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Proposed Remedial Action Document

for

International Creosoting
Land-Based Operable Unit

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October 21, 1998

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INTERNATIONAL CREOSOTING STATE SUPERFUND SITE
LAND-BASED OPERABLE UNIT
PROPOSED REMEDIAL ACTION DOCUMENT
October 21, 1998

PURPOSE

This document presents the recommended remedial action for surface soils, subsurface soils, and groundwater for the Land-based Operable Unit (LBOU) at the International Creosoting State Superfund Site. The proposed remedy is designed to ensure the protection of human health and the environment on the LBOU, and was made in accordance with the Texas Solid Waste Disposal Act (codified as the Texas Health and Safety Code, Chapter 361) and all applicable state and federal environmental regulations.

The Texas Natural Resource Conservation Commission (TNRCC) is providing a description of the recommended remedy with reasons for the recommendation. The purpose of this document is: 1) describe the proposed remedial action; 2) solicit public review and comment on the recommended remedial action; and 3) provide information on how the public can be involved in the remedy selection process.

This Proposed Remedial Action Document (PRAD) summarizes information that can be found in greater detail in several documents located in the International Creosoting site files (refer to the list at the end of this document). The results of sampling activities and an evaluation of site risk are presented in the Remedial Investigation (RI) and the Baseline Risk Assessment (BRA) reports. The evaluation of site remedial alternatives is presented in the Feasibility Study (FS) Report. All of the figures included in this PRAD are from the FS Report prepared by Roy F. Weston, Inc.

The TNRCC encourages the public to review these documents in order to gain a more comprehensive understanding of the site, the state Superfund activities that have been conducted, and the development of the proposed remedial alternative to address contamination at the site. The TNRCC also encourages the public to participate in the decision making process for the site. The International Creosoting site files are available at: TNRCC Central Records, Building D, Room 190, 12118 North IH-35, Austin, Texas 78753. Copies of the documents listed at the end of the PRAD are also available at the Beaumont Public Library, 801 Pearl Street, Beaumont, Texas 77701.

SITE LOCATION

The International Creosoting State Superfund site is located at 1110 Pine Street in Beaumont, Texas. It is bounded on the west by Pine Street, on the east by Brakes Bayou, on the north by Interstate Highway 10, and on the south by unoccupied industrial property and Trinity Industries (across Brakes Bayou). The LBOU is 14.7 acres in size. A site location map is presented as Figure 2-1.

SITE HISTORY

The International Creosoting site was used for wood-treatment operations from 1898 to 1973. The facility was purchased by Moss-American Corporation, a subsidiary of Kerr-McGee Chemical Corporation in 1969. Documentation exists that both creosote and creosote mixed with pentachlorophenol were used in wood-treatment operations at the site. The wood-treatment operations ended in November 1973 when Moss-American sold the property to Keown Contracting Company. At that time, sludges from a creosote/wastewater impoundment (stabilization pond) were cleaned out and taken to Kerr-McGee Chemical Company's Texarkana facility.

Keown Contracting Company operated an asphaltic concrete ready-mix production facility at the site. Keown Supply Company bought the property from Keown Contracting Company in 1979 and continued these operations. Asphalt and aggregate/granular materials (e.g., sand, rock, shell, cement) were used at the site. These operations ceased in 1987, and Keown Supply Company filed for bankruptcy in 1989, but the court dismissed the bankruptcy proceedings. In October 1998, Jefferson County sold the property at a foreclosure auction where it was purchased by a subsidiary of Kerr-McGee Chemical LLC.

In 1981, Moss-American notified the EPA, as required by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), that hazardous waste had been disposed of and handled in the surface impoundment (stabilization pond) used to separate creosote and wastewater. Moss-American estimated that this waste impoundment had been used to store/dispose of waste from 1920 to 1973. Subsequent investigations performed by the Texas Water Commission (predecessor agency of the TNRCC) and private entities established that surface soils, subsurface soils, and groundwater had been impacted by creosote and asphalt constituents.

