foregoing Trust.

**Sudden Occurrence**

1. Attached April 29, 1983 letter \$1,000,000 coverage.
2. Attached July 6, 1983 letter \$10,000,000 umbrella policy.

**Non-Sudden Occurrence**

1. Initial binder - Loveless and Company.
2. Report from Environmental Risk Assessment Service. Note Page 1 "Vertac is seeking to obtain Environmental Impairment Liability insurance coverage for its operations in West Helena, Arkansas and Vicksburg, Mississippi. As a condition of granting such insurance, underwriters have required Vertac to retain ERAS to perform a survey of the operations and to prepare a report summarizing the risks of environmental liabilities associated with their activities."
3. Present binder.

2(17)  
**B** **BADER INSURANCE AGENCY, INC.**  
Highest Standards of Professional Service



# 4 Shackelford Plaza  
Little Rock, Arkansas 72211  
Telephone (501) 224-6325

April 29, 1983

Jack McMillan, Director  
Division of Solid Waste Management  
Mississippi Department of Natural Resources  
Bureau of Pollution Control  
P.O. Box 10385  
Jackson, Mississippi 39209

Re: Certificate of Liability Insurance

Dear Mr. McMillan:

Attached is the Certificate of Liability Insurance for sudden/  
accidental occurrence for Vertac Chemical Corporation.

Regards,

Verne Bader

LMB/nh

Enc.

c.c. to John Bumpers  
Vertac Chemical Corporation  
5100 Poplar Ave.  
Memphis, Tn. 38137

HAZARDOUS WASTE FACILITY  
CERTIFICATE OF LIABILITY INSURANCE

1. National Union Insurance Company, (the "Insurer"), of New York  
New York certifies that it has issued liability insurance  
covering bodily injury and property damage to Vertac Chemical Corporation  
the "insured", of 5100 Poplar Ave., Memphis, Tn. in connection with the insured's  
obligation to demonstrate financial responsibility under 264.147 or 265.147  
The coverage applies at Vicksburg, Mississippi for sudden/accidental occurrence.  
The limits of liability are \$ 1,000,000. each occurrence and \$ 1,000,000 annual  
aggregate, exclusive of legal defense costs. The coverage is provided under policy  
number GLA9456807RA, issued on 3-1-83. The effective date of said policy is  
3-1-83.

2. The Insurer further certifies the following with respect to the insurance de-  
scribed in Paragraph 1:

(a) Bankruptcy or insolvency of the insured shall not relieve the Insurer of  
its obligations under the policy.

(b) The Insurer is liable for the payment of amounts within any deductible  
applicable to the policy, with a right of reimbursement by the insured for any such  
payment made by the Insurer. This provision does not apply with respect to the amount  
of any deductible for which coverage is demonstrated as specified in Mississippi  
Hazardous Waste Regulation Part 264.147 (f) or 265.147 (f).

(c) Whenever requested by the Executive Director of the Mississippi  
Department of Natural Resources the Insurer agrees to furnish to the Executive Director  
of the Mississippi Department of Natural Resources a signed duplicate original of the  
policy and all endorsements.

(d) Cancellation of the insurance, whether by the Insurer or the insured,  
will be affective only upon written notice and only after the expiration of sixty (60)  
days after a copy of such written notice is received by the Regional Administrator (s)  
of the EPA Region (s) in which the facility(ies) is (are) located.

(e) Any other termination of the insurance will be effective only upon writte  
notice and only after the expiration of thirty (30) days after a copy of such written  
notice is received by the Regional Administrator(s) of the EPA Region(s) is which the  
facility(ies) is (are) located.

I hereby certify that the wording of this instrument is identical to the wording  
specified in the Mississippi Hazardous Waste Regulations Part 264.151 (j) as such  
regulation was constituted on the date first above written, and that the Insurer is licen-  
transact the business of insurance, or eligible to provide insurance as an excess or surp  
lines insurer, in one or more States.

  
Authorized Representative

EPA Identification Number ARD 000023440  
Vertac Chemical Corporation, Jacksonville Plant  
P.O. Box 69  
Jacksonville, Arkansas 72076

EPA Identification Number ARD 990660649  
Vertac Chemical Corporation, West Helena Plant  
P.O. Box 2648  
West Helena, Arkansas 72390



# 4 Shackelford Plaza  
Little Rock, Arkansas 72211  
Telephone (501) 224-6325

**B** *BADER INSURANCE AGENCY, INC.*  
*Highest Standards of Professional Service*

July 6, 1983

Jack McMillan, Director  
Division of Solid Waste Management  
Mississippi Department of Natural Resources  
Bureau of Pollution Control  
P.O. Box 10385  
Jackson, Mississippi 39209

Re: Certificate of Liability Insurance

Dear Mr. McMillan:

Attached is the Certificate of Liability Insurance for sudden/  
accidental occurrence for Vertac Chemical Corporation.

Regards,

Verne Bader

LMB/nh

Enc.

c.c. to John Bumpers  
Vertac Chemical Corporation  
5100 Poplar Ave.  
Memphis, Tn. 38137

HAZARDOUS WASTE FACILITY  
CERTIFICATE OF LIABILITY INSURANCE

1. California Union Insurance Company, (the "Insurer"), of Los Angeles California certifies that it has issued liability insurance covering bodily injury and property damage to Vertac Chemical Corporation (the "insured"), of 5100 Poplar Ave., Memphis, Tn. in connection with the insured's obligation to demonstrate financial responsibility under Arkansas Hazardous Waste Management Code. The coverage applies at refer to the attached for sudden/accidental occurrence. The limits of liability are \$10,000,000 excess of \$1,000,000 primary per occurrence and annual aggregate exclusive of legal defense costs. The coverage is provided under policy number ZU002173, issued on 3-1-83. The effective date of said policy is 3-1-83.

2. The Insurer further certifies the following with respect to the insurance described in Paragraph 1:

(a) Bankruptcy or insolvency of the insured shall not relieve the Insurer of its obligations under the policy.

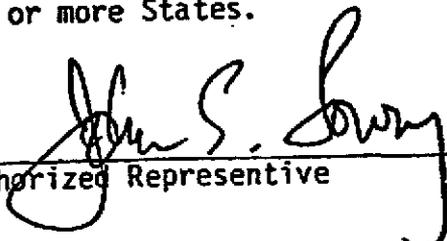
(b) The insurer is liable for the payment of amounts within any deductible applicable to the policy, with a right of reimbursement by the insured for any such payment made by the Insurer. This provision does not apply with respect to the amount of any deductible for which coverage is demonstrated as specified in Arkansas Waste Management Code, Section 3 or 12.

(c) Whenever requested by a Regional Administrator of the U. S. Environmental Protection Agency (EPA), the Insurer agrees to furnish to the Regional Administrator a signed duplicate original of the policy and all endorsements.

(d) Cancellation of the insurance, whether by the Insurer or the insured, will be affective only upon written notice and only after the expiration of sixty (60) days after a copy of such written notice is received by the Regional Administrator(s) of the EPA Region(s) in which the facility (ies) is (are) located.

(e) Any other termination of the insurance will be effective only upon written notice and only after the expiration of thirty (30) days after a copy of such written notice is received by the Regional Administrator(s) of the EPA Region(s) in which the facility (ies) is (are) located.

I hereby certify that the wording of this instrument is identical to the wording specified in Arkansas Hazardous Waste Management Code as such regulation was constituted on the date first above written, and that the Insurer is licensed to transact the business of insurance, or eligible to provide insurance as an excess or surplus lines insurer, in one or more States.

  
Authorized Representative



## LOVELESS & COMPANY, INC. INSURANCE

7201 PERIMETER CENTER EAST, N.E.  
ATLANTA, GEORGIA 30346

TELEPHONE (404) 393-4788  
TELEX 70-0536

ASSIGNED POLICY No. 57424/82

In consideration of the stipulations contained herein, the several Insurers as listed and as appear on the file in the Office of Loveless & Company, Inc. to which authority this Certificate specifically refers are hereby severally bound unto:

INSURERS: International Insurance Company

ASSURED: Vertac Chemical Corporation  
AND 5100 Poplar Ave., 24th Floor  
ADDRESS: Memphis, Tennessee 38137

PERIOD COVERED:

FROM: 12/27/82  
(120 days)

TO: 4/24/83

RATE: N/A

PREMIUM: \$27,207.00

LIMITS \$5,000,000. any one claim  
AND \$10,000,000. in the aggregate  
COVERAGE: Environmental Impairment Liability

### See Page 2 for Terms and Conditions

When a policy or policies of the Company are issued in lieu of their undertaking under this Certificate, and delivered to the Assured or his agent, this obligation of the Company shall cease and be void.

It is understood that the policy period shall be from the date shown above beginning and ending with 12:01 A.M. Standard time at the place of location of risks insured.

This Certificate may be cancelled at the request of the assured at the customary short rates; or by the Company by giving Ten (10) day's notice of such cancellation through LOVELESS & COMPANY, INC., ATLANTA, GEORGIA.

It is agreed that in the event of the failure of Company hereon to pay any amount claimed to be due hereunder, Company hereon, at the request of the Assured, will submit to the jurisdiction of any Court of competent jurisdiction within the United States and will comply with all requirements necessary to give such Court jurisdiction and all matters arising hereunder shall be determined in accordance with the law and practice of such Court.

It is further agreed that service of process in such suit may be made upon Loveless & Company, Inc.

7201 Perimeter Center, East  
Atlanta, Ga. 30346

and  
that in any suit instituted against any one of them upon this contract, Company will abide by the final decision of such Court or of any Appellate Court in the event of an appeal.

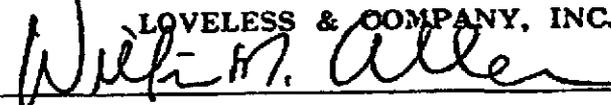
The above-named are authorized and directed to accept service of process on behalf of the Company in any such suit and/or upon the Assured's request to give a written undertaking to the Assured that they will enter a general appearance upon Company's behalf in the event such suit shall be instituted.

Subject to the usual printed clauses of the contracts of the Company with whom this cover is effected.

It is expressly understood and agreed by the Assured by accepting this instrument that Loveless & Company, Inc. is not an insurer hereunder and that Loveless & Company, Inc. is not nor shall be in any way or to any extent liable for any loss claim whatever, but the insurers hereunder are those insurers stated in this Certificate.

This Certificate shall not be valid unless signed by LOVELESS & COMPANY, INC.

LOVELESS & COMPANY, INC.

By   
William M. Allen

**VERTAC CHEMICAL CORPORATION  
ENVIRONMENTAL IMPAIRMENT LIABILITY  
TERMS & CONDITIONS:**

- (1) Exclude all claims and cost of clean up resulting from any incident or situation known to assured at inception date.
- (2) Exclude all claims and cost of clean up arising from the Vertac, Inc., Jacksonville, Arkansas site or any other site on EPA Superfund interim or final National priorities list (full wording to be supplied).
- (3) Any addition exclusions imposed as a result to survey to apply from inception date.
- (4) Premium and policy period will be annualized at the completion of survey and 120 day period. Annual premium \$82,755.00.
- (5) Deductible: \$50,000. per claim
- (6) Premium payment must be received in London within maximum of 30 days - URGENT.

REPORT ON

VERTAC CHEMICAL CORPORATION

VICKSBURG, MISSISSIPPI

AND

WEST HELENA, ARKANSAS

JUNE 8, 1983



ENVIRONMENTAL RISK ASSESSMENT SERVICE (USA), LTD.

131 STATE STREET BOSTON, MASSACHUSETTS 02109 TELEPHONE: 617/720-1931 TELEX: 94-8202

REPORT ON

VERTAC CHEMICAL CORPORATION  
VICKSBURG, MISSISSIPPI  
AND  
WEST HELENA, ARKANSAS

JUNE 8, 1983

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1. INTRODUCTION

Vertac Chemical Corporation ("Vertac") is a diversified, privately held chemical manufacturer with plants located in the South Central United States and corporate headquarters in Memphis, Tennessee. The company produces a variety of herbicides, insecticides, and fertilizers for agriculture, as well as chemical intermediates and performance chemicals for industry. Additionally, Vertac manufactures a number of proprietary products under contracts with major chemical companies throughout the world.

Vertac Chemical Corporation was organized in 1975 to bring together a number of companies including: Vicksburg Chemical Company, East River Chemical Corporation, Transvaal Inc., and Chemform Corporation. This last company (later known as the West Memphis plant) was sold in 1981. Dyticon, Inc., a holding company, has owned Vertac since 1975.

Vertac had net sales of \$58 million dollars in 1982. This was slightly from the 1981 net sales of \$53 million dollars; the projected net sales for 1983 is \$70 million dollars. The total work force at all three plants is about 300 people.

Vertac is seeking to obtain Environmental Impairment Liability insurance ("EIL") coverage for its operations in West Helena, Arkansas and Vicksburg, Mississippi. As a condition of granting such insurance, underwriters have required Vertac to retain Environmental Risk Assessment Service (USA), Ltd. ("ERAS") to perform a survey of operations and to prepare a report summarizing the risks of environmental liability associated with these activities.

The risk rating given by ERAS in this and similar reports is based on the following factors:

- A) The nature and quantities of the materials handled, in particular the potential for damage to health (of human, animal, or plant life) or property if releases to the environment were to occur.
- B) The degree of control exercised in materials processing, handling, and storage.

- C) The adequacy of controls on the treatment of waste streams released to the environment.
- D) The amount of management attention given to matters of environmental concern.
- E) The location of the insured's operations relative to possible damage targets.

The evaluation is largely qualitative and is given on a verbal scale from very high to very low risks.

## 2. DISCLAIMER

The material that follows is furnished pursuant to an express agreement that the ERAS study and report are made for the benefit of both Vertac and the potential insurers and that ERAS is free to inform the potential insurers of any information relevant to the evaluation of the potential risk coming to its attention in the course of the survey or preparation for it. It is further understood and agreed that ERAS accepts no liability to the potential insured, insurer, reinsurers, or others for any losses sustained by Vertac as a result of any denial of any insurance based on the survey or report.

Factual information has been obtained from Vertac's personnel and has been assumed to be correct and complete by ERAS. A draft of the report has been reviewed by Vertac.

## 3. RISK ASSESSMENT

The manufacture of pesticides, fertilizers and chemical intermediates, taken as a composite class, represents a risk of environmental impairment that is greater (i.e., more hazardous) than average, compared with all other commercial and industrial activities. Within this class of activities, Vertac's operations represent a risk of environmental impairment that is slightly above (i.e., slightly more hazardous than) average compared with similar operations.

Vertac's current environmental management personnel appears knowledgeable; however, the two sites do have on-site contamination problems that resulted from past management practices. The West Helena plant is currently in compliance with all environmental regulations, the Vicksburg plant is in compliance with air emission standards, and had experienced difficulties recently in meeting its NPDES permit.

limitations for pesticides due to increased production of DNBP. 7 violations lasted three quarters; since January, 1983, Vertac has these process wastewaters off-site disposal. This action ended NPDES permit violations.

ERAS expresses a high degree of concern about the following aspects of Vertac's operations:

A) the potential for the escape of contaminants into groundwater at the West Helena, AR facility, until Vertac supplies underwriters with groundwater monitoring results satisfactory to underwriters to verify that leakage from the concrete encased drum storage area closed pond area are not causing degradation of off-site groundwater resources. Vertac notes that while the encased drum area and closed pond lie some distance from the existing monitoring network, the areas are between one upgradient and three downgradient wells. It is possible that results from these wells can be used to establish impacts of activities in these two areas on groundwater.

B) Vertac's indirect past use of EPAC- Bayou Sorrel, LA, a Superfund Priority site. Both West Helena and Vicksburg used the CLAW-Bayou Sorrel site for deep well injection of wastes. Some of these wastes may have been diverted to the EPAC ponds by CLAW. CLAW and EPAC were owned by the same entity. Vertac has entered into discussions with the EPA concerning this site.

C) any claims arising out of the escape of contaminants from Vertac's site at Marshall Road, Jacksonville, Arkansas, a site listed on EPA's Proposed Superfund Priorities List.

D) the potential for the escape of contaminants into groundwater and surface waters at the Vicksburg, MS facility until Vertac supplies underwriters with the following information:

i) documentation issued by the Mississippi Department of Natural Resources certifying that the on-site disposal area has been closed to the Agency's Specifications. Vertac should also indicate that contaminated spills have been removed from the area. Vertac expects that this documentation will be available during the summer of 1983.

ii) groundwater monitoring data, which indicate, to the

underwriters' satisfaction, that the abandoned on-site disposal area and 3-million gallon surface impoundment are not contributing groundwater contamination; the surface impoundment is not lined. Monitoring wells surround these areas.

iii) documentation indicating that the 3-million gallon surface impoundment has had improvements made to it such that river flooding will not breach the pond's containment walls. Vertac has initiated an engineering study and is committed to completion of remedial design measures by July 1, 1983. The purpose of the study is to ensure the structural integrity of the containment walls.

ERAS expresses a significant, but lesser degree of concern about

A) the absence of paving and a spill collection system associated with the railroad area at the West Helena, AR site. ERAS urges Vertac to provide this area with spill retention features such as a collection sump, the contents of which could be treated by the facility's wastewater treatment system.

B) the storage of greater than 350 drums containing hazardous materials generated from past operations at the Vicksburg facility. Vertac has tested and identified these wastes. They will be removed for proper disposal prior to August 15, 1983.

ERAS encourages Vertac to periodically analyze the water and fish of the Vicksburg facility fish pond. Company employees fish from the pond and eat these fish. Vertac states that it agrees with this recommendation and also notes that the pond is remote from all pesticide operations.

#### 4. OPERATIONS

##### A) Corporate Headquarters

Vertac has undergone two management changes in the last five years. The company's founder left it in 1978 as part of a Chapter 11 bankruptcy settlement; at that time, the present owner, Dyticon, (a holding company), took over operations.

The first management team left the company in 1980 after two years of financial losses. The present management, which started in 1980, has shown a profit for its two years of operations. A significant increase in profitability is expected for 1983.

The corporate function of Environment and Safety was established in 1978 by Dyticon, Inc. Prior to 1978, the individual plants were responsible for environmental and safety management with no direct input from corporate staff. Mr. R.D. Karkkainen, Director of Environment and Safety, has been in this position since 1978. He has a Master's Degree in Chemical Engineering and worked for 16 years in the chemical industry prior to taking this position. This position is a full-time responsibility.

Mr. Karkkainen reports to the Vice President of Operations; he is assisted by an Environmental Affairs person at each plant. Mr. Karkkainen has no corporate staff.

Mr. Karkkainen's responsibilities include obtaining new permits for the plants and the renewal of existing permits, regulatory compliance and establishing contractual relationships for off-site disposal. He is also responsible for addressing environmental problems created prior to 1978 by the previous ownership; these efforts occupy much of his time.

Vertac has made a commitment to employee safety and protection of the environment. Its corporate brochure identifies these areas as a priority, and recognizes the need for training and development of responsible attitudes in addition to providing adequate funding for environmental control equipment and structures. The brochure also pledges to develop and research methods to reduce product waste to streams.

Both the West Helena and Vicksburg plants sent wastes to be disposed of by deep well injection to CLAW-Bayou Sorrel, LA. EPAC-Bayou Sorrel, a site now listed as a Proposed Superfund Priorities site, is owned by the same owners of CLAW. Wastes from CLAW may have been diverted to EPAC. ERAS expresses a high degree of concern about past waste management practice. Vertac notes that it has entered into discussions with the EPA concerning this site.

B) West Helena, Arkansas

The West Helena plant occupies 50-acres of a corner of an industrial park. The site is surrounded by soybean and wheat fields to the west, warehouses to the east, a small chemical plant to

south, and a paving contractor to the north. Residential housing is located about a mile from the plant; the closest surface water is miles away.

Groundwater at the site is found between 12-20 ft. below the surface. The surface soils are deposits from floods of the Mississippi River; the sub-surface soils are fine grained silts and clays of low permeability which extend 30-40 ft. in depth.

The West Helena plant for the most part produces custom products in five process units. At the time of the survey, only three units were operational.

The first unit manufactures 'propanil' which is a combination of dichloraniline, propionic acid, and propionic anhydride. An emulsifier and mesityl oxide are added to formulate three or four different blends of the product. The second unit manufactures synthetic pyrethroids for the ICI Corporation. This process includes reacting permethrin acid ester with sodium hydroxide and methyl alcohol. Other components of the production scheme include hydrochloric acid, toluene, 3-phenoxybenzyl alcohol and thionyl chloride.

The third and fourth units are used for custom chemical manufacture. The fifth unit is used for the manufacture of a friction reducing polymer ("Arcoflo") which is added to crude oil in long transmission lines. The product is made for ARCO Corporation. Raw materials needed for this product are kerosene, dodecene, butene, methanol, caustic.

Raw materials are delivered to the site by both truck and rail. The materials are stored on-site in aboveground storage tanks. Approximately one truck per day of solvent is delivered to the site. The storage of acids and caustics is sufficient for about one week of production.

The finished products leave the plant site either in drums by truck, or in bulk by rail. The truck loading area was paved; stormwater is collected for treatment. The rail area is not paved. The collection of stormwater run-off from this area is stated to be part of the stormwater treatment process. Run-off from certain non-process areas within the plant does not flow through the treatment process.

Figure 1 illustrates the plant layout. The major features are the process units, biological wastewater treatment system, drum storage area and the bulk storage tank farm. The plant and waste treatment areas are surrounded by a six foot fence; a guard is on duty 24 hours per day.

The plant appears well run in terms of environmental management; it is not clear if this was the case during the previous ownership. Plant personnel work with and seek advice from regulatory agencies as well as the corporate staff. The plant grounds are inspected three times per day; this inspection includes the waste treatment ponds, dikes, and drum storage areas. A contingency plan, closure plan, Spill Prevention Control and Countermeasure plan, and other operational documents have been prepared by the West Helena plant. The materials were examined during the site survey of the facility, and found to be adequate.

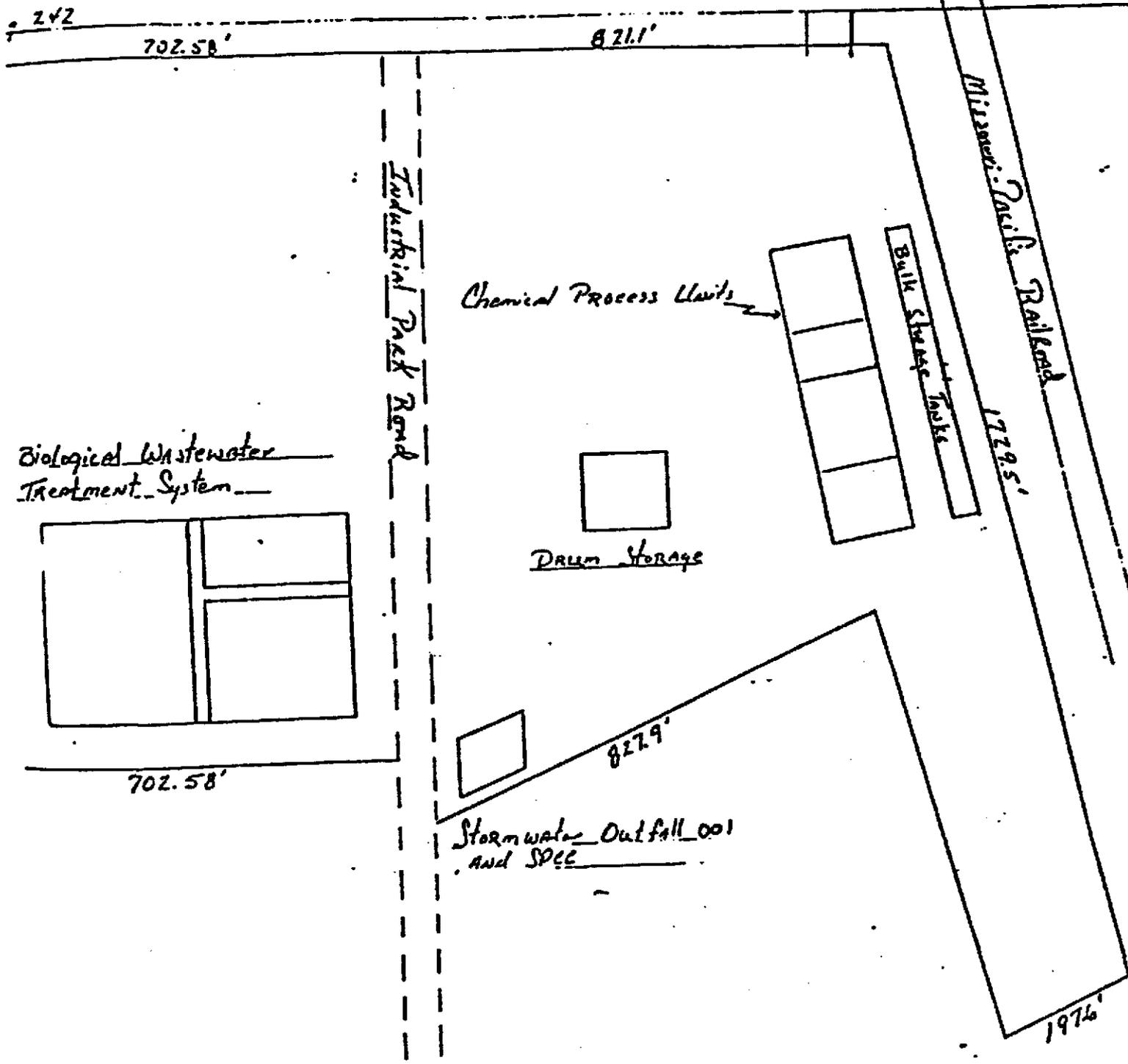
Air emissions from the process units are controlled by scrubbers. Special air permits are required for emissions generated by any new chemical processes (i.e., new contracts) performed by Vertac. Vertac's modified Air Pollution Control Permit issued by the Arkansas Commission on Pollution Control and Technology is numbered 126 and issued July 24, 1981. The air emissions meet EPA emission standards.

Figure 2 illustrates the West Helena plant's use and distribution of supply water. Sanitary wastes are sent to a local septic system. Non-contact cooling water, boiler feed blowdown and uncontaminated stormwater run-off are discharged via Outfall #001 into the White River which feeds the Mississippi.

Wastewater from the pyrethroid process unit amounts to 2.4 million gallons per year (gpy); this is disposed of off-site by deep well injection. The propanil unit generates 250,000 gpy, and the polychlorinated biphenyl unit 50,000 gpy. Most surface water run-off from the site is collected and treated along with the process wastewaters. Wastewaters are treated in a biological wastewater treatment system which has a design flow of 90,000 gallons per day. The ponds used in the treatment of wastes are lined with bentonite clay over a base of natural soils with permeabilities of approximately  $10^{-7}$  cm/sec. Treatment

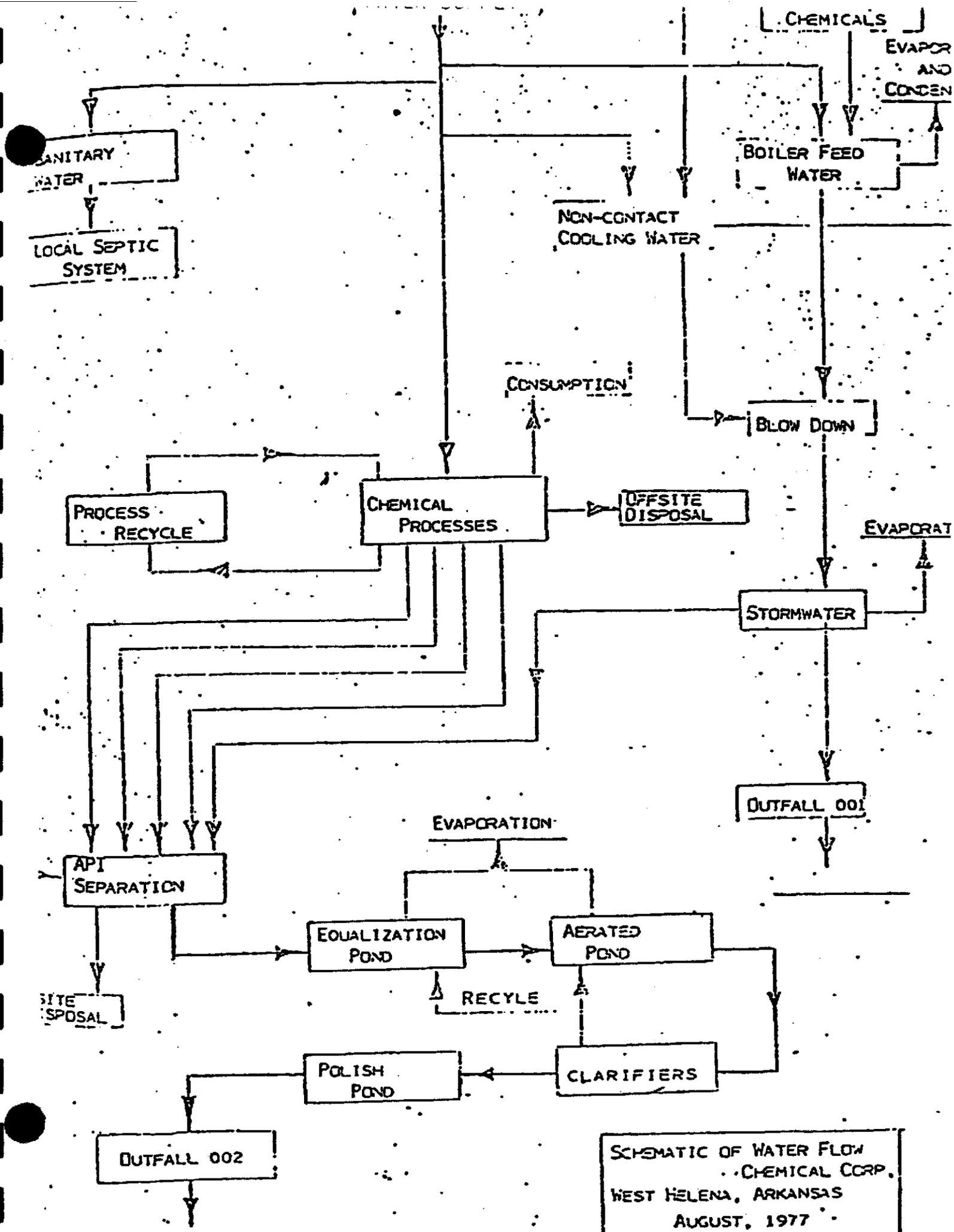
REPLY TO: P. O. BOX 2648  
WEST HELENA, AR 72390  
5011 572-3708

To Aug 49



J.E. Peter 1/00

FIGURE 1.



SCHEMATIC OF WATER FLOW  
 CHEMICAL CORP.  
 WEST HELENA, ARKANSAS  
 AUGUST, 1977

consists of flow through an API separator to separate water insoluble organics, biological treatment in an aeration pond, clarification and final polishing prior to discharge to the Mississippi River via Outfall #002.

Three downstream groundwater wells were placed in 1978, for the purpose of monitoring. Local residents are on a municipal water supply which draws water from several hundred feet below the ground surface. Additionally, the site's 30-40 feet of silts and clays of low permeability should help in attenuating the escape of contaminants.

West Helena's NPDES Permit No. AR0036412 and was issued February 22, 1977. The permit places limits on flow, COD, Oil and Grease, Total Pesticides and pH for Outfall #001; for Outfall #002, these same parameters, with the exception of oil and grease, are measured as well as BOD, TSS, phenol and ammonia-nitrogen. The renewal permit is on hold until new pesticide standards can be included in the permit. To date, this plant has a history of compliance with its NPDES permit.

Adjacent to the wastewater treatment ponds there is a low marsh area on Vertac's property. This area is used for hunting and other recreational activities by the plant personnel and possibly local residents. It is not known if there are any surface or groundwater flow paths between the site, the waste treatment area, and this wetland; however, there is no evidence to suggest such a flow path.

The West Helena facility is registered as a generator, treater, storer and disposer of hazardous waste; its EPA identification number is ARD990660649; the biological treatment system is considered a RCRA waste treatment unit. The Arkansas Department of Pollution Control and Ecology conducted a waste management inspection on March 25, 1978; no deficiencies were found. One of the hazardous wastes shipped off-site is a product of Arcoflo production; it is a mixture of kerosene and other petroleum products which is sent to ARCO in Houston, Texas by rail car for fuel value recovery. Permethrin process wastewater has been manifested to Chemical Resources, Inc. for deep-well injection. Other wastes (i.e., API separator sludges) are sent to Brown & Ferris, Inc.

Hazardous wastes are stored in two 20,000 and 93,000 gallon tanks; a small drum storage area adjacent to the warehouse storing drummed hazardous materials.

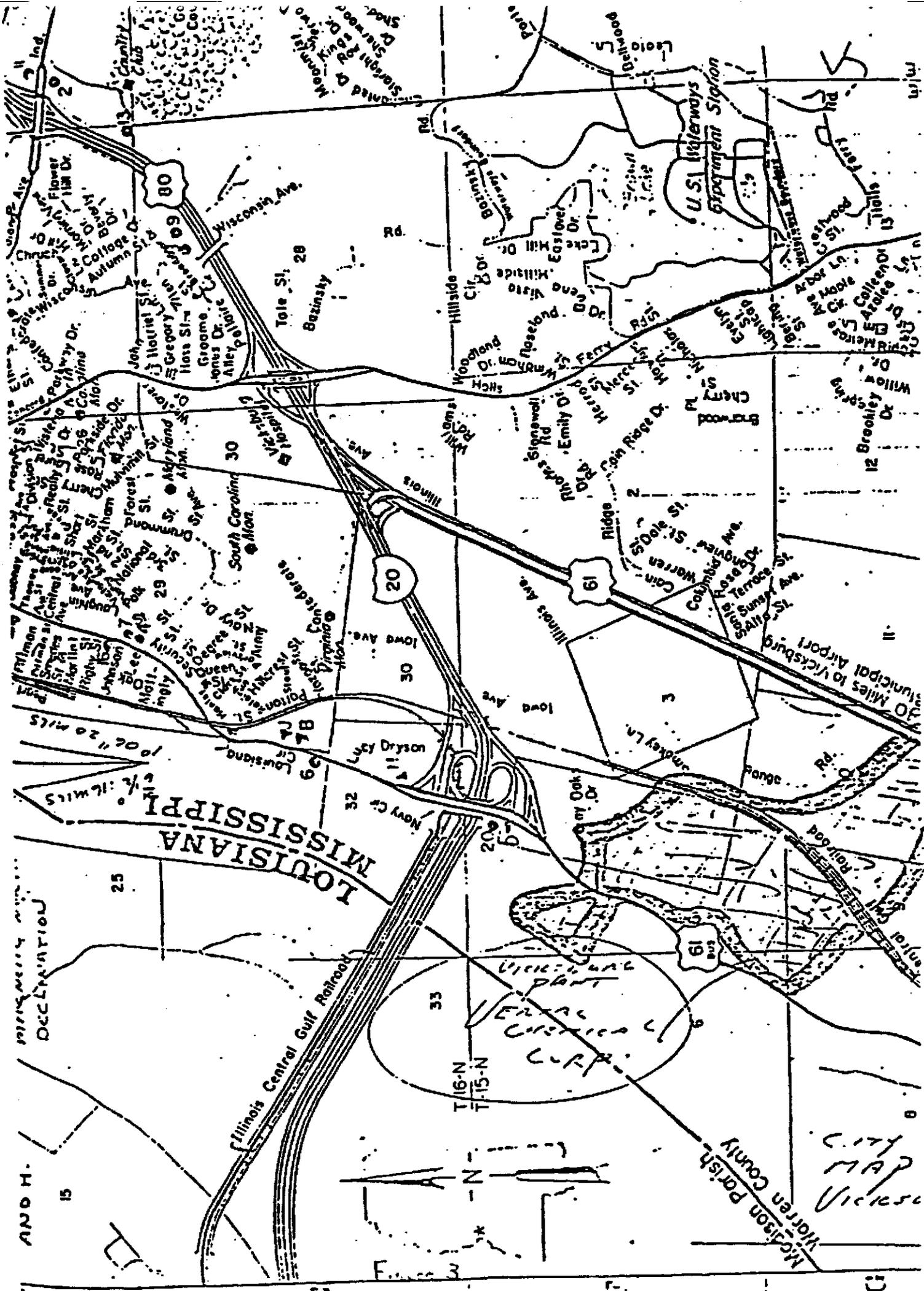
In 1978, one pond with three sections which contained waste from Helena Chemical was "closed". Liquids from these ponds were disposed off-site in deep wells, and the pond area was covered with native soil. There has been no separate monitoring of these areas to determine the effectiveness of the cover and the escape of contaminants, if any, from these ponds. In addition, wastes from a previous herbicide production process are buried on the site. Traces of yellow color in soil are evident throughout the site, suggesting contamination from previous dinitro products.

