ACTION MEMORANDUM

NORTH RYAN STREET SITE

LAKE CHARLES, CALCASIEU PARISH, LOUISIANA

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MEMORANDUM

SUBJECT: Request for Approval of a Consistency Exemption to the Statutory Two Million Dollar Limit for the Conduct of a Non-Time Critical Removal Action at North Ryan Street Site, Lake Charles, Calcasieu Parish, Louisiana

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I. Purpose

The purpose of this memorandum is to request and document approval of a Non-Time Critical Removal Action and exemption to the statutory two million dollar limit imposed by Section 104 (c) (1) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. §9601 et seq. and §9604 (c) (1), for the North Ryan Street Site located at 303 North Ryan Street in Lake Charles, Louisiana. (See Figure 1-Site Location Map). The proposed removal action is based upon the Engineering Evaluation and Cost Analysis (EE/CA) dated November 1998, prepared by Entergy Gulf States Inc. (Entergy) pursuant to an Administrative Order on Consent dated July 7, 1997, as well as public comments received by the U.S. Environmental Protection Agency (EPA) on the EE/CA and the removal action alternatives recommended therein. The basis for the request for exemption from this statutory limitation is that the proposed action to be undertaken is necessary, otherwise appropriate, and consistent with future remedial actions to be taken at the site.

The objective of the proposed removal action is to remove or eliminate principal threat wastes, thereby eliminating or reducing risks from potential exposure pathways from those wastes, at the site and in the nearby Calcasieu River. The areas to be addressed in this removal action are: 1) a former marshlands area possibly used for disposal of gasification products and other debris (the exposed tar area); 2) a storm sewer pipe which cuts through the exposed tar area (the storm sewer area); and, 3) Calcasieu River sediment at the storm sewer discharge point into the river. The specific objectives for the two on-site contaminated soil regions, known as the exposed tar and storm sewer areas are: 1) to limit the exposure of site workers and visitors to chemicals of concern in this area at or near the surface; and, 2) to reduce the amount of heavily contaminated source material to minimize the continued threat of chemical migration from this material into the shallow ground water and surrounding soils. The specific objectives for the Calcasieu River sediment at the storm water discharge point are: 1) to reduce the direct ecological impact of contaminated sediment by reducing polynuclear aromatic hydrocarbons (PAHs) to below action level values specified in the table found in Appendix E; 2) to minimize the

potential direct exposure of recreational users and indirect exposure from fish and shellfish consumption; and, 3) to limit migration of chemicals of concern in the Calcasieu River sediment away from the point of elevated contaminant levels. (See Figures 2 and 3 for maps depicting location of the removal areas.)

Recommended Removal Action

Source material and contaminated soils located in the western utility yard are known as the "exposed tar area" and the "storm sewer area." Based upon the streamlined risk evaluation, there is a potential exposure threat to human health in these areas through ingestion and dermal contact by current site workers, visitors and trespassers to the near surface soil and source ("tar") material. The contaminants of concern are polynuclear aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs) and benzene, toluene, ethylbenzene and xylene (BTEX). These materials present both a cancer and non-cancer risk to human health. The exposed tar area will be treated using an in-situ thermal treatment process. The contaminated soils in the storm sewer area will be excavated to a depth of five feet, characterized and, following treatment, if deemed necessary, transported to an appropriate off-site disposal facility that is in compliance with the off-site rule. In order to protect human health and the environment, EPA has set the removal action goals for total carcinogenic PAHs at 10 parts per million (ppm) (calculated using benzo(a)pyrene (BAP) equivalents), 50 ppm total PCBs and 2 ppm total benzene. The removal action goals are the maximum concentrations of a contaminant which may remain in a specific medium (i.e., soil) after treatment and still be protective of human health and the environment.

Prior to full-scale implementation of in-situ thermal treatment, a treatability study will be conducted to confirm that the stated removal action goals can be met. If the treatment technology for the exposed tar area does not meet the stated removal action goals, the same volume of source materials and contaminated soils that would have been treated on-site will be excavated and transported off-site for treatment and disposal. Verification sampling of the sides and bottom of the excavation must confirm that removal action goals have been met.

The Calcasieu River sediment at the storm sewer discharge point will be dredged and removed for off-site disposal. Based upon the streamlined risk evaluation, the river sediment does not pose a potential risk to human health. However, the ecological risk assessment indicated the river sediment does pose a potential risk to the benthic community due to PAHs and some metals. The action level goals for the Calcasieu River sediment are based upon screening level median values within the range that would effect these benthic organisms. Verification sampling will confirm that the remaining river sediment is below the action level values for PAHs. (See Appendix E - Table of Values for PAHs).

There are some departures from the originally proposed preferred alternatives set forth in the EE/CA. The EE/CA proposed to handle the excavated storm sewer material as a hazardous waste and place it into the thermal treatment area, prior to offsite disposal. Based on existing data, EPA

anticipates that this material would not be classified as a hazardous waste and therefore could be handled just one time for shipment off-site to an eligible and appropriate disposal facility. Dredging the river sediment has been selected over the original capping alternative for the following reasons: 1) public comments expressed concern and opposition to that removal alternative; 2) excavation and off-site disposal is more consistent with, and will contribute better to, future remedial performance; 3) unlike capping, excavation and disposal has no perpetual operation and maintenance requirement; and, 4) excavation and disposal will be more protective because there will be less residual effects to the environment than from capping.

The total project cost ceiling will exceed the two million dollar statutory limit. Approval of this document constitutes a determination that the removal action proposed herein is necessary, otherwise appropriate, and consistent with the remedial actions to be taken and grants a consistency waiver (exemption) to the two million dollar statutory limitation on removal actions.

The EE/CA Approval Memorandum dated June 13, 1996 (See Appendix D), established that conditions at the site meet the criteria for removal actions taken pursuant to Section 104 (b) of CERCLA [(see 40 CFR Section 300.415 (b)]. That is, it is clear from the information which EPA has gathered regarding the site that there is reason to believe that a threat to public health or welfare or the environment exists and that EPA should take action to abate, prevent, minimize, stabilize, mitigate, or eliminate the release or the threat of release. Furthermore, since a planning period in excess of six months existed before on-site activities were to be initiated, conduct of this action as a non-time critical removal action is appropriate.

II. Site Conditions and Background

CERCLIS ID Number: LAD985169317
Category of Removal: Non-Time Critical
Site ID Number: Z6
National Significance: Proposed NPL Site

A. Site Description

1. Removal site evaluation

The site is a former manufactured gas plant and is currently used as a utility storage yard by Entergy Gulf States, Inc. Discovery of conditions at the site occurred on July 20, 1988, when utility workmen digging a trench along the north side of the property's northern fence line discovered an oily material leaking out of the side of the trench closest to the facility. The Louisiana Department of Environmental Quality

(LDEQ) was notified and it, along with the former property owner, Gulf States Utilities (GSU), sampled this material. A more thorough investigation of the site revealed a pit where a black substance was found at the surface in the center of the western utility storage yard. On September 19, 1988, LDEQ ordered GSU to determine the extent of contamination and propose a plan for remediation. As a result of the LDEQ order, GSU generated three reports describing the nature and extent of contamination. They were the *Phase I Evaluation Report and Phase II Drilling and Sampling Plan* dated February 1989, the *Phase II Evaluation Report* dated July 1989, and the *Phase III Evaluation Report* dated October 1990. All three of these reports were prepared by Walk, Haydel & Associates, Inc. on behalf of GSU. These reports may be reviewed in the Administrative Record.

The EPA initiated a Screening Site Inspection (SSI) in 1990 in order to determine if Superfund involvement with the site was appropriate. The SSI was completed on September 24, 1992. As a result of the SSI, the site was proposed to the National Priorities List on February 13, 1995, (60 FR 8212) with a Hazardous Ranking System score of 50.43.

Starting in February 1997, Entergy Gulf States, Inc (formerly Entergy Services, Inc., which acquired Gulf States Utilities in 1993), initiated a Remedial Investigation and Feasibility Study (RI/FS) and an EE/CA, in accordance with a subsequent Administrative Order on Consent (AOC) with the U.S. EPA dated July 7, 1997.

Based upon the results of the EE/CA investigation, the following key problem areas were identified:

- a former marshland area (previously defined as the “exposed tar area”) located in the northwestern part of the west utility yard, initially used for landfilling of coal tar by-products generated during gas plant activities, and then subsequently used for disposal of other debris such as electrical equipment and poles, appliances, transformers, capacitors, and drums of used transformer oil. The contaminants of concern are PAHs, PCBs, benzene, toluene, ethylbenzene and xylenes (BTEXs), and selected metals;

- a storm sewer pipe (previously defined as the “storm sewer area”) through the exposed tar area where some elevated levels of PAHs were found. This pipe is thought to serve as a potential pathway for contaminant migration from the exposed tar area to the Calcasieu River discharge point.

- an area of the Calcasieu River where sediments are contaminated with PAHs resulting from migration of on-site source materials.

2. Physical location

The site is located at the Entergy Service Center, 303 North Ryan Street, in the City of Lake Charles within Calcasieu Parish, Louisiana, in the northeast portion of Section 31, Township 9 South, Range 8 West.

The site is bounded to the north by River Road and the Calcasieu River, to the east by North Ryan Street and lots zoned for industrial use with small grassy areas, to the south by commercial businesses, to the southwest by wastewater holding ponds and the wastewater treatment plant, and to the west by a cypress wetland. A drainage ditch and an abandoned railroad spur are located along the southern boundary of the site and separate the site from the water treatment plant. The western edge of the site is also bounded by a drainage ditch and an unpaved access road for the wastewater treatment plant property. (See Figure 4).

The Calcasieu River is used for boating and recreational/commercial fishing. In 1947, a ship containing as much as 100,000 gallons of fuel oil reportedly sank in the Calcasieu River along the northwest portion of the site. A former petroleum storage facility and loading dock are present along the Calcasieu River northeast of the site, at the east end of the east storage yard (the vacant lot on the east side of North Ryan Street that was once used by GSU for storage of equipment and supplies). The discharge pipe for the treated effluent from the wastewater treatment plant is located immediately west of the service center property boundary.

The site area is currently zoned for commercial and industrial use. City planning documents indicate that there are no anticipated future zoning changes for the site (City of Lake Charles 1994). On the basis of 1990 census data, the total population within one mile of the site is 2,564, with a total of 1,397 household units. The average population density is 816 persons per square mile. Within five miles of the site, the total population is 84,845, with a total of 35,127 household units. This results in a higher population density of 1,078 persons per square mile. This difference in population density reflects the relatively undeveloped areas immediately west and north of the Entergy Service Center.

3. Site characteristics

The GSU has owned and operated the site since 1927. Gas production at the site occurred between the years of 1916 and 1932. The manufacture of gas was discontinued in 1932, at which point GSU started to dismantle the gas plant and use the property as a service center/utility yard. In 1993, GSU was acquired by Entergy Corporation. The GSU became Entergy Gulf States, Inc., (Entergy) in 1997. Entergy currently operates and maintains a service center at the site.

The original gas manufacturing process used the Tenney carbureted water gas system. Then, in 1931, the plant was converted to the Kenns horizontal carbureted water gas process for one year of production. The former gas plant (depicted in Figure 4) consisted primarily of a structure that housed the gas manufacturing equipment and materials (retorts, coke house, compressor, scrubbers, and purifiers), an above-ground gas tank holder, seven above-ground gas storage tanks, and two above-ground oil storage tanks. In addition, an electric generating plant, a 300,000-gallon capacity reservoir, a smaller reservoir of unknown dimensions, and two partially underground tanks for crude oil storage (7,500 barrel and 2,000 barrel capacities) were located north and northwest of the gas plant. The reservoirs were likely used for the storage of water for electric-generating processes. The Sanborn Fire Insurance maps from 1919 to 1925 indicate that six water process/production wells were also present on site at that time. Using the Sanborn maps, it appears that several changes were made to the gas plant between 1919 and 1925. The oil tanks are referred to as gas tanks on the 1925 map, and two additional above-ground gas tanks, one rectangular scrubber, and two oil tanks located 90 feet east of the gas holder, are shown on the 1925 map.

The tar byproducts generated during gas plant activities were discharged into marshlands that were located in the western portion of the current site property. The total size of the marshlands was approximately six acres. After the gas plant ceased operations in 1932, the marshlands were filled using a variety of material, including electrical equipment and poles, appliances, and other debris as fill material. By 1980, the area was filled and covered with shells and soil. It is now used as an equipment storage area. The exposed tar area was identified at the northern portion of these former marshlands. This area of black, viscous material is visible and is approximately eight by eight feet at the surface. During the EE/CA investigation in February 1997, Entergy found mostly tires and plastic and paper trash in test pits excavated to delineate the extent of the exposed tar area.

Although the former manufactured gas plant structures have been dismantled, some remnants of the gas plant foundation are still present on site. The gas holder foundation is a four-foot high structure still visible on the site. Test pits excavated during the February 1997 investigation did not reveal the presence of underground storage tanks (USTs) at this location. Only petroleum-contaminated soil, with a diesel fuel odor, was observed in these test pits.

A storm water drainage pipeline extends south to north across the site. The line was formerly used by the City of Lake Charles and GSU for the discharge of surface water runoff. A line running east to west on the southeast side of the Entergy property is also connected to this pipeline. The city periodically discharged back-flush water from the filters of the Wastewater treatment plant, located on the adjacent property, into the north-south storm water pipeline. The south end of the pipe adjacent to the city property was plugged with a metal plate because the back flush water would

occasionally flood the Entergy yard. The north end of the pipe near the fence along the south side of River Road was also plugged.

Currently, the site consists of east and west service yards separated by North Ryan Street. The west service yard is approximately 16 acres. The east service yard is three to four acres in size. The west service yard is used as a storage area and a repair center associated with the Lake Charles service center operations. The area east of North Ryan Street, originally leased for storage, is no longer used.

4. Release or threatened release into the environment of a hazardous substance, or pollutant or contaminant

A streamlined risk evaluation dated October 1998 was prepared for EPA by the U. S. Army Corps of Engineers in accordance with EPA Risk Assessment Guidance for Superfund. The purpose of this evaluation was to determine the immediate risk to human health posed by contamination found during the site investigations. This evaluation included data evaluation, exposure assessment, toxicity assessment and risk characterization. Through the elimination of compounds that were below detection limits, a toxicity screening, and a comparison with background, EPA determined that the main chemicals of potential concern for the exposed tar area were PCBs and PAHs. For Calcasieu River sediment at the storm sewer discharge point, EPA determined that PAHs were the chemicals of concern. These are "hazardous substances" as defined in Section 101(14) of CERCLA, 42 U.S.C. §9601(14). The highest concentrations of contaminants in source material and soil samples were detected in the former marshland area (i.e. 13,000 to 62,000 ppm total PAHs and 26 to 533 ppm PCBs). Tar-like material was observed in all the borings and test pits in this area and samples of the tar indicate that it is a Resource Conservation and Recovery Act (RCRA) characteristic hazardous waste on the basis of toxicity for benzene.

Completion of the exposure assessment resulted in the following direct contact exposure scenario for the exposed tar and storm sewer areas:

- the exposure of current site workers, visitors, and trespassers to near surface soil and tar through ingestion and dermal contact.

The material to be treated on-site in this removal is the source material (coal tar) in the exposed tar area, and contaminated soils along 200 feet of storm sewer at the north property line. These are the areas where the highest contamination levels have been found and could possibly serve as contributing contaminants to the shallow groundwater.

Based upon the streamlined risk evaluation, the Calcasieu River sediment at the

storm sewer discharge point does not pose a potential risk to human health. The cancer risk from recreational exposure of area residents to the Calcasieu River sediment was 6.48×10^{-5} which falls within EPA acceptable risk range of $1x10^{-4}$ to $1x10^{-6}$. In addition, a non-cancer risk was not indicated. However, the ecological risk assessment indicated potential risk to the benthic community from a direct exposure in this sediment to lead, acenaphthylene, acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene, fluorene, fluoranthene, phenanthrene, and pyrene. The same sediment also contains chemicals that may present a risk to ecological communities through food-chain transfer. These chemicals include aluminum, lead, silver, zinc and dibenzofuran.

5. NPL status

The North Ryan Street site was proposed for placement on the National Priorities List (NPL) on February 13, 1995. [60 Fed.Reg. 8212 (1995)]. A final listing has not been published.

6. Maps, pictures, and other graphic representations

A map showing the site location is contained in Figure 1. Figure 2 is a map of the exposed tar and storm sewer areas. A map of the Calcasieu River sediment is depicted in Figure 3. Figure 4 is a site map.

B. Other Actions to Date

1. Previous actions

The GSU conducted removal and disposal of two underground storage tanks in 1992, with oversight by the State. No other previous actions have been conducted.

2. Current actions

Under the terms of the July 7, 1997, Administrative Order on Consent (AOC) between Entergy Gulf States, Inc., and EPA Region 6, Entergy is currently conducting the RI/FS and baseline risk assessment for the site. The primary focus of the RI/FS is to determine if there are contaminant impacts on the shallow ground water and proposed actions for mitigation.

C. State and Local Authorities' Role

1. State and local actions to date

As previously noted, on July 7 1988, utility workers discovered a release of material into a trench they were excavating along the northern property boundary of the site. The LDEQ was notified and responded by conducting a site inspection on that date. The material released in the trench was sampled and sent for analysis by LDEQ. The LDEQ inspectors also investigated on-site areas and identified several pits used in the past to store and dispose of transformers and drums.

The LDEQ issued a Compliance Order to GSU on September 19, 1988. The order instructed GSU to submit a plan to fully characterize the physical dimensions of the waste disposal area, to characterize the chemical composition of the wastes, to identify and delineate any plumes of ground water contamination, and to schedule an expeditious corrective action designed to remove all wastes and waste constituents within 30 days of issuance of the order.

In order to comply with the requirements of the Order, GSU contracted Walk, Haydel and Associates to conduct remedial investigation activities. These investigations resulted in completion of the *Phase I Evaluation Report and Phase II Drilling and Sampling Plan* dated February 1989, the *Phase II Evaluation Report* dated July 1989, and the *Phase III Evaluation Report* dated October 1990.

On September 25, 1989, representatives of the LDEQ's Ground Water Protection Division collected four water samples from the site. A conference was held on January 10, 1990, between representatives of GSU and the LDEQ to discuss Phase III of the investigation that had been ordered by the State in the September 1988 Compliance Order. As a result of the conference, an addendum to the Phase III study was developed and submitted to the LDEQ in February 1990. The final report for Phase III was then completed in October 1990.

2. Potential for continued State/local response

The EPA became involved with the site in 1989 when a Field Investigation Team (FIT) was tasked to conduct a Preliminary Assessment (PA) of the site. As previously noted, on July 7, 1997, an Administrative Order on Consent was executed between EPA and Entergy Gulf States, Inc., which provided that Entergy would perform a Remedial Investigation and Feasibility Study and an Engineering Evaluation and Cost Analysis of the site. As part of this order, Entergy will provide LDEQ a copy of all correspondence and deliverables submitted to EPA. The LDEQ is part of the technical review team working with EPA to oversee the conduct of the EE/CA, and other aspects of this overall project. There is no known potential for State or local response independent of the Federal Superfund project.

III. Threat to Public Health or Welfare or the Environment, and Statutory and Regulatory Authorities

A. Threats to Public Health or Welfare

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP), at 40 CFR §300.415, lists the factors to be considered in determining the appropriateness of a Removal Action. The following paragraphs of Section 300.415 of the NCP apply to the North Ryan Street site:

1. [Section 300.415 (b) (2) (i)] - "Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants."

2. [Section 300.415 (b) (2) (ii)] - "Actual or potential contamination of drinking water supplies or sensitive ecosystems."

3. [Section 300.415 (b) (2) (iv)] - "High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate."

Hazardous substances have been found in subsurface borings conducted at the site at depths ranging from 3 to 17 feet below the surface. The highest concentrations of contaminants in source material and soil samples were detected in the exposed tar area (i.e., 13,000 to 62,000 ppm total PAHs and 26 to 533 ppm PCBs). These are hazardous substances as defined in Section 101(14) of CERCLA, 42 U.S.C. § 9601(14). Tar-like material was observed in all the borings and test pits in this area, and samples of the tar indicate that it is a Resource Conservation and Recovery Act (RCRA) characteristic hazardous waste on the basis of toxicity for benzene. The potential exists for nearby human populations, animals, or the food chain to be exposed to these hazardous substances or pollutants or contaminants if not addressed by this response action.

