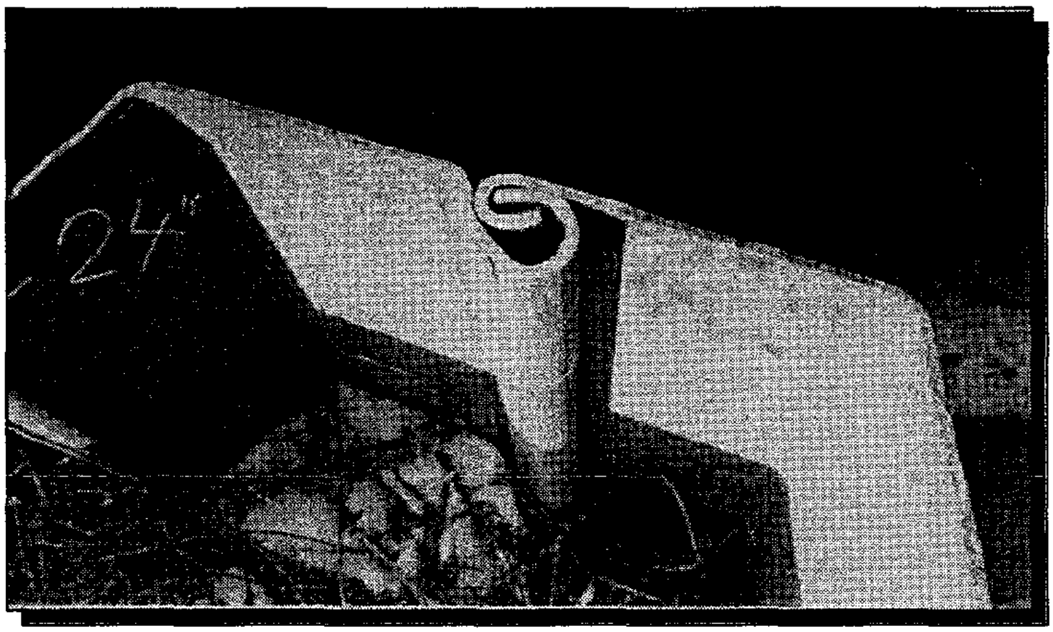
Appendix D

Sealable Joint Sheet Piling Information

Former Gulf States Creosoting Site
Hattiesburg, Mississippi

WATERLOO BARRIER®

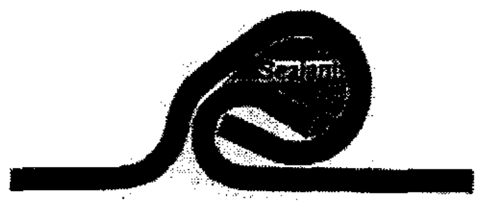
A LOW PERMEABILITY CONTAINMENT WALL FOR GROUNDWATER POLLUTION CONTROL



Low permeability containment walls are used in groundwater pollution control and remediation. Containment enclosures (source zone isolation) can minimize or avoid the need for plume control by groundwater pumping with water treatment. Contaminants are prevented from moving off-site while control activities, such as source removal and plume remediation, are carried out in the isolated subsurface environment inside the walled enclosure. The Waterloo Barrier®, constructed of steel sheet piling with sealable joints, offers significant performance and safety advantages over conventional containment walls. The Waterloo Barrier® system is described in a British Patent No. 2228760, United States Patents 5782583, 5711546, 5957625, and 547520. Patent submissions in Canada are pending, Application No. 2011386-3.

The Waterloo System

A new type of containment wall composed of sealable steel sheet piling has been developed at the University of Waterloo's Institute for Groundwater Research under the direction of Dr. John Cherry. The interlocking joints between individual sheet piles incorporate a cavity that is filled with sealant after driving to prevent leakage through the joints. Cold roll forming forms an internal cavity as the sheet pile itself is manufactured.



Internal Cavity

Standard pile driving equipment and techniques are used to construct a vertical sheet pile wall. Sheet piling can be driven to depths of 100 ft. (30 m) or more in unconsolidated deposits lacking boulders.

A footplate at the bottom of each cavity displaces soil laterally as the sheets are driven into the ground and the joints remain largely soil-free. Soil that does enter the joints is relatively loose and easily removed by jetting with water. A watertight sealant is then injected into the sealable cavities between sheet piles to create a low permeability barrier.

Foot Plate

Design Features

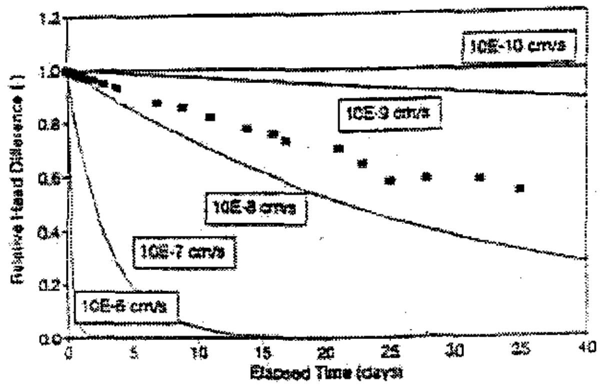
The internal cavity of Waterloo Barrier® is manufactured by cold roll forming under license by Canadian Metal Rolling Mills (CMRM) of Cambridge, Ontario. It is available in two sizes, WZ75, .295 (7.5 mm) in thickness and WEZ95, .375 (9.5 mm) in thickness.

Sealant is selected according to site conditions and project requirements. A variety of sealant materials may be used including bentonitic clay grouts, attapulgite clay grouts, vermiculitic grouts, cementitious grouts, epoxies, and organic polymers. The preferred grout for permanent installations is WBS301, a silica fume modified cementitious grout.

PERFORMANCE

The joints of conventional sheet piling are designed for mechanical strength but not watertightness. Leakage of water through the unsealable joints is acceptable for most civil engineering applications but generally not for environmental applications. Conventional unsealed, cold roll formed sheet piling has a bulk hydraulic conductivity in the range of 10^{-4} to 10^{-5} cm/s.

In comparison, bulk hydraulic conductivities of 10^{-8} to 10^{-10} cm/s are typically achieved in test cells constructed of Waterloo Barrier®. An hydraulic conductivity at or below 10^{-7} cm/s is required by regulatory agencies for vertical barriers around waste sites.



Hydraulic Test Results of Waterloo Barrier® Test Cell Sealed With Bentonitic Grout

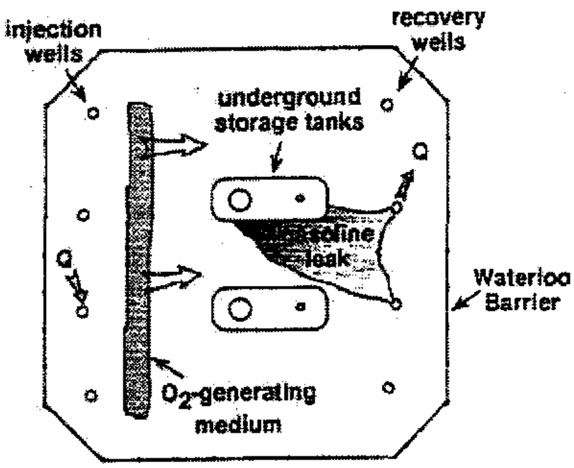
QUALITY ASSURANCE AND CONTROL

Potential leak paths through the Barrier are limited to the sealed joints and therefore the joints are the focus of quality control procedures. Joints are inspected between cleaning and sealing operations to confirm that the sheets have not separated and that the complete length of the joint is open and can be sealed. Each joint is sealed from bottom to top using sealant injection lines, facilitating the emplacement of sealant into the entire length of the joint. Repair procedures can be initiated if a joint separation or blockage is suspected.

Field Data Collection

APPLICATIONS

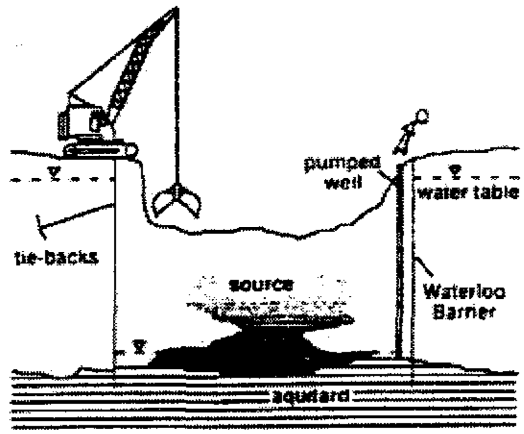
The Waterloo Barrier® offers considerable versatility. It can be installed to completely enclose a site (source zone isolation) to prevent off-site migration of contaminants until a remedial plan can be implemented, or to isolate a site while remedial actions are in progress.



Enclosure of a Gasoline Station During In Situ Bioremediation Using an Oxygen Flush

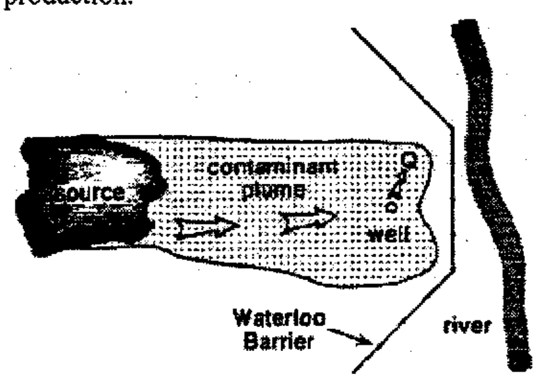
The hydraulic isolation afforded by complete enclosure can improve the effectiveness of in situ remedial processes by minimizing the dilution of treatment fluids and allowing flow directions to be easily controlled. Pump-and-treat costs can be reduced as a significantly smaller volume of contaminated ground water is processed.

Waterloo Barrier® can function as a temporary enclosure during the excavation of soils. Internal bracing or tiebacks may be required dependent upon the soil conditions and the desired depth of excavation. Small temporary enclosures are also useful for conducting pilot scale field trials of remedial measures. In some situations, an open-ended Waterloo Barrier® can be effectively used in conjunction with extraction wells to provide hydraulic containment.



Enclosure During Excavation

At new industrial sites, Waterloo Barrier® can be installed to enclose the site as a preventive or security measure to control chemical releases that could occur in the future. Enclosures around new landfills can be coupled with caps or infiltration systems to manage the rate of waste degradation and leachate production.

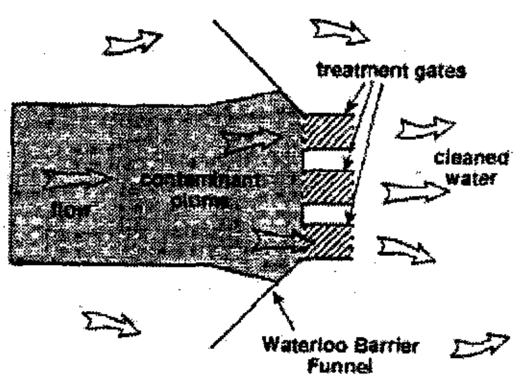


Waterloo Barrier® Along a Riverbank Prevents Seepage of Contaminated Groundwater

Waterloo Barrier® can be used to direct or funnel a contaminant plume into a subsurface treatment gate containing a reactive porous medium or other in situ treatment. The steel treatment gate is screened to allow the plume to flow through it and be remediated. Reactive porous media suitable for use in treatment gates include an abiotic, metal-catalysed dehalogenation medium for the remediation of DNAPLS and various biotic media. Air sparging can also be conducted in treatment gates.

The Funnel-and-Gate® treatment system can be designed to treat a variety of plume configurations and contaminants. An arrangement of multiple gates can be used to intercept exceptionally wide plumes.

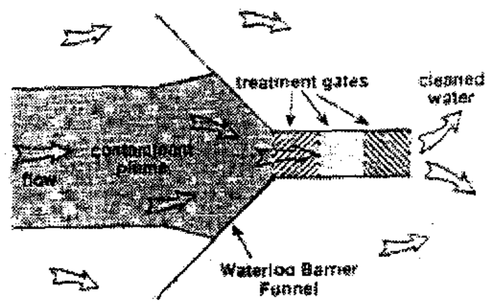
A complex plume containing a number of different contaminants can be treated by passing through a series of gates aligned in sequences, each containing a different reactive porous medium.



Sequential Gates

In civil engineering applications, Waterloo Barrier® can be used during excavation of compressible soils in urban areas to prevent settlement due to groundwater seepage.

The Barrier can also be used to limit the amount of dewatering required during construction below the water table. Its use in cofferdams can be cost effective on longer-term projects by virtually eliminating the necessity for continual pumping in order to dewater the enclosure.



Multiple Gates

ADVANTAGES

The Waterloo Barrier® serves the same general functions as other types of containment walls, such as the common soil bentonite wall. It has a number of unique advantages for containing polluted groundwater:

Minimal Site Disturbance

A major advantage of the Waterloo Barrier® is that excavation of subsurface materials is not required, thus there is less damage to the site and disruption of normal site activities. The high costs normally associated with the health and safety precautions necessary to excavate contaminated material and the high costs of its disposal are avoided.

Rapid and Easy Installation
Installation of the Waterloo Barrier® is relatively clean and rapid. Corners and irregular wall geometries can be easily constructed. Topography and depth to water table have little effect on installation techniques and the Barrier can even be installed through surface water bodies.

Design Versatility
The Waterloo Barrier® offers a number of design options not available with other types of containment walls. Various options, such as single or double sealable joints, and single or double walls, can be combined on a single project where parts of the wall have one design and others parts another design.

The Barrier can be used for containment purposes only or used in combination with various in situ remediation techniques.

Economical Use of Sealants
The volume of sealant required is relatively small, so it is feasible to use special sealants particularly resistant to chemical degradation that are too expensive to use in large quantity.

Superior Quality Assurance and Control
The materials and construction techniques make the Waterloo Barrier® less prone to leaking than other types of containment walls, providing a greater degree of confidence in its performance.

The integrity of the Barrier can be confirmed by inspection during construction. Rigorous, post-construction hydraulic testing is possible with double-walled configurations.

Removability
The use of a removable sealant, such as a bentonitic grout, allows the sheet piles to be removed from the ground and used elsewhere once a site has been successfully remediated. Removability is also advantageous for the isolation of portions of a site for pilot scale tests and for progressive or temporary installations for construction purposes.

