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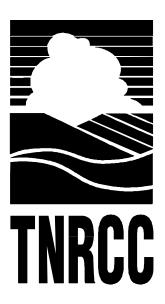
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PROPOSED REMEDIAL ACTION DOCUMENT



TEXAS AMERICAN OIL STATE SUPERFUND SITE MIDLOTHIAN, ELLIS COUNTY, TEXAS

June 2000

PREPARED BY:
TEXAS NATURAL RESOURCE CONSERVATION COMMISSION
SUPERFUND CLEANUP SECTION
REMEDIATION DIVISION

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TEXAS AMERICAN OIL MIDLOTHIAN, ELLIS COUNTY, TEXAS PROPOSED REMEDIAL ACTION DOCUMENT

I. INTRODUCTION

The Texas American Oil State Superfund site (TAO), as shown in Figure 1, is located approximately 3 miles north of Midlothian, Ellis County, Texas, just west of Highway 67. The site covers 8 acres, and land use near the site is primarily rural. Old Highway 67 borders the eastern site boundary. Residential areas are located south and west of the site, and commercial properties are present along the northern site boundary. The property is currently inactive. No buildings are present; however, several large concrete slabs are located on-site.

The site was divided into three sections (Figure 2) for the Remedial Investigation (RI). The waste pits are located within the western third of the site. Here, oily wastes were disposed of in unlined impoundments. The lower process area makes up the middle third of the site, and is presumably the former location of several process units. The upper process area, where some above ground storage tanks were located, makes up the eastern third of the site.

II. STATEMENT OF BASIS AND PURPOSE

This *Proposed Remedial Action Document (PRAD)* presents the proposed *Remedial Action*, which is designed to ensure the protection of public health and safety and the environment at the TAO site. The selection of the proposed Remedial Action 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 response action will be conducted under the Risk Reduction Rules found in Title 30, Chapter 335, Subchapter S. Words appearing in italics in this document are defined in Section IX, Glossary.

The purposes of this document are:

- to describe the actions taken by the *Texas Natural Resource Conservation Commission (TNRCC)* to investigate and mitigate the contamination;
- 2) to solicit public review and comment on the actions taken and decisions made by the TNRCC with regard to the proposed Remedial Action; and
- 3) to provide information on how the public can comment on the actions taken by the TNRCC with regard to the proposed Remedial Action.

This PRAD summarizes information that can be found in greater detail in various studies and reports located in the site files. Relevant documents summarized in this PRAD include:

- 1) the *Hazard Ranking System* document that consists of the preliminary evaluation (ranking) that qualified the site for listing on the State Registry and allowed funds to be used to investigate and remediate the site under the State Superfund program;
- 2) the *Remedial Investigation* Report that contains the Technical Report from the State's consultant, which has the results of the sampling and analyses data collected during the remedial investigations at the site;
- 3) the *Baseline Risk Assessment Report*, which assesses the potential human health and ecological risks posed by contamination at the site; and
- 4) the *Presumptive Remedy Document* that describes and evaluates the alternatives for the Remedial Action.

The TNRCC encourages the public to review these documents to gain a better understanding of the TAO site, the State Superfund process, and the actions taken by the TNRCC. Copies of the documents summarized in this PRAD, as well as other relevant information, can be found in Midlothian at the following location:

A.H. Meadows Library 921 South 9th Street Midlothian, Ellis County, Texas 76065

or in Austin at the TNRCC Records Management Center:

TNRCC Building D, Room 190 12100 Park 35 Circle Austin, Texas 78753

III. SITE HISTORY

Prior to 1970, the site was used as a limestone quarry. The face of the former quarry rises about 65 feet from the floor along the northern site boundary. Along the southern boundary, a smaller face about 20 feet above the quarry floor is present. From 1970 to 1978, the TAO site was a used crankcase and transmission oil refinery. During the operation, the used wastes were placed in three unlined pits located on the western portion of the site. When the refinery closed, the waste pits were pumped out, and the sludge remaining in the pits was mixed with

soil. Reportedly, the pits were then covered with a three-inch layer of asphalt in compliance with an order from the Texas Department of Water Resources.