In addition, samples collected from shallow aquifers located beneath the site indicate that the shallow ground water is contaminated with hazardous substances. Some residents are using relatively shallow private wells as their drinking water supply. In addition, there were formerly two municipal wells located on site in the coal tar contaminated area which were screened in the Chicot Aquifer. The Chicot Aquifer is a major drinking water source for area residents. These wells have been plugged and abandoned. Four additional wells located within a one-half mile radius of the site are also screened in the Chicot Aquifer. Contaminated ground water could migrate through the underlying strata or through the voids created by the existing wells and contaminate the aquifer. Therefore, the hazardous substances found at the surface and near surface, if not addressed by this response action, may migrate, or result in actual or potential contamination of drinking water supplies or sensitive ecosystems.

B. Threats to the Environment

Under the terms of the AOC with EPA, Entergy performed an ecological risk assessment on the site. The ecological risk assessment indicates that sediment in the Calcasieu River contains site-related chemicals (i.e., PAHs and metals) at levels that may adversely affect the benthic organism community known to exist in these types of sediments. The location of this area is along the southern river bank which is adjacent to the northern property line of the site. It appears that the contamination is localized in the area where the storm water discharge pipe, which traverses the site property, emptied into the Calcasieu River. The contaminated sediment covers an area which extends slightly to the north and west of the pipe discharge and then approximately 60 feet toward the east, encompassing a total area of approximately 17,000 square feet or 1,900 square yards. Response actions designed to remove these sediments would reduce the ecological risk to biological communities on or near the site.

IV. Endangerment Determination

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the action selected in this Action Memorandum, may present an imminent and substantial endangerment to public health, or welfare, or the environment.

V. Exemption From Statutory Limit

The authority to conduct the removal action described in this memorandum and the authority to make the findings necessary to obtain the statutory exemption was vested in the President of the United States by Section 104 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) 42 U.S.C. §9604. This authority was delegated to the Administrator of the U.S. Environmental Protection Agency (EPA) by Executive Order Number 12580, January 23, 1987, 52 FR 2923, and redelegated to the Regional Administrator of EPA Region 6 and Superfund Division Director by Delegation R6-14-2-B. The proposed source control measures are appropriate and consistent with any remedial action to be taken. This proposed removal action therefore warrants exemption from the two-million dollar statutory limitations on removal actions. Approval of this action will invoke the consistency waiver (exemption) to the statute.

VI. Proposed Actions and Estimated Costs

A. Proposed Actions

1. Exposed Tar and Storm Sewer Areas

a. <u>In Situ Thermal Treatment and Excavation</u>

The removal action to address the source material and contaminated soil in the exposed tar and storm sewer areas, identified as Alternative 4 in the EE/CA dated

November 1998, meets CERCLA's preference for treatment. The EE/CA is available for review in the Administrative Record. In general, this action consists of installing thermal wells within the exposed tar area and heating the contaminated material to vaporize the organic contaminants. The contaminated soils and associated pipeline of the storm sewer area will be excavated and the waste material will be characterized, treated on-site or off-site as necessary, and disposed of off-site at an eligible RCRA landfill.

In-situ treatment to a depth of 6 feet over an area of 22,400 square feet (approximately 4,970 cubic yards of material) is assumed under this action. The material within the exposed tar area will be left in place following treatment. In order to be protective of human health and the environment, EPA has set the removal action goal for total carcinogenic PAHs at 10 ppm (calculated using benzo(a)pyrene (BAP) equivalents), 50 ppm total PCBs, and 2 ppm total benzene. The removal action goal for the PAHs represents an excess cancer risk of about 10^{-6} at the surface based upon the existing industrial land use scenario. The benzene action level is based upon conservative human health cancer risk-based values, as well as RCRA requirements. Although the PCB action level also considered the human health cancer risk-based values, the Toxic Substance Control Act (TSCA) PCB Cleanup Levels for an industrial site scenario were ultimately applied. Sampling inside of, at the base of, and at the perimeter extent of the treatment area, will be used to confirm that removal action goals are met. These removal action goals will apply to both the in-situ thermal treatment and for any associated soil excavation.

Contaminated soil around the storm sewer line at the north site boundary will be excavated to a depth of five feet, and the material will be characterized by collecting composite samples and analyzing for volatiles, semi-volatiles, and PCBs. Based upon the results of this analysis, following any necessary treatment, the material will be appropriately disposed of off-site. Verification sampling of the sides and bottom of the excavation must show that the remaining soils are below the above stated removal action goals. Any debris encountered during excavation will be decontaminated on site and disposed of at a RCRA Subtitle D landfill.

The north section of the storm sewer line will be removed and the ends of the pipe remaining in place will be plugged with concrete to prevent it from becoming a conduit for future contaminant migration. The excavated area would be backfilled with clay and surfaced with granular roadstone.

Prior to implementing this action, a treatability study will be conducted to confirm that the stated removal action treatment goals will be met. The EPA will also require confirmation that this thermal treatment will not generate dioxin in soil or air emissions, since dioxin is a potential by-product of thermal treatment.

Process

The in-situ thermal treatment process involves heating the contaminated soil in-place to vaporize the organic contaminants to a depth of six feet below ground surface (bgs). It is anticipated that this will be achieved by installing wells to a depth of up to nine feet on a grid of equilateral triangles, spaced from 5 to 20 feet apart over the exposed tar area. Heating elements will be installed in the wells and used to heat the surrounding soil to vaporize organic contaminants in the soil. The surface area to be treated will be covered with silicone rubber mats both for insulation and to form a vapor barrier.

A vapor extraction system will also be installed in the wells to create a vacuum and remove contaminants volatilized during heating. The initial heating will boil off water trapped in the pores of the soil and vaporize contaminants dissolved in this water. Subsequent heating of the soil, which will reach temperatures of up to 1000" F, will desorb any additional contaminants adsorbed to the soil matrix. Vaporized or desorbed contaminants will be collected by the vapor extraction system and treated in an on-site treatment system. Vapor-phase contaminants will either be absorbed on activated carbon or destroyed by thermal oxidation.

Under this action, the only area of the exposed tar and storm sewer areas to be excavated will be the section of storm sewer near the northern property fence line. The contaminated soil in the area of the storm sewer will be excavated to a depth of five feet bgs. The soil will be characterized by collecting composite samples and analyzing for volatiles [including the Toxicity Characteristic Leaching Procedure (TCLP) for benzene], semi-volatiles, and PCBs. Based upon the results of this analysis, the material will either be treated, if necessary, prior to appropriate (i.e., at an eligible RCRA facility) disposal off-site, or simply disposed of properly at an eligible RCRA facility. Verification sampling of the sides and bottom of the excavation must show that the remaining soils are below the above-stated removal action goals.

The section of the storm sewer pipeline exposed after excavation of the soils will be removed, decontaminated on site as required, and transported to a RCRA Subtitle D landfill for disposal. The EPA estimates that approximately 200 feet of the sewer pipe will be removed. The ends of the storm sewer pipe left in place will be plugged with grout or concrete and the excavated area will be backfilled with compacted clay. Prior to backfilling, soil samples of the bottom and sides of the excavated area will be collected and analyzed for PAHs, PCBs and benzene in order to confirm that the removal action goals have been met. The invert elevation of the storm sewer is estimated to be approximately four feet bgs in this area; therefore, it is assumed that four feet of compacted clay will be placed in the excavation followed by 12 inches of road base material to match the existing surface material. The cap will be constructed to match the surrounding grade and sloped to facilitate surface water

runoff.

Water used for decontamination, and any water collected during dewatering, will be sampled, treated, if necessary, and disposed of appropriately. The water treatment and disposal options will be determined as part of the removal design.

In-situ thermal treatment is designed to prevent the release of volatile and particulate contaminants. At the surface, the collected vapors are sent through a flameless oxidizer and an activated carbon filter to ensure that all vaporized contaminants are either oxidized or adsorbed to the filter media. Although no emissions of contaminants above health-based State or Federal action levels for ambient air quality are anticipated, monitoring and sampling will be conducted during in-situ thermal treatment and excavation. The emissions and ambient air monitoring and sampling are intended to verify that the capture and treatment process is effective in destroying the airborne contaminants and that no harmful releases are occurring during removal operations.

Several types of air monitoring and sampling will be employed while the removal action operations are being conducted. An air monitoring/sampling action plan will need to be drafted and approved by EPA as part of the removal design. The following requirements will apply, at a minimum. For early detection, which is required for worker safety and emergency response purposes, one type will include using hand held instantaneous read-out instruments including a photoionization detector (PID) for detection of total airborne volatile organic compounds (VOCs) and a mini-RAM PDM-3, or equivalent, portable aerosol monitor for detection of respirable particulates (dust). Prior to the start of the work, background levels should be collected over several days to establish baseline values for these parameters.

The next type of monitoring will be at the vent of the treatment unit using a total hydrocarbon analyzer. This instrument will be installed to ensure that no breakthrough is occurring from the treatment unit into the atmosphere. Prior to the start of the work, background levels should be collected over several days to establish baseline values for this parameter.

The last type, which is to ensure protection of public health and the environment during removal activities, will be perimeter sampling at no less than four stations (one upwind, one downwind and two cross wind). For purposes of this removal action, perimeter is defined as the site boundary in proximity to where the removal activities are being conducted. While the treatability study for the in-situ thermal treatment is being conducted, four sampling devices will be required at each of the four perimeter stations, for a total of sixteen. Each air sampler will be used for the duration of a work day with subsequent chemical analysis by an EPA certified laboratory providing a maximum 48-hour turn-around time for obtaining preliminary results. One of the four samplers used

for collection of ambient air samples will be a Summa Passivated Canister which, after the specified sampling duration, will be analyzed using EPA Method TO-14, or its equivalent, for VOCs. One will be a High Volume Polyurethane Foam sampler to be analyzed using EPA Method TO-9, or its equivalent, for dioxin. Another will be a PUF/XAD-2 Adsorption sampler to be analyzed using EPA Method TO-13, or its equivalent, for PAHs. The last sampler will be set for collection of total suspended particulates (TSP) using a high-volume TSP air sampler. The sampling will be consistent with methods specified by the National Ambient Air Quality Standards for Total Suspended Particulate Matter as outlined in 40 CFR Part 50, Appendix B. Samples collected by this method for the full duration of each work day will be sent to an off-site laboratory and analyzed for TSP with a maximum turn-around time of 48 hours. A work day is defined as a day when removal activities are being conducted from start to finish (e.g. 7 a.m. to 6 p.m.). Perimeter sampling will be required on each of these days until such time that EPA determines that there should be an increase or decrease in sampling frequency based upon the sampling results.

Exceeding any of the action levels for these parameters will require modification to work procedures which could possibly include shutting down operations. The action levels for total suspended particulate (TSP) using the mini-RAM are1 mg/m^3 for a one minute average and 150 $\mu g/m^3$ in a workday average for the high volume TSP results. The action level requiring modification to work procedures for VOCs using the photoionization device is three ppm instantaneous at the perimeter. If the monitoring results for the total hydrocarbon analyzer exceed 3 ppm above background, then alteration of work procedures will be necessary. The analytical results for VOCs, PAHs, and dioxin will have action levels that are chemical dependent and will need to be evaluated by EPA and LDEQ for the chemical specific release. If dioxin is detected at any level, however, operations must cease immediately.

During treatment, soil and the heating element probes will be used to track the progression of the treatment process. In-situ samples of the treated material within the exposed tar area will be collected and analyzed to confirm attainment of the removal action treatment goals. This data will also be used both to determine the levels of remaining residual contamination and to assist in completing a follow-up risk assessment for the site. After treatment is complete, the thermal wells will be removed from the treatment area.

Effectiveness

As noted, treatability studies will be needed to prove the effectiveness of this innovative treatment technology. The EPA believes that in-situ treatment of highly contaminated source material and soil will effectively reduce the current and future long-term risks at the site associated with potential direct human contact with the contaminants in the exposed tar area, as well as minimize the potential for the migration

of contaminants. Under this action, residual contamination will remain below six feet and could continue to migrate in the subsurface. However, a large portion of the contaminants in the exposed tar area will be treated and only lower residual concentrations will remain below six feet. In addition, the removal of the storm sewer will eliminate that migration pathway of contaminants into the river. Residual subsurface contamination will be addressed in a future ground water or residual soil/sediment remedial action, if warranted.

Although this in-situ thermal treatment technology has not been demonstrated in the field on tar source material or on sites with PAH contamination, it has been demonstrated in the field on PCBs and in the laboratory (bench scale) on PAHs. Performance standards and removal action treatment goals, as stated previously, have been established for this site and must be demonstrated in the field before full-scale application of the technology is implemented at the site. During field testing, modifications to the in-situ process may be required to achieve performance standards. Assuming that the thermal wells effectively treat the contaminants to a depth of six feet, it is estimated that a total volume of approximately 4,970 cubic yards of contaminated material will be treated in the exposed tar area. If the treatability studies cannot demonstrate that the in-situ thermal treatment meets removal action goals, then the contingent removal action of excavation of all contaminated soil on-site in the exposed tar area with appropriate off-site treatment and disposal at a RCRA permitted facility will be implemented. The details of this contingent action follow on page 18.

The short-term risks associated with implementing this action include possible accidents or injuries to workers associated with setup and operation of the thermal treatment unit and associated equipment, and possible volatilization and emission of contaminants. There are also possible risks associated with excavation of the storm sewer soils due to possible accidents associated with operation of heavy equipment and having open excavations for a short period of time. These risks will be minimized by compliance with applicable Occupational Safety and Health Administration (OSHA) regulations and the use of proper personal protective equipment and construction safety practices. Any contaminant emissions from the process are to be captured and treated. Therefore, no exposure to the public and environment to airborne particulates and volatile contaminants is anticipated. However, air monitoring will be conducted during treatment to ensure that the air quality is not adversely affected.

If the removal action treatment goals using the in-situ thermal treatment process can be met, then the toxicity, mobility and volume of contaminated material will have effectively been reduced.

The EPA estimates that this component of the removal action could be completed in approximately six months, which includes mobilization; equipment setup;

well installation; slurry wall construction, if necessary; in-situ treatment; storm sewer pipe material excavation and disposal; and, site restoration.

Implementability

In-situ thermal treatment will be implemented using equipment available from TerraTherm Environmental Services or other possible vendors of this technology. The limited number of vendors available may affect the implementability of this action. Excavation, loading, and transport of material around the storm sewer will be performed using conventional excavation equipment and methods.

Installation of the thermal wells within the exposed tar area might be complicated by the amount of debris that may be present in the area. Maintenance of the thermal treatment unit could be extensive during setup and operation. As noted, the technology has been demonstrated on PCB-contaminated soil, but not on PAH-contaminated soil or tar source material. Shallow ground water could interfere with, or increase the time and cost of, treatment. It is assumed that sheet piling or a slurry wall, and dewatering, will be required to implement this action. If these measures are not effective in removing ground water from the area, it might not be possible to implement this action. During field testing, modifications to the in-situ process may be required to achieve performance standards.

Limited maintenance will need to be conducted after the in-situ treatment has been completed, particularly in the area in which storm sewer and associated soil is removed. Any repairs to the final cover material will be completed in conjunction with the general maintenance of the facility's road stone surfacing.

In-situ thermal treatment of contaminated material will be compatible with any future remedial activities, including possible future ground water remediation proposed for the site. Treating this material to the action levels specified for soil in this Action Memorandum will significantly reduce continuing releases of contaminants into the surrounding shallow ground water and will allow for any future ground water remediation to be conducted more effectively.

Cost Estimate

The capital costs include both direct and indirect capital costs. The direct capital costs include treatment system setup; thermal well installation; thermal treatment system operation including power cost; air monitoring/sampling; excavation, transport, and disposal of soil around the storm sewer; confirmation sampling; and site restoration. These costs are estimated to be $1,406,000. With the addition of the indirect costs, the total capital cost for this portion of the response action is estimated to be $2,270,200. These costs assume the need for a slurry wall around the exposed tar

area.

Post Removal Site Control (PRSC) costs will be minimal under this action. The only long-term maintenance required will be associated with maintaining the final cover material placed over the treatment area and excavation areas. This will be addressed routinely in conjunction with the maintenance of the service center yard. Therefore, this action requires no PRSC costs and the present worth of this action is the same as the total capital cost.

b. <u>Contingent Action: Excavation and Off-Site Treatment/Disposal</u>

This contingent removal action will be implemented if the treatability studies for in-situ thermal treatment fail to meet the previously defined removal action treatment goals. It is based upon Alternative 3 as identified in the EE/CA dated November 1998, which may be reviewed in the Administrative Record.

This action involves the excavation of source material and contaminated soil from the exposed tar area and around the storm sewer line that exceed total carcinogenic PAHs at 10 ppm (calculated using benzo(a)pyrene (BAP) equivalents), 50 ppm total PCBs and 2 ppm total benzene. The excavation in the exposed tar area is presumed to extend to a depth of six feet bgs. Excavation of the storm sewer area located at the northern property boundary is presumed to extend to a depth of five feet bgs.

For the areas around the storm sewer, sections of the pipe would be removed and the ends of the pipe remaining in place would be plugged with concrete. It is estimated that approximately 200 feet of pipe would be removed. The excavated areas would be capped with clay and surfaced with approximately 12 inches of road base granular cover material. The material would be placed to match the existing grade.

Sampling would be conducted in the excavated areas to determine if the contaminated soils are either RCRA characteristic hazardous waste or a TSCA waste (due to PCB contamination) in order to make arrangements for appropriate treatment and disposal. In evaluating the cost of this action, it has been assumed that all excavated material would be considered a RCRA hazardous waste and would be transported off-site to either a RCRA-permitted or TSCA-permitted facility for treatment and disposal. Any excavated material which is neither RCRA hazardous waste nor contains PCB concentrations over 50 mg/kg, based upon analysis, would be disposed of in a RCRA-permitted Subtitle D landfill.

The total amount of material to be excavated (combined exposed tar and storm sewer areas) under this action was estimated to be approximately 5,555 cubic yards. Large debris excavated from this area would be separated, decontaminated, and

transported off-site for appropriate disposal. It was assumed in developing this action that five percent of the volume to be excavated would contain debris requiring disposal at a RCRA Subtitle D landfill. Therefore, approximately 255 cubic yards of debris and 5,300 cubic yards of RCRA and/or TSCA waste would be addressed. If any electrical equipment containing PCBs was found during excavation, it would be separated from the excavated material, then treated and disposed of properly at a facility permitted for handling TSCA waste. For the purpose of developing a cost estimate for this action, it was assumed that a total of 15 capacitors and transformers would be found during excavation and transported to a TSCA-permitted treatment facility for treatment and disposal.

Excavating to a depth of six feet would expose a significant amount of tar to the atmosphere and strong odors as well as volatile emissions (particularly of benzene) are likely to be associated with this activity. This is particularly true when temperatures are above 50" F, as they are during most of the year in the Lake Charles area. Therefore, it is anticipated that excavation to depths of six feet would require use of a temporary containment structure. This structure would consist of a metal frame covered with a chemical-resistant material. Fans would be used to create a slight vacuum and feed air removed from the structure through an air emissions treatment system. Airlocks would be provided for personnel and vehicle entrances. Personnel within the structure would require level B protective equipment which includes a supplied air system.

Air monitoring and sampling would be conducted at the perimeter of the facility and between the excavation area and service center operations facility during excavation and material handling to ensure that the levels of airborne site contaminants do not exceed applicable State and Federal action levels set for ambient air quality. Air monitoring would also be conducted in accordance with the site health and safety plan for protection of site workers. Temporary construction fencing would be erected around the excavation and operations area to restrict access of unauthorized personnel. The emissions and ambient air monitoring and sampling is intended to verify that no harmful releases are occurring during removal operations.

Two types of air monitoring and sampling would be employed while the contingent removal action operations were being conducted. An air monitoring/sampling action plan would need to be drafted and approved by EPA as part of the removal design. The following requirements would apply, at a minimum. For early detection, which is required for worker safety and emergency response purposes, one type would include using hand held instantaneous read-out instruments including a photoionization detector (PID) for detection of total airborne volatile organic compounds (VOCs) and a mini-RAM PDM-3, or equivalent, portable aerosol monitor for detection of respirable particulates (dust). Prior to the start of the work, background levels should be collected over several days to establish baseline values for these parameters.