DESIGNING YOUR SYSTEM

The design specifications of each Waterloo Barrier® containment system must be customized to meet the site requirements.

The design is dependent on:

- Surficial Geology
- Nature and Depth of Contamination
- Plume Morphology and Flow Rate

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TECHNICAL DATA

Waterloo Barrier®

PILE DRIVING AND JOINT SEALING SPECIFICATION

TDS 1-98(Rev 3 March, 2000) **Date: February, 1998**

PART 1 - GENERAL

1.1 WORK INCLUDED

1.1.1 This section specifies requirements for furnishing all materials and equipment and for performing all operations to install the Waterloo Barrier® steel sheet pile walls, including joint sealing procedures, as shown on the contract drawings. Sheet piling shall also be installed where required by the Contractor's method of construction and the existing conditions. Waterloo Barrier® steel sheet pile wall technology is described in a British Patent No. 2228760, United States Patents 5782583, 5711546, 5957625, and 547520. Patent submissions in Canada are pending, Application No. 2011386-3.

1.2 REFERENCE STANDARDS

1.2.1 American Society for Testing and Materials (ASTM):

1. A 328 - Standard Specification for Steel Sheet Piling.
2. A 572 - High Strength Low Alloy Columbium-Vanadium Steels of Structural Quality.

1.2.2. American Welding Society (AWS). D1.1 - Structural Welding Code.

1.2.3. Figures showing sections of the Waterloo Barrier® are provided at the end of this section.

1.3 SUBMITTALS

1.3.1. Submit the following items for review by the Engineer:

a) Pile Installation Plan which outlines detailed pile placement, equipment to be used, splicing requirements, quality control measures and joint preparation prior to sealing.
b) Proposed welding procedures and certification of welders.
c) Certification of the License Agreement with Waterloo Barrier Inc. for the provision of quality control services for the sheet pile installation and joint seasling.
d) Mill test documentation for the piling to be used on the project.

1.4 COORDINATION

1.4.1. Notify the Engineer at least 5 working days prior to beginning pile driving operations at any location. This will not relieve the Contractor of his responsibilities for performing the work in accordance with these specifications and contract drawings.

1.4.2 The Contractor will be required to schedule work activities and work in conjunction with C3 Environmental Limited to complete the barrier wall installation in the scheduled time period and to the satisfaction of the Owner and Engineer.

1.5 QUALITY ASSURANCE/QUALITY CONTROL

1.5.1 The Quality Assurance/Quality Control (QA/QC) program and joint sealing operations shall be completed by C3 Environmental Limited.

1.5.2 Horizontal Alignment: The maximum permissible horizontal tolerance in pile driving shall be a deviation of not more than 150mm (6 inches) from the plan location indicated on the contract drawings.

1.5.3 All surveying and barrier wall layout is to be completed by the Contractor.

PART 2 PRODUCTS

2.1 SHEET PILES

2.1.1. WZ75 and WEZ95 sheet piles, as manufactured by CMRM (Canadian Metal Rolling Mills), will be supplied in custom rolled or custom cut, lengths as specified by the engineer.

2.1.2. A foot plate shall be welded to the base of each female joint of the sealable sheet piling to prevent soil from entering the joint as the pile is driven into the ground. The Contractor will be responsible for all cutting of the sheet piles and attachment of the foot plates. The Contractor shall make the necessary arrangements to assure that attachment of the foot plates does not delay the sheet pile installation.

2.1.3. Section Properties of Piling: **WZ75**

	Imperial	**Metric**
Thickness:	0.295 in	7.50 mm
Nominal Width:	24 in	610 mm
Section Area:	10.7 in^2	69 cm^2
Weight:	36.6 lbs/lineal ft.	54.3 kg/lineal m
Moment of Inertia	69.3 in^4/wall ft.	9460 cm^4/wall m
Radius of Gyration:	3.6 in	91.4 mm
Section Modulus:	15.9 in^3/wall ft.	860 cm^3/wall m

2.1.3. Section Properties of Piling: **WEZ95**

	Imperial	Metric
Thickness:	0.375 in	9.50 mm
Nominal Width:	25 in	635 mm
Section Area:	14.9 in^2	96.2 cm^2
Weight:	50.5 lbs/lineal ft.	75.2 kg/lineal m
Moment of Inertia	134 in^4/wall ft.	18300 cm^4/wall m
Radius of Gyration:	4.33 in	110 mm
Section Modulus:	24.9 in^3/wall ft.	1340 cm^3/wall m

2.1.4 Waterloo Barrier® Sealant Material:
The material used to seal the sheet pile wall shall be **WBS-301** supplied and installed by C3 Environmental Limited in accordance with existing site and design conditions and shall be compatible with the Waterloo Barrier® System.

PART 3 EXECUTION

3.1 SHEET PILE INSTALLATION

3.1.1. Handling Sheet Piles:

a) Lift in a manner which will not cause excessive bending stresses.
b) Do not damage sheet piles in either handling or installing operations.
c) The joint of each sheet pile shall be visually inspected by the Contractor prior to installation. Any foreign material shall be removed and damaged joints and/or sheet piles shall be rejected.
d) Replace or repair sheet piles which are damaged during installation.

3.1.2. Location and Tolerances:

a) Drive piles vertically and in correct alignment so that the top of the wall lies on a straight line and ensure a proper interlocking throughout the entire length of the piles.
b) Sheet pile locations on the contract drawings are approximate and will be field located when appropriate and when approved by the Engineer.
c) Deviation in horizontal alignment shall not exceed 10 degrees at each joint.
d) The maximum permissible vertical tolerance (plumbness) in the pile installation shall not be greater than a deviation of 1/5 inch per 1 foot vertical. The integrity of the interlock between adjacent piles shall be verified by flushing the joint. Joint inspection and flushing shall be performed by the Quality Assurance/Quality Control Technician (C3 Environmental Limited).

3.1.3 The Contractor shall use suitable templates to ensure alignment and plumbness during driving.

3.1.4 Sheet Pile Installation Equipment:

a). Install piles with vibratory pile driving equipment suitable for the conditions encountered. The method and equipment selected shall install the piling to the design depths as shown on the contract drawings and minimize damage to each end of piling and adjacent interlocks. Suitable procedures shall be employed to prevent damage to the pile tops and joints.

3.1.5. Pile Installation:

a) Prevent and correct any tendency of the sheet piles to bend, twist or rotate, and to pull out of interlock. The integrity of each pile and interlocked joint shall be maintained during and after driving.

b) Working from the start location the Contractor will install the sheet piling with the smaller (Male) joint leading and thread the larger (Female) joint with attached foot plate on to the installed Male joint to form the sealable cavity (as indicated on the foot plate drawing). The Contractor will ensure that the enlarged Female joint is not driven to an elevation lower than the previously installed Male joint in order to prevent obstructions from entering the sealable cavity. The only exceptions to this criteria will be when the pile length increases from one section of wall to another.

c) Top of pile at elevation of cut-off shall be within 1 inch of the specified elevation. Manipulation of piles to force them into position will not be permitted. Piles will be checked for heave. Piles found to have heaved shall be redriven to the required point elevation. Where required, to meet the top of wall elevation, the sheet piling shall be cut to remove excess material. Costs associated with sheet pile cutting are to be included in the sheet pile installation pricing.

d) Piles damaged or driven outside the above tolerances shall be replaced. Any sheet pile ruptured in the interlock or otherwise damaged during installation shall be immediately pulled and replaced.

e) All sheet piles shall be driven to the design depth or to refusal in underlying bedrock. Sheet pile driving will be considered complete when the sheet piling has been installed to the design depth or refusal to the assumed bedrock elevation shown on the contract drawings and progress on any one sheet pile is less then 2 inches per minute.

f) Once the sheet piling has been installed the Quality Control Technician shall confirm that the sealable cavity is open for the full length and free of obstructions. The Contractor shall cooperate with the Quality Control Technician and assist as required to remove obstructions and clear the sealable cavity to the base of the joint. This work will include providing the necessary labour, equipment and materials to vibrate the sheet piling while the Quality Control Technician flushes the sealable cavity of the problem joints and/or removing and replacing sheet piling damaged during driving at no additional cost to the Owner.

g) Pull any sheet piling that are known to have pulled out of the interlock or are suspected of having tip or interlock damage, as determined by the Quality Control Technician, for visual inspection before proceeding further.

h) Splicing is permitted if shown on the contract drawings or as approved by the Engineer.

i) Make splices using a full penetration weld or as otherwise directed by the Engineer for structural purposes.

j) An optional video inspection may be conducted on one sheet pile joint in every fifty installed. The inspection will be preformed by the C3 Environmental Limited's QA/QC Technician using fibre-optic video inspection equipment that can be lowered to the bottom of the sealable cavity.

3.2 JOINT SEALING

3.2.1 All sheet pile joints are to be sealed. Joint sealing shall be completed by C3 Environmental Limited.

3.2.2 Joint sealing shall not be performed within 100 feet of the sheet pile installation operation or until a satisfactory joint inspection is achieved.

3.2.3. After the sheet piling has been installed in the ground all sealable cavities shall be checked by probing and flushing of the joints with pressurized water to remove any loose material.

3.2.4 A tremie hose or tube for pressure injection of the sealant shall be inserted into the sealable cavity. When the tube has reached the bottom of the hole, sealant injection will begin. The hose shall be withdrawn progressively up the hole as the sealant fills the space below. Keep tremie nozzle at least 1 foot below the rising surface of sealant.

3.3 RECORDS

C3 Environmental's QA/QC Technicians will document the following information and provide it to the Owner and Engineer in report format upon completion of the barrier wall installation:

3.3.1. Provide accurate records of each sheet pile driven. Submitted records shall include the following information:

a) Pile identification number.
b) Date and time of driving.
c) Elevation of top of pile.
d) Length of sheet pile in the ground when driving is complete.
e) Driving logs showing the time to install each foot of each sheet pile.
f) Detailed remarks concerning alignment, obstructions, etc.
g) Plumbness records of each sheet pile installed.
h) Joint flushing records for each joint installed.

3.3.2 Mark a waterproof identification number that is clearly visible on each sheet pile, within 2 feet from the top of pile.

3.3.3 Spray paint all sheet piles rejected from the work for any reason, at the time of rejection, with the letter "X" within 3 feet of both ends.

3.3.4 Provide accurate sealant installation records. Submitted records shall include the following information:

a) Joint identification number.
b) Date and time of sealing operation.
c) A complete list of the equipment used during the installation.
d) Volume of sealant required to seal each joint.

3.4 REJECTION

3.4.1 If rejected from the work because of deviation from location, plumbness requirements, excessive bending, twisting, pulling out of interlock, or other reasons, take suitable corrective action at no additional cost to the Owner. Suitable action includes extracting, furnishing and driving of replacement sheet piles, so that all sheet piles installed meet the requirements of this Specification.

3.5 CERTIFICATION

C3 Environmental Limited shall certify the bulk hydraulic conductivity of the Waterloo Barrier wall will be equal or less than $1x10^{-7}$ cm/sec for up to one year after completion of the barrier wall installation.

END OF SECTION

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e mail: c3enviro@c3group.com

Removal Action Work Plan

Northeast Drainage Ditch
Hattiesburg, Mississippi

August 3, 2001

Project No. 21-04

MICHAEL PISANI & ASSOCIATES, INC.
Environmental Management and Engineering Services
1100 Poydras Street
1430 Energy Centre
New Orleans, Louisiana 70163
(504) 582-2468

MP&A21-04/10R

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Hattiesburg, Mississippi

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Removal Action Work Plan

Northeast Drainage Ditch
Hattiesburg, Mississippi

1.0 Introduction

1.1 Project Background

Installation of approximately 3,700 feet of culvert pipe is planned to replace an open ditch ("the northeast drainage ditch") in Hattiesburg, Mississippi. The purpose of the project is to improve existing drainage in the project area and to address ditch sediments and soils containing polycyclic aromatic hydrocarbons (PAHs). The activities described herein were originally presented as part of a *Remedial Action Work Plan* for the former Gulf States Creosoting site, which was submitted to the Mississippi Department of Environmental Quality (MDEQ) in February 2000. In order to expedite completion of the ditch project, the plan for improving drainage and cleaning up the ditch is being submitted in this stand-alone *Removal Action Work Plan.*

1.2 Removal Action Objectives

The activities described in this work plan are designed to address impacted media within and adjacent to the northeast drainage ditch. The specific objectives of this removal action are to:

- eliminate the potential for exposure to impacted sediments and soils in the ditch;
- eliminate the potential for surface runoff to come in contact with impacted sediments and soils; and
- eliminate or greatly reduce the potential for infiltration of precipitation through impacted sediments and soils to shallow ground water.

1.3 Overview of Removal Action

The scope of the removal action to address the northeast drainage ditch consists of the following steps:

1. Remove existing culvert along the drainage pathway.
2. Excavate PAH-impacted ditch sediments and adjacent soils.
3. Load, transport, and dispose of impacted materials at an approved offsite facility.
4. Place an HDPE liner and sand bed (as necessary) in the excavated ditch.
5. Install culvert and drop inlets to provide for storm water collection and conveyance.
6. Backfill around culvert with clean soil and vegetate backfilled area with native grass.

The original plan was to remove impacted sediments and install culvert in the ditch up to a point approximately 2,400 feet downstream of the Southern railroad tracks. This point represents the distance past which no significant impact to sediments has been detected. During the engineering design study, however, it was determined that in order to accommodate runoff from the upstream drainage basin, it would be necessary to install culvert pipe significantly larger than that already in place. Therefore, the proposed culvert system has been extended an additional 1,300 feet downstream of the originally planned termination point in order to tie in to the recently completed Hall Avenue drainage project. It is not anticipated that PAH-impacted materials will be encountered in the ditch downstream of the originally planned termination point, thus this design modification is warranted strictly for drainage purposes.

2.0 Summary of Remedial Investigation Findings

During the Remedial Investigation (RI), sediment samples were collected and analyzed to determine the offsite extent of site constituents in the northeast drainage ditch. Samples have also been analyzed to determine if ditch sediments and soils contain characteristically hazardous wastes. In addition, samples from monitoring wells and temporary well points have been collected and analyzed to delineate the extent of the ground water plume associated with the ditch. Results of these sampling activities are summarized in this section.