The asphalt cover has since cracked allowing infiltration of surface runoff and migration of wastes from the pits. Following storm events, an oily residue has been observed in the drainage ditch bordering the north end of the waste pit. The oily residue appears to be seeping from the asphalt cap and the perimeter of the north side of the waste pit area.

Jones & Neuse conducted a site inspection for the TNRCC in 1987. Soil and sediment samples were collected and analyzed for total metals (barium, lead, and chromium) and volatile organic compounds. Results indicated elevated levels of metals, but they did not detect volatile organics. As a result of the site inspection, a Hazard Ranking System (HRS) analysis was done for the site, which received a HRS score of 19.07.

Lockwood, Andrews & Newnam, Inc.(LAN) conducted a Remedial Investigation (RI) of the TAO site between 1992 and 1994, and submitted an RI report, dated August 1995, to the TNRCC. The RI identified barium, chromium, lead, chloroform and polychlorinated biphenyls (PCBs) as chemicals of potential concern (COPC) in soil at the site. Based on the RI data, Harding Lawson Associates (HLA) conducted a Risk Assessment (RA) study on the site. Prior to the beginning of the treatability study, in December 1998 Roy F. Weston (Weston) conducted additional sampling and analyses of soil and groundwater at the site and confirmed lead, PCBs, and chloroform as the appropriate soil COCs for the site. In May 2000 Weston also prepared the Presumptive Remedy Document (PRD). These investigations are summarized below.

IV. SUMMARY OF INVESTIGATION REPORTS

A. REMEDIAL INVESTIGATION

Soil Contamination

Both surface and subsurface soil samples were analyzed to determine the extent of contamination at the site. The upper 0 to 5 feet of the subsurface consists of topsoil and residual clays from the Austin Chalk formation. Bedrock was generally encountered between two and five feet and consisted of interbedded, weathered shale and limestone. Samples were analyzed for metals, volatile and semi-volatile organic compounds, PCBs, and pesticides.

Waste Pit

The highest levels of total organic compounds (148 mg/kg) at the site were found in and around the waste pits at a depth of 2.5 to 5 feet. PCB concentrations ranged from

below detection to 15.4 mg/kg. The highest concentrations of barium, chromium, and lead were detected in the waste pits. Lead values in the waste pits ranged from 29.9 to 22,500 mg/kg; the highest barium concentration was 3,160 mg/kg and that of the chromium was 4.2 mg/kg. It appeared that contaminant migration from the waste pits had occurred both to the north, as well as to the southwest.

Lower Process Area

In addition to the surface and subsurface samples, sediments were also sampled and analyzed in this area. The highest level of total organic compounds was 73.6 mg/kg at a depth of zero to 2.5 feet. The PCB concentration ranged from below detection to 12.3 mg/kg. Barium, chromium, and lead were detected near the surface by the north cliff face and near or in the drainage ditch. Lead values range from 168 to 2,610 mg/kg. The highest concentrations of barium and chromium were 273 mg/kg and 11.6 mg/kg, respectively.

Upper Process Area

Metals appear to be a surface phenomenon in this area with concentrations significantly decreasing with increasing depth. At a depth of zero to 2.5 feet, the highest concentrations of barium, chromium and lead were 57.4 mg/kg, 8.9 mg/kg, and 195 mg/kg, respectively. Organic compounds were detected at very low levels in this area and appeared to be limited to the upper 5 feet of the subsurface. Part of these organic compounds were most likely due to a laboratory contaminant.