In 1976, drums containing waste (of unknown type) were encased in a basement of concrete and surrounded by a bentonite/sand mixture. The top of the encapsulated area is now the floor of a covered warehouse used for storage of drums containing final products. There has been no separate monitoring of this area to determine the effectiveness of the "closure". Vertac notes however, that both the pond and the encased drum area lie between one upgradient and three downgradient monitoring wells. Pesticides generated by the facility are among the parameters included for analysis.

#### B) Vicksburg, Mississippi

The Vicksburg plant is a 600 acre site located in Warren County on the Louisiana-Mississippi border (see Figure 3). Interstate 20 passes to its north, and Rt. 61 passes its eastern border. The site is completely surrounded by the City of Vicksburg. A school is within one mile of the site and a hospital is within two miles of the site. The closest resident is approximately one-quarter mile from the site.

A creek borders a portion of the east side of the plant site, then flows through the plant property. The creek drains a large portion of Vicksburg prior to entering the plant property and empties into the Mississippi River several miles downstream of the site. A groundwater table exists at 10 to 15 feet below the surface. The soils beneath the site are silts and clays and are expected to have low permeabilities.



AND H.

15

DECLARATION

25

MISSISSIPPI

Illinois Central Gulf Railroad

T. 16-N  
T. 15-N

33

VICINIAL PART  
VERMILION  
C.R.P.

Warren County  
Missouri

VICINIAL  
MAP  
CITY

30 Miles to Vicksburg  
Municipal Airport

1000 1/20 MILS  
6 1/2 1/2 MILS

Lucy Dryson  
Nov Cr 32

Illinois Ave.  
20  
30  
35

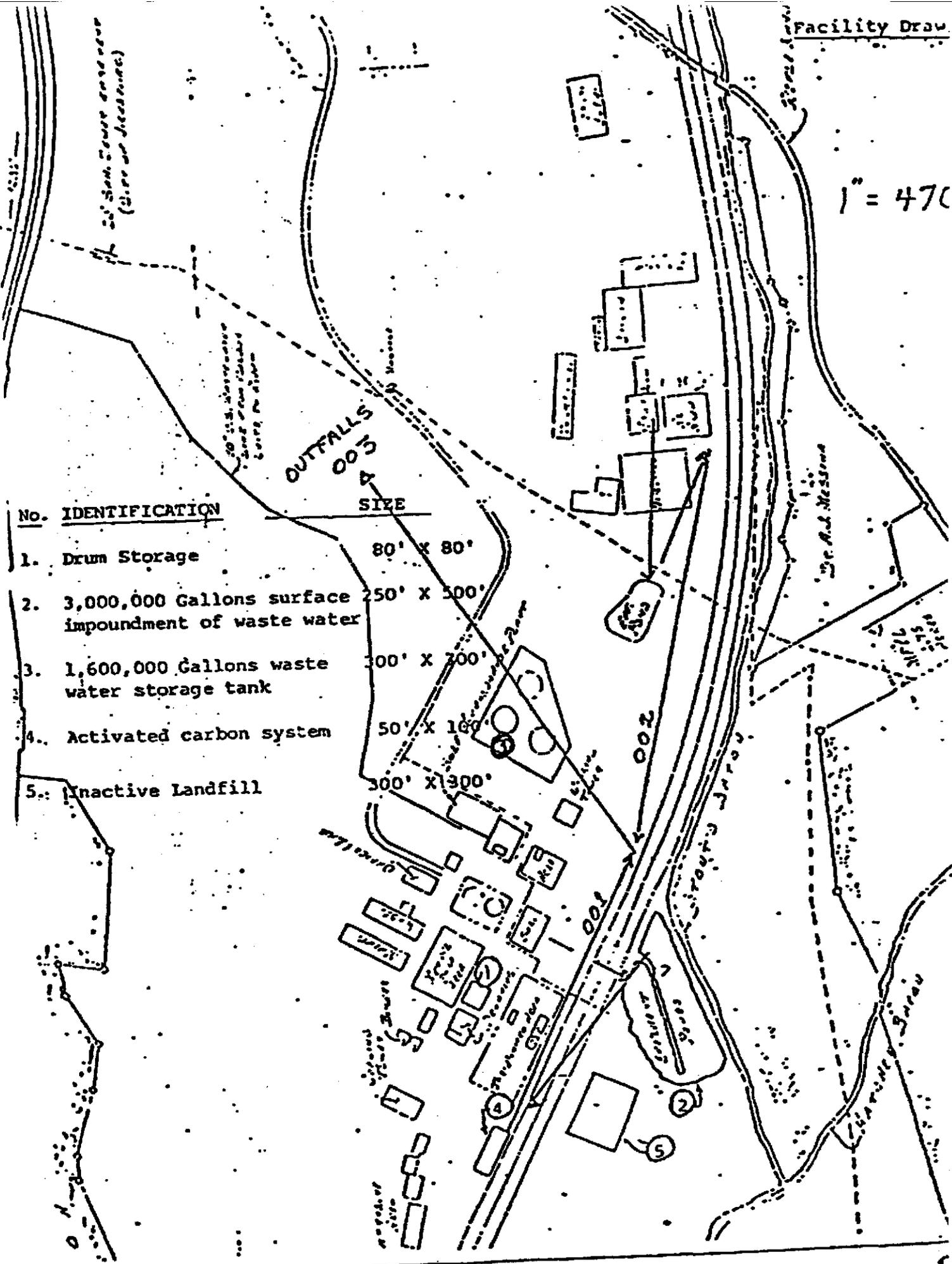
Warren  
Columbia Ave  
Langley Ave  
Tennison St  
Warren St  
Cain St

U.S. Waterways  
Experiment Station

80  
Wisconsin Ave.  
Tale St. 28  
Bazinsky

11 Ind.  
Country Club  
United Dr  
Strength Dr  
Sherwood Dr  
Merrill Dr  
King Dr  
Merrill Dr

1" = 470'



No.	IDENTIFICATION	SIZE
1.	Drum Storage	80' x 80'
2.	3,000,000 Gallons surface impoundment of waste water	250' x 300'
3.	1,600,000 Gallons waste water storage tank	300' x 300'
4.	Activated carbon system	50' x 100'
5.	Inactive Landfill	300' x 300'

FIGURE 4

The Vicksburg, Mississippi plant site has two separate facilities or operations. Figure 4 illustrates the plant layout. The north plant produces potassium nitrate, chloride, and nitrogen tetroxide. The raw materials for these processes are potassium chloride and nitric acid.

In the south plant, the products are nitric acid, dinitro butyl phenol (Dinoseb or DNBP) and MSMA (monosodium methanarsenate). MSMA is an arsenical herbicide. At the time of the survey, two other process units for Toxaphene and atrazine production was shut down; both toxaphene and atrazine are organic pesticides. Raw materials for the operating processes are chlorine, camphene, OSBP, arsenic trioxide, caustic, methyl chloride and sulfuric acid.

Vertac's operating personnel appeared to be knowledgeable and supportive of environmental concerns. It has a good working relationship with Mississippi regulatory personnel.

The plant is guarded 24 hrs/day at plant access points; part of the perimeter is fenced and warning signs are posted. The wastewater pond area treatment system, and other areas are inspected daily. The drum storage area is inspected weekly. Vertac's inspection sheet notes the level of liquids in the aboveground storage tank (the "H Tank" used for the storage of wastewaters from the north plant) and the surface impoundment. It also prepares a daily report on wastewater discharge contaminant levels and graphically plots these values over time.

A Contingency plan and Spill Prevention Control and Countermeasure plan have been prepared for the Vicksburg plant. A closure plan was revised to address the closure of the inactive disposal area. Vertac has established a training program for its personnel regarding hazardous chemical management as part of its safety program. Calgon, which supplies the carbon adsorption equipment used to treat process wastewater, provides training in its use. A specific hazardous waste management training program will be established prior to August, 1979.

The raw materials for the north plant are delivered by bulk rail or piped in from the south plant. Raw materials for the south plant are delivered primarily by truck. Products from both plants are s

ped by both truck and rail. The rail loading area is connected to the stormwater collection system, which discharges to the Mississippi River.

Vertac's air emissions are regulated by the Mississippi Department of Natural Resources Operating Permit No. 2780-00041, which expires June 1, 1984. The following sources are permitted:

- Nitric Acid Plant (Gulf Process NO<sub>x</sub> Exhaust)
- Potassium Nitrate Plant (baghouses, scrubbers, absorber, vent)
- Toxaphene Plant (caustic scrubber, activated carbon column water scrubber)
- Dinoseb Plant (Sulfonation Reactor, Nitration Reactor, Flare)
- Gas-Fired Fuel Boilers (3-north plant, 2-south plant)
- Storage tanks (for all process plants)

Four air monitors around the site measure nitrogen oxide levels. Vertac has experienced no air violations of its permit. Due to the proximity of residential housing, it is important to monitor these emissions closely.

Figure 5 is a schematic of the plant's water flow. Effluent from the potassium nitrate plant, boiler blow down, and cooling tower blow down feed a wastewater storage tank with a 1.6 million gallon capacity. Effluent from the nitric acid plant and carbon treated-DNBP process water enter an unlined 3 million gallon holding pond which also receives all stormwater run-off from the south plant. The pond water is neutralized and sent through an activated carbon system; the effluent from carbon adsorption (Discharge #001) is combined with neutralized wastewater from the potassium nitrate plant (Discharge #002). The combined flow (Discharge #003) is discharged to the Mississippi River at a rate of 1.5 MGD under NPDES Permit No. MS0027995 which expires June 30, 1986. According to Vertac's description of the MSMA production process, metallo-organic pesticides, such as arsenicals, are not allowed to be discharged to navigable waters. For this reason, the MSMA process and waste effluent treatment were designed to provide no discharge of wastewater. Wastewater from the Dinoseb process

SCHEMATIC OF WATER FLOW

VERTAC CHEMICAL CORPORATION  
P. O. BOX 3  
VICKSBURG, MS. 39180

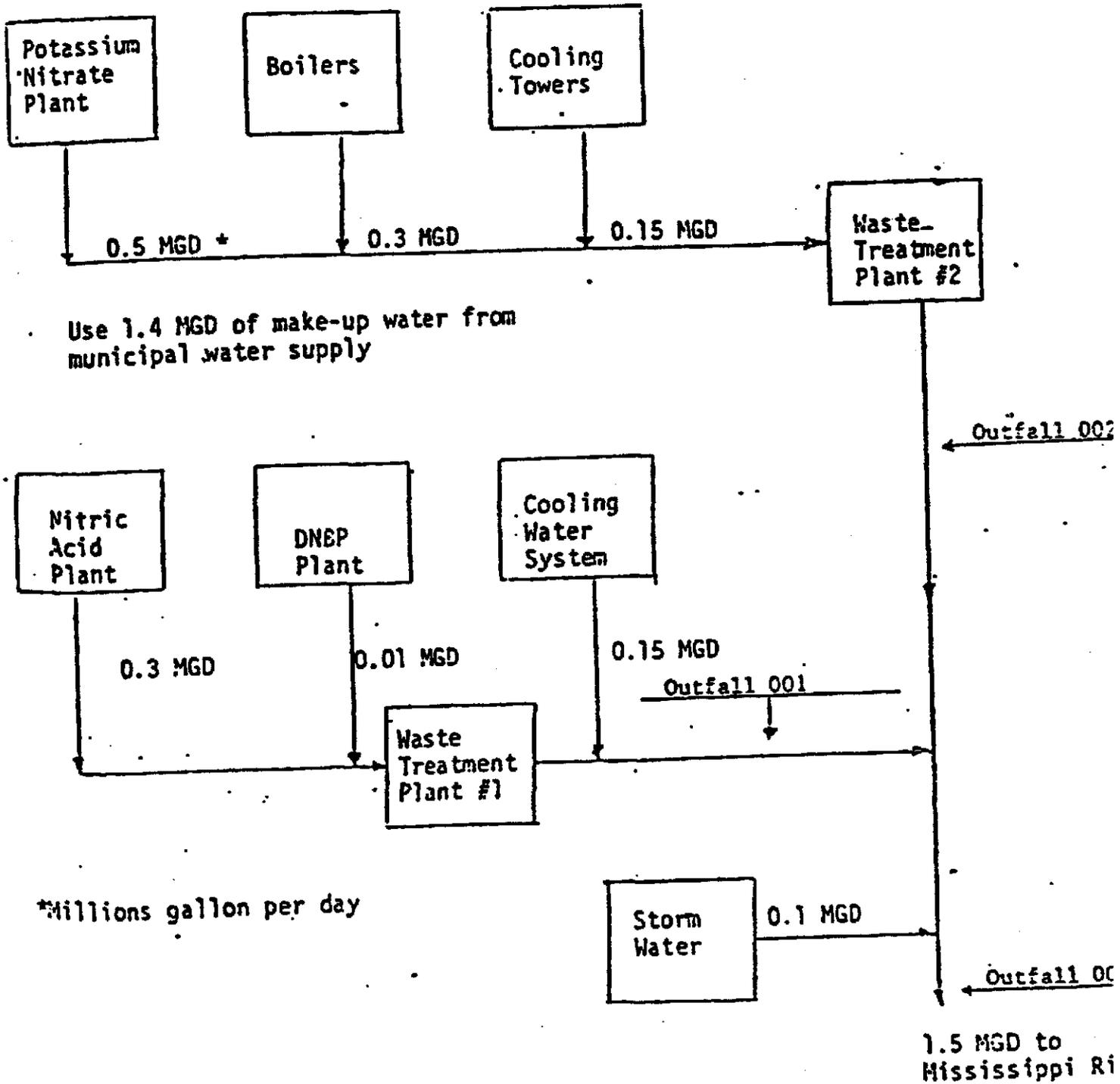


FIGURE 5

treated in a separate activated carbon system prior to its discharge into the holding pond. About half of the Dinoseb process wastewaters are sent off-site for deep-well injection. The total flow to the Mississippi River is between 200-400 million gallons per year.

Discharge #001 is monitored for flow, COD, BOD, TSS, DNBP, and Toxaphene; Outfall #002 has limits placed on flow and nitrate nitrogen; the total plant effluent is monitored for nitrates and temperature.

Vertac has performed a static bioassay test on its discharge and has also had a priority pollutant analysis performed on Outfall #001. All pollutants fell below the minimum detection limits. The plant has been in violation of its wastewater permit for several quarters due to increases in DNBP production capacity; as of January, 1983, these process wastewaters have been sent off-site for deep-well injection, thereby eliminating the cause of NPDES permit exceedances.

In addition, during a flood, the creek waters adjacent to the 3 million gallon surface impoundment breached the dike wall of the surface impoundment. Approximately 700,000 gallons of wastewater were lost; samples taken downstream of the break indicated that the stream water was within standards. Vertac has initiated a study of the structural integrity of the impoundment. The creek water is not tested for contamination from the surface impoundment or from site run-off. The plant site is monitored by seven groundwater wells. Groundwater analyses are performed quarterly for groundwater quality and contamination parameters as designated in RCRA part 265.92, and primary drinking water standards. Groundwater data from an April, 1982 sample obtained from Well #1 (located beside the 3 million gallon effluent pond) indicated that all parameters are below the primary drinking water standards, except for chromium (0.61 vs. 0.05 mg/l). Vertac has recently installed four additional wells as part of its closure plan for the inactive on-site disposal area.

This plant is assigned EPA ID No. MSD990714081 as a waste generator, treater, storer and disposer. Its RCRA part A form indicates that xylene, toxaphene, chloroform, methyl parathion, dinitrocr and butyl-dinitrophenol comprise a portion of the 1.5 million tons of wastewater impounded annually. Pesticide-contaminated trans

drummed (300-500 drums/year); salt produced from the MSMA is placed in bins (5-10 million lbs/yr). These wastes are sent to either Chemical Waste Management in Emelle, AL or Browning Ferris Industries. As of February 4, 1983, there were 367 drums on-site containing hazardous wastes; these drums have accumulated from previous operations. An internal memorandum supplied by Vertac indicates that drums holding liquid waste and suitable for carbon adsorption are, or will be, emptied into the effluent pond, or sent off-site for deep-well injection. The remaining drums will be tested and sent off site for disposal. Vertac has indicated that it will dispose of these drums by August 1, 1983, and thereby eliminate the need for a drum storage area. A representative of the Mississippi DNR indicated that these drums are of some concern to the agency.

Vertac has submitted a Notification of Hazardous Waste Site (NOHWS) form to the EPA as required under Superfund 103(c) for an inactive on-site disposal area. General chemical and pesticide wastes (4.6 million gallons) were stored or disposed of in a 231,600 sf landfill impoundment between 1972-1975. Some wastes were drummed; some drums were both buried and aboveground. Stored liquids were drained to the plant effluent treatment system. The form indicates that there are no releases to the environment. Until recently, this plant has been operating under a consent order to complete the clean-up of the disposal area. Vertac is in the process of completing the necessary closure steps to the satisfaction of the regulatory agency. The steps include installing additional monitoring wells, capping, and grading the site. Grading and capping are scheduled to be initiated during the summer of 1983.

Liquid wastes from this area were removed. The closure plan addressed both the disposal area and the drainage ditch from the area. Soils in both areas are contaminated with pesticides and are being eroded.

A fish pond is located at the north plant near the administration building. The pond is upstream of the activities at both north and south plant. Plant personnel fish in the pond and eat the fish. Vertac states it will periodically sample and analyze the pond.

water and fish to verify that the pond is not affected adversely by the plant's operations.

#### 5. SURVEY ACTIVITIES

On February 22-24, 1983, Drs. Norbert Dee and James Wallace of Law Engineering Testing Company, acting as consultants to ERAS, visited the corporate headquarters of Vertac Chemical Corporation in Memphis, Tennessee and the West Helena, AR and Vicksburg, MS plant. Operations and facilities were discussed with Mr. R.D. Karkkain, Corporate Director of Environment & Safety; Mr. Joe E. Porter, Environmental Engineer at West Helena and Mr. Robert Maraman, Chief Chemist at Vicksburg. After discussions about the plant, there was a tour of each facility. Mr. Porter spends 100-percent of his time on environmentally related matters. Mr. Maraman spends about 20-80% of his time on environmental concerns. Neither West Helena nor Vicksburg is facing any current or pending litigation.

The surveyors contacted the Arkansas Department of Environmental Control and Ecology (501-562-7444) and spoke with Jim Shell, Chief of the Water Division; John Ward, Chief of Permits; and J.B. Jones, Chief of Field Operations. These contacts indicated that the West Helena facility was in compliance and that the agency had no significant problems with Vertac.

Within the Mississippi Department of Natural Resources (601-961-5099), Chuck Estes, of the Hazardous Waste Division; Jeb Banks, Air; and Steve Spangler, Water were contacted.

The Vicksburg plant's air quality has been in compliance according to Mr. Banks. However, Mr. Estes saw three problems regarding hazardous waste: 1) inactive disposal area, 2) drum storage area and 3) storage pond. Mr. Estes indicated that the state may issue a compliance order for the pond area in the near future. Since that conversation, Vertac has initiated an engineering study to ensure the structural integrity of the pond walls. The inactive disposal area had been the source of a compliance order; the requirements of that order have been satisfied.

According to the Mississippi regulatory officials there have been

a number of violations of NPDES permit limitations in the last seven quarters. These violations have been caused by an increase in D production at the plant such that the capacity of the wastewater treatment system has been exceeded. These compliance problems were eliminated in January, 1983 when Vertac started to send DNBP process wastewaters off-site for deep-well injection.



## LOVELESS & COMPANY, INC. INSURANCE

7201 PERIMETER CENTER EAST, N.E.  
ATLANTA, GEORGIA 30346

TELEPHONE (404) 393-4788  
TELEX 70-0536

ASSIGNED POLICY No. 560-000-145

In consideration of the stipulations contained herein, the several Insurers as listed and as appear on the file in the Office of Loveless & Company, Inc. to which authority this Certificate specifically refers are hereby severally bound unto:

INSURERS: International Insurance Company

ASSURED: Vertac Chemical Corporation  
AND  
ADDRESS: 24th Floor, 5100 Poplar  
Memphis, TN. 38137

PERIOD COVERED:

FROM: 6/24/83

TO: 12/27/83

RATE: N/A

PREMIUM: \$41,944.00

LIMITS \$5,000.00. any one Claim  
AND \$10,000,000. In the aggregate  
COVERAGE: Environmental Impairment Liability

When a policy or policies of the Company are issued in lieu of their undertaking under this Certificate, and delivered to the Assured or his agent, this obligation of the Company shall cease and be void.

It is understood that the policy period shall be from the date shown above beginning and ending with 12:01 A.M. Standard time at the place of location of risks insured.

This Certificate may be cancelled at the request of the assured at the customary short rates or by the Company by giving Ten (10) day's notice of such cancellation through LOVELESS & COMPANY, INC., ATLANTA, GEORGIA.

It is agreed that in the event of the failure of Company hereon to pay any amount claimed to be due hereunder, Company hereon, at the request of the Assured, will submit to the jurisdiction of any Court of competent jurisdiction within the United States and will comply with all requirements necessary to give such Court jurisdiction and all matters arising hereunder shall be determined in accordance with the law and practice of such Court.

It is further agreed that service of process in such suit may be made upon

Loveless & Company, Inc.  
7201 Perimeter Center, East  
Atlanta, Ga. 30346

and that in any suit instituted against any one of them upon this contract, Company will abide by the final decision of such Court or of any Appellate Court in the event of an appeal.

The above-named are authorized and directed to accept service of process on behalf of the Company in any such suit and/or upon the Assured's request to give a written undertaking to the Assured that they will enter a general appearance upon Company's behalf in the event such suit shall be instituted.

Subject to the usual printed clauses of the contracts of the Company with whom this cover is effected.

It is expressly understood and agreed by the Assured by accepting this instrument that Loveless & Company, Inc. is not an insurer hereunder and that Loveless & Company, Inc. is not nor shall be in any way or to any extent liable for any loss claim whatever, but the insurers hereunder are those insurers stated in this Certificate.

This Certificate shall not be valid unless signed by LOVELESS & COMPANY, INC.

By William M. Allen  
LOVELESS & COMPANY, INC.  
William M. Allen

(a) (18) State Financial Mechanism

Not Applicable

VERTAC CHEMICAL CORPORATION  
VICKSBURG FACILITY  
PART B PERMIT APPLICATION  
APPENDIX

(c) (1)

**Summary of Groundwater Monitoring Data**

WELL I.D. 1

GROUP 1  
INORGANICS

	December 1981	April 1982	October 1982	January 1983	June 1983
Arsenic	0.015	0.003	—	—	
Barium	0.364	0.103	0.170	0.926	
Cadmium	0.003	—	0.006	0.023	
Chromium	0.019	0.61	0.044	0.059	
Flouride	0.680	0.42	0.650	0.690	
Lead	0.007	0.024	0.048	0.063	
Mercury	—	—	0.014	0.003	
Nitrate	0.250	0.18	0.15	0.280	
Selenium	—	0.006	—	0.017	
Silver	0.001	0.006	0.021	0.001	
Organics					
Endrin	—	—	—	—	
Lindane	—	0.001	—	—	
Methoxychlor	—	—	—	—	
Toxaphene	—	—	—	—	
2,4-D	0.00006	—	—	—	
2,4,5-TP Silvex	—	—	—	—	
Radiochemistry					

Gross Alpha	6.3+1.0	—	3.3+1.2	6.0+2	
Gross Beta	12.7+3.1	6.2+3.0	16.0+3.6	46.5+3	
Total Radium	—	—	—	—	
Others					
Turbidity	7.4	5.0	1.9	1.1	
Total Coliform	—	2	2	2	

GROUP 2

Chloride	65.9	76.0	80.9	88	98
Iron	0.14	0.30	—	0.24	—
Manganese	0.57	0.73	0.33	0.48	0.39
Sodium	87.6	92.3	82.3	123	89.9
Sulfate	89.8	82.4	82.7	100	86.0
Phenols	—	0.05	1.28	0.28	0.12

GROUP 3

pH	7.5	7.14	7.12	6.98	7.6, 7.58, 7.6, 7.62
Specific Conductance	3600	3350	4100	3900	4100, 4100, 4150, 4200
Total Organic Carbon	41.37	63.49	64.59	59.85	47.15, 47.68, 48.19, 47.97
Total Organic Halogen	0.12	0.20	0.11	0.11	0.148, 0.136, 0.144, 0.152

WELL I.D. 2

GROUP 1  
INORGANICS

December 1981      April 1982      October 1982      January 1983      June 1983

Arsenic	---	0.003	---	0.002	
Barium	0.560	0.090	---	0.688	
Cadmium	0.002	---	0.003	0.005	
Chromium	---	0.004	---	---	
Flouride	0.40	0.36	0.50	0.50	
Lead	---	---	0.05	---	
Mercury	---	---	0.01	0.0047	
Nitrate	1.50	0.86	0.36	1.0	
Selenium	0.033	---	---	0.015	
Silver	0.0003	0.005	0.0079	0.0008	
Organics					
Endrin	---	---	---	---	
Lindane	---	---	---	---	
Methoxychlor	---	---	---	---	
Toxaphene	---	---	---	---	
2,4-D	0.0002	---	---	---	
2,4,5-TP Silvex	---	---	---	---	
Radiochemistry					
Gross Alpha	1.85+1.00	---	---	---	
Gross Beta	9.71+3.05	2.5+3.0	23.8+3.7	33.6+3.6	
Total Radium	---	---	---	---	
Parameters					
Turbidity	5.2	2.5	3.1	1.8	
Total Coliform	---	1	1	3	

GROUP 2

Chloride	42.0	48.0	54.9	54	45
Iron	0.2	0.15	0.03	0.47	---
Manganese	1.18	0.32	0.04	0.79	---
Sodium	33.8	36.8	31.3	34	28.6
Sulfate	112.9	32.4	181.6	112	105.9
Phenols	---	---	1.15	0.08	---

GROUP 3

pH	7.51	7.17	7.12	7.02	7.75, 7.76, 7.74, 7.7
Specific Conductance	990	880	1,300	990	1100, 1100, 1050, 110
Total Organic Carbon	39.56	86.77	85.23	67.65	59.35, 59.03, 60.05,
Total Organic Halogen	0.062	1.076	0.022	0.021	--, --, --, --

WELL I.D. 3

	December 1981	April 1982	October 1982	January 1983
<b>GROUP 1</b>				
<b>INORGANICS</b>				
Arsenic	0.003	0.0048	—	0.018
Barium	0.704	0.144	0.049	0.647
Cadmium	0.0005	—	0.0009	—
Chromium	—	—	—	—
Flouride	0.44	0.42	0.35	0.4
Lead	0.0027	—	0.0479	—
Mercury	—	—	—	0.0025
Nitrate	0.22	0.24	0.13	0.95
Selenium	0.0295	0.0012	—	—
Silver	0.00045	0.0053	0.0147	0.00057
<b>Organics</b>				
Endrin	—	—	—	—
Lindane	—	—	—	—
Methoxychlor	—	—	—	—
Toxaphene	—	—	—	—
2,4-D	—	—	—	—
2,4,5-TP Silvex	—	—	—	—
<b>Radiochemistry</b>				
Gross Alpha	0.93+0.94	—	1.9+1.1	—
Gross Beta	5.18+3.02	1.0+2.8	14.2+3.6	28.4+4.3
Total Radium	—	—	—	—
ers				
Turbidity	450	5.0	2.3	1.8
Total Coliform		2	3	1
<b>GROUP 2</b>				
Chloride	5.0	10.0	13.9	24.0
Iron	1.92	0.37	—	1.20
Manganese	8.65	9.21	1.64	8.40
Sodium	22.1	23.1	16.6	31.0
Sulfate	18.1	51.2	147.9	178.0
Phenols	—	—	1.25	—
<b>GROUP 3</b>				
pH	7.2	6.6	7.09	6.77
Specific Conductance	920	980	860	1300
Total Organic Carbon	43.89	120.7	91.46	76.22
Total Organic Halogen	0.034	0.033	0.006	0.024

*Turbidity Readings for Wells 1, 2, 4  
in Dec. 81 are not consistent.  
Case out in statistical analysis.  
RJK 8/1/83*

WELL I.D. 4 Upstream

OUF 1

Decem

Inorganics

Arsenic	--
Barium	0.292
Cadmium	0.000%
Chromium	--
Fluoride	0.40
Lead	0.001%
Mercury	--
Nitrate	0.15
Selenium	0.035%
Silver	--

Organics

Endrin	--
Lindane	--
Methoxychlor	--
Toxaphene	--
2,4-D	--
2,4,5-TP Silvex	--

Radiochemistry

Gross Alpha	1.34+
Gross Beta	3.28+
Total Radium	0.14

Others

Turbidity	325
Total Coliform	

Group 2

Chloride	14.0
Iron	0.66
Manganese	0.80
Sodium	24.3
Sulfate	54.4
Phenols	0.05

Group 3

pH	7.26,
Specific Conductance	750, $\mu$
Total Organic Carbon	50.21,
Total Organic Halogen	0.030,

WELL I.D. 4 Upstream

<u>OUP 1</u>	December, 1981	April, 1982	October, 1982	January, 1983	June, 1983
<b>Inorganics</b>					
Arsenic	---	0.0039	---	0.0089	---
Barium	0.292	0.103	0.142	0.366	0.048
Cadmium	0.0002	---	0.0015	---	0.0007
Chromium	---	0.009	---	---	---
Fluoride	0.40	0.30	0.50	0.60	0.55
Lead	0.0017	---	0.041	---	0.0039
Mercury	---	0.099	0.007	0.0024	---
Nitrate	0.15	0.11	1.1	0.57	1.8
Selenium	0.0351	---	---	0.0026	0.0079
Silver	---	---	0.006	0.00095	---
<b>Organics</b>					
Endrin	---	---	---	---	---
Lindane	---	---	---	---	---
Methoxychlor	---	---	---	---	---
Toxaphene	---	---	---	---	---
2,4-D	---	---	---	---	---
2,4,5-TP Silvex	---	---	---	---	---
<b>Radiochemistry</b>					
Gross Alpha	1.34±.97	---	3.3±1.2	---	---
Gross Beta	3.28±2.98	1.0±2.8	14.6±3.6	34.6±4.4	---
Total Radium	0.14	---	---	---	---
<b>Microbiology</b>					
Turbidity	325	8.5	1.9	1.2	3
Total Coliform	---	---	1	5	11
<b>Group 2</b>					
Chloride	14.0	22.0	21.9	23	15
Iron	0.66	0.26	---	0.27	---
Manganese	0.80	0.23	1.37	0.27	---
Sodium	24.3	25.2	20.8	33	17.4
Sulfate	54.4	71.2	92.4	132	59.2
Phenols	0.05	---	1.11	---	---
<b>Group 3</b>					
pH	7.26, 7.31, 7.24, 7.21	6.72, 6.70, 6.69, 6.69-6.92, 6.94, 6.94, 6.96	6.89, 6.86, 6.93, 6.97	7.47, 7.30, 7.36, 7.40	6.92
Specific Conductance	750, 800, 760, 760	770, 770, 770, 770	-1100, 1150, 1200, 1100	830, 850, 830, 840	820, 825, 830, 825
Total Organic Carbon	50.21, 50.28, 50.15, 50.96	71.40, 72.42, 68.60, 71.71-65.85, 64.48, 58.54, 61.62	44.92, 41.44, 40.79, 41.49	59.10, 57.00, 56.44, 59.67	52.4
Total Organic Halogen	0.030, 0.026, 0.030, 0.028	0.029, 0.028, 0.025, 0.027-0.041, 0.016, 0.039, 0.047	0.012, 0.015, 0.017, 0.020	0.020, 0.023, 0.020, 0.018	0.022

Turbidity Remaining For  
 Wells 3 & 4 in Dec. 81 ARC NOT  
 CONSISTENT. CAST out in  
 STATISTICAL ANALYSIS.  
 RAC  
 9/2/83

	<u>Well 5</u>	<u>Well 6</u>	<u>Well 7</u>	<u>Well 8</u>
<b>GROUP 1</b>				
<b>INORGANICS</b>				
	June 1983	June 1983	June 1983	June 1983
Arsenic	0.165	0.042	0.011	0.8
Barium	0.0005	0.0056	0.2	0.0006
Cadmium	0.009	---	0.014	---
Chromium	0.45	0.80	0.004	0.50
Flouride	---	---	0.60	---
Lead	---	---	---	---
Mercury	2.6	3.0	1.3	2.2
Nitrate	0.0064	0.0037	0.0028	0.0055
Selenium	0.0005	0.0017	---	---
Silver	---	---	---	---
<b>Organics</b>				
Endrin	---	---	---	---
Lindane	---	---	---	---
Methoxychlor	---	---	---	---
Toxaphene	---	---	---	---
2,4-D	---	---	---	---
2,4,5-TP Silvex	---	---	---	---
<b>Radiochemistry</b>				
Gross Alpha	---	---	---	---
Gross Beta	---	---	---	---
Total Radium	---	---	---	---
Others	16	8	9	64
Turbidity	---	---	---	---
Total Coliform	---	---	---	---
<b>GROUP 2</b>				
Chloride	44	24	11	20
Iron	0.18	---	0.05	5.74
Manganese	30.8	32.2	18.9	31.4
Sodium	95.7	68.7	6.6	11.8
Sulfate	0.06	---	---	0.05
Phenols	---	---	---	---
<b>GROUP 3</b>				
pH	6.95	7.10	7.33	6.95
Specific Conductance	1500	1510	780	1200
Total Organic Carbon	76.42	71.89	64.86	103.6
Total Organic Halogen	0.085	0.042	0.024	0.364

12/81

# ENVIRONMENTAL LABORATORIES, Inc.

*Doc #1*

P.O. Drawer 2309 / Gulfport, Mississippi 39503 / (601) 863-3036

## GROUNDWATER MONITORING

**CLIENT** Vertac, Inc.  
Memphis, Tennessee

**FACILITY** Vicksburg Plant

**WELL I.D.** 1

**SAMPLE NO.** 4529

**SAMPLE BY** Client

**CLIENT NO.** RCRA22-001

**DATE** 12-17-81

**UPSTREAM**

**DOWNSTREAM**

### GROUP 1

#### Inorganics

Arsenic .015 mg/l

Barium .364 mg/l

Cadmium .00320 mg/l

Chromium .019 mg/l

Cyanide 0.68 mg/l

Lead .0074 mg/l

Mercury <0.0008 mg/l

Nitrate 0.25 mg/l

Selenium <0.0012 mg/l

Silver .00099 mg/l

#### Organics

Endrin <0.0002 mg/l

Lindane <0.00004 mg/l

Methoxychlor <0.002 mg/l

Toxaphene <0.004 mg/l

2, 4-D 0.00006 mg/l

2, 4, 5-TP Silvex <0.00001 mg/l

#### Radiochemistry

Gross Alpha 6.30 <sup>+</sup> 1.00 pCi/l

Gross Beta 12.7 <sup>+</sup> 3.14 pCi/l

Total Radium <0.03 <sup>+</sup> \_\_\_\_\_ pCi/l

#### Others

Turbidity 7.4 NTU

Total Coliform <1 ct/100ml

### GROUP 2

Chloride 65.9 mg/l

Iron 0.14 mg/l

Manganese 0.57 mg/l

Sodium 87.6 mg/l

Sulfate 89.8 mg/l

Phenols <0.05 mg/l

*✓*

# ENVIRONMENTAL LABORATORIES, Inc.

P.O. Drawer 2309 / Gulfport, Mississippi 39503 / (601) 863-3036

## GROUNDWATER MONITORING PAGE 2

WELL I.D. 1

UPSTREAM   
DOWNSTREAM

### GROUP 3

	1	2	3	4	
pH	7.46				S.U.
Specific Conductance	3600				umhos/cm
Total Organic Carbon	41.37				mg/l
Total Organic Halogen	0.115				mg/l

Copies:

ENVIRONMENTAL LABORATORIES, INC.

Karen H. Brown

KAREN H. BROWN

Lab Director

Environmental Division

*[Handwritten signature]*

CHAIN OF CUSTODY RECORD

Field Section

Well # 1

Location of Sampling: Beside Railroad down from Acid Plant  
Shipper's Name: VERTAL Chemical Corp  
Shipper's Address: Rifle Range Road, Vicksburg, MS  
Collector's Name: David G. Gilm Telephone # 601-636-12  
(Signature)  
Date Sampled: 12-16-81  
Time Sampled: 10:30 AM  
Field Information:

Special Handling/Storage:

Laboratory Section

Received by: H. Brown

Date: 12/17 - @ 6:00

Analysis Required: RCAH

Comments:

All samples cold - No, broken bottles.

