STATEMENT OF BASIS FOR PROPOSED FINAL REMEDY

HSWA Permit under the 1984 Hazardous and Solid Waste Amendments
for
Fernwood Industries, LLC
1047 Fernwood Road
Fernwood, Mississippi 39635
MSD 008 183 519

INTRODUCTION

This Statement of Basis was prepared pursuant to Title 40 of the Code of Federal Regulations (C.F.R.), Section 124.7, for a permit renewal by the United States Environmental Protection Agency (EPA), Region 4, to Fernwood Industries, LLC (Fernwood), the owner and operator of a facility located at 1047 Fernwood Road in Fernwood, Mississippi (hereinafter, the "Facility").

The EPA is issuing this Statement of Basis consistent with the public participation provisions of the Resource Conservation and Recovery Act (RCRA) and the Hazardous and Solid Waste Amendments of 1984 (HSWA). The purpose of this document is to outline the proposed remedy/corrective action for the Facility. The EPA will make a final decision on the necessary corrective action after evaluating any information received during the public comment period.

The corrective action program is designed to ensure that facilities have investigated and cleaned up any releases of hazardous waste and hazardous constituents that may have occurred as a result of operations at their facilities. After reviewing the results of site investigations and sampling data, the EPA believes that the following proposed remedy is necessary to address residual soil and sediment contamination at the Facility:

- limited soil removal and backfilling at selected solid waste management units (SWMUs) [completed];
- the installation of low permeability caps and security fencing surrounding selected SWMUs, and enclosing a total of 28.72 acres [completed; ongoing maintenance of fencing];
- annual groundwater sampling from monitoring well MW-1 and the boiler spring [ongoing];
- annual storm water sampling from four (4) culverts draining the Facility's fenced areas [ongoing];
- the recording of a deed notice stating that the property had been used to manage hazardous waste [completed]; and
- the recording of an Environmental Covenant developed and executed pursuant to the Mississippi Uniform Environmental Covenants Act, Miss. Code Ann. §§ 89-23-1 et seq., for the 28.72 acres encompassed by the security fencing which shall: 1) restrict this portion of the Facility to commercial and/or industrial/silvicultural land use only; 2) restrict the installation of groundwater wells or the extraction of groundwater for any purpose, except as approved by EPA and the Mississippi Department of Environmental Quality (MDEQ); and 3) restrict surface or subsurface demolition, excavation or other activities, except as approved by EPA and MDEQ [to commence within one hundred eighty (180) calendar days of the effective date of the HSWA Permit].

This document summarizes information that can be found in greater detail in documents included in the Administrative Record, including the *RCRA Facility Investigation Report* (RFI Report), dated August 21, 1991, and the *Addendum to RCRA Facility Investigation Report* (Addendum to the RFI Report), dated June 10, 1993.

PERMIT PUBLIC NOTICE

This HSWA Permit, in conjunction with the Hazardous Waste Post-Closure Permit (Post-Closure Permit) issued by MDEQ, constitutes the Facility's full RCRA Permit. The portion of the RCRA Permit issued by the MDEQ covers those portions of RCRA for which the State of Mississippi has final authorization to administer, including post-closure care for hazardous waste management units. Consequently, the federal portion of the RCRA Permit (hereinafter, the "HSWA Permit") addresses those provisions of RCRA which the State has not received final authorization to administer, including HSWA corrective action.

The EPA is soliciting public review and comment on the draft HSWA Permit and Statement of Basis for the proposed remedy/corrective action at the Facility. A HSWA Permit renewal was originally issued for public comment in July 2012. Fernwood submitted comments which resulted in the EPA making significant changes to the draft HSWA Permit. Because of these changes, the EPA decided to withdraw the initial draft permit and instead publish for comment a revised draft HSWA Permit incorporating the EPA's responses to Fernwood's comments, and proposing a final corrective action remedy for the Facility. The EPA's responses to the comments are attached to this Statement of Basis.

Pursuant to 40 C.F.R. § 124.10, draft permits issued under RCRA require a 45-day public comment period. The comment period for this draft HSWA Permit renewal will begin on June 1, 2016 and will end on July 15, 2016. The Statement of Basis and draft HSWA Permit will be available on EPA Region 4's web site at the following URL:

http://www.epa.gov/aboutepa/about-epa-region-4-southeast.

Additional copies of the draft HSWA Permit and Statement of Basis will be available for public review at the following locations:

McComb Public Library
1022 Virginia Avenue
McComb, MS 39648

(601) 783-6565; call for hours

EPA Region 4 Library
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, Georgia 30303

Office hours: 8:00 a.m. to 4:30 p.m.
(404) 562-8190

Mississippi Department of Environmental Quality
Office of Pollution Control
515 East Amite Street
Jackson, Mississippi 39202

Office hours: 8:00 a.m. to 4:30 p.m.
(601) 961-5171

The entire Administrative Record for this HSWA Permit is available for public review at the following location:

EPA Region 4 Library
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, Georgia 30303

Persons wishing to request a public hearing or to comment on the proposed corrective measures and permit conditions should submit such requests or comments in writing to:

Mr. John E. Johnston
USEPA Region 4
Corrective Action and Permitting Section
RCR Division
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, Georgia 30303
Phone: (404) 562-8458
Email: johnston.john@epa.gov

Depending on the scope of the comments received during the public comment period, the EPA may schedule a public hearing to clarify any details of the proposed remedy at the Facility and to answer any further questions by the community.

After the EPA's consideration of the public comments that are received, the EPA will summarize and respond to such comments in a Final Decision and Response to Comments document. This Response to Comments document will be drafted after the conclusion of the public comment period and will be incorporated into the Administrative Record. The final permit decision shall become effective thirty (30) calendar days after service of notice of the decision, unless a later date is specified or review is requested under 40 C.F.R. § 124.19. If no comments are received requesting a change in the draft HSWA Permit, the final HSWA Permit shall become effective immediately upon issuance.