2.1 Sediment and Soil Analytical Results

Samples of sediment within the northeast drainage ditch were collected and analyzed in 1998 and 2000 as part of the RI. Sediment sampling locations are depicted on Figure 2-1. The results of laboratory analyses are summarized in Tables 2-1 and 2-2. The analytical results indicate that polycyclic aromatic hydrocarbons (PAHs) are present in sediments within the northeast drainage ditch, and that constituent concentrations decrease significantly with distance from the former site.

In May 2001, samples of ditch sediments and soils were collected at the four locations shown on Figure 2-2 and were analyzed for hazardous characteristics. The results of these analyses are summarized in Table 2-3. The analytical data demonstrate that none of the samples exceeded the TCLP threshold concentrations, nor were they reactive, corrosive, or ignitable, demonstrating that the sediments and soils within the ditch are not characteristically hazardous. Appendix A of this plan contains additional information on waste classification issues associated with sediments and soils within the ditch.

2.2 Ground Water Analytical Results

Ground water samples from the monitoring wells and temporary well points shown on Figure 2-3 were collected and analyzed in 1998 and 2000 as part of the RI. The approximate extent of ground water exceeding the Tier 1 TRG for naphthalene in ground water (6.2 micrograms per liter) is also shown on Figure 2-3. The ground water analytical results demonstrate that the plume originating from the former Process Area and the plume associated with the northeast drainage ditch are separate and distinct. One objective of the proposed removal action is the removal of source materials affecting ground water and the reduction of hydraulic driving forces.

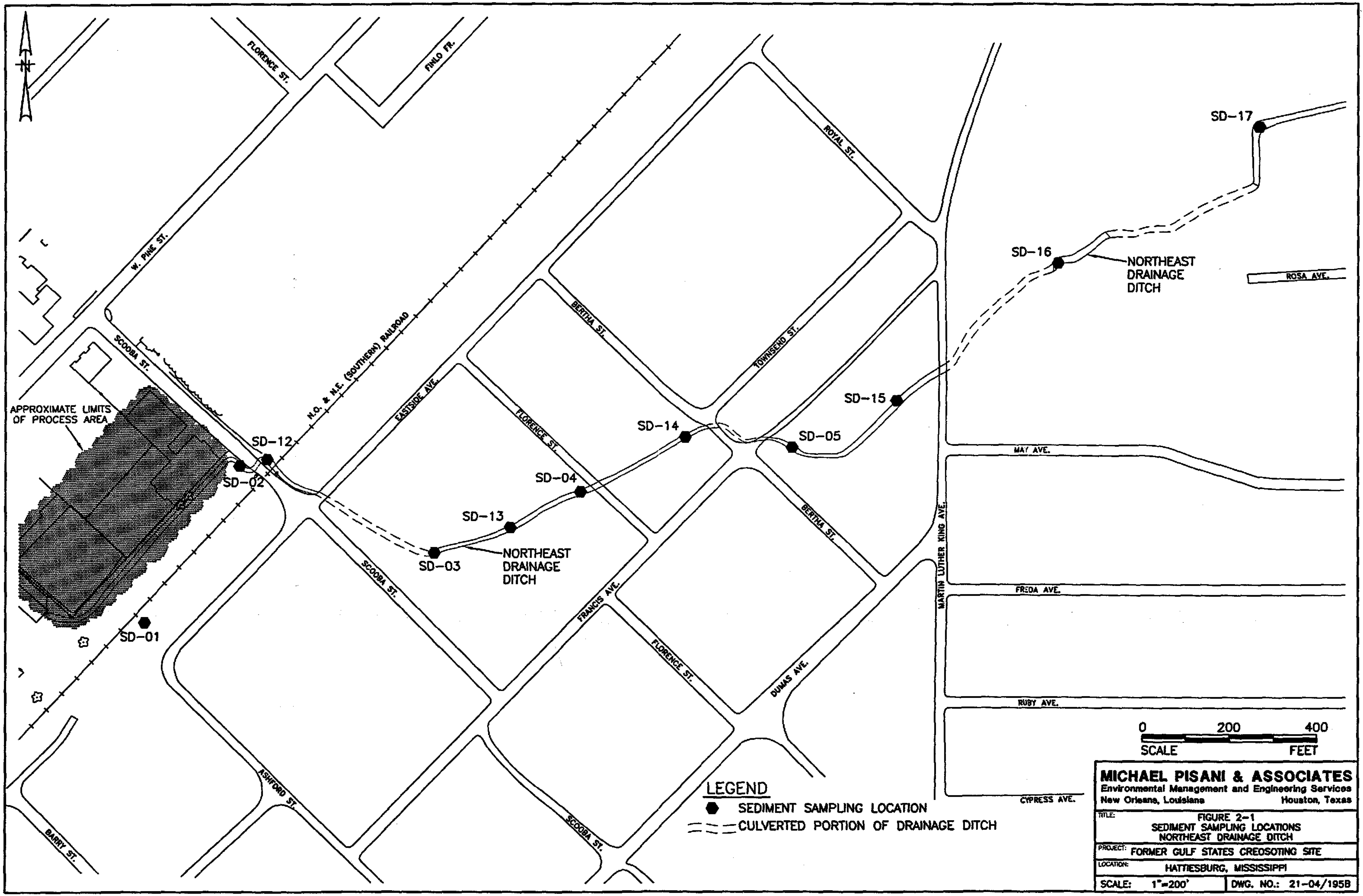

N
FLORENCE ST.
FINLO FR.
W. PINE ST.
SCOOBA ST.
N.O. & N.E. (SOUTHERN) RAILROAD
EASTSIDE AVE.
FLORENCE ST.
BERTHA ST.
TOWNSEND ST.
ROYAL ST.
MARTIN LUTHER KING AVE.
MAY AVE.
FREDA AVE.
RUBY AVE.
CYPRESS AVE.
ROSA AVE.
FRANCIS AVE.
DUMAS AVE.
ASHFORD ST.
BARRY ST.
APPROXIMATE LIMITS OF PROCESS AREA
SD-01
SD-02
SD-03
SD-04
SD-05
SD-12
SD-13
SD-14
SD-15
SD-16
SD-17
NORTHEAST DRAINAGE DITCH
NORTHEAST DRAINAGE DITCH
0
200
400
SCALE
FEET
LEGEND
SEDIMENT SAMPLING LOCATION
CULVERTED PORTION OF DRAINAGE DITCH
MICHAEL PISANI & ASSOCIATES
Environmental Management and Engineering Services
New Orleans, Louisiana
Houston, Texas
TITLE:
FIGURE 2-1
SEDIMENT SAMPLING LOCATIONS
NORTHEAST DRAINAGE DITCH
PROJECT: FORMER GULF STATES CREOSOTING SITE
LOCATION: HATTIESBURG, MISSISSIPPI
SCALE: 1"=200'
DWG. NO.: 21-04/195B

TABLE 2-1

SEDIMENT SAMPLE DATA SUMMARY
PHASE II REMEDIAL INVESTIGATION

Gulf Coast Creosoting Site
Hattiesburg, Mississippi

Analytical Parameter	CAS Registry Number	Units	Sample Identifier SD-01	SD-02	SD-03	SD-04	SD-05	SD-06
TCL Semivolatile Organics [(a)]								
1,2,4-trichlorobenzene	120-82-1	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
1,2-dichlorobenzene	95-50-1	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
1,3-dichlorobenzene	541-73-1	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
1,4-dichlorobenzene	106-46-7	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
2,2'-oxybis (1-chloropropane)	108-60-1	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
2,4,5-trichlorophenol	95-95-4	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
2,4,6-trichlorophenol	88-06-2	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
2,4-dichlorophenol	120-83-2	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
2,4-dimethylphenol	105-67-9	mg/kg	ND (0.079) U	1.5 (1) J	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
2,4-dinitrophenol	51-28-5	mg/kg	ND (0.230) U	ND (3)	ND (0.25) U	ND (2.3)	ND (0.24) U	ND (0.23) U
2,4-dinitrotoluene	121-14-2	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.4)	ND (0.084) U	ND (0.078) U
2,6-dinitrotoluene	606-20-2	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
2-chloronaphthalene	91-58-7	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
2-chlorophenol	95-57-8	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
2-methylnaphthalene	91-57-6	mg/kg	ND (0.039) U	150 (25)	0.44 (0.043)	38 (0.4)	0.091 (0.042) J	ND (0.039) U
2-methylphenol	95-48-7	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
2-nitroaniline	88-74-4	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
2-nitrophenol	88-75-5	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
3,3'-dichlorobenzidine	91-94-1	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
3- and 4-methylphenol	106-44-5	mg/kg	ND (0.079) U	ND (1)	0.093 (0.085) J	ND (0.8)	0.11 (0.084) J	ND (0.078) U
3-nitroaniline	99-09-2	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
4,6-dinitro-2-methylphenol	534-52-1	mg/kg	ND (0.200) U	ND (2.5)	ND (0.21) U	ND (2)	ND (0.21) U	ND (0.19) U
4-bromophenyl phenyl ether	101-55-3	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
4-chloro-3-methylphenol	59-50-7	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
4-chloroaniline	106-47-8	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
4-chlorophenyl phenyl ether	7005-72-3	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
4-nitroaniline	100-01-6	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
4-nitrophenol	100-02-7	mg/kg	ND (0.200) U	ND (2.5)	ND (0.21) U	ND (2)	ND (0.21) U	ND (0.19) U
acenaphthene	83-32-9	mg/kg	ND (0.039) U	100 (25)	0.89 (0.043)	140 (20) J	0.1 (0.042) J	ND (0.039) U
acenaphthylene	208-96-8	mg/kg	ND (0.039) U	35 (0.51)	8.9 (0.85)	6.8 (0.4)	0.17 (0.042) J	ND (0.039) U
anthracene	120-12-7	mg/kg	ND (0.039) U	190 (25)	5.5 (0.85) J	3.3 (0.4) J	0.88 (0.042)	ND (0.039) U
benzo (a) anthracene	56-55-3	mg/kg	0.062 (0.039) J	330 (25)	27 (0.85)	100 (20) J	0.93 (0.042)	ND (0.039) U
benzo (a) pyrene	50-32-8	mg/kg	0.056 (0.039) J	130 (25) J	49 (0.85)	33 (0.4)	0.97 (0.042)	ND (0.039) U
benzo (b) fluoranthene	205-99-2	mg/kg	0.120 (0.039) J	180 (25) J	78 (0.85)	46 (0.4)	1.4 (0.042)	ND (0.039) U
benzo (ghi) perylene	191-24-2	mg/kg	0.046 (0.039) J	36 (0.51)	32 (0.85)	9.5 (0.4)	0.42 (0.042)	ND (0.039) U
benzo (k) fluoranthene	207-08-9	mg/kg	ND (0.039) U	64 (0.51)	23 (0.85)	18 (0.4)	0.5 (0.042)	ND (0.039) U
bis (2-chloroethoxy) methane	111-91-1	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
bis (2-chloroethyl) ether	111-44-4	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
bis (2-ethylhexyl) phthalate	117-81-7	mg/kg	0.082 (0.079) U*	ND (1)	0.25 (0.085) U*	0.88 (0.8) J (c)	0.15 (0.084) U*	ND (0.078) U
butyl benzyl phthalate	85-68-7	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
carbazole	86-74-8	mg/kg	ND (0.039) U	590 (25)	0.97 (0.043)	100 (20) J	0.22 (0.042) J	ND (0.039) U
chrysene	218-01-9	mg/kg	0.077 (0.039) J	290 (25)	42 (0.85)	76 (20) J	1.3 (0.042)	ND (0.039) U
di-n-butyl phthalate	84-74-2	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
di-n-octyl phthalate	117-84-0	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
dibenz (a,h) anthracene	53-70-3	mg/kg	ND (0.039) U	12 (0.51)	9.6 (0.85)	3.3 (0.4) J	0.15 (0.042) J	ND (0.039) U
dibenzofuran	132-64-9	mg/kg	ND (0.039) U	940 (25)	0.48 (0.043)	150 (20) J	0.1 (0.042) J	ND (0.039) U
diethyl phthalate	84-66-2	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
dimethyl phthalate	131-11-3	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
fluoranthene	206-44-0	mg/kg	0.089 (0.039) J	160 (25)	21 (0.85)	470 (20)	2 (0.042)	ND (0.039) U
fluorene	86-73-7	mg/kg	ND (0.039) U	120 (25)	1 (0.043)	260 (20)	0.18 (0.042) J	ND (0.039) U
hexachlorobenzene	118-74-1	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
hexachlorobutadiene	87-68-3	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
hexachlorocyclopentadiene	77-47-4	mg/kg	ND (0.200) U	ND (2.5)	ND (0.21) U	ND (2)	ND (0.21) U	ND (0.19) U
hexachloroethane	67-72-1	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
indeno (1,2,3-cd) pyrene	193-39-5	mg/kg	0.049 (0.039) J	47 (0.51)	39 (0.85)	12 (0.4)	0.54 (0.042)	ND (0.039) U
isophorone	78-59-1	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
N-nitrosodi-n-propylamine	621-64-7	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
N-nitrosodiphenylamine	86-30-6	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
naphthalene	91-20-3	mg/kg	ND (0.039) U	300 (25)	1.6 (0.043)	14 (0.4)	0.16 (0.042) J	ND (0.039) U
nitrobenzene	98-95-3	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
pentachlorophenol	87-86-5	mg/kg	ND (0.200) U	ND (2.5)	ND (0.21) U	ND (2)	ND (0.21) U	ND (0.19) U
phenanthrene	85-01-8	mg/kg	ND (0.039) U	320 (25)	3.6 (0.043)	870 (20)	0.66 (0.042)	ND (0.039) U
phenol	108-95-2	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
pyrene	129-00-0	mg/kg	0.110 (0.039) J	100 (25)	32 (0.85)	300 (20)	1.6 (0.042)	ND (0.039) U
Other Parameters								
Moisture Content[(b)]	N.A.	wt. %	15.1 (0.08)	34.2 (0.08)	21.9 (0.08)	16.4 (0.08)	20.5 (0.08)	14.3 (0.08)

NOTES:

ND denotes "Not Detected" at method detection limit shown in parentheses.
(a) Target Compound List (TCL) base neutral/acid-extractable organic compounds by EPA SW-846 method 8270, reported as dry-weight concentrations.
(b) EPA method 160.3 (*Methods for Chemical Analysis of Water and Wastes*, March 1983).
(c) Low concentrations of this common laboratory contaminant warrant caution if this value is used as basis for environmental risk assessment or other decision-making process.
U qualifier denotes not detected.
J qualifier denotes quantitation is estimated due to limitations identified during data validation quality assurance review.
U* qualifier denotes that compound should be considered "not-detected" since it was detected in a corresponding field, trip, and/or laboratory blank sample at a similar concentration.