# ENVIRONMENTAL LABORATORIES, Inc.

P.O. Drawer 2309 / Gulfport, Mississippi 39503 / (601) 863-3036

## GROUNDWATER MONITORING

**CLIENT** Vertac, Inc.  
Memphis, Tennessee  
**FACILITY** Vicksburg Plant  
**WELL I.D.** 2

**SAMPLE NO.** 4530  
**SAMPLE BY** Client  
**CLIENT NO.** RCRA 22-001  
**DATE** 12-17-81  
**UPSTREAM**   
**DOWNSTREAM**

### GROUP 1

#### Inorganics

Arsenic	<0.003	mg/l
Barium	0.560	mg/l
Cadmium	0.0019	mg/l
Chromium	<0.001	mg/l
Flouride	0.40	mg/l
Lead	<0.0008	mg/l
Mercury	<0.0008	mg/l
Nitrate	1.50	mg/l
Selenium	0.0327	mg/l
Silver	0.00033	mg/l

#### Organics

Endrin	<0.00001	mg/l
Lindane	<0.000002	mg/l
Methoxychlor	<0.0001	mg/l
Toxaphene	<0.0002	mg/l
2, 4-D	0.0002	mg/l
2, 4, 5-TP Silvex	<0.00001	mg/l

#### Radiochemistry

Gross Alpha	<u>1.85</u>	<u>+ 1.00</u>	pCi/l
Gross Beta	<u>9.71</u>	<u>+ 3.05</u>	pCi/l
Total Radium	<u>&lt;0.03</u>	<u>-</u>	pCi/l
Others			
Turbidity	5.2	NTU	
Total Coliform	<1	ct/100ml	

### GROUP 2

Chloride	42.0	mg/l
Iron	0.20	mg/l
Manganese	1.18	mg/l
Sodium	33.8	mg/l
Sulfate	112.9	mg/l
Phenols	<0.05	mg/l

*J.P.K.*

# ENVIRONMENTAL LABORATORIES, Inc.

P.O. Drawer 2309 / Gulfport, Mississippi 39503 / (601) 863-3036

## GROUNDWATER MONITORING PAGE 2

WELL I.D. 2

UPSTREAM   
DOWNSTREAM

### GROUP 3

	1	2	3	4	
pH	7.51				S.U.
Specific Conductance	990				umhos/cm
Total Organic Carbon	39.56				mg/l
Total Organic Halogen	.062				mg/l

es:

ENVIRONMENTAL LABORATORIES, INC.

Karen H. Brown

KAREN H. BROWN

Lab Director

Environmental Division

*J. J.*

CHAIN OF CUSTODY RECORD

Field Section

Well #

2

Location of Sampling: Beside Scale House; South Plant  
Shipper's Name: VEKTAC Chemical Corp  
Shipper's Address: Rifle Range Road; Vicksburg, Ms.  
Collector's Name: David Shelton Telephone # 601-634-1231  
(Signature)  
Date Sampled: 12-16-81  
Time Sampled: 10:00 AM  
Field Information:

Special Handling/Storage:

Laboratory Section

Received by:

K Brown

Date:

12/17/81 @ 6:00 P

Analysis Required:

RCA

Comments:

Same as #1

# ENVIRONMENTAL LABORATORIES, Inc.

P.O. Drawer 2309 / Gulfport, Mississippi 39503 / (601) 863-3036

## GROUNDWATER MONITORING

**CLIENT** Vertac, Inc.  
Memphis, Tennessee

**FACILITY** Vicksburg Plant

**WELL I.D.** 3

**SAMPLE NO.** 4531

**SAMPLE BY** Client

**CLIENT NO.** RCRA22-001

**DATE** 12-17-81

**UPSTREAM**

**DOWNSTREAM**

### GROUP 1

#### Inorganics

Arsenic	0.003	mg/l
Barium	0.704	mg/l
Cadmium	0.00053	mg/l
Chromium	<0.001	mg/l
Fluoride	0.44	mg/l
Lead	0.0027	mg/l
Mercury	<0.0008	mg/l
Nitrate	0.22	mg/l
Selenium	0.0295	mg/l
Silver	0.00045	mg/l

#### Organics

Endrin	<0.00001	mg/l
Lindane	<0.000002	mg/l
Methoxychlor	<0.0001	mg/l
Toxaphene	<0.0002	mg/l
2, 4-D	<0.00001	mg/l
2, 4, 5-TP Silvex	<0.00001	mg/l

#### Radiochemistry

Gross Alpha	<u>0.93</u>	+	<u>0.94</u>	pCi/l
Gross Beta	<u>5.18</u>	+	<u>3.02</u>	pCi/l
Total Radium	<u>&lt;0.03</u>	+		pCi/l

#### Others

Turbidity	450	NTU
Total Coliform	< 1	ct/100ml

### GROUP 2

Chloride	5.0	mg/l
Iron	1.92	mg/l
Manganese	8.65	mg/l
Sodium	22.1	mg/l
Sulfate	18.1	mg/l
Phenols	<0.05	mg/l

*Handwritten signature/initials*

# ENVIRONMENTAL LABORATORIES, Inc.

P.O. Drawer 2309 / Gulfport, Mississippi 39503 / (601) 863-3036

## GROUNDWATER MONITORING PAGE 2

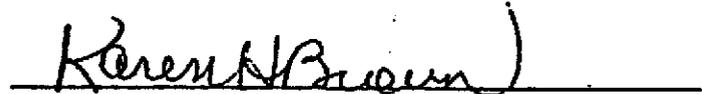
WELL I.D. 3

UPSTREAM   
DOWNSTREAM

### GROUP 3

	1	2	3	4	
pH	7.20				S.U.
Specific Conductance	920				umhos/cm
Total Organic Carbon	43.89				mg/l
Total Organic Halogen	0.034				mg/l

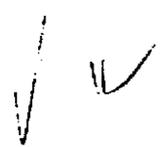
ENVIRONMENTAL LABORATORIES, INC.



KAREN H. BROWN

Lab Director

Environmental Division



CHAIN OF CUSTODY RECORD

Well # 3

Field Section

Location of Sampling: Intersection on Hatcher and Stout's Bayou  
Shipper's Name: VERTAC Chemical Corp  
Shipper's Address: Rifle Range Rd. Vicksburg, MS  
Collector's Name: David Allen Telephone # 601-636-1231  
(Signature)  
Date Sampled: 12-14-81  
Time Sampled: 2:00 PM  
Field Information:

Special Handling/Storage:

Laboratory Section

Received by: K. Brown  
Date: 12/17/81 @ 6:00 PM  
Analysis Required: RCRA

Comments:

Same as #1

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## GROUNDWATER MONITORING

**CLIENT** Vertac, Inc.  
Memphis, Tennessee

**FACILITY** Vicksburg Plant

**WELL I.D.** 4

**SAMPLE NO.** 4532

**SAMPLE BY** Client

**CLIENT NO.** RCRA 22-001

**DATE** 12-17-81

**UPSTREAM**

**DOWNSTREAM**

### GROUP 1

#### Inorganics

Arsenic	<0.003	mg/l
Barium	0.292	mg/l
Cadmium	0.00020	mg/l
Chromium	<0.001	mg/l
Flouride	0.40	mg/l
Lead	0.0017	mg/l
Mercury	<0.0008	mg/l
Nitrate	0.15	mg/l
Selenium	0.0351	mg/l
Silver	<0.0004	mg/l

#### Organics

Endrin	<0.00001	mg/l
Lindane	<0.000002	mg/l
Methoxychlor	<0.0001	mg/l
Toxaphene	<0.0002	mg/l
2, 4-D	<0.00001	mg/l
2, 4, 5-TP Silvex	<0.00001	mg/l

#### Radiochemistry

Gross Alpha	<u>1.34</u>	+	<u>.97</u>	pCi/l
Gross Beta	<u>3.28</u>	+	<u>2.98</u>	pCi/l
Total Radium	<u>0.14</u>	+		pCi/l

#### Others

Turbidity	325	NTU
Total Coliform	<1	ct/100ml

### GROUP 2

Chloride	14.0	mg/l
Iron	0.66	mg/l
Manganese	0.80	mg/l
Sodium	24.3	mg/l
Sulfate	54.4	mg/l
Phenols	0.05	mg/l

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## GROUNDWATER MONITORING PAGE 2

WELL I.D. 4

UPSTREAM   
DOWNSTREAM

<u>GROUP 3</u>	1	2	3	4	S.U.
pH	7.26	7.31	7.24	7.21	umhos/cm
Specific Conductance	750	800	760	760	mg/l
Total Organic Carbon	50.21	50.28	50.15	50.96	mg/l
Total Organic Halogen	0.030	.026	.030	.028	

Copies:

ENVIRONMENTAL LABORATORIES, INC.



KAREN H. BROWN  
Lab Director  
Environmental Division

*J.K.*

CHAIN OF CUSTODY RECORD

Field Section

Well #

4

Location of Sampling: By North Administration Building

Shipper's Name: VERTAC Chemical

Shipper's Address: Box 3 Rifle Range Road, Vicksburg, MS

Collector's Name: David Green Telephone # 601-636-1231  
(Signature)

Date Sampled: 12-16-81

Time Sampled: 9:30 AM

Field Information:

Special Handling/Storage:

Laboratory Section

Received by: K. Brown

Date: 12/17/81 @ 6:00

Analysis Required: RCFB

Comments:

Same #1

*[Handwritten signature and date]*  
12/16/81



# ENVIRONMENTAL LABORATORIES, Inc.

P.O. Drawer 2309 / Gulfport, Mississippi 39503 / (601) 863-3036

*April 82*

## GROUNDWATER MONITORING

CLIENT Vertac, Inc.

Memphis, Tenn.

FACILITY Vicksburg Plant

WELL I.D. #1

SAMPLE NO. 4746-A

SAMPLE BY Client

CLIENT NO. RCRA22-001

DATE April 15, 1982

UPSTREAM

DOWNSTREAM

### GROUP 1

#### Inorganics

Arsenic	0.0028	mg/l
Barium	0.103	mg/l
Cadmium	< 0.0001	mg/l
Chromium	0.61	mg/l
Flouride	0.42	mg/l
Lead	0.0241	mg/l
Mercury	< 0.0008	mg/l
Nitrate	0.18	mg/l
Selenium	0.0064	mg/l
Silver	0.00576	mg/l

#### Organics

Endrin	< 0.00016	mg/l
Lindane	0.001	mg/l
Methoxychlor	< 0.001	mg/l
Toxaphene	< 0.002	mg/l
2, 4-D	< 0.002	mg/l
2, 4, 5-TP Silvex	< 0.002	mg/l

#### Radiochemistry

Gross Alpha	< 2	+	_____	pCi/l
Gross Beta	6.2	+	_____ 3.0	pCi/l
Total Radium	< 2	+	_____	pCi/l

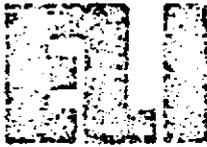
#### Others

Turbidity	5.0	NTU
Total Coliform	2	ct/100ml

### GROUP 2

Chloride	76.0	mg/l
Iron	0.30	mg/l
Manganese	0.73	mg/l
Sodium	92.3	mg/l
Sulfate	82.4	mg/l
Phenols	0.05	mg/l

*V.P.*



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## GROUNDWATER MONITORING PAGE 2

WELL I.D.           #1          

UPSTREAM   
DOWNSTREAM

<u>GROUP 3</u>	1	2	3	4	
pH	7.14				S.U.
Specific Conductance	3350				umhos/cm
Total Organic Carbon	63.49				mg/l
Total Organic Halogen	0.195				mg/l

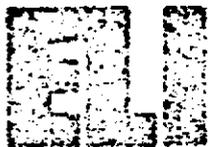
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Karen H. Brown

KAREN H. BROWN  
Lab Director  
Environmental Division

1/1



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P.O. Drawer 2309 / Gulfport, Mississippi 39503 / (601) 863-3036

## GROUNDWATER MONITORING

CLIENT Vertac, Inc.

Memphis, Tenn.

FACILITY Vicksburg Plant

WELL I.D. #2

SAMPLE NO. 4746-A

SAMPLE BY Client

CLIENT NO. RCRA22-001

DATE April 15, 1982

UPSTREAM

DOWNSTREAM

### GROUP 1

#### Inorganics

Arsenic	0.0032	mg/l
Barium	0.090	mg/l
Cadmium	< 0.0001	mg/l
Chromium	0.004	mg/l
Flouride	0.36	mg/l
Lead	< 0.0008	mg/l
Mercury	< 0.0008	mg/l
Nitrate	0.86	mg/l
Selenium	< 0.0012	mg/l
Silver	0.00529	mg/l

#### Organics

Endrin	< 0.00016	mg/l
Lindane	< 0.001	mg/l
Methoxychlor	< 0.001	mg/l
Toxaphene	< 0.002	mg/l
2, 4-D	< 0.002	mg/l
2, 4, 5-TP Silvex	< 0.002	mg/l

#### Radiochemistry

Gross Alpha	< 2	+	_____	pCi/l
Gross Beta	2.5	+	3.0	pCi/l
Total Radium	< 2	+	_____	pCi/l

#### Others

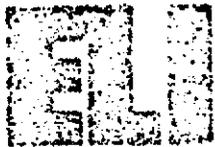
Turbidity	2.5	NTU
Total Coliform	1	ct/100ml

### GROUP 2

Chloride	48.0	mg/l
Iron	0.15	mg/l
Manganese	0.32	mg/l
Sodium	36.8	mg/l
Sulfate	32.4	mg/l
Phenols	< 0.05	mg/l

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# ENVIRONMENTAL LABORATORIES, Inc.

P.O. Drawer 2309 / Gulfport, Mississippi 39503 / (601) 863-3036

## GROUNDWATER MONITORING

**CLIENT** Vertac, Inc.  
Memphis, Tenn.  
**FACILITY** Vicksburg Plant  
**WELL I.D.** #3

**SAMPLE NO.** 4746-A  
**SAMPLE BY** Client  
**CLIENT NO.** RCRA22-001  
**DATE** April 15, 1982  
**UPSTREAM**   
**DOWNSTREAM**

### GROUP 1

#### Inorganics

Arsenic	0.0048	mg/l
Barium	0.144	mg/l
Cadmium	< 0.0001	mg/l
Chromium	< 0.001	mg/l
Flouride	0.42	mg/l
Lead	< 0.0008	mg/l
Mercury	< 0.0008	mg/l
Nitrate	0.24	mg/l
Selenium	0.0012	mg/l
Silver	0.00529	mg/l

#### Organics

Endrin	< 0.00008	mg/l
Lindane	< 0.0005	mg/l
Methoxychlor	< 0.001	mg/l
Toxaphene	< 0.002	mg/l
2, 4-D	< 0.002	mg/l
2, 4, 5-TP Silvex	< 0.002	mg/l

#### Radiochemistry

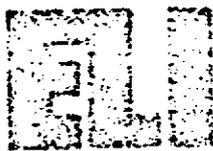
Gross Alpha	< 2	+	_____	pCi/l
Gross Beta	1.0	+	2.8	pCi/l
Total Radium	< 2	+	_____	pCi/l

#### Others

Turbidity	5.0	NTU
Total Coliform	2	ct/100ml

### GROUP 2

Chloride	10.0	mg
Iron	0.37	mg
Manganese	9.21	mg
Sodium	23.1	mg
Sulfate	51.2	mg
Phenols	< 0.05	mg



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## GROUNDWATER MONITORING PAGE 2

WELL I.D.                     #3                    

UPSTREAM   
DOWNSTREAM

### GROUP 3

	1	2	3	4	S.U.
pH	6.64				umhos/cm
Specific Conductance	980				mg/l
Total Organic Carbon	120.7				mg/l
Total Organic Halogen	0.033				

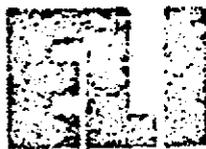
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ENVIRONMENTAL LABORATORIES, INC

*Karen H. Brown*

KAREN H. BROWN  
Lab Director  
Environmental Division

*1/11*



# ENVIRONMENTAL LABORATORIES, Inc.

P.O. Drawer 2309 / Gulfport, Mississippi 39503 / (601) 863-3036

## GROUNDWATER MONITORING

**CLIENT** Vertac, Inc.  
Memphis, Tenn  
**FACILITY** Vicksburg Plant  
**WELL I.D.** #4

**SAMPLE NO.** 4746-A  
**SAMPLE BY** Client  
**CLIENT NO.** RCRA22-001  
**DATE** April 15, 1928  
**UPSTREAM**   
**DOWNSTREAM**

### GROUP 1

#### Inorganics

Arsenic	0.0039	mg/l
Barium	0.103	mg/l
Cadmium	< 0.0001	mg/l
Chromium	0.0092	mg/l
Flouride	0.30	mg/l
Lead	< 0.0008	mg/l
Mercury	0.0991	mg/l
Nitrate	0.11	mg/l
Selenium	< 0.0012	mg/l
Silver	< 0.00004	mg/l

#### Organics

Endrin	< 0.00008	mg/l
Lindane	< 0.0005	mg/l
Methoxychlor	< 0.001	mg/l
Toxaphene	< 0.002	mg/l
2, 4-D	< 0.002	mg/l
2, 4, 5-TP Silvex	< 0.002	mg/l

#### Radiochemistry

Gross Alpha	< 2	+	_____	pCi/l
Gross Beta	1.0	+	_____ 2.8	pCi/l
Total Radium	< 2	+	_____	pCi/l

#### Others

Turbidity	8.5	NTU
Total Coliform	< 1	ct/100ml

### GROUP 2

Chloride	22.0	mg/l
Iron	0.26	mg/l
Manganese	0.23	mg/l
Sodium	25.2	mg/l
Sulfate	71.2	mg/l
Phenols	< 0.05	mg/l

*Handwritten mark: a checkmark and the number '2010'.*



CHAIN OF CUSTODY RECORD

Well # 1

Field Section

Location of Sampling: Beside the waste pond  
Shipper's Name: VERTAE Chemical  
Shipper's Address: Rifle Range Rd Vicksburg, MS, 39090  
Collector's Name: David Green Telephone # 601-636-1231  
(Signature)  
Date Sampled: 4-13-82  
Time Sampled: 3:00 pm  
Field Information:

Special Handling/Storage:

*Sample stored in refrigerator overnight*

Laboratory Section

Received by: K Brown  
Date: 4/15/82 @ 9:00 am  
Analysis Required: RCA

Comments:

*All samples cold - None broken*

CHAIN OF CUSTODY RECORD

Well # 2

Field Section

Location of Sampling: South of Atrazine Plant  
Shipper's Name: VEKTAR Chemical  
Shipper's Address: Rifle Range Rd, Vicksburg, MS. 39090  
Collector's Name: David Green Telephone # 601-636-1231  
(Signature)  
Date Sampled: 4-13-82  
Time Sampled: 2:30 PM  
Field Information:

Special Handling/Storage:

*Samples stored in refrigerator overnight*

Laboratory Section

Received by: Karen Brown  
Date: 4/15/82 @ 9:00 am  
Analysis Required: RCRA

Comments:

*All samples cold. None broken*

CHAIN OF CUSTODY RECORD

Well # 3

Field Section

Location of Sampling: Across Hatchers Creek from Plant  
Shipper's Name: VERTAC Chemical  
Shipper's Address: Rifle Range Rd. Vicksburg, Ms. 39090  
Collector's Name: David Allen Telephone # 601-636-1231  
(Signature)  
Date Sampled: 4-13-82  
Time Sampled: 3:45 PM  
Field Information:

Special Handling/Storage:

*Sample stored in refrigerator overnight*

Laboratory Section

Received by: Karen H. Brown  
Date: 4/15/82 @ 9:00 am  
Analysis Required: RCA

Comments:

*All samples cold - None broken*

CHAIN OF CUSTODY RECORD

Well # 4

Field Section

Location of Sampling: Just below North Adm. Building

Shipper's Name: VERBAE Chemical

Shipper's Address: Rifle Range Rd., Vicksburg, MS. 39090

Collector's Name: David Green Telephone # 601-636-1231  
(Signature)

Date Sampled: 4-13-82

Time Sampled: 2:00 PM

Field Information: This is the upstream sample

Special Handling/Storage:

Samples stored in refrigerator overnight.

Laboratory Section

Received by: Karen H. Brown

Date: 4/15/82 @ 9:00 am

Analysis Required: RCA

Comments:

All samples cold - None broken

DICK KARKKAINEN, MEMPHIS



# ENVIRONMENTAL LABORATORIES, Inc.

*O.T  
jr*

P.O. Drawer 2309 / Gulfport, Mississippi 39503 / (601) 863-3036  
**GROUNDWATER MONITORING**

**CLIENT** Vertac, Inc.  
Memphis, Tenn.

**SAMPLE NO.** 5321

**SAMPLE BY** Client

**FACILITY** Vicksburg Plant

**CLIENT NO.** RCRA22-001

**DATE** October 30, 1982

**WELL I.D.** #1

**UPSTREAM**   
**DOWNSTREAM**

## GROUP 1

### Inorganics

Arsenic	<0.0004	mg/l
Barium	0.170	mg/l
Cadmium	0.00621	mg/l
Chromium	0.044	mg/l
Fluoride	0.65	mg/l
Lead	0.0481	mg/l
Mercury	0.0136	mg/l
Nitrate	0.15	mg/l
Selenium	<0.0012	mg/l
Silver	0.02069	mg/l

### Organics

Endrin	<0.00008	mg/l
Lindane	<0.0005	mg/l
Methoxychlor	<0.001	mg/l
Toxaphene	<0.002	mg/l
2, 4-D	<0.002	mg/l
2, 4, 5-TP Silvex	<0.002	mg/l

### Radiochemistry

Gross Alpha	<u>3.3</u>	*	<u>1.2</u>	pCi/l
Gross Beta	<u>16.0</u>	*	<u>3.6</u>	pCi/l
Total Radium	<u>&lt;2</u>	*		pCi/l

### Others

Turbidity	1.9	NTU
Total Coliform	2	ct/100ml

## GROUP 2

Chloride	80.9	mg/l
Iron	<0.006	mg/l
Manganese	0.33	mg/l
Sodium	82.3	mg/l
Sulfate	82.7	mg/l
Phenols	1.28	mg/l

*✓*



# ENVIRONMENTAL LABORATORIES, Inc.

P.O. Drawer 2309 / Gulfport, Mississippi 39503 / (601) 863-3036  
GROUNDWATER MONITORING

**CLIENT** Vertac, Inc.  
Memphis, Tenn.

**FACILITY** Vicksburg Plant

**WELL I.D.** #2

**SAMPLE NO.** 5321

**SAMPLE BY** Client

**CLIENT NO.** RCRA22-001

**DATE** October 30, 1982

**UPSTREAM**

**DOWNSTREAM**

## GROUP 1

<b>Inorganics</b>		
Arsenic	<0.0004	mg/l
Barium	<0.003	mg/l
Cadmium	0.00307	mg/l
Chromium	<0.001	mg/l
Fluoride	0.50	mg/l
Lead	0.0503	mg/l
Mercury	0.0102	mg/l
Nitrate	0.36	mg/l
Selenium	<0.0012	mg/l
Silver	0.00792	mg/l
<b>Organics</b>		
Endrin	<0.00008	mg/l
Lindane	<0.0005	mg/l
Methoxychlor	<0.001	mg/l
Toxaphene	<0.002	mg/l
2, 4-D	<0.002	mg/l
2, 4, 5-TP Silvex	<0.002	mg/l
<b>Radiochemistry</b>		

## GROUP 2

Chloride	54.9	mg/l
Iron	0.03	mg/l
Manganese	0.04	mg/l
Sodium	31.3	mg/l
Sulfate	181.6	mg/l
Phenols	1.15	mg/l

Gross Alpha	<2	-	_____	pCi/l
Gross Beta	23.8	-	3.7	pCi/l
Total Radium	<2	-	_____	pCi/l
<b>Parameters</b>				
Turbidity	3.1			NTU
Total Coliform	1			ct/100ml

# ENVIRONMENTAL LABORATORIES, Inc.

P.O. Drawer 2309 / Gulfport, Mississippi 39503 / (601) 863-3036

## GROUNDWATER MONITORING PAGE 2

WELL I.D.                     #2                    

UPSTREAM   
DOWNSTREAM

### GROUP 3

	1	2	3	4	
pH	7.12				S.U.
Specific Conductance	1,300				umhos/cm
Total Organic Carbon	85.23				mg/l
Total Organic Halogen	0.022				mg/l

ies:

ENVIRONMENTAL LABORATORIES, INC.

Karen H. Brown

KAREN H. BROWN

Lab Director

Environmental Division

# ENVIRONMENTAL LABORATORIES, Inc.

P.O. Drawer 2309 / Gulfport, Mississippi 39503 / (601) 863-3036

## GROUNDWATER MONITORING

**CLIENT** Vertac, Inc.  
Memphis, Tenn.

**FACILITY** Vicksburg Plant

**WELL I.D.** #3

**SAMPLE NO.** 5321

**SAMPLE BY** Client

**CLIENT NO.** RCRA22-001

**DATE** October 30, 1982

**UPSTREAM**

**DOWNSTREAM**

### GROUP 1

#### Inorganics

Arsenic	<0.0004	mg/l
Barium	0.049	mg/l
Cadmium	0.00086	mg/l
Chromium	<0.001	mg/l
ride	0.35	mg/l
Lead	0.0479	mg/l
Mercury	<0.0008	mg/l
Nitrate	0.13	mg/l
Selenium	<0.0012	mg/l
Silver	0.01466	mg/l

#### Organics

Endrin	<0.00008	mg/l
Lindane	<0.0005	mg/l
Methoxychlor	<0.001	mg/l
Toxaphene	<0.002	mg/l
2, 4-D	<0.002	mg/l
2, 4, 5-TP Silvex	<0.002	mg/l

#### Radiochemistry

Gross Alpha	<u>1.9</u>	±	<u>1.1</u>	pCi/l
Gross Beta	<u>14.2</u>	±	<u>3.6</u>	pCi/l
il Radium	<u>&lt;2</u>	±		pCi/l

#### Others

Turbidity	2.3	NTU
Total Coliform	3	ct/100ml

### GROUP 2

Chloride	13.9	mg/l
Iron	<0.006	mg/l
Manganese	1.64	mg/l
Sodium	16.6	mg/l
Sulfate	147.9	mg/l
Phenols	1.25	mg/l

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## GROUNDWATER MONITORING PAGE 2

WELL I.D.                     #3                    

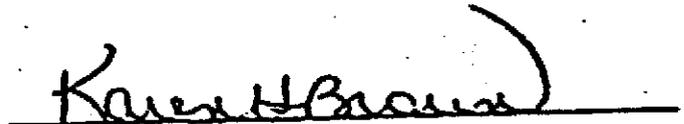
UPSTREAM   
DOWNSTREAM

### GROUP 3

	1	2	3	4	
pH	7.09				S.U.
Specific Conductance	860				umhos/cm
Total Organic Carbon	91.46				mg/l
Total Organic Halogen	0.006				mg/l

Copies:

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KAREN H. BROWN  
Lab Director  
Environmental Division

J.K.

# ENVIRONMENTAL LABORATORIES, Inc.

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## GROUNDWATER MONITORING

**CLIENT** Vertac, Inc.  
Memphis, Tenn.

**FACILITY** Vicksburg Plant

**WELL I.D.** #4

**SAMPLE NO.** 5321

**SAMPLE BY** Client

**CLIENT NO.** RCRA22-001

**DATE** October 30, 1982

**UPSTREAM**

**DOWNSTREAM**

### GROUP 1

#### Inorganics

Arsenic	<0.0004	mg/l
Barium	0.142	mg/l
Cadmium	0.00147	mg/l
Chromium	<0.001	mg/l
Fluoride	0.50	mg/l
Lead	0.0410	mg/l
Mercury	0.0069	mg/l
Nitrate	1.1	mg/l
Selenium	<0.0012	mg/l
Silver	0.00556	mg/l

#### Organics

Endrin	<0.00008	mg/l
Lindane	<0.0005	mg/l
Methoxychlor	<0.001	mg/l
Toxaphene	<0.002	mg/l
2, 4-D	<0.002	mg/l
2, 4, 5-TP Silvex	<0.002	mg/l

#### Radiochemistry

Gross Alpha	<u>3.3</u>	+	<u>1.2</u>	pCi/l
Gross Beta	<u>14.6</u>	+	<u>3.6</u>	pCi/l
Total Radium	<u>&lt;2</u>	+		pCi/l

#### Others

Turbidity	1.9	NTU
Total Coliform	1	ct/100ml

### GROUP 2

Chloride	21.9	mg/l
Iron	<0.006	mg/l
Manganese	1.37	mg/l
Sodium	20.8	mg/l
Sulfate	92.4	mg/l
Phenols	1.11	mg/l

*J*  
*10/30/82*

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## GROUNDWATER MONITORING PAGE 2

WELL I.D. \_\_\_\_\_ #4 \_\_\_\_\_

UPSTREAM   
DOWNSTREAM

### GROUP 3

	1	2	3	4	
pH	6.92	6.94	6.94	6.96	S.U.
Specific Conductance	1,100	1,150	1,200	1,100	umhos/cm
Total Organic Carbon	65.85	64.48	58.54	61.62	mg/l
Total Organic Halogen	0.041	0.016	0.039	0.047	mg/l

Ass:

ENVIRONMENTAL LABORATORIES, INC.

Karen H. Brown

KAREN H. BROWN

Lab Director

Environmental Division

✓  
hpl

# ENVIRONMENTAL LABORATORIES, Inc.

P.O. Drawer 2309 / Gulfport, Mississippi 39503 / (601) 863-3036

## CHAIN OF CUSTODY RECORD

Field Section

Well # 1

Location of Sampling: Near Effluent Pond  
Shipper's Name: VERTAC Chemical Corp  
Shipper's Address: Box 3 Riffe Range Rd., Vicksburg, Mo. 39180  
Collector's Name: David Chen Telephone # 601-636-1231  
(Signature)  
Date Sampled: 9-30-82  
Time Sampled: 1:50 PM  
Field Information:

Special Handling/Storage:

*Sample refrigerated from 9/30 to 10/4 when shipped.*

Laboratory Section

Received by: Karen Brown, ELI  
Date: 10/5/82 @ 9:00am  
Analysis Required: RCRA

Comments: *sample cold and intact*

# ENVIRONMENTAL LABORATORIES, Inc.

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## CHAIN OF CUSTODY RECORD

Field Section

Well # 2

Location of Sampling: South of Atrazine Plant  
Shipper's Name: VERTAC Chemical Corp.  
Shipper's Address: Box 3 Rifle Range Rd., Vicksburg, Ms. 39180  
Collector's Name: David Green Telephone # 601-636-1231  
(Signature)  
Date Sampled: 9-30-82  
Time Sampled: 1:40 PM  
Field Information:

Special Handling/Storage:

*Sample refrigerated from 9/30 to 10/4 when shipped*

Laboratory Section

Received by:

Kaen Brown, ELI

Date:

10/5/82 @ 9:00

Analysis Required:

RCRA

Comments:

*sample cold and intact*

# ENVIRONMENTAL LABORATORIES, Inc.

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## CHAIN OF CUSTODY RECORD

Field Section

Well # 3

Location of Sampling: Across Hatcher Bayou

Shipper's Name: VERTAC Chemical Corp.

Shipper's Address: Box 3 Rifle Range Rd, Vicksburg, MS, 39180

Collector's Name: David Green Telephone # 601-636-1237

(Signature)

Date Sampled: 9-30-82

Time Sampled: 3:00 PM

Field Information:

Special Handling/Storage:

*Samples refrigerated from 9/30 to 10/4 when shipped.*

Laboratory Section

Received by: Karen Brown ELI

Date: 10/5/82 @ 9:00

Analysis Required: RCA

Comments:

*sample cold and intact*

# ENVIRONMENTAL LABORATORIES, Inc.

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## CHAIN OF CUSTODY RECORD

Field Section

Well # 4

Location of Sampling: By Administration Bldg.

Shipper's Name: VEKTAC Chemical Corp

Shipper's Address: Box 3 Rifle Range Rd. Vicksburg, MS, 39180

Collector's Name: David M. [Signature] Telephone # 601-636-1231

Date Sampled: 9-30-82

Time Sampled: 2:20 PM

Field Information:

*Upstream Sample*

Special Handling/Storage:

*Sample refrigerated from 9/30 to 10/4 when shipped.*

Laboratory Section

Received by: Karen Bauer ELI

Date: 10/5/82 @ 9:00

Analysis Required: RCRA

Comments:

*Sample cool and intact*



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*Jan 83*

## GROUNDWATER MONITORING

**CLIENT** Vertac, Inc.

**SAMPLE NO.** 5615

Vicksburg, Mississippi

**SAMPLE BY** Client

**FACILITY** Vicksburg Plant

**CLIENT NO.** RCRA22-001

**DATE** January 31, 1983

**WELL I.D.** 1

**UPSTREAM**

**DOWNSTREAM**

### GROUP 1

#### Inorganics

Arsenic	<0.0008	mg/l
Barium	0.926	mg/l
Cadmium	0.02320	mg/l
Chromium	0.059	mg/l
Chloride	0.69	mg/l
Lead	0.0630	mg/l
Mercury	0.0029	mg/l
Nitrate	0.28	mg/l
Selenium	0.0173	mg/l
Silver	0.00100	mg/l

### GROUP 2

Chloride	88	mg/l
Iron	9.24	mg/l
Manganese	0.48	mg/l
Sodium	123	mg/l
Sulfate	100	mg/l
Phenols	0.28	mg/l

#### Organics

Endrin	<0.00012	mg/l
Lindane	<0.0007	mg/l
Methoxychlor	<0.001	mg/l
Toxaphene	<0.002	mg/l
2, 4-D	<0.002	mg/l
2, 4, 5-TP Silvex	<0.002	mg/l

#### Radiochemistry

Gross Alpha	<u>6.0</u>	<u>2.4</u>	pCi/l
Gross Beta	<u>46.5</u>	<u>3.7</u>	pCi/l
Total Radium	<u>1.8</u>	<u>2.1</u>	pCi/l

#### Others

Turbidity	1.1	NTU
Total Coliform	2	ct/100ml

*1/83*

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## GROUNDWATER MONITORING PAGE 2

WELL I.D. 1

UPSTREAM   
DOWNSTREAM

### GROUP 3

	1	2	3	4	
pH	6.98				S.U.
Specific Conductance	3,900				umhos/cm
Total Organic Carbon	59.85				mg/l
Total Organic Halogen	0.113				mg/l

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*Karen H. Brown*

KAREN H. BROWN  
Lab Director  
Environmental Division

*✓ 11*

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## CHAIN OF CUSTODY RECORD

Field Section

Well # 1

Location of Sampling:

Beside Effluent Pond

Shipper's Name:

VERTAC Chem. Corp

Shipper's Address:

Box 3 Rithe Range Rd., Vicksburg, MS. 39180

Collector's Name:

David Green  
(Signature)

Telephone # 601-636-1231

Date Sampled:

12-23-82

Time Sampled:

1:45 PM

Field Information:

Special Handling/Storage:

*Refrigerated over weekend*

Laboratory Section

Received by:

K Brown, ELI

Date:

12/28/82 @ 9:00 am

Analysis Required:

RCRA

Comments:

# ENVIRONMENTAL LABORATORIES, Inc.

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## GROUNDWATER MONITORING

**CLIENT** Vertac, Inc.  
Vicksburg, Mississippi

**FACILITY** Vicksburg Plant

**WELL I.D.** 2

**SAMPLE NO.** 5615

**SAMPLE BY** Client

**CLIENT NO.** RCRA22-001

**DATE** January 31, 1983

**UPSTREAM**

**DOWNSTREAM**

### GROUP 1

**Inorganics**

Arsenic 0.0024 mg/l

Barium 0.688 mg/l

Cadmium 0.00541 mg/l

Chromium <0.001 mg/l

Fluoride 0.50 mg/l

Lead <0.0008 mg/l

Mercury 0.0047 mg/l

Nitrate 1.0 mg/l

Selenium 0.0154 mg/l

Silver 0.00084 mg/l

**Organics**

Endrin <0.00008 mg/l

Lindane <0.0005 mg/l

Methoxychlor <0.001 mg/l

Toxaphene <0.002 mg/l

2, 4-D <0.002 mg/l

2, 4, 5-TP Silvex <0.002 mg/l

**Radiochemistry**

### GROUP 2

Chloride 54 mg/l

Iron 0.47 mg/l

Manganese 0.79 mg/l

Sodium 34 mg/l

Sulfate 112 mg/l

Phenols 0.08 mg/l

Gross Alpha <2 <sup>+</sup> \_\_\_\_\_ pCi/l

Gross Beta 33.6 <sup>+</sup> 3.6 pCi/l

<sup>226</sup>Radium <2 <sup>+</sup> \_\_\_\_\_ pCi/l

**Others**

Turbidity 1.8 NTU

Total Coliform 3 ct/100ml

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## GROUNDWATER MONITORING PAGE 2

WELL I.D. 2

UPSTREAM   
DOWNSTREAM

### GROUP 3

	1	2	3	4	
pH	7.02				S.U.
Specific Conductance	990				umhos/cm
Total Organic Carbon	67.65				mg/l
Total Organic Halogen	0.021				mg/l

Copies:

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Karen H. Brown

KAREN H. BROWN

Lab Director

Environmental Division

# ENVIRONMENTAL LABORATORIES, Inc.

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## CHAIN OF CUSTODY RECORD

Field Section

Well #

2

Location of Sampling:

South of Atrazine Plant

Shipper's Name:

VERTAC Chemical Corp

Shipper's Address:

Box 3 Rifle Range Rd. ; Vicksburg, MS. 39180

Collector's Name:

David Green  
(Signature)

Telephone # 601-636-1231

Date Sampled:

12-23-82

Time Sampled:

1:15 PM

Field Information:

Special Handling/Storage:

*Refrigerated over holiday weekend*

Laboratory Section

Received by:

K. Brown, ELI

Date:

12/23/82 @ 9:00am

Analysis Required:

RCRA

Comments:

# ENVIRONMENTAL LABORATORIES, Inc.

P.O. Drawer 2309 / Gulfport, Mississippi 39503 / (601) 863-3036

## GROUNDWATER MONITORING

**CLIENT** Vertac, Inc.

Vicksburg, Mississippi

**FACILITY** Vicksburg Plant

**WELL I.D.** 3

**SAMPLE NO.** 5615

**SAMPLE BY** Client

**CLIENT NO.** RCRA22-001

**DATE** January 31, 1983

**UPSTREAM**

**DOWNSTREAM**

### GROUP 1

#### Inorganics

Arsenic	0.0018	mg/l
Barium	0.647	mg/l
Cadmium	<0.00003	mg/l
Chromium	<0.001	mg/l
Fluoride	0.40	mg/l
Lead	<0.0008	mg/l
Mercury	0.0025	mg/l
Nitrate	0.95	mg/l
Selenium	<0.0012	mg/l
Silver	0.00057	mg/l

#### Organics

Endrin	<0.00008	mg/l
Lindane	<0.0005	mg/l
Methoxychlor	<0.001	mg/l
Toxaphene	<0.002	mg/l
2, 4-D	<0.002	mg/l
2, 4, 5-TP Silvex	<0.002	mg/l

#### Radiochemistry

Gross Alpha	<u>&lt;2</u>	-	_____	pCi/l
Gross Beta	<u>28.4</u>	-	<u>4.3</u>	pCi/l
Total Radium	<u>&lt;2</u>	-	_____	pCi/l

#### Others

Turbidity	1.8	NTU
Total Coliform	1	ct/100ml

### GROUP 2

Chloride	24	mg/l
Iron	1.20	mg/l
Manganese	8.40	mg/l
Sodium	31	mg/l
Sulfate	178	mg/l
Phenols	<0.05	mg/l

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## GROUNDWATER MONITORING PAGE 2

WELL I.D. 3

UPSTREAM

DOWNSTREAM

### GROUP 3

	1	2	3	4	
pH	6.77				S.U.
Specific Conductance	1300				umhos/cm
Total Organic Carbon	76.22				mg/l
Total Organic Halogen	0.024				mg/l

copies:

ENVIRONMENTAL LABORATORIES, INC.