In 1988, the EPA referred the site to the Texas Water Commission, and it was proposed for listing on the Texas Registry of Superfund sites late that year. After a public meeting at which the site was proposed for listing, it was added to the state Superfund registry on March 31, 1989.

In 1990, Kerr-McGee Chemical Company, now Kerr-McGee Chemical LLC (KMC), entered into an Agreed Order with the Texas Water Commission to complete the remedial investigation/ feasibility study (RI/FS) for the site. In 1992, KMCC completed decommissioning/demolishing most of the remaining structures at the site, disposing of debris and some waste materials left at the surface, and consolidating other waste materials. At present, the site still contains two diesel underground storage tanks, a hot-mix asphalt impoundment with a storage tank at the surface, a drum storage area, and a machine shed in which containerized investigation derived waste (IDW) is being stored. A site map showing the locations of former and existing structures on the site is presented in Figure 2-2.

In 1996, the site was split into two operable units, one was the 14.7 acres of the Land-based Operable Unit (LBOU) and the other was comprised of Brakes Bayou in the vicinity of the site, the Bayou-based Operable Unit (BBOU). At that time the remedial investigation (RI) had been completed for the land-

based portion of the site, but not for the bayou. Therefore, the operable units were created to expedite completion of the RI/FS process for the LBOU, which could then proceed separately from that of the BBOU.

COMMUNITY PARTICIPATION

A public meeting was held on December 15, 1988, at the Beaumont Public Library to propose the site for inclusion on the Texas Registry of state Superfund sites. Notice of the hearings was published in the *Texas Register*. The site was added to the state Superfund registry on March 31, 1989.

The public is invited to comment on the proposed remedy selection. The public comment period begins on October 31, 1998 [previously indicated as November 2, 1998], and ends December 1, 1998, at the close of the public meeting. During the public comment period, written comments may be submitted to:

G. Nell Tyner, Ph.D., P.G.
Superfund Cleanup Section
Remediation Division
Texas Natural Resource Conservation Commission - MC-143
P.O. Box 13087
Austin, TX 78711-3087

In addition, oral comments will be accepted at the public meeting scheduled for December 1, 1998, beginning at 7:00 p.m., at the Beaumont ISD Administration Building Board Room located at 3395 Harrison Avenue [previously identified as Harrison Street], Beaumont, Texas 77701. The TNRCC will answer all comments received during the public comment period in a document called a Responsiveness Summary. The Responsiveness Summary will be available to the public at the TNRCC Central Records and the local repository (Beaumont Public Library).

SUMMARY OF SITE CHARACTERISTICS

A remedial investigation was conducted to define the general geology and hydrology of the LBOU, and to determine the nature and extent of the contamination present. The surface of the LBOU consists of variable amounts of fill material that has been placed on the site during the period of its active operation. This fill material is comprised of gravel, silty sands, silty and sandy clays, shell fragments, wood fragments, concrete, and construction debris. It varies from 2.5 to 12 feet thick, and is thicker toward the bayou. Beneath the fill on the LBOU, extending down to depths of approximately 80 feet below land surface (bls), are interlayered beds of silty and sandy clays, silty and clayey sands, sands, and clays. These beds slope toward the bayou and become increasingly rich in sand in this direction, as well as toward the northeastern end of the LBOU. A generalized cross section across the LBOU showing these strata is presented in

Figure 2-3. A cross section parallel to the bayou is shown in Figure 2-5.

Results of the field investigation and laboratory analyses show that both soil and groundwater are impacted by constituents found in creosote, asphalt, and organic solvents. The constituents of concern are polyaromatic hydrocarbons (PAHs), semivolatile organic compounds (SVOCs), volatile organic compounds (VOCs), and metals (particularly arsenic, chromium, lead, and mercury). The largest portion of the site is impacted by PAHs, SVOCs, and metals. A smaller area at the south end of the site is impacted with chlorinated VOCs.