Table 2-2

Summary of Sediment Analytical Results
Northeast Drainage Ditch

Gulf States Creosoting Site
Hattiesburg, Mississippi

Analytical Parameter	CAS Number	Units	SD-12	SD-12 Duplicate[a]	SD-13	SD-14	SD-15	SD-16	SD-17
Polycyclic Aromatic Hydrocarbons (PAHs)									
Naphthalene	91-20-3	mg/kg	ND (180)	ND (190)	ND (1.80)	ND (2.90)	ND (3.50)	ND (3.30)	ND (3.50)
Acenaphthylene	208-96-8	mg/kg	ND (180)	ND (190)	ND (1.80)	ND (2.90)	ND (3.50)	ND (3.30)	ND (3.50)
Acenaphthene	83-32-9	mg/kg	320 J	370 J	ND (1.80)	3.90 J	ND (3.50)	ND (3.30)	ND (3.50)
Fluorene	86-73-7	mg/kg	580	710	0.78 J	0.65 J	ND (0.32)	2.80 J	ND (0.33)
Phenanthrene	85-01-8	mg/kg	1820	2110	2.27	ND (0.11) U*	ND (0.13) U*	4.50	ND (0.13) U*
Anthracene	120-12-7	mg/kg	1110	1490	3.47	9.91	1.48	23.9	ND (0.065) U*
Fluoranthene	206-44-0	mg/kg	922	1030	6.52	22.9	1.22	12.0	0.92
Pyrene	129-00-0	mg/kg	900	970	8.40	30.8	2.77 J	12.9	2.28 J
Benz(a)anthracene	56-55-3	mg/kg	168	184	2.91	11.8	1.02	3.61	0.94
Chrysene	218-01-9	mg/kg	129	134	2.97	19.6	ND (0.13) U*	3.0	ND (0.13) U*
Benzo(b)fluoranthene	205-99-2	mg/kg	60.0	67.0	4.17	14.2	2.88	3.03	2.50
Benzo(k)fluoranthene	207-08-9	mg/kg	35.0	39.0	2.08	7.85	1.39	1.60	1.26
Benzo(a)pyrene	50-32-8	mg/kg	69.0	73.0	3.27	12.2	2.42	2.80	2.26
Dibenz(a,h)anthracene	53-70-3	mg/kg	6.50 J	11.6 J	0.48	1.61	0.37 J	0.384 J	0.365 J
Benzo(g,h,i)perylene	191-24-2	mg/kg	14.0 J	15.0 J	2.00	4.40	1.38 J	1.05 J	1.21 J
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	28.1 J	30.3 J	2.53	7.30	2.00	1.60	1.60
Other Parameters									
Moisture		%	26.5%	29.9%	24.7%	8.39%	21.8%	18.5%	23.1%

Notes:

(a) Identified as sample "SD-99" on sample custody documentation.

ND denotes "not detected" at reporting limit shown in parentheses.

Values shown are dry-weight concentrations.

J data validation qualifier denotes estimated value.

B data validation qualifier denotes constituent was detected in corresponding laboratory blank.

U* data validation qualifier denotes originally reported positive result that should be considered "not detected" due to trace-level presence of the analyte in associated laboratory method blanks and/or rinsate blanks.

MPA 19-07/SedSed.xls
T0-7

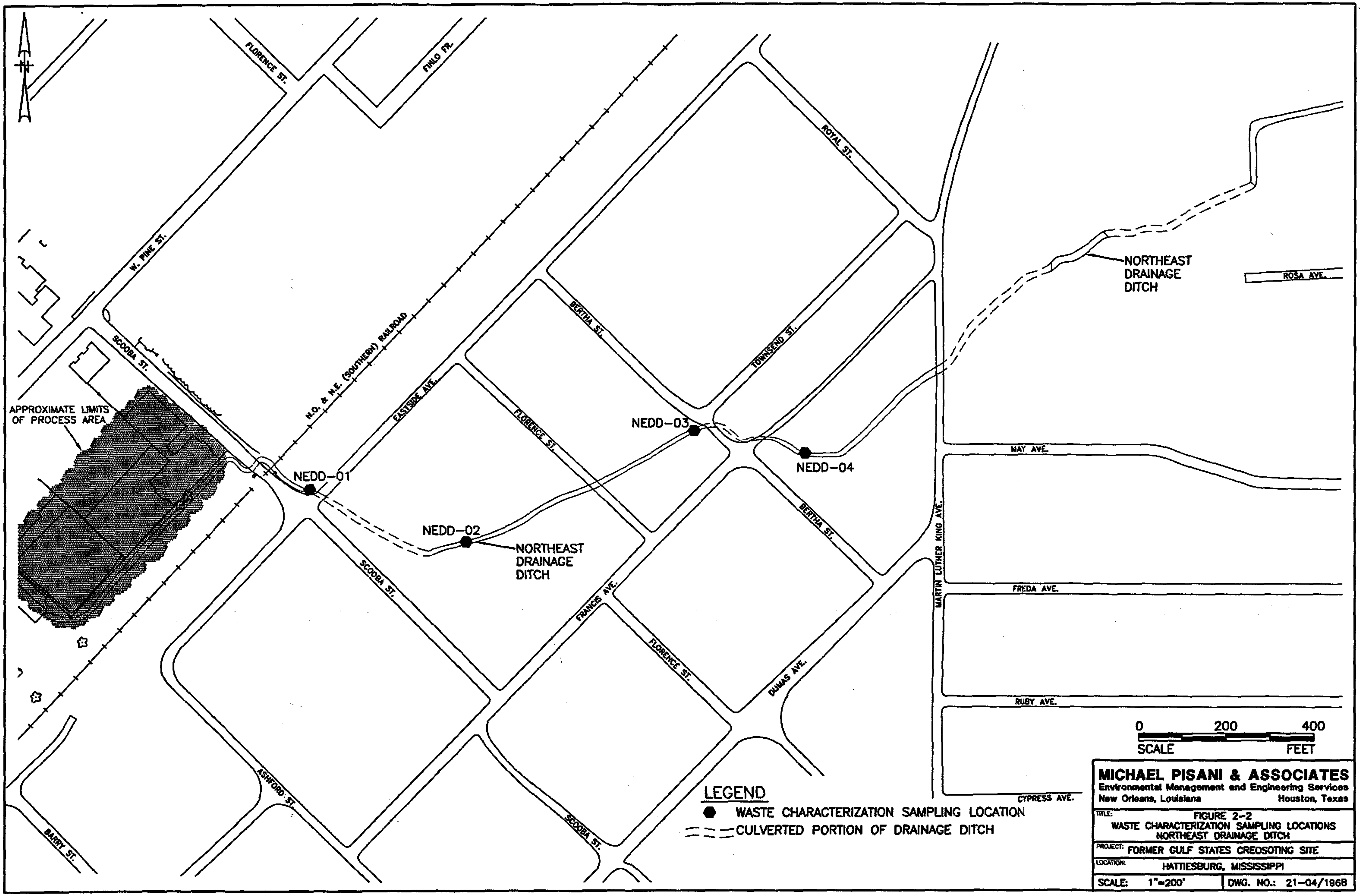

N
FLORENCE ST.
FINLO FR.
ROYAL ST.
W. PINE ST.
N.O. & N.E. (SOUTHERN) RAILROAD
SCOOBA ST.
EASTSIDE AVE.
FLORENCE ST.
BERTHA ST.
TOWNSEND ST.
NORTHEAST DRAINAGE DITCH
ROSA AVE.
APPROXIMATE LIMITS OF PROCESS AREA
NEDD-01
NEDD-02
NEDD-03
NEDD-04
NORTHEAST DRAINAGE DITCH
MAY AVE.
BERTHA ST.
MARTIN LUTHER KING AVE.
FREDA AVE.
SCOOBA ST.
FRANCIS AVE.
FLORENCE ST.
DUMAS AVE.
RUBY AVE.
ASHFORD ST.
BARRY ST.
SCOOBA ST.
CYPRESS AVE.
LEGEND
WASTE CHARACTERIZATION SAMPLING LOCATION
CULVERTED PORTION OF DRAINAGE DITCH
0 200 400
SCALE FEET
MICHAEL PISANI & ASSOCIATES
Environmental Management and Engineering Services
New Orleans, Louisiana Houston, Texas
TITLE: FIGURE 2-2
WASTE CHARACTERIZATION SAMPLING LOCATIONS
NORTHEAST DRAINAGE DITCH
PROJECT: FORMER GULF STATES CREOSOTING SITE
LOCATION: HATTIESBURG, MISSISSIPPI
SCALE: 1"=200'
DWG. NO.: 21-04/196B

Table 2-3

Summary of Hazardous Characteristic Analyses
Northeast Drainage Ditch

Gulf States Creosoting Site
Hattiesburg, Mississippi

Analytical Parameter	Limit	Units	NEDD-01	NEDD-02	NEDD-03	NEDD-04
TCLP Metals						
Mercury	0.2	mg/l	ND (0.000026)	NA	NA	ND (0.000026)
Arsenic	5.0	mg/l	0.0616 J	NA	NA	0.00063 J
Selenium	1.0	mg/l	0.0054 J	NA	NA	0.0079 J
Barium	100.0	mg/l	0.731	NA	NA	0.237
Cadmium	1.0	mg/l	0.00080 J	NA	NA	0.00012 J
Chromium	5.0	mg/l	0.0022 J	NA	NA	0.0077 J
Lead	5.0	mg/l	0.166	NA	NA	0.0459 J
Silver	5.0	mg/l	ND (0.0013)	NA	NA	ND (0.0013)
TCLP Pesticides						
Gamma BHC - Lindance	0.4	mg/l	ND (0.000010)	NA	NA	ND (0.000010)
Heptachlor	0.008	mg/l	ND (0.000010)	NA	NA	0.000022 J
Heptachlor Epoxide	0.008	mg/l	ND (0.000010)	NA	NA	ND (0.000010)
Methoxychlor	10.0	mg/l	ND (0.00010)	NA	NA	ND (0.00010)
Endrin	0.02	mg/l	0.000089 J	NA	NA	ND (0.000020)
Chlordane	0.03	mg/l	ND (0.00025)	NA	NA	ND (0.00025)
Toxaphene	0.5	mg/l	ND (0.0015)	NA	NA	ND (0.0015)
TCLP Herbicides						
2,4-D	10.0	mg/l	ND (0.0020)	NA	NA	ND (0.0020)
2,4,5-TP	1.0	mg/l	ND (0.00020)	NA	NA	ND (0.00020)
TCLP Acid Base/Neutrals						
Pyridine	5.0	mg/l	ND (0.0040)	ND (0.0040)	ND (0.0040)	ND (0.0040)
1,4-Dichlorobenzene	7.5	mg/l	ND (0.0020)	ND (0.0020)	ND (0.0020)	ND (0.0020)
2-Methylphenol	200.0 (b)	mg/l	ND (0.0020)	ND (0.0020)	ND (0.0020)	ND (0.0020)
4-Methylphenol (a)	200.0 (b)	mg/l	ND (0.0060)	ND (0.0060)	ND (0.0060)	ND (0.0060)
Hexachloroethane	3.0	mg/l	ND (0.0020)	ND (0.0020)	ND (0.0020)	ND (0.0020)
Nitrobenzene	2	mg/l	ND (0.0020)	ND (0.0020)	ND (0.0020)	ND (0.0020)
Hexachlorobutadiene	0.5	mg/l	ND (0.0040)	ND (0.0040)	ND (0.0040)	ND (0.0040)
2,4,6-Trichlorophenol	2.0	mg/l	ND (0.0040)	ND (0.0040)	ND (0.0040)	ND (0.0040)
2,4,5-Trichlorophenol	400.0	mg/l	ND (0.0040)	ND (0.0040)	ND (0.0040)	ND (0.0040)
2,4-Dinitrotoluene	0.13	mg/l	ND (0.0020)	ND (0.0020)	ND (0.0020)	ND (0.0020)
Hexachlorobenzene	0.13	mg/l	ND (0.0040)	ND (0.0040)	ND (0.0040)	ND (0.0040)
Pentachlorophenol	100.0	mg/l	ND (0.0060)	ND (0.0060)	ND (0.0060)	ND (0.0060)
TCLP Volatiles						
Vinyl Chloride	0.2	mg/l	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)
1,1-Dichloroethene	0.7	mg/l	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)
Chloroform	6.0	mg/l	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)
Carbon Tetrachloride	0.5	mg/l	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)
Benzene	0.5	mg/l	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)
1,2-Dichloroethane	0.5	mg/l	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)
Trichloroethene	0.5	mg/l	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)
Tetrachloroethene	0.7	mg/l	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)
Chlorobenzene	100.0	mg/l	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)
2-Butanone	200.0	mg/l	ND (0.015)	ND (0.015)	ND (0.015)	ND (0.015)
Other Parameters						
Sulfide (Reactivity)	500	mg/kg	ND 33	ND 33	ND 33	ND 33
Cyanide (Reactivity)	250	mg/kg	ND 95	ND 99	ND 99	ND 99
Corrosivity (pH)	≤2 or ≥12.5	s.u.	7.30	6.92	6.05	6.03
Ignitability	Ignitable?	yes/no	no	no	no	no

Notes:

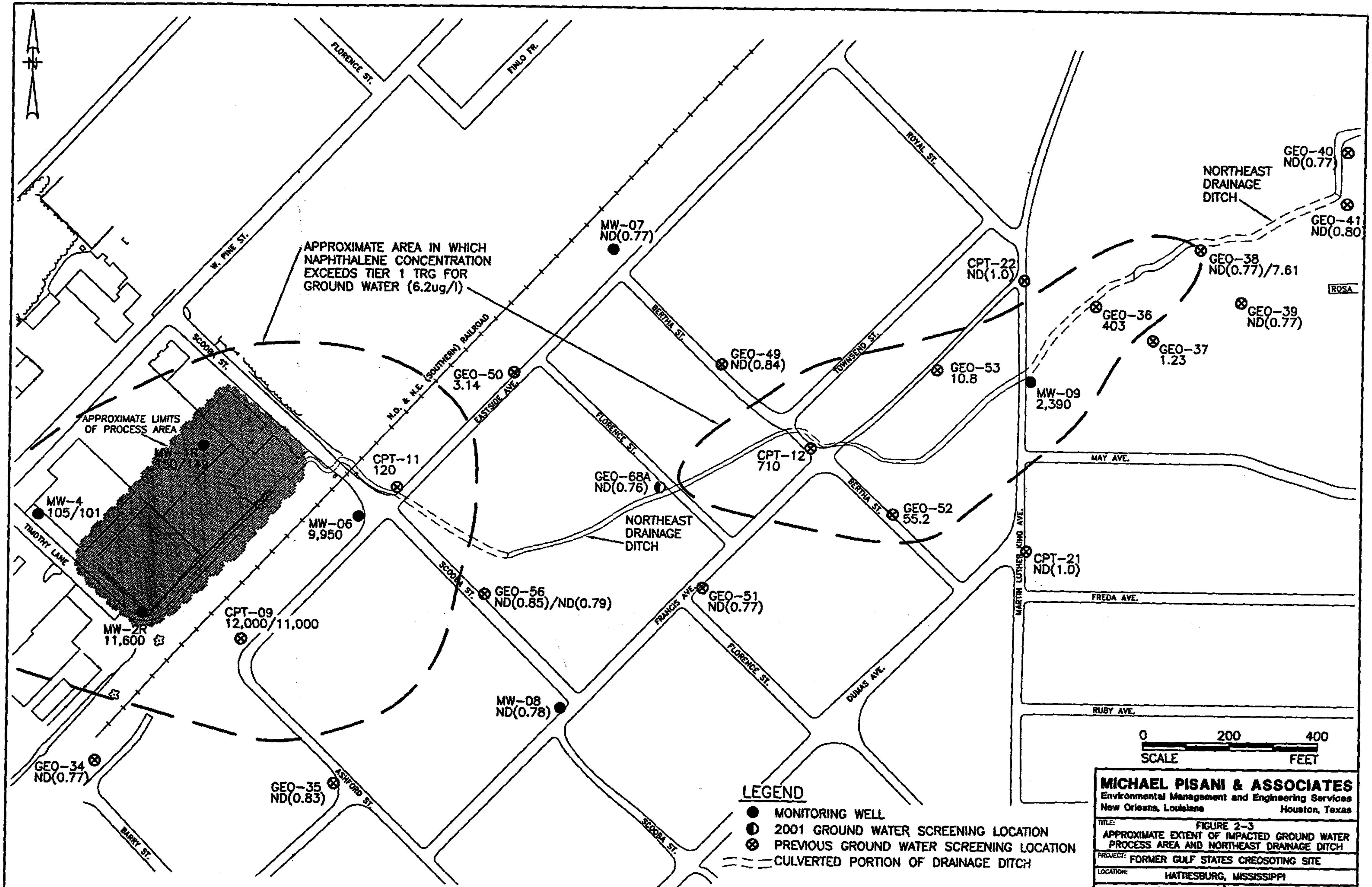
ND denotes "not detected" at reporting limit shown in parentheses.

J qualifier denotes estimated value.

NA denotes sample not analyzed for this TCLP fraction.

(a) 3-methylphenol and 4-methylphenol cannot be differentiated; reported value represents the combined total of both compounds.

(b) TCLP limit for total methylphenols.


N
FLORENCE ST.
FINLO PR.
W. PINE ST.
ROYAL ST.
NORTHEAST
DRAINAGE
DITCH
GEO-40
ND(0.77)
GEO-41
ND(0.80)
MW-07
ND(0.77)
APPROXIMATE AREA IN WHICH
NAPHTHALENE CONCENTRATION
EXCEEDS TIER 1 TRG FOR
GROUND WATER (6.2ug/l)
CPT-22
ND(1.0)
GEO-38
ND(0.77)/7.61
ROSA
BERTHA ST.
GEO-36
403
GEO-39
ND(0.77)
SCOOBA ST.
N.O. & N.E. (SOUTHERN) RAILROAD
GEO-49
ND(0.84)
TOWNSEND ST.
GEO-37
1.23
GEO-50
3.14
GEO-53
10.8
EASTSIDE AVE.
MW-09
2,390
APPROXIMATE LIMITS
OF PROCESS AREA
FLORENCE ST.
CPT-11
120
CPT-12
710
MAY AVE.
GEO-68A
ND(0.76)
MW-4
105/101
BERTHA ST.
NORTHEAST
DRAINAGE
DITCH
GEO-52
55.2
MW-06
9,950
TIMOTHY LANE
CPT-21
ND(1.0)
MARTIN LUTHER KING AVE.
SCOOBA ST.
GEO-56
ND(0.85)/ND(0.79)
FREDA AVE.
GEO-51
ND(0.77)
FRANCIS AVE.
CPT-09
12,000/11,000
MW-2R
11,600
FLORENCE ST.
DUMAS AVE.
MW-08
ND(0.78)
RUBY AVE.
0
200
400
SCALE
FEET
GEO-34
ND(0.77)
GEO-35
ND(0.83)
ASHFORD ST.
LEGEND
MONITORING WELL
2001 GROUND WATER SCREENING LOCATION
PREVIOUS GROUND WATER SCREENING LOCATION
CULVERTED PORTION OF DRAINAGE DITCH
BARRY ST.
SCOOBA ST.
MICHAEL PISANI & ASSOCIATES
Environmental Management and Engineering Services
New Orleans, Louisiana
Houston, Texas
TITLE:
FIGURE 2-3
APPROXIMATE EXTENT OF IMPACTED GROUND WATER
PROCESS AREA AND NORTHEAST DRAINAGE DITCH
PROJECT: FORMER GULF STATES CREOSOTING SITE
LOCATION: HATTIESBURG, MISSISSIPPI
SCALE: 1"=200'
DWG. NO.: 21-04/194B

3.0 Selection of Remedial Alternative

Section 4.0 of the February 2000 *Remedial Action Work Plan* presented the results of a Feasibility Study in which a wide range of remedial alternatives for addressing affected media at former wood treating sites were evaluated. The selected alternative for the northeast drainage ditch was removal and offsite disposal of impacted sediments and soils, followed by the installation of a culvert system within the existing ditch. Selection of this remedy was based on the following:

- The proposed remedy will result in overall protection of human health and the environment by reducing the potential for direct contact with impacted sediments and soils, as well as the potential for surface water runoff to come in contact with impacted sediments and soils.
- The proposed remedy will result in the reduction of a continuing source of ground water contamination.
- The proposed remedy represents a readily implementable and cost-effective long-term solution that has met with acceptance by both the public and MDEQ.

The selection criteria for the northeast drainage ditch remedial alternative apply with the same force to the proposed removal action, and the removal action proposed in this work plan is the same as the remedial alternative for the ditch presented in the February 2000 *Remedial Action Work Plan.*

4.0 Pre-Construction Activities

Certain tasks must be completed prior to mobilizing to the field for construction activities. These tasks include the following:

- coordinating with the City of Hattiesburg to obtain construction easements from landowners and/or surface leaseholders and for contracting the overall project;
- coordinating the clearance of subsurface and overhead utilities;
- surveying construction easements and anticipated excavation boundaries;
- designating exclusion zones and other work areas; and
- coordinating with the City of Hattiesburg on traffic control issues.

Details regarding these tasks are provided in this section.

4.1 Construction Easements

The City of Hattiesburg Public Services Department is currently working to obtain easements from landowners and/or surface leaseholders along the ditch. The City will obtain two types of easements for the project:

- a 15-foot wide drainage easement (i.e., 7.5 feet on either side of the centerline of the proposed drainage pipe) to allow the City or its contractor to perform maintenance of the culvert system; and
- 10-foot wide temporary construction easements running parallel with and adjacent to both edges of each drainage easement.

Proposed City easements are shown on Sheets 3 through 9 of the construction drawing package, which is submitted with this work plan and incorporated herein by reference.

4.2 Utilities Clearance

The contractor selected to provide construction services will be responsible for identifying all subsurface and overhead utility lines located within the easements for the project. This will consist of requesting utilities clearance from Mississippi One-Call and coordinating with the City of Hattiesburg Public Services Department. The contractor will take precautions to protect utilities from damage during construction. Should the relocation of utility lines be required, the contractor will coordinate with the utility owner regarding the scope, schedule, and payment for such relocation.

4.3 Surveying and Temporary Fencing

Prior to mobilization, the following boundaries will be surveyed by a professional land surveyor licensed in Mississippi:

- the outer boundaries of the construction easements on each side of the ditch; and
- the approximate boundaries of the anticipated excavation.

The excavation will be a minimum of 6 feet wide (i.e., 3 feet on either side of the centerline of the proposed pipe), but may be as wide as 12 feet in some areas (e.g., in areas where tandem pipes must be installed to provide adequate drainage capacity). A line of stakes with flagging tape will be driven along the excavation boundaries.

Construction easement boundaries will be surveyed in order to confine construction activities to these easements. Temporary fencing will be installed along the easement boundaries prior to commencing construction.

4.4 Designation of Work Areas

The temporarily fenced area (i.e., the area within the construction easement) will be considered an exclusion zone, with access limited to construction workers, MDEQ personnel, and City of Hattiesburg Public Works Department personnel only. A temporary building (e.g., a mobile home or similar structure) will be brought in to serve as the field office, and will be stationed at a location yet to be determined. The surface leases for several lots adjacent to the ditch have reverted to the City of Hattiesburg; one or more of these lots may be utilized for equipment and materials storage. Additional details regarding specific work areas will be provided to MDEQ and the City prior to field mobilization.

4.5 Traffic Control

During the removal action, existing culverts beneath several City streets will need to be removed and replaced. In addition, trucks loaded with material bound for offsite disposal will result in increased vehicular traffic in the project area. The construction contractor will coordinate with the City of Hattiesburg Public Works Department to address street closings, rerouting of traffic, and appropriate routes for truck traffic.

5.0 Construction Activities

Procedures for conducting the actual removal action are established in this section. The construction drawing package provided with this document includes demolition plans, proposed plans and profiles for the proposed culvert system, detailed design drawings for all components of the system, and cross sections depicting existing grade and proposed culvert elevations.

5.1 Mobilization

Once all pre-construction tasks are completed, and upon receipt of written approval of this plan from MDEQ, the construction contractor will mobilize to the field all equipment, materials, and personnel required to complete the project. The temporary field office will be set up and equipment and materials storage areas will be established. Prior to commencing construction, a start-of-job meeting will be conducted at the site to discuss the sequence of project tasks and to establish clear lines of communications between the construction contractor and MDEQ and City of Hattiesburg personnel.

5.2 Clearing and Grubbing

All trees and shrubs within the anticipated excavation boundaries will be removed prior to commencing excavation. Tree and shrub removal will include cutting the limbs and trunk and grubbing out of the entire root system, to the extent practicable. Trees less than 8 inches in diameter and all shrubs will also be removed from the construction easement to allow construction to proceed unencumbered. The removal of larger trees will be considered on a case-by-case basis.

5.3 Excavation and Loading

Excavation will be conducted using a trackhoe, with soil either loaded directly into trucks for immediate transportation and offsite disposal or stockpiled onsite for subsequent transportation and offsite disposal. A minimum of 18 inches of sediment and soil beneath the existing base of the ditch will be excavated; typical excavation detail is shown on Sheet 13 of the construction drawing package. Greater than 18 inches of material will be removed in areas where necessary to achieve the proposed elevation for the base of pipe, and/or in areas where grossly-impacted materials extend to greater depths. In no instance will excavation proceed past the first encountered ground water.

As documented in Section 2.1 of this plan, ditch sediments and soils have been tested and determined to be nonhazardous. However, should materials containing free-phase hydrocarbon be encountered during excavation, such materials will be stockpiled or placed in roll-off boxes and tested to determine appropriate disposition. At a minimum, materials containing free liquids will be mixed with a sufficient amount of stabilizing agent to meet transportation and disposal requirements for free liquid content.

The planned excavation sequence is to begin by removing and replacing the existing culverts at all road crossings along the ditch. These road crossings are, starting at the Southern railroad tracks and moving downstream, Eastside Avenue, Florence Street, Harrell Street, Francis Street, Martin Luther King Avenue, Charles Street, and Katie Avenue. Once the new road crossing culverts are in place, the project will proceed from downstream to upstream.

It is important to note that the following two segments of the project are located in areas where impacted materials are not anticipated:

- from the Eastside Avenue culvert crossing to back of the residence at 106 Scooba Street (from approximately Station 11+40 to Station 15+00 on the construction drawings); and
- from the Francis Street Apartments to the tie-in with the Hall Avenue drainage project at Katie Avenue (from approximately Station 37+40 to the downstream project termination point on the construction drawings).

Unless visibly-impacted materials are encountered within these areas, the excavated materials will not be removed from the site and will be utilized as backfill material, as needed.