KAREN H. BROWN

Lab Director

Environmental Division

*Handwritten initials*

# ENVIRONMENTAL LABORATORIES, Inc.

P.O. Drawer 2309 / Gulfport, Mississippi 39503 / (601) 863-3036

## CHAIN OF CUSTODY RECORD

Field Section

Well # 3

Location of Sampling: across from Hatcher Bayou

Shipper's Name: VERTAE chemical corp

Shipper's Address: Box 3 Right Range Rd., Vicksburg, MS. 39180

Collector's Name: David Green Telephone # 601-636-1231

(Signature)

Date Sampled: 12-27-1982

Time Sampled: 9:30 AM

Field Information:

Special Handling/Storage:

none

Laboratory Section

Received by: K. Brown, ELI

Date: 12/28/82 @ 9:00 am

Analysis Required: RCRA

Comments:

# ENVIRONMENTAL LABORATORIES, Inc.

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## GROUNDWATER MONITORING

**CLIENT** Vertac, Inc.  
Vicksburg, Mississippi  
**FACILITY** Vicksburg Plant  
**WELL I.D.** 4

**SAMPLE NO.** 5615  
**SAMPLE BY** Client  
**CLIENT NO.** RCRA22-00L  
**DATE** January 31, 1983  
**UPSTREAM**   
**DOWNSTREAM**

### GROUP 1

#### Inorganics

Arsenic	0.0089	mg/l
Barium	0.360	mg/l
Cadmium	<0.00003	mg/l
Chromium	<0.001	mg/l
Fluoride	0.60	mg/l
Lead	<0.0008	mg/l
Mercury	0.0024	mg/l
Nitrate	0.57	mg/l
Selenium	0.0026	mg/l
Silver	0.00095	mg/l

#### Organics

Endrin	<0.00008	mg/l
Lindane	<0.0005	mg/l
Methoxychlor	<0.001	mg/l
Toxaphene	<0.002	mg/l
2, 4-D	<0.002	mg/l
2, 4, 5-TP Silvex	<0.002	mg/l

#### Radiochemistry

Gross Alpha	<u>&lt;2</u>	+	_____	pCi/l
Gross Beta	<u>34.6</u>	-	<u>4.4</u>	pCi/l
Total Radium	<u>&lt;2</u>	+	_____	pCi/l

#### Others

Turbidity	1.2	NTU
Total Coliform	5	ct/100ml

### GROUP 2

Chloride	23	mg/l
Iron	0.27	mg/l
Manganese	0.27	mg/l
Sodium	33	mg/l
Sulfate	132	mg/l
Phenols	<0.05	mg/l

*J-R*

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## GROUNDWATER MONITORING PAGE 2

WELL I.D. 4

UPSTREAM

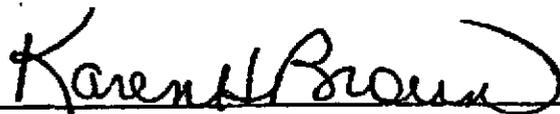
DOWNSTREAM

### GROUP 3

	1	2	3	4	S.U.
pH	6.89	6.86	6.93	6.97	
Specific Conductance	830	850	830	840	umhos/cm
Total Organic Carbon	44.92	41.44	40.79	41.49	mg/l
Total Organic Halogen	0.012	0.015	0.017	0.020	mg/l

Notes:

ENVIRONMENTAL LABORATORIES, INC.



KAREN H. BROWN

Lab Director

Environmental Division



# ENVIRONMENTAL LABORATORIES, Inc.

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## CHAIN OF CUSTODY RECORD

Field Section

Well #

4

Location of Sampling:

By Administration Bldg.

Shipper's Name:

VERTAC Chemical Corp

Shipper's Address:

Box 3 Rifle Range Rd., Vicksburg, MS. 39180

Collector's Name:

David Olsen  
(Signature)

Telephone # 601-636-1231

Date Sampled:

12-27-1982

Time Sampled:

9:00 AM

Field Information:

Upstream sample

Special Handling/Storage:

None

Laboratory Section

Received by:

K. Brown, ELI

Date:

12/28/82 @ 9:00 am

Analysis Required:

RCPA

Comments:



# ENVIRONMENTAL LABORATORIES, Inc.

P.O. Drawer 2309 / Gulfport, Mississippi 39503 / (601) 863-3036

76-83

## REPORT OF ANALYSIS

**CLIENT:** Vertac, Inc.  
Rifle Range Road  
Vicksburg, MS 39180

**FACILITY:** Vicksburg Plant

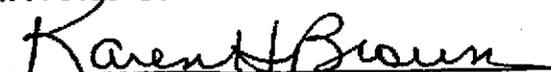
**DATE SAMPLE RECEIVED:** 6-14-83  
**MONTH COVERED:** June, 1983  
**CLIENT NUMBER:** RCRA22-001  
**SAMPLE NUMBER:** 6012  
**SAMPLED BY:** Client  
**FREQUENCY:** Special  
**DATE:** July 15, 1983

**IDENTIFICATION:** Well 1

PARAMETER					UNITS
pH	7.60	7.58	7.60	7.62	S.U.
Specific Conductance	4100	4100	4150	4200	µmhos
Total Organic Carbon	47.15	47.68	48.19	47.97	mg/l
Total Organic Halogen	0.148	0.136	0.144	0.152	mg/l
Chloride	98				mg/l
Iron	<0.05				mg/l
Manganese	0.39				mg/l
Phenols	0.12				mg/l
Sodium	89.9				mg/l
Sulfate	86.0				mg/l

ANALYSIS HAS BEEN MADE BY  
E.P.A. APPROVED PROCEDURES,  
UNLESS NOTED OTHERWISE.

APPROVED BY:

  
KAREN H. BROWN, LAB DIRECTOR  
ENVIRONMENTAL DIVISION



# ENVIRONMENTAL LABORATORIES, Inc.

P.O. Drawer 2309 / Gulfport, Mississippi 39503 / (601) 863-3036

## CHAIN OF CUSTODY RECORD

Field Section

Well # 1

Location of Sampling: Beside Effluent Pond

Shipper's Name: VERTAC Chemical

Shipper's Address: Box 3 Rifle Range Rd. Vicksburg, MS, 39180

Collector's Name: David Green Telephone # 601-636-1231  
(Signature)

Date Sampled: 6-3-83

Time Sampled: 1:45 PM

Field Information:

Special Handling/Storage:

*Refrigerated until shipped*

Laboratory Section

Received by: K Brown, ELI

Date: 6/14/83 @ 8:00am

Analysis Required: RCRA II & III

Comments:

*Samples intact*

# ENVIRONMENTAL LABORATORIES, Inc.

P.O. Drawer 2309 / Gulfport, Mississippi 39503 / (601) 863-3036

## REPORT OF ANALYSIS

**CLIENT:** Vertac, Inc.  
Rifle Range Rd.  
Vicksburg, MS 39180

**FACILITY:** vicksburg Plant

**DATE SAMPLE RECEIVED:** 6-14-83  
**MONTH COVERED:** June, 1983  
**CLIENT NUMBER:** RCRA22-001  
**SAMPLE NUMBER:** 6012  
**SAMPLED BY:** Client  
**FREQUENCY:** Special  
**DATE:** July 15, 1983

**IDENTIFICATION:** Well 2

PARAMETER					UNITS
pH	7.75	7.76	7.74	7.75	S.U.
Specific Conductance	1100	1100	1050	1100	µmhos
Total Organic Carbon	59.35	59.03	60.05	60.42	mg/l
Total Organic Halogen	<0.010	<0.010	<0.010	<0.010	mg/l
Chloride	45				mg/l
Iron	<0.05				mg/l
Manganese	<0.02				mg/l
Phenols	<0.05				mg/l
Sodium	28.6				mg/l
Sulfate	105.9				mg/l

ANALYSIS HAS BEEN MADE BY  
E.P.A. APPROVED PROCEDURES,  
UNLESS NOTED OTHERWISE.

APPROVED BY:

*Karen H. Brown*  
KAREN H. BROWN, LAB DIRECTOR  
ENVIRONMENTAL DIVISION



# ENVIRONMENTAL LABORATORIES, Inc.

P.O. Drawer 2309 / Gulfport, Mississippi 39503 / (601) 863-3036

## CHAIN OF CUSTODY RECORD

Field Section

Well # 2

Location of Sampling: South of Atrazine Plant

Shipper's Name: VERTAC Chemical

Shipper's Address: Box 3 Rifle Range Rd., Vicksburg, MS. 39180

Collector's Name: K. Brown Telephone # \_\_\_\_\_  
(Signature)

Date Sampled: 6-3-83

Time Sampled: 9:45 AM

Field Information:

Special Handling/Storage:

*Refrigerated over weekend*

Laboratory Section

Received by: K Brown, FLI

Date: 6/14/83 @ 8:00 am

Analysis Required: PCRA II and III

Comments:

*Samples intact*

# ENVIRONMENTAL LABORATORIES, Inc.

P.O. Drawer 2309 / Gulfport, Mississippi 39503 / (601) 863-3036

## GROUNDWATER MONITORING

**CLIENT** Vertac, Inc.  
Vicksburg, Mississippi

**FACILITY** Vicksburg Plant

**WELL I.D.** Well 4

**SAMPLE NO.** 6012

**SAMPLE BY** Client

**CLIENT NO.** RCRA22-001

**DATE** July 15, 1983

**UPSTREAM**

**DOWNSTREAM**

### GROUP 1

#### Inorganics

Arsenic	<0.0004	mg/l
Barium	0.048	mg/l
Cadmium	0.00068	mg/l
Chromium	<0.001	mg/l
Fluoride	0.55	mg/l
Lead	0.0039	mg/l
Mercury	<0.0008	mg/l
Nitrate	1.8	mg/l
Selenium	0.0079	mg/l
Silver	<0.00004	mg/l

#### Organics

Endrin	<0.00008	mg/l
Lindane	<0.0005	mg/l
Methoxychlor	<0.001	mg/l
Toxaphene	<0.002	mg/l
2, 4-D	<0.002	mg/l
2, 4, 5-TP Silvex	<0.002	mg/l

#### Radiochemistry

Gross Alpha	<3	pCi/l
Gross Beta	<3	pCi/l
Total Radium	<3	pCi/l

#### Others

Turbidity	3	NTU
Total Coliform	11	ct/100ml

### GROUP 2

Chloride	15	mg/l
Iron	<0.05	mg/l
Manganese	<0.02	mg/l
Sodium	17.4	mg/l
Sulfate	59.2	mg/l
Phenols	<0.05	mg/l

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## GROUNDWATER MONITORING PAGE 2

WELL I.D. Well 4

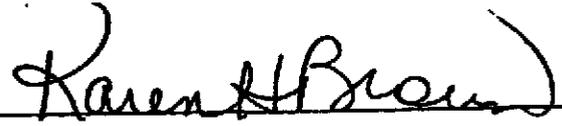
UPSTREAM   
DOWNSTREAM

### GROUP 3

	1	2	3	4	
pH	7.47	7.30	7.36	7.40	S.U.
Specific Conductance	820	825	830	825	umhos/cm
Total Organic Carbon	59.10	57.00	56.44	59.67	mg/l
Total Organic Halogen	0.020	0.023	0.020	0.018	mg/l

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KAREN H. BROWN

Lab Director

Environmental Division

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## CHAIN OF CUSTODY RECORD

Field Section

Well # 4

Location of Sampling: North Administration Building

Shipper's Name: VERTAC Chemical

Shipper's Address: Box 3 Rifle Range Rd. Vicksburg, MS. 39180

Collector's Name: David Green Telephone # 601-636-1231  
(Signature)

Date Sampled: 6-3-83

Time Sampled: 1:30 PM

Field Information:

*Upstream well*

Special Handling/Storage:

*Refrigerated until shipped*

Laboratory Section

Received by: K. Brown, ECI

Date: 6/14/83 @ 8:00am

Analysis Required: PCPA I, III, IV

Comments:



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## GROUNDWATER MONITORING

**CLIENT** Vertac, Inc.  
Vicksburg, Mississippi

**FACILITY** Vicksburg Plant

**WELL I.D.** Well 5

**SAMPLE NO.** 6012

**SAMPLE BY** Client

**CLIENT NO.** RCRA22-001

**DATE** July 15, 1983

**UPSTREAM**

**DOWNSTREAM**

### GROUP 1

#### Inorganics

Arsenic	<0.0004	mg/l
Barium	0.165	mg/l
Cadmium	0.00049	mg/l
Chromium	0.009	mg/l
Fluoride	0.45	mg/l
Lead	<0.0008	mg/l
Mercury	<0.0008	mg/l
Nitrate	2.6	mg/l
Selenium	0.0064	mg/l
Silver	0.00052	mg/l

### GROUP 2

Chloride	44	mg/l
Iron	<0.05	mg/l
Manganese	0.18	mg/l
Sodium	30.8	mg/l
Sulfate	95.7	mg/l
Phenols	0.06	mg/l

#### Organics

Endrin	<0.00008	mg/l
Lindane	<0.0005	mg/l
Methoxychlor	<0.001	mg/l
Toxaphene	<0.002	mg/l
2, 4-D	<0.002	mg/l
2, 4, 5-TP Silvex	<0.002	mg/l

#### Radiochemistry

Gross Alpha	<3	-	pCi/l
Gross Beta	<3	-	pCi/l
Total Radium	<3	-	pCi/l

#### Others

Turbidity	16	NTU
Total Coliform		ct/100ml

*✓*  
*200*

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## **GROUNDWATER MONITORING PAGE 2**

WELL I.D. Well 5

UPSTREAM   
DOWNSTREAM

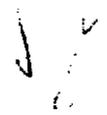
<b>GROUP 3</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	
pH	6.95				S.U.
Specific Conductance	1500				umhos/cm
Total Organic Carbon	76.42				mg/l
Total Organic Halogen	0.085				mg/l

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**KAREN H. BROWN**  
Lab Director  
Environmental Division





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## CHAIN OF CUSTODY RECORD

Well # 5

### Field Section

Location of Sampling: at intersection of streams

Shipper's Name: Vertac Chemical Corp.

Shipper's Address: P.O. Box 3, Rifle Range Road, Vickburg, Ms. 39180

Collector's Name: David Green Telephone # 601-636-1231  
(Signature)

Date Sampled: 6-14-83

Time Sampled: 10:00 AM

### Field Information:

### Special Handling/Storage

*Refrigerated until shipped*

### Laboratory Section

Received by: K Brown, ECI

Date: 6/15/83 @ 8:00 am

Analysis Required: RCRA I, II, III

### Comments:

*Sample intact*

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## GROUNDWATER MONITORING

**CLIENT** Vertac, Inc.  
Vicksburg, Mississippi

**FACILITY** Vicksburg Plant

**WELL I.D.** Well 6

**SAMPLE NO.** 6012

**SAMPLE BY** Client

**CLIENT NO.** RCRA22-001

**DATE** July 15, 1983

**UPSTREAM**

**DOWNSTREAM**

### GROUP 1

#### Inorganics

Arsenic	<0.0004	mg/l
Barium	0.042	mg/l
Cadmium	0.00556	mg/l
Chromium	<0.001	mg/l
Fluoride	0.80	mg/l
Lead	<0.0008	mg/l
Mercury	<0.0008	mg/l
Nitrate	3.0	mg/l
Selenium	0.0037	mg/l
Silver	0.00169	mg/l

### GROUP 2

Chloride	24	mg/l
Iron	<0.05	mg/l
Manganese	<0.02	mg/l
Sodium	32.2	mg/l
Sulfate	68.7	mg/l
Phenols	<0.05	mg/l

#### Organics

Endrin	<0.00008	mg/l
Lindane	<0.0005	mg/l
Methoxychlor	<0.001	mg/l
Toxaphene	<0.002	mg/l
2, 4-D	<0.002	mg/l
2, 4, 5-TP Silvex	<0.002	mg/l

#### Radiochemistry

Gross Alpha	<3	+	_____	pCi/l
Gross Beta	<3	+	_____	pCi/l
Total Radium	<3	+	_____	pCi/l

#### Others

Turbidity	8	NTU
Total Coliform	<1	ct/100ml

*12/12*

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## **GROUNDWATER MONITORING PAGE 2**

WELL I.D. Well 6

UPSTREAM   
DOWNSTREAM

<b>GROUP 3</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	
pH	7.10				S.U.
Specific Conductance	1510				umhos/cm
Total Organic Carbon	71.89				mg/l
Total Organic Halogen	0.042				mg/l

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*Karen H. Brown*

**KAREN H. BROWN**  
**Lab Director**  
**Environmental Division**

J L  
1/2

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## CHAIN OF CUSTODY RECORD

Well # 6

### Field Section

Location of Sampling: 100 yds south of well #5  
Shipper's Name: Vertac Chemical  
Shipper's Address: P.O. Box 3, Rifle Range Rd., Wickburg, Mo. 39180  
Collector's Name: David Green Telephone # 601-636-1231  
(Signature)  
Date Sampled: 6-14-83  
Time Sampled: 10:10 AM  
Field Information:

### Special Handling/Storage

Refrigerated until shipped

### Laboratory Section

Received by: J. Brown, ELI  
Date: 6/15/83 @ 8:00 am  
Analysis Required: RCRA I, II, III  
Comments: Sample intact

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## GROUNDWATER MONITORING

**CLIENT** Vertac, Inc.  
Vicksburg, Mississippi

**FACILITY** Vicksburg Plant

**WELL I.D.** Well 7

**SAMPLE NO.** 6012

**SAMPLE BY** Client

**CLIENT NO.** RCRA22-001

**DATE** July 15, 1983

**UPSTREAM**

**DOWNSTREAM**

### GROUP 1

#### Inorganics

Arsenic	0.0111	mg/l
Barium	0.2	mg/l
Cadmium	0.01412	mg/l
Chromium	0.004	mg/l
Fluoride	0.60	mg/l
Lead	<0.0008	mg/l
Mercury	<0.0008	mg/l
Nitrate	1.3	mg/l
Selenium	0.0028	mg/l
Silver	<0.00004	mg/l

### GROUP 2

Chloride	.11	mg/l
Iron	<0.05	mg/l
Manganese	0.05	mg/l
Sodium	18.9	mg/l
Sulfate	6.6	mg/l
Phenols	<0.05	mg/l

#### Organics

Endrin	<0.00008	mg/l
Lindane	<0.0005	mg/l
Methoxychlor	<0.001	mg/l
Toxaphene	<0.002	mg/l
2, 4-D	<0.002	mg/l
2, 4, 5-TP Silvex	<0.002	mg/l

#### Radiochemistry

Gross Alpha	<3	pCi/l
Gross Beta	<3	pCi/l
Total Radium	<3	pCi/l

#### Others

Turbidity	9	NTU
Total Coliform	<1	ct/100ml

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## **GROUNDWATER MONITORING PAGE 2**

WELL I.D. Well 7

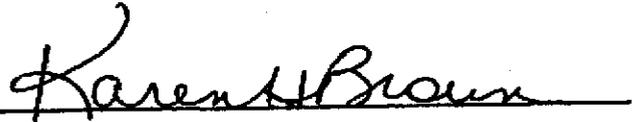
UPSTREAM   
DOWNSTREAM

### **GROUP 3**

	1	2	3	4	
pH	7.33				S.U.
Specific Conductance	780				umhos/cm
Total Organic Carbon	64.86				mg/l
Total Organic Halogen	0.024				mg/l

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**KAREN H. BROWN**

**Lab Director**

**Environmental Division**

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## CHAIN OF CUSTODY RECORD

Well # 7

### Field Section

Location of Sampling: southern edge of hill

Shipper's Name: Vertac Chemical

Shipper's Address: P.O. Box 3, Rifle Range Rd., Wickburg, Mo. 39180

Collector's Name: David Green Telephone # 601-636-1231  
(Signature)

Date Sampled: 6-14-83

Time Sampled: 10:20 AM

Field Information:

### Special Handling/Storage

*Refrigerated until shipped*

### Laboratory Section

Received by: H. Brown, ECI

Date: 6/15/83 @ 8:00 am

Analysis Required: RCA I, II, III

Comments:

*Sample intact*

# ELI ENVIRONMENTAL LABORATORIES, Inc.

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## GROUNDWATER MONITORING

**CLIENT** Vertac, Inc.  
Vicksburg, Mississippi

**FACILITY** Vicksburg Plant

**WELL I.D.** Well 8

**SAMPLE NO.** 6012

**SAMPLE BY** Client

**CLIENT NO.** RCRA22-001

**DATE** July 15, 1983

**UPSTREAM**

**DOWNSTREAM**

### GROUP 1

#### Inorganics

Arsenic	<0.0004	mg/l
Barium	0.8	mg/l
Cadmium	0.00056	mg/l
Chromium	<0.001	mg/l
Fluoride	0.50	mg/l
Lead	<0.0008	mg/l
Mercury	<0.0008	mg/l
Nitrate	2.2	mg/l
Selenium	0.0055	mg/l
Silver	<0.00004	mg/l

### GROUP 2

Chloride	20	mg/l
Iron	<0.05	mg/l
Manganese	5.74	mg/l
Sodium	31.4	mg/l
Sulfate	11.8	mg/l
Phenols	0.05	mg/l

#### Organics

Endrin	<0.00008	mg/l
Lindane	<0.0005	mg/l
Methoxychlor	<0.001	mg/l
Toxaphene	<0.002	mg/l
2, 4-D	<0.002	mg/l
2, 4, 5-TP Silvex	<0.002	mg/l

#### Radiochemistry

Gross Alpha	<3	+	_____	pCi/l
Gross Beta	<3	+	_____	pCi/l
Total Radium	<3	+	_____	pCi/l

#### Others

Turbidity	64	NTU
Total Coliform	<1	ct/100ml

*10/15/83*



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## GROUNDWATER MONITORING PAGE 2

WELL I.D. Well 8

UPSTREAM   
DOWNSTREAM

### GROUP 3

	1	2	3	4	
pH	6.95				S.U.
Specific Conductance	1200				umhos/cm
Total Organic Carbon	103.6				mg/l
Total Organic Halogen	0.364				mg/l

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KAREN H. BROWN

Lab Director

Environmental Division



# ENVIRONMENTAL LABORATORIES, Inc.

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## CHAIN OF CUSTODY RECORD

Field Section

Well # 8

Location of Sampling: Between tracks at Atrazine Plant

Shipper's Name: VERTAC Chemical

Shipper's Address: Box 3 Rifle Range Rd. ; Vicksburg, MS. 39180

Collector's Name: David Green Telephone # \_\_\_\_\_  
(Signature)

Date Sampled: 6-3-83

Time Sampled: 0930 AM

Field Information:

*upstream well for 5, 6, & 7.*

Special Handling/Storage:

*Refrigerated over weekend*

Laboratory Section

Received by: K Brown, EU

Date: 6/14/83 @ 8:00am

Analysis Required: PCRA I, II, III

Comments:

REGULATORY COMPLETENESS CHECKLIST FOR HAZARDOUS WASTE STORAGE, TREATMENT AND DISPOSAL FACILITIES

Facility Name Vertac Chemical Corp.  
 Address P. O. Box 3  
Rifle Range Road  
Vicksburg, Mississippi 39180  
 Contact Name Bob Maraman  
 Contact Phone Number (601) 636-1231

EPA I.D. Number MSD990714081  
 Permit Review Team \_\_\_\_\_  
 \_\_\_\_\_  
 Date Application Received \_\_\_\_\_  
 Date Review Completed \_\_\_\_\_

Subject requirement	40 CFR section Nos.	Location in application	Comments
<b>PART A - APPLICATION</b>	270.11(a) and b, 270.10(d) 270.13		
<b>FORM 1</b>			
<b>A-1 Label Items</b>		A	
<ul style="list-style-type: none"> <li>• EPA ID number</li> <li>• Facility name</li> <li>• Facility mailing address</li> <li>• Facility location</li> </ul>			
<b>A-2 Pollutant Characteristics</b>		A	
<b>A-3 Name of Facility</b>		A	
<b>A-4 Facility Contact</b>		A	
<ul style="list-style-type: none"> <li>• Name and title</li> <li>• Telephone</li> </ul>			
<b>A-5 Facility Mailing Address</b>		A	
<b>A-6 Facility Location</b>		A	
<b>A-7 SIC Code(s)</b>		A	
<ul style="list-style-type: none"> <li>• Four digits</li> </ul>			
<b>A-8 Operator Information</b>		A	
<ul style="list-style-type: none"> <li>• Name</li> <li>• Address</li> <li>• Status</li> <li>• Phone</li> </ul>			
<b>A-9 Indian Land</b>		A	

Subject requirement	40 CFR section Nos.	Location in application	Comments
<b>A-10 <u>Existing Environmental Permits</u></b> <ul style="list-style-type: none"> <li>• NPDES</li> <li>• UIC</li> <li>• RCRA</li> <li>• PSD</li> <li>• Other</li> </ul>		A	
<b>A-11 <u>Map</u></b> <ul style="list-style-type: none"> <li>• One mile beyond property line</li> <li>• Outline of facility</li> <li>• Location of existing and proposed intake and discharge structures</li> <li>• Hazardous waste treatment, storage, and disposal facilities</li> <li>• Underground injection wells</li> <li>• Springs, rivers, and other surface water bodies</li> <li>• Drinking water wells</li> </ul>		A	
<b>A-12 <u>Nature of the Business</u></b>		A	
<b>A-13 <u>Certification</u></b> <ul style="list-style-type: none"> <li>• Name, title, and date</li> <li>• Acceptable signature</li> </ul>		A A	
<b><u>FORM 3</u></b>		A	
<b>A-14 <u>EPA ID Number</u></b>		A	
<b>A-15 <u>First or Revised Application</u></b> <ul style="list-style-type: none"> <li>• Existing/New</li> <li>• Interim/Permitted</li> </ul>		A	
<b>A-16 <u>Process - Codes and Design Capacities</u></b> <ul style="list-style-type: none"> <li>• Process codes</li> <li>• Amount</li> <li>• Unit of measure</li> </ul>		A	
<b>A-17 <u>Description of Hazardous Wastes</u></b> <ul style="list-style-type: none"> <li>• EPA hazardous waste number</li> <li>• Estimated annual quantity</li> <li>• Unit of measure</li> <li>• Process code</li> <li>• Process description</li> </ul>		A	
<b>A-18 <u>Facility Drawing</u></b>		A	

(continued)

Subject requirement	40 CFR section Nos.	Location in application	Comments
A-19 <u>Facility Photograph</u>		A	
A-20 <u>Latitude and Longitude</u>		A	
A-21 <u>Facility Owner</u> <ul style="list-style-type: none"> <li>◦ Name</li> <li>◦ Address</li> <li>◦ Telephone</li> </ul>		A	
A-22 <u>Owner Certification</u> <ul style="list-style-type: none"> <li>◦ Name, signature, date</li> </ul>		A	
A-23 <u>Operator Certification</u> <ul style="list-style-type: none"> <li>◦ Name, signature, date</li> </ul>		A	
<b>PART B - FACILITY DESCRIPTION</b>			
B-1 <u>General Description</u>  A general description of the facility. Include the nature of the business. Offsite facilities should identify the types of industry served; on-site facilities should briefly describe the process(es) involved in the generation of hazardous waste.	270.14(b)(1) Guidance	B-1	
B-2 <u>Topographic Map</u>  B-2a <u>General Requirements</u>  A topographic map showing the facility and a distance of 1000 feet around it. The following information is required:  <ul style="list-style-type: none"> <li>◦ Scale 1 in = 200 ft</li> <li>◦ Contours sufficient to show surface water flow</li> <li>◦ Extend 1000 ft beyond property</li> <li>◦ Map scale</li> <li>◦ Map date</li> <li>◦ 100-yr floodplain</li> <li>◦ Surface waters</li> <li>◦ Surrounding land use</li> <li>◦ Wind rose</li> <li>◦ Map orientation</li> <li>◦ Legal boundaries</li> <li>◦ Location of access control</li> <li>◦ Injection and withdrawal wells <ul style="list-style-type: none"> <li>- on-site</li> <li>- off-site</li> </ul> </li> </ul>	270.14(b)(19)	B-2	

(continued)

Subject requirement	40 CFR section Nos.	Location in application	Comments
<p><b>B-2a (continued)</b></p> <ul style="list-style-type: none"> <li>• Buildings</li> <li>• Structures</li> <li>• Sewers</li> <li>• Loading and unloading areas</li> <li>• Fire control facilities</li> <li>• Flood control or drainage barriers</li> <li>• Run-off control systems</li> <li>• Location of hazardous waste units</li> <li>• Access and internal roads</li> </ul> <p>For large facilities the use of other scales may be acceptable on a case-by-case basis.</p>			
<p><b>B-2b <u>Additional Topographic Requirements For Land Storage, Treatment and Disposal Facilities</u></b></p> <p>(See Section E-3 - Topographic Map Requirements.)</p>	270.14(c)(3) and (4)		
<p><b>B-3 <u>Location Information</u></b></p>	270.14(b)(11)		
<p><b>B-3a <u>Seismic Considerations</u></b></p> <p>For new facilities only, applicant must identify the political jurisdiction (county, township, or election district) in which facility will be located. If located in any of the political jurisdictions specified in Part 264 Appendix VI, the applicant must prove that the facility is located at least 3000 ft from any fault where movement has taken place in Holocene time or that no such faults pass within 200 ft of the portions of the facility used for treatment, storage, or disposal of hazardous waste. Proof may come from geologic studies, aerial photographs, field observations or subsurface investigations. All information gathered must be acceptable by a geologist experienced in evaluating seismic activity.</p>	270.14(b)(11) (i) and (ii) 264.18(a) 264 Appendix VI	NA	
<p><b>B-3b <u>Floodplain Standard</u></b></p> <p>Documentation of whether or not the facility is located within a 100-yr floodplain including the source of data (Federal Insurance Administration Map, or other maps and calculations). If map other than FIA map is used demonstration of equivalent mapping technique should be provided. If located in 100-yr floodplain include:</p>	270.14(b)(11) (iii) 264.18(b)	B-3	

(continued)

Subject requirement	40 CFR section Nos.	Location in application	Comments
B-3b (continued)			
<ul style="list-style-type: none"> <li>° 100-yr floodplain level</li> <li>° Other special flooding factors (e.g., wave action) that must be considered to prevent washout</li> </ul>			
<p><b>B-3b(1) Demonstration of Compliance</b></p> <p>For facilities located within the 100-yr floodplain, a description of how the facility is designed, constructed, operated, and maintained to prevent washout of any hazardous waste during a flood. Either of the following may be used:</p>	270.14(b)(11) (iv) 264.18(b)	B-3	
<p><b>B-3b(1)(a) Flood Proofing and Flood Protection</b></p> <p>A structural or other engineering study showing how design of the tanks, containers, or waste piles and the flood proofing and protection devices at the facility will prevent washout including:</p> <ul style="list-style-type: none"> <li>° Engineering analysis of hydrodynamic and hydrostatic forces</li> <li>° Structural or other engineering studies of hazardous waste units and flood protection devices</li> </ul>	270.14(b)(11) (iv) (A) and (B)	NA	
<p><b>B-3b(1)(b) Flood Plan</b></p> <p>Description of the procedures to be followed to remove hazardous waste to safety before the facility is flooded. The plan must address the following:</p> <ul style="list-style-type: none"> <li>° Timing related to flood levels</li> <li>° Estimated time to move the waste</li> <li>° Description of the location to which the waste will be moved and proof of the receiving facility's eligibility to receive hazardous waste</li> <li>° Procedures, equipment, and personnel to be used and the means to ensure that these resources will be available</li> <li>° Potential for accidental discharge of the waste</li> </ul>	270.14(b)(11) (iv)(C)	NA	

(continued)

Subject requirement	40 CFR section Nos.	Location in application	Comments
<p><b>B-3b(2) <u>Plan for Future Compliance with Floodplain Standard</u></b></p> <p>For facilities located within the 100-yr floodplain that do not comply with the floodplain standard, a plan showing how and when the facility will be brought into compliance. A compliance schedule must be included.</p>	270.14(h)(11)(v)	NA	
<p><b>B-3b(3) <u>Waiver for Land Storage and Disposal Facilities (Existing Facilities Only)</u></b></p> <p>If a waiver from the Floodplain Standard is requested, the owner or operator must demonstrate that there will be no adverse effects on human health or the environment if washout occurs. The following factors must be considered in this demonstration:</p> <ul style="list-style-type: none"> <li>• Volume and physical and chemical characteristics of the waste</li> <li>• Concentration of hazardous constituents that would potentially affect surface waters</li> <li>• Impact of such concentrations on the current or potential uses of and water quality standards established for the affected surface waters</li> <li>• Impact of hazardous constituents on the sediments of affected surface waters or the soils of the 100-year floodplain</li> </ul>	264.1R(b)(11)	NA	
<p><b>B-4 <u>Traffic Information</u></b></p> <p>A description of the means of transporting hazardous wastes.</p> <p>All facilities should describe movement of waste on the facility. Description must include:</p> <ul style="list-style-type: none"> <li>• Estimated volume</li> <li>• Traffic pattern</li> <li>• Traffic control</li> <li>• Access road(s) surfacing and load-bearing capacity</li> </ul> <p>Off-site facilities (only) should also describe movement of waste to the facility from the point where it leaves nearest major highway</p>	270.14(b)(10)	B-4	Guidance