Free-phase creosote is present at depths of between approximately 10 to 40 feet below land surface in the vicinity of the former creosote process area and the former creosote/wastewater impoundment. It appears to have migrated downward and collected in sand-rich layers at depth. Figure 2-12 shows where creosote has been encountered in soil borings and in monitoring wells beneath the LBOU along the edge of the bayou.

The greatest impacts on surface soils are found in the vicinity of the former creosote process area and the asphalt impoundment. Figure 2-9 shows where visual impacts can be seen in soils down to approximately 20 feet bls. Based upon visual observations and analytical data, the estimated total volume of creosote-contaminated soil extending from the surface down to 20 feet bls is 200,000 yd^3. Low levels of PAH compounds have been detected in soils down to depths of approximately 60 feet bls in some portions of the site.

Data supporting the existence of a hydraulic connection between the LBOU and the BBOU were obtained in 1995 when pumping tests were performed and water levels in the bayou and groundwater in monitoring wells were measured. During this study, there appeared to be a correlation between fluctuations in the bayou surface water level and fluctuations in the groundwater levels in wells adjacent to the bayou. The estimated rate of groundwater flow into Brakes Bayou from the LBOU was calculated to be approximately 40 gallons per minute (gpm).

SUMMARY OF SITE RISKS

Human Health

A Baseline Risk Assessment report was completed in March 1998 to evaluate the risk from exposure to the contaminants at the site in the absence of any remedial action. The baseline risk assessment uses information from the remedial investigation and standard toxicological assumptions that include the ingestion, dermal contact, and inhalation of contaminated media. This information is used to estimate the potential for adverse effects on human health from exposure to the contaminants at the site. The risk is evaluated for both current and potential future exposure to the contaminants. The contaminated media at the site included

surface soils, subsurface soils, and groundwater.

Complete exposure pathways for soil include ingestion, dermal absorption through skin contact, and inhalation of dust and vapors from contaminated soil. Current receptors are limited to on-site trespassers exposed to surface soils. Potential future receptors are on-site workers, construction workers, and trespassers exposed to the soils and groundwater.

Based upon a required cleanup level for carcinogenic compounds of no greater than 1E-06 risk level and for noncarcinogenic compounds of a hazard index of less than 1, several areas of the site exceeded acceptable levels of several compounds. These areas are being proposed for capping to eliminate exposure pathways to future on-site workers and trespassers.

Dioxins were omitted from the risk assessment due to the limited amount of data available from the remedial investigation. Remedial action to address potential dioxin contamination will be addressed as part of the remedial design. The remedy for dioxins in surface soil does not differ from that for PAHs (i.e., isolation by capping/containment). Therefore, the TNRCC is allowing KMC to address potential dioxin contamination by collecting confirmation samples when the capping is performed to ensure that any soils left uncapped will not present an unacceptable risk due to dioxins.

Groundwater contains free product and several organic chemicals at levels above federal maximum contaminant levels (MCLs). Therefore, ingestion of groundwater poses an unacceptable risk to human health and it must be addressed through remedial action.

Ecological

As part of the risk assessment, an ecological risk screening evaluation was performed following TNRCC guidance. The purpose of the screening was to evaluate whether remedial actions developed for protection of human health would also be protective of ecological receptors. A Tier 1 ecological screening assessment checklist, a Tier 2 Level A screening assessment, and a Tier 2 Level B screening assessment were completed.

An ecological screening assessment allows the remedial actions that are planned for protection of human health to be taken into consideration, rather than being a baseline assessment (i.e., no remedial action assumed) as is the case for human health risk assessments. Therefore, the ecological risk assessment evaluated areas of the site that have not been proposed to be capped based on human health risk.

Based upon the results of the Tier 2 Level A assessment, the Level B assessment focused on polyaromatic hydrocarbons (PAHs), arsenic, chromium, copper, lead, and mercury as constituents of potential concern (COPCs). These are the COPCs that exceeded ecological benchmark screening values in areas of the site

that were not expected to be capped. As in the case of human health risk, dioxins were not addressed in the ecological risk assessment, but will be addressed during the remedial action.