Groundwater Contamination

Groundwater samples were collected from the eight monitor wells. The three off-site public supply and irrigation wells were also sampled. The samples were analyzed for metals, volatile and semi-volatile organic compounds, PCBs and pesticides. Metals were not detected above the drinking water maximum contaminant level (MCL). Vinyl chloride was the only organic compound detected in the groundwater samples collected from the monitor well MW-02. Its concentrations ranged from 0.061 mg/l to 0.11 mg/l, its MCL being 0.002 mg/l.

Neither metals nor organic compounds were detected in the two wells immediately south of the site at the trailer park. Groundwater generally flows from northeast to southwest beneath the site and has apparently not been impacted to the north or south of the site.

B. BASELINE RISK ASSESSMENT (BRA)

1. Human Health

A Baseline Risk Assessment is a procedure that uses a combination of facts and assumptions to estimate the potential for adverse effects on human health from exposure to contaminants found at a site. Risks are determined by comparing conservatively pre-calculated medium specific concentration values that are protective of human health, and actual chemical concentrations at a site. Conservative assumptions used in calculating risks weigh in favor of protecting human health.

A BRA was performed for the TAO site by HLA in October 1995. The RI data were used to identify the Chemicals of Potential Concern (COPCs), develop exposure scenarios, assess toxicity characteristics and calculate exposure point concentrations. The BRA report provided site-specific calculations for estimating non-carcinogenic adverse health effects and carcinogenic health risks for the following three scenarios:

- Adult Residential
- Child/Adult Residential
- Industrial Worker

The exposure media considered were soil (both surface and sub-surface) and groundwater. The specific exposure pathways considered were:

- Soil: Ingestion, Inhalation, Dermal, and Migration to Groundwater;
- Groundwater: Ingestion, Inhalation, and Dermal.

Based on the risk assessment calculations, for an adult residential receptor, the cumulative risk for all the exposure pathways results in a cancer risk calculation of 5.8 E⁻⁴ and a non-carcinogenic hazard index of 0.7. For the child/adult scenario, the cumulative risk for all of the exposure pathways resulted in a cancer risk calculation of 8.0 E⁻⁴ and a non-cancer hazard index of 2.0. For an industrial worker scenario, a carcinogenic risk of 8.2 E⁻⁵ was calculated with a hazard index of 0.2. The constituents contributing the majority of risk at the TAO site were identified to be lead in the soil and vinyl chloride in the groundwater.

2. Ecological

The RA also evaluated potential ecological receptors at the site. Except in areas of concrete or asphalt, the site is characterized mainly by short grasses including Johnson grass, pancium, and paspalum. Significant population of snow-on-the-mountain, ragweed, cottonwood, and sunflower are also present at certain time of the year. Among the trees are scrubby cedars, mesquite, cottonwoods, and oaks. Shallow soil depths limit the size of the trees.

Deer, squirrel, rabbits, quail, dove, waterfowl and fish are common in Ellis County. Some of them are likely to be present in the wooded area around the site. A search of the Texas Natural Heritage Program Information System "revealed no presently known occurrences of special species or natural communities in the immediate vicinity of the site."

C. ADDITIONAL INVESTIGATION

Weston performed additional investigation of the TAO site to collect data to be used in combination with the RI data to conduct a *feasibility study* for the determination of remedial alternatives. A total of 102 samples were analyzed for barium, chromium, and lead in the field using a field portable X-ray Fluorescence Analyzer (XRF). Fifteen of these samples were submitted to the laboratory for the analysis of barium, chromium and lead by Synthetic Precipitation Leaching Procedure (SPLP). All the SPLP barium and chromium results were below the ground water protection values. The maximum concentration of lead, 51,698 mg/kg, was detected outside the waste pit area at a depth of 3 feet. A PCB concentration of 125.7 mg/kg was detected for a sludge collected from a former tank bottom. The maximum PCB concentration for soil inside the waste pit area was detected to be 20.9 mg/kg. The maximum concentration reported for chloroform was 136 mg/kg in the waste pit area. The volume of soil potentially requiring remediation was estimated to be 37,000 cubic yards.