(continued)

Subject requirement	40 CFR section Nos.	Location in application	Comments
<b>PART C - WASTE CHARACTERISTICS</b>			
<b>C-1 <u>Chemical and Physical Analyses</u></b> For each hazardous waste treated, stored or disposed at the facility, the following information should be provided: <ul style="list-style-type: none"> <li>• General description of the waste</li> <li>• Hazardous characteristics</li> <li>• Basis for hazard designation</li> <li>• Laboratory report on analyses results</li> <li>• Existing published or documented data on hazardous waste or hazardous waste from a similar process (new facilities only)</li> </ul> At a minimum, the analyses should include all the information which must be known to treat, store, or dispose of the waste in accordance with 264 requirements.	270.14(b)(2) 264.13(a) 270.62(b)(2)(1) Guidance  Guidance Guidance Guidance  Guidance	C	
<b>C-1a <u>Containers</u></b> <ul style="list-style-type: none"> <li>• Compatibility of waste with container</li> <li>• Free liquids</li> <li>• Waste specific parameters based on hazardous designation</li> <li>• Other information required for safe operation</li> </ul>	Guidance  264.172 Guidance Guidance  Guidance	NA	
<b>C-1b <u>Tanks</u></b> <ul style="list-style-type: none"> <li>• Specific gravity</li> <li>• Waste specific parameters based on hazardous designation</li> <li>• Other information required for safe operation</li> </ul>	264.191(a)  Guidance Guidance	NA	
<b>C-1c <u>Waste Piles</u></b> <ul style="list-style-type: none"> <li>• Appendix VIII constituents</li> <li>• Indicator parameters (groundwater monitoring)</li> <li>• Percent moisture</li> <li>• Leachate generation rate</li> <li>• Compatibility of liner(s) and waste/leachate</li> <li>• Mobility of hazardous constituent(s) through liner</li> <li>• Fluid conductivity (hydraulic, leachate, organic)</li> <li>• Vapor pressure of hazardous constituents</li> </ul>	Guidance Guidance  Guidance 264.251(a)(1)(1)  Guidance Guidance Guidance	NA	

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Subject requirement	40 CFR section Nos.	Location in application	Comments
<p><b>C-1d <u>Surface Impoundments</u></b></p> <ul style="list-style-type: none"> <li>• Appendix VIII constituents</li> <li>• Indicator parameters (groundwater monitoring)</li> <li>• Compatibility of liner and wastes</li> <li>• Mobility of hazardous constituents through liner(s)</li> <li>• Fluid conductivity (hydraulic, organic)</li> <li>• Vapor pressure of hazardous constituents</li> </ul>	<p>Guidance Guidance</p> <p>264.221(a)(1) Guidance</p> <p>Guidance Guidance</p>	<p>C</p>	
<p><b>C-1e <u>Incinerators</u></b></p>			
<p><b>C-1e(1) <u>Trial Burn</u></b></p> <p>If a trial burn is proposed (or has been conducted already), an analysis of each waste or waste mixture to be burned during the trial burn (or burned during the previous trial burn) and after the trial burn is complete, which includes:</p> <ul style="list-style-type: none"> <li>• Heat value</li> <li>• Viscosity (liquids)</li> <li>• Physical form (nonliquids)</li> <li>• Identification of hazardous organic constituents listed in Appendix VIII</li> <li>• Approximate quantification of hazardous constituents</li> </ul>	<p>270.62(b)(2)(1)</p>	<p>NA</p>	
<p><b>C-1e(2) <u>Data in Lieu of Trial Burn</u></b></p> <p>Data may be supplied in lieu of the results of a trial burn. The data must include an analysis of each waste or waste mixture to be burned, including:</p> <ul style="list-style-type: none"> <li>• Heat value</li> <li>• Viscosity (if applicable) or description of physical form of the waste</li> <li>• Identification of hazardous organic constituents listed in Appendix VIII</li> <li>• Approximate quantification of hazardous constituents</li> <li>• Quantification of hazardous constituents which may be designated as POHC's based on data submitted from other trial or operational burns which demonstrate compliance with the performance standard in 264.343.</li> <li>• Comparison of waste for which permit data submitted in lieu of a trial burn, including identified POHC's</li> </ul>	<p>270.19(c)(1)</p> <p>Guidance</p>		

(continued)

Subject requirement	40 CFR section Nos.	Location in application	Comments
<p><b>C-1f Landfills</b></p> <ul style="list-style-type: none"> <li>• Appendix VIII constituents</li> <li>• Percent moisture</li> <li>• Leachate generation rate</li> <li>• Compatibility of liner and waste/leachate</li> <li>• Mobility of hazardous constituent through liner(s)</li> <li>• Fluid conductivity (hydraulic, leachate, organic)</li> </ul>	<p>Guidance Guidance</p> <p>264.301(a)(1) Guidance</p> <p>Guidance</p>	<p>NA</p>	
<p><b>C-1g Land Treatment</b></p> <ul style="list-style-type: none"> <li>• Demonstrate that waste can be completely degraded, transformed, or immobilized in treatment zone</li> <li>• Percent moisture</li> <li>• Specific gravity or bulk density</li> <li>• pH</li> <li>• Conductivity</li> <li>• Acidity or alkalinity</li> <li>• TOC</li> <li>• Appendix VIII constituents</li> <li>• Concentration and identification of volatile hazardous constituents</li> </ul>	<p>264.272(a)</p> <p>Guidance Guidance Guidance Guidance Guidance 264.272(c)(1)(i) Guidance</p>	<p>NA</p>	
<p><b>C-1h Additional Requirements for Land Storage, Treatment and Disposal Facilities</b></p> <p>If the facility utilizes hazardous waste surface impoundments, piles, land treatment units or landfills, a description of the procedures used to determine the existence and concentration of Appendix VIII constituents in any plume of contamination or groundwater must be submitted.</p>	<p>270.14(c)(4)(ii)</p>	<p>E-1</p>	
<p><b>C-2 Waste Analysis Plan</b></p> <p>A copy of the waste analysis plan required by 264.13(b) and, if applicable, 264.13(c). The Waste Analysis Plan should describe the procedures used to obtain chemical and physical information and data on the wastes to insure proper storage, treatment, and disposal. Minimum requirements include:</p>	<p>270.14(b)(3) 264.13(b) and (c), 264.341</p>	<p>C</p>	
<p><b>C-2a Parameters and Rationale</b></p> <p>A list of parameters chosen for analysis and an explanation of the rationale for their selection.</p>	<p>264.13(b)(1)</p>		

(continued)

Subject requirement	40 CFR section Nos.	Location in application	Comments
<b>C-2b Test Methods</b> A description of the test methods used to test for parameters chosen.	264.13(b)(2)	C	
<b>C-2c Sampling Methods</b> A list of the sampling methods used to obtain a representative sample of each waste to be analyzed.	264.13(b)(3)	C	
<b>C-2d Frequency of Analysis</b> A description of the frequency at which the analyses will be repeated. The frequency must be sufficient to ensure that the analysis is accurate and up-to-date. (For an on-site facility this will be whenever there is a process change. For an incinerator, this will be as often as required to verify consistency of the waste feed.)	264.13(b)(4) Guidance	C	
<b>C-2e Additional Requirements for Wastes Generated Offsite</b> A written operating record must be maintained that includes: <ul style="list-style-type: none"> <li>• Written notices per 264.12(b)</li> <li>• Quantity of each hazardous waste received, as well as method and dates for treatment, storage, or disposal</li> <li>• Location and quantity of each hazardous waste within the facility</li> <li>• Results of waste analysis</li> <li>• Any and all pertinent records and reports generated</li> <li>• Closure cost estimates</li> <li>• Post-closure estimates for disposal facilities</li> <li>• For disposal facilities, the location and quantity of each hazardous waste must be recorded on a map or diagram of each cell or disposal area.</li> </ul> Records must be available for inspection and submitted at time of closure.  A description of the procedures used to inspect and/or analyze wastes generated off-site that includes:	264.73(a),(b) 264.13(b)(5) 264.13(c)	NA	

(continued)

Subject requirement	40 CFR section Nos.	Location in application	Comments
<ul style="list-style-type: none"> <li>• Procedures to determine waste identity</li> <li>• Sampling frequency</li> <li>• Sampling methods</li> <li>• Waste analysis information supplied by generator</li> </ul> <p><b>C-2f <u>Additional Requirements for Facilities Handling Ignitable, Reactive, or Incompatible Waste</u></b></p> <p>If the facility stores or treats ignitable, reactive, or incompatible waste, a description of methods which will be used to meet the additional waste analysis requirements necessary for complying with the regulatory requirements specified in Section F-5.</p>	<p>264.13(b)(6) 264.17</p>	<p>NA</p>	

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Subject requirement	40 CFR section Nos.	Location in application	Comments
<p><b>D-4 Surface Impoundment Design</b></p>			
<p><b>D-4a List of Wastes</b></p> <p>The application must provide a list of all</p> <ul style="list-style-type: none"> <li>• Hazardous Wastes in the impoundment</li> <li>• Analytical and sampling techniques</li> <li>• Appendix VIII constituents</li> <li>• Ignitability, compatibility, reactivity and corrosivity</li> </ul>	<p>270.17(a)</p> <p>Guidance Guidance Guidance</p>	<p>C</p>	
<p><b>D-4b Detailed Plan and Engineering Report</b></p>	<p>270.17(b) 264.221(a)</p>	<p>NA</p>	
<p><b>D-4b(1) Liner System Exemption</b></p> <p>If an exemption from the liner installation requirements is requested, the application must demonstrate that alternate design and operating practices, together with location characteristics will prevent groundwater and surface water contamination at any future time. Information to be submitted includes:</p> <ul style="list-style-type: none"> <li>• Nature and quantity of waste</li> <li>• Alternative design and operation plans</li> <li>• Hydrogeologic setting                             <ul style="list-style-type: none"> <li>- attenuative capacity</li> <li>- thickness of liner</li> <li>- thickness of soil between the bottom of the surface impoundment and seasonal groundwater and surface water elevations</li> </ul> </li> <li>• Other factors which would influence the quantity, quality, and mobility of any leachate</li> </ul>	<p>264.221(b) 270.17(b)(1)</p>	<p>NA</p>	
<p><b>D-4b(2) Liner System</b></p> <p>If a liner is required, the application must provide detailed plans and an engineering report describing the liner system. The application must demonstrate that migration of waste into the liner for storage facilities is permitted. Migration into the liner for disposal facilities is not permitted. The following information is needed.</p>	<p>264.221(a) (1),(2),(3) 270.17(b)(1)</p>	<p>NA</p>	

(continued)

Subject requirement	40 CFR section Nos.	Location in application	Comments
<p>D-4b(2) (continued)</p> <ul style="list-style-type: none"> <li>• Material of construction</li> <li>• Physical strength</li> <li>• Chemical properties</li> <li>• Thickness               <ul style="list-style-type: none"> <li>- synthetic</li> <li>- natural</li> </ul> </li> <li>• Foundation design</li> <li>• Size/area covered</li> <li>• Liner/waste compatibility</li> <li>• Liner installation procedures</li> <li>• Liner vendor/manufacturer</li> <li>• Subsurface exploration data</li> <li>• How the system's integrity will be maintained against:               <ul style="list-style-type: none"> <li>- internal and external pressure gradients including static head, settlement, compression, uplift, lateral</li> </ul> </li> </ul>			
<p>D-4b(3) <u>Overtopping Controls</u></p> <p>The application must describe the design and operating procedures that will provide protection against impoundment overtopping.</p> <ul style="list-style-type: none"> <li>• Spillway or weirs</li> <li>• Sensors and alarms</li> <li>• Automatic or manual controls</li> <li>• Discharge destination</li> <li>• Minimum freeboard based (2 foot) (100-year flood event)</li> <li>• Process flow diagram</li> </ul>	<p>270.17(b)(2) 264.221(c)</p>	<p>D</p>	
<p>D-4b(4) <u>Dike Design and Structural Integrity</u></p> <p>The application must demonstrate that dikes are designed, constructed, and maintained with sufficient structural integrity in such a manner that massive failure will not occur.</p> <ul style="list-style-type: none"> <li>• Structural integrity analysis, assuming no functioning liner system</li> <li>• Maintenance procedures</li> <li>• Erosion protection, inside and outside</li> <li>• Stress pressure exerted by wastes</li> <li>• Control of scouring and piping without dependence on liner system</li> <li>• Engineers' certification</li> </ul>	<p>270.17(b)(3)  270.17(e) 264.221(d) 264.22(e)</p>	<p>D</p>	

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Subject requirement	40 CFR section Nos.	Location in application	Comments
D-4b(4) (continued) <ul style="list-style-type: none"> <li>- qualifications of certifying engineer</li> <li>- after extended nonuse of surface impoundment (6 months)</li> <li>- after initial construction (new facility)</li> <li>- after repairs</li> </ul>			
D-4c <u>Groundwater Monitoring Exemption</u>			
D-4c(1) <u>Double-Lined Surface Impoundments</u>  To be exempt from groundwater monitoring requirements the application must provide detailed plans and an engineering report describing: <ul style="list-style-type: none"> <li>• How the surface impoundment and liners will be constructed so that they are above the seasonal high water table</li> <li>• That the impoundment is underlain by two liners which are designed and constructed in a manner that prevents migration between liners. Both liners must meet all specifications of 264.221(a), as listed in Section D-4(d)(1).</li> <li>• A leak detection system between the liners capable of detecting any migration of liquids into the space between the liners in a timely manner</li> </ul> <ul style="list-style-type: none"> <li>- proper location of detection points, network diagram</li> <li>- drainage media, tile sizing</li> <li>- describe operation of system, analog or digital signal, open or closed circuits</li> </ul>	270.17(c) 264.222  264.222(a)(1)  264.222(a)(2)  264.222(a)(3)  Guidance Guidance Guidance	NA	

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Subject, requirement	40 CFR section Nos.	Location in application	Comments
<b>PART E - GROUNDWATER MONITORING</b>			
<b>E-1 <u>Interim Status Monitoring Data</u></b> Summary of groundwater monitoring data obtained during interim status period.	270.14(c)(1) 265.90-265.94	E-1	
<b>E-2 <u>General Hydrogeologic Information</u></b> Identification of uppermost aquifer and aquifers hydraulically interconnected beneath facility, including: <ul style="list-style-type: none"> <li>• Groundwater flow direction and rate</li> <li>• Basis for identification</li> </ul>	270.14(c)(2)	E-1	
<b>E-3 <u>Topographic Map Requirements</u></b> Unless exempt from groundwater monitoring requirements, surface impoundments, waste piles, land treatment, and landfill facilities must include the following information on the topographic map: <ul style="list-style-type: none"> <li>• Groundwater flow direction and rate (isometric graph)</li> <li>• Point of compliance</li> <li>• Groundwater monitoring wells</li> <li>• The extent of any plume</li> <li>• Hazardous waste management area</li> </ul> The following required information may be incorporated into the topographic map if possible, or at least should be discussed in the text. <ul style="list-style-type: none"> <li>• Groundwater flow rate</li> <li>• Boundaries of uppermost aquifer</li> <li>• Underlying interconnection between uppermost aquifer and lower aquifer</li> <li>• Hydraulic downgradient limit</li> <li>• Waste management area</li> <li>• Uppermost aquifer</li> </ul> (Although many of these items can be shown on a single map, it is allowable to use additional maps to display some of the information. Presentation of all of this information on a single map may sacrifice clarity.)	270.14(c)(2), (3),(4),(1)	E-2	
<b>E-4 <u>Contaminant Plume Description</u></b> Description of any plume of contamination that has already entered groundwater from a regulated unit.	270.14(c)(4) 261, Appendix VIII	E-1	

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Subject requirement	40 CFR section Nos.	Location in application	Comments
E-4 (continued) : <ul style="list-style-type: none"> <li>• Delineation of extent of the plume on the topographic map</li> <li>• Identification and concentrations of Appendix VIII constituents throughout the plume or maximum concentrations of these constituents in the plume</li> </ul>			
E-5 <u>General Monitoring Program Requirements</u>  Waiver request - applicant must certify that there will be no migration of liquid to uppermost aquifer during active life and postclosure. If waiver is not requested, applicant must provide detailed plans and an engineering report describing proposed groundwater monitoring program to meet general groundwater monitoring requirements. The following information is required:	270.14(c)(5) 264.97 264.90(b)(4)	NA	
E-5a <u>Description of Wells</u> <ul style="list-style-type: none"> <li>• Number of wells</li> <li>• Locations</li> <li>• Depths</li> <li>• Casing description</li> <li>• Assurance of unaffected background water measurement</li> <li>• Assurance of compliance point groundwater measurement</li> </ul>	264.97(a),(b) 264.97(c)	NA	
E-5b <u>Description of Sampling/Analysis Procedures</u> <ul style="list-style-type: none"> <li>• Sample collection methods</li> <li>• Sample preservation/shipment</li> <li>• Analytical procedures</li> <li>• Chain-of-custody control</li> <li>• Documentation of proper sampling and analysis procedures</li> <li>• Procedure for determination of groundwater elevation with each sample</li> </ul>	264.97(d) 264.97(e) 264.97(f)	NA	
E-5c <u>Procedures for Establishing Background Quality</u> <ul style="list-style-type: none"> <li>• Each hazardous constituent, or monitoring parameters and other constituents</li> <li>• One year quarterly monitoring data from upgradient well(s)</li> </ul>	264.97(g)	NA	

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Subject requirement	40 CFR section Nos.	Location in application	Comments
<p><b>E-5d <u>Statistical Procedures</u></b></p> <p>Statistical procedures specify the statistical comparison techniques that will be used to evaluate whether there has been a statistically significant increase over background values for each parameter or constituent monitored at the compliance permit.</p> <ul style="list-style-type: none"> <li>◦ Specify the statistical comparison procedures which will be used</li> <li>◦ Specify any equivalent statistical procedures which will be used</li> </ul>	264.97(h)	NA	
<p><b>E-6 <u>Description of Detection Monitoring Program for Facilities Not Detecting the Presence of Hazardous Constituents Including:</u></b></p>	270.14(c)(6) 264.91(a)(4) 264.98	NA	
<p><b>E-6a <u>List of Indicator Parameters, Waste Constituents, Reaction Products to be Monitored for, Including</u></b></p> <ul style="list-style-type: none"> <li>◦ Type, quantities, concentrations expected in wastes</li> <li>◦ Mobility, stability, persistence in unsaturated zone</li> <li>◦ Detectability in groundwater</li> <li>◦ Concentrations or values and coefficients of variation of proposed parameters in the groundwater background.</li> </ul>	270.14(c)(6)(i) 264.93 264.98(a)	NA	
<p><b>E-6b <u>Description of Groundwater Monitoring System</u></b></p> <ul style="list-style-type: none"> <li>◦ Hydraulic downgradient limit</li> <li>◦ Waste management area</li> <li>◦ Uppermost aquifer</li> </ul>	270.14(c)(6)(i) 264.98(b) 264.95, 264.297(a)(2),(b),(c)	NA	
<p><b>E-6c <u>Background Groundwater Concentration Values for Proposed Parameters</u></b></p> <ul style="list-style-type: none"> <li>◦ Use of an appropriate groundwater monitoring system, and</li> <li>◦ Quarterly sampling data (mean and coefficient of variation) of upgradient wells for one year, or</li> <li>◦ Quarterly sampling data (mean and coefficient of variation) of other wells for one year, and</li> <li>◦ Data from a minimum of one sample/well and minimum of four samples for the entire system used to determine background groundwater quality, or</li> <li>◦ Presentation of procedures to calculate such values (mean and coefficient of variation)</li> </ul>	270.14(c)(6)(iii) 264.98(c)(1), (2), and (3) 264.97(g)(1) 264.97(g)(3) 265.97(g)(4)	NA	

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Subject requirement	40 CFR section Nos.	Location in application	Comments
<p>E-7a(4) (continued)</p> <ul style="list-style-type: none"> <li>- Use of an appropriate groundwater monitoring system, and</li> <li>- Data that is available prior to permit issuance</li> <li>- Data that accounts for measurement errors in sampling and analysis</li> <li>- Data that accounts for seasonal groundwater quality fluctuations</li> <li>- Data from a minimum of one sample per well and a minimum of four samples from monitoring system, each time system is sampled</li> </ul>			
<p>E-7a(5) <u>Detailed plans of an engineering report Describing Groundwater Monitoring System</u></p> <ul style="list-style-type: none"> <li>- Represent quality of groundwater passing point of compliance</li> <li>- Proposed compliance point</li> <li>- Number of wells</li> <li>- Location and depths of wells</li> <li>- Casing and construction of wells</li> </ul>	<p>270.14(c)(7)(v) 264.99(b)</p> <p>264.97(a)(2)</p> <p>264.95</p> <p>264.97(a)(2)</p> <p>264.97(a)(2)</p> <p>264.97(c)</p>	E-1	
<p>E-7a(6) <u>Description of proposed sampling and Statistical Analysis Procedures Utilized Evaluating Groundwater Data</u></p> <ul style="list-style-type: none"> <li>- Compliance period</li> <li>- Sample collection methods</li> <li>- Sample preservation/shipment</li> <li>- Analytical procedures</li> <li>- Chain-of-custody control</li> <li>- Documentation of proper sampling and analysis procedures</li> <li>- Procedures for determining groundwater elevation</li> <li>- Sampling frequency (at least quarterly)</li> <li>- Procedures for annual determination of uppermost aquifer flow rate and direction</li> <li>- Annual testing procedures for Appendix VIII constituents</li> </ul> <p>° Procedures for determining a statistically significant increase for any monitored parameters</p> <ul style="list-style-type: none"> <li>- Comparing compliance point data to the concentration limit using the procedure in 264.97(h)(2)</li> </ul>	<p>270.14(c)(7)(vi) 264.99(d),(e), (f),(g)</p> <p>264.99(d)</p> <p>264.97(d)</p> <p>264.97(d)</p> <p>264.97(d)</p> <p>264.97(d)</p> <p>264.97(e)</p> <p>264.97(f)</p> <p>264.97(d)</p> <p>264.99(e)</p> <p>264.99(f)</p> <p>264.99(h)</p>		

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Subject requirement	40 CFR section Nos.	Location in application	Comments
<p><u>E-7a(7) Procedures to be Implemented if Groundwater Protection Standard is Exceeded at Compliance Point Monitoring Well</u></p> <ul style="list-style-type: none"> <li>• Written notification to Regional Administrator</li> <li>• An application for permit modification to establish a corrective action program, including details of the program to comply with groundwater protection standard and details of groundwater monitoring to demonstrate effectiveness of the corrective action program</li> </ul>	<p>264.99(i) 264.99(j)</p>		
<p><u>E-7b An Engineering Feasibility Plan for a Corrective Action Program</u></p>	<p>270.14(c)(7) 264.98(h)(5) (i) 264.100</p>		
<p><u>E-8 Description of Corrective Action Program Program</u></p>	<p>270.14(c)(8)</p>	E-3	
<p><u>E-8a Corrective Action Program</u></p>	<p>264.100</p>		
<p><u>E-8a(1) Characterization of Contaminated</u></p> <ul style="list-style-type: none"> <li>- Identified hazardous constituents</li> <li>- Concentrations of hazardous constituents</li> </ul>	<p>270.14(c)(8)(i)</p>		
<p><u>E-8a(2) Concentration Limit for Each Hazardous constituent</u></p>	<p>270.14(c)(8)(ii) 264.100(a)</p>		
<p><u>E-8a(3) Detailed Plan and an Engineering Report Describing the Corrective Actions to be Taken</u></p> <ul style="list-style-type: none"> <li>- Time period necessary to implement corrective action program</li> </ul>	<p>264.94 270.14(c)(8) (iii) 264.100(b) 264.100(c)</p>		
<p><u>E-8a(4) Description of Groundwater Monitoring Program That Will Be Sufficient to Assess the Adequacy of Corrective Action</u></p> <ul style="list-style-type: none"> <li>• Procedure to remove or treat constituents in groundwater between compliance point and downgradient facility boundary</li> <li>• Procedure for semiannually submitting written reports to the Regional Administrator on program effectiveness</li> </ul>	<p>270.14(c)(8) (iv) 264.100(d)  264.100(e)  264.100(g)</p>		
<p><u>E-8b Alternate Concentration Limits</u></p> <ul style="list-style-type: none"> <li>• Sufficient information to establish a compliance monitoring program</li> <li>• Justification for proposed concentration limits meeting requirements of 264.94</li> </ul>	<p>270.14(c)(8) 264.99 270.14(c)(7)</p>		

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Subject requirement	40 CFR section Nos.	Location in application	Comments
<b>PART F - PROCEDURES TO PREVENT HAZARDS</b>			
<b>F-1 Security</b>			
<b>F-1a Security Procedures and Equipment</b>  Unless a waiver is granted, the Part B must include a description of the security procedures and equipment required by 264.14:	264.14 172.75(a)(4)	F-1	
<b>F-1a(1) 24-Hour Surveillance System</b>  A 24-hour surveillance system (e.g., television monitoring or surveillance by guards or facility personnel) that continuously monitors and controls entry onto the active portion of the facility:  <ul style="list-style-type: none"> <li>• Procedures and personnel to be used</li> <li>• Location and description of equipment</li> </ul>	264.14(b)(1)     Guidance Guidance	NA	
<b>F-1a(2) Barrier and Means to Control Entry</b>  (In lieu of a 24-hour surveillance system, the applicant may elect to use a barrier and other means to control entry.)	264.14(b)(2)(1)		
<b>F-1a(2)(a) Barrier</b>  An artificial or natural barrier (e.g., a fence in good repair or a fence combined with a cliff) that completely surrounds the active portion of the facility:  <ul style="list-style-type: none"> <li>• Height</li> <li>• Material of construction</li> </ul>	Guidance Guidance	F-1	
<b>F-1a(2)(b) Means to Control Entry</b>  A means to control entry, at all times, through the gates or other entrances to the active portion of the facility (e.g., an attendant, television monitors, locked entrance, or controlled roadway access to the facility):  <ul style="list-style-type: none"> <li>• Procedure and personnel to be used</li> <li>• Location and description of equipment</li> </ul>	264.14(b)(2)(11)     Guidance Guidance	F-1	

(continued)

Subject requirement	40 CFR section Nos.	Location in application	Comments
<p><b>F-1a(3) <u>Warning Signs</u></b></p> <p>The facility must have a sign with the legend, "Danger - Unauthorized Personnel Keep Out", which must:</p> <ul style="list-style-type: none"> <li>◦ Be posted at each entrance to the active portion of the facility</li> <li>◦ Be in sufficient numbers to be seen from any approach to the active portion of the facility</li> <li>◦ Legend must be in English and any other language predominated in the area</li> <li>◦ Be legible from a distance of at least 25 feet</li> </ul> <p>Existing signs with a legend other than "Danger - Unauthorized Personnel Keep Out" may be used if the legend on the sign indicates that only authorized personnel are allowed to enter the active portion and that entry onto the active portion can be dangerous.</p>	264.14(c)	F-1	
<p><b>F-1b <u>Waiver</u></b></p> <p>If a waiver of these requirements is requested, the owner or operator must demonstrate the following:</p>	264.14(a)	NA	
<p><b>F-1b(1) <u>Injury to Intruder</u></b></p> <p>Physical contact with the waste, structure, or equipment within the active portion of the facility will not injure unknowing or unauthorized persons or livestock that may enter the active portion of a facility; and</p>	264.14(a)(1)		
<p><b>F-1b(2) <u>Violation Caused by Intruder</u></b></p> <p>Disturbance of the waste or equipment by the unknowing or unauthorized entry of persons or livestock onto the active portion of a facility will not cause a violation of the requirements of 40 CFR Part 264.</p> <p>Note: To address F-1b(1) and F-1b(2) the applicant should include:</p>	264.14(a)(2)		Guidance

(continued)

Subject requirement	40 CFR section Nos.	Location in application	Comments
F-1b(2) (continued)			
<ul style="list-style-type: none"> <li>• Nature and duration of hazard potential from wastes</li> <li>• Equipment and structures to minimize potential for an intruder to 1) cause a spill; 2) mix incompatible wastes; 3) ignite ignitable or reactive wastes; 4) damage containment or monitoring systems</li> <li>• Features that prevent contact with waste</li> </ul>	<p>Guidance</p> <p>Guidance</p> <p>Guidance</p>		
<b>F-2 Inspection Schedule</b>	270.14(h)(5) 264.15		
<p>A copy of the general inspection schedule required by 264.15(b) including, where applicable, specific requirements of 264.174, 264.194, 264.226, 264.254, 264.273, 264.303, and 264.347.</p>		F-2	
<b>F-2a General Inspection Requirements</b>	270.14(b)(5) 264.15(a) and (b)		
<p>A description of the facility inspection schedule (schedule must be kept at the facility) for the following equipment:</p>			
<ul style="list-style-type: none"> <li>• Monitoring equipment</li> <li>• Emergency and safety equipment</li> <li>• Security devices</li> <li>• Operating and structural equipment that are vital to prevent, detect, or respond to environmental or human health hazards.</li> <li>• Testing as necessary of communications or alarm systems, fire protection equipment and decontamination equipment</li> </ul>	264.15(a) and (b)		
<p>Examples of monitoring equipment that should be inspected at treatment, storage, and disposal facilities are:</p>	264.33		
<ul style="list-style-type: none"> <li>• Scales</li> <li>• Flow and liquid level monitors</li> <li>• Hazardous gas detectors</li> <li>• pH monitors</li> <li>• Leachate monitors</li> <li>• Pressure sensors</li> <li>• Temperature gauges</li> </ul>	Guidance		
<p>Examples of monitoring equipment that should be inspected at facilities with incinerators are:</p>	Guidance		

(continued)

Subject requirement	40 CFR section Nos.	Location in application	Comments
<p>F-2a (continued)</p> <ul style="list-style-type: none"> <li>• Waste flow monitors and recorders</li> <li>• Auxiliary fuel flow monitors</li> <li>• Combustion air flow monitors</li> <li>• Temperature monitors</li> <li>• Flame sensors</li> <li>• CO monitors and recorders</li> <li>• Pressure differential indicators</li> <li>• Pressure sensors</li> <li>• pH monitors</li> <li>• Ammeters for measuring blower current draw</li> </ul> <p>Examples of safety and emergency equipment to be inspected at TSD facilities are:</p> <ul style="list-style-type: none"> <li>• Respirators</li> <li>• Communication systems</li> <li>• Alarm systems</li> <li>• Emergency lighting and power systems</li> <li>• Smoke detectors</li> <li>• Fire protection equipment</li> <li>• First aid equipment and supplies</li> <li>• Decontamination equipment</li> <li>• Protective clothing</li> </ul> <p>Examples of security devices to be inspected at TSD facilities are:</p> <ul style="list-style-type: none"> <li>• Surveillance systems</li> <li>• Barrier surrounding facility</li> <li>• Locking devices</li> </ul> <p>Examples of operating and structural equipment at TSD facilities are:</p> <ul style="list-style-type: none"> <li>• Spill detection devices</li> <li>• Spill control and collection equipment</li> <li>• Fire and explosion barriers</li> <li>• Ventilation equipment</li> <li>• Sump pumps</li> <li>• Bikes, bases, and foundations</li> </ul> <p>In addition, areas such as waste storage, mixing, loading, and unloading areas, which are subject to spills, must be inspected.</p>	<p>Guidance</p> <p>Guidance</p> <p>Guidance</p>		
<p>F-2a(1) <u>Types of Problems</u></p> <p>The schedule must identify the types of problems to look for during the inspection (e.g., leaks, deterioration, readings out of specified range, missing items or materials, inoperative equipment, etc.).</p>	<p>264.15(b)(3)</p>	<p>F-2</p>	

(continued)



Subject requirement	40 CFR section No.	Location in application	Comments
<p>F-2b(2) (continued)</p> <ul style="list-style-type: none"> <li>• A schedule showing the level of waste in uncovered tanks is inspected <u>daily</u></li> <li>• A schedule and procedure for assessing the condition of the tank, including detection of leaks, cracks, or wall thinning to less than minimum shell thickness</li> <li>• A procedure for emptying a tank to allow entry and inspection when necessary to detect corrosion or erosion of the tank sides and bottom</li> </ul>			
<p>F-2b(3) <u>Waste Pile Inspection</u></p> <p>The application must provide a description of the procedures to:</p> <ul style="list-style-type: none"> <li>• Inspect liners and covers during construction and immediately after installation for: <ul style="list-style-type: none"> <li>- Uniformity, damage, and imperfections, holes, cracks, thin spots, bulges, root holes, light seams and joints, permeability and compaction</li> </ul> </li> <li>• Remove the waste pile and periodically inspect liners for deterioration, cracks and other imperfections</li> <li>• Perform weekly inspections and after storms to detect: <ul style="list-style-type: none"> <li>- Deterioration, malfunctions, or improper operation of run-on and run-off control systems</li> <li>- The presence of liquids in leak detection systems, where installed</li> <li>- Proper functioning of wind dispersal control systems, where present</li> <li>- The presence of leachate in and proper functioning of leachate collection and removal systems, where present</li> </ul> </li> </ul>	<p>270.14(b)(5) 270.18(e) 264.254</p>	<p>NA</p>	
<p>F-2b(4) <u>Surface Impoundment Inspection</u></p> <p>The application must provide a description of how each surface impoundment, including the liner</p>	<p>270.14(b)(5) 270.17(d) 264.226(b)</p>	<p>F-2</p>	

(continued)

Subject requirement	40 CFR section Nos.	Location in application	Comments
<p>F-2b(4) (continued)</p> <p>and cover systems and appurtenances for control of overtopping, will be inspected <u>weekly and after storms</u> to detect evidence of any of the following:</p> <ul style="list-style-type: none"> <li>° Deterioration, malfunctions, or improper operation of overtopping topping control systems</li> <li>° Sudden drops in the level of the impoundment's contents</li> <li>° The presence of liquids in leak detection systems, where installed</li> <li>° Severe erosion or other signs of deterioration in dikes or other containment devices</li> </ul> <p>For new facilities a description of how the liners will be inspected during construction and immediately after installation to detect nonuniformity, damages, and imperfections (holes, cracks, thin spots, bulges, root holes, tight seams and joints, permeability, and compaction).</p>	<p>264.226(a)</p>		
<p>F-2b(5) <u>Incinerator Inspection</u></p> <ul style="list-style-type: none"> <li>° Incinerator and associated equipment must be inspected visually at least <u>daily</u> for leaks, spills, fugitive emissions and signs of tampering.</li> <li>° Emergency waste feed cut-off system and associated alarms must be tested <u>weekly</u> unless the applicant demonstrates that weekly frequency is unduly restrictive and that less frequent inspection will be adequate. At minimum operational testing must be conducted <u>monthly</u>.</li> </ul>	<p>264.347</p>	<p>NA</p>	
<p>F-2b(6) <u>Landfill Inspection</u></p> <p>Landfill owners or operators must provide a description of procedures for:</p> <ul style="list-style-type: none"> <li>° For new facilities, inspection of liners/covers during and immediately after installation</li> <li>° Inspections <u>weekly and after storms</u> for</li> </ul>	<p>270.21(d) 264.15(a) 264.303</p>	<p>NA</p>	

(continued)

Subject requirement	40 CFR section Nos.	Location in application	Comments
<p>F-2b(6) (continued)</p> <ul style="list-style-type: none"> <li>- Operation of run-on/run-off controls</li> <li>- Liquids in leak detection system</li> <li>- Proper functioning of wind dispersal controls</li> <li>- Leachate in and proper operation of leachate collection/removal system</li> </ul>			
<p>F-2b(7) <u>Land Treatment Inspection</u></p> <p>A description of the inspection procedures. Specifically the unit must be inspected weekly and after storms for:</p> <ul style="list-style-type: none"> <li>• Deterioration, malfunctions, or improper operation of run-on and run-off control systems</li> <li>• Improper functioning of wind dispersal control measures</li> </ul>	<p>270.20(c)(5) 264.273(g)</p>	<p>NA</p>	
<p>F-2c <u>Remedial Action</u></p> <p>A description of procedures for taking remedial actions when inspections reveal problems or when problems are imminent. [These may alternately be described in the contingency plan (see 264.194(c), 264.227, 264.171)].</p>	<p>264.15(c)</p>	<p>F-2</p>	
<p>F-2d <u>Inspection Log</u></p> <p>A copy or description of the inspection log or summary form including the following:</p> <ul style="list-style-type: none"> <li>• Dates and times of inspections</li> <li>• Name(s) of inspector(s)</li> <li>• Observations made</li> <li>• Date and nature of repairs or remedial actions taken</li> </ul>	<p>264.73(b)(5) 264.15(d)</p>	<p>F-2</p>	
<p>F-3 <u>Waiver of Preparedness and Prevention Requirements</u></p> <p>A justification of any request for a waiver of preparedness and prevention requirements of Part 264, Subpart C.</p>	<p>270.14(b)(6)</p>	<p>NA</p>	
<p>F-3a <u>Equipment Requirements</u></p> <p>Unless it can be demonstrated that none of the hazards posed by waste handled at the facility could require a particular kind of</p>	<p>264.32</p>		