The second type, which is to ensure protection of public health and the environment during removal activities, would be perimeter sampling at no less than four stations (one upwind, one downwind and two cross wind). For the purposes of this removal action, perimeter is defined as the site boundary in proximity to where the removal activities are being conducted. While the excavation is being conducted, three sampling devices would be required at each of the four perimeter stations. Each air sampler would be used for the duration of a work day with subsequent chemical analysis by an EPA certified laboratory providing a maximum 48-hour turn-around time for obtaining preliminary results. One of the three samplers used for collection of ambient air samples would be a Summa Passivated Canister which after the specified sampling duration would be analyzed using EPA Method TO-14, or its equivalent for VOCs. Another would be a PUF/XAD-2 Adsorption sampler to be analyzed using EPA Method TO-13, or its equivalent for PAHs. The last sampler would be set for collection of total suspended particulates (TSP) using a high-volume TSP air sampler. The sampling would be consistent with methods specified by the National Ambient Air Quality Standards for Total Suspended Particulate Matter as outlined in 40 CFR Part 50, Appendix B. Samples collected by this method for the full duration of each work day would be sent to an off-site laboratory and analyzed for TSP with a maximum turn-around time of 48 hours. A work day is defined as a day when removal activities are being conducted. Perimeter sampling would be required on each of these days until such time that EPA determines that there should be an increase or decrease in sampling frequency based upon the sampling results.

Exceeding any of the action levels for these parameters would require modification to work procedures which could possibly include shutting down operations. The action levels for total suspended particulate (TSP) using the mini-RAM are 1 mg/m^3 for a one minute average and 150 Fg/m^3 in a workday average for the high volume TSP results. The action level requiring modification to work procedures for VOCs using the PID is three ppm instantaneous at the perimeter. The analytical results for VOCs and PAHs would have action levels that are chemical dependent and would need to be evaluated by EPA and LDEQ for the chemical specific release.

Water used for decontamination and any water collected during dewatering, would be sampled, treated if necessary, and disposed of appropriately. The water treatment and disposal options would be determined as part of the removal design.

Confirmation samples of unexcavated material would be collected and analyzed to determine if the removal action goals were being met. This data would also serve to determine levels of residual contamination, so that the risk assessment of the site could be reevaluated after completion of the excavation.

After excavating soil and source material from the exposed tar and storm sewer areas, a clay cap would be constructed over the excavated areas. The cap would

consist of 5 feet of compacted clay and 12 inches of road base material to match the existing surface material. The cap would be constructed to match the surrounding grade and would be sloped to manage storm water runoff.

Effectiveness

This action would be effective in minimizing the threats to human health and the environment posed by exposed tar at the surface and contaminated material to a depth of six feet bgs and attain the removal action objective. By removing the source of contaminants in the exposed tar area, this action would also be effective in minimizing the migration of contaminants into shallow ground water. The removal of the storm sewer pipe and surrounding soil and the plugging of the remaining pipe would also eliminate this contaminant migration pathway to the Calcasieu River.

Removal of the highly contaminated material to a depth of six feet would effectively reduce both the current and future risks at the site associated with potential direct human contact with the contaminants in the exposed tar area, as well as minimize the potential for continued migration of contaminants. Residual contamination would remain below six feet and could continue to migrate in the subsurface. However, a large portion of the material in the exposed tar area would be removed, and only lower residual concentrations would remain below six feet. In addition, the clay fill material would minimize surface water infiltration that could contribute to contaminant transport. The removal of the storm sewer would eliminate that migration pathway of contaminants into the river.

The land use for this site is industrial, and is projected to remain industrial in the future. Since the response actions described herein are based upon an industrial land use scenario, if any change in this land use is being contemplated or implemented, institutional controls, such as a deed restriction or deed notice, may need to be considered for future site management purposes.

Treatment of the excavated material would destroy the organic contaminants, thereby reducing the toxicity, mobility, and volume associated with the excavated source material. It is estimated that approximately 5,300 cubic yards (6,360 tons) of contaminated material would be excavated and transported off site for treatment. Landfilling a portion of the material would not reduce the toxicity or volume of the contaminants. However, it would indirectly reduce the mobility through containment. Long-term risk associated with those contaminants would be minimized through proper management of the landfill in accordance with RCRA regulations.

The short-term risks associated with implementing this action would involve potential worker exposure to contaminants during excavation, loading, transport, offsite treatment, and backfilling. Exposure to the public and the environment could also

occur from airborne particulates and contaminant volatilization, surface runoff, or as a result of an accidental spill during transport. The use of a containment structure would minimize the potential for volatile and particulate emissions, as well as reduce the possibility of contaminated runoff from open excavations or uncovered stockpiles. Air monitoring would be used to ensure emissions of site contaminants do not exceed applicable State and Federal action levels for ambient air quality. Risks to site workers would be minimized by compliance with applicable OSHA requirements and guidelines for hazardous waste site activities.

All material handling and transportation operations would comply with the appropriate RCRA and Department of Transportation (DOT) regulations. These regulations are designed to minimize the possibility of accidental release during transport and to reduce the hazards associated with such a release, should it occur. Transport of material off site would result in some increase in traffic around the site, with potential resulting increases in noise and fugitive dust emissions. These impacts, however, would be of limited duration.

It is estimated that this contingent removal action could be completed in approximately five months which includes mobilization; excavating, transporting, and offsite treatment of the material; cap construction; and site restoration.

Implementability

Excavation and site restoration, as well as transport and offsite treatment of contaminated material, could be implemented using conventional construction equipment. Excavation and treatment are proven technologies for the destruction of organic contaminants.

A containment structure may need to be constructed in order to prevent infiltration of shallow ground water into the excavation areas. Use of a containment structure would complicate implementation and increase both the time and cost required to complete site activities. Operation within the structure would require the implementation of additional worker safety measures, including the use of supplied air.

On the basis of previous experience, stabilizing backfilled material could be difficult. Because the area was formerly a marsh and because of the presence of shallow ground water, it has historically been difficult to compact backfill to provide a stable subsurface for yard operations.

No maintenance would be required after completion of the removal action, with the exception of minor repairs to the final cover on the excavated areas. Such repairs would be completed in conjunction with general maintenance of the facility's road stone surfacing. Operation and maintenance of the off-site treatment and landfill facilities

would be the responsibility of the owner/operators of those facilities. The capacity of the RCRA-permitted landfill and treatment facilities may be severely limited at the time of implementation. Pricing and waste storage availability may also vary from current conditions.

Excavation and off-site treatment/disposal of contaminated material would be compatible with any future remedial activities including possible future ground water remediation currently being investigated and considered for the site.

Cost Estimate

The capital costs for this contingent removal action include both direct and indirect capital costs. The direct capital costs include excavation, material loading, transportation to the offsite treatment facility, treatment and disposal fees at the facility, air monitoring, excavated material and confirmation sampling, cap construction, and site restoration. These costs are estimated to be $4,871,200. With the addition of the indirect costs, the total capital cost is estimated to be $7,865,100. These costs assume the need for a slurry wall around the exposed tar area.

The only maintenance required would be associated with the road stone surfacing over the clay cap and would consist of maintaining the 12-inch cover over the clay cap. This would be completed in conjunction with the routine maintenance of the remainder of the service center yard. Therefore, this action would require no PRSC costs and the present worth of this action would be the same as the total capital cost.

2. Calcasieu River Sediment at the Storm Sewer Discharge Point

The removal action to address the river sediment at the storm sewer discharge point is based on Alternative 3, as identified in the EE/CA, dated November 1998, which is available for review in the Administrative Record. Based upon the streamlined risk evaluation, the river sediment does not pose a current risk to human health. However, the ecological risk assessment indicated potential risk to the benthic community due to PAHs and some metals. The action level goals for the Calcasieu River sediment are based upon screening level median values within the range that would effect these benthic organisms. The defined area of contaminated sediment (i.e., where action level values for PAHs, listed in Appendix E, are exceeded) will be dredged and tested for RCRA hazardous waste characteristics.

If the sediment does not display hazardous waste characteristics, it will be disposed of offsite at a RCRA Subtitle D solid waste landfill. If the sediment does display hazardous waste characteristics, it will be disposed of offsite at a RCRA Subtitle C landfill. Based upon analytical data collected to date, there is no indication that this sediment will be classified as RCRA hazardous waste. Therefore, a RCRA

Subtitle D landfill should be acceptable for disposal of this sediment. Waste characterization sampling and analyses of these river sediments will be conducted, however, to confirm that this material is RCRA non-hazardous prior to any off-site shipment. Verification sampling will confirm that the remaining river sediment is below the action level values for PAHs.

There are three types of dredging processes available for the removal of contaminated sediment: mechanical, hydraulic, and pneumatic. Mechanical and hydraulic dredging are most commonly used in the United States. Mechanical dredges remove sediment by the direct application of mechanical force to dislodge the sediment. The most commonly used mechanical dredge is the clamshell dredge. Hydraulic dredges use centrifugal pumps to remove sediment in a liquid slurry form. Often, a cutterhead is fitted to the suction end of the dredge to assist in dislodging bottom materials. Pneumatic dredges are a subcategory of hydraulic dredges that use compressed air or hydrostatic force, rather than centrifugal force, to remove sediment. Each type of dredging technique has advantages and disadvantages. The actual dredging method will be selected during removal action design and will be the one with the least possibility of re-suspension of contamination.

The chosen dredge could be mounted on a barge or operated from a conventional land-based crane. However, because of the lack of space available for setup and operation of a crane on land, a barge-mounted crane will be used. The EPA estimates that approximately 1,244 cubic yards of sediment will be removed, based on an estimated excavation depth of two feet over an area of 16,800 square feet. The area of excavation will have to be larger than the area of contaminated sediment identified in the Final Ecological Risk Assessment (used as the basis for defining the area of contamination) as exceeding action level values for PAHs (Appendix E), in order to account for the low angle of repose of the soft river sediments and to ensure that all the contaminated material is removed.

Silt curtains, sheet piling or some other form of containment may be required to minimize the potential for spreading contaminated sediments during dredging. This aspect will be evaluated during the design phase. Confirmation sediment samples will be collected from the excavated areas to verify that the sediment containing PAHs in excess of the action level values have been removed.

The excavated sediment might require dewatering or, if it is RCRA non-hazardous and not too wet, it may be feasible to transport it directly to the landfill for use as cover material. The feasibility of disposing of the sediment without dewatering will depend on the moisture content of the sediment and the requirements of the disposal facility. For the purposes of this Action Memorandum, it has been assumed that dewatering will be required.

The excavated sediment will be placed on a barge for transport to a land-based dewatering facility. A temporary dewatering and sediment storage pad will be constructed on the vacant east yard property for this action. There are two types of dewatering techniques: air and mechanical processes. Air drying requires a larger land area and is more labor intensive than mechanical processes. Air drying requires the construction of an appropriately managed confined disposal facility (CDF). These structures are designed to retain solids during dredging and provide storage time for gravity drainage, consolidation, and evaporation. Mechanical dewatering involves processes in which water is forced out of the sediment through mechanically induced pressure. Mechanical dewatering processes include filtration, centrifuges, and gravity thickening. Because belt filter presses are the most commonly used, this type of dewatering technology will be used. Modification to the dewatering technique may occur during the final design phase.

Water from the dewatering operations will be treated on site and discharged by appropriate means, either by discharging it to the city sewer or by transporting it off-site for disposal. These issues will be assessed as part of the removal design. Samples of the dewatered sediment will be collected and analyzed to ensure that the material is properly characterized for disposal.

Air monitoring and sampling will be conducted at the perimeter of the east yard where the dewatering operations are being conducted during material handling to ensure that the levels of airborne site contaminants do not exceed applicable State and Federal action levels set for ambient air quality. Air monitoring will also be conducted in accordance with the site health and safety plan for protection of site workers. Temporary construction fencing will be erected around the operations area to restrict access of unauthorized personnel. The emissions and ambient air monitoring and sampling is intended to verify that no harmful releases are occurring during removal operations.

Two types of air monitoring and sampling will be employed while the removal action operations are being conducted. An air monitoring/sampling action plan will need to be drafted and approved by The EPA as part of the removal design. The following requirements will apply, at a minimum. For early detection, which is required for worker safety and emergency response purposes, one type of air monitoring will include using hand held instantaneous read-out instruments including a photoionization detector (PID) for detection of total airborne volatile organic compounds (VOCs) and a mini-RAM PDM-3, or equivalent, portable aerosol monitor for detection of respirable particulates (dust). Prior to the start of the work, background levels should be collected over several days to establish baseline values for these parameters.

The second type of monitoring, which is to ensure protection of public health and the environment during removal activities, will be perimeter sampling at no less than

four stations (one upwind, one downwind and two cross wind). For purposes of this removal action, perimeter is defined as the site boundary around where the removal activities are being conducted. While the dewatering is being conducted, three sampling devices will be required at each of the four perimeter stations. Each air sampler will be used for the duration of a work day with subsequent chemical analysis by an EPA certified laboratory providing a maximum 48-hour turn-around time for obtaining preliminary results. One of the three samplers used for collection of ambient air samples will be a Summa Passivated Canister which, after the specified sampling duration, will be analyzed using EPA Method TO-14, or its equivalent for VOCs. Another will be a PUF/XAD-2 Adsorption sampler to be analyzed using EPA Method TO-13, or its equivalent for PAHs. The last sampler will be set for collection of total suspended particulates (TSP) using a high-volume TSP air sampler. The sampling will be consistent with methods specified by the National Ambient Air Quality Standards for Total Suspended Particulate Matter as outlined in 40 CFR Part 50, Appendix B. Samples collected by this method for the full duration of each work day will be sent to an off-site laboratory and analyzed for TSP with a maximum turn-around time of 48 hours. A work day is defined as a day when removal activities are being conducted. Perimeter sampling will be required on each of these days until such time that EPA determines that there should be an increase or decrease in sampling frequency based upon the sampling results.

Exceeding any of the action levels for these parameters will require modification to work procedures which could possibly include shutting down operations. The action levels for total suspended particulate (TSP) using the mini-RAM are 1 mg/m^3 for a one minute average and 150 $\mu g/m^3$ in a workday average for the high volume TSP results. The action level requiring modification to work procedures for VOCs using the PID is three ppm instantaneous at the perimeter. The analytical results for VOCs and PAHs will have action levels that are chemical dependent and will need to be evaluated by EPA and LDEQ for the chemical specific release.

Effectiveness

This action will be effective in minimizing the threat to ecological receptors posed by contaminated sediment in the Calcasieu River. Because sediment containing PAH concentrations in excess of the action level values will be removed, this action will be protective of the public health and environment. It will also minimize potential long-term transport of contaminated sediment to other portions of the river, dissolution of contaminants into the water column, and possible migration of contaminants into the shallow ground water.

Implementation will directly reduce the toxicity, mobility, or volume of the contaminants at the site because the contaminated sediment will be permanently removed from the site and, based on analytical results for waste characterization, be

contained in an off-site RCRA landfill.

The short-term risks associated with implementation of this action include potential worker exposure to sediment contaminants during dredging, dewatering, testing, loading, transport, and off-site landfill placement, as well as potential exposure of the public and the environment to contaminants in sediment re-suspension during dredging, surface runoff during dewatering operations, or as a result of an accidental spill during transport. The amount of re-suspension will be minimized by using an experienced dredge operator, watertight bucket, and silt curtains. Risks to workers will be minimized by compliance with applicable OSHA requirements and guidelines for hazardous waste and construction activities, to be outlined in the removal design plan. To minimize the potential for migration of contaminants by surface water runoff during dewatering operations, berms and sumps will be constructed around the dewatering area. A temporary pad will be constructed for sediment stockpiling and dewatering. Air monitoring will be conducted to ensure emissions are not above any State or Federal regulated levels for various contaminants and/or pollutants.

All material handling and transportation operations will comply with the appropriate DOT regulations. These are designed to minimize the possibility of accidental release during transport and to reduce the hazards associated with such a release, should it occur. Transport of material off-site will result in some increase in traffic around the site, noise, the potential for fugitive dust emissions, and accidents. These increases, however, will be of limited duration.

It is estimated that the time required to dredge and dewater the sediment, test and dispose of the dewatered sediment in an offsite landfill will be approximately two months.

Implementability

Dredging and dewatering the sediment, and subsequent off-site disposal, can be implemented using conventional equipment. The dredge will be suitable for the small volume (approximately 1,244 cubic yards) of contaminated sediment at the site. The chosen dredge will have medium to high production rates and cause minimal resuspension of sediments. The dredge head will be able to be transported over existing roads, be able to be mounted on conventional cranes, and be widely available. A barge for the loading and transport of the dredged sediment will have to be used for transporting the material to an unloading area. The east yard will be used as the unloading and dewatering operations area. If access to the east yard area cannot be obtained, the sediment will have to be loaded into water tight trailers or roll-off boxes for transport to a dewatering facility. Sufficient space at the dewatering facility will be required for stockpiling the dredged and dewatered material, storage of the water and the water treatment components, and the dewatering equipment.

The EPA believes a sunken ship is located in the river channel to the northwest of the storm sewer discharge point. If such is the case, this might affect the implementability of this response action, since it is not desirable to disturb the ship. On the basis of historical information, the ship may be located within the area to be dredged because the soft sediments will require dredging beyond the boundaries of the defined area of sediment contamination. If so, it might be necessary to use coffer dams to contain the area to be dredged. This will greatly increase the time and cost for implementing this approach.

A belt filter press will be used for dewatering. This is a common dewatering technique and is fairly rapid when effective. The belts can deteriorate rapidly in the presence of abrasive or gritty material, and the process generates a substantial amount of wastewater that requires treatment prior to discharge. Dewatering of fine sediments can be extremely difficult and might require specialized equipment if filter presses are not effective.

Ambient air monitoring will be conducted before and during dredging and dewatering activities to determine the background air quality and to ensure that the levels of airborne site contaminants do not exceed applicable State and Federal action levels for ambient air quality. Samples of the dewatered sediment will be collected to ensure that the material is properly characterized for disposal at the selected landfill. Confirmation sediment samples will also be collected following dredging operations to verify that the contaminants have been adequately removed per the specified removal action goals. Coordination with the service center personnel, regulatory agencies (Coast Guard, Fish and Wildlife, Corps of Engineers, etc.), and/or vendors will likely be necessary.

Dredging and offsite disposal of contaminated sediment will be compatible with any future remedial activities. The plugging of the storm sewer line on site will be performed in conjunction with this action to ensure that recontamination of the sediment will not occur from storm sewer line discharges.

Costs

The capital costs include both direct and indirect capital costs. The direct capital costs include dredging, testing and transporting the sediment to a dewatering facility, sediment dewatering, and, if analysis shows that the material is non-hazardous waste, transporting the dewatered sediment to an off-site RCRA Subtitle D landfill for disposal. These costs are estimated to be $278,500. With the addition of the indirect costs, the total capital cost for this part of the removal action is estimated to be $449,700.

No PRSC costs are associated with this Action. Therefore, the present worth

cost is the same as the total capital cost.

3. Contribution to remedial performance

The North Ryan Street site was proposed to the National Priorities List on February 13, 1995. Because the removal action described in this Action Memorandum is in the nature of a source control action, the removal action will contribute to the efficient performance of any anticipated long-term remedial action. Source material and contaminated soils located in the western utility yard known as the "exposed tar area" will be treated using an in-situ thermal treatment process. Soils in the storm sewer area will be characterized, treated, if necessary, and disposed of off-site. The Calcasieu River sediment at the storm sewer discharge point will be dredged, tested for RCRA hazardous waste characteristics, and removed for off-site disposal. This action will eliminate the direct contact pathway to hazardous substances found in site surface and subsurface soils, and Calcasieu River sediment. In addition, source control will decrease likelihood of migration of contaminants to shallow ground water beneath the site.

4. Description of alternative technologies

The in-situ thermal treatment selected for the exposed tar and storm sewer areas is considered an innovative technology. Performance based objectives and removal action goals have been established that must be achieved while conducting the treatability studies. If these goals and objectives fail to be reached, then the contingent action for excavation with offsite treatment and disposal will be implemented for the exposed tar and storm sewer areas. There are no other proven alternative technologies that could feasibly be applied to the Calcasieu River sediment at the storm sewer discharge pipe.

5. EE/CA

A community fact sheet summarizing the EE/CA was mailed to the site mailing list and a copy of the Administrative Record was placed in each of the repositories. The repositories are located at the Reference Section of the Central Calcasieu Public Library, 301 West Claude Street in Lake Charles, Louisiana, or through the EPA Region 6 Library, 1445 Ross Avenue, 12th Floor in Dallas, Texas. An advertisement of the formal 30-day public comment period was placed in the American Press during the week of November 9, 1998. A community Open House was held on November 17, 1998, at the Carnegie Memorial Library in Lake Charles, Louisiana. The formal public comment period as advertised in the newspaper, ran from November 18, 1998, through December 18, 1998. At the request of the community, the public comment period was then extended to January 28, 1999.