Receptors that were evaluated as being representative of the feeding guilds having the greatest potential for exposure included the short-tailed shrew, white-footed mouse, American robin, red-tailed hawk, and red fox. The Tier 2 Level B assessment concluded that chromium is the only COPC that is present in surface soils at levels that pose an unacceptable risk to any ecological receptors. Because chromium will bioaccumulate in worms dwelling in the soil, the ecological risk to the American robin consuming those worms is unacceptable in several separate areas of the site. Therefore, the remedial action proposes to cap or excavate these areas to remove and/or isolate these soils.

PRELIMINARY REMEDIAL GOALS AND REMEDIAL GOALS

Preliminary remedial goals (PRGs) were developed to evaluate appropriate remedial alternatives and to focus on the most effective remedy. The PRGs are the levels of chemicals that, if allowed to remain at the site, will not pose an unacceptable risk of adverse health effects. The process of calculating the PRGs is found in the EPA guidance document, *Risk Assessment for Superfund: Volume I - Human Health Evaluation Manual (Part B, Development of Risk-based Preliminary Remediation Goals), EPA/540/R-92/003, Publication 9285.7-01B, December 1991.* All applicable or relevant and appropriate state and federal requirements have been addressed in the development of the PRGs. Once it has been determined that the PRGs provide an appropriate level of protection of human health and the environment, then remedial goals can be established for the cleanup.

The remedial goals for carcinogenic compounds were calculated based upon a maximum acceptable risk of a $1X10^{-6}$ (one in one million) target risk level. The carcinogenic compounds that exceed this risk level and the calculated acceptable concentrations to which they must be remediated include the following:

Constituent	Type of Compound	Cleanup Level in Soils to Attain a 1E-06 Risk Level (mg/kg)
benzo(a) anthracene	PAH	2.8
benzo(b) fluoranthene	PAH	2.8
benzo(a) pyrene	PAH	0.29
carbazole	SVOC	123.3
vinyl chloride	VOC	0.03

The remedial goal for arsenic in soils is the current TNRCC industrial cleanup level of 200 mg/kg, or for

areas where cross-media protection of groundwater is a concern, 5 mg/kg (30 Texas Administrative Code 335, Subchapter S, Section 335.563(i)). To protect ecological receptors, a reasonable protective concentration limit (PCL) of 30 mg/kg of chromium in soils was calculated. The approximate areas where surface soils must be remediated for protection of human health and the environment are shown on Figure 2-13.

OBJECTIVES OF THE REMEDIAL ACTION

The objectives of the remedial action include:

- To reduce the potential for adverse human health and ecological impacts due to exposure to surface soils, subsurface soils, and groundwater in areas where an unacceptable level of risk is present due to contamination from PAHs, SVOCs, VOCs, metals, or dioxins.

- To reduce the potential for, and eliminate if possible, future adverse impacts to Brakes Bayou due to the presence of free-phase creosote, contaminated soils, and contaminated groundwater on the LBOU.

- To reduce, as much as practicable, the further migration of contaminants into groundwater.

- To remove, to the extent practicable, free-phase creosote within the LBOU.

SUMMARY OF THE PROPOSED REMEDIAL ACTION

The TNRCC is proposing a remedial action that includes on-site containment of soils and groundwater across the large portion of the site where creosote-impacted media are found, combined with groundwater extraction and treatment in a small portion of the site outside of the containment area where chlorinated organic compounds are found. The proposed remedial action will consist of the following:

- Installation of a cap over the surface soils (and any spoils created during remediation activities) to prevent exposure of humans and environmental receptors to unacceptable concentrations of contaminated materials. Confirmation sampling will be conducted to ensure that all surface soils have been capped that present unacceptable risk due to their PAH, volatile and semivolatile organic compound, metal, or dioxin contents.

- Installation of a physical barrier (slurry wall) completely surrounding the affected subsurface soils. The barrier wall will be completed to a depth of approximately 50 feet below the ground surface and will have an approximate length of 3,625 feet. This barrier will reduce the volume of affected water that must be extracted and treated, and will isolate the creosote-affected soils, groundwater,

and free-phase creosote from the bayou.