(continued)

Subject, requirement	40 CFR section Nos.	Location in application	Comments
F-3a (continued) :			
equipment specified below, the facility must have the following equipment: (These requirements are not specifically listed in 270.14-270.29 for inclusion in a Part B.)			
<b>F-3a(1) Internal Communications</b> An internal communications or alarm system capable of providing immediate emergency instruction (voice or signal) to facility personnel.	264.32(a)	NA	
<b>F-3a(2) External Communications</b> A device such as a telephone (immediately available at the scene of operations) or a handheld two-way radio, for summoning emergency assistance from local police departments, or state or local emergency response teams.	264.32(b)	NA	
<b>F-3a(3) Emergency Equipment</b> <ul style="list-style-type: none"> <li>• Fire control equipment (including special extinguishing equipment, such as that using foam, inert gas, or dry chemicals and portable fire extinguishers</li> <li>• Spill control equipment</li> <li>• Decontamination equipment</li> </ul>	264.32(c)	NA	
<b>F-3a(4) Water for Fire Control</b> One of the following: <ul style="list-style-type: none"> <li>• Water at adequate volume and pressure to supply water hose streams, or</li> <li>• Foam-producing equipment, or</li> <li>• Automatic sprinklers or water spray systems</li> </ul>	264.32(d)	NA	
<b>F-3b Aisle Space Requirement</b> Requests for a waiver of the aisle space requirement must be accompanied by a demonstration that aisle space is not needed to allow the unobstructed movement of personnel, fire protection equipment, or spill control equipment to any area of facility operation in an emergency.	264.35	NA	

(continued)

Subject requirement	40 CFR section Nos.	Location in application	Comments
<b>F-4 Preventive Procedures, Structures, and Equipment</b>	270.14(b)(8)		
A description of procedures, structures, or equipment used at the facility for the following must be included:		F-3	
<b>F-4a Unloading Operations</b>			
Prevention of hazards in unloading operations (e.g., use of ramps or special forklifts).	270.14(b)(8)(i)		
<b>F-4b Runoff</b>			
Prevention of runoff from hazardous waste handling areas to other areas of the facility or environment, or prevention of flooding (e.g., berms, dikes, trenches).	270.14(b)(8)(ii)		
<b>F-4c Water Supplies</b>			
Prevention of contamination of water supplies.	270.14(b)(8)(iii)		
<b>F-4d Equipment and Power Failure</b>			
Mitigation of effects of equipment failure and power outages.	270.14(b)(8)(iv)		
<b>F-4e Personal Protection Equipment</b>			
Prevention of undue exposure of personnel to hazardous waste (e.g., protective clothing).	270.14(b)(8)(v)		
<b>F-5 Prevention of Reaction of Ignitable, Reactive and Incompatible Wastes</b>		NA	
<b>F-5a Precautions to Prevent Ignition or Reaction of Ignitable or Reactive Waste</b>	270.14(b)(9) 264.17(a) and (c)		
A description of the precautions taken by a facility that handles ignitable, reactive or incompatible waste to demonstrate compliance with 264.17 including documentation demonstrating compliance with 264.17(c). Precautions to prevent actual ignition, including separation from sources of ignition such as:			
<ul style="list-style-type: none"> <li>• Open flames</li> <li>• Smoking</li> <li>• Cutting and welding</li> <li>• Hot surfaces</li> <li>• Frictional heat</li> </ul>			

(continued)

Subject, requirement	40 CFR section Nos.	References	Location in application	Comments
<p>r-5a (continued) 1</p> <ul style="list-style-type: none"> <li>• Sparks (static, electrical, or mechanical)</li> <li>• Spontaneous ignition (heat producing chemical reactions)</li> <li>• Radiant heat</li> </ul> <p>Demonstration that when ignitable or reactive waste is being handled, the owner or operator confines smoking and open flames to specially designated locations. "No Smoking" signs must be conspicuously placed wherever a hazard exists from ignitable or reactive waste.</p>				
<p><b>F-5b</b> <u>General Precautions for Handling Ignitable or Reactive Waste and Mixing of Incompatible Waste</u></p> <p>A description of the precautions taken by a facility that treats, stores, or disposes of ignitable or reactive waste, or accidentally mixes incompatible waste or incompatible wastes and other materials, to prevent reactions which: (1) generate extreme heat or pressure, fire or explosions or violent reactions; (2) produce uncontrolled flammable fumes, dusts, or gases in sufficient quantities to threaten human health or the environment; (3) produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions; (4) damage the structural integrity of the device or facility; (5) by similar means threaten human health or the environment.</p> <p>Documentation to meet requirements of 264.17(a) or (b) may be based on references to published scientific or engineering literature, data from trial tests, waste analyses, or results of treatment of similar wastes by similar treatment processes and under similar operating conditions.</p>	<p>270.14(b)(9) 264.17(b) and (c)</p> <p>264.17(c)</p>		<p>NA</p>	
<p><b>F-5c</b> <u>Management of Ignitable or Reactive Wastes In Containers</u></p> <p>Sketches, drawings, or data demonstrating that containers of ignitable or reactive waste are located at least 15 meters (50 feet) from the facility's property line.</p>	<p>270.15(c) 264.176</p>		<p>NA</p>	

(continued)

Subject requirement	40 CFR section Nos.	Location in application	Comments
<p><b>F-5d</b> <u>Management of Incompatible Wastes in Containers</u></p> <p>A description of procedures to demonstrate compliance with 264.177(a) and (b) and 264.17(b) and (c).</p> <ul style="list-style-type: none"> <li>• The procedures used to ensure that incompatible wastes and materials are not placed in the same container (unless 264.17(b) is complied with) or in an unwashed container that previously held incompatible waste</li> <li>• Dikes, berms, walls, or other devices used to separate wastes in containers, piles, open tanks, or surface impoundments</li> </ul>	<p>270.15(d) 264.177(a)</p> <p>264.177(h)</p>	<p>NA</p>	
<p><b>F-5e</b> <u>Management of Ignitable or Reactive Wastes in Tanks</u></p> <p>A description of the procedures for handling incompatible, ignitable, or reactive wastes, including the use of buffer zones. 264 requirements include:</p> <ul style="list-style-type: none"> <li>• Waste must be treated, rendered, or mixed before or immediately after placement in the tank so that it is no longer considered ignitable and complies with 264.17(b); or the waste is stored or treated in such a way that it is protected from any material or conditions that may cause the waste to react or ignite; or the tank is used solely for emergencies</li> <li>• Facilities that treat or store ignitable or reactive waste in covered tanks must comply with the National Fire Protection Association's buffer zone requirements for tanks</li> </ul>	<p>270.16(f)</p> <p>264.198(a)</p> <p>264.198(b)</p>	<p>NA</p>	
<p><b>F-5f</b> <u>Incompatible Wastes in Tanks</u></p> <p>A statement that incompatible wastes and materials are not stored in the same tank or in an unwashed tank that previously held an incompatible waste or material (unless 264.17(b) is complied with).</p>	<p>270.16(f) 264.199(b)</p>	<p>NA</p>	
<p><b>F-5g</b> <u>Ignitable or Reactive Wastes in Waste Piles</u></p> <p>The application must include a description of the procedures for handling ignitable,</p>	<p>270.18(q) 264.256 264.17</p>	<p>NA</p>	

(continued)

Subject, requirement	40 CFR section Nos.	Location in application	Comments
1-5g (continued) :			
<p>or reactive wastes, including the use of buffer zones. Waste must be treated, rendered, or mixed before or immediately after placement in the waste pile so that it is no longer considered ignitable and complies with 264.17(b); or the waste is stored or treated in such a way that it is protected from any material or conditions that may cause the waste to react or ignite.</p>			
F-5h <u>Incompatible Wastes in Waste Piles</u>	270.10(h) 264.257	NA	
The application must include:			
<ul style="list-style-type: none"> <li>• A statement that incompatible wastes and materials are not stored in the same waste pile or on the same base that previously held an incompatible waste or material unless 264.17(b) is complied with</li> </ul>			
<ul style="list-style-type: none"> <li>• A description of the procedures (dikes, beams, walls, distances) utilized to separate a waste pile of hazardous waste that is incompatible with any waste or other material stored nearby</li> </ul>			
F-5i <u>Ignitable or Reactive Wastes in Surface Impoundments</u>	270.17(h) 264.229	NA	
<ul style="list-style-type: none"> <li>• A description of the procedures for handling ignitable, or reactive wastes, including the use of buffer zones. Waste must be treated, rendered, or mixed before or immediately after placement in the surface impoundment so that it is no longer considered ignitable and complies with §264.17(b); or</li> <li>• the waste is stored or treated in such a way that it is protected from any material or conditions that may cause the waste to react or ignite; or</li> <li>• The impoundment is used only for emergencies</li> </ul>	270.17(i) 264.230		
F-5j <u>Incompatible Wastes in Surface Impoundments</u>			
The application must include:			
<ul style="list-style-type: none"> <li>• A statement that incompatible wastes and materials are not stored in the same surface impoundment or in the</li> </ul>		NA	

(continued)

Subject requirement	40 CFR section Nos.	Location in application	Comments
F-5j (continued)			
<p>impoundment that previously held an incompatible waste or material unless 264.17(b) is complied with</p>			
<p><b>F-5k <u>Ignitable or Reactive Wastes in Landfills</u></b></p> <p>Documentation of procedures for:</p> <ul style="list-style-type: none"> <li>• Rendering wastes nonreactive or ignitable prior to or immediately after placement in the landfill</li> <li>• Preventing reactions</li> <li>• Protecting ignitable wastes in containers from materials or conditions that may cause them to ignite</li> </ul>	<p>270.21(f) 264.312</p>	<p>NA</p>	
<p><b>F-5l <u>Incompatible Wastes in Landfills</u></b></p> <p>Applicant must provide procedures for:</p> <ul style="list-style-type: none"> <li>• Insuring that incompatible wastes will not be disposed of in the same landfill cell</li> </ul>	<p>270.21(g) 264.313</p>	<p>NA</p>	
<p><b>F-5m <u>Liquid Wastes in Landfills</u></b></p> <ul style="list-style-type: none"> <li>• For landfills without a liner and leachate collection/removal system, method(s) used to stabilize bulk waste containing free liquids so that no free liquids remain when landfilled</li> <li>• Procedures for removing or stabilizing free-standing liquids in containers</li> </ul>	<p>270.21(h) 264.314(a)</p>	<p>NA</p>	
<p><b>F-5n <u>Special Requirements for Containers Disposed in Landfills</u></b></p> <p>Documentation of procedures for ensuring that containers (except very small ones) are at least 90 percent full when placed in the landfill</p> <ul style="list-style-type: none"> <li>• Documentation of procedures for crushing, shredding, or reducing volume of empty containers prior to landfilling</li> <li>• Description of procedures, containers, and materials used to ensure that lab packs comply with all requirements of 264.316</li> </ul>	<p>270.21(i) 264.314 264.315 264.316</p>	<p>NA</p>	
<p><b>F-5o <u>Ignitable or Reactive Wastes in Land Treatment</u></b></p> <p>A description of the management of ignitable or reactive wastes which will be placed in or on the treatment zone, if</p>	<p>270.20(g) 264.281 264.17(b)</p>	<p>NA</p>	

(continued)

Subject requirement	40 CFR section Nos.	Location in application	Comments
<p>F-5o (continued) <sup>1</sup></p> <p>applicable, and an explanation of how the following requirements will be complied with:</p> <ul style="list-style-type: none"> <li>• The waste is immediately incorporated into the soil so that the resulting waste, mixture, or dissolution of material no longer meets the definition of ignitable or reactive waste and the requirements of 264.17(b) are complied with, or</li> <li>• The waste is managed in such a way that it is protected from any material or conditions which may cause it to ignite or react</li> </ul>			
<p>F-5p <u>Incompatible Wastes in Land Treatment</u></p> <p>A description of the management of incompatible wastes must be submitted if incompatible wastes, or incompatible wastes and materials, will be placed in or the same treatment zone including an explanation of how the following requirements will be complied with:</p> <ul style="list-style-type: none"> <li>• The incompatible wastes, or incompatible wastes and materials must not place in or on the same treatment zone, unless 264.17(b) is complied with</li> </ul>	<p>270.20(h) 265.282 264.17(b)</p>	<p>NA</p>	
<p><b>PART G - CONTINGENCY PLAN</b></p> <p>A copy of the contingency plan required in Part 264, Subpart D. Include, where applicable, specific requirements in 264.227 and 264.255.</p> <p>An existing spill prevention control plan can be amended to incorporate hazardous waste management provisions sufficient to comply with 264, Subpart D requirements.</p>	<p>270.14(b)(?) 264.50 through 264.56</p>	<p>G</p>	
<p>G-1 <u>General Information</u></p> <ul style="list-style-type: none"> <li>• Facility name and location and owner or operator name</li> <li>• Site plan</li> <li>• Description of facility operations</li> </ul> <p>(continued)</p>	<p>264.52 264.53 265.37</p>	<p>A</p>	

Subject requirement	40 CFR section Nos.	Location in application	Comments
<b>G-2 <u>Emergency Coordinators</u></b> <ul style="list-style-type: none"> <li>• Names, addresses, office and home phone numbers, and duties of primary and alternate coordinators in sequence as alternates</li> <li>• A statement authorizing designated coordinators to commit the necessary resources to implement the contingency plan</li> <li>• Can reach facility in short period of time</li> </ul>	264.52(d) 264.55	G	
<b>G-3 <u>Implementation</u></b> <p>Criteria for implementation of contingency plan for any potential emergency</p> <ul style="list-style-type: none"> <li>• Fires/explosions</li> <li>• Unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water</li> </ul>	264.52(a) 264.56(d)	G	
<b>G-4 <u>Emergency Response Procedures</u></b>			
<b>G-4a <u>Notification</u></b> <p>Methodology for immediate notification of facility personnel and necessary state or local agencies.</p>	264.56(a)	G	
<b>G-4b <u>Identification of Hazardous Materials</u></b> <p>Available data and/or procedures for identification of hazardous materials involved in the emergency and quantity and areal extent of release. Include information on:</p> <ul style="list-style-type: none"> <li>• Characteristics of waste</li> <li>• Exact source</li> <li>• Amount</li> <li>• Areal extent of release</li> </ul>	264.56(b)	G	
<b>G-4c <u>Hazard Assessment</u></b> <ul style="list-style-type: none"> <li>• Procedure for assessment of possible hazards to the environment and human health</li> <li>• Procedure for determining the need for evacuation and notification of authorities. The authorities to be notified must include the On-Scene-Coordinator for that area or the National Response Center</li> </ul>	264.56(c) 264.56(d)	G	

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Subject, requirement	40 CFR section Nos.	Location in application	Comments
<b>G-4d Control Procedures</b> <ul style="list-style-type: none"> <li>• Specific responses and control procedures to be taken in the event of a fire, explosion, or release of hazardous waste to air, land, or water</li> </ul>	264.52(x)	G	
<b>G-4e Prevention of Recurrence or Spread of Fires, Explosions, or Releases</b> <p>During an emergency situation, a description of the necessary steps to be taken to ensure that fires, explosions, or releases do not occur, reoccur, or spread to other hazardous waste at the facility. Steps must include, where applicable:</p> <ul style="list-style-type: none"> <li>• Shut-down of processes and continued monitoring of them</li> <li>• Collecting, containing, and treating released wastes</li> <li>• Removing and isolating containers</li> <li>• Proper use of fire control structures (e.g., fire doors), systems (e.g., sprinkler systems), and equipment (e.g., extinguishers)</li> </ul>	264.56(e)  Guidance	G	
<b>G-4f Storage and Treatment of Released Material</b> <ul style="list-style-type: none"> <li>• Provisions to monitor for leaks, pressure buildup, gas generation, or ruptures as appropriate if operations at the facility are stopped in response to a release, fire or explosion</li> <li>• Provisions for treatment, storage, or disposal of any hazardous waste resulting from a release, fire, or explosion at the facility</li> <li>• Equipment available</li> <li>• Procedures for deployment of these resources</li> <li>• Methods to contain, treat, and clean up a hazardous release and decontaminate the affected area</li> </ul>	264.56(f) 264.56(g)  Guidance Guidance Guidance	G	
<b>G-4g Incompatible Waste</b> <p>Provisions for preventing waste which is incompatible with the released material from being treated, stored, or located in the affected areas until cleanup procedures are completed.</p>	264.56(h)(1)	G	

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Subject requirement	40 CFR section Nos.	Location in application	Comments
<b>G-4h <u>Post-Emergency Equipment Maintenance</u></b> Procedures for ensuring that all emergency equipment listed in the contingency plan is cleaned and fit for its intended use before operations are resumed. (This includes advising authorities)	264.56(h)(2)  264.56(i)	G	
<b>G-4i <u>Container Spills and Leakage</u></b> Procedures for responding to container spills or leakage including removal of spilled waste and repair or replacement of containers.	264.171	G	
<b>G-4j <u>Tank Spills and Leakage</u></b> Procedures for responding to tank spills or leakage including removal of spilled waste and repair of tank.	264.194(c)	G	
<b>G-4k <u>Waste Pile Spills and Leakage</u></b> The application must describe the procedures to be used when responding to waste pile spills and leakage: <ul style="list-style-type: none"> <li>• Notify Regional Administrator if liquids are detected in a leak detection system</li> <li>• Procedures and criteria for identifying removing accumulated liquids, repairing or replacing the liner(s)</li> <li>• Obtain qualified engineer certification of repairs and probability of leakage</li> <li>• Procedures and criteria for enacting groundwater detection, compliance, and corrective action programs</li> <li>• Procedures and criteria which will be used if an inspectable liner is found to be deteriorating, cracking or defective</li> </ul>	270.14(b)(7) 264.252 264.253	NA	
<b>G-4l <u>Surface Impoundments Spills, Leakage and Sudden Drops</u></b> The application must describe the procedures to be used when responding to surface impoundment spills and leakage: <ul style="list-style-type: none"> <li>• Procedures for notifying Regional Administrator if liquids are detected in a leak detection system</li> </ul>	270.14(b)(7) 264.222 264.227	D	

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Subject requirement	40 CFR section Nos.	Location in application	Comments
<p>G-4I (continued):</p> <ul style="list-style-type: none"> <li>• Procedures and criteria for identifying and removing accumulated liquids, repairing or replacing the liner(s)</li> <li>• Procedures and criteria for enacting groundwater detection, compliance, and corrective action programs</li> <li>• Procedures for stopping waste additions</li> <li>• Procedures for stopping leaks and preventing sudden drops and preventing catastrophic failure</li> <li>• Procedures and criteria for emptying impoundment</li> </ul> <p>• Obtain qualified engineers certification of repairs and probability of leakage or failure</p>		D	
<p>G-4m <u>Landfill Leakage</u></p> <p>G-4m(1) <u>Liner Repair and Replacement</u></p> <p>For double-lined landfills with leak detection systems when liquid is detected in the system:</p> <ul style="list-style-type: none"> <li>• Procedures to notify the Regional Administrator within 7 days</li> <li>• Procedures to remove accumulated liquid</li> <li>• Procedures to repair or replace the facility liner</li> <li>• Obtain certification from a qualified engineer that the leak has been stopped.</li> </ul>	<p>264.302(b)(1) 264.302(b)(2) (1)</p>	NA	
<p>G-4m(2) <u>Detection Monitoring Program</u></p> <p>If liquid is detected in the leak detection system and a detection monitoring program is established as a permit condition:</p> <ul style="list-style-type: none"> <li>• Procedures that will be taken by the landfill owner or operator to implement the detection monitoring program</li> </ul>	<p>264.302(b)(2) (1)</p>		
<p>G-5 <u>Emergency Equipment</u></p> <p>Location, description, and capabilities of emergency equipment. This should include:</p> <p>(continued)</p>	<p>264.52(e)</p>	G	

Subject requirement	40 CFR section Nos.	Location in application	Comments
G-5 (continued) , <ul style="list-style-type: none"> <li>• Spill control equipment</li> <li>• Fire control equipment</li> <li>• Personnel protective items such as respirators and protective clothing</li> <li>• First aid and medical supplies</li> <li>• Emergency decontamination equipment</li> <li>• Emergency communication and alarm systems</li> </ul>	Guidance		
G-6 <u>Coordination Agreements</u> <ul style="list-style-type: none"> <li>• A description of coordination agreements with local police and fire departments, hospitals, contractors, and state and local emergency response teams to familiarize them with the facility and actions needed in case of emergency</li> <li>• A statement indicating that a copy of the contingency plan has been submitted to these organizations</li> <li>• If applicable, documentation of refusal to enter into a coordination agreement</li> </ul>	264.37 264.52(c)  264.53(b)  264.37(b)	G	
G-7 <u>Evacuation Plan</u> The plan must include: <ul style="list-style-type: none"> <li>• Criteria for evacuation</li> <li>• A description of signal(s) to be used to begin evacuation</li> <li>• Primary and alternate evacuation routes</li> </ul>	264.52(f)	G	
G-8 <u>Required Reports</u> <ul style="list-style-type: none"> <li>• Provisions for submission of reports of emergency incidents within 15 days of occurrence</li> <li>• Notation of such incidents in the operating record identifying the time, date, and details of these emergency incidents</li> </ul>	264.56(j)	G	
PART H - PERSONNEL TRAINING	270.14(b)(12) 264.16	H	
H-1 <u>Outline of Training Program</u> An outline of both the introductory and continuing training programs by owners or operators to prepare the personnel to operate and maintain the facility in a safe manner as required to demonstrate compliance with 264.16. Include a brief description of how training	270.14(b)(12)		

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Subject requirement	40 CFR section Nos.	Location in application	Comments
H-1 (continued)			
<p>will be designed to meet actual job tasks in accordance with requirements in 264.16(a)(3). (Note: On-the-job training may be used to comply with these requirements.)</p>			
<p><b>H-1a Job Titles and Duties</b></p> <p>For each employee whose position at the facility is related to hazardous waste management, the following must be maintained at the facility:</p> <ul style="list-style-type: none"> <li>• Job title</li> <li>• Job duties</li> <li>• Job description</li> </ul>	<p>264.16(d)(1) 264.16(d)(2)</p>	<p>H</p>	
<p><b>H-1b Training Content, Frequency, and Techniques</b></p> <p>In both introductory and continuing training (including an annual review of the initial training) for each employee describe:</p> <ul style="list-style-type: none"> <li>• Training content</li> <li>• Frequency of training</li> <li>• Technique(s) used in training</li> </ul>	<p>264.16(d)(3) 264.16(c) 264.16(a)(1)</p>	<p>H</p>	
<p><b>H-1c Training Director</b></p> <p>Demonstration that the program is directed by a person trained in hazardous waste management.</p> <ul style="list-style-type: none"> <li>• Credentials of training director</li> </ul>	<p>264.16(a)(2)</p> <p>Guidance</p>	<p>H</p>	
<p><b>H-1d Relevance of Training to Job Position</b></p> <p>A brief description of how instructions of facility personnel in hazardous waste management procedures (including contingency plan implementation) is relevant to their positions. (To demonstrate compliance with 264.16(a)(2).)</p>	<p>264.16(a)(2)</p>	<p>H</p>	
<p><b>H-1e Training for Emergency Response</b></p> <p>Documentation that the training program trains facility personnel to respond effectively to emergencies and trains them to be familiar with emergency procedures, emergency equipment, and emergency systems, include where applicable:</p> <ul style="list-style-type: none"> <li>• Procedures for using, inspecting, repairing, and replacing facility emergency and monitoring equipment</li> </ul>	<p>264.16(a)(3)</p> <p>264.16(a)(3)(1)</p>	<p>H</p>	

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Subject requirement	40 CFR section Nos.	Location in application	Comments
<p>H-1e (continued),</p> <ul style="list-style-type: none"> <li>• Key parameters for automatic waste feed cutoff systems</li> <li>• Communications or alarm systems</li> <li>• Response to fires or explosions</li> <li>• Response to groundwater contamination incidents</li> <li>• Shutdown of operations</li> </ul>	<p>264.16(a)(3)(ii)  264.16(a)(3)(iii)  264.16(a)(3)(iv)  264.16(a)(3)(v)  264.16(a)(3)(vi)</p>		
<p>H-2 <u>Implementation of Training Program</u></p> <ul style="list-style-type: none"> <li>• Indication that training has been and will be successfully completed by facility personnel within 6 months of their employment or assignment to a facility, or transfer to a new position at a facility, whichever is later. (Note: employees hired after the effective date of these regulations must not work in unsupervised positions until they have completed the training requirements.)</li> <li>• Records documenting that the required training has been given to and completed by facility personnel must be maintained</li> </ul>	<p>264.16(d)(4)  264.16(b)</p>	<p>H</p>	
<p><b>PART I - CLOSURE PLANS, POSTCLOSURE PLANS, AND FINANCIAL REQUIREMENTS</b></p>	<p>270.14(b)(13);  270.14(b)(15)  270.14(b)(16)  270.14(b)(17)  270.14(b)(18)  264.110-  264.115,  264.351,  264.178,  264.197  264.258  264.228  264.280  264.310</p>		
<p><b>I-1 <u>Closure Plans</u></b></p> <p>A copy of the written closure plan required by 264.112 and consistent with items I-1a through I-1f.</p> <p>Where applicable, the specific requirements in 264.178, 264.197, 264.228, 264.258, 264.280, 264.310, and 264.351, must be included.</p>	<p>270.14(b)(13)</p>	<p>I-1</p>	

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Subject, requirement	40 CFR section Nos.	Location in application	Comments
<b>1-1a Closure Performance Standard</b> A description of how closure <ul style="list-style-type: none"> <li>• Minimizes the need for postclosure maintenance</li> <li>• Minimizes or eliminates releases of hazardous wastes, hazardous waste constituents, leachate, and contaminated rainfall to the air, groundwater, surface water, and surrounding land</li> </ul>	264.111 (264.112 requires consistency with 264.111)	I-1	
<b>1-1b Partial Closure and Final Closure Activities</b> Fully describe time and all activities required for: <ul style="list-style-type: none"> <li>• Partial closure, if applicable</li> <li>• Final closure</li> <li>• Maximum extent of operation which will be active during life of facility</li> </ul> Description must identify how requirements of 264.111, 264.113, 264.114, 264.115 and applicable requirements of 264.178, 264.197, 264.228, 264.258, 264.280, 264.310, and 264.351 will be met.	264.112(a)(1) (264.112(a)(1) through 264.112(a)(4) outline minimum acceptable plan elements)	I-1	
<b>1-1c Maximum Waste Inventory</b> A description of the maximum inventory of wastes that could be in storage, treatment and disposal at any time during the life of the facility.	264.112(n)(2)	I-1	
<b>1-1d Schedule for Closure</b> A schedule for final closure including: <ul style="list-style-type: none"> <li>• Estimated expected year of closure</li> <li>• Closure schedule with total time to close, time for intervening closure activities, and inspection schedule during closure</li> </ul>	264.112(o)(4)	I-1	
<b>1-1d(1) Time Allowed for Closure</b> The schedule for closure must show <ul style="list-style-type: none"> <li>• All hazardous wastes will be treated, removed off-site, or disposed of on-site within 90 days from receipt of final volume of waste</li> <li>• All closure activities will be completed within 180 days from receipt of final volume of waste</li> </ul>	264.113(a) and (b)		

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Subject, requirement	40 CFR section Nos.	Location in application	Comments
<p><b>1-1d(1)(a) Extensions for Closure Time</b></p> <p>A petition made to the Regional Administrator for a schedule for closure which exceeds the 90 days for treatment, removal, or disposal of wastes and/or the 180 days for completion of closure activities made to the Regional Administrator. One of the following must be demonstrated:</p> <ul style="list-style-type: none"> <li>• Closure activities require longer than 180 days (or facility has capacity to receive additional wastes).</li> <li>• There is a reasonable likelihood that a person other than owner or operator will recommence operation of the site</li> <li>• Closure would be incompatible with continued operation</li> </ul> <p>Demonstrate that all steps have and will be taken to prevent threats to human health and environment from unclosed but inactive facility.</p>	<p>264.113(a) 264.113(b)</p>	<p>NA</p>	
<p><b>1-1e Inventory Disposal, Removal or Decontamination of Equipment</b></p> <p>A description of how all facility equipment and structures will be decontaminated or disposed of when closure is completed. The following should be included:</p> <ul style="list-style-type: none"> <li>• Decontamination procedures</li> <li>• Criteria for determining contamination</li> <li>• List equipment</li> <li>• Disposal of contaminated soil</li> <li>• Decontamination of clean up materials, equipment, and residues</li> <li>• Demonstrate decontamination has been effective</li> </ul>	<p>264.114</p> <p>Guidance Guidance Guidance Guidance Guidance</p>	<p>I-1</p>	
<p><b>1-1e(1) Closure of Containers</b></p> <p>A description of how at closure, all hazardous waste residues will be removed from the containment system, and how remaining containers, bases, and soil containing or contaminated</p>	<p>264.178</p>	<p>NA</p>	

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Subject requirement	40 CFR section Nos.	Location in application	Comments
<p>1-1e(1) (continued)</p> <p>with hazardous waste or hazardous waste residues will be decontaminated or removed.</p> <ul style="list-style-type: none"> <li>• Hazardous waste removal and disposal</li> <li>• Container decontamination and disposal</li> <li>• Site decontamination and disposal including linings, soil, and washes</li> <li>• Verification of decontamination</li> <li>• Maximum inventory</li> </ul> <p>The description should address the following:</p>	<p>Guidance Guidance Guidance Guidance</p>		
<p>1-1e(2) <u>Closure of Tanks</u></p> <p>A description of how at closure, all hazardous waste residues will be removed from tanks, discharge control equipment, and discharge confinement structure, and the facility will be decontaminated. The description should address the following:</p> <ul style="list-style-type: none"> <li>• Waste removal from tanks and equipment</li> <li>• Decontamination of all components</li> <li>• Verification of decontamination</li> <li>• Disposal of wastes and residues</li> <li>• Maximum inventory</li> </ul>	<p>264.197</p> <p>Guidance Guidance Guidance Guidance</p>	<p>NA</p>	
<p>1-1e(3) <u>Closure of Waste Piles (Reserved)</u></p> <p>The application must describe how all hazardous waste residues, contaminated containment system components (liners, etc.), contaminated subsoils, and structures and equipment contaminated with waste and leachate will be removed or decontaminated at closure and managed as hazardous waste. If any wastes, waste residues or contaminated materials or soils will remain after closure, provide plans for closing the pile as a landfill [1-1f(6)] and provide postclosure plan [1-2]. Piles without liners or with liners that do not meet the requirements of D-3e must also provide contingent plans for closing the facility as a landfill</p>	<p>270.17(f) 264.258</p>	<p>NA</p>	

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Subject, requirement	40 CFR section Nos.	Location in application	Comments
<p><b>1-1e(3) (continued)</b></p> <p>[1-1d(6)] and a contingent post-closure [1-2], except for dry, enclosed piles meeting the requirements of D-3b or piles for which a liner exemption is sought in accordance with D-3c.</p> <ul style="list-style-type: none"> <li>• Procedure and criteria for determining whether or not decontamination has been successful</li> <li>• Sampling and analytical techniques</li> <li>• Continuance of treatment during closure (if appropriate)</li> </ul>	<p>Guidance</p> <p>Guidance</p> <p>Guidance</p>		
<p><b>1-1e(4) Closure of Surface Impoundments</b></p> <p>A description of how all hazardous waste residues, contaminated containment system components (liners, etc.), contaminated subsoils, and structures and equipment contaminated with waste and leachate will be removed or decontaminated at closure and managed as hazardous waste. If any wastes, waste residues or contaminated materials or soils will remain after closure, provide plans for closing the surface impoundment as landfill [1-1e(6)] and provide post-closure plans [1-2]. Surface impoundments without liners or with liners that do not meet the requirements of D-4d must also provide contingent plans for closure as a landfill [1-1e(6)] and a contingent post-closure plan [1-2], except for impoundments requesting a liner exemption in accordance with D-4b.</p> <ul style="list-style-type: none"> <li>• Procedure and criteria for determining whether or not decontamination has been successful</li> <li>• Sampling and analytical techniques</li> <li>• Continuance of treatment during closure (if appropriate)</li> </ul>	<p>270.17(g) 264.228</p> <p>Guidance</p> <p>Guidance</p> <p>Guidance</p>	<p>I-1</p>	
<p><b>1-1e(5) Closure of Incinerators</b></p> <p>Description of how at closure all hazardous residues will be removed from the incinerator, associated ductwork, piping, air pollution control</p>	<p>264.351</p>	<p>NA</p>	

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Subject requirement	40 CFR section Nos.	Location in application	Comments
<p>I-1e(5) (continued)</p> <p>equipment, sumps, and any other structures or operating equipment such as pumps, valves, etc., that have come into contact with the hazardous waste. Alternatively, a description of how the incinerator and associated units and equipment will be dismantled and disposed of as a hazardous waste will suffice.</p>			
<p>I-1e(6) <u>Closure of Landfills</u></p> <p>Provide detailed plans and an engineering report which describes the final cover components in detail. These detailed plans and engineering report must describe how the final cover will:</p> <ul style="list-style-type: none"> <li>• Provide long-term minimization of migration of liquids through closed landfill</li> <li>• Function with minimum maintenance</li> <li>• Promote drainage and minimize erosion/abrasion</li> <li>• Settle/subside without losing integrity</li> <li>• Be less permeable than bottom liners or subsoils</li> </ul>	<p>270.21(e) 264.310(a)</p>	<p>I-1</p>	<p>I-1</p>
<p>I-1e(7) <u>Closure of Land Treatment</u></p> <p>During closure of land treatment facilities the owner or operator must comply with the following:</p> <ul style="list-style-type: none"> <li>• Continued all operations (including pH control) necessary to maximize degradation, transformation, or immobilization of hazardous constituents within the treatment zone as required, except to the extent such measures are inconsistent with 264.280(a)(8)</li> <li>• Continue all operations in the treatment zone to minimize run-off of hazardous constituents</li> <li>• Maintain the run-on control system</li> <li>• Maintain the run-off management system</li> <li>• Control wind dispersal of hazardous waste if required</li> </ul>	<p>270.28(f) 264.280(a) 264.280(b)</p>	<p>NA</p>	

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Subject requirement	40 CFR section Nos.	Location in application	Comments
<p><b>1-1e(7) (continued)</b></p> <ul style="list-style-type: none"> <li>• Continue to comply with any prohibitions or conditions concerning growth of food-chain crops</li> <li>• Continue unsaturated zone monitoring except that soil-pore liquid monitoring may be terminated 90 days after the last application of waste to the treatment zone</li> <li>• Establish a vegetative cover on the portion of the facility being closed at such time that the cover will not substantially impede degradation, transformation, or immobilization of hazardous constituents in the treatment zone. The vegetative cover must be capable of maintaining growth without extensive maintenance</li> </ul> <p>When closure is complete the owner or operator may submit to the Regional Administrator certification by an independent qualified soil scientist, in lieu of an independent registered professional engineer, that the facility has been closed in accordance with the specifications in the approved closure plan.</p>			
<p><b>1-2 Post-Closure Plan</b></p>		I-1	
<p><b>1-2a Post-Closure Plan</b></p> <p>An owner or operator of a disposal facility must have a written post-closure plan. A copy of the approved plan and all revisions to the plan must be kept at the facility until the postclosure care begins. The plan must include the following:</p> <ul style="list-style-type: none"> <li>• Description of groundwater monitoring activities and frequencies</li> <li>• Description of maintenance activities and frequencies for: <ul style="list-style-type: none"> <li>- Final containment structures</li> <li>- facility monitoring equipment</li> <li>- Security devices</li> <li>- Erosion damage</li> <li>- Vegetative cover</li> <li>- Run-on run-off control systems</li> <li>- Leachate collection, detection, and removal systems</li> </ul> </li> </ul>	<p>270.14(b)(13)  270.17(g)  270.18(i)  270.20(f)  270.21(e)  264.117  264.118(a)  264.228(b)  264.228(c)  264.280(c)  264.310(h)  Guidance</p>		