The removal action for the Calcasieu River sediment departs from the proposed preferred alternative set forth in the EE/CA of capping. The final decision was revised, in part, based upon: 1) public comments which were received during the comment period concerning the EE/CA expressed opposition to that removal alternative; 2) excavation and off-site disposal will contribute to remedial performance; 3) unlike capping, excavation and off-site disposal has no perpetual operation and maintenance requirement; and, 4) excavation and disposal is more protective because there will be less residual effects to the environment. In addition, the EE/CA had proposed to handle the excavated storm sewer material as hazardous waste and place it into the thermal treatment area, prior to off-site disposal. Based upon existing data, EPA anticipates that this material would not be classified as a hazardous waste and therefore could be handled just one time for shipment off-site to an eligible and appropriate disposal facility. This is a more efficient way of handling the material. The selected removal actions are referenced in the EE/CA (Appendix B) as Alternative 4 - In-Situ Thermal Treatment, with Alternative 3 - Excavation as a contingent action, for the exposed tar and storm sewer areas, and Alternative 3 - Dredging the Calcasieu River sediment. A complete synopsis of public comments, with EPA's response to those comments, is included in the Responsiveness Summary attached hereto as Appendix A.

The EE/CA, included as Appendix B, and the EE/CA Fact Sheet (Appendix C) were released to the public, and describe all the alternatives which EPA considered. The EE/CA Approval Memorandum is included as Appendix D.

6. ARARs

This removal action will be conducted to eliminate the actual or potential release of hazardous substances, pollutants, or contaminants to the environment pursuant to CERCLA, 42 U.S.C. § 9601 et seq., in a manner consistent with the National Oil and Hazardous Substances Contingency Plan (NCP), 40 CFR Part 300, as required at 33 U.S.C. § 1321(c)(2) and 42 U.S.C. § 9605. Pursuant to 40 CFR § 300.415(j), removal actions under Sections 104 or 106 of CERCLA, 42 U.S.C.§§ 9604 and 9606, shall, to the extent practicable considering the exigencies of the situation, attain applicable or relevant and appropriate standards under Federal environmental law, including but not limited to, Toxic Substances Control Act (TSCA), 15 U.S.C. Section 2601 et seq., Clean Air Act (CAA), 42 U.S.C. Section 7401 et seq., Solid Waste Disposal Act (SWDA), 40 U.S.C. Section 6901 et seq., the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Section 6901 et seq., Fish and Wildlife Coordination Act (FWCA) 16 U.S.C. Section 661 et seq., Hazardous Materials Transportation Act (HMTA) 49 U.S.C. Section 1801 et seq., or any promulgated standard, applicable or relevant and appropriate requirements, criteria or limitations under a State environmental or facility siting law that is more stringent than any Federal standard, requirement, criteria, or limitation contained in a program approved, authorized or delegated by the Administrator and identified to the President by the

State.

While implementing this response action, it will be necessary to maintain the chemical, physical, and biological integrity of the Nation's waters. As such the requirements of the Federal Water Pollution Control Act (FWPCA) as amended by the Clean Water Act (CWA), 33 U.S.C. § 1251 et seq. would apply. These requirements are achieved through the control of discharges of pollutants into navigable waters.

The CWA prohibits the unpermitted discharge of any pollutant or combination of pollutants to waters of the United States from any point source. A point source is defined as:

> ... any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, ... from which pollutants are or may be discharged. 40 CFR § 122.2.

A pollutant is defined for regulatory purposes to include:

> ... dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewer sludges, munitions, chemical waste, ... and industrial, municipal and agricultural waste discharged into water. 40 CFR § 122.2.

All pollutants are regulated under the CWA. For the purpose of regulation, the CWA divides the pollutants into the following three categories:

- Priority pollutants: the 126 individual toxic pollutants contained in 65 toxic compounds or classes of toxic compounds adopted by EPA pursuant to § 307 (a) (1) of the CWA, including, for example, asbestos, benzene, and chloroform;

- Conventional pollutants: pollutants classified, pursuant to § 304 (a) (4) of the CWA as biological oxygen demand (BOD), TSS, fecal coliform, oil and grease, and pH; and,

- Nonconventional pollutants: any pollutants not identified as either conventional or priority, i.e., ammonia nitrogen, COD, total organic carbon (TOC), total solids, and non-priority toxic pollutants.

Three requirements established under the CWA may contain potential action-specific ARARs if treated water from the site (i.e., ground water, treated rinsate water, or other treated waters resulting from site activities) is directly discharged to surface water. These requirements are:

- Criteria and Standards for the National Pollutant Discharge Elimination System (40 CFR Part 129);

- Toxic Pollutant Effluent Standards (40 CFR Part 129); and,

- Water Quality Standards (40 CFR Part 131).

Treated water may be directly discharged to surface water. Therefore, requirements of the CWA are potentially applicable.

For excavated Calcasieu River sediments and excavated material in the storm sewer area, or in the event the contingent remedy for the exposed tar area and storm sewer area is implemented, testing, analysis and off-site disposal will be required. As such, RCRA waste analysis requirements found at 40 CFR §§ 261.20 and 261.30 are applicable for the Site. If the waste analysis reveals that this material is hazardous waste, then RCRA manifesting requirements found at 40 CFR § 262.20, and RCRA packaging and labeling requirements found at 40 CFR § 262.30 may be appropriate requirements for this removal action. In addition, these materials will need to meet all of the land disposal restrictions requirements as found at 40 CFR § 268. Because on-site storage of hazardous wastes is not expected to exceed ninety days, specific storage requirements found at 40 CFR 265 are neither applicable or relevant and appropriate. See 40 CFR § 262.34. All off-site transportation of hazardous waste will be performed in conformance with RCRA and US Department of Transportation (USDOT) requirements. See generally 40 CFR 263.

All hazardous substances, pollutants, or contaminants removed off-site for treatment, storage, or disposal shall be treated, stored, or disposed of at a facility in compliance, as determined by EPA, pursuant to CERCLA Section 121(d)(3), 42 U.S.C. Section 121(d)(3), and the following rule: "Amendment to the National Oil and Hazardous Substances Pollution Contingency Plan; Procedures for Planning and Implementing Off-Site Response Action: Final Rule." 58 FR 49200 (September 22, 1993), and codified at 40 CFR § 300.440.

In-situ thermal treatment for the on site wastes and dredging and disposal of the contaminated river sediments off site are the principal elements of this removal action. The analysis of ARARs identified the following as applicable State regulations: 1) Louisiana Air Regulations, Title 33, Part III, Chapters 1-64 which establish regulations and standards for the emission of air pollutants and odors, protection of ambient air quality, and air pollution prevention; 2) Louisiana Hazardous Waste and Hazardous Materials Regulations, Title 33, Part V, Chapters 1-101 which establish rules regarding generation, transportation, treatment, disposal and storage of hazardous waste, as well as air emission standards for hazardous waste facilities including identifying prohibitions on land disposal and lists of hazardous wastes; 3) Louisiana Water Quality Regulations,

Title 33, Part IX, Chapters 1-21 which establish control for storm water run-off, effluent limitations for wastewater discharges and water quality standards for the protection of state water bodies; and, 4) Louisiana Natural Resources Regulations, Title 43 which provides rules and regulations for protecting Louisiana's natural resources, including coastal public land.

In addition, other items have been identified as requirements to be considered (TBCs). The EPA Region 6 Risk-Based Concentrations are not regulations or guidance; they are concentrations of chemicals in soil that correspond to an excess cancer risk of 10^{6} (one in a million) for an age-integrated industrial receptor using standard exposure assumptions, and are intended to serve as a screening mechanism for contaminants of potential concern at a site. Another potential TBC is based upon an EPA Office of Solid Waste and Emergency Response (OSWER) Directive 9347.3-06FS which may be used for guidance in establishing cleanup goals since it deals with treatment levels for contaminated soil and sediment. The Federal Ambient Water Quality Criteria (AWQC) were established for protection of aquatic organisms and human health from contaminants in sediment. These are potential TBCs since elevated levels of certain site contaminants have been detected in Calcasieu River sediment.

7. Project Schedule

The project will begin once the decision has been made regarding enforcement (i.e., whether the potentially responsible party (PRP) or EPA will implement the work). The estimated time for completion of the design and planning is approximately six months. It is estimated that implementation of both the in-situ thermal treatment and the dredging in the Calcasieu River will take approximately eight months, for a total of 14 months. Favorable weather may improve scheduling.

B. Estimated Costs

The total cost of the recommended actions is estimated to be $2.75 million ($2.3 million for thermal treatment and $450,000 for sediment dredging), assuming in situ thermal treatment meets the removal action treatment goals, or $8.35 million ($7.9 million for excavation and treatment/disposal and $450,000 for sediment dredging) if the on-site excavation contingency is implemented. The cost estimate tables for each of these actions are attached in Appendix G.

VII. Expected Change in the Situation Should Action Be Delayed or Not Taken

Should the actions described in this Action Memorandum be delayed or not taken, the potential for human and ecological exposure to hazardous substances will remain unabated.

VIII. Outstanding Policy Issues

There are no outstanding policy issues.

IX. Enforcement

The enforcement information can be found in the Enforcement Attachment which is Appendix F of this document.

X. Recommendation

This decision document represents the selected removal action for the North Ryan Street site in Lake Charles, Calcasieu Parish, Louisiana, both for surface and subsurface areas associated with the exposed tar area and storm sewer area at the site and for sediment in the Calcasieu River adjacent to the property. This document was developed in accordance with CERCLA, as amended, and is not inconsistent with the National Oil and Hazardous Substances Contingency Plan (NCP). This decision is based on the Administrative Record for the site.

Conditions at the site meet the criteria found at NCP section 300.415(b), 40 CFR §300.415(b) for a removal action, as well as the criteria for an exemption from the two million dollar statutory limits set forth in CERCLA Section 104(c)(1), 42 U.S.C.§ 9604 (c)(1) because the proposed action is necessary, otherwise appropriate, and consistent with remedial actions to be taken at the site. It is recommended that the Superfund Division Director approve this action by his authority under CERCLA delegation relating to the consistency waiver for removal actions (R6-14-2-B).

APPROVED

You may indicate your approval by signing below:

Pamela Phillips

Date: 6/4/99

Myron O. Knudson, P.E., Director
Superfund Division (6SF)