FACILITY BACKGROUND

Site Description

From approximately 1937 until 1988, Fernwood owned and operated a wood preserving operation at the Facility, which pressure treated utility poles and timbers with creosote and pentachlorophenol (PCP). Facility operations ceased in 1988. Fernwood does not presently conduct any commercial business activities at the Facility.

The Facility is located east of U.S. Highway 51 near the town of Fernwood in Pike County in southwestern Mississippi (Figure 1). The Facility consists of approximately 150 acres, of which approximately 76 acres were previously used for wood preserving operations.

The Little Tangipahoa River historically formed the southwestern border of the Facility. However, during the groundwater investigations at the Facility, some contamination was unexpectedly found on the west side of the river. It was learned that the river had been channelized for flood control in the early 1950s, and the channel had been moved to the east to its present location bisecting the pre-existing but unknown groundwater contamination. Fernwood subsequently acquired the land on the west side of the river that overlies the small area of groundwater contamination. The Facility is bordered on the north, west, south, and southeast by dense woods and on the east by approximately eight duplex-style residences.

Waste Management and Regulatory History

During its past operations, Fernwood utilized three surface impoundments and a sand filtration unit for the management of process wastewaters. The impoundments stored process wastewater and generated bottom sediment sludge and the sand filtration unit was used to dewater sludge generated by the Facility's wastewater treatment system. These sludges were classified as listed hazardous waste K001 under RCRA, which is defined as bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or PCP. Hazardous wastes carrying the waste code K001 may carry any of the following hazardous constituents: pentachlorophenol, phenol, 2-chlorophenol, p-chloro-m-cresol, 2,4-dimethylphenyl, 2,4-dinitro-phenol, trichlorophenols, tetrachlorophenols, 2,4 dinitrophenol, creosote, chrysene, naphthalene, fluroanthene, benzo(b)fluroanthene, benzo(a)pyrene, indeno (1,2,3-cd)pyrene, benz(a)anthracene, dibenz(a)anthracene, and acenaphthalene.

The three impoundments and the sand filtration unit are RCRA regulated hazardous waste treatment, storage, and disposal units and were closed between 1987 and 1989 in accordance with closure plans approved by MDEQ. Closure of these four units consisted of removal of all liquids and pumpable sludge, if present, stabilization of any remaining sludge, backfilling with clean soil, and construction of a low permeability cap equipped with a cover layer to support native grass.

A Hazardous Waste Post-Closure Permit (Post-Closure Permit) was issued by MDEQ on July 25, 1989 for post-closure care of these four regulated units and for the remediation of groundwater contamination resulting from such units. Groundwater remediation, using a pump and treat system, was initiated in October 1990. In addition, the MDEQ Post-Closure Permit also requires site-wide groundwater monitoring through a network of monitoring wells. The Post-Closure Permit was reissued by MDEQ for a second 10-year term on November 12, 1999. The permit was reissued again by MDEQ for a third

10-year term on August 27, 2012. The MDEQ-issued Post-Closure Permit is for groundwater recovery and treatment. The treated groundwater is discharged into a small ditch that runs approximately 700 feet through the Fernwood property before entering the Little Tangipahoa River. The discharge is regulated under the terms of a State-issued National Pollutant Discharge Elimination System (NPDES) permit.

Because the State of Mississippi does not have authorization to administer HSWA corrective action requirements, the EPA originally issued a HSWA Permit for the Facility on August 25, 1989. Specific areas of the Facility which are subject to the corrective action requirements of the HSWA Permit are called solid waste management units (SWMUs) and areas of concern (AOCs). SWMUs are any units which have been used for the treatment, storage, or disposal of solid waste at any time, irrespective of whether the unit is or ever was intended for the management of hazardous waste. AOCs are areas having a probable release to the environment of a hazardous waste or hazardous constituent which is not associated with a SWMU and is determined to pose a current or potential threat to human health or the environment. Based on information submitted by Fernwood, information contained in MDEQ and EPA records, and the Facility's *RCRA Facility Assessment*, dated July 1987, a total of fifteen (15) SWMUs were identified at the Facility. Eleven (11) of these SWMUs are regulated under the Facility's HSWA Permit (SWMU 1, SWMU 2, SWMU 3, SWMU 4, SWMU 5, SWMU 6, SWMU 7, SWMU 8, SWMU 9, SWMU 10, and SWMU 11). Four of these SWMUs are the three surface impoundments (SWMU 12, SWMU 13, and SWMU 14) and the sand filtration unit (SWMU 15), which are regulated units being addressed by the Facility's MDEQ Post-Closure Permit.

In accordance with the conditions of the EPA's HSWA Permit, three of the eleven (11) SWMUs being addressed through the HSWA Permit were identified as no further action (SWMU 9, SWMU 10, and SWMU 11). Fernwood performed a RCRA Facility Investigation (RFI) on the remaining eight (8) SWMUs. This investigation was documented in the *RCRA Facility Investigation Report* (RFI Report), dated August 29, 1991, and the *Addendum to RCRA Facility Investigation Report* (Addendum to the RFI Report), dated January 15, 1993. The reports included a streamlined Corrective Measures Study (CMS) that outlined additional corrective measures proposed to mitigate any potential risks associated with hazardous constituents present at the SWMUs. The EPA approved the RFI Report and the Addendum to the RFI Report on June 10, 1993. The EPA is now selecting the corrective measures proposed in the RFI Report and the Addendum to the RFI Report as the proposed remedy for SWMU 1, SWMU 2, SWMU 3, SWMU 4, SWMU 5, SWMU 6, SWMU 7, and SWMU 8. Most of these actions have been completed as interim measures or are ongoing.

<u>Summary of Contamination</u>

As a result of operations at the Facility, surface soil, subsurface soil, sediments, and groundwater have been contaminated with the following constituents of potential concern (COPCs):
Acenaphthene
Acenaphthylene
Acetophenone
Anthracene
Benz(a)anthracene
Benzene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(k)fluoranthene
Benzo(g,h,i)perylene

Chrysene
m-Cresol
o-Cresol
p-Cresol
Dibenz(a,j)acridine
Dibenz(a,h)anthracene
3,3'-Dichlorobenzidine
2,4-Dimethylphenol
2,4-Dichlorophenol
Fluoranthene
Fluorene
Indeno(1,2,3-c,d)pyrene
Methyl Chloride
(Chloromethane)
Naphthalene
Pentachlorophenol
Phenanthrene
Phenol
Pyrene
2,3,4,5-Tetrachlorophenol
2,3,4,6-Tetrachlorophenol
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
Toluene

Geology/Hydrogeology

The uppermost aquifer at the Facility is a water table aquifer in the Citronelle Formation of the Pliocene Age. This aquifer, which ranges in thickness from 25 to more than 60 feet at the Facility, is separated from deeper aquifers by a locally continuous low permeability clay member more than 20 feet in thickness. This clay layer precludes any interconnection between the aquifers at this location.

All groundwater from the Facility flows toward the Little Tangipahoa River, which, as stated earlier, now cuts across a small portion of the southwestern corner of the Facility. During a March 1990 Groundwater Quality Assessment required by the MDEQ, groundwater contamination was found to be present on both sides of the river. In approximately 1950, the river channel was physically moved further to the east in order to reduce flooding. As a result, the new channel cut across the area of pre-existing contamination that was unknown at the time. Subsequent to the groundwater investigations, Fernwood acquired the land on the west side of the river that overlies the area of groundwater contamination. Groundwater on either side of the Little Tangipahoa River flows towards the river.

The Citronelle Formation, which contains the uppermost aquifer, or water table aquifer, is not used for drinking water within a three-mile radius of the Facility. The area public water supply wells are completed within confined aquifers at depths exceeding 400 feet. The nearest known well completed within these deeper confined aquifers is located on an abandoned industrial site approximately one half mile west of the Little Tangipahoa River. This well was sampled in 1990 by Fernwood and MDEQ and analyzed for the organic constituents that comprise K001 listed hazardous waste. None of these organic constituents were detected at or above the reported method detection limits.

GROUNDWATER CONTAMINATION ADDRESSED BY THE POST-CLOSURE PERMIT

Analytical results indicate that on-site groundwater in the uppermost aquifer is contaminated with polycyclic aromatic hydrocarbons (PAHs) and phenolic compounds, including PCP. PAHs are a group of chemicals that are present in products such as creosote that are made from fossil fuels. The contaminants found in the groundwater at the Facility are associated with the creosote and PCP wood treating process. Groundwater contamination exists as soluble constituents, constituents sorbed to the soil matrix, and droplets and stringers of free product resembling creosote, classified as dense non-aqueous phase liquid (DNAPL). There is no evidence that groundwater contamination has migrated beyond the boundaries of the Facility. The underlying Miocene clay effectively prohibits vertical movement of contamination through it into the deeper aquifers. Fernwood currently operates a pump and treat groundwater remediation system at the Facility as required by its MDEQ Post-Closure Permit. The pump and treat system is being implemented to address contamination from the Facility's four regulated units (SWMU 12, SWMU 13, SWMU 14, and SWMU 15). A final remedy for site-wide groundwater contamination has been selected and is conducted pursuant to Module V-Corrective Action Program for Regulated Units of the Hazardous Waste Post-Closure Permit issued by MDEQ. The groundwater protection standards are those established pursuant to Module IV.C.-Groundwater Protection Standards of the Hazardous Waste Post-Closure Permit issued by MDEQ.

The pump and treat system was designed to stop the migration of the contaminant plume and to remove the contaminants from the groundwater. The system, activated in October 1990, consists of five pairs of groundwater recovery wells and six DNAPL recovery wells. All of the water and DNAPL recovered by these wells is pumped to an on-site treatment unit, which consists of two oil/water separators and three carbon adsorption columns connected in series. The treated water is then discharged to the Little Tangipahoa River in accordance with Fernwood's MDEQ National Pollutant Discharge Elimination System (NPDES) Permit. The recovered DNAPL, which may include some quantity of water, oil/water emulsions, carbon fines, and other system residues, is shipped off-site for disposal as K001 hazardous waste.

As a condition of its MDEQ Post-Closure Permit, Fernwood is required to submit, annually, a report on the effectiveness of the post-closure pump and treat system. These reports contain the analytical results of on-site groundwater sampling, groundwater elevations in all on-site monitoring wells, and groundwater flow direction. At least annually, these reports also show flow rates and contain isoconcentration maps showing plumes for each monitored constituent and a composite map indicating the total extent of groundwater contamination at the Facility. Based on the March 2015 Annual Corrective Action Effectiveness Report, the post-closure pump and treat system treated over 35 million gallons of water during calendar year 2014. Although over 99,000 gallons of DNAPL have been recovered since the system started in 1990, the rate of contaminant recovery is slow and has declined with time. Contaminants in the monitoring wells are continuing to decrease over time based on historical groundwater monitoring results.

SURFACE WATER IMPACTS

The only significant surface water potentially impacted by the Facility is the Little Tangipahoa River, which crosses the southwestern portion of the Facility. The discharge from the sewage treatment system for the town of McComb, Mississippi, enters the Little Tangipahoa approximately two miles upstream from the Facility. Based on data obtained from McComb's Public Works Department, a substantial

portion of the normal flow of the Little Tangipahoa River in this area is treated wastewater from McComb's sewage system. The river is not used as a source of drinking water and there are no known agricultural uses. Prior to the initiation of the groundwater pump and treat system, surface water samples were obtained downstream of the Facility and analyzed for site-specific COPCs. All analytical results reported that no COPCs were present at or above the reported method detection limits.

RCRA INVESTIGATION SUMMARY

During the RFI process, soil sampling identified on-site soil contamination by constituents of creosote and PCP and, at SWMU 4, diesel fuel. The creosote constituents found to exceed the respective screening levels for human exposures to surface soils were carcinogenic polycyclic aromatic hydrocarbons (cPAHs). In order to assess the relative toxicity of cPAHs, EPA Region 4 has adopted a Toxicity Equivalent Factor (TEF) methodology for assessing human health risks associated with cPAHs. The TEFs are based on the potency of each cPAH compound compared to that of benzo(a)pyrene (BaP) (hereinafter referred to as the "BaP TEQ").

EPA Region 4 used the Region 9 Preliminary Remediation Goals (PRGs), now known as the EPA Regional Screening Levels (RSLs) to select the COPCs for the Facility (identified above). The EPA RSL Table combines current human health toxicity values with standard exposure factors to estimate contaminant concentrations in environmental media (soil, air, and water) that are considered by the EPA to be protective of human health (including sensitive groups), over a lifetime. The EPA RSL for BaP in soils at an industrial site is 0.21 milligrams per kilogram (mg/kg). This level represents an increased cancer risk of one person in one million ($1x10^{-6}$) developing cancer over the course of a lifetime due to exposure to this level of contamination in surface soils at an industrial location. For human health, the EPA's goal is to reduce the threat from carcinogenic contaminants so that, for any medium, the excess risk of cancer to an individual exposed over a lifetime generally falls within a range from one in ten thousand to one in one million (i.e., $1x10^{-4}$ to $1x10^{-6}$). A brief description of the eight SWMUs addressed by the Facility's RFI and the findings for each SWMU follows:

<u>SWMU 1 – Drip Track Area</u>

SWMU 1 consists of the area in front of the wood preserving retorts, which is where freshly treated wood was managed while it was still on tram cars. The "tracks" were conventional standard gauge railroad tracks constructed on a clayey gravel rail bed with creosoted cross-ties. The area between ties had been filled to the top of the rails. Approximately 50 years of use resulted in visible oily contamination on the surface of the area.

In 1988, when the Facility ceased operations, the most highly contaminated soil in SWMU 1 was removed and placed in the Treating Cylinder Sumps (SWMU 3), which were then capped with asphalt (discussed in detail below). SWMU 1 was then backfilled with clean fill material.

During the RFI, soil samples were taken from four locations along the length of the drip track. Samples at each location were taken from three discrete depth intervals: 0'-1', 4'-5', and 7.5'-8.2'. The samples were composited by depth and subjected to physical and chemical analyses. Soil sampling at the 0'-1' depth confirmed that K001 constituents were present above RSLs. In the 0'-1' composite sample, two cPAH constituents were detected: benzo(a)pyrene at 84 mg/kg and chrysene at 30 mg/kg, which collectively corresponds to a total BaP TEQ of 84.03 mg/kg. This combined BaP TEQ concentration corresponds to an excess carcinogenic risk level for an industrial worker of four in ten thousand

($4x10^{-4}$). Two non-carcinogenic constituents were also detected: fluoranthene at 236 mg/kg, which was below the industrial soil RSL of 22,000 mg/kg, and phenathrene at 103 mg/kg, which does not have an industrial soil RSL. Pentachlorophenol (PCP) was also detected at 64 mg/kg, which was above the industrial soil RSL of 9 mg/kg. Although contaminant constituents were detected at all three intervals, the concentrations decreased with depth.

Due to the proximity of SWMU 1 to SWMU 2, the surface water and sediment investigations for SWMU 1 were included with those accomplished for the Treated Wood Storage Yard (SWMU 2) and are discussed in detail below.

Groundwater sampling was not conducted at SWMU 1 due to its proximity to monitoring well MW-33, a well already identified as being located within the plume of groundwater contamination at the Facility.

SWMU 1 is located within the area enclosed by the site security fencing.

The proposed remedy for SWMU 1 includes the excavation of highly contaminated soil and backfilling with clean soil (performed at closure of the SWMU in 1988).

<u>SWMU 2 – Treated Wood Storage Yard</u>

SWMU 2 consists of approximately 16.5 acres of land, which was used to store finished products from the wood preserving plant while awaiting shipment to consumers. The area was mostly unimproved native soils, except for railbeds and roadways. Preservative drippage and rainfall wash-off are the likely sources of any contamination present.

This SWMU was investigated during the RFI through soil samples, sediment samples, run-off samples, and analysis of samples from two wells and the boiler spring. Soil samples were taken from 15 locations within this unit from depths of 0'-1' and 4'-5'. Composite soil samples from the 0'-1' interval showed the presence of six PAH constituents, four of which are cPAHs: chrysene at 5 mg/kg, benzo(b)fluoranthene at 22 mg/kg, benzo(a)pyrene at 8.2 mg/kg, and benzo(a)anthracene at 13 mg/kg, corresponding to a combined BaP TEQ of 11.7 mg/kg. This concentration corresponds to an excess carcinogenic risk level of $5.6x10^{-5}$ for an industrial worker. Two non-carcinogenic PAHs were also detected: fluoranthene at 24 mg/kg, which is below the industrial soil RSL of 22,000 mg/kg, and phenathrene at 2.4 mg/kg, which does not have an industrial soil RSL. Composite soil samples from 4'-5' in depth showed the presence of three contaminants: pentachlorophenol at 1.3 mg/kg, which is below the industrial soil RSL of 9 mg/kg; phenathrene at 3.1 mg/kg, which does not have an industrial soil RSL, and fluoranthene at 1.8 mg/kg, which is below the industrial soil RSL of 22,000 mg/kg.