Based on the RI, barium, chloroform, chromium, lead and PCBs were identified as potential constituents of concern for soils. The additional investigation conducted in 1998 indicated that barium and chromium concentrations at the site were below cleanup levels. Therefore, the soil constituents of concern and the *Preliminary Remediation Goals* are as follows:

SOIL ACTION LEVELS

| Constituent of Concern | SAI-Res (mg/kg) ^a | GWP-Res (mg/kg) ^b |
|------------------------|------------------------------|------------------------------|
| Lead | 500 | 323 |
| Chloroform | .31 | 10 |

PCBs 10 .05

A site-specific Ground Water Protection (GWP) value for lead was determined based on total lead and Synthetic Precipitate Leachate Procedure (SPLP) lead analysis following completion of the December 1998 investigation. The cleanup level for chloroform is the SAI-Residential level. The PCB cleanup level is 10 ppm. The SAI-Res level of 10 ppm is based on the TSCA limit defined in 40 CFR 761.125. PCBs were not reported in samples collected from the eight monitoring wells at the site. PCBs present in the waste and soil have not impacted shallow ground water. For this reason the RRS (Risk Reduction Standard) No. 2 SAI value was selected as the appropriate cleanup goal for the soils outside the waste pit area

The ground water was resample in December 1998 to verify the presence of vinyl chloride. This constituent was responsible for the calculated ground water risk in the BRA. The sample results that exceeded RRS No. 2 GW-RES values were benzene in two monitoring wells and chlorobenzene and 1,4-dichlorobenzene in one well. Vinyl chloride was not detected in samples collected from the monitor wells. Therefore, vinyl chloride was dropped from the list of COCs.

GROUND WATER ACTION LEVELS

| Constituent of Concern | GW-Res (mg/L) ^a |
|------------------------|----------------------------|
| Benzene | 0.005 |
| Chlorobenzene | 0.1 |
| 1.4-dichlorobenzene | 0.075 |

^aGW-RES - Ground water concentration for Residential Use

^a SAI-Res soil MSC for Residential use based on inhalation, ingestion, and dermal contact

^b GWP-Res soil MSC for residential use based on groundwater protection

D. PRESUMPTIVE REMEDY DOCUMENT

Weston, the TNRCC's consultant, prepared the Presumptive Remedy Document (PRD), which compares different possible Remedial Action alternatives, that are based on criteria established by State regulations. The proposed Remedial Action for the TAO site is selected based on the Remedial Action that the Executive Director of the TNRCC determines to be the lowest cost alternative, which is technologically feasible and reliable, effectively mitigates and minimizes damage to the environment, and provides adequate protection of the public health and safety and the environment. During the preparation of the PRD, a treatability study was conducted to determine the most effective procedure to treat the wastes in the pits and the contaminated soil. The cleanup goals for the TAO site COCs are as follows:

- Lead: A site-specific groundwater protection (GWP) value of 323 mg/kg was determined based on the total and SPLP lead analysis.
- PCBs: Since the onsite containment option includes a clay cap covering the treated waste and a perimeter fence surrounding the waste pit area, the TSCA Spill Cleanup Policy was interpreted as allowing onsite containment of soils with PCB concentrations up to 100 mg/kg. Use of 10 mg/kg as a PCB cleanup goal for the soil outside the waste pit area assumed that access to the containment area will be restricted.
- Chloroform: The selected chloroform cleanup goal is 0.31 mg/kg.

The three options for treatment, containment and capping of the waste and affected soil at the TAO site include the following:

- Option 1 In-situ Stabilization
- Option 2 Ex-situ Stabilization
- Option 3 Without Stabilization (Slurry wall)

Each option involves excavation of contaminated soils outside the waste pit area followed by transportation to the waste pits and remediation along with the wastes in the pits. The first two options involve stabilization of the affected soil and the oily waste prior to the implementation of a capping system. The stabilized product will have sufficient Unconfined Compressive Strength (UCS) to support the weight of the cap, low enough permeability to minimize water infiltration, and low leachability to minimize liquid release from the stabilized waste.