Attachments

FIGURE 1

SITE LOCATION MAP OF NORTH RYAN STREET SITE

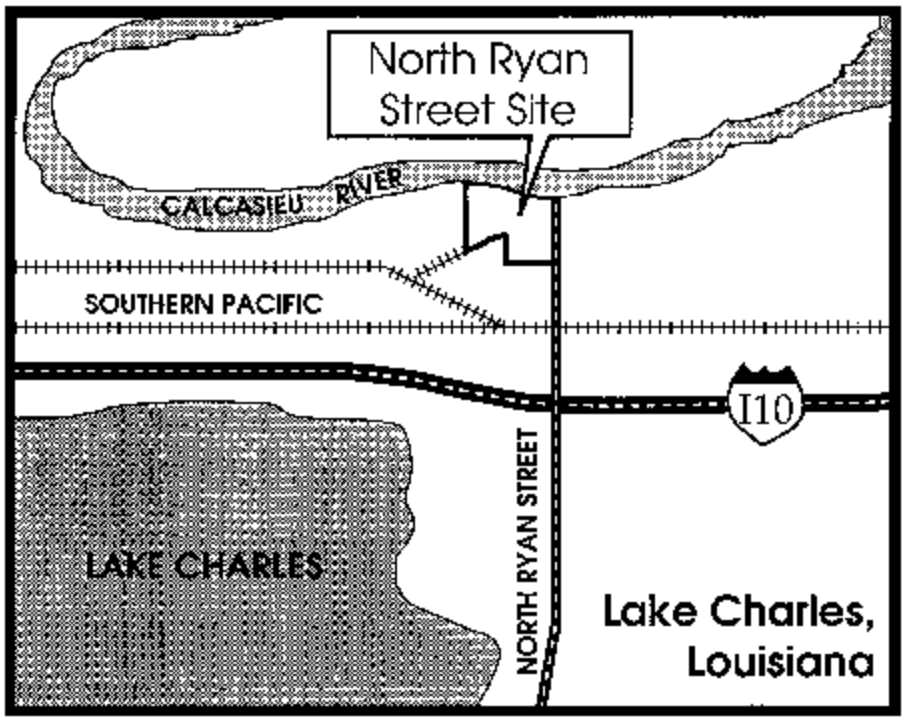


Figure 1 - Site Location Map

FIGURE 2

MAP OF EXPOSED TAR AND STORM SEWER AREAS

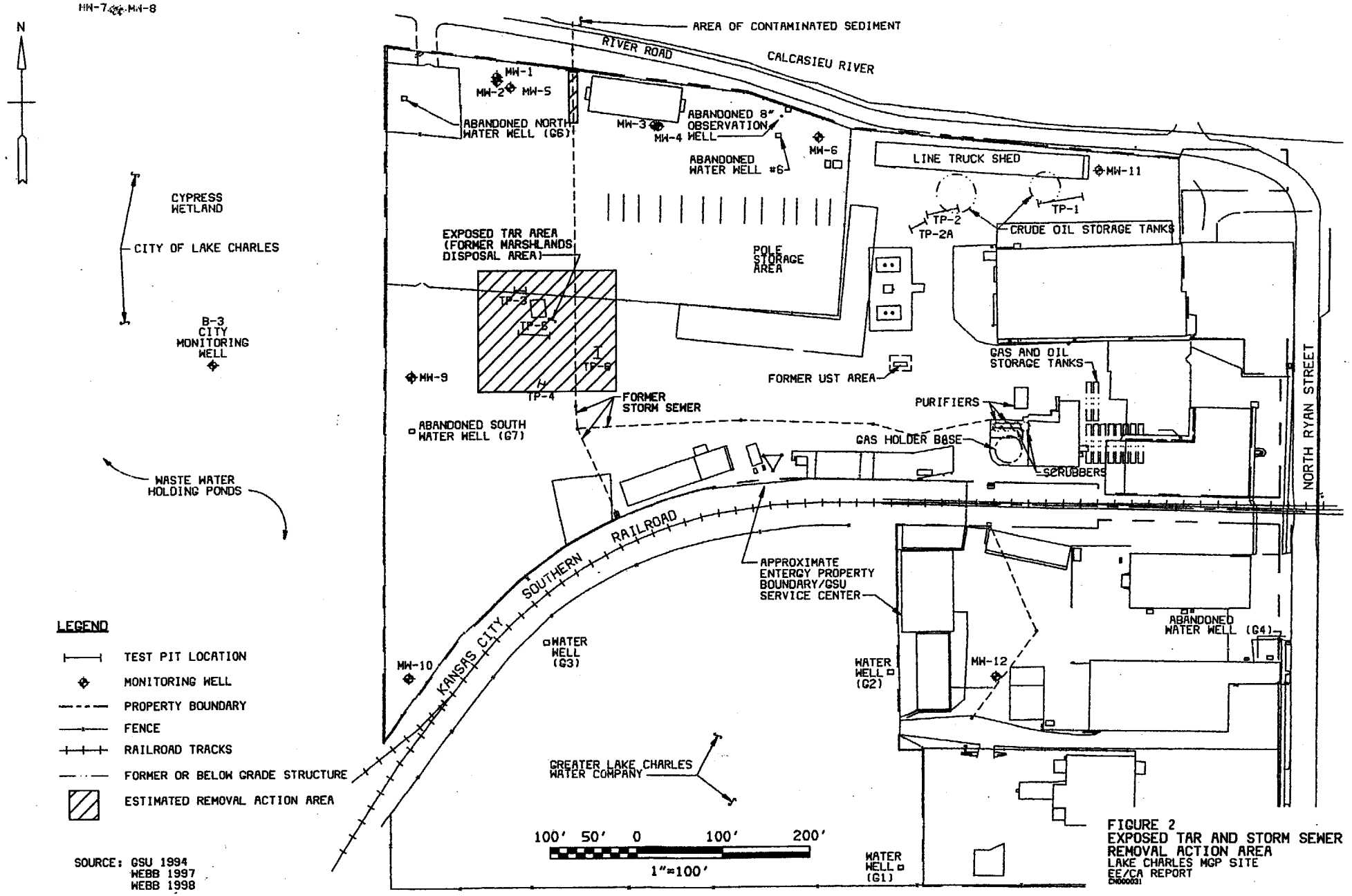


FIGURE 2
EXPOSED TAR AND STORM SEWER REMOVAL ACTION AREA
LAKE CHARLES MGP SITE
EE/CA REPORT
CN000031

FIGURE 3

MAP OF CALCASIEU RIVER SEDIMENT

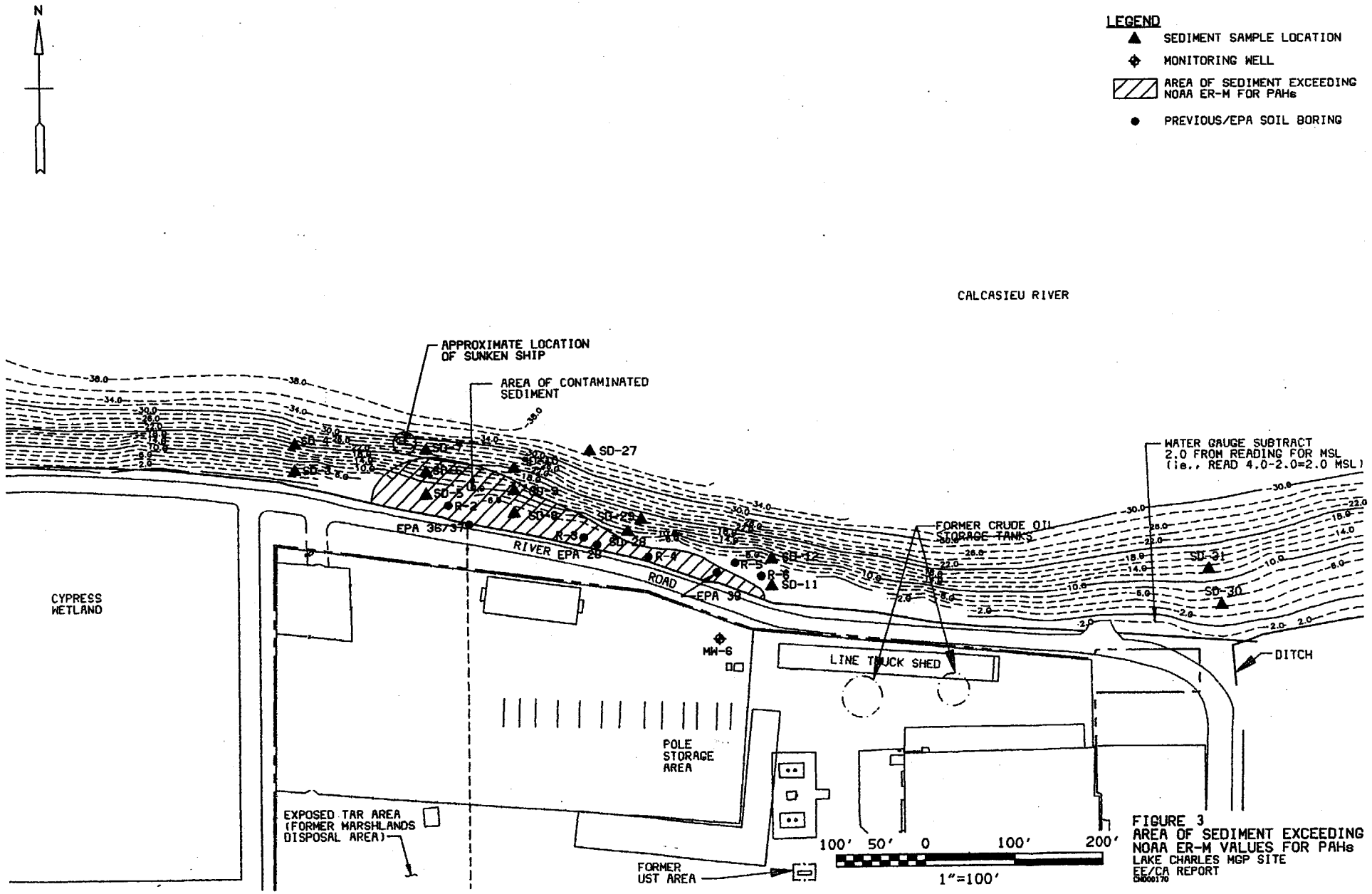


FIGURE 3
AREA OF SEDIMENT EXCEEDING NOAA ER-M VALUES FOR PAHs
LAKE CHARLES MGP SITE
EE/CA REPORT
CM000170

FIGURE 4

SITE MAP

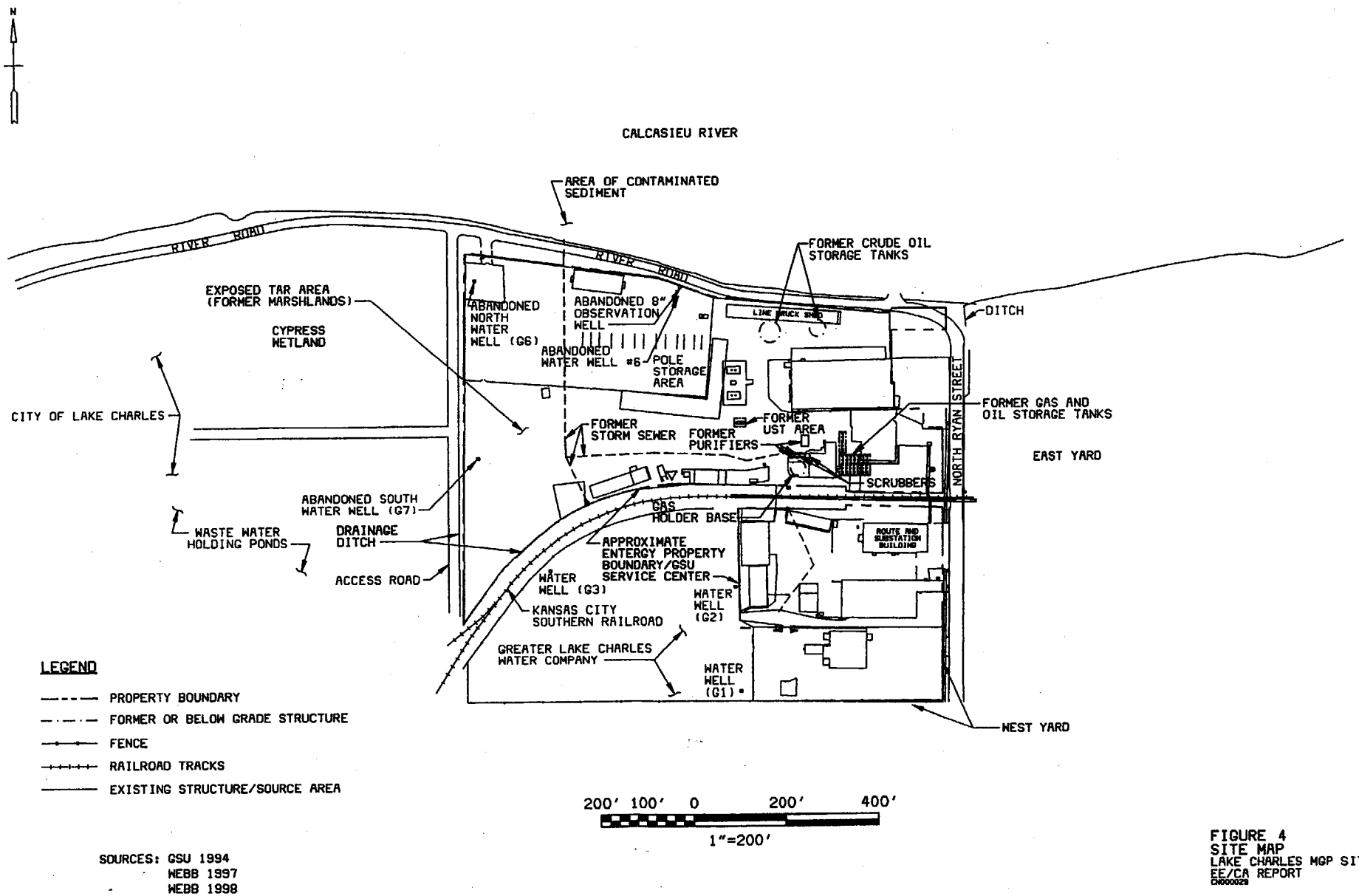


FIGURE 4
SITE MAP
LAKE CHARLES MGP SITE
EE/CA REPORT
CH000029

APPENDIX A

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY FOR THE NORTH RYAN STREET SITE ENGINEERING EVALUATION AND COST ANALYSIS

General Comments

1. **Comment:** Why is this site being looked at and considered for removal and remedial action and not the polluting industries located down river from this site?

Response: The North Ryan Street site was proposed to the National Priorities List (NPL), a compilation of sites which have ranked priority releases, in February 1995. At this time, under a separate EPA action the whole of the Calcasieu Estuary is being considered for conduct of an investigation and study.

2. **Comment:** Several commenters have asked/requested that the United States Geological Survey (USGS) be involved with this site for both the investigation and to have an oversight role in the cleanup process.

Response: EPA Region 6 in Dallas has a USGS staff person assigned to the regional office who will be consulted for input and assistance for this site and for the whole Calcasieu Estuary. This person is assisting with evaluation of the regional ground water issues throughout the Lake Charles area.

3. **Comment:** One commenter requested that the public be allowed to review and make comments on information that is completed or revised after the official comment period closes. They would like for any new information regarding this site to be placed in the Public Library in Lake Charles when it becomes available and be notified when the material is there. They also request that they be allowed to review and comment on any of the information placed in the library. They ask that this process continue throughout the assessment and cleanup of this site, including any long term monitoring that may be necessary.

Response: The Superfund process requires that copies of all available documentation used to support an EPA decision, must be made available to the public in a repository. Formal proposals, such as the EE/CA and proposed plans, are provided to the community during a public comment period. The public is given an opportunity to review all of the documents which support a particular decision and to provide their own input. After EPA makes the response decision for the site, the documents form the Administrative Record and will be maintained at the repository. EPA will make every effort to place documents in the repository as they become available. After close of comment period, the public may still provide EPA with input on the site, although it will not be officially considered in the response selection decision process.

4. **Comment:** Need to make an address correction to the Community Involvement Plan, November 1998 for the group known as RESTORE, page A-5. The address is P.O. Box 233, Longville, Louisiana 70652.

Response: This comment is so noted and the correction will be made.

5. **Comment:** One commenter stated that he is frustrated that this cleanup process is taking so long and cannot believe that there is any legitimate excuse for the delay.

Response: While the initial activities took time to develop, actions have progressed well since the Administrative Order on Consent between EPA and Entergy Gulf States, Inc., was finalized in 1997. A significant amount of investigatory work has been conducted over the last year and a half. A human health baseline risk assessment is almost complete and the ecological risk assessment is essentially finished. The EE/CA and the streamlined risk evaluation was completed and had significant impact on the development of the proposed removal action. This level of investigation, while time consuming, is necessary so that EPA can make informed decisions to ensure the protection of human health and the environment.

6. **Comment:** One commenter expressed disappointment in how long it took for placement of some older documents relating to the site into the repository located at Central Library in Lake Charles. This commenter also noted that when the new Administrative Record materials arrived, this resulted in duplicate Bates stamping numbers.

Response: EPA took the necessary steps to get those materials into the repository as quickly as possible. Unfortunately, due to the holidays and some unanticipated bad weather days during that time period, it took longer than EPA anticipated. The EPA is committed to putting site information and related materials into the library repository in a timely fashion. Regarding duplicate Bates stamps, the original Administrative Record was placed in the repository as a draft and should have been discarded once the final record was received. Although the library staff was informed of this, the substitution did not occur as quickly as EPA had hoped and anticipated.

7. **Comment:** One commenter believes that attempts have been made to link the contamination that has been found at this site with contamination known or thought to exist in the Calcasieu Estuary. He stated that the chemicals of concern noted in the river at North Ryan Street are mainly PAHs and the chemicals found in the estuary have primarily been PCBs, mercury and chlorinated hydrocarbons. These chemicals have not been detected at North Ryan Street through their own investigations. Therefore, he believed that a "clear distinction" should be made between the North Ryan Street site and other parts of the Calcasieu Estuary. This commenter does not believe that excessive remedial requirements should be imposed simply to set a precedent for any future remediation of the estuary.

Response: EPA believes that the characterization of the site in the EE/CA sufficiently defines current and past intrusion into the River. Implementing the dredging to the conservative ecological risk-based levels will preclude any future consideration of being connected to the estuary.

8. **Comment:** Why is this site not on the Superfund list? Is it true that Governor Edwards refused

to sign a letter allowing it to go on Superfund?

Response: This site was proposed for inclusion on the National Priorities List (NPL), so it has been proposed as a Superfund site. That proposed inclusion has not yet been finalized.

There is no record that the State Governor was solicited to give approval on whether or not to allow this site to go final on the NPL. There is documentation, however, that the Louisiana Department of Environmental Quality (LDEQ) had some objections to placement of this site on the NPL (April 12, 1995 letter to Carol Browner, EPA Administrator from James B. Thompson, III, LDEQ Assistant Secretary). In this letter, LDEQ asks that EPA defer listing this site so that the property owner could begin cleanup of the site under the supervision of the LDEQ.

9. **Comment:** What is the Hazard Ranking System (HRS) score for this site and how does it compare to other sites in Louisiana?

Response: The HRS score for this site is 50.43. Any site that is above 28.50 is thought to rank high enough to be proposed for inclusion on the NPL. The EPA would caution against comparing sites based on HRS scores because HRS information is a screening tool used to assess whether a more thorough investigation should be done at the site.

10. **Comment:** During the public meeting held on January 19, 1999, a commenter entered into the record a copy of the local governing body's position on environmental issues as stated in a January 11, 1997 *American Press* newspaper article. The Police Jury president, Mr. Andrepont was quoted as saying that the Police Jury "is not in the environmental business, it's in the economic development business."

Response: Comment noted. At the public meeting, the District 3 Police Jury Representative, Elizabeth Griffin, responded to this commenter by saying that this comment represented the view of one other police jury member. She stated that she was aware of the issues and this was not her position.

Comments on Investigation

1. **Comment:** What assurances do we have that the contaminated areas have been adequately delineated?

Response: Numerous investigations have been conducted which included sampling and analysis of soil (at various depths), source material (i.e. the coal tar), sediment, surface water and ground water. The EPA has reviewed all of these investigations, made comments on the investigation reports, and provided input as to where more information might be needed. The EPA has also reviewed all of the EE/CA work plans and work plan amendments, and approved them prior to any work being conducted at the site. Based upon these reviews, EPA believes that the contaminated areas have been adequately delineated. However, in accordance with an Administrative Order on Consent between Entergy and EPA, Entergy is performing a Remedial Investigation and Feasibility

Study (RI/FS) under EPA oversight, to further ascertain delineation of contaminated areas and their potential impacts on human health and the environment.

2. **Comment:** Are the results of the sampling that EPA did during a 1990 site investigation available to the public for review?

Response: Yes. This report can be obtained by sending a Freedom of Information Act (FOIA) request to the EPA FOIA officer at 1445 Ross Avenue, Suite 1200, Dallas, Texas 75202. This document is also available in the repository at the Central Library located on Claude Street in Lake Charles.

3. **Comment:** Was Black & Veatch, the contractor who performed the EE/CA, employed and paid by Entergy?

Response: Yes, Black & Veatch is a contractor employed by Entergy.

4. **Comment:** Is the information submitted by Black & Veatch full, complete and accurate?

Response: Entergy submitted a quality assurance project plan (QAPP) prior to the start of this project for EPA's review and approval. The QAPP was prepared for Entergy by Black & Veatch. The data must undergo a rigorous quality assurance/quality control protocol in order to meet EPA standards. In addition, either EPA or EPA's oversight contractor, the U. S. Army Corps of Engineers, is on-site with Entergy whenever any sampling events take place. Entergy is required to follow a work plan that has been approved by EPA prior to initiating any field work. All reports generated after the initiation of field work are reviewed and commented on by EPA prior to being finalized. Entergy submits monthly reports to EPA documenting its progress on the investigation of the site. Therefore, EPA is comfortable that the information submitted by Black & Veatch has been full, complete and accurate.

5. **Comment:** Is it not EPA practice to use third party oversight and inspection on samples and sampling procedures?

Response: Yes. In this case, EPA has a contract with the U. S. Army Corps of Engineers to oversee any of the field activities that are being conducted by Entergy relative to this site investigation work. After completion of field work, the Corps sends a trip report to EPA documenting the field activities that were overseen by them.

6. **Comment:** According to a 1995 article in the American Press there were indications as early as 1988 that coal tar was found at depths of 80 feet. How deep does it actually go?

Response: Extensive site sampling during the various investigations conducted at this site have included samples taken at depths up to 90 feet. At this depth no chemical contamination was indicated. The maximum depth where coal tar was noted in early investigations was between 59 and 61 feet in an area located in the north central portion of the western utility yard. In this zone, two small specks of coal tar were visually observed in a wet pocket of the clay sample. An analytical sample of this material taken at a depth of 61.5 feet resulted in low concentrations of pyrene and phenanthrene, both PAH constituents commonly found in coal tar. The concentrations were about 0.24 ppm pyrene and 0.59 ppm phenanthrene.

The focus of this phase of the cleanup is determining which areas show the highest potential exposure risk to either humans or the environment. The EPA believes that the highest potential risk is presented by the source material (i.e., the coal tar), associated contaminated soils and the sediment in the Calcasieu River that was impacted by on-site operations. These areas could potentially continue to be a source of contributing contamination to ground water, surface water, soil and sediment, if not treated, removed or otherwise contained. In addition to the removal phase of this cleanup, an investigation of ground water is also being conducted to determine if cleanup alternatives should be recommended for the ground water. It may not be feasible or advisable to remove isolated contamination at depth. However, by assessing potential impacts to ground water caused by any of this deep contamination, a determination of appropriate treatment of the groundwater can be made.

7. **Comment:** Has ground water contamination reached the residential water wells on River Road? When will the River Road residents' wells be tested for the full range of chemicals present on the Entergy property? Is this type of testing not the responsibility of the USGS?

Response: One private well was sampled as part of the Engineering Evaluation and Cost Analysis investigation. The well is located on a residential property about ¼ mile west of the site. According to the State database, this 2-inch well was drilled to a depth of 375 feet in December 1987. When it was sampled in February 1997, the total depth of the well was measured at 306 feet bgs and the water level was measured at 160 feet bgs. This well was analyzed for volatile organic compounds (VOCs), polynuclear aromatic hydrocarbons (PAHs), phenols, Target Analyte List (TAL) metals, and ambient water quality parameters. No volatiles, PAHs, or phenols were detected. The only parameters detected were the following metals which are either naturally occurring or at otherwise acceptable levels: barium, calcium, copper, iron, lead, magnesium, manganese, potassium, and sodium. The EPA sampled a total of twenty-one wells, including the one described above, along River Road during the week of April 12, 1999. Routine testing of residential water wells is not the responsibility of the USGS.

8. **Comment:** Is the soil on the properties along River Road contaminated due to over 80 years of seepage from the site and periodic flooding of the area? When will these properties be tested? Should USGS be involved in this issue?

Response: It is not likely that the property soils along River Road are contaminated from activities at the North Ryan Street site. Shallow soil samples from land surface areas adjacent to the site

have been collected and analyzed as part of various site investigations and have not shown elevated levels of the on-site contaminants. In addition, a dirt and shell cover has been placed over portions of the site. At the location of the exposed tar area, a device has been constructed to limit tar seepage and to protect the on site workers from exposure to the tar. The containment device consists of a limestone levee around the seep, with plywood, plastic sheeting and aluminum sheeting placed over the limestone. Most of the surface water runoff from the site drains north toward the river. Analytical results have indeed revealed the presence of hazardous substances attributable to the site in the sediments of the Calcasieu River. There is no evidence to warrant an investigation of the soils along the River Road residential properties, and there is no requirement for the USGS to be involved. As stated in an earlier response, some of the private wells along River Road were sampled in April 1999.

9. **Comment:** When will blood tests be given to nearby residents to determine if living in close proximity to the site, recreating on the river and eating crabs and fish from the river has caused disease? Have any tissue samples been taken from aquatic life in the river? If not, why not? How was a risk assessment conducted without tissue data?

Response: No blood testing of nearby residents is currently scheduled in conjunction with other studies taking place at this site. Comprehensive and conservative reports on human health baseline and ecological risk assessments have been prepared based on sampling and analytical data that has been generated from a number of site investigations. The baseline risk assessment quantitatively evaluated the future non-cancer and cancer risks posed by soil contamination in the west and east yards, as well as current and future non-cancer and cancer risks posed by soil contamination in the area along the north fenceline, and sediment and surface water contamination in cypress wetlands, drainage ditches, and the Calcasieu River. Current and future risks associated with the incidental ingestion of chemicals through consumption of fish and shellfish obtained from the river and future ground water exposure were also evaluated. In calculating the potential for non-cancer health effects the hazard quotient (ratio of a single substance exposure level over a specified time period to a reference dose for that substance derived from a single exposure period) for multiple substances and/or multiple exposure pathways is summed. If the sum of the hazard quotients exceed 1.0, then further investigation of potential non-cancer health effects needs to be conducted. The following exposure scenarios at the North Ryan Street site had a hazard index value greater than 1.0 : 1) future onsite construction worker exposure to soil in the west yard; 2) future onsite utility worker exposure to soil in the west yard; 3) current/future offsite construction worker exposure to drainage ditch surface water; 4) current/future adult/child trespasser exposure to drainage ditch surface water; 5) current/future adult/child trespasser exposure to Calcasieu River surface water; 6) current/future subsistence fisherman exposure to Calcasieu River surface water; and, 7) future ground water exposure to onsite workers. Fish and shellfish tissue samples were not collected from the Calcasieu River during the Remedial Investigation and EE/CA investigation, or any of the previous investigations. Therefore, concentrations must be extrapolated from other data to evaluate the potential exposure of residents and recreational populations to contaminant concentrations resulting from consumption of fish and shellfish from the river. Both sediment and surface water concentrations can be used to model tissue concentrations. In general, tissue concentrations extrapolated from river sediment data are higher than those calculated from surface water. Therefore, to provide the most conservative level of screening, in the absence of

fish tissue concentrations, the sediment-extrapolated concentrations were used. The Calcasieu River exposure pathways exhibited risks due to dermal exposure with the contaminant thallium. This was the only contaminant found which contributed to an unacceptable risk. Based on these findings, EPA does not believe that conducting blood testing on the River Road residents is warranted. The EPA has reviewed these reports and found the procedures employed in reaching these conclusions to be both appropriate and acceptable, indicating that fish and shellfish tissue sampling is not warranted in conjunction with this site.

10. **Comment:** When will the results of the Remedial Investigation Report be available for review and public comment?

Response: When EPA releases the proposed plan for ground water, the community will be solicited to make comments. All of the documentation that is used to develop the proposed plan, including the Remedial Investigation Report, will be available in the repository for review. The anticipated time for this to occur, according to the most recent project schedule, is in early 2000.

11. **Comment:** Several commenters wondered if while conducting any of the site investigations were samples collected and analyzed for dioxin and asked if not, why not?

Response: Dioxin samples have not been collected and analyzed for this site. The first relates to the broad and complex definition of "dioxin". The chlorinated dibenzo-*p*-dioxins are a class of compounds that are loosely referred to as dioxins. There are 75 possible dioxins produced from a variety of activities and processes. The one with four chlorine atoms at positions 2,3,7 and 8 of the dibenzo-*p*-dioxin chemical structure is called 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (2,3,7,8-TCDD). It is a colorless solid with no known odor. 2,3,7,8-TCDD does not occur naturally nor is it intentionally manufactured by any industry, except as a reference standard. It can be inadvertently produced in very small amounts as an impurity during the manufacture of certain herbicides and germicides and has been detected in products of incineration of municipal and industrial wastes. At the present time, 2,3,7,8-TCDD is not used for any purpose other than scientific research. The main environmental sources of 2,3,7,8-TCDD are: 1) use of herbicides containing 2,4,5-trichlorophenoxy acids (2,4,5 -T); 2) production and use of 2,4,5-trichlorophenol in wood preservatives; 3) production and use of hexachlorophene as a germicide; 4) pulp and paper manufacturing plants; 5) incineration of municipal and certain industrial wastes; 6) small amounts formed during the burning of wood in the presence of chlorine; 7) accidental transformer/capacitor fires involving chlorinated benzenes and biphenyls; 8) exhaust from automobiles powered with leaded gasoline; and, 9) improper disposal of certain chlorinated chemical wastes. Since historical and current activities at the North Ryan Street site do not indicate that any of these activities or processes occurred, there has been no reason to conduct sampling for dioxin at this site. A private citizen of Calcasieu Parish provided analytical data which included one sediment sample taken from the Calcasieu River in close proximity to the North Ryan Street site. This sample was analyzed for dioxins. The results revealed 0.0005 parts per billion (ppb) of the 2,3,7,8-TCDD and a dioxin TCDD equivalent (TEQ), which is the sum of the individual components using Toxicity Equivalent Factors (TEFs), of 0.013 ppb. This data was reviewed by the Agency for Toxic Substances and Disease Registry (ATSDR) which published a health consultation

report on October 16, 1998. The report concludes that ATSDR typically recommends that dioxin levels in residential areas should not exceed 1 ppb (no recommended level has been established for sediment). The sediment sample taken from the river does not pose a public health hazard because of limited opportunity for human contact with the sediment and its low level. The EPA will require Entergy to test for dioxin during the treatability studies for the in-situ thermal treatment process, both in the soils of the treatment area and in the emission gases. During the scheduled sampling of ground water from the residential private wells in April 1999, sampling for dioxin was conducted.