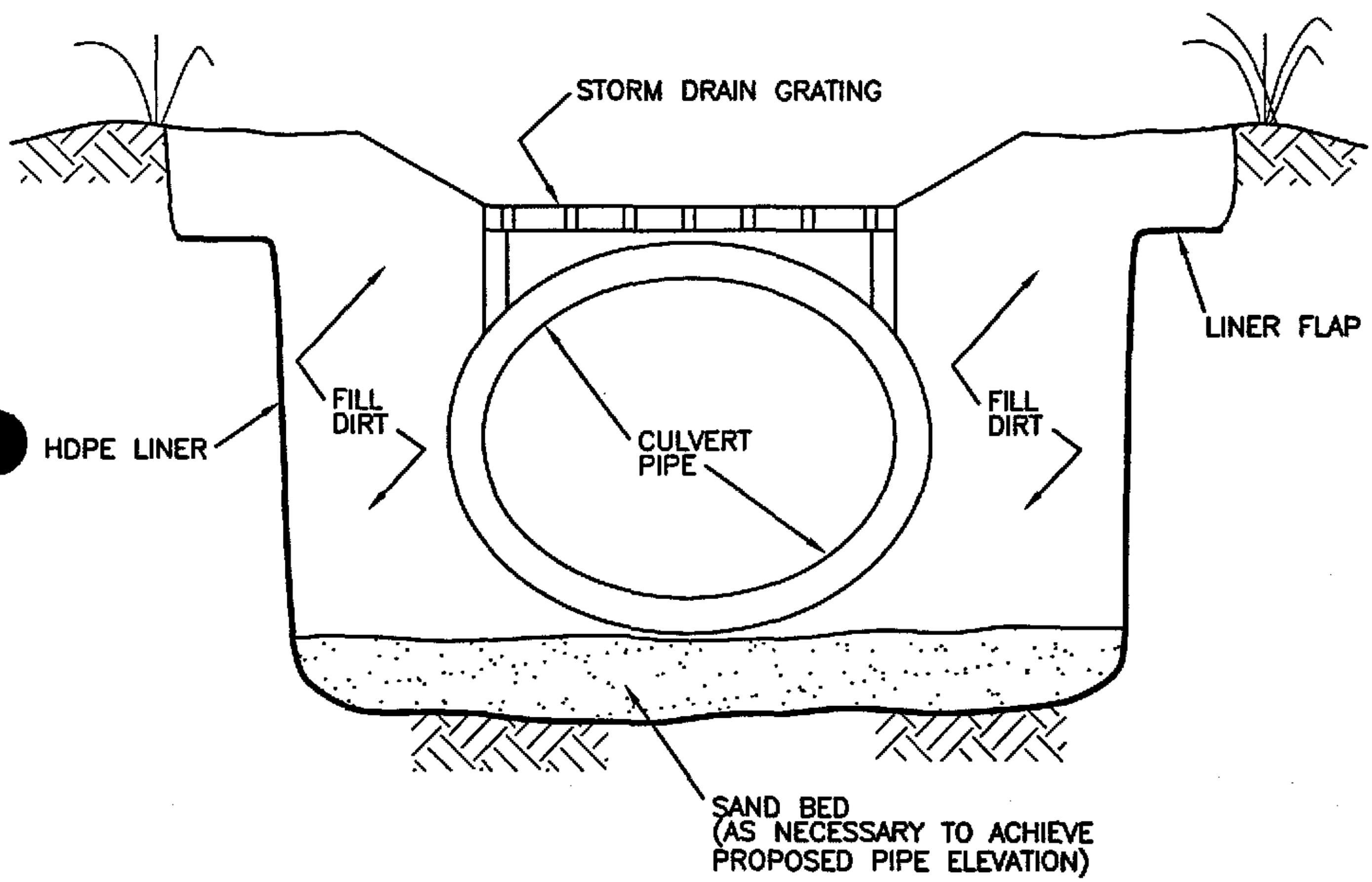
5.4 Transportation and Disposal

Loaded trucks will proceed directly to an industrial solid waste (Subtitle D) landfill to be designated prior to field mobilization. The best route for truck traffic will be determined during discussions with City of Hattiesburg personnel. The construction contractor will responsible for keeping waste manifests and other transportation and disposal records, as appropriate.

5.5 Installation of Liner and Sand Bed

In order to preclude contact with residual site constituents during culvert installation, and to minimize the potential for infiltration of surface water to ground water, an HDPE liner will be installed in the excavation prior to piping. The 20 mil liner will cover the bottom and the sides of the excavation, and will be keyed into the sidewall by excavating a small "shelf" for a flap, as shown on Figure 5-1. Fill material will be placed on the flap to keep the liner in place until the pipe is installed and the excavation backfilled.

In most areas, it is anticipated that the culvert pipe will rest directly atop the liner in the base of the excavation. In areas where overexcavation is required, however, it will be necessary to place a sand bed atop the liner to achieve the proposed base of pipe elevations.



MICHAEL PISANI & ASSOCIATES **Environmental Management and Engineering Services** **New Orleans, Louisiana Houston, Texas**	FIGURE 5-1 CULVERT SECTION VIEW FORMER GULF STATES CREOSOTING SITE HATTIESBURG, MISSISSIPPI
SCALE: NTS	DWG. NO.: 21-04/197A	

5.6 Installation of Culvert System

The culvert system will be installed as shown on the construction drawings. The concrete culvert piping ranges in size from 27 by 44 inch arch pipe at the inception of the project to tandem box culverts (72 by 42 inches and 96 by 36 inches) at the downstream end of the project. Pipe joints will be constructed in accordance with Mississippi Department of Transportation specifications. Grated storm water inlets will be installed at approximately 100- to 150-foot intervals, as shown on the drawings.

5.7 Backfilling and Seeding

Backfilling will proceed as the system is installed so that the excavation does not remain open longer than necessary. Backfilled materials will be compacted to 90% of standard proctor density until the pipe has a cover of not less than one foot. Excavations across roadways or in areas to be paved will be backfilled in 6 inch layers and will be compacted to 95% of standard proctor density. To facilitate storm water collection, the surface of the backfilled culvert trench will be graded to direct surface flow to the nearest storm water inlet. All backfilled areas will be repaired with common Bermuda grass seeding.

6.0 Community Relations

In previous meetings with MDEQ, it was decided that MDEQ would conduct a public meeting to inform the residents potentially affected by the removal action (i.e., those holding surface leases along or in the general vicinity of the ditch) of proposed removal action activities. Landowners/leaseholders will be notified of the meeting by distributing flyers throughout the residential area in the vicinity of the ditch. The area in which flyers will be distributed will be determined during future discussions with MDEQ. Representatives of the City of Hattiesburg PSD will be on hand to assist MDEQ in answering any questions that may arise at the meeting.

7.0 Health and Safety

The contractor selected to provide construction services will be responsible for developing a comprehensive Health and Safety program for the project. All workers involved in the removal and handling of impacted materials must be HAZWOPER trained in accordance with OSHA regulation 40 CFR 1910.120. Within 14 calendar days of being awarded the construction contract for the project or the relevant portion of any such contract, the contractor to perform removal and handling of impacted materials will develop and submit to the City of Hattiesburg PSD a Health and Safety Plan for the removal action. This plan will address, at a minimum, physical and chemical hazards, safe work practices, hazard communications, worker personal protective equipment, and key health and safety personnel. All persons working at or visiting the site, including but not limited to MDEQ and City of Hattiesburg PSD personnel, will adhere to the provisions of the relevant contractor's Health and Safety Plan.

8.0 Reporting

Once the removal action is under way, Monthly Progress Reports will be submitted to MDEQ prior to the 10th of each month. These reports will summarize activities completed during the previous month and will outline anticipated activities for the upcoming month. Progress reports will contain an estimate of the percentage of the project completed, and will document any problems encountered and the resolution of any such problems.

Upon completion of the project, a *Removal Action Report* will be submitted to MDEQ for review and approval. This report will document field activities, including any deviations from the approved *Removal Action Work Plan* and the reasons for any such deviations. Copies of the contractor's as-built drawings will be provided with the report.

9.0 Schedule

The schedule for the removal action is largely dependent on site access and contracting issues. The City is currently obtaining easements and will soon begin the process of selecting a construction contractor. It is anticipated that mobilization will occur within one month of contractor selection.

Appendix A

Position Paper on Waste Classification of Sediments and Soils

Former Gulf States Creosoting Site
Hattiesburg, Mississippi

Waste Classification of Sediments and Soils from the Northeast Drainage Ditch

Former Gulf States Creosoting Site Hattiesburg, Mississippi

Summary

The City of Hattiesburg ("City") planned to improve a portion of an existing open drainage ditch commencing near Scooba Street and Eastside Avenue and terminating near Katie Avenue and Charles Street ("Ditch"). After this work was planned by the City, and in the course of investigating conditions at the former Gulf States Creosoting site ("Site"), previously located at Scooba Street and West Pine Street, it was determined that portions of the Ditch are impacted with polycyclic aromatic hydrocarbons (PAHs). In order to coordinate the City's planned work on the Ditch with response to the discovered contamination, it is now anticipated that the open Ditch will be replaced with approximately 3,700 feet of culvert pipe.

Affected sediments and soils in the Ditch were sampled and analyzed for hazardous characteristics. The results of these analyses demonstrate that the sediments and soils within the Ditch are not characteristic hazardous waste.

Because the area drained by the Ditch included the Site, the hazardous waste listings were reviewed to determine whether listed waste may be present in the Ditch. The Ditch is not on the parcel of property previously occupied by the Site. Documentation relating to the Site was reviewed and no information was found indicating that any listed hazardous waste was placed in the Ditch. Therefore, and in accordance with USEPA guidance, it is assumed that the sediments and soils in the Ditch do not contain listed hazardous waste.

Even if the sediments and soils in the Ditch arguably contain listed hazardous waste, MDEQ has the authority to make a "contained in" determination that these materials no longer contain hazardous waste and may be managed as solid waste. This position paper documents the facts, regulations, guidance, and rationale supporting classification of the Ditch sediments and soils as solid waste and not hazardous waste. Concurrence by MDEQ with this position is requested for the City to commence the culvert project for the Ditch.

Background

The Site was a wood treating facility located near the intersection of Scooba Street and West Pine Street in Hattiesburg, Mississippi. The Site operated from the early 1900s to approximately 1960 with a single pressure treating cylinder using creosote only for treating wood products. The Site was redeveloped beginning in approximately 1962 for commercial and light industrial use. The Site remains in commercial use with much of the Site dedicated to automobile sales and service.

The Site has been investigated for environmental impacts by various agencies and contractors since 1990. Kerr-McGee Chemical (KMC) entered into a voluntary agreement for investigation of the Site in 1996 and completed a Remedial Investigation from 1997 to 2001. Investigations have resulted in the identification of PAHs as the primary constituents of concern. The origin of PAHs is not known, however these constituents may be associated with the wood treating compounds and/or blending oils historically used at the Site. [Note: Sanborn maps clearly identify oil blending and storage tanks located on Site. The presence of these tanks is consistent with deposition testimony of former Site employees that carrier oil was stored and blended with creosote prior to its use for wood treating.]

Samples of sediment within the Ditch were collected and analyzed in 1998 and 2000 as part of KMC's Remedial Investigation. Sediment sampling locations are depicted on Figure 1. The results of laboratory analyses are summarized in Tables 1 and 2. The analytical results indicate that PAHs are present in sediments within the Ditch, and that constituent concentrations decrease significantly with distance from the former Site.

Currently, installation of a culvert is planned for the Ditch. The purpose of the culvert is to convey storm water and reduce the potential for exposure to PAH-affected sediments and soils within the open Ditch. Some affected material within the Ditch will be removed prior to installation of the culvert. The waste classification and management issues for the affected material are discussed in detail in this position paper.

Waste Classification and Management Issues

The waste classification and management options for affected material in the vicinity of the Site are dependent on the answers to the following questions: 1) Are the affected sediments/soils characteristically hazardous? 2) Are the affected sediments/soils contaminated with listed hazardous waste? and 3) If the sediments/soils are a hazardous waste, could the sediments/soils qualify for a "contained-in" determination from the MDEQ?

Characteristically Hazardous Waste Issue

Solid wastes from unknown specific origin are considered hazardous waste only if they exhibit a characteristic of hazardous waste (i.e., reactivity, corrosivity, ignitability, or toxicity). The toxicity characteristic of solid waste is determined by analyzing the material using the Toxicity Characteristic Leaching Procedure (TCLP) and comparing the results to toxicity threshold levels promulgated by USEPA.

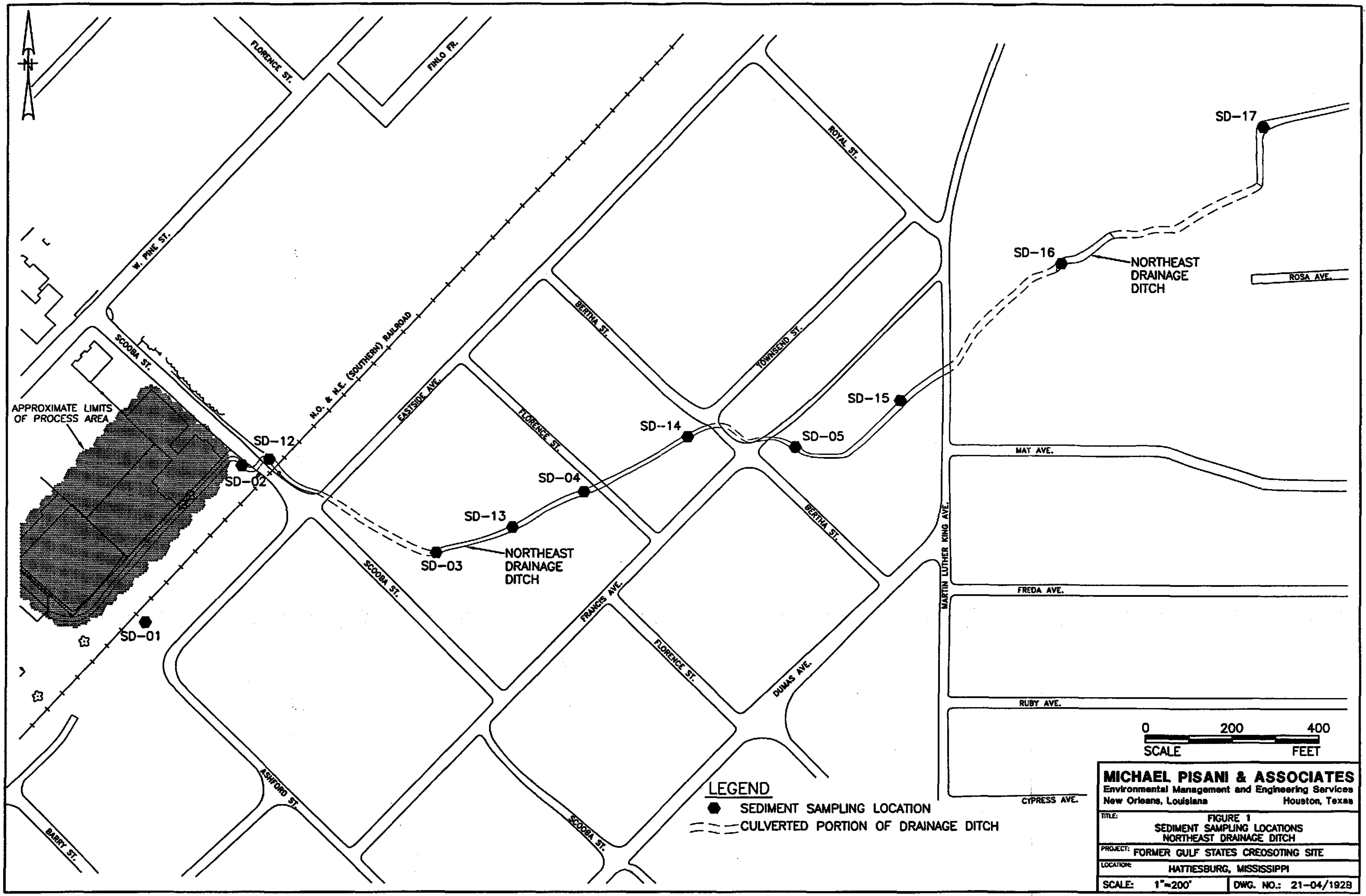

FLORENCE ST.
FINLO FR.
W. PINE ST.
SCOOBA ST.
N.O. & N.E. (SOUTHERN) RAILROAD
ROYAL ST.
BERTHA ST.
TOWNSEND ST.
EASTSIDE AVE.
FLORENCE ST.
SD-17
SD-16
NORTHEAST
DRAINAGE
DITCH
ROSA AVE.
SD-15
SD-05
SD-14
SD-04
SD-13
SD-12
SD-02
SD-03
NORTHEAST
DRAINAGE
DITCH
APPROXIMATE LIMITS
OF PROCESS AREA
SD-01
MAY AVE.
BERTHA ST.
MARTIN LUTHER KING AVE.
FREDA AVE.
SCOOBA ST.
FRANCIS AVE.
FLORENCE ST.
DUMAS AVE.
RUBY AVE.
ASHFORD ST.
SCOOBA ST.
BARRY ST.
CYPRESS AVE.
0
200
400
SCALE
FEET
LEGEND
SEDIMENT SAMPLING LOCATION
CULVERTED PORTION OF DRAINAGE DITCH
MICHAEL PISANI & ASSOCIATES
Environmental Management and Engineering Services
New Orleans, Louisiana
Houston, Texas
TITLE:
FIGURE 1
SEDIMENT SAMPLING LOCATIONS
NORTHEAST DRAINAGE DITCH
PROJECT: FORMER GULF STATES CREOSOTING SITE
LOCATION: HATTIESBURG, MISSISSIPPI
SCALE: 1"=200'
DWG. NO.: 21-04/1929