The third option involves the installment of a sheet pile or slurry wall system that prohibits the migration of contaminants. This option does not involve any treatment of waste, but relies on the barrier system and the bedrock (approximately 12 feet below ground surface) to prevent migration of contaminants.

It should be noted that all three options require restriction for future land use, and fencing and deed restriction of the containment area. Additionally, TSCA requirements dictate that the material in the former tank bottom, where PCB concentrations exceeded 100 mg/kg, be excavated and disposed off-site.

A treatability study was conducted to identify the most cost effective mixture design capable of improving the physical properties of the affected soil. The goal of the study was to stabilize the soil in order to meet the following criteria:

- Unconfined Compressive Strength (UCS): >15 psi
- Permeability: < 10E⁻⁷ cm/s
- Liquid Release Test: Pass (no liquid released from the treated sample)

Based on the laboratory treatability study results, it was recommended to use a mixture of 15% Type I Portland Cement and 15% hydrated lime to stabilize the wastes.

Based on the evaluation of the TAO site using the presumptive remedy process, containment with stabilization (in-situ) is the recommended alternative (Figure 3).

V. PROPOSED REMEDIAL ACTIONS

Containment with in-situ stabilization will significantly reduce the mobility and toxicity of the contaminants, which will reduce the threat to groundwater from the treated soil as well as reduce seepage of the stabilized materials from the pit area. In addition to stabilization, the construction of a clay cap will prevent direct contact of potential receptors to the impacted soil and will provide a barrier to the infiltration of storm-water and surface water. In-situ stabilization is also the most cost-effective.

A small volume of soil having PCB concentrations of more than 100 mg/kg will be excavated and disposed of off-site. The area surrounding the waste pits will be fenced and groundwater monitoring wells will be installed. After closure, the cap area and remaining site areas with constituents exceeding background concentrations will be deed recorded. Long-term maintenance and groundwater monitoring of the cap system will be conducted.

VI. EVALUATION OF THE PROPOSED REMEDIAL ACTION

The Executive Director of the TNRCC proposes containment with in-situ stabilization as the Remedial Action for the Texas American Oil site. The TNRCC has evaluated and selected it as the Remedial Action that is the lowest cost alternative that is technologically feasible and reliable, effectively mitigates and minimizes damage to the environment, and provides adequate protection of the public health and safety and the environment.

VII. SUMMARY OF RECOMMENDED REMEDIAL ACTION

As a result of an evaluation of the above-mentioned criteria, the TNRCC proposes Remedial Action alternative Option 1 (In-situ Stabilization and a containment cap) as the remedy for the TAO site. A summary of the activities required to implement the recommended remedy is provided below:

- Excavation of soils outside the waste pit area that are above residential health-based levels.
- Placement of the excavated soils from the waste pit area and from surface soils outside the waste pit area to a staging location.
- Stabilization of the affected soil in the waste pit area for the interval of 5 to 12 feet below ground surface. A stabilizing mix of 15% fly ash and 15% portland cement is recommended.
- Installation of a cap system over the former waste pit area to minimize infiltration. The clay will be compacted according to the final design and covered with topsoil. The topsoil will be seeded and irrigated to establish vegetation.
- Installation of groundwater monitoring wells around the waste pit area, and the abandonment of the existing monitoring wells in the other site areas.
- Deed recordation of the cap system and remaining site areas with constituents exceeding background concentrations.
- Long-term maintenance and groundwater monitoring to verify the performance of the stabilization and cap system and observe the concentrations of the constituents detected in the ground water.

