

Five-Year Review Report

**First Five-Year Review Report
for
MOTCO Superfund Site
La Marque, Galveston County, Texas**

September 2002

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Work Assignment Number 948-FRFE-06ZZ**

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FIVE-YEAR REVIEW
MOTCO Superfund Site
EPA ID# TXD980629851
La Marque, Galveston County, Texas

This memorandum documents the United States Environmental Protection Agency's (EPA's) performance, determinations, and approval of the MOTCO Superfund Site First Five-Year Review, provided in the attached First Five-Year Review Report prepared by CH2M HILL, Inc., on behalf of EPA.

Summary of Five-Year Review Findings

The first five-year review for this site indicates that the remedial actions set forth in decision documents for this site have been implemented as planned. The original onsite pits have been remediated (the wastes excavated, stabilized, and disposed in the excavated pits onsite), a cap is in place to protect the stabilized wastes, and a 55 foot deep cutoff slurry wall that forms a closed perimeter around the site is in place to help prevent migration of affected ground water from inside the wall, with inward and upward gradients across the wall maintained by the ground water extraction system. The Long-Term Response Action (LTRA) is ongoing; LTRA activities