12. **Comment:** Several commenters wondered if, while conducting any of the site investigations, samples were collected and analyzed for chlorinated organic compounds and asked, if not, why not?

Response: The fact that the site potentially contained hazardous substances was initially discovered by utility workers who noticed an oily material seeping from a trench on the northern boundary of the property. Samples were collected and analyzed by both the Louisiana Department of Environmental Quality and Gulf States Utilities, the property owner at that time (July 1988). Volatile organic compounds (VOCs) and some chlorinated organic compounds were noted in the results, including 1,1,2-trichloroethane, tetrachloroethylene, and 1,1,1-trichloroethane. All subsequent sampling which has occurred both on-site and off-site, has generally included sampling for VOCs, usually by EPA SW-846 Methods 8240 and 8260 in soils, and Method 624 in water. All of these methods use the gas chromatograph and mass spectrometer (GC/MS) type equipment for analysis. If chlorinated organic compounds are present above detection limits, these methods would reveal them. In all of the investigations the most prevalent organics detected have been benzene, toluene, ethylbenzene, and xylenes. The chlorinated organic compounds have not been prevalent at this site. Many of the reports that have been made available to the public summarize only those chemicals or compounds that have been detected, rather than all potential chemicals or compounds. This is why it appears that chlorinated organics have not been addressed. In reality, they have.

13. **Comment:** Does EPA consider as part of the current remedial planning process the areas outside the small square mapped in the center of the western service yard known as the "exposed tar area" and the river area labeled as "area of known sediment contamination"? This commenter is concerned that the map showing the major portion of the tar wedge passing under the North Ryan roadway east of the "area of known sediment contamination" is being ignored. This commenter believes that a far more concentrated plume of toxic halocarbons is oozing out to the east of the area. The commenter also asks "Is the area not yet fully investigated and addressed and included in the process?"

Response: EPA does consider areas of the site other than the exposed tar area and river sediment. However, the area is not yet "fully investigated and addressed". This cleanup is being conducted in phases. The first phase is to clean up the areas that we believe are the source areas in the soils and sediments by conducting a removal as documented by the alternatives presented in the EE/CA document. Concurrently, a remedial investigation of impacts to the groundwater in the area of the site is being conducted. A response action may be warranted depending upon the findings of this study, and the feasibility study (or proposed alternative) will be presented to the community for review and

comment at the conclusion of the remedial investigation. The EPA could also order or perform, or reach an agreement with Entergy to perform a response action on any remaining soil/sediment contamination, if a threat to human health and the environment is still indicated after the other two response actions have been completed. With regard to the comment about the tar wedge passing under the North Ryan roadway, EPA has reviewed all of the investigation reports generated for this site and found no documentation showing significant contamination either on the eastern portion of the site or in the river sediment east of the site. There may be a misunderstanding regarding a schematic drawing that was presented in Appendix H of the Phase III Evaluation Report by Walk, Haydel & Associates dated October 1990. Appendix H includes a report that was prepared by Quaternary Resources Investigations, Inc. (QRI), the company assisted Walk, Haydel in the HTAS™ (Hard to Access Sampling) sampling technique. As part of their report, they included a schematic drawing (Figure 1) which shows a zone of coal tar occurrence all the way to the river. This, however, was not what they intended to portray since there is no data to support a conclusion that the coal tar extends all the way to the river. The point they were trying to make here was to show that they had gone out too deep (water depth of approximately 21 feet) with that sample and that if the coal tar did extend to the river this sample location would completely miss finding it because the sample would be below the zone. So QRI determined that the optimum samples should be taken in water depths of about 6 feet and the total sample length should be about 14 feet. This would ensure that if the coal tar was there, they would find it. This, in fact, occurred in a sample taken from 0 to 1.5 feet in sediment boring R-2, which detected some naphthalene and some phenanthrene. Based upon this, more extensive sampling was conducted around R-2 to help define the horizontal and vertical extent of contamination around this boring. This part of the investigation showed a fan shaped configuration out away from where the storm sewer drain discharge point enters the river, extending out about 90 feet to the north, 65 feet to the west and about 25 feet to the east. The maximum depth where coal tar constituents were noted was 11 inches.

14. **Comment:** A commenter requested that the City of Lake Charles' water wells be tested for the presence of chlorinated chemicals and PAHs. There are concerns that the drinking water aquifer used to supply these water wells has been contaminated by downward migration of contaminants found at the North Ryan Street site, especially PAHs which have been identified during these investigations in the on-site ground water monitoring wells. This commenter requested that every water well identified within a five mile radius of the site be tested for chemical contamination and mentioned that some nearby residents depend on their water from private wells.

Response: Sampling of City of Lake Charles' water wells was conducted on four separate occasions, including each one of the three phases of remedial investigation conducted by Walk , Haydel and Associates for Gulf States Utilities Company. The reports of these investigations are dated February 1989 for Phase I, July 1989 for Phase II and October 1990 for Phase III. Two greater Lake Charles Water Company wells (G6 and G7) located on the North Ryan Street site were sampled for all priority pollutants. There were no volatile organic compounds (VOCs), base neutral acids (BNAs) or polynuclear aromatic hydrocarbons (PAHs), pesticides and polychlorinated biphenyls (PCBs) detected in these wells. The analysis for VOCs would reveal any detectable chlorinated organics. The only contaminants found at elevated levels were barium and mercury. The mercury levels in both wells

exceeded the Primary Drinking Water Standard. These wells were sampled again for mercury during the Phase II investigation conducted by Walk, Haydel & Associates in July 1989. These results showed that mercury levels in both wells were below the Primary Drinking Water Standard. The wells were sampled for all parameters again during Phase III, including VOCs, PAHs, PCBs and metals. Only the metals silver and zinc were detected, and they were below both primary and secondary drinking water standards. A site screening inspection report was provided to EPA by its Field Inspection Team (FIT) contractor, ICF Technology Incorporated in September 1992. As part of the investigation, city wells G-1, G-2, G-4, G6 and G7 were sampled and the ground water was analyzed for VOCs, PAHs, PCBs and metals. The results revealed no contaminants other than metals. None of the metals detected exceeded the primary or secondary drinking water standards. The city water wells have not been tested as part of the current investigation since the previous investigations did not reveal any cause to do so. The EPA conducted ground water sampling of some area private wells in April 1999. Any contamination of the shallow aquifer will be addressed as part of the response action for site wide ground water (Operable Unit 1). The investigation for ground water is currently being conducted, and results should be available within the next year.

15. **Comment:** A request was made to conduct a complete health risk assessment based on the current status of contamination of this site, as well as on the toxicity of any other contamination that becomes evident during the investigation of the site. This commenter states that having the health risk done on greatly reduced levels after cleanup of the site ignores the current and past impacts that living near this site has had on the health and well being of over 84,000 people.

Response: As part of the remedial investigation being conducted on this site, a baseline human health risk assessment has been prepared and is in the process of being finalized. Once EPA, the State, and the natural resource trustees have reviewed this report it will be available to the public in the Administrative Record located in the repository at the Central Library in Lake Charles. This risk assessment was prepared with all usable data available from the EPA site screening investigation and all other data subsequent to that. This risk assessment quantitatively evaluated the current and future risks posed by soil contamination in the west and east service yards, the current and future risks posed by soil contamination in the area along the north fenceline, and sediment and surface water contamination in the cypress wetlands, drainage ditches, and Calcasieu River. The EPA also evaluated current and future risks associated with the incidental ingestion of chemicals through the consumption of fish and shellfish from the river and exposure to ground water. In addition, the Louisiana Department of Health and Hospitals (LDHH) under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR), is preparing the site Public Health Assessment and has said that they will be releasing it for public comment by June 1999. An initial release was circulated to other agencies for internal comments in April 1996. The new report will incorporate these comments, as well as any additional data that has been received since that initial release.

16. **Comment:** Some commenters believe that the area on the eastern part of the property is poorly defined.

Response: The EPA has either been involved with or has overseen all of the investigatory

work conducted on this site since 1990. From 1988 until 1990, the State of Louisiana was overseeing site investigation work. At every step of the way, one of these two agencies has reviewed all of the documentation prepared and submitted by the Potentially Responsible Party (PRP), Entergy. The EPA, as well as other stakeholders, including the State, U. S. Fish and Wildlife, the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Army Corps of Engineers, believe that the work that has been done to date and the conclusions that have been drawn from the data gathered is technically sound and based in scientific procedure. The EPA is aware that some contamination was found in the vicinity of MW-6, and that there are some other hot spots noted even further to the east than that. However there is no indication of any large deposits of coal tar or PCB contaminated soil in these areas. If any subsurface contamination is not addressed by conducting the proposed removal action as specified in the Action Memorandum, and Remedial Investigation indicates additional actions are warranted, it will most assuredly be addressed during a ground water remedial action or residual soil/sediment contamination remedial action.

17. **Comment:** A commenter requested that certain investigatory work be done based upon the recommendations in the ATSDR Public Health Assessment dated April 2, 1996. This requested work included: 1) sampling sediment and fish in the river adjacent to the site for PCB and other contaminants (dioxins); 2) posting signs regarding hazards of fishing and recreation near this site; 3) testing local residents drinking water wells which are located in 200' sands; 4) monitoring annual cancer incidence rates; 5) conducting public health education and environmental medical education to inform physicians regarding the contaminants of concern and health issues at the site; 6) creel survey to be conducted by USGS to assess the number and species of fish caught in the river near the site to include an adequate distance for fish migration; 7) further fish, soil and sediment sampling to assess the contaminants migration on- and off-site and the populations impacted; 8) all municipal drinking water wells in the surrounding area will be identified and water analyzed for contaminants of concern; 9) more precisely identify exposure to surrounding populations by ground water contamination, including defined sources such as private and municipal well use; 10) contact OSHA to conduct exposure survey of workers on-site; and, 11) health outcome data and health education activities to assess concerns in the community regarding cancer (particularly lung cancer) and other diseases or syndromes that may be a result of exposure to contaminants associated with this site.

Response: Some of these things have already been done, because they are indeed specific to the North Ryan Street site. These include sediment sampling for PCBs, posting signs, and sampling the local residents drinking water wells. The other items are broader than the scope of the North Ryan Street site investigation. It is likely that some of these additional issues and concerns will be covered on an estuary-wide basis during the remedial investigation and feasibility study for the Calcasieu Estuary.

18. **Comment:** A commenter was concerned that one of the old city water wells that was supposed to be located somewhere on the North Ryan Street site was never found. The concern is that because it is unknown whether or not this well was appropriately plugged and abandoned, this well might serve as a conduit for migration of contaminants from the site into the aquifer.

Response: The EPA believes that the investigation of ground water in the vicinity of the site,

conducted as part of the remedial investigation, will be rigorous enough to determine whether or not impacts to ground water, especially a ground water source used for drinking water, have occurred or are occurring.

19. **Comment:** One commenter noted that, in the initial release of the Public Health Assessment dated February 13, 1996 prepared by the Louisiana Department of Health and Hospitals (LDHH) under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR), it was projected that the area of contamination equaled 77,600 cubic yards. The amount of material projected as the area of contamination in the EE/CA is approximately 5500 cubic yards. The commenter wanted an explanation of this discrepancy.

Response: The projection made in the ATSDR report was based upon early site studies with minimal data. The report incorporated the entire 6 acre landfill area and assumed a minimum depth of 8 feet, which equals 48 acre feet, or 77,600 cubic yards. The EE/CA projection is based upon extensive sampling which defines the area of contamination that is the "worst", and the Streamlined Risk Evaluation dated October 1998,which targeted risk to site workers due to ingestion and dermal (skin) contact. Based on this investigation, this much smaller area was found to require immediate attention through the non-time critical removal action. The focus of the EE/CA is to reduce the potential risk to human health and the environment by responding to any identified immediate threat wastes.

20. **Comment:** During the investigations of the site and its surrounding area, some levels of coal tar contaminants have been noted in the marshy area west of the western site boundary. A commenter was wondering if this is being addressed.

Response: Yes. All data was considered for inclusion in the Streamlined Risk Evaluation, which requires that the sample analytical data reflect a high enough concentration of a contaminant and that there be a possible receptor to warrant that this location would need to be considered in the EE/CA as an area posing an immediate threat to human health and/or the environment. High levels of coal tar contaminants were not noted in the marshy area west of the site.

Comments on Alternative Selection

1. **Comment:** Several commenters either proposed that different alternatives be considered within the EE/CA or proposed modifications to the preferred alternatives. Many opposed the alternative proposing to cap the river sediment and preferred the alternative proposing to dredge and dispose of contaminated sediment. Other commenters also expressed their opinion that the capping solution in the river would be suitable. The main issues related to the preferred alternative for the on-site contamination was that no quantitative chemical action level had been set that would indicate appropriate remediation had been achieved and that in-situ thermal treatment is not a proven technology for PAHs. One commenter also indicated a belief that the area around monitoring well six located at the northern property boundary near the pole storage area should be remediated under this EE/CA as a source area.

Response: All of the alternatives were evaluated using criteria which would ensure that the solution is protective of human health and the environment. The major criteria considered by EPA were effectiveness, implementability and cost. CERCLA also requires EPA to solicit public comments, and consider those comments while preparing the decision document [see 40 CFR § 300.415 (n) (4)]. The EPA modified its preferred removal action alternatives, in large part after consideration of comments received during the public comment periods concerning the EE/CA. Source material and contaminated soils located in the western utility yard known as the "exposed tar and storm sewer areas" will be treated using an in-situ thermal treatment process (Alternative 4 in the EE/CA). In order to be protective of human health and the environment, EPA has set the removal action goal for total carcinogenic PAHs at 10 ppm (calculated using benzo(a)pyrene (BAP) equivalents), 50 ppm total PCBs and 2 ppm total benzene. These removal action goals each represent an excess cancer risk of between 10^{-4} and 10^{-6} at the surface based on the existing industrial land use scenario. Before full scale implementation of this portion of the removal, EPA will require that a treatability study show that these removal action goals will be met using the in-situ thermal treatment. If these removal action goals cannot be met during treatability study, then Alternative 3, Excavation with Off-Site Treatment will be employed. The Calcasieu River sediment at the storm sewer discharge point will be dredged and removed for off-site disposal (Alternative 3 in the EE/CA). Verification sampling of the underlying sediment that remains in the river bottom must be below the action level values for PAHs specified in the Action Memorandum in Appendix E.

2. **Comment:** Do any of the suggested alternatives allow for the future re-development of the site and/or dredging of the river?

Response: Although not specifically stated, part of the criteria used in selecting an alternative considers effectiveness and implementability which takes future use into consideration. In addition, these types of issues will be considered and addressed while developing the removal design plan. However, the removal action assumes that the use for the site will remain industrial.

3. **Comment:** Several commenters expressed a concern that whatever removal alternative is chosen for the river sediment at this site will set a precedence for removal or remedial actions all along the Calcasieu River where there are other areas of contaminated sediment.

Response: This would not be true. Each site will have its own Engineering Evaluation/Cost Analysis (EE/CA) or Remedial Investigation/Feasibility Study (RI/FS) conducted on it which will take site specific data in mind for all phases of the investigations, including any risk assessment. The resulting conclusions may lead to a completely different solution for the response actions. The conditions of each site will be reviewed individually, and the environmental response action will be tailored to meet those conditions.

4. **Comment:** Why was an unproven technology chosen for the exposed tar and storm sewer area (i.e. in situ thermal treatment of PAHs)?

Response: This thermal technology has been applied successfully to PCBs which are similar in

chemical makeup to PAHs. In order to drive off the PAH contaminants, however, the temperature levels will have to be much higher than they would be for PCBs. Prior to implementing this alternative, a treatability study must be conducted in order to assist in project design and also to assess the viability of this innovative treatment technology for this particular setting. The EPA will require a demonstration that the stated removal action goals can be met, and the contaminant dioxin will not be generated by this process. During treatability study, there will be dioxin testing both in the soil and in the off gases or emissions generated by the process.

5. **Comment:** What are administrative controls for capping of sediment? These controls should not restrict use of the waterways or result in devaluation of the property around or accessed through the cleanup site. If the cleanup process requires warning signs or restrictions that lead people to believe the area still contains toxic hazards, the cleanup process should be considered ineffective and other methods investigated.

Response: As is evident from the Action Memorandum, EPA has chosen dredging and off-site disposal as the remedy for the contaminated river sediments, rather than capping. This was in part due to EPA's concern regarding the long-term effectiveness of the capping alternative. As a general rule, any administrative controls, such as limiting traffic in the waterway, to be applied would be determined during the design and implementation stages of the response action. Any controls would have to ensure that the criteria such as effectiveness and implementability continue to be met.

6. **Comment:** What is the time estimate for total cleanup?

Response: Currently the schedule anticipates that the removal action to address the source/soil/sediment cleanup which is proposed in the EE/CA would be completed by April 2000. The ground water issues are being dealt with as a different phase and will be handled as a remedial action. We anticipate having determined a potential ground water cleanup alternative for consideration by December 1999. Implementation of the chosen remedy would follow.

7. **Comment:** Could removal of concrete capping generate as much mixing of sediment and water as a complete removal of sediment?

Response: In this question, EPA assumes that the concrete to which the writer is referring would be the rip-rap material which lines the river bank. This is the sort of question that would need to be answered during the design phase of the removal action, keeping in mind the implementability and effectiveness of the remedy.

8. **Comment:** None of the alternatives are acceptable, because none offered assurance that all contaminated soil would be removed from the site.

Response: EPA disagrees with this statement. The alternatives proposed in the EE/CA are removal actions to deal with the "worst first", i.e., to remove source material, contaminated soils and contaminated sediment that might continue to be contributing contaminants to ground water, surface

water, soil and sediment. In conjunction with this phase of the cleanup, an investigation of the ground water is also being conducted to determine whether the source, soil and sediment removal and cleanup of the ground water will alleviate the threat of risk to human health and the environment. If it will not, additional remediation will take place.

9. **Comment:** What is going to be done about the numerous transformers, capacitors and drums of transformer oil which are buried on Entergy property at depths of greater than 6 feet?

Response: This question appears to relate to the selection of in-situ thermal treatment as the recommended alternative for the exposed tar and storm sewer areas which would not include any excavation of the buried transformers, capacitors and drums of transformer oil. This alternative proposes to treat contamination to a depth of six feet in the area, where the bulk of the coal tar contamination is known to exist. By selecting in-situ thermal treatment, any waste buried underground would not be disturbed and would be treated in place. The in-situ thermal treatment would be designed to reduce the contaminant levels of PAHs and PCBs that are known to exist, based on investigatory work, in the exposed tar and storm sewer areas on-site. The site investigation does not support a conclusion that there are numerous transformers, capacitors and drums of transformer oil at depths greater than six feet. However, if the contingent excavation alternative is implemented, then some of these transformers, capacitors and drums could be encountered in the subsurface. These items would then be segregated, tested and properly disposed.

10. **Comment:** Wouldn't the recommended alternative of in-situ thermal treatment for the exposed tar and storm sewer areas cause the contaminants to be driven even deeper into the water table?

Response: No. The water table beneath this site is very shallow. Ground water has been encountered as shallow as two feet below ground surface (bgs) during wet seasons. If contaminants are soluble, they may already be dissolved in the shallow water. If so, they will be dealt with during the remedial action for ground water, if indications warrant an action should be taken. The remaining contaminants will continue to be adhered to the soil particles until this treatment is applied. This treatment, which involves heating the contaminated soil in place, will change the character of the contaminant from a solid or liquid into a gas. The ground surface in the area to be treated will be covered with silicone rubber mats for insulation and to form a vapor barrier. A vapor extraction system will be installed in the wells to create a vacuum and remove contaminants that are volatilized during heating. The initial heating will boil off water trapped in the pores of the soil and vaporize contaminants dissolved in this water. Subsequent heating of the soil would reach temperatures of up to 1000EF, which will desorb or oxidize in-place additional contaminants adsorbed to the soil matrix. Vaporized or desorbed contaminants would be collected by the vapor extraction system by bringing the contaminants upward rather than downward.