VIII. COMMUNITY PARTICIPATION IN THE SUPERFUND PROCESS

The public is invited to comment on the proposed Remedial Action for the TAO site. Those wanting to make oral comments may do so at the Public Meeting. The meeting is scheduled for 6:30 p.m. July 31, 2000, 6:30 p.m., City Hall Chambers, located at 104 West Avenue E, Midlothian, Texas. The Public Comment Period begins June 23, 2000, and ends on July 31, 2000, at the close of the public meeting. During this time period, the public may comment on any aspect of the site, the proposed Remedial Action, the investigation of the site or other

TNRCC actions concerning the site. Written comments concerning the proposed Remedial Action must be received by the close of the public meeting on July 31, 2000. Comments should be submitted to:

Michael L. Garrigan, Project Manager Superfund Cleanup Section (MC 143) Remediation Division Texas Natural Resource Conservation Commission P.O. Box 13087 Austin, Texas 78711-3087

The TNRCC will respond to all comments received during the public comment period in the *Responsiveness Summary*. The Responsiveness Summary will be made available to the public upon request and in the site files.

IX. GLOSSARY

Baseline Risk Assessment (BRA) — a process to characterize the current and potential threats to human health and the environment that may be posed by contaminants migrating to groundwater or surface water; releasing to air; leaching through soil; remaining in the soil and bio-accumulating in the food chain. The primary purpose of the baseline risk assessment is to provide risk managers with an understanding of the actual and potential risks to human health and the environment posed by the site and any uncertainties associated with the assessment. This information may useful in determining whether a current or potential threat to human health or the environment exists that warrants remedial action.

Feasibility Study (FS) — A study that describes and evaluates a set of remedial action alternatives for effectively mitigating or minimizing damage to, and providing adequate protection of, the public health and safety and the environment.

Hazard Ranking System (HRS) — The method used by the U.S. Environmental Protection Agency and the TNRCC to evaluate relative potential of hazard substance release to cause health or safety problems, ecological or environmental damage. The scoring system was developed by the U.S. Environmental Protection Agency as set out in 40 Code of Federal Regulations Part 300, Appendix A, as amended.

Preliminary Remediation Goals — The concentration of contaminants in soil, sediment, water or air which are protective of human health, safety and the environment.

Presumptive Remedy — preferred proven technologies for common categories of sites, based on the TNRCC's experience and its scientific and engineering evaluation of alternative

technologies. The objective of the presumptive remedies initiative is to use the Superfund program's experience to streamline site characterization and speed up the selection of cleanup actions.

Proposed Remedial Action Document (PRAD) — The document which describes the TNRCC's planned remediation.

Remedial Action — An action, including remedial design and post-closure care, consistent with a remedy taken instead of or in addition to a removal action in the event of a release or threatened release of hazardous substances into the environment to prevent or minimize the release of a hazardous substance so that the hazardous substance does not cause an imminent and substantial endangerment to present or future public health and safety or the environment.

Remedial Investigation — An investigative study which may include removals, feasibility study, baseline risk assessment, or similar study, designed to adequately determine the nature and extent of release or threatened release of hazardous substances and, as appropriate, its impact on airs, soils, groundwater and surface water, both within and beyond the boundaries of the facility.

Responsiveness Summary — A document in which the TNRCC summarizes its response to all comments received on the PRAD during the public comment period.

Texas Natural Resource Conservation Commission (TNRCC) — The State agency given primary responsibility for implementing the constitution and laws of this State relating to the conservation of natural resources and protection of the environment.

Texas Solid Waste Disposal Act (SWDA) — the 71st Legislature in 1990 codified Chapter 361 of the Texas Health and Safety Code, and took control of hazardous waste storage, processing and disposal, requiring that only permitted hazardous industrial solid waste facilities be allowed to accept and process hazardous waste. The state assesses a registration fee of \$25-500 per disposal site, plus an average of 50 cents a ton for hazardous waste hauled to the permitted facilities. These collected fees are added to the Hazardous & Solid Waste Remediation Fee Account for use by the Texas Natural Resource Conservation Commission (TNRCC) and other state agencies that deal with hazardous waste.