TABLE 1

SEDIMENT SAMPLE DATA SUMMARY
PHASE II REMEDIAL INVESTIGATION

Gulf Coast Creosoting Site
Hattiesburg, Mississippi

Analytical Parameter	CAS Registry Number	Units	Sample Identifier SD-01	SD-02	SD-03	SD-04	SD-05	SD-06
TCL Semivolatile Organics [(a)]								
1,2,4-trichlorobenzene	120-82-1	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
1,2-dichlorobenzene	95-50-1	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
1,3-dichlorobenzene	541-73-1	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
1,4-dichlorobenzene	106-46-7	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
2,2'-oxybis (1-chloropropane)	108-60-1	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
2,4,5-trichlorophenol	95-95-4	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
2,4,6-trichlorophenol	88-06-2	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
2,4-dichlorophenol	120-83-2	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
2,4-dimethylphenol	105-67-9	mg/kg	ND (0.079) U	1.5 (1) J	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
2,4-dinitrophenol	51-28-5	mg/kg	ND (0.230) U	ND (3)	ND (0.25) U	ND (2.3)	ND (0.24) U	ND (0.23) U
2,4-dinitrotoluene	121-14-2	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.4)	ND (0.084) U	ND (0.078) U
2,6-dinitrotoluene	606-20-2	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
2-chloronaphthalene	91-58-7	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
2-chlorophenol	95-57-8	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
2-methylnaphthalene	91-57-6	mg/kg	ND (0.039) U	150 (25)	0.44 (0.043)	38 (0.4)	0.091 (0.042) J	ND (0.039) U
2-methylphenol	95-48-7	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
2-nitroaniline	88-74-4	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
2-nitrophenol	88-75-5	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
3,3'-dichlorobenzidine	91-94-1	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
3- and 4-methylphenol	106-44-5	mg/kg	ND (0.079) U	ND (1)	0.093 (0.085) J	ND (0.8)	0.11 (0.084) J	ND (0.078) U
3-nitroaniline	99-09-2	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
4,6-dinitro-2-methylphenol	534-52-1	mg/kg	ND (0.200) U	ND (2.5)	ND (0.21) U	ND (2)	ND (0.21) U	ND (0.19) U
4-bromophenyl phenyl ether	101-55-3	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
4-chloro-3-methylphenol	59-50-7	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
4-chloroaniline	106-47-8	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
4-chlorophenyl phenyl ether	7005-72-3	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
4-nitroaniline	100-01-6	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
4-nitrophenol	100-02-7	mg/kg	ND (0.200) U	ND (2.5)	ND (0.21) U	ND (2)	ND (0.21) U	ND (0.19) U
acenaphthene	83-32-9	mg/kg	ND (0.039) U	100 (25)	0.89 (0.043)	140 (20) J	0.1 (0.042) J	ND (0.039) U
acenaphthylene	208-96-8	mg/kg	ND (0.039) U	35 (0.51)	8.9 (0.85)	6.8 (0.4)	0.17 (0.042) J	ND (0.039) U
anthracene	120-12-7	mg/kg	ND (0.039) U	190 (25)	5.5 (0.85) J	3.3 (0.4) J	0.88 (0.042)	ND (0.039) U
benzo (a) anthracene	56-55-3	mg/kg	0.062 (0.039) J	330 (25)	27 (0.85)	100 (20) J	0.93 (0.042)	ND (0.039) U
benzo (a) pyrene	50-32-8	mg/kg	0.056 (0.039) J	130 (25) J	49 (0.85)	33 (0.4)	0.97 (0.042)	ND (0.039) U
benzo (b) fluoranthene	205-99-2	mg/kg	0.120 (0.039) J	180 (25) J	78 (0.85)	46 (0.4)	1.4 (0.042)	ND (0.039) U
benzo (ghi) perylene	191-24-2	mg/kg	0.046 (0.039) J	36 (0.51)	32 (0.85)	9.5 (0.4)	0.42 (0.042)	ND (0.039) U
benzo (k) fluoranthene	207-08-9	mg/kg	ND (0.039) U	64 (0.51)	23 (0.85)	18 (0.4)	0.5 (0.042)	ND (0.039) U
bis (2-chloroethoxy) methane	111-91-1	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
bis (2-chloroethyl) ether	111-44-4	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
bis (2-ethylhexyl) phthalate	117-81-7	mg/kg	0.082 (0.079) U*	ND (1)	0.25 (0.085) U*	0.88 (0.8) J (c)	0.15 (0.084) U*	ND (0.078) U
butyl benzyl phthalate	85-68-7	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
carbazole	86-74-8	mg/kg	ND (0.039) U	590 (25)	0.97 (0.043)	100 (20) J	0.22 (0.042) J	ND (0.039) U
chrysene	218-01-9	mg/kg	0.077 (0.039) J	290 (25)	42 (0.85)	76 (20) J	1.3 (0.042)	ND (0.039) U
di-n-butyl phthalate	84-74-2	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
di-n-octyl phthalate	117-84-0	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
dibenz (a,h) anthracene	53-70-3	mg/kg	ND (0.039) U	12 (0.51)	9.6 (0.85)	3.3 (0.4) J	0.15 (0.042) J	ND (0.039) U
dibenzofuran	132-64-9	mg/kg	ND (0.039) U	940 (25)	0.48 (0.043)	150 (20) J	0.1 (0.042) J	ND (0.039) U
diethyl phthalate	84-66-2	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
dimethyl phthalate	131-11-3	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
fluoranthene	206-44-0	mg/kg	0.089 (0.039) J	160 (25)	21 (0.85)	470 (20)	2 (0.042)	ND (0.039) U
fluorene	86-73-7	mg/kg	ND (0.039) U	120 (25)	1 (0.043)	260 (20)	0.18 (0.042) J	ND (0.039) U
hexachlorobenzene	118-74-1	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
hexachlorobutadiene	87-68-3	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
hexachlorocyclopentadiene	77-47-4	mg/kg	ND (0.200) U	ND (2.5)	ND (0.21) U	ND (2)	ND (0.21) U	ND (0.19) U
hexachloroethane	67-72-1	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
indeno (1,2,3-cd) pyrene	193-39-5	mg/kg	0.049 (0.039) J	47 (0.51)	39 (0.85)	12 (0.4)	0.54 (0.042)	ND (0.039) U
isophorone	78-59-1	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
N-nitrosodi-n-propylamine	621-64-7	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
N-nitrosodiphenylamine	86-30-6	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
naphthalene	91-20-3	mg/kg	ND (0.039) U	300 (25)	1.6 (0.043)	14 (0.4)	0.16 (0.042) J	ND (0.039) U
nitrobenzene	98-95-3	mg/kg	ND (0.039) U	ND (0.51)	ND (0.043) U	ND (0.4)	ND (0.042) U	ND (0.039) U
pentachlorophenol	87-86-5	mg/kg	ND (0.200) U	ND (2.5)	ND (0.21) U	ND (2)	ND (0.21) U	ND (0.19) U
phenanthrene	85-01-8	mg/kg	ND (0.039) U	320 (25)	3.6 (0.043)	870 (20)	0.66 (0.042)	ND (0.039) U
phenol	108-95-2	mg/kg	ND (0.079) U	ND (1)	ND (0.085) U	ND (0.8)	ND (0.084) U	ND (0.078) U
pyrene	129-00-0	mg/kg	0.110 (0.039) J	100 (25)	32 (0.85)	300 (20)	1.6 (0.042)	ND (0.039) U
Other Parameters								
Moisture Content[(b)]	N.A.	wt. %	15.1 (0.08)	34.2 (0.08)	21.9 (0.08)	16.4 (0.08)	20.5 (0.08)	14.3 (0.08)

NOTES:

ND denotes "Not Detected" at method detection limit shown in parentheses.
(a) Target Compound List (TCL) base neutral/acid-extractable organic compounds by EPA SW-846 method 8270, reported as dry-weight concentrations.
(b) EPA method 160.3 (*Methods for Chemical Analysis of Water and Wastes*, March 1983).
(c) Low concentrations of this common laboratory contaminant warrant caution if this value is used as basis for environmental risk assessment or other decision-making process.
U qualifier denotes not detected.
J qualifier denotes quantitation is estimated due to limitations identified during data validation quality assurance review.
U* qualifier denotes that compound should be considered "not-detected" since it was detected in a corresponding field, trip, and/or laboratory blank sample at a similar concentration.

Table 2

Summary of Sediment Analytical Results
Northeast Drainage Ditch

Gulf States Creosoting Site
Hattiesburg, Mississippi

Analytical Parameter	CAS Number	Units	SD-12	SD-12 Duplicate[a]	SD-13	SD-14	SD-15	SD-16	SD-17
Polycyclic Aromatic Hydrocarbons (PAHs)									
Naphthalene	91-20-3	mg/kg	ND (180)	ND (190)	ND (1.80)	ND (2.90)	ND (3.50)	ND (3.30)	ND (3.50)
Acenaphthylene	208-96-8	mg/kg	ND (180)	ND (190)	ND (1.80)	ND (2.90)	ND (3.50)	ND (3.30)	ND (3.50)
Acenaphthene	83-32-9	mg/kg	320 J	370 J	ND (1.80)	3.90 J	ND (3.50)	ND (3.30)	ND (3.50)
Fluorene	86-73-7	mg/kg	580	710	0.78 J	0.65 J	ND (0.32)	2.80 J	ND (0.33)
Phenanthrene	85-01-8	mg/kg	1820	2110	2.27	ND (0.11) U*	ND (0.13) U*	4.50	ND (0.13) U*
Anthracene	120-12-7	mg/kg	1110	1490	3.47	9.91	1.48	23.9	ND (0.065) U*
Fluoranthene	206-44-0	mg/kg	922	1030	6.52	22.9	1.22	12.0	0.92
Pyrene	129-00-0	mg/kg	900	970	8.40	30.8	2.77 J	12.9	2.28 J
Benz(a)anthracene	56-55-3	mg/kg	168	184	2.91	11.8	1.02	3.61	0.94
Chrysene	218-01-9	mg/kg	129	134	2.97	19.6	ND (0.13) U*	3.0	ND (0.13) U*
Benzo(b)fluoranthene	205-99-2	mg/kg	60.0	67.0	4.17	14.2	2.88	3.03	2.50
Benzo(k)fluoranthene	207-08-9	mg/kg	35.0	39.0	2.08	7.85	1.39	1.60	1.26
Benzo(a)pyrene	50-32-8	mg/kg	69.0	73.0	3.27	12.2	2.42	2.80	2.26
Dibenz(a,h)anthracene	53-70-3	mg/kg	6.50 J	11.6 J	0.48	1.61	0.37 J	0.384 J	0.365 J
Benzo(g,h,i)perylene	191-24-2	mg/kg	14.0 J	15.0 J	2.00	4.40	1.38 J	1.05 J	1.21 J
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	28.1 J	30.3 J	2.53	7.30	2.00	1.60	1.60
Other Parameters									
Moisture		%	26.5%	29.9%	24.7%	8.39%	21.8%	18.5%	23.1%

Notes:

(a) Identified as sample "SD-99" on sample custody documentation.

ND denotes "not detected" at reporting limit shown in parentheses.

Values shown are dry-weight concentrations.

J data validation qualifier denotes estimated value.

B data validation qualifier denotes constituent was detected in corresponding laboratory blank.

U* data validation qualifier denotes originally reported positive result that should be considered "not detected" due to trace-level presence of the analyte in associated laboratory method blanks and/or rinsate blanks.

In May 2001, samples of Ditch sediments and soils were collected at the four locations shown on Figure 2 and were analyzed for hazardous characteristics. The results of these analyses are summarized in Table 3. The analytical data demonstrate that none of the samples exceeded the TCLP threshold concentrations, nor were they reactive, corrosive, or ignitable, demonstrating that the sediments and soils within the Ditch are not characteristically hazardous.

Listed Hazardous Waste Definitions

Material may also be defined as hazardous waste if it contains listed hazardous waste. Potential hazardous waste listings that may apply to sediments and soils in the vicinity of the Site, including the Ditch, as presented in 40 CFR 261.21 and 261.32 are as follows:

K001 Bottom sediment sludge from the treatment of wastewaters from the wood preserving processes that use creosote and/or pentachlorophenol

U051 Creosote as a commercial chemical product, intermediate, or off-specification product

F034 Wastewaters (except those that have not come into contact with process contaminants), process residuals, preservative drippage, and spent formulations from wood preserving processes that use creosote formulations. This listing does not included K001.