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Subject, requirement	40 CFR section Nos.	Location in application	Comments
<p><b>1-2a (continued)</b></p> <ul style="list-style-type: none"> <li>- Gas venting system</li> <li>- Groundwater monitoring system (saturated and/or unsaturated)</li> <li>- Fugitive dust control system</li> <li>- Cron prohibitions</li> <li>- pH control</li> </ul> <ul style="list-style-type: none"> <li>• Location(s) and number of copies of post-closure plan</li> <li>• Identification and location (address and phone number) of person responsible for storage and updating of facility copy of post-closure plan prior to closure</li> <li>• Identification and location (address and phone number) of person responsible for storage and updating facility copy of post-closure plan during post-closure period</li> <li>• Procedure for updating all other copies of post-closure plan</li> </ul>	<p>264.118(a)(3)</p> <p>Guidance</p>		
<p><b>1-2b Contingent Post-Closure Plans</b></p> <p>If surface impoundments or waste piles without approved liner systems or exemptions from liner requirements are utilized and the owner/operator intends to remove all wastes and contamination, the application must include a contingent post-closure plan. The requirements of the contingent post-closure plan are identified to the post-closure plan required for landfills (see 1-2a).</p>	<p>270.17(g) 270.18(i) 264.228(c)(1) 264.258(b) 264.258(c)</p>	<p>NA</p>	
<p><b>1-2c Specific Post-Closure Plan Requirements</b></p> <p>Items 1-2c(1) through 1-2c(4) present specific post-closure plan requirements for surface impoundments, waste piles, land treatment facilities and landfills.</p>			
<p><b>1-2c(1) Surface Impoundments</b></p> <p>For an owner or operator of a surface impoundment closed with wastes in place, the post-closure plan must include:</p> <ul style="list-style-type: none"> <li>• Procedures for maintenance and repair of final cover</li> <li>• Procedures for maintenance and monitoring of leak detection system</li> <li>• Procedures for maintenance and monitoring of groundwater monitoring system</li> </ul>	<p>270.17(g) 264.118 264.228(c)(1)</p>	<p>I-1</p>	

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Subject requirement	40 CFR section Nos.	Location in application	Comments
<p><b>1-2c(4) Land Treatment Facilities</b></p> <p>An owner or operator of a land treatment facility must include the following in the post-closure plan:</p> <ul style="list-style-type: none"> <li>• Procedures to enhance degradation of wastes in treatment zone</li> <li>• Procedure for maintaining vegetative cover</li> <li>• Procedure for maintaining run-on controls</li> <li>• Procedure for maintaining run-off controls</li> <li>• Procedures for wind dispersal control</li> <li>• Procedures to ensure compliance with food-chain crop prohibitions</li> <li>• Procedures for unsaturated zone monitoring</li> </ul>	<p>270.20(d)(6) 264.118 264.210(c)</p>	<p>NA</p>	
<p><b>1-3 Notices Required for Disposal Facilities</b></p>			
<p><b>1-3a Notice to Local Land Authority</b></p> <p>Documentation by applicant that within 90 days after closure a survey plat indicating location and dimensions of landfill cells or other disposal areas with respect to permanently surveyed benchmarks, along with a record of the type, location and quantity of hazardous waste within each cell or disposal area will be submitted to the appropriate local land use authority and to the Regional Administrator.</p>	<p>264.119</p>	<p>I-1</p>	
<p><b>1-3b Notice in Deed to Property</b></p> <p>Documentation by applicant that he has or will record a notation on the facility deed, or other instrument examined during a title search, that notifies any potential purchase of the property that:</p> <ul style="list-style-type: none"> <li>• The property has been used to manage hazardous wastes</li> <li>• Use of the land is restricted to activities that will not disturb integrity of final cover system, or monitoring system during post-closure care period</li> <li>• Requirements stated under 1-3a above has been complied with</li> </ul>	<p>270.14(b)(14) 264.120</p>		

(continued)

Subject requirement	40 CFR section Nos.	Location in application	Comments
<p><b>1-4 Closure Cost Estimate</b></p> <p>A copy of the most recent closure or contingent closure cost estimate, prepared in accordance with 264.142.</p> <ul style="list-style-type: none"> <li>• Cost estimate</li> <li>• Fully loaded</li> <li>• No salvage credits</li> <li>• Current year costs</li> <li>• Cost adjusted annually from anniversary date of first cost estimate</li> <li>• Based on point in operating life when extent and manner of operation would make closure most expensive.</li> </ul>	<p>270.14(h)(15)</p> <p>264.142 Guidance Guidance 264.142(a) 264.142(b)</p> <p>264.142(a)</p>	<p>I-2</p>	
<p><b>1-5 Financial Assurance Mechanism for Closure</b></p> <p>A copy of the established financial assurance mechanism for facility closure adopted in compliance with 264.143. The mechanism must be one of the following (1-5(a) through 1-5(f)) and include due dates and use standard wording.</p>	<p>270.14(h)(15) 264.143 264.151</p>	<p>I-2</p>	
<p><b>1-5a Closure Trust Fund</b></p> <p>A copy of the closure trust fund agreement with the wording required in 264.151(a)(1) and a formal certification of acknowledgment.</p> <ul style="list-style-type: none"> <li>• Bank or approval institution</li> <li>• Mechanics <ul style="list-style-type: none"> <li>- Pay-in period; life of permit or remaining life of facility, whichever is shorter</li> <li>- Annual payment; unfunded liability divided by years left in pay-in period</li> </ul> </li> </ul>	<p>264.143(r) 264.151(a)(1)</p>		
<p><b>1-5b Surety Bond</b></p> <p>A surety bond from a federally acceptable surety company meeting one of the following requirements:</p> <ul style="list-style-type: none"> <li>• Surety bond guaranteeing payment into a closure trust fund. A copy of the surety bond with the wording required in 264.151(b), a copy of the standby trust fund agreement</li> <li>• Surety bond guaranteeing performance of closure. A copy of the surety bond with the wording required in Part 264.151</li> </ul>	<p>264.143(b) 264.151(h)</p> <p>264.143(b)</p> <p>264.143(c)</p>		

(continued)

Subject requirement	40 CFR section Nos.	Location in application	Comments
I-5b (continued) <sup>1</sup>		I-2	
<p>(c), guaranteeing that the owner or operator will perform closure according to the closure plan and the requirements of Subpart M</p>			
<b>I-5c Closure Letter of Credit</b>	264.143(d) 264.151(d)		
<p>A copy of a closure letter of credit with the wording required in 264.151(d)</p> <ul style="list-style-type: none"> <li>• Irrevocable letter of credit</li> <li>• At least one year period, automatic renewal</li> <li>• Standby trust fund</li> <li>• Amount reflects current cost estimate</li> </ul>			
<b>I-5d Closure Insurance</b>	264.151(e)		
<p>To demonstrate that the owner or operator has closure insurance, he or she must submit to the Regional Administrator 60 days before hazardous waste is received a certificate of insurance worded as specified in 264.151(e).</p> <ul style="list-style-type: none"> <li>• Noncancellable policy, automatic renewal</li> <li>• Insurer licensed or eligible surplus lines carrier</li> <li>• Certificate of insurance</li> <li>• Funds available whenever final closure occurs</li> </ul>			
<b>I-5e Financial Test and Corporate Guarantee for Closure</b>	264.143(f) 264.151(f) 264.151(h)		
<p>To demonstrate that this test is met, an owner or operator must submit a letter signed by the company's chief financial officer that is worded as specified in 264.151(f) and meets the following criteria:</p> <ul style="list-style-type: none"> <li>• Tangible net worth \$10 million</li> <li>• Tangible net worth 6 x all closure and post-closure costs</li> <li>• U.S. assets at least 90% of total assets or at least six times all closure and post-closure costs</li> <li>• Bond rating requirement or alternative financial ratio tests</li> <li>• Application must include;</li> </ul>			

(continued)

Subject requirement	40 CFR section Nos.	Location in application	Comments
<p>1-5e (continued) :</p> <ul style="list-style-type: none"> <li>- Copy of a report on the company's latest financial statements drafted by an independent certified public accountant (CPA)</li> <li>- Copy of a report from the owner's or operator's independent CPA to the owner or operator stating that he or she has examined the data in the letter from the chief financial officer and that it is consistent with the amounts in the independently-audited year-end financial statements for the latest fiscal year and that no matters came to attention to cause him to believe that the data should be adjusted</li> </ul> <p>In lieu of the above items, the owner or operator may submit a corporate guarantee worded as required by 264.151(h). This guarantee provides that the guarantor, which must be the parent company of the owner or operator, will perform final closure in accordance with the closure plan if the owner or operator fails to do so or will establish a closure trust fund for the owner or operator. A copy of these items should be submitted with the Part B for review by the permit writer.</p>	<p>264.143(f)(10)</p>	<p>I-2</p>	
<p>1-5f <u>Combinations</u></p>			
<p>1-5f(1) <u>Use of Multiple Financial Mechanisms</u></p> <p>A copy of a combination of trust fund agreements, surety bond guaranteeing payment into a closure trust fund or letters of credit, insurance, and state assumption of responsibility, which provide financial assurance for the amount of closure. Combined financial assurance must be at least equal to the adjusted closure cost estimate. Financial assurance instruments must meet requirements of 264.143(a),(b),(d), or (e) which include closure trust fund, surety bond guaranteeing payment into a closure trust fund, closure letter of credit, and closure insurance, respectively.</p>	<p>264.143(g)</p> <p>264.149</p>		
<p>1-5f(2) <u>Use of Financial Mechanism for Multiple Facilities</u></p> <p>A copy of a financial assurance mechanism for more than one facility showing for</p>	<p>264.143(h)</p>		

(continued)

Subject requirement	40 CFR section Nos.	Location in application	Comments
<p><b>1-5f(2) (continued)</b></p> <p>each facility, the EPA ID number, name, address, and amount of closure funds assured by the mechanism. Total funding must be no less than the sum required for each facility considered separately. Documents must be submitted to each Region where facilities are located. Financial test applies to sum of closure and post-closure costs for all facilities.</p>			
<p><b>1-6 Post-Closure Cost Estimate</b></p> <p>If landfill, land treatment, surface impoundments, or waste piles are utilized, the application must include a post-closure or a contingent post-closure cost estimate prepared in accordance with 264.144.</p> <ul style="list-style-type: none"> <li>• Fully loaded labor rate</li> <li>• No salvage values</li> <li>• No operation credits (gas, crops, livestock)</li> <li>• Current year</li> <li>• Based on the extent of operation most likely to make postclosure most expensive</li> <li>• Inspection costs</li> <li>• Administration</li> <li>• Transportation</li> </ul>	<p>270.14(b)(16) 264.144</p> <p>Guidance Guidance Guidance Guidance</p> <p>Guidance Guidance Guidance</p>	<p>I-2</p>	
<p><b>1-7 Financial Assurance Mechanism for Post-Closure</b></p> <p>A copy of the established financial assurance mechanism for post-closure care adopted in compliance with 264.145. The mechanism must be one of the following (1-7(a) through 1-7(f) and include due dates and use standard wording.</p>	<p>270.14(b)(16) 264.145 264.151</p>	<p>I-2</p>	
<p><b>1-7a Post-closure Trust Fund</b></p> <p>A copy of the post-closure trust fund agreement with the wording required in 264.151(a)(1) and a formal certification of acknowledgment.</p> <ul style="list-style-type: none"> <li>• Bank or approval institution</li> <li>• Mechanics <ul style="list-style-type: none"> <li>- Pay-in period; life of permit or remaining life of facility, whichever is shorter</li> <li>- Annual payment; unfunded liability divided by years left in pay-in period</li> </ul> </li> </ul>	<p>264.145(a) 264.151(a)(1)</p>		

(continued)

Subject, requirement	40 CFR section Nos.	Location in application	Comments
<p><b>1-7b Surety-Bond</b></p> <p>A surety bond from a federally acceptable surety company meeting one of the following requirements:</p> <ul style="list-style-type: none"> <li>• Surety bond guaranteeing payment into a post-closure trust fund. A copy of the surety bond with the wording required in 264.151(b), a copy of the standby trust fund agreement</li> <li>• Surety bond guaranteeing performance of post-closure activities. A copy of the surety bond with the wording required in Part 264.151(c), guaranteeing that the owner or operator will perform post-closure activities according to the post-closure plan and the requirements of Subpart H</li> </ul>	<p>264.145(b) and (c) 264.151(b) 264.151(c)</p> <p>264.145(b)</p> <p>264.145(c)</p>	<p>I-2</p>	
<p><b>1-7c Post-closure Letter of Credit</b></p> <p>A copy of postclosure letter of credit with the wording required in 264.151(d)</p> <ul style="list-style-type: none"> <li>• Irrevocable letter of credit</li> <li>• At least one year period, automatic renewal</li> <li>• Standby trust fund</li> <li>• Amount reflects current cost estimate</li> </ul>	<p>264.145(c) 264.151(f)</p>		
<p><b>1-7d Post-closure Insurance</b></p> <p>To demonstrate that the owner or operator has post-closure insurance, he or she must submit to the Regional Administrator 60 days before hazardous waste is received a certificate of insurance worded as specified in 264.151(e).</p> <ul style="list-style-type: none"> <li>• Noncancellable policy, automatic renewal</li> <li>• Insurer licensed or eligible surplus lines carrier</li> <li>• Certificate of insurance</li> <li>• Funds available whenever final post-closure occurs</li> </ul>	<p>264.145(e) 264.151(e)</p>		
<p><b>1-7e Financial Test and Corporate Guarantee for Post-Closure</b></p> <p>To demonstrate that this test is met, an owner or operator must submit a letter signed by the company's chief financial officer that is worded as specified in 264.151(f) and meets the following criteria:</p>	<p>264.145(f) 264.151(f) 264.151(h)</p>		

(continued)

Subject requirement	40 CFR section Nos.	Location in application	Comments
<p><b>1-7e (continued)</b></p> <ul style="list-style-type: none"> <li>• Tangible net worth \$10 million</li> <li>• Tangible net worth 6 x all closure and post-closure costs</li> <li>• U.S. assets at least 90 percent of total assets or at least six times all closure and postclosure costs</li> <li>• Bond rating requirements or alternative financial ratio tests</li> <li>• Application must include: <ul style="list-style-type: none"> <li>- Copy of a report on the company's latest financial statements drafted by an independent certified public accountant (CPA)</li> <li>- Copy of a report from the owner's or operator's independent CPA to the owner or operator stating that he or she has examined the data in the letter from the chief financial officer and that it is consistent with the amounts in the independently-audited year-end financial statements for the latest fiscal year and that no matters came to attention to cause him to believe that the data should be adjusted</li> </ul> </li> </ul> <p>In lieu of the above items, the owner or operator may submit a corporate guarantee worded as required by 264.151(h). This guarantee provides that the guarantor, which must be the parent company of the owner or operator, will perform post-closure activities in accordance with the post-closure plan if the owner or operator fails to do so or will establish a post-closure trust fund for the owner or operator. A copy of these items should be submitted with the Part B for review by the permit writer.</p>	<p>264.145(f)(10)</p>	<p>I-2</p>	
<p><b>1-7f Combinations</b></p> <p><b>1-7f(1) Use of Multiple Financial Mechanisms</b></p> <p>A copy of a combination of trust fund agreements, surety bond guaranteeing payment into a post-closure trust fund or letters of credit, insurance, and state assumption of responsibility, which provide financial assurance for the amount of post-closure. Combined financial assurance must be at least equal to the adjusted post-closure cost estimate. Financial assurance instruments must meet requirements</p>	<p>264.145(g)</p> <p>264.149</p>		

(continued)

Subject requirement	40 CFR section Nos.	Location in application	Comments
<p>1-7f(1) (continued)</p> <p>of 264.143(a),(b),(d), or (e) which include post-closure trust fund, surety bond guaranteeing payment into a post-closure trust fund, postclosure letter of credit, and post-closure insurance, respectively.</p>			
<p>1-7f(2) <u>Use of Financial Mechanism for Multiple Facilities</u></p> <p>A copy of a financial assurance mechanism for more than one facility showing for each facility, the EPA ID number, name, address, and amount of closure funds assured by the mechanism. Total funding must be no less than the sum required for each facility considered separately. Documents must be submitted to each Region where facilities are located. Financial test applies to the sum of closure and post-closure costs for all facilities.</p>	264.145(h)		
<p>1-8 <u>Liability Requirements</u></p> <p>Where applicable, a copy of the insurance policy or other documentation which comprise compliance with the requirements of 264.147. (Coverage is for all facilities owned and operated and applies until certification for closure and post-closure is completed. For facilities in Phase I authorized states, originally signed duplicates of executed instruments or certificates of insurance are not required until the time of permit issuance, except as required by state law.)</p>	270.14(b)(17) 264.147(a) 264.147(b)	I-3	
<p>1-8a <u>Sudden Insurance</u></p> <p>Hazardous waste treatment, storage, or disposal facilities must demonstrate financial responsibility for bodily injury and property damage to third parties caused by sudden accidental occurrences.</p> <ul style="list-style-type: none"> <li>* Amount of at least \$1 million per occurrence</li> <li>* An annual total of at least \$2 million, exclusive of legal costs</li> </ul>	264.147 (a through d) 264.151 (g, i, j) 264.147(a)		

(continued)

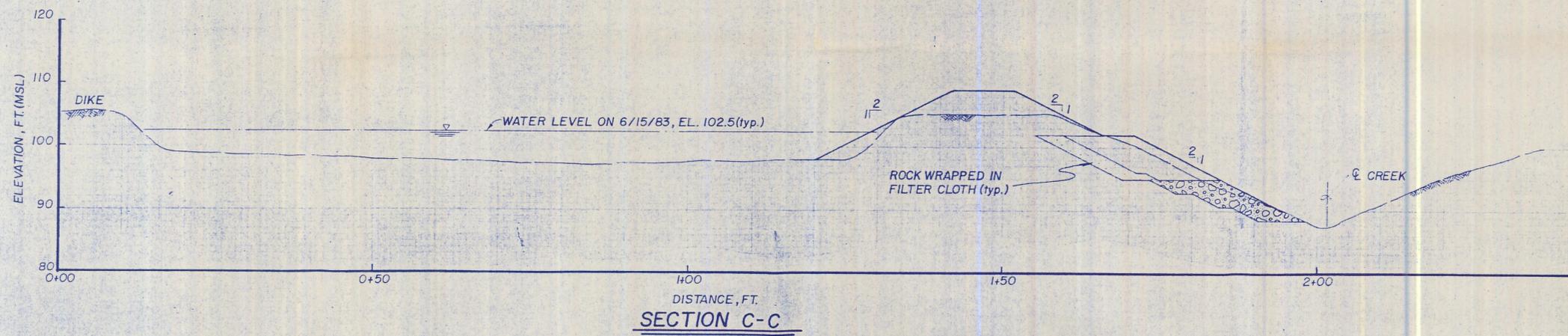
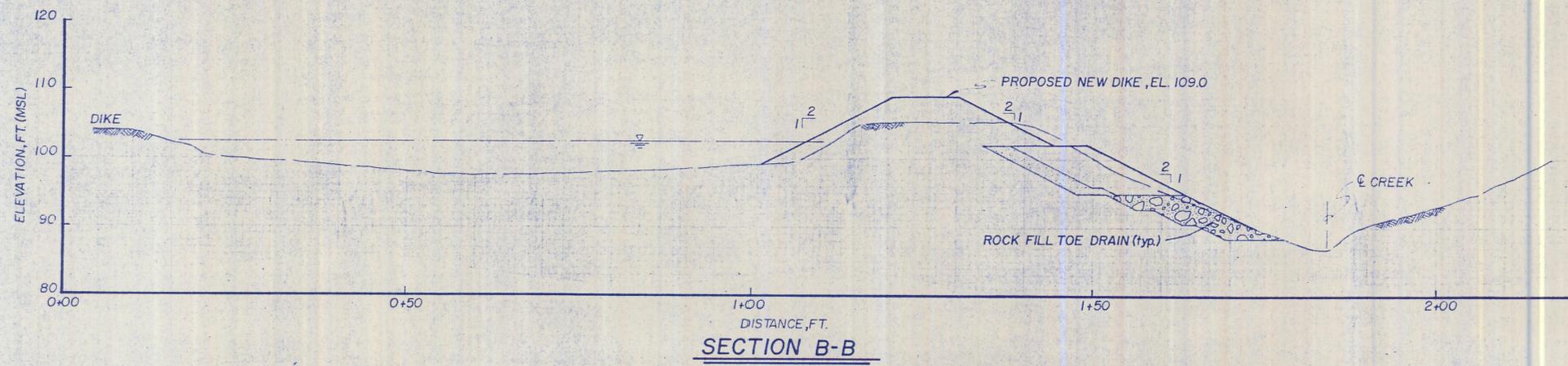
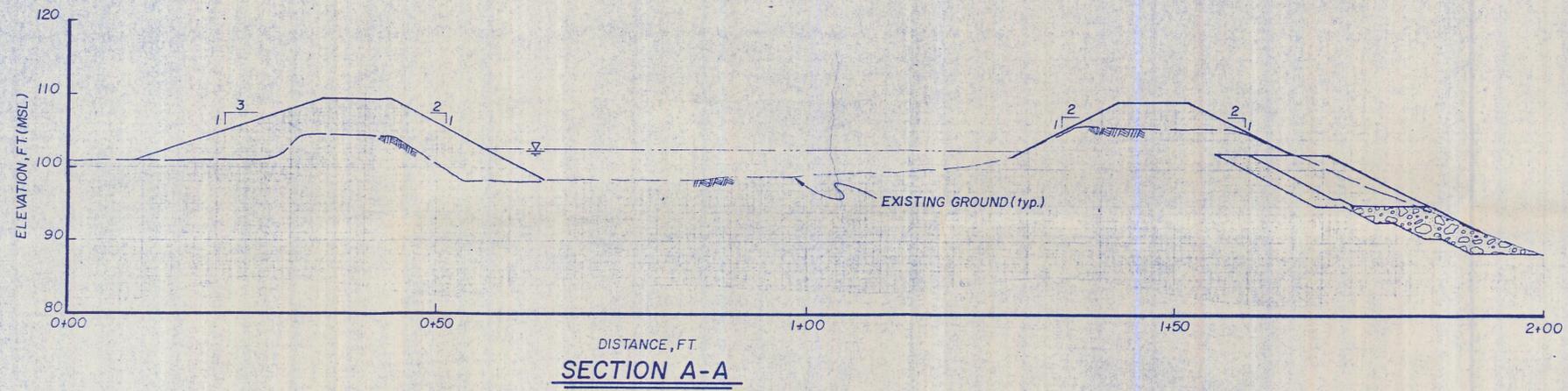
Subject requirement	40 CFR section Nos.	Location in application	Comments
<p><b>1-8a (continued)</b></p> <ul style="list-style-type: none"> <li>• A signed duplicate original of the Hazardous Waste Facility Liability Endorsement worded as specified in 264.151(i), or</li> <li>• A Certificate of Liability Insurance worded as specified in 264.151(j)</li> <li>• Financial test <ul style="list-style-type: none"> <li>- Letter from CFO</li> <li>- Auditor report</li> <li>- Auditor opinion</li> <li>- Other information requested by R.A.</li> <li>- Acceptable ratios</li> </ul> </li> </ul>		I-3	
<p><b>1-8b <u>Nonsudden Insurance</u></b></p> <p>This applies to high risk storage facilities (designated by Regional Administrator), surface impoundments, land disposal and land treatment.</p> <ul style="list-style-type: none"> <li>• At least \$3 million per occurrence</li> <li>• An annual total of at least \$6 million is required, exclusive of legal costs</li> <li>• Some endorsement or certification requirements as for sudden insurance coverage</li> <li>• Financial test <ul style="list-style-type: none"> <li>- Letter from CFO (264.151(g))</li> <li>- Auditor's report</li> <li>- Auditor's opinion</li> <li>- Other information requested by RA</li> </ul> </li> </ul>	<p>264.147(b) and (d) 264.151(i) and (j)</p> <p>264.147(f) 264.151(d)</p>		
<p><b>1-8c <u>Variance Procedures and RA Adjustments</u></b></p> <p>Evaluation of degree and duration of risk sufficient to allow RA to make a judgement on reduction of required liability. The financial responsibility levels specified above for liability insurance for sudden accidental occurrences may be adjusted downward if the owner or operator can prove to the Regional Administrator that these levels are not consistent with the degree and duration of risk at the owner's or operator's facility. Conversely, the Regional Administrator may adjust the levels of financial responsibility up</p>	<p>264.147(c) and (d)</p>		

(continued)

Subject requirement	40 CFR section Nos.	Location in application	Comments
<p>1-8c (continued)</p> <p>or down, based on the Administrator's assessment of the degree and duration of risk associated with the facility.</p>			
<p>1-9 <u>State Financial Mechanism</u></p> <p>Where appropriate, proof of coverage by a State financial mechanism in compliance with 264.149 or 264.150.</p>	270.14(b)(18)	NA	
<p>1-9a <u>Use of State-Required Mechanisms</u></p> <p>Where a state has hazardous waste regulations with equivalent or greater liability requirements for financial assurance for closure and post-closure care, evidence of establishment of the state-required financial mechanisms, including the facility EPA ID number, name, address, and amounts of coverage. If state-required mechanism does not satisfy amount of funds required, funds may be made available through increasing funds available through the state-required mechanisms or by using additional mechanisms specified in 264.143.</p>	264.149(a)		
<p>1-9b <u>State Assumption of Responsibility</u></p> <p>If a state assumes legal responsibility for compliance with closure, post-closure, or liability requirements or the state assures that state funds are available to cover those requirements, then facility is in compliance and must include a copy of a letter from the state describing the state assumption of responsibility and a letter from the owner or operator requesting that the state's assumption of responsibility be considered acceptable in meeting the financial coverage requirements, and including the facility EPA ID number, name, address, and amounts of liability coverage or funds for closure or post-closure care that are assured by the state.</p>	264.150		

(continued)

Subject requirement	40 CFR section Nos.	Location in application	Comments
<p><b>PART J - OTHER FEDERAL LAWS</b></p> <p>Demonstration of compliance if applicable with the requirements of applicable other federal laws such as the Wild and Scenic Rivers Act, National Historic Preservation Act of 1966, Endangered Species Act, Coastal Zone Management Act, Fish and Wildlife Coordination Act.</p>	<p>270.14(b)(20) 270.3</p>	<p>Ref. 3</p> <p>NA</p>	
<p><b>PART K - CERTIFICATION</b></p> <ul style="list-style-type: none"> <li>• Certification of application by a principal executive of the company of at least the level of vice president.</li> <li>• Certification by a general partner or proprietor for a partnership or sole proprietorship, respectively.</li> <li>• Certification by a principal executive officer or ranking elected official for a municipality, state, federal, or other public agency.</li> </ul>	<p>270.11</p>	<p>I-4</p>	

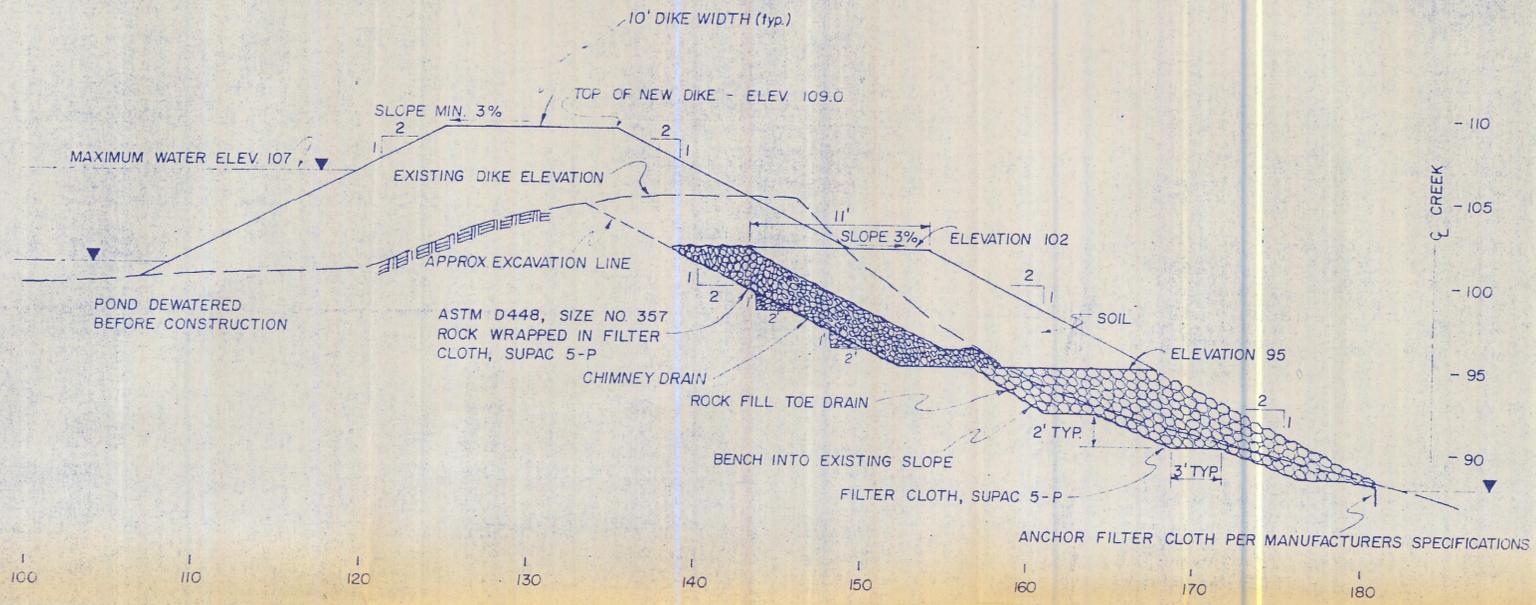


**NOTE**

SEE SHEET 3 FOR TYPICAL PROFILE DEPICTING DETAIL OF CONSTRUCTION OF THE DIKE EMBANKMENT.



DATE	REVISIONS	BY
<b>VERTAC CHEMICAL CORPORATION</b> <b>VICKSBURG, MS.</b> <b>POND CROSS - SECTIONS</b>		
SCALE: 1" = 10' (horz. and vert.)		
PREPARED FOR: VERTAC CHEMICAL CORP.		
<b>MCI/CONSULTING ENGINEERS, INC.</b> <small>KNOXVILLE, TENNESSEE</small>		
PROJ. 83-560	DATE 8/8/83	SHEET 4 OF 5



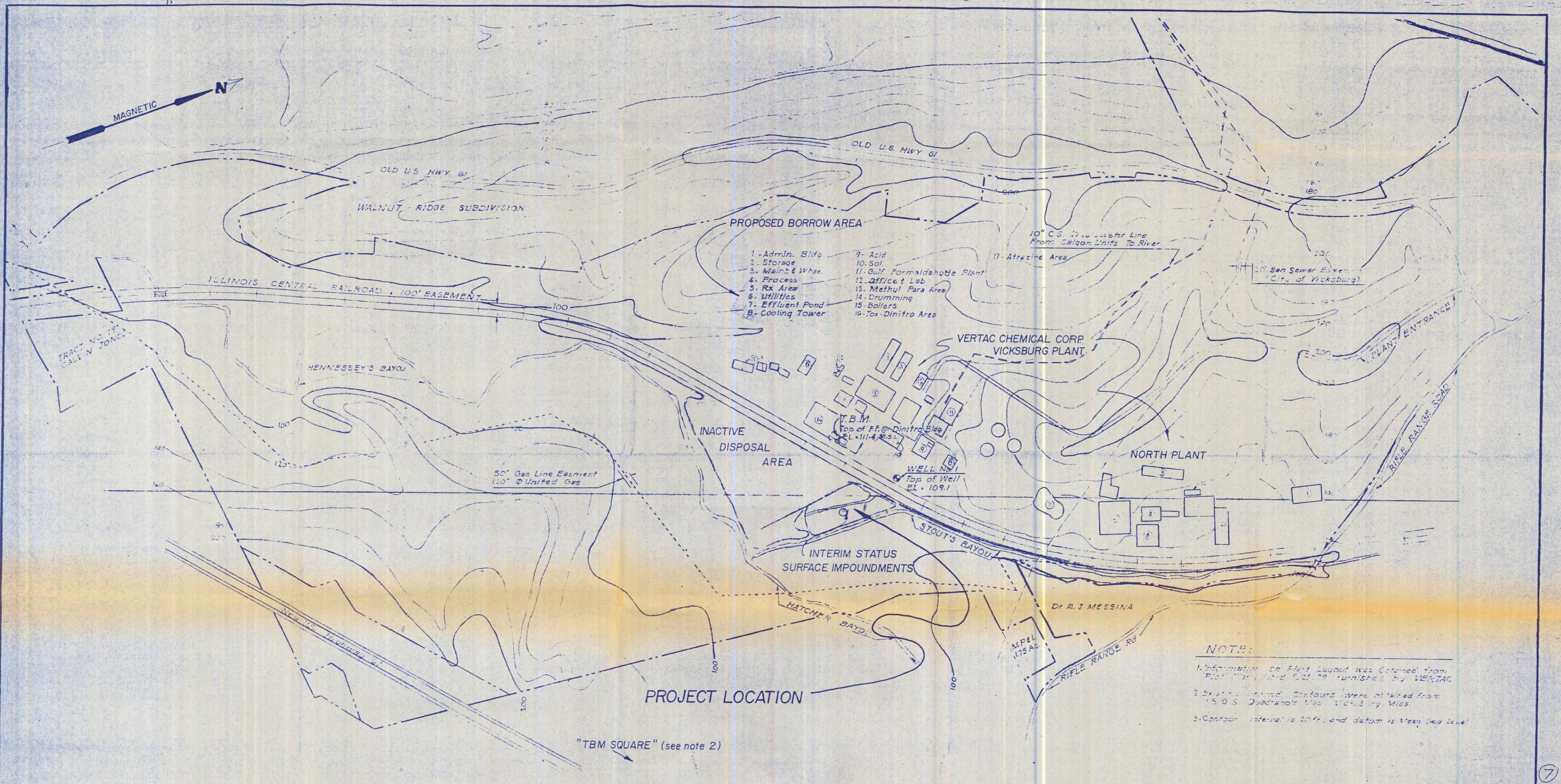
TYPICAL PROFILE  
SCALE 1" = 5'

**NOTE**  
SEE TECHNICAL SPECIFICATIONS FOR DETAILS OF CONSTRUCTION DETAILS.



DATE	REVISIONS	BY
<b>VERTAC CHEMICAL CORPORATION</b> <b>VICKSBURG, MS.</b> <b>TYPICAL PROFILE</b>		
SCALE: AS SHOWN		
PREPARED FOR: VERTAC CHEMICAL CORP.		
<b>MCI/CONSULTING ENGINEERS, INC.</b> KNOXVILLE, TENNESSEE		
PROJ. 83-560	DATE 8/8/83	SHEET 3 OF 5

BRUNING 44-142 266537



- 1- Admin. Bldg
- 2- Storage
- 3- Maint. & Whse.
- 4- Process
- 5- Rx Area
- 6- Utilities
- 7- Effluent Pond
- 8- Cooling Tower
- 9- Acid
- 10- Sol.
- 11- Gulf Formaldehyde Plant
- 12- Office & Lab
- 13- Methul Para Area
- 14- Drumming
- 15- Boilers
- 16- Tox-Dinitro Area
- 17- Atrazine Area

**NOTE:**  
 1. Information on Plant Layout was obtained from Plant map, dated 5-21-79, furnished by VERTAC.  
 2. Existing ground contours were obtained from U.S.G.S. Quadrangle Map, Vicksburg, Miss.  
 3. Contour interval is 20 ft. and datum is Mean Sea Level.

- NOTES:**
- 1) MAP AND ELEVATIONS PROVIDED BY DISC, MEMPHIS, TN
  - 2) CORPS OF ENGINEERS BENCHMARK, LOCATED AT THE INTERSECTION OF NEW U.S. HWY 61 AND HATCHER BAYOU, WAS USED TO ESTABLISH ELEVATIONS FOR TOPOGRAPHIC MAP OF SURFACE IMPOUNDMENTS. SEE SHEET 2 OF THESE PLANS FOR FURTHER DETAILS.