11. **Comment:** Many of the commenters requested that a quantitative chemical action level be set as part of the removal objective. They state that any contaminated material which exceeds the chemical action levels should be remediated. They also say that visual observation is inadequate to assure an adequate cleanup. They request that this be done in order to ensure complete removal of contaminated

source materials and to minimize future remedial activities.

Response: The EPA has set quantitative chemical action levels as part of the removal objectives. Source material and contaminated soils located in the western utility yard known as the "exposed tar and storm sewer areas" will be treated using an in-situ thermal treatment process (Alternative 4 in the EE/CA). In order to be protective of human health and the environment, EPA has set the soil removal action goal for total carcinogenic PAHs at 10 ppm (calculated using benzo(a)pyrene (BAP) equivalents), 50 ppm total PCBs and 2 ppm total benzene. These removal action goals each represent an excess cancer risk of between10^{-4} and 10^{-6} at the surface based on the existing industrial land use scenario. These removal action goals are also levels which are calculated to be protective of ground water. Prior to implementing this alternative a treatability study must be conducted in order to assist in project design and also to assess the viability of this innovative treatment technology for this particular setting. The EPA will require that the stated removal action goals be met, as well as assurances that while applying this thermal treatment process, the contaminant, dioxin, will not be generated. While conducting the treatability studies, dioxin will need to be tested for both in the soil and in the off gases or emissions generated by the process. Specific action levels for air monitoring and sampling will be outlined in an air monitoring/sampling action plan. This will be drafted and approved by EPA as part of the removal design. The contingent proposed removal action for the exposed tar and storm sewer areas of excavation with off-site treatment (Alternative 3 as defined in the EE/CA dated November 1998) would be implemented if the treatability studies for in-situ thermal treatment fail to meet the defined removal action goals. Alternative 3 would involve the excavation of source material and contaminated soil from the exposed tar area and around the storm sewer line. Under this alternative, the excavation in the exposed tar area would extend to a depth of six feet bgs. Excavation of the storm sewer at the property boundary would extend to a depth of five feet bgs. The Calcasieu River sediment at the storm sewer discharge point will be dredged and removed for off-site disposal (Alternative 3 in the EE/CA report). Verification sampling of the underlying sediment that remains in the river bottom must be below the action level values for PAHs specified in the Action Memorandum (see Appendix E).

12. **Comment:** Some commenters expressed a concern about the selection or even consideration of Alternative 5 for the exposed tar area or Alternative 4 for the river sediment in the EE/CA because both include use of an offsite utility boiler for treatment of the contaminated material. The named utility boiler proposed is located at the Nelson Power Plant in the Lake Charles area. The concern here is that if the Nelson Power Plant were used for this purpose it would have the potential to be turned into a treatment center for any manufactured gas plant remedial wastes under the control of Entergy.

Response: Neither one of these alternatives were selected for the cleanup at the North Ryan Street site.

13. **Comment:** One commenter believes that the angle or slope of the Calcasieu River bank where the capping remedy is to be implemented is too steep for this remedy to be effective.

Response: This was one consideration that prompted EPA to change the remedy from capping to dredging with offsite disposal.

Comments on Future Land Use

1. **Comment:** What effect will remediation of the site have on future public works projects such as storm sewers and water lines along River Road? The remediation should allow utilities to pass through the area via "normal" methods in light of some of the problems that have occurred for the community located west of the site who have had difficulty accessing the public water and sewer systems.

Response: These types of issues will be considered and addressed while developing the removal design plan. The EPA will make every effort in working with Entergy on this project to minimize any inconvenience to local residents, keeping in mind the need for future utility requirements for the River Road residents.

2. **Comment:** What will be done to compensate residents of River Road if the property values have been adversely affected by the contamination at the Entergy site?

Response: Should this occur, it would be a legal issue between the River Road residents and Entergy Gulf States, Inc. It is EPA's goal to work with Entergy to accomplish complete and appropriate clean up of this site.

Comments on Removal Design Criteria

1. **Comment:** Provisions should be made to allow River Road residents access during the cleanup process. If road closures are required, the alternate route should be such that the residents will not fear damaging their vehicles while driving to and from their homes. If the roadway is at all damaged or needs to be removed during the cleanup process, provisions should be made to effectively repair the road.

Response: These types of issues will be considered and addressed while developing the removal design plan. All efforts will be made to minimize interruptions of daily routines for residents and that safe, temporary alternate access will be designed, as needed.

2. **Comment:** The proposed capping of sediment in the river should be sufficient to accommodate anchoring of boats. This section of the river is commonly used when there is the threat of a hurricane in the Gulf of Mexico. Shrimp boats, tug boats and offshore equipment such as jack up rigs routinely anchor in this section of the river.

Response: This may be a moot point, since sufficient commentary has been received to warrant a removal action change for the Calcasieu River sediment from capping (Alternative 2) to dredging of the material with off site disposal (Alternative 3).

3. **Comment:** A commenter asked that EPA consider some method of informing property owners of the process and results of the cleanup proposal and work, in addition to the public notices in local

newspapers. This commenter was interested in any information on results of new samples which he felt should be included when appropriate.

Response: EPA agrees and believes this is adequately addressed in the November 1998 Community Involvement Plan. This plan has allowances in it for revisions, if necessary. The EPA is constantly trying to ensure that the site mailing list is accurate and up-to-date so that any mailings will be sent to those people who have expressed an interest in receiving this type of information. The EPA will use bulletins and local meetings to inform the community of removal status and items of interest. The EPA, or its representative, will be available at the site during the removal to answer any questions or address any problems.

4. **Comment:** One commenter requested that information be provided on disposal of metal and debris that might be excavated during the in-situ thermal treatment.

Response: As stated in the EE/CA and the Action Memorandum, any debris encountered during excavation will be decontaminated on site and disposed of at a RCRA Subtitle D landfill. For any transportation of this type of material off site either a waste manifest or a Department of Transportation trip ticket will be required. These types of documents are used to track off site shipments and will be required to be included in any final report which summarizes all of the site activities that occur during the response action.

5. **Comment:** Information on expected odors and noise should be communicated to the residents prior to accepting the cleanup process. A method of addressing and resolving these types of concerns should be included and made available to the residents during the cleanup process.

Response: While preparing the removal design plan for the response actions, all efforts will be made to minimize noise and odor generation. Prior to implementing the in-situ thermal treatment alternative, a treatability study must be conducted both to assist in project design and to assess the viability of this innovative treatment technology for this particular setting. The EPA will require that the stated removal action goals are met. While conducting the treatability studies, the off gases or emissions generated by the process will be monitored and sampled. Prior to implementation of the field work, EPA will hold a community meeting to discuss design specifics and detail implementation activities.

6. **Comment:** A proposed time line and completion date should be included in the cleanup process with routine updates. This information should be made available to the public in an easily accessed method.

Response: As in any engineering or design project, a time line will be required which anticipates the project tasks from start through completion. Due to the relatively short anticipated length of time for the field work of this project, EPA would likely require status submissions on a weekly or bi-weekly basis. Community involvement is, and will remain, an important part of this project through completion and beyond. The EPA will make every effort to keep the community

informed on this project as it advances.

APPENDIX B

ENGINEERING EVALUATION/COST ANALYSIS

THIS DOCUMENT IS AVAILABLE IN THE SITE REPOSITORIES LOCATED IN LAKE CHARLES, LA AND AT EPA'S REGION 6 OFFICES IN DALLAS, TX

APPENDIX C

ENGINEERING EVALUATION/COST ANALYSIS FACT SHEET

Community Fact Sheet

EPA Recommends Cleanup Alternatives

Lake Charles/North Ryan Former Manufactured Gas Plant Site
Lake Charles, Louisiana

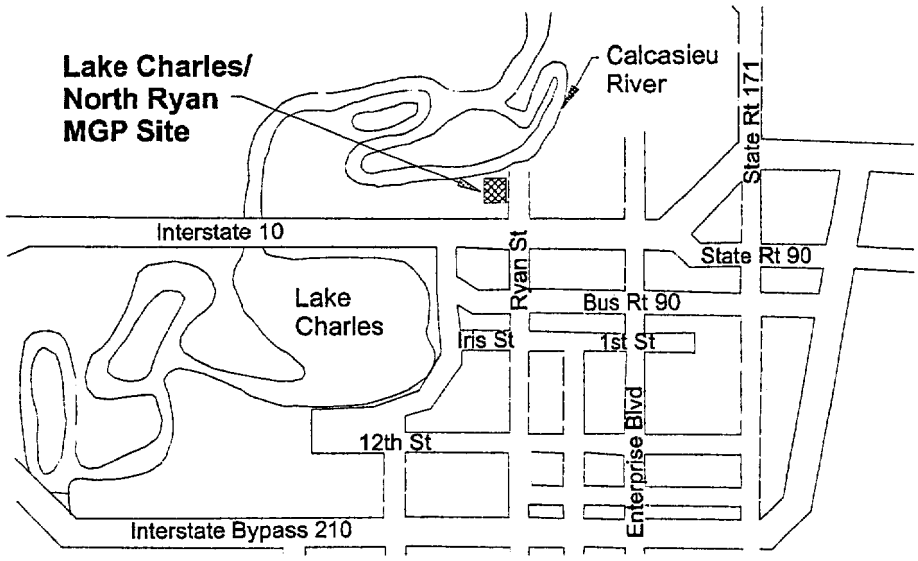
November 1998

Community Open House

EPA will host a community open house to explain and answer questions about the EE/CA.

Date: Tuesday, November 17, 1998
Time: 7:00 to 9:00 p.m.
Place: Community Meeting Room, Carnegie Memorial Library 411 Pujo Street, Lake Charles

(EPA will make a short presentation beginning at 7:30 p.m.)



Lake Charles/North Ryan MGP Site
Location Map

Introduction

The U.S. Environmental Protection Agency (EPA) has approved a document called an Engineering Evaluation/Cost Analysis (EE/CA) for the Lake Charles/North Ryan Former Manufactured Gas Plant (MGP) site (Lake Charles MGP site) in Lake Charles, Louisiana. The site is on and near the Entergy Gulf States, Inc., (Entergy) Service Center property on North Ryan Street. Entergy completed the EE/CA under EPA oversight.

The EE/CA evaluated a range of alternatives to address tar and tar byproducts in selected site areas. This fact sheet announces EPA's recommended cleanup alternative for each area and describes why these alternatives are being recommended. This fact sheet also lists other alternatives reviewed by EPA. A detailed description of the recommended alternatives and other alternatives evaluated is presented in the EE/CA report[1].

[1]Section 300.415(b)(4)(i) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and Section 113(k)(2) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requires publication of a notice describing EPA's recommended alternatives. The EE/CA must also be made available to the public for comment. This fact sheet is a summary of the information contained in the EE/CA for the Lake Charles/North Ryan MGP site. Please consult the EE/CA for more detailed information.

Background

The Lake Charles MGP site is located at 303 North Ryan Street in Lake Charles. Entergy uses this area as a storage and repair center for its Lake Charles operations.

MGP Operations

Between 1916 and 1932, a manufactured gas plant or MGP operated on North Ryan Street, at the Entergy Service Center location. The plant provided gas for cooking, heating, and industrial use before natural gas was available. Tar from MGP operations was often stored underground and sold for use in wood preserving, road paving, and roofing materials.

Tar/Tar Byproducts

Although the Lake Charles MGP was shut down more than 60 years ago, some tar and tar byproducts from gas plant operations were left in the ground. In recent years, more has been learned about the environmental and public health effects associated with tar. The primary compounds of concern in tar are polynuclear aromatic hydrocarbons (PAHs), which may cause health risks for persons who are exposed to them over long periods of time.

At the Lake Charles MGP site, tar byproducts from gas plant operations reportedly were disposed of in about 6 acres of marshlands west of the plant, on existing Entergy property. After gas plant operations stopped, the marshlands were used as a landfill for the disposal of electrical equipment and poles, appliances, and other debris. By 1980, the area was filled and covered with shells and soil. Today, Entergy uses this area for storage.

Environmental Investigation Results

Environmental investigations have been completed at the Lake Charles MGP site by Gulf States Utilities, EPA, and Entergy. During these investigations, shallow and deep soil borings were drilled; monitoring wells were installed; a sediment and surface water investigation was conducted; and soil, sediment, source, and ground water samples were collected. Ground water samples were also collected from City of Lake Charles monitoring wells and former onsite water supply wells.

EPA developed a Hazard Ranking System (HRS) score for the site. Based primarily on this score, EPA proposed that the Lake Charles MGP site be placed on the National Priorities List (NPL), EPA's list of sites eligible for Superfund money. The site has an exposed tar area, which has been covered and a storm water drainage pipeline into the Calcasieu River, which was plugged in 1995.

Under EPA oversight, Entergy has completed a remedial investigation and an engineering evaluation/cost analysis or EE/CA. The purpose of the remedial investigation was to collect additional information about the nature and extent of contamination and to assess the risk to human health and the environment. The EE/CA developed and evaluated removal action alternatives for selected site areas. Entergy is doing the remedial investigation and EE/CA in accordance with an Administrative Order on Consent with the EPA.

The primary site contaminants of concern are PAHs, BTEX (benzene, toluene, ethylbenzene, and total xylenes) compounds, and selected metals. As expected, PAHs were the contaminants present at the highest concentrations; these concentrations were found in the marshlands disposal area.

Sediment and surface water samples were collected from the Calcasieu River. Only one river water sample contained PAHs; the concentration of PAHs in this sample was relatively low. In sediment samples, PAHs were found primarily in samples taken from sediment near the discharge point of the former stormwater pipeline.

EPA's Recommended Alternatives

The EE/CA evaluated six alternatives for the exposed tar and storm sewer area and four alternatives for sediment in the Calcasieu River in the area of the discharge point of the storm sewer.

EPA's recommended alternative for the exposed tar and storm sewer area is Alternative 4: In-Situ Thermal Treatment, which involves in-situ (or in place) heat treatment of the contaminated material in

the exposed tar and storm sewer area.

EPA's recommended alternative for the Calcasieu River sediment is Alternative 2: Capping, which involves placing a cap over the contaminated sediment and conducting inspections to ensure the integrity of the cap is maintained over time.

EPA recommends these alternatives because each protects human health and the environment, is less difficult to implement safely than the other technologies considered, and each is cost effective.

Evaluating the Alternatives

EPA used the following three criteria to compare the alternatives in the EE/CA and to recommend a practical and safe alternative for each selected site area:

Effectiveness-considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.

Implementability-consists of the technical and administrative feasibility of implementing the alternative, such as availability of goods and services.

Cost-includes estimated capital, operation, and maintenance costs, as well as present net worth costs. Present net worth is an alternative's total cost over time in terms of today's dollars.

Other Alternatives Considered

EPA considered five other alternatives for the exposed tar and storm sewer area:
Alternative 1: No Action
Alternative 2: Limited Excavation, Offsite Incineration, Capping
Alternative 3: Excavation, Offsite Incineration
Alternative 5: Excavation, Offsite Utility Boiler Thermal Treatment
Alternative 6: Excavation, Onsite Thermal Desorption

EPA also considered three other alternatives for the Calcasieu River sediment:
Alternative 1: No Action
Alternative 3: Dredging, Offsite Disposal
Alternative 4: Dredging, Offsite Utility Boiler Treatment

Because the areas to be addressed are marshlands and river sediment, it is difficult to excavate or dredge material without creating the potential for additional significant environmental or human health risks. Comparing the alternatives for effectiveness, implementability, and cost led EPA to recommend in-place thermal treatment for the exposed tar and storm sewer area and capping for river sediments.

What Happens Next?

EPA will consider public comments received during the public comment period (November 18 through December 17, 1998) before approving a final plan for each selected site area. EPA's decision will be presented in an action memorandum that will be available for public review in early 1999.

Opportunities for Public Involvement

Public Comment Period

Your input on EPA's recommended alternatives for the Lake Charles/North Ryan MGP Site is important. Public comments assist EPA in making its decision for selected areas at the site.

EPA will accept written comments on the recommended alternatives presented in the EE/CA during a 30-day public comment period: **November 18 through December 17, 1998.**

Comments must be postmarked by **December 17, 1998**. You may also submit comments through the Internet to the following address:
coats.janetta@epa.gov

If you have a question about the comment period, please contact Janetta Coats, toll free, at 1-800-533-3508.

Community Advisory Group Option

A community advisory group includes representatives of diverse community interests who join together in a public forum to present and discuss their needs and concerns related to site cleanup decisions. EPA invites interested residents who would like more information about forming a community advisory group for the Lake Charles/North Ryan MGP site to contact EPA community involvement coordinator Janetta Coats, toll-free, at 1-800-533-3508.

Additional Information

If you have questions about the information in this fact sheet or would like additional information about the Lake Charles/North Ryan MGP site, please contact any of the following individuals:

EPA Region 6
Caroline Ziegler (6 SF-LL)
Remedial Project Manager
Email: ziegler.caroline@epa.gov

Janetta Coats (6 SF-PO)
Community Involvement Coordinator
Email: coats.janetta@epa.gov

U.S. EPA Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733
Toll-Free: 1-800-533-3508

Entergy Gulf States, Inc.
Rick McCabe
Project Manager
(501) 377-3888

Jerry Roberts
Senior Environmental Specialist
(501) 377-4035

425 West Capitol Avenue
P.O. Box 551
Little Rock, AR 72203-0551

Louisiana Department of Environmental Quality
Rich Johnson
Inactive/Abandoned Sites Division
P.O. Box 82282
Baton Rouge, LA 70884-2282
(504) 765-0487

Louisiana Office of Public Health
Angelique Delonde
234 Loyola Avenue, Room 620
New Orleans, LA 70112
(504) 568-5592

The EE/CA report, Community Involvement Plan, and other site-related information are available for review in the site information repository or the administrative record file at the Reference Section, Central Calcasieu Public Library, 301 West Claude Street, in Lake Charles or at the EPA Region 6 Library in Dallas, Texas.

APPENDIX D

ENGINEERING EVALUATION/COST ANALYSIS APPROVAL MEMORANDUM

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

June 13, 1996

MEMORANDUM

SUBJECT: Engineering Evaluation/Cost Analysis
North Ryan Street Site, Lake Charles, Calcasieu Parish, Louisiana

FROM: Carl Edlund, Chief
Louisiana/New Mexico Branch
Superfund Division (6SF-L)
Ghassan Khoury For Carl Edlund

TO: Myron O. Knudson, P.E., Director
Superfund Division (6SF)

PURPOSE:

Pursuant to Section 104(b)(1) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, and 40 CFR Part 300.415(b)(4) of the National Oil and Hazardous Substances Contingency Plan (NCP), this memorandum is to request your approval to conduct an Engineering Evaluation/Cost Analysis (EE/CA) in support of a non-time-critical removal action. The EE/CA will help determine the selection of a feasible and cost effective non-time critical removal action remedy at the North Ryan Street Site (the "Site"). The Site encompasses approximately 19 acres and is located at 303 North Ryan Street in the city of Lake Charles, Louisiana. At this time, we anticipate that the EE/CA will be conducted by Gulf States Utilities Company (GSU), a potentially responsible party (PRP) for the Site.

JURISDICTION:

Authority vested in the President of the United States by Sections 104, and 106(a) of CERCLA has been delegated to the Administrator of the U.S. Environmental Protection Agency ("EPA") by Executive Order No. 12580, January 23, 1987, 52 Federal Register 2923. CERCLA Section 104(b) investigative authority, including the authority to authorize an EE/CA, has been delegated to the Regional Administrator, EPA Region 6, by EPA Delegation 14-8-A (September 13, 1987), and redelegated to the Superfund Division Director by Region 6 Delegation R6-14-8-A (August 4, 1995). The authority to make a determination of Imminent and Substantial Endangerment under CERCLA Section 106 was delegated to the Regional Administrator, Region 6, by Delegation 14-14-A

(April 15, 1994), and redelegated to the Superfund Division Director by Delegation R6-14-14-A (August 4, 1995).

BACKGROUND:

The Lake Charles Gas Company began gas production at the Site around 1916. The Lake Charles Gas Company operated the Manufactured Gas Plant (MGP) until 1924. The MGP was operated by the Lake Charles Electric Company in 1925, and by the Louisiana Electric Company, Inc., in 1926. GSU operated the MGP between 1927 and 1932. The annual production of gas during the years of operation at the Site ranged from approximately 50 to 85 million cubic feet. Manufactured gas was phased out in 1932 when natural gas service became available to the City of Lake Charles.