- Installation and operation of extraction wells to (1) recover free-phase creosote, (2) provide hydraulic control within the walled area, and (3) recover groundwater from the area where chlorinated organic compounds have been detected.

- Installation of shallow and deep monitoring wells to monitor the effectiveness of the physical barrier.

- Installation of erosion protection along the southern end of the LBOU to stabilize the bank of the bayou along this portion of the site. The proposed method of stabilizing the bank is installation of a bulkhead comprised of treated timbers that would be installed by drilling methods.

- Installation of erosion protection along the northern end of the property adjacent to the bayou. This will be accomplished by grading to reduce the slope of the bank and installation of erosion control matting and revegetation.

- Removal of the two underground storage tanks, one surface storage tank, and the remaining asphalt within the asphalt impoundment.

- Separation of extracted creosote from water on-site, which will then either be disposed of off-site by burning or recycled. Recovered groundwater will be pretreated to remove the creosote and to reduce the concentrations of dissolved chemicals, and will be appropriately disposed of off-site.

- Deed recordation of the implemented remedy, site use restrictions, and institutional controls necessary to maintain the required level of protection will be put in place.

- Financial Assurance will be required to ensure that the containment system described above will be maintained and replaced, if necessary, as long as hazardous substances remain on-site.

Figure 5-5 shows the proposed locations of the capped areas, physical barrier (slurry wall), slope stabilization area, erosion control area, and extraction wells for the proposed remedy. A schematic of the treatment system for creosote-contaminated groundwater is presented in Figure 5-7.

SUMMARY OF EVALUATION OF THE PROPOSED REMEDY

The on-site containment remedy combined with pumping and treating of groundwater addresses the criteria for evaluation of remedies of Texas Administrative Code (TAC) Section 335.348(g). These requirements and a discussion of how the proposed remedy meets them are described below.

1) *Long-Term Effectiveness* is the extent to which an alternative mitigates long-term exposure to any residual contamination. The on-site containment remedy of installing a slurry wall around the site and capping over surface soils eliminates exposure to contaminants above cleanup levels.

2) *Compliance with Applicable Regulations* is the extent to which the alternative achieves remediation standards and complies with applicable federal and state regulations. The remedy alternative will meet remediation standards and complies with applicable federal and state regulations.

3) *Reduction of toxicity, mobility and volume* is the extent to which the alternative permanently and significantly reduces the volume, toxicity and mobility of hazardous substances. The remedy does not reduce the toxicity of hazardous substances, but it reduces the mobility by consolidating the soil under a cap and preventing further migration of impacted groundwater off-site through the installation of a containment barrier around the site. It also reduces the mobility posed by leaching of the consolidated material by minimizing the infiltration through the cap. The volume of contaminant will be reduced by the pumping of free-phase creosote and groundwater from behind the containment barrier and by the recovery of groundwater containing chlorinated chemicals at the south end of the site.

4) *Relative Cost* is the estimated present value costs, including total costs of implementation and annual operation and maintenance costs over the life of the project. The estimated cost of this alternative was $5 million. Estimated costs for all of the alternatives ranged from $4.64 million to $5.75 million.

5) *Impacts of implementation* evaluates other significant impacts on human health and the environment resulting from implementation of the remedial action alternative. The on-site capping

and containment alternative presents some potential for significant impacts. The slurry wall will bring soils to the surface that contain creosote contamination. These soils must be handled properly to reduce the risk that additional areas of the site will be contaminated at the surface. Also, exposure to these contaminated soils during implementation of the remedial action must be limited, and air emissions will be monitored to ensure that areas surrounding the site are not impacted during the remedial action. Runoff controls and dust suppression will prevent the spread of contaminants or possible exposure to particulates during the remedial action.