**LEGEND**  
 PROPOSED BORROW AREA FOR SOURCE OF SOIL TO BE USED AS COVER MATERIAL



DATE	REVISIONS	BY

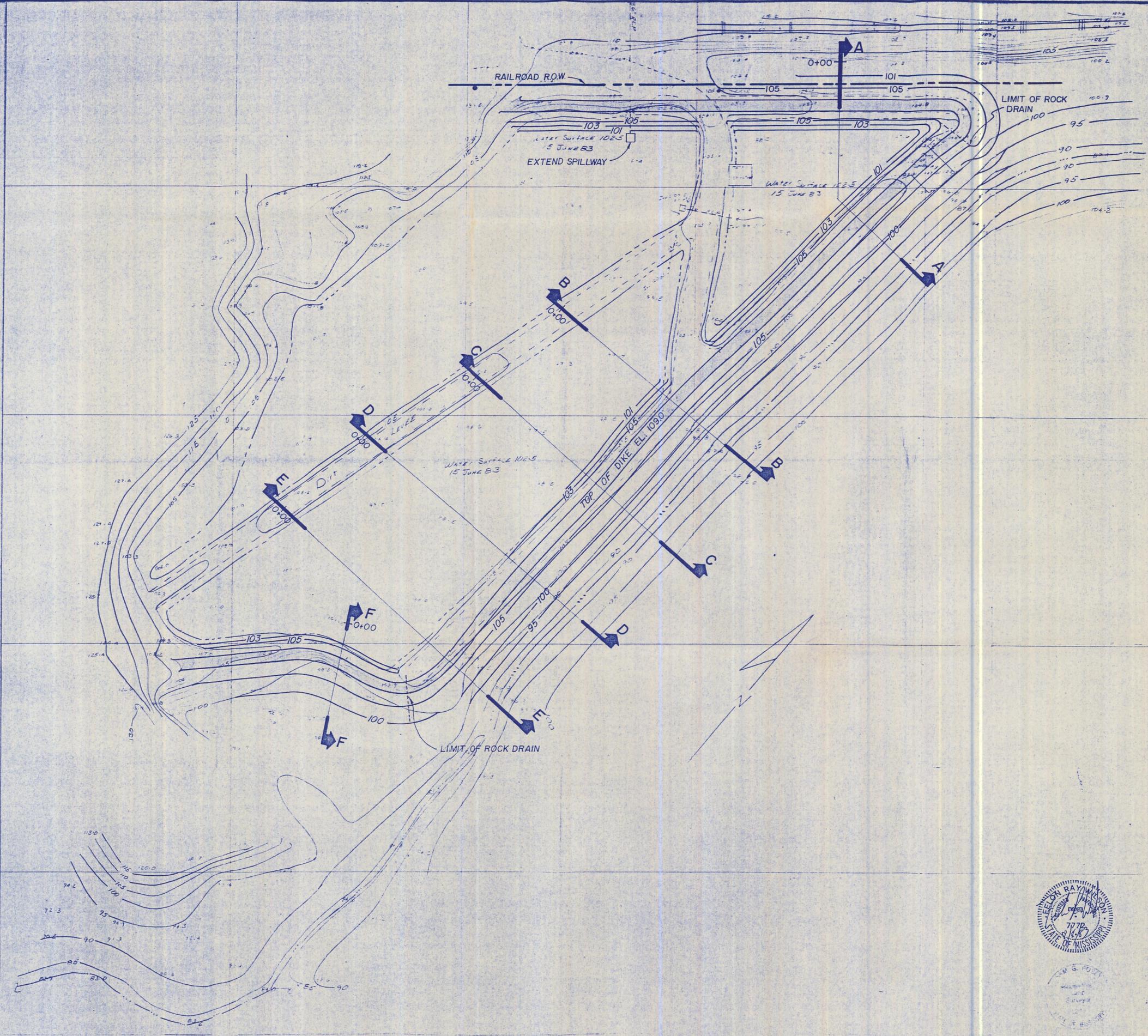
**SITE MAP**  
**VERTAC CHEMICAL CORP.**  
 VICKSBURG, MS.

SCALE 1" = 300'

PREPARED FOR  
 VERTAC CHEMICAL CORPORATION

**MCI/CONSULTING ENGINEERS, INC.**  
 NASHVILLE & KNOXVILLE, TENNESSEE

83-560 8/8/83 SHEET 1 OF 5



**NOTES**

- 1) SEE SHEETS 4 AND 5 FOR DETAILED CROSS-SECTIONS A-A THROUGH F-F.
- 2) EXISTING CONTOURS PROVIDED BY MAPTECH, JACKSON, MS.

**LEGEND**

EXISTING CONTOURS	— 90 —
PROPOSED CONTOURS	— 105 —
TOP OF DIKE	====



DATE	REVISIONS	BY
<b>VERTAC CHEMICAL CORPORATION</b> <b>VICKSBURG, MS.</b> <b>FINAL DIKE CONTOURS</b>		
SCALE: 1" = 40'		
PREPARED FOR: VERTAC CHEMICAL CORP.		
<b>MCI CONSULTING ENGINEERS, INC.</b> NASHVILLE & KNOXVILLE, TENNESSEE		
PROJ. 83-560	DATE 8/8/83	SHEET 2 OF 5

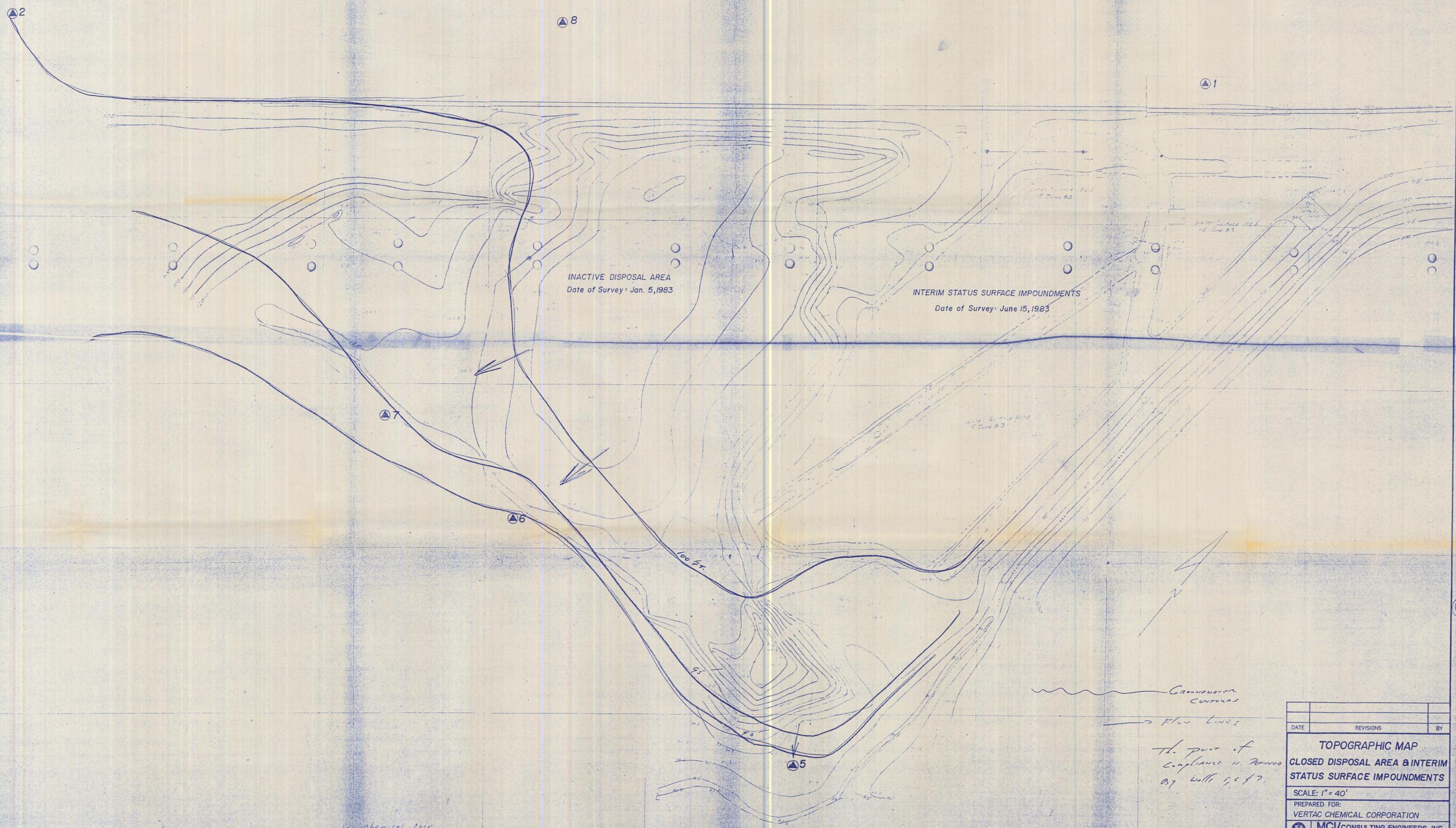
DRAWING 44-142 28620

**NOTES**

- 1) MAP BASED ON TWO DIFFERENT SURVEYS, BOTH BY MAP TECH, JACKSON, MS.
- 2) LOCATIONS OF MONITORING WELLS ARE APPROXIMATE.
- 3) CORPS OF ENGINEERS BENCHMARK LOCATED AT THE INTERSECTION OF U.S. HWY 61 AND HATCHER BAYOU, WAS USED TO ESTABLISH ELEVATIONS.
- 4) ALL ELEVATIONS REFER TO MEAN SEA LEVEL.

**LEGEND**

GROUND WATER MONITORING WELL . . . . . 



INACTIVE DISPOSAL AREA  
Date of Survey: Jan. 5, 1983

INTERIM STATUS SURFACE IMPOUNDMENTS  
Date of Survey: June 15, 1983

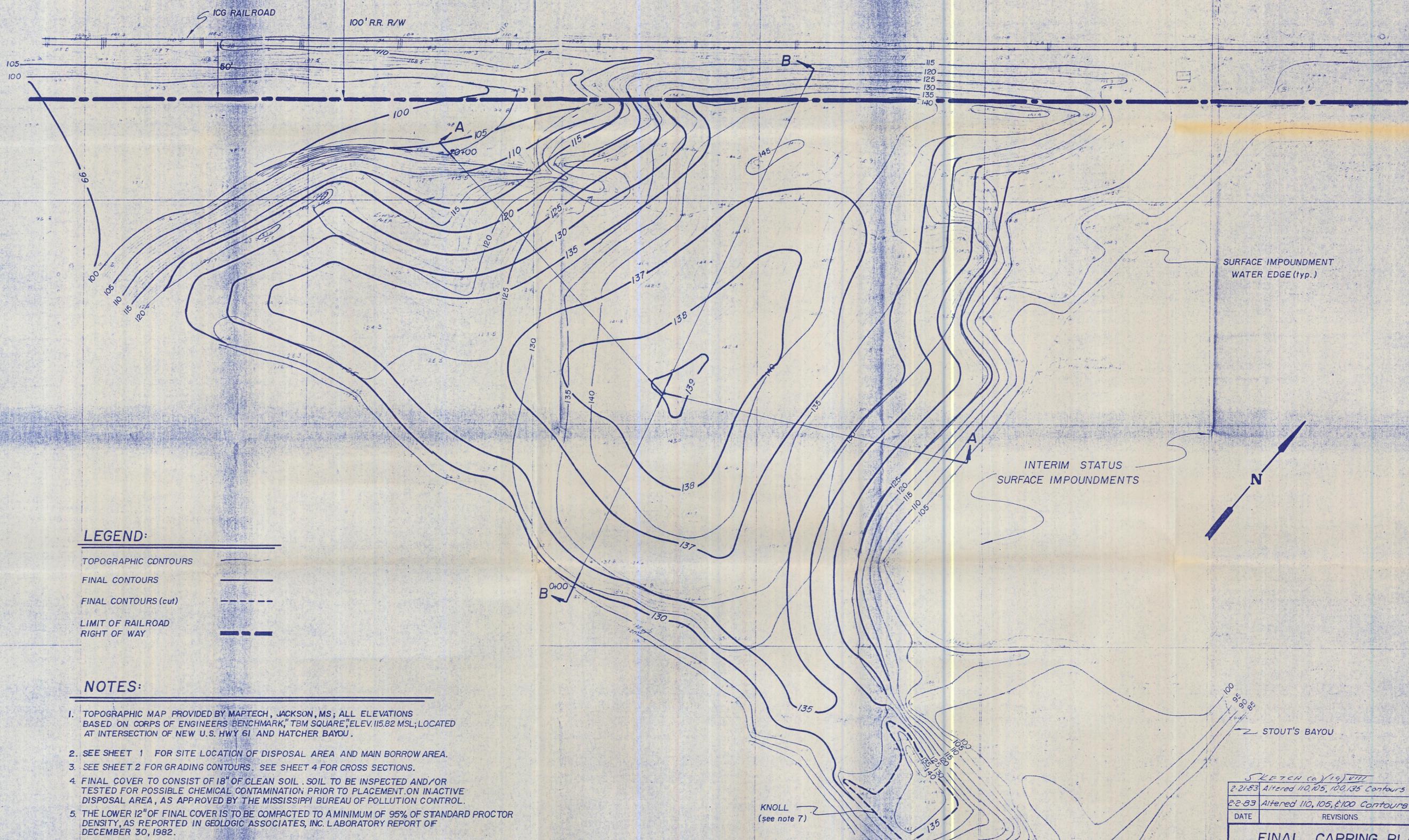
Groundwater  
Contours  
Flow Lines

The part of  
Compliance is removed  
07 with 50 & 7.

Vertac Chemical Corp

DATE	REVISIONS	BY

**TOPOGRAPHIC MAP**  
**CLOSED DISPOSAL AREA & INTERIM STATUS SURFACE IMPOUNDMENTS**  
 SCALE: 1" = 40'  
 PREPARED FOR:  
 VERTAC CHEMICAL CORPORATION  
 **MCI CONSULTING ENGINEERS, INC.**  
 NASHVILLE & KNOXVILLE, TENNESSEE  
 PROJ. 83-604 | DATE 12/6/83 | SHEET 1 OF 1



**LEGEND:**

- TOPOGRAPHIC CONTOURS
- FINAL CONTOURS
- FINAL CONTOURS (cut)
- LIMIT OF RAILROAD RIGHT OF WAY

**NOTES:**

1. TOPOGRAPHIC MAP PROVIDED BY MAPTECH, JACKSON, MS; ALL ELEVATIONS BASED ON CORPS OF ENGINEERS BENCHMARK, "TBM SQUARE," ELEV. 115.82 MSL; LOCATED AT INTERSECTION OF NEW U.S. HWY 61 AND HATCHER BAYOU.
2. SEE SHEET 1 FOR SITE LOCATION OF DISPOSAL AREA AND MAIN BORROW AREA.
3. SEE SHEET 2 FOR GRADING CONTOURS. SEE SHEET 4 FOR CROSS SECTIONS.
4. FINAL COVER TO CONSIST OF 18" OF CLEAN SOIL. SOIL TO BE INSPECTED AND/OR TESTED FOR POSSIBLE CHEMICAL CONTAMINATION PRIOR TO PLACEMENT ON INACTIVE DISPOSAL AREA, AS APPROVED BY THE MISSISSIPPI BUREAU OF POLLUTION CONTROL.
5. THE LOWER 12" OF FINAL COVER IS TO BE COMPACTED TO A MINIMUM OF 95% OF STANDARD PROCTOR DENSITY, AS REPORTED IN GEOLOGIC ASSOCIATES, INC. LABORATORY REPORT OF DECEMBER 30, 1982.
6. UPON PLACEMENT OF FINAL COVER, THE SITE SHOULD BE SEEDED, MULCHED AND FERTILIZED. THE WARREN COUNTY AGRICULTURAL EXTENSION SERVICE SHOULD BE CONTACTED FOR SPECIFIC SEEDING REQUIREMENTS APPLICABLE TO THE SITE AND THE GROWING SEASON.
7. KNOLL IS TO BE USED AS SOURCE OF BORROW FOR FINAL COVER IN ADDITION TO THE MAIN BORROW AREA IDENTIFIED ON SHEET 1.
8. APPROVAL OF PLAN IS TO BE OBTAINED FROM THE ICG RAILROAD PRIOR TO COMMENCING.

DATE	REVISIONS	BY
2-21-83	Altered 110, 105, 100, 135 Contours	FRW
2-2-83	Altered 110, 105, 100 Contours	FRW

**FINAL CAPPING PLAN  
INACTIVE DISPOSAL AREA  
VICKSBURG, MS.**

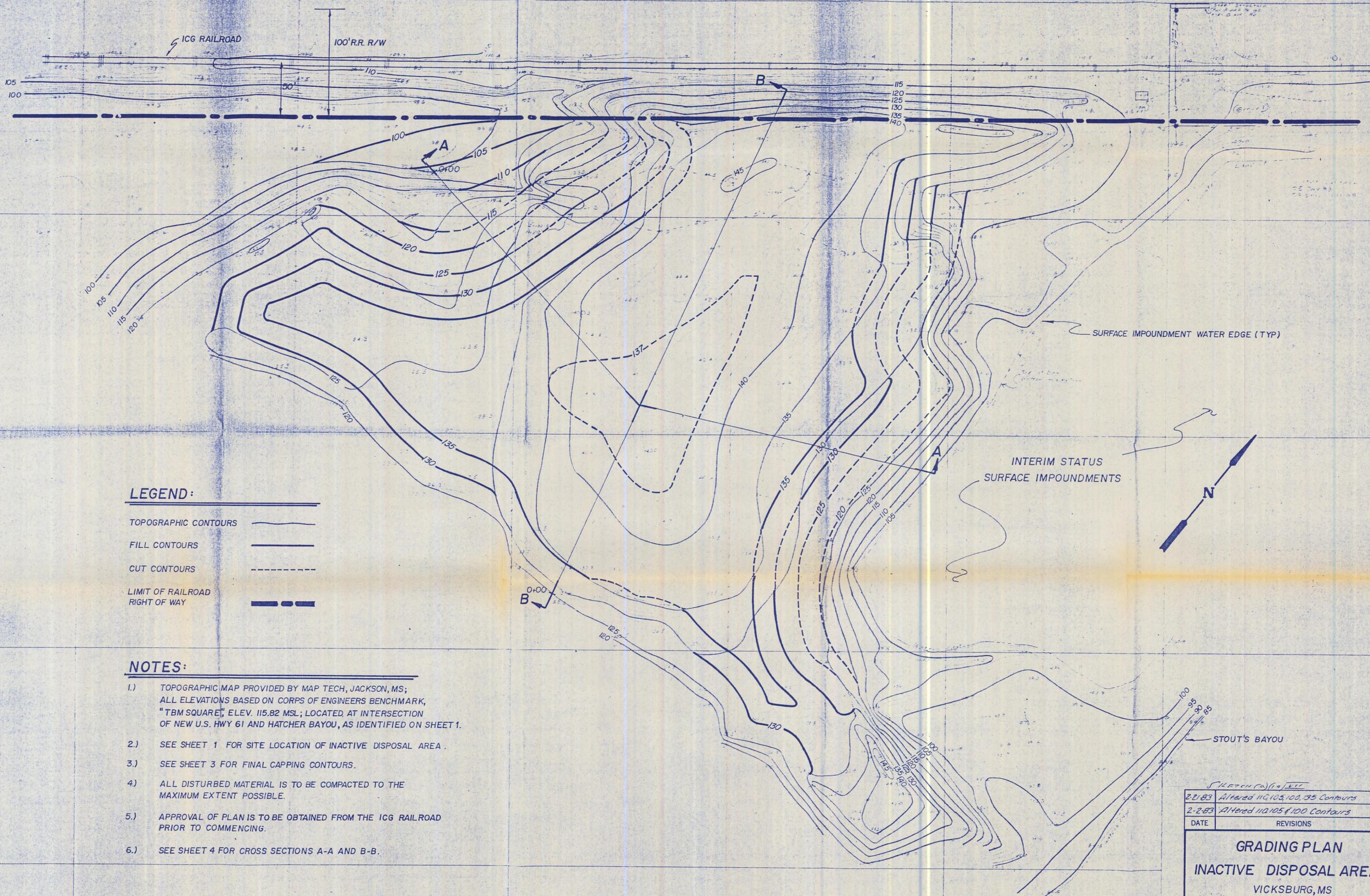
SCALE: 1"=40'

PREPARED FOR:  
**VERTAC CHEMICAL CORP.**

**MCI/CONSULTING ENGINEERS, INC.**  
NASHVILLE & KNOXVILLE, TENNESSEE

PROJ. 82-529    DATE 1-24-83    SHEET 3 OF 4

BRUNING 44-142 26653



**LEGEND:**

- TOPOGRAPHIC CONTOURS
- FILL CONTOURS
- CUT CONTOURS
- LIMIT OF RAILROAD RIGHT OF WAY

**NOTES:**

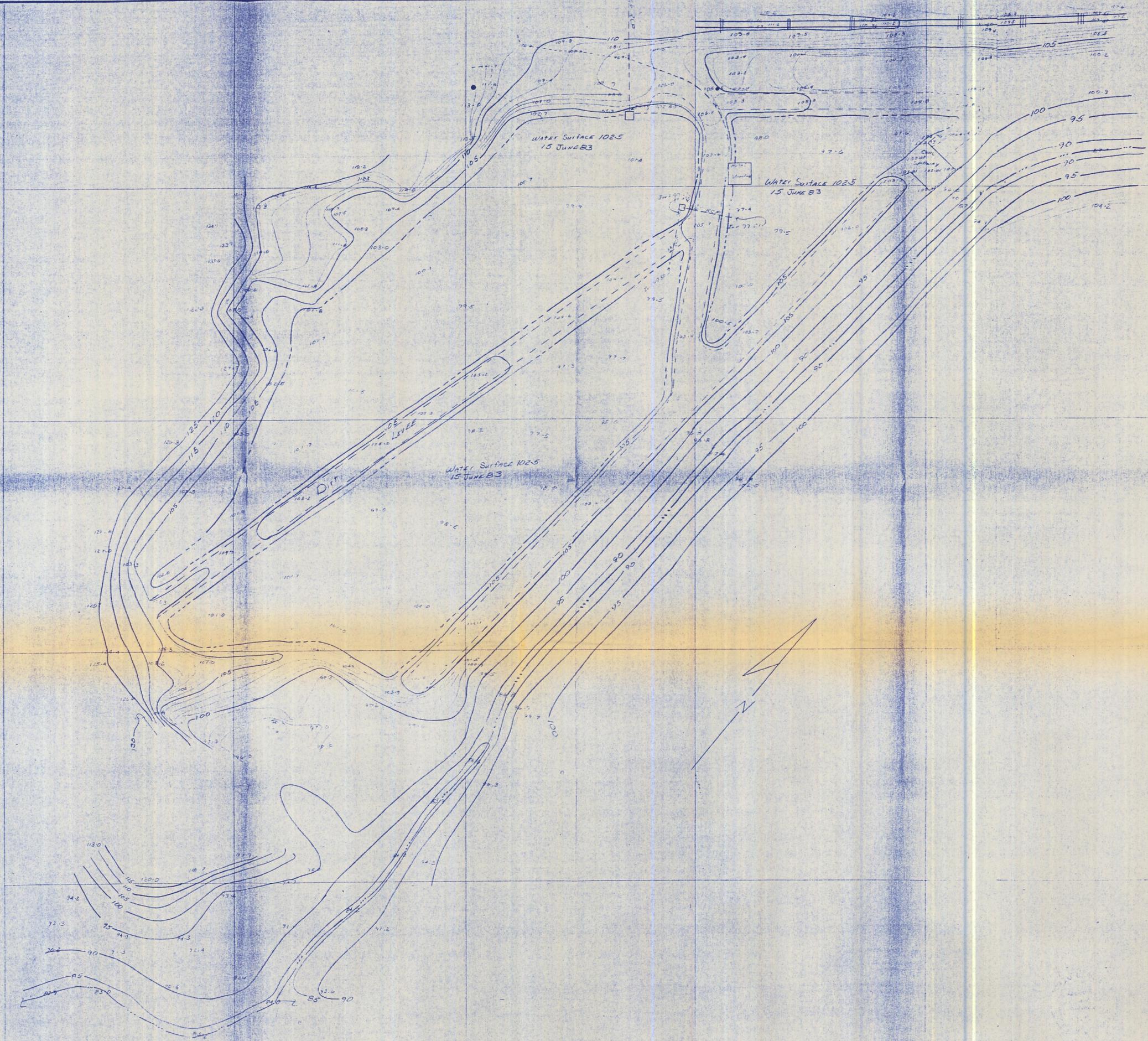
- 1.) TOPOGRAPHIC MAP PROVIDED BY MAP TECH, JACKSON, MS; ALL ELEVATIONS BASED ON CORPS OF ENGINEERS BENCHMARK, "TBM SQUARE", ELEV. 115.82 MSL; LOCATED AT INTERSECTION OF NEW U.S. HWY 61 AND HATCHER BAYOU, AS IDENTIFIED ON SHEET 1.
- 2.) SEE SHEET 1 FOR SITE LOCATION OF INACTIVE DISPOSAL AREA.
- 3.) SEE SHEET 3 FOR FINAL CAPPING CONTOURS.
- 4.) ALL DISTURBED MATERIAL IS TO BE COMPACTED TO THE MAXIMUM EXTENT POSSIBLE.
- 5.) APPROVAL OF PLAN IS TO BE OBTAINED FROM THE ICG RAILROAD PRIOR TO COMMENCING.
- 6.) SEE SHEET 4 FOR CROSS SECTIONS A-A AND B-B.

DATE	REVISIONS	BY
2-21-83	Altered 110, 105, 100, 95 Contours	F.R.W.
2-2-83	Altered 110, 105 & 100 Contours	F.R.W.

**GRADING PLAN**  
**INACTIVE DISPOSAL AREA**  
 VICKSBURG, MS

SCALE: 1" = 40'  
 PREPARED FOR:  
 VERTAC CHEMICAL CORPORATION

**MCI/CONSULTING ENGINEERS, INC.**  
 NASHVILLE & KNOXVILLE, TENNESSEE

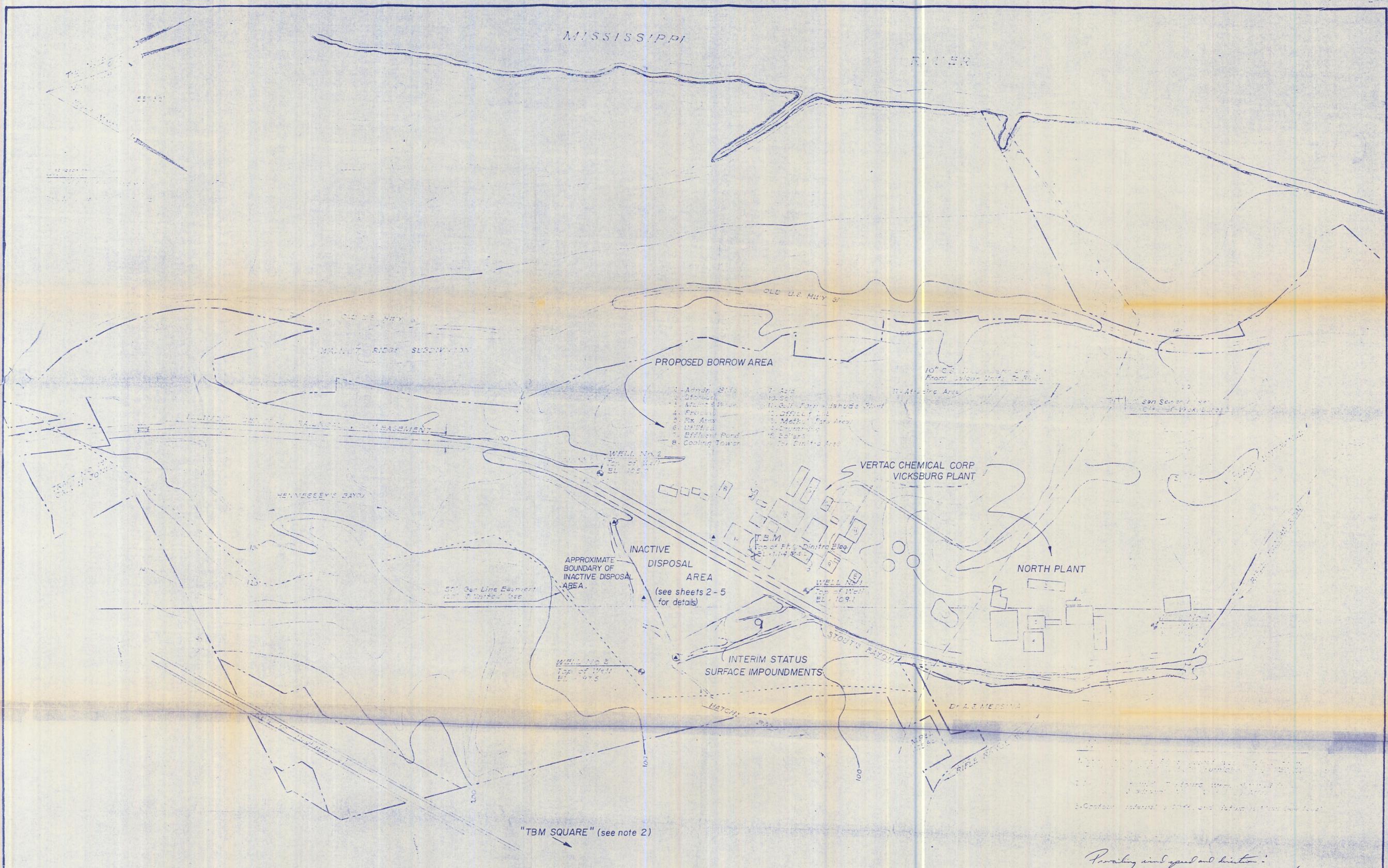


DATE	REVISIONS	BY
SKETCH (2/19/83) <i>[Signature]</i> Topo - Surface Improvement		
SCALE:		
PREPARED FOR:		
 <b>MCI/CONSULTING ENGINEERS, INC.</b> NASHVILLE & KNOXVILLE, TENNESSEE		
PROJ.	DATE	SHEET OF

DRAWING 44-142-58620

MISSISSIPPI

RIVER



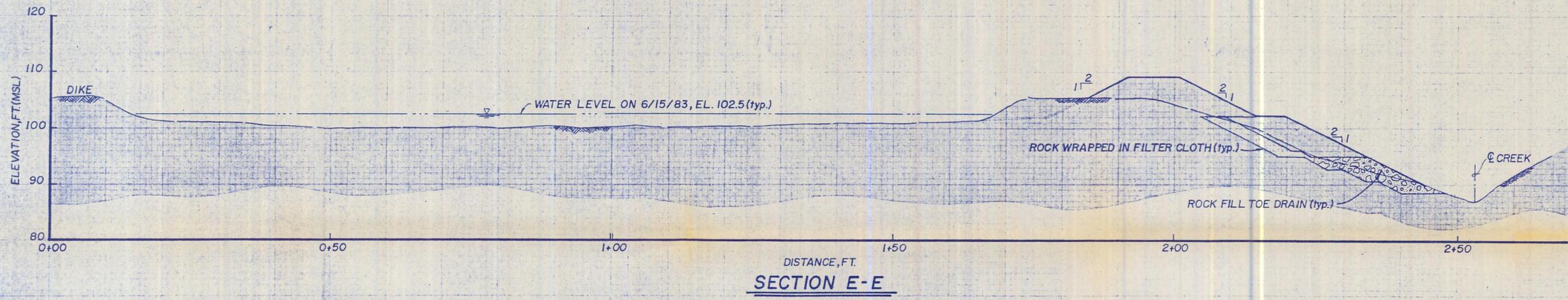
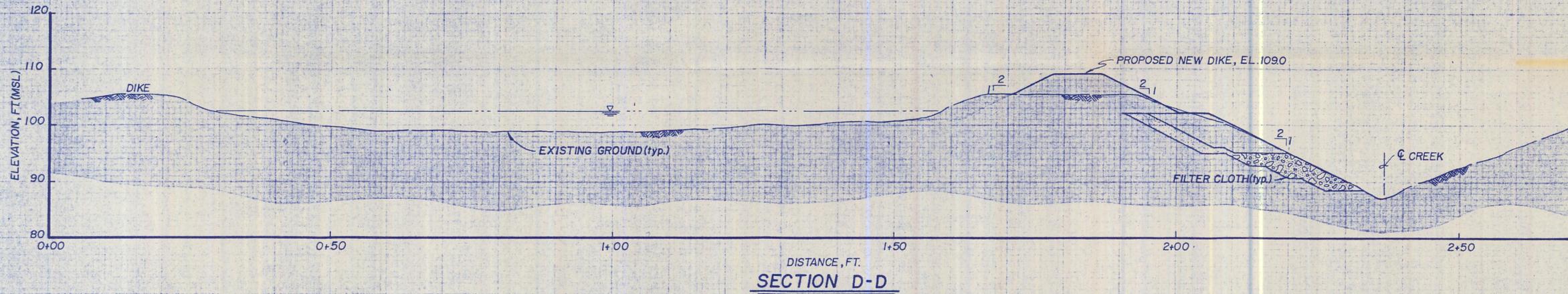
- 1- Adm'r. Bldg.
- 2- Storage
- 3- Maintenance
- 4- Process
- 5- Ex. Army
- 6- Utilities
- 7- Effluent Pond
- 8- Cooling Tower
- 9- Acid
- 10- Sol.
- 11- Gulf. Farm. Washoda Plant
- 12- Office Bldg.
- 13- Medical Equip. Area
- 14- Dispensing
- 15- Bolters
- 16- Dry Distilla Area

- NOTES:**
- 1) M.A. AND ELEVATION FROM WELL BY DISCO, MEMPHIS, TN.
  - 2) CORPS OF ENGINEERS BENCHMARK, LOCATED AT THE INTERSECTION OF NEW U.S. HWY 61 AND HATCHER BAYOU, WAS USED TO ESTABLISH ELEVATIONS FOR TOPOGRAPHIC MAP OF INACTIVE DISPOSAL AREA (SEE SH. 2 & 3 OF THESE PLANS FOR FURTHER DETAILS).
  - 3) EXACT LOCATION OF PROPOSED MONITORING WELLS TO BE DETERMINED IN THE FIELD BY FIELD REPRESENTATIVE AND THE MISSISSIPPI BUREAU OF POLLUTION CONTROL.

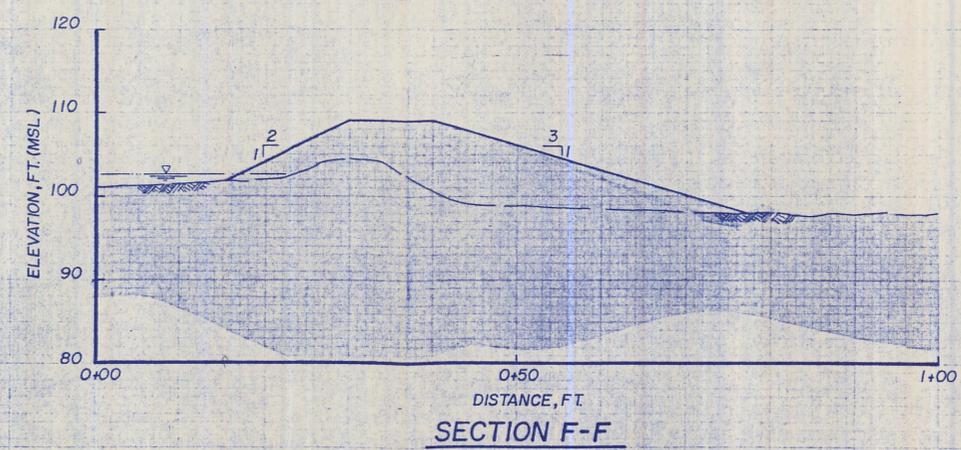
- LEGEND:**
- PROPOSED MONITORING WELL LOCATION
  - EXISTING MONITORING WELLS
  - PROPOSED BORROW AREA FOR SOURCE OF SOIL TO BE USED AS COVER MATERIAL

*Providing wind speed and direction:  
Out of the Southwest at 5-10 mph.*

Sketch (6/10/77)		
DATE	REVISIONS	BY
<b>SITE MAP</b>		
<b>VERTAC CHEMICAL CORP</b>		
VICKSBURG, MS.		
SCALE: 1" = 300'		
PREPARED FOR: VERTAC CHEMICAL CORPORATION		
MCM ENGINEERING INC.		
NO.	DATE	SHEET
		1



**NOTE**  
SEE SHEET 3 FOR TYPICAL PROFILE DEPICTING DETAILS OF CONSTRUCTION OF THE DIKE EMBANKMENT.



DATE	REVISIONS	BY
<b>VERTAC CHEMICAL CORPORATION</b> <b>VICKSBURG, MS.</b> <b>POND CROSS-SECTIONS</b>		
SCALE: 1" = 10' (horz. and vert.)		
PREPARED FOR: VERTAC CHEMICAL CORP		
<b>MCI/CONSULTING ENGINEERS, INC.</b> KNOXVILLE, TENNESSEE		
PROJ. 83-560	DATE 8/8/83	SHEET 5 OF 5