The Ditch is not located on the parcel of property previously occupied by the Site, therefore it is unknown if the presence of PAHs in Ditch sediments and soils is attributable to historical wood treating activities. Based on the definitions presented in 40 CFR 261.31 and 261.32, none of the above listings applies to sediments and soils excavated from the Ditch.

Listed Waste and Contaminated Media

USEPA has issued several guidance documents regarding when contaminated soils should be considered a listed hazardous waste. This guidance was summarized in the USEPA memorandum titled *Management of Remediation Waste under RCRA* dated October 14, 1998 (provided as Attachment A to this position paper). The guidance states the following:

> "Where a facility owner/operator makes a good faith effort to determine if a material is a listed hazardous waste but cannot make a determination because documentation regarding a source of contamination, contaminant, or waste is unavailable or inconclusive, EPA has stated that one may assume the source, contaminant or waste is not listed hazardous waste and, therefore, provided the material in question does not exhibit a characteristic of hazardous waste, RCRA requirements do not apply."

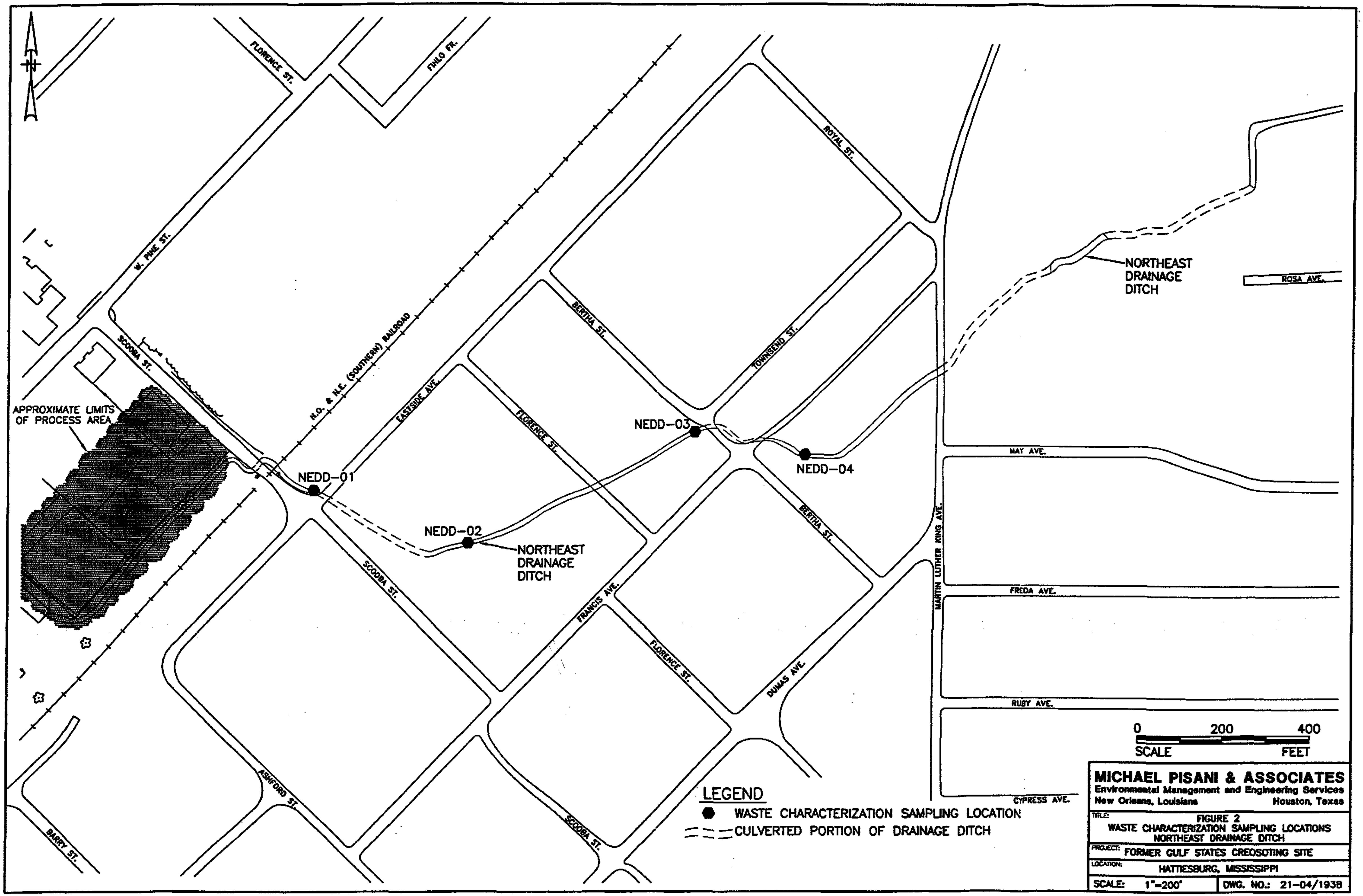

N
FLORENCE ST.
FINLO FR.
W. PINE ST.
SCOOBA ST.
N.O. & N.E. (SOUTHERN) RAILROAD
EASTSIDE AVE.
APPROXIMATE LIMITS OF PROCESS AREA
ROYAL ST.
BERTHA ST.
TOWNSEND ST.
FLORENCE ST.
NEDD-01
NEDD-02
NEDD-03
NEDD-04
NORTHEAST DRAINAGE DITCH
NORTHEAST DRAINAGE DITCH
ROSA AVE.
MAY AVE.
BERTHA ST.
MARTIN LUTHER KING AVE.
FREDA AVE.
SCOOBA ST.
FRANCIS AVE.
FLORENCE ST.
DUMAS AVE.
RUBY AVE.
ASHFORD ST.
BARRY ST.
SCOOBA ST.
CYPRESS AVE.
0 200 400
SCALE FEET
LEGEND
WASTE CHARACTERIZATION SAMPLING LOCATION
CULVERTED PORTION OF DRAINAGE DITCH
MICHAEL PISANI & ASSOCIATES
Environmental Management and Engineering Services
New Orleans, Louisiana Houston, Texas
TITLE: FIGURE 2
WASTE CHARACTERIZATION SAMPLING LOCATIONS NORTHEAST DRAINAGE DITCH
PROJECT: FORMER GULF STATES CREOSOTING SITE
LOCATION: HATTIESBURG, MISSISSIPPI
SCALE: 1"=200'
DWG. NO.: 21-04/193B

Table 3

Summary of Hazardous Characteristic Analyses
Northeast Drainage Ditch

Gulf States Creosoting Site
Hattiesburg, Mississippi

Analytical Parameter	Limit	Units	NEDD-01	NEDD-02	NEDD-03	NEDD-04
TCLP Metals						
Mercury	0.2	mg/l	ND (0.000026)	NA	NA	ND (0.000026)
Arsenic	5.0	mg/l	0.0616 J	NA	NA	0.00063 J
Selenium	1.0	mg/l	0.0054 J	NA	NA	0.0079 J
Barium	100.0	mg/l	0.731	NA	NA	0.237
Cadmium	1.0	mg/l	0.00080 J	NA	NA	0.0012 J
Chromium	5.0	mg/l	0.0022 J	NA	NA	0.0077 J
Lead	5.0	mg/l	0.166	NA	NA	0.0459 J
Silver	5.0	mg/l	ND (0.0013)	NA	NA	ND (0.0013)
TCLP Pesticides						
Gamma BHC - Lindance	0.4	mg/l	ND (0.000010)	NA	NA	ND (0.000010)
Heptachlor	0.008	mg/l	ND (0.000010)	NA	NA	0.000022 J
Heptachlor Epoxide	0.008	mg/l	ND (0.000010)	NA	NA	ND (0.000010)
Methoxychlor	10.0	mg/l	ND (0.00010)	NA	NA	ND (0.00010)
Endrin	0.02	mg/l	0.000089 J	NA	NA	ND (0.000020)
Chlordane	0.03	mg/l	ND (0.00025)	NA	NA	ND (0.00025)
Toxaphene	0.5	mg/l	ND (0.0015)	NA	NA	ND (0.0015)
TCLP Herbicides						
2,4-D	10.0	mg/l	ND (0.0020)	NA	NA	ND (0.0020)
2,4,5-TP	1.0	mg/l	ND (0.00020)	NA	NA	ND (0.00020)
TCLP Acid Base/Neutrals						
Pyridine	5.0	mg/l	ND (0.0040)	ND (0.0040)	ND (0.0040)	ND (0.0040)
1,4-Dichlorobenzene	7.5	mg/l	ND (0.0020)	ND (0.0020)	ND (0.0020)	ND (0.0020)
2-Methylphenol	200.0 (b)	mg/l	ND (0.0020)	ND (0.0020)	ND (0.0020)	ND (0.0020)
4-Methylphenol (a)	200.0 (b)	mg/l	ND (0.0060)	ND (0.0060)	ND (0.0060)	ND (0.0060)
Hexachloroethane	3.0	mg/l	ND (0.0020)	ND (0.0020)	ND (0.0020)	ND (0.0020)
Nitrobenzene	2	mg/l	ND (0.0020)	ND (0.0020)	ND (0.0020)	ND (0.0020)
Hexachlorobutadiene	0.5	mg/l	ND (0.0040)	ND (0.0040)	ND (0.0040)	ND (0.0040)
2,4,6-Trichlorophenol	2.0	mg/l	ND (0.0040)	ND (0.0040)	ND (0.0040)	ND (0.0040)
2,4,5-Trichlorophenol	400.0	mg/l	ND (0.0040)	ND (0.0040)	ND (0.0040)	ND (0.0040)
2,4-Dinitrotoluene	0.13	mg/l	ND (0.0020)	ND (0.0020)	ND (0.0020)	ND (0.0020)
Hexachlorobenzene	0.13	mg/l	ND (0.0040)	ND (0.0040)	ND (0.0040)	ND (0.0040)
Pentachlorophenol	100.0	mg/l	ND (0.0060)	ND (0.0060)	ND (0.0060)	ND (0.0060)
TCLP Volatiles						
Vinyl Chloride	0.2	mg/l	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)
1,1-Dichloroethene	0.7	mg/l	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)
Chloroform	6.0	mg/l	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)
Carbon Tetrachloride	0.5	mg/l	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)
Benzene	0.5	mg/l	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)
1,2-Dichloroethane	0.5	mg/l	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)
Trichloroethene	0.5	mg/l	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)
Tetrachloroethene	0.7	mg/l	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)
Chlorobenzene	100.0	mg/l	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)
2-Butanone	200.0	mg/l	ND (0.015)	ND (0.015)	ND (0.015)	ND (0.015)
Other Parameters						
Sulfide (Reactivity)	500	mg/kg	ND (33)	ND (33)	ND (33)	ND (33)
Cyanide (Reactivity)	250	mg/kg	ND (95)	ND (99)	ND (99)	ND (99)
Corrosivity (pH)	≤2 or ≥12.5	s.u.	7.30	6.92	6.05	6.03
Ignitability	Ignitable?	yes/no	no	no	no	no

Notes:

ND denotes "not detected" at reporting limit shown in parentheses.

J qualifier denotes estimated value.

NA denotes sample not analyzed for this TCLP fraction.

(a) 3-methylphenol and 4-methylphenol cannot be differentiated; reported value represents the combined total of both compounds.

(b) TCLP limit for total methylphenols.

Current USEPA guidance (see Attachment A) also states the following:

> "...contained in determinations (should) be made based on the direct exposure using a reasonable maximum exposure scenario and that conservative, health based standards (should) be used to develop the site-specific health based levels of hazardous constituents below which contaminated environmental media would be considered to no longer contain hazardous waste."

The Preamble to the final rule, Land Disposal Restrictions Phase IV (excerpt in Attachment D to this document), summarizes the policy with the following statement:

> "Typically, these so called "contained-in" determinations do not mean that no hazardous constituents are present in environmental media but simply that the concentrations of hazardous constituents present do not warrant management of media as hazardous waste."

The concentrations of constituents in the Ditch sediments, which are common to wood treating sites, are several orders of magnitude less than those typically encountered in wood treating sludges and process residue. Therefore, if warranted, MDEQ could rule that the sediments and soils no longer contain listed hazardous waste. Such a determination should be made prior to actively managing excavated material to avoid applicability of Land Disposal Restriction (LDR) treatment requirements when the waste is generated.

USEPA has provided similar guidance on the listed hazardous waste issue in the following documents:

> OSWER Directive No. 9441.01(84) (provided as Attachment B to this document)
> Proposed National Contingency Plan (NCP) preamble dated December 21, 1988
>
> Preamble to the proposed HWIR – Media Rule Federal Register dated April 29, 1996 (excerpt in Attachment C to this document)

These guidance documents state that available Site information such as manifests, storage records and vouchers should be used in an effort to ascertain the sources of waste or contaminants. When this documentation is not available or inconclusive, the lead agency may assume that wastes (or contaminants) are not listed hazardous wastes.

Contaminated sediments and soils in the Ditch may have resulted from former wastewater treatment discharge or from runoff containing wood treating residues from any number of potential sources in the area drained by the Ditch. Contamination may also have resulted from subsequent Site uses over the past 40 years, including automotive repair, construction and paving of parking lots, and/or wastes from other commercial or light industrial facilities.

From the discussion presented in various USEPA documents, it is clear that affected soil resulting from runoff of precipitation that contacted treated wood is not considered a listed hazardous waste based on the runoff exclusion outlined in the derived-from rule (40 CFR 261.3 (c)(2)). Since the source of contamination and exact origin cannot be conclusively determined, the sediments and soils in the Ditch should not be classified as listed hazardous waste.

In summary, the Ditch residues are neither characteristically hazardous waste nor listed hazardous waste.

Contained-in Determination

Even if the sediments and soils in the Ditch are viewed as listed hazardous waste, an entity may apply for a "contained-in" determination from the appropriate regulatory agency, in this case, MDEQ. USEPA guidance documents (see Attachment A) state the following:

> "EPA considers a contaminated environmental media to no longer contain hazardous waste: 1) when the waste no longer exhibits a characteristic of hazardous waste; and 2) when concentrations of hazardous constituents from listed hazardous wastes are below health-based levels."