6) *Technical Merit* evaluates each remedial alternative relative to the others. Containment is the presumptive remedy of choice for Texas state Superfund sites where large volumes of contaminated soil are present, as is the case at this site (see *Presumptive Remedies for Soils at Texas State Superfund Sites, TNRCC Guidance Doc. RG-277, April 1997)*. Containment is the most effective and cost-efficient alternative of those considered. For the small area containing chlorinated organic chemicals in the groundwater, pumping and treating the groundwater is the most viable solution. The on-site containment, capping, and pump and treat technologies are commercially available and have been applied full-scale at similar sites.

7) *Community Acceptance* evaluates the extent to which local community concerns are addressed and whether implementation of the alternative would result in other adverse effects on the local community. The community may have some objections since the contaminants will remain on the site. However, the alternative does allow for future industrial use of the property if a change in use is obtained from the TNRCC to ensure the integrity of the soil cap and the slurry wall. Returning the site to productive industrial property would be of benefit to the local government and community.

In summary, the evaluation criteria support the remedial alternative of on-site containment combined with pump and treat. This proposed remedial action will: 1) reduce the potential for exposure to contaminated soil by capping all surface soil with concentrations above health-based and ecological risk levels, 2) contain contamination at depth to prevent further migration of contaminants, and 3) remediate groundwater outside of the containment area. These technologies have been successfully applied at other sites and, combined as a remedial alternative, have the greatest anticipated long term effectiveness in achieving the remedial action objectives. The remedial alternative should be acceptable to the community since it will prevent human health and ecological exposure to contaminants above cleanup levels and allow for potential future industrial use of the land.

DOCUMENT LIST

Burlington Environmental Inc., *Technical Memorandum - Preliminary Evaluation of the Phase I Remedial Investigation of the International Creosoting State Superfund Site, Beaumont, Texas, Volume I - Technical Report (August 1992).*

Burlington Environmental Inc., *Technical Memorandum - Preliminary Evaluation of the Phase I Remedial Investigation of the International Creosoting State Superfund Site, Beaumont, Texas, Volume II - Appendices A through D (August 1992).*

Burlington Environmental Inc., *Decommissioning Report [for] the International Creosoting State Superfund Site, Beaumont, Texas (September 1992).*

Burlington Environmental Inc., *Technical Memorandum - Phase II Remedial Investigation, International Creosoting State Superfund Site, Beaumont, Texas (October 1993).*

Burlington Environmental Inc., *International Creosoting State Superfund Site, Beaumont, Texas. Response to Comments from the Texas Natural Resource Conservation Commission on the Phase II Remedial Investigation Technical Memorandum (August 1994).*

Roy F. Weston, *International Creosoting State Superfund Site Phase II Addendum Remedial Investigation Technical Memorandum (March 1996).*

Roy F. Weston, *Risk Assessment for the Land-based Operable Unit for International Creosoting State Superfund Site, Beaumont, Texas (March 1998).*

Roy F. Weston, *Feasibility Study Report for the Land-based Operable Unit for International*

Creosoting State Superfund Site, Beaumont, Texas (July 1998).

Roy F. Weston, *Technical Memorandum Procedure to Determine Extent of Cap, Land-based Operable Unit (LBOU), International Creosoting Site (September 1998).*

PROPOSED REMEDIAL ACTION DOCUMENT

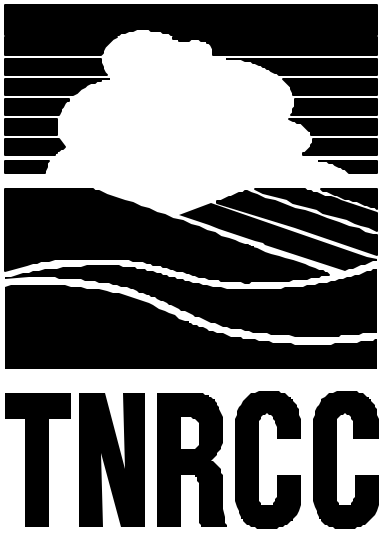
FOR THE

LAND-BASED OPERABLE UNIT

OF THE

INTERNATIONAL CREOSOTING STATE SUPERFUND SITE

BEAUMONT, TEXAS



TEXAS NATURAL RESOURCE
CONSERVATION COMMISSION

October 21, 1998