The analytical results of groundwater samples from monitoring wells MW-2, MW-3, and MW-17, which are located near SWMU 2, and the boiler spring were non-detect for all COPCs.

Sediment samples were collected from the upstream and downstream ends of the two culverts which drain this unit under a paved road. Samples from the upstream end of the western culvert contained the following four cPAHs: benzo(a)pyrene at 4.9 mg/kg, benzo(a)anthracene at 11 mg/kg, benzo(b)fluoranthene at 13 mg/kg, and chrysene at 11 mg/kg, corresponding to a BaP TEQ of 7.3 mg/kg. This concentration corresponds to an excess carcinogenic risk level of $3.5x10^{-5}$ for an industrial worker. Other constituents present included the following: flouranthene at 37 mg/kg, which is below the industrial soil RSL of 22,000 mg/kg, phenanthrene at 16 mg/kg, which does not have an industrial soil

RSL, pentachlorophenol at 3.4 mg/kg, which is below the industrial soil RSL of 9 mg/kg, and napthalene at 1.3 mg/kg, which is below the industrial soil RSL of 2 mg/kg. Sediment samples from the downstream end of the western culvert contained the following four cPAHs: benzo(a)pyrene at 6.6 mg/kg, benzo(a)anthracene at 15 mg/kg, benzo(b)fluoranthene at 17 mg/kg, and chrysene at 16 mg/kg, corresponding to a BaP TEQ of 9.8 mg/kg. This concentration corresponds to an excess carcinogenic risk level of 4.7×10^{-5} for an industrial worker. Other constituents present included the following: flouranthene at 55 mg/kg, phenanthrene at 17 mg/kg, and pentachlorophenol at 3.6 mg/kg.

Sediment samples from the upstream end of the eastern culvert contained only one contaminant, flouranthene at 3.1 mg/kg (RSL is 22,000 mg/kg for industrial soil). No contaminants were reported in the downstream sediment samples from the eastern culvert.

This area is enclosed within the 6-foot high chain link security fencing and is not accessible to the public.

<u>SWMU 3 – Treating Cylinder Sumps</u>

SWMU 3 was a concrete structure which met the definition of an in-ground tank. It was used as the foundation for the wood preserving retorts and as a containment device for rainfall, minor leaks and drips, and potential spill events.

Prior to approximately 1970, rainfall and preservative spills, leaks, and drips were pumped to Surface Impoundment No. 1 (SWMU 12). In later years, liquids went to the oil/water separation system. Oil was returned to the process and the water was pre-treated prior to disposal.

The wood preserving chemicals which accumulated in the area contained the hazardous constituents found in K001 hazardous waste. These chemicals are primarily acid and base/neutral extractable organic compounds. The wood preserving chemical leaks, drips, and/or spills which may have accumulated in the unit ranged from free flowing liquids to tarry materials. Rainfall within the area became contaminated by contact with the chemicals.

Upon closure of the wood preserving facility, the retorts, valves, piping, etc. were removed and disposed of as scrap metal. The unit was cleaned by scraping, sweeping, and rinsing with water. All residues removed were managed as hazardous waste. The unit was then filled with soil removed from the Drip Track Area (SWMU 1), and the Wastewater Treatment Area (SWMU 6). Approximately 1,000 cubic yards of soil from these areas were placed in this concrete tank. The surface was mounded in the center to a height higher than the walls. The soil surface was then compacted, graded, and paved with an estimated four-inch thick asphalt cap.

During the RFI, soil samples were taken from two locations along the outside of the concrete wall on the downstream side. Although the approved RFI Work Plan called for sampling from three discrete depths at each of two locations, due to subsurface conditions, only two depths were sampled at the first location. In the 0’-1’ sample from the first location, the only cPAH detected was benzo(a)anthracene at 36 mg/kg, corresponding to a BaP TEQ of 3.6. This concentration corresponds to an excess carcinogenic risk level of 1.7×10^{-5} for an industrial worker. Other constituents in this sample include phenanthrene at 161 mg/kg, which does not have an RSL for industrial soils, fluoranthene at 177 mg/kg, which is below the industrial soil RSL of 22,000 mg/kg, and pentachlorophenol at 94 mg/kg, which is

above the industrial soil RSL of 9 mg/kg. The soil sample from 3.2'-3.6' at the first location contained phenanthrene at 128 mg/kg, fluoranthene at 82 mg/kg, and pentachlorophenol at 96 mg/kg.

No constituents were detected in the 0'-1' sample from the second location. The sample from the 4'-5' interval at the second location contained the following: phenanthrene at 241 mg/kg, which does not have an RSL for industrial soils, fluoranthene at 128 mg/kg, which is below the industrial soil RSL of 22,000 mg/kg, napthalene at 5.3 mg/kg, which is below the industrial soil RSL of 20 mg/kg, and pentachlorophenol at 100 mg/kg, which is above the industrial soil RSL of 9 mg/kg. The sample from the 9'-10' interval at the second location contained the following: phenanthrene at 345 mg/kg, fluoranthene at 174 mg/kg, napthalene at 15 mg/kg, and pentachlorophenol at 156 mg/kg. In the 9'-10' sample from the second location, the only cPAH detected was benzo(b)fluoranthene at 21 mg/kg , which corresponds to a BaP TEQ of 2.1 for an increased carcinogenic risk of $1x10^{-5}$ for an industrial worker.

SWMU 3 lies between three regulated closed hazardous waste management units (SWMU 12, SWMU 14, and SWMU 15) and is immediately adjacent to two other SWMUs (SWMU 1 and SWMU 6) in an area of known groundwater contamination. Monitoring well MW-34 is located approximately 35 feet downgradient from SWMU 3. Analyses of samples from this well indicate the presence of groundwater contamination. The corrective action system presently in operation as part of the MDEQ Post-Closure Permit will effectively manage any groundwater contamination emanating from this unit.

SWMU 3 is presently capped by a four-inch asphalt cover and is located within the area enclosed by the security fencing.

<u>SWMU 4 – Diesel Fuel Tank Containment Area</u>

SWMU 4 consists of the area around an above-ground diesel fuel tank which was surrounded by a spill containment dike. The diesel fuel tank and the containment barrier were removed at plant closure. SWMU 4 is immediately adjacent to the Drip Track Area (SWMU 1). During closure activities to replace the soil at the Drip Track Area (SWMU 1), SWMU 4 was covered with 0.5'-1.0' of clean sandy clay. SWMU 4 is immediately adjacent to, and upgradient from, SWMU 1.

Any contamination from SWMU 4 would be characterized by the presence of non-volatile petroleum hydrocarbons. During the RFI, SWMU 4 was investigated by analyses of soil samples from two locations and by analysis of one groundwater sample from an existing monitoring well. No surface water and/or sediment investigations were planned or executed for this unit.

Soil samples were taken from two locations within the former containment area. Samples at each location were taken from three discrete depth intervals: 0'-1', 4'-5' and 9'-10', and the samples were composited by depth. The samples were analyzed for the petroleum indicators benzene, toluene, xylene, and ethyl benzene, and the results were reported as total petroleum hydrocarbons. The contaminant concentrations decreased with depth, from 347 mg/kg at 0'-1' to 178 mg/kg at 4'-5' to 92 mg/kg at 9'-10'.

A sample of groundwater from monitoring well MW-33 was analyzed for the presence of total petroleum hydrocarbons. The results do not indicate contamination by these compounds and there is no evidence that SWMU 4 has had any impact on the groundwater.

SWMU 4 is located within the area enclosed by security fencing that has been installed around certain portions of the Facility.

SWMU 5 - Boiler Ditch

SWMU 5 was a ditch which ran from the vicinity of the wood waste fired boiler and joined the main drainage ditch for the central portion of the Facility which borders the closed Surface Impoundment No. 1 (SWMU 12). Toward the end of the Facility's operations, this ditch received only run-off from untreated product storage areas and the wood waste boiler area. Earlier, this ditch may have drained portions of the treated product storage yard or process areas. Any contamination associated with this unit would be from the wood preserving chemicals.

SWMU 5 was investigated through the analysis of a composite of three sediment samples. A surface water run-off sample was collected prior to the RFI and results of this sample showed non-detectable levels of COPCs. No other investigations were planned or performed at this unit because the boiler ditch runs over areas of known subsurface contamination associated with other units.

Three sediment samples were collected from along a length of the ditch located northwest of and adjacent to Surface Impoundment No. 1 (SWMU 12). These three sediment samples were composited and analytical results showed the following: fluoranthene at 4.4 mg/kg, which is below the industrial soil RSL of 22,000 mg/kg, pentachlorophenol at 2.7 mg/kg, which is below the industrial soil RSL of 9 mg/kg, and phenanthrene at 1.9 mg/kg, which does not have an industrial soil RSL.

The ditch exhibited very little in the way of sediment accumulation. Any sediment carried in this ditch must flow across the river flood plain where velocities would be substantially less, and the likelihood of it becoming trapped would increase. Prior sediment sampling in the river did not reveal any measurable impact from the Facility during its time of operation. Potential future impacts will be declining due to the closed nature of the Facility.

SWMU 5 is located within the area enclosed by security fencing that has been installed around certain portions of the Facility.

SWMU 6 – Wastewater Treatment Area

SWMU 6 is physically adjacent to and south of the Treating Cylinder Sumps (SWMU 3). It consisted of concrete and earthen areas surrounded by a retaining wall. During wood preserving operations, the unit contained aboveground or on-ground steel tanks used for oil/water separation and water treatment, and a cooling tower.

When the Facility closed, the steel tanks and cooling tower were dismantled and sold as scrap metal, except for three steel tanks which were modified for use and moved to the groundwater treatment system.

SWMU 6 was investigated by the analysis of soil samples taken at three depths in one location. Contaminant concentrations were found to increase slightly with depth, to the low parts per million (ppm or mg/kg) range. The sample from the 0'-1' interval did not reveal the presence of any contaminants. The sample from the 4'-5' interval showed the following: fluoranthene at 0.41 mg/kg, which is below the industrial soil RSL of 22,000 mg/kg, pentachlorophenol at 0.4 mg/kg, which is below

the industrial soil RSL of 9 mg/kg, and phenanthrene at 0.35 mg/kg, which does not have an industrial soil RSL. The sample from the 9'-10' interval showed the following: fluoranthene at 2 mg/kg, pentachlorophenol at 3.2 mg/kg, and phenanthrene at 6 mg/kg.

SWMU 6 lies between three closed RCRA hazardous waste management units (SWMU 12, SWMU 14, and SWMU 15) and immediately adjacent to and downgradient from SWMU 1 and SWMU 3. Groundwater under the unit is contaminated as shown by analysis from monitoring well MW-34, which is within the boundary of SWMU 6. Any potential groundwater impact from this unit will be masked by the impacts from the RCRA units. Groundwater beneath this unit will be captured by the corrective action system presently in operation as part of the MDEQ Post-Closure Permit.

SWMU 6 is located within the area enclosed by security fencing that has been installed around certain portions of the Facility.

SWMU 7 – Spray Field

SWMU 7 is a flat, grassy, approximately one-acre field in the river plain which was used as a spray irrigation field for water pumped from Surface Impoundment No. 2 (SWMU 13), which stored pretreated process wastewater and rainfall run-off from the wood preserving process area. The process wastewater and rainfall run-off were sprayed onto the grassy area for biological degradation. This area was used from the mid-1970s until 1984.

Soil samples were collected from eleven locations within SWMU 7 at a depth of 0'-1' and composited. The composite sample from the eleven locations was non-detect for all COPCs.

Three shallow monitoring wells (MW-19, MW-20, and MW-21, with a maximum total depth of 23' below ground surface) were installed downgradient of SWMU 7 prior to the RFI activities. Analyses for these three wells continue to be non-detect for all COPCs.

SWMU 7 is presently covered in thick grasses and shows no signs of impact.

SWMU 8 – Condenser Tank

SWMU 8 was a concrete tank which was partially in-ground. It was used as a source of condenser water and the contents were recycled through a barometric condenser.

Soil samples were taken from one location at SWMU 8 at depths of 0'-1' and 3'-4'. Constituents detected in the 0'-1' interval included fluoranthene at 2.3 mg/kg, which is below the industrial soil RSL of 22,000 mg/kg and phenanthrene at 1.9 mg/kg, which does not have an industrial soil RSL. The soil sample from the 3'-4' interval was non-detect for all COPCs.

The lack of contamination in the deeper sample supports a finding that this tank was structurally sound and not leaking. The surface contamination is at very low levels and could be the result of rainfall transport or other general contamination resulting during the operating years of the Facility.

Any potential groundwater impacts from this unit would be masked by the nearby RCRA units, and groundwater in this area is included in the capture zone of the corrective action system presently in operation as part of the MDEQ Post-Closure Permit. The unit itself presents no direct exposure risk, and

is located within the area enclosed by security fencing that has been installed around certain portions of the Facility.

INTERIM MEASURES

In 1988, Fernwood ceased wood preserving operations at the Facility. During the closure of operations, certain interim measures were conducted. These interim measures are described in the *RCRA Facility Investigation Plan*, dated December 20, 1989, and in the SWMU discussion above. These interim measures have mitigated the risk to human health from direct contact with contaminants in surface soils and the migration of contaminants, via storm water runoff, from the Facility, and are now being selected as part of the final remedy for the Facility.

CORRECTIVE MEASURES STUDY

In the RFI Report, dated August 29, 1991, and the Addendum to the RFI Report, dated January 15, 1993, Fernwood prepared a streamlined Corrective Measures Study (CMS) and presented corrective measures to address all SWMUs where contamination was identified in soils at concentrations exceeding the respective screening level for the identified COPCs. The EPA approved the RFI Report and the Addendum to the RFI Report on June 10, 1993. Monitoring and the performance of interim measures have taken place at the Facility consistent with the streamlined CMS. The monitoring and interim measures are being incorporated into the proposed remedy for the Facility as set forth below.

PROPOSED REMEDY

The streamlined Corrective Measures Study (CMS), as presented in the RFI Report and the Addendum to the RFI Report, detailed the preferred corrective measures and cleanup objectives for remediation of contamination at the Facility. The EPA is now proposing these corrective measures as the final remedy at the Facility. These proposed corrective measures include:

1. Soil and debris removal, backfill, and construction of a low-permeability cap at SWMU 1 and SWMU 3 [completed].

2. Construction of a security fence around SWMU 1, SWMU 2, SWMU 3, SWMU 4, SWMU 5, SWMU 6, and SWMU 8 to prevent access. Ongoing maintenance required [construction completed; maintenance ongoing].

3. Preparation of a survey plat of the 28.72 acres encompassed by the security fence and recording a notice in the deed to the Facility that the area may contain hazardous constituents [completed].

4. Collection of groundwater samples from monitoring well MW-1 and the “boiler spring” annually. Analyze these samples for the COPCs and report the results of these analyses annually. This sampling will ensure that there is no unknown or unaddressed groundwater impact from any of the SWMUs [ongoing].

5. Collection of storm water samples annually from the four culverts under Fernwood Road which drain run-off from the fenced area containing the SWMUs. Analyze these samples for the COPCs. Report the results of these analyses to the EPA annually. This sampling will determine if there is exposure via rainfall run-off [ongoing].

6. Implement an Environmental Covenant for the 28.72 acres encompassed by the security fence to: 1) restrict areas of the Facility known or suspected to have surface soil contamination or groundwater contamination as identified on the site survey to commercial and/or industrial/silvicultural land use only; 2) restrict the installation of groundwater wells or the extraction of groundwater in the areas of the Facility known or suspected to have groundwater contamination for any purpose, except as approved by EPA and the MDEQ; 3) restrict surface or subsurface demolition, excavation or other activities at the Facility, except as approved by EPA and MDEQ [to commence within one hundred eighty (180) calendar days of the effective date of the HSWA Permit].

The EPA acknowledges that an evaluation of multiple alternatives is not always necessary, particularly if a desirable remedy can be developed directly from site characterization, application of available engineering controls, and implementation of a long-term monitoring program and institutional controls. Because the proposed remedy was identified on the basis of its ability to protect human health and the environment, and because of the likelihood that it can be implemented efficiently, the EPA did not find it necessary to develop alternatives. The EPA considered the remedy presented in the streamlined CMS as the basis for the proposed remedy for the Facility.

In preparing this Statement of Basis, the EPA reviewed the recommendations proposed by Fernwood for the final remedy for each of the SWMUs to evaluate its conformance to the EPA's four threshold criteria for corrective measures. The four threshold criteria are:

- Overall protection of human health and the environment:

  The proposed remedy includes corrective measures that have been implemented to minimize or eliminate the direct contact or ingestion of contaminated media (soil, sediment, or groundwater) with COPCs through the construction of engineered barriers and the use of institutional controls to restrict the current and future use of the property. The Facility is closed with access controls that will be maintained as part of the HSWA Permit.

- Attain media cleanup standards:

  The remedy includes contaminated soil and debris removal, backfilling, and installation of a low-permeability cap to reduce soil contamination to levels at or below those allowed for an industrial site. (Groundwater protection standards are addressed in Module IV.C. – "Groundwater Protection Standards" of the Hazardous Waste Post-Closure Permit issued by MDEQ.)

- Control the sources of releases:

  The Facility has been closed and decommissioned by the removal of all former processing equipment. No areas of the Facility were identified in the RFI that would represent a source for cross-contamination of media.

- Comply with standards for management of wastes:

  The Facility is closed and no wastes are generated. The management of all investigation derived waste (*i.e.*, purged groundwater as a result of the ongoing monitoring programs), are subject to the conditions contained in the MDEQ Post-Closure Permit.

Based on the information presented in this Statement of Basis and in the Administrative Record, the EPA has selected the remedies proposed by Fernwood for each of the units described above. It should be noted that the recommended remedies discussed in this Statement of Basis are based on current site-usage as an industrial facility. If the site-usage ceases to be utilized as industrial, additional corrective measures may be necessary to achieve an acceptable (*i.e.*, unrestricted) site clean-up.
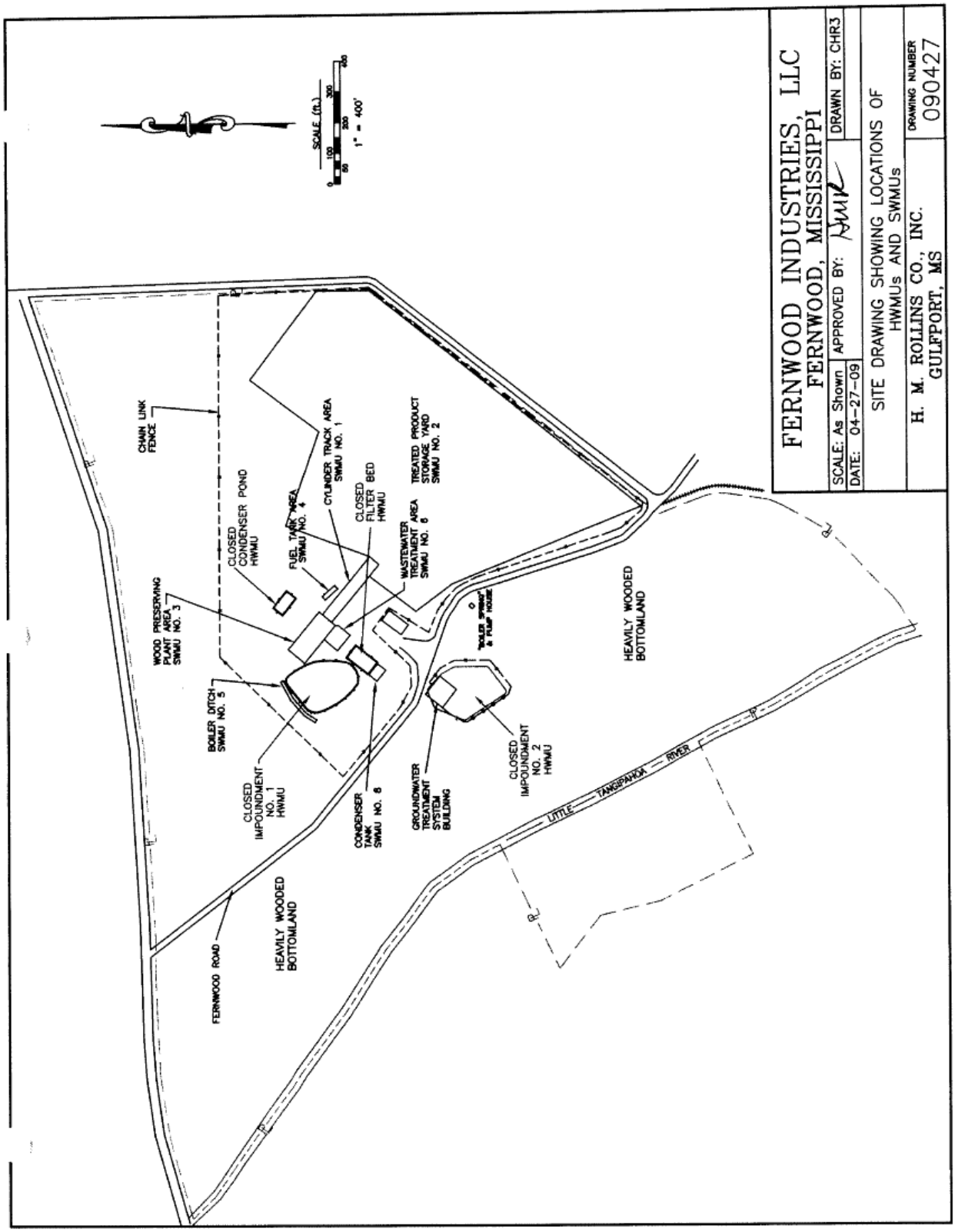
FIGURE 1: FACILITY MAP