The coal tar by-products generated during gas plant activities were reportedly disposed into marshlands west of the facility. The size of the marshland was approximately 6 acres. An area of exposed coal tar, referred to as the tar outcropping, has been identified at the northern portion of these former operations. This area is approximately 8 feet by 8 feet.

After the gas plant ceased operations, the marshlands were used as a landfill for the disposal of electrical equipment and poles, appliances, and other debris. Transformers, capacitors, and drums containing used transformer oil were also reported to have been disposed in this area. By 1980, since the area was at its capacity, it was filled and covered with shells and soil. GSU covered areas of fill that sank into the marsh in concrete. GSU now uses this area for equipment storage. GSU currently operates and maintains a service center at the Site.

The MGP structures have been dismantled. However, remnants of the gas plant foundation are still present onsite and GSU is currently using the area for storage. GSU reportedly filled the crude oil storage tanks by 1990. The gas holder foundation is a four-foot high structure and is still visible on the Site.

Two underground storage tanks (USTs) were removed from the area of the existing gas tanks, north of the former MGP operations area.

A drainage pipeline extends south to north across the west service yard area. The line was originally used by the Greater Lake Charles Water Company. An underground line from the meter shop is connected to the main line. The pipeline discharged to the Calcasieu River before it was plugged with concrete at its entrance and a steel plate at its terminus near the river. Water flow from the pipeline on the south side of the northern fenceline has been observed since the line was plugged.

The city of Lake Charles obtains its water supply from thirteen water wells that are screened in either the 500-foot sand or the 700-foot sand. Three of the water wells (G-4, G-6, and G-7) were located on the GSU property, screened in the 700-foot sand. These three wells have been abandoned. Five other city water wells are located within 300 to 400 yards south of the Site on the Lake Charles City Water Department property.

A total of eleven water wells were reported to have been located on the Site. Six of these wells are known to have been abandoned, including the three potable water supply wells, G-4, G-6, and G-7, discussed above. Three of the remaining wells are in areas not impacted by the MGP in the northeast portion of the Site. EPA believes the other two wells are inaccessible (one beneath a concrete reservoir and one now believed to be in the Calcasieu River).

THREATS TO PUBLIC HEALTH, WELFARE, OR THE ENVIRONMENT:

On July 20, 1988, the Louisiana Department of Environmental Quality (the "State") was notified that an oily substance was flowing into a trench which was being developed on the north side of the Site. Both the State and GSU analyzed samples of the oily substances found in the trench. In all, four investigations of the Site have been completed. Following the issuance of a Compliance Order by the State, GSU conducted Phase I, II, and III investigations in December 1988, March 1989, and March 1990 (respectively) under State oversight. EPA completed a screening site inspection (SSI) at the Site in October 1990.

Specific chemicals found at the Site included toluene; 1,1,2-trichloroethane; 1,1,1-trichloroethane; tetrachloroethane; and xylene. The State also analyzed samples collected from an exposed pit found on the Site. Chemicals detected in the pit sample included benzene, ethylbenzene, toluene, xylene, acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, naphthalene, polychlorinated biphenyl (PCB), and several others. These chemicals are hazardous substances as defined by CERCLA in Section 101(14), 42 U.S.C. § 9601(14), and the NCP in Section 40 CFR Part 302.4.

Hazardous substances have been found in subsurface borings conducted at the Site at depths ranging from 3 to 17 feet below the surface. Samples collected from shallow aquifers located beneath the Site indicate that the groundwater is contaminated with hazardous substances. (National Priorities List (NPL) Proposed Rule 18 Update).

The Chicot Aquifer is a major drinking water source for area residents. There were two municipal wells located onsite in the

coal tar contaminated area which were screened in the Chicot Aquifer. As previously noted, these wells have been plugged and abandoned. Four additional wells located within a one-half mile radius of the Site are also screened in the Chicot Aquifer. Contaminated groundwater could migrate through the underlying Site strata or through voids created by the existing wells and contaminate the Chicot Aquifer.

ENDANGERMENT DETERMINATION:

Actual or threatened releases of hazardous substances at and from this Site, if not addressed by a response action, may present an imminent and substantial endangerment to public health, or welfare, or the environment.

ENFORCEMENT ACTIONS:

EPA has performed a PRP search to determine the identities of the former owners and operators of the Site. Gulf States Utilities operated a manufactured gas plant at the Site from 1927 to approximately 1932. Entergy Corporation, a Florida corporation, has reported to EPA that on December 31, 1993, Entergy merged with and into Entergy-GSU Holdings, Inc., a Delaware corporation, which was then renamed Entergy Corporation ("Entergy"). On December 31, 1993, Entergy acquired all of the outstanding stock of GSU, a Texas corporation. Therefore, GSU is a wholly-owned subsidiary of Entergy.

On or about May 25, 1995, EPA issued a Special Notice Letter to Entergy and GSU, informing them of their potential liabilities associated with the Site and giving them an opportunity to negotiate a settlement providing for the PRPs to conduct or finance response actions at the Site. In conjunction with the Special Notice Letter, EPA also sent Entergy a Request for Information under the authority of Section 104(e), 42 U.S.C. §9604(e). On or about June 28, 1995, Entergy submitted a response to EPA's information request. In a meeting on September 7, 1995, EPA and Entergy discussed a concurrent EE/CA and Remedial Investigation/Feasibility Study (RI/FS) project to expedite response actions at the Site. Entergy, as well as its wholly-owned subsidiary GSU, appears to have sufficient technical and financial resources to perform or finance the proposed EE/CA.

On January 24, 1996, and again on April 8, 1996, representatives of EPA Region 6 held a teleconference with representatives of GSU and Entergy to finalize negotiations regarding an Administrative Order on Consent (AOC) for the investigation of the Site. Entergy and GSU have indicated at meetings with EPA that they are interested in performing the

investigation of the Site and will fund EPA oversight of that activity.

PROPOSED PROJECT AND COSTS:

The EE/CA project will involve the conduct of field engineering investigations to determine the extent of contamination at the Site. The general scope and role of the non-time critical removal action will be to remove or eliminate those principal threat wastes at the Site, thereby eliminating or reducing risks from potential exposure pathways from those wastes. Principal threat wastes are those source materials considered to be highly toxic or mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur.

The goals of the EE/CA are to identify specific objectives of the non-time critical removal action for each source area and to analyze the various alternatives that may be used to satisfy these objectives for cost, effectiveness, and implementability at the Site.

GSU has agreed to execute an AOC with EPA, under the terms of which GSU will perform the EE/CA and an RI/FS. Due to the interest and expected participation of GSU in the EE/CA (and in any subsequent removal action) under an AOC, no funding is requested at this time for oversight of the removal action. Under the terms of the anticipated AOC, GSU has agreed to establish a special reimbursement account (RUB) to retain funds which EPA will use for the payment of its future response costs in carrying out the AOC. EPA will notify GSU when the special account has been drawn down to $50,000, and GSU has agreed to replenish the account to an estimated annual future response cost amount.

However, future funding may be needed for oversight of the EE/CA (and subsequent removal). This is because either party will have the ability, on an annual basis, to modify the special account funding program. If either party does modify the special account funding program, EPA will resort to retroactive billing of GSU for future response costs.

EPA oversight costs for the EE/CA are expected to be about $600,000.00. If, for some unexpected reason, the PRP does not conduct the EE/CA, then EPA will incur the cost of the EE/CA, which is expected to be about $2,000,000.00, including oversight.

The project will involve the full integration of Removal and Remedial elements, consistent with recent Headquarters guidance. By this approach, any data gathering and evaluation will accommodate the needs of the Removal, the Pre-Remedial, and the

Remedial programs' needs respectively. The ultimate non-time critical removal action addressing the contamination will be thorough, and the cleanup standards will be risk-based and consistent with Remedial program standards.

CONCLUSIONS:

Conditions at the Site meet the criteria for removal actions taken pursuant to Section 104(b) of CERCLA. see 40 CFR Section 300.415(a)(3). That is, it is clear from the information which EPA has gathered regarding the Site that EPA has reason to believe that a release has occurred or is about to occur, or that illness, disease, or complaints thereof may be attributable to exposure to a hazardous substance, pollutant, or contaminant and that a release may have occurred or be occurring at the Site. Furthermore, a planning period in excess of six months exists, and therefore, pursuant to 40 CFR § 300.415(b)(4)(i), the conduct of an EE/CA for a non-time critical removal action is appropriate.

APPROVAL:

You may indicate your approval by signing below:

7/1/97
Date

Myron O. Knudson, P.E.
Director, Superfund Division (6SF)

APPENDIX E

TABLE OF ACTION LEVEL VALUES FOR PAHS

ACTION LEVEL VALUES FOR PAHs

CHEMICAL	SEDIMENT
SEMIVOLATILE, PAHS	*Effects Range-Median (ERM), ppb*[1]
Acenaphthene	500
Acenaphthylene	640
Anthracene	1100
Benzo(a)pyrene	1600
Benzo(a)anthracene	1600
Chrysene	2800
Dibenz(a,h)anthracene	260
Fluoranthene	5100
Fluorene	540
2-Methylnaphthalene	670
Naphthalene	2100
Phenanthrene	1500
Pyrene	2600
Low Molecular Weight PAHs	3160
High Molecular Weight PAHs	9600
Total PAHs	44792

[1] NOAA Screening Quick Reference Table for Organics

APPENDIX F

ENFORCEMENT ATTACHMENT

CONFIDENTIAL DOCUMENT
NOT AVAILABLE FOR PUBLIC REVIEW

APPENDIX G

COST ESTIMATE TABLES

EXPOSED TAR AND STORM SEWER AREAS

IN-SITU THERMAL TREATMENT

TABLE A-24
EXPOSED TAR AND STORM SEWER AREAS
ALTERNATIVE 4 - IN-SITU THERMAL TREATMENT
COST SENSITIVITY ANALYSIS -- SLURRY WALL AROUND EXPOSED TAR AREA
COST ESTIMATE
Lake Charles MGP Site
EE/CA Report

Assembly	Quantity	Unit of Measure	Unit Cost	Total Cost (1)
In-Situ Thermal Treatment (2)	1	LS	1,214,600.00	1,214,600
Temporary Fencing (3)	1,300	LF	5.30	6,900
Decontamination Pad Construction (4)	5,600	SF	1.50	8,400
Decontamination (5)	1	LS	10,000.00	10,000
Excavate/Stockpile/Load Contaminated Material from Storm Sewer Area (6)	140	TON	27.70	3,900
Treated Soil/Debris Transport and Disposal (7)	140	TON	34.60	4,800
Material Sampling				
In-Situ Confirmation Samples (8)	115	SAMPLE	550.00	63,300
Excavated/Treated Material Samples (9)	2	SAMPLE	620.00	1,200
Backfilling (10)	950	CY	12.10	11,500
Slurry Wall Construction (11)	9,600	SF	5.20	49,900
Air Monitoring (12)	45	DAY	700.00	31,500
CONSTRUCTION SUBTOTAL				1,406,000
Bid Contingencies (15%)				210,900
Scope Contingencies (15%)				210,900
CONSTRUCTION TOTAL				1,827,800
Permitting and Legal (5%)				91,400
Construction Services (10%)				182,800
TOTAL IMPLEMENTATION COST				2,102,000
Engineering Design (8%)				168,200
TOTAL CAPITAL COST				2,270,200

Notes:

(1) All costs rounded to the nearest hundred. Unless otherwise noted, assembly item unit costs were obtained from the 1996 R.S. Means Environmental Restoration Assemblies and Unit Cost Books. The 1996 costs were increased by 4.5% for 1998 costs.

(2) Budgetary quote provided by TerraTherm Environmental Services for in-situ treatment using thermal wells. Cost includes mob/demob, site setup, work plan preparation and regulatory approval support, energy costs, and remediation. Assumes the use of thermal wells installed to a depth of 9 feet bgs.

(3) Unit cost includes set up and take down of fence, gates, and signs.

(4) Assumes a temporary decon pad (80'x70') would be constructed in the southwest corner of the site. A concrete pad would not be constructed due to the limited material handling involved with this alternative.

(5) Includes equipment, debris, and personnel decontamination; water treatment; decon water sampling.

(6) Based on approx. 110 cy of material excavated from around 60 feet of storm sewer at north property line, spread out over the exposed tar area for treatment, and loaded into trucks for transport off site.

(7) Estimated quantity of 140 tons of treated soil, debris, and pipe from storm sewer excavation. RCRA Subtitle D facility is located approx. 45 miles from Lake Charles.

(8) One sample for PCB and PAH analysis collected for every 200 sf of treatment area. Two-day turn-around assumed for analytical results. Samples collected using a soil probe unit, which is included in the cost.

(9) One sample for PCB, PAH, and volatiles collected for every 100 cy of material. Two-day turn-around assumed for analytical results.

(10) Includes material cost, transportation, and placement. Clay backfill placed in the excavation around the storm sewer and road stone placed over the exposed tar area following treatment.

(11) Budgetary quote provided by Terra Constructors. Cost based on approx. 800 feet of slurry wall to a depth of 12 feet around the exposed tar area.

(12) Summa cannisters for VOC analysis and rental of portable monitoring equipment. Assumed two samples collected every day of excavation and treatment operations.

EXPOSED TAR AND STORM SEWER AREAS

EXCAVATION, OFF-SITE TREATMENT AND DISPOSAL

TABLE A-23
EXPOSED TAR AND STORM SEWER AREAS
ALTERNATIVE 3 - EXCAVATION, INCINERATION
COST SENSITIVITY ANALYSIS -- SLURRY WALL AROUND EXPOSED TAR AREA
COST ESTIMATE
Lake Charles MGP Site
EE/CA Report

Assembly	Quantity	Unit of Measure	Unit Cost	Total Cost (1)
Mob/Demob Equipment and Personnel (2)	1	LS	187,400.00	187,400
Temporary Fencing (3)	1,300	LF	5.30	6,900
Decontamination Pad Construction (4)	5,600	SF	2.90	16,200
Decontamination (5)	1	LS	28,900.00	28,900
Excavate/Stockpile/Load Contaminated Material (6)	6,360	TON	36.23	230,400
Debris Transport and Disposal (7)	400	TON	34.60	13,800
Air Monitoring (8)	64	DAY	700.00	44,800
Material Sampling				
Confirmation Samples (9)	115	SAMPLE	400.00	46,000
Stockpile Samples (10)	53	SAMPLE	315.00	16,700
Material Transportation (11)	290	LOAD	700.00	203,000
RCRA Incineration(11)	12,720,000	LB	0.30	3,816,000
Backfilling (12)	5,520	CY	12.00	66,200
Containment Structure (13)	1	LS	145,000.00	145,000
Slurry Wall Construction (14)	9,600	SF	5.20	49,900
CONSTRUCTION SUBTOTAL				4,871,200
Bid Contingencies (15%)				730,700
Scope Contingencies (15%)				730,700
CONSTRUCTION TOTAL				6,332,600
Permitting and Legal (5%)				316,600
Construction Services (10%)				633,300
TOTAL IMPLEMENTATION COST				7,282,500
Engineering Design (8%)				582,600
TOTAL CAPITAL COST				7,865,100

Notes:
(1) All costs rounded to the nearest hundred. Unless otherwise noted, assembly item unit costs were obtained from the 1996 R.S. Means Environmental Restoration Assemblies and Unit Cost Books. The 1996 costs were increased by 4.5% for 1998 costs.
(2) Mob/demob assumed to be 4 percent of construction subtotal.
(3) Unit cost includes set-up and take-down of fence, gates, and signs.
(4) Assumes an 80'x70' concrete pad constructed in the southwest corner of the site.
(5) Includes equipment, debris, and personnel decontamination; water treatment; decon water sampling.
(6) Based on 100 tons/day excavated, stockpiled, and loaded (Level B). Total quantity is 6,360 tons (1.2 tons/cy) based on areas shown on Figure 5-1 and specified excavation depths (less 5% debris).
(7) Estimated quantity of 400 tons (5% debris and 200 feet of pipe). RCRA Subtitle D facility is located approx. 45 miles from Lake Charles.
(8) Summa cannisters for VOC analysis and rental of portable monitoring equipment. Assumed two samples collected every day of excavation and loading operations.
(9) One sample for PCB and PAH analysis collected for every 200 sf of excavation. Two-day turn-around assumed for analytical results.
(10) One sample for PCB and TCLP-benzene collected for every 100 cy of stockpiled material. Two-day turn-around assumed for analytical results.
(11) Transport to Deer Park, TX (Laidlaw) RCRA incineration facility, 22 tons/load. Cost includes transport and and disposal of capacitors/transformers found during excavation.
(12) Includes material cost, transportation, and placement.
(13) Based on a budgetary quote provided by Sprung Instant Structures.
(14) Budgetary quote provided by Terra Constructors. Cost based on 800 feet of slurry wall to a depth of 12 feet around the exposed tar area.

CALCASIEU RIVER SEDIMENT

DREDGING AND OFF-SITE DISPOSAL

TABLE A-7
CALCASIEU RIVER SEDIMENT
ALTERNATIVE 3 - DREDGING, OFFSITE LANDFILLING
COST ESTIMATE
Lake Charles MGP Site
EE/CA Report

Assembly	Quantity	Unit of Measure	Unit Cost	Total Cost (1)
Mob/Demob (2)	1	LS	13,300.00	13,300
Temporary Fence Around Operations Area (3)	1,900	LF	5.80	11,000
River Road Resurfacing (4)	1,000	LF	7.90	7,900
Operations Area Barriers in River (5)	400	LF	51.10	20,400
Decon/Dewatering Pad Construction (6)	10,000	SF	2.70	27,000
Demolish Decon Pad/Dispose of Rubble (7)	130	CY	99.40	12,900
Decontamination (8)	1	LS	11,100.00	11,100
Sediment Dredging and Transport to Dewatering Facility (9)	1,500	CY	32.00	48,000
Dewatering Operation (10)	1,425	CY	54.40	77,500
Dewatered Sediment Transport and Disposal (11)	800	TON	34.60	27,700
Dewatered Material Sampling (12)	15	SAMPLE	745.00	11,200
Air Monitoring (13)	15	DAY	700.00	10,500
CONSTRUCTION SUBTOTAL				278,500
Bid Contingencies (15%)				41,800
Scope Contingencies (15%)				41,800
CONSTRUCTION TOTAL				362,100
Permitting and Legal (5%)				18,100
Construction Services (10%)				36,200
TOTAL IMPLEMENTATION COST				416,400
Engineering Design (8%)				33,300
TOTAL CAPITAL COST				449,700

Notes:
(1) All costs rounded to the nearest hundred. Unless otherwise noted, assembly item unit costs were obtained from the 1996 R.S. Means Environmental Restoration Assemblies and Unit Cost Books. The 1996 costs were increased by 4.5% for 1998 costs.
(2) Mob/demob assumed to be 5 percent of construction subtotal.
(3) Unit cost includes set up and take down of fence, gates, and signs. Assumes closure of one lane of River Road during removal operations and fencing around the dewatering/decon operation area.
(4) Assumes that resurfacing of a section of River Road would be required following operations.
(5) Assumes buoys, ropes, barricades, etc. would be used in the river around the operations area. Time required assumed to be one month. Also assumes a silt curtain would be erected around the operations area.
(6) Concrete pad assumed to be constructed in east yard and used for both decon and dewatering operations.
(7) Concrete pad would be demolished following operations and rubble would be transported to the RCRA Subtitle D facility located approx. 45 miles from Lake Charles for disposal.
(8) Includes equipment and personnel decontamination and water treatment.
(9) Assumes clamshell dredging from a barge at a rate of 40 cy/hour, barge transport of dredged material to the east yard unloading area, and loading dewatered sediment and debris into trucks for transport to the RCRA Subtitle D landfill. Volume based on area shown on Figure 5-2, with 20% overdredging and removal to a depth of 2 feet.
(10) Assume sediment contains approx. 40% solids and 5% debris by volume, and a belt filter press hydraulic loading rate of 40 gpm.
(11) Assume dewatered sediment would weigh 1.2 tons/cy. and concrete rubble and debris (5% of total volume) weighs 1.5 tons/cy. RCRA Subtitle D facility located approx. 45 miles from site.
(12) Material would be analyzed for PAHs, VOCs, and metals. Assume one sample collected for every 100 cubic yards of material.
(13) Summa cannisters for VOC analysis and rental of portable monitoring equipment. Two samples collected every day of dredging, dewatering, and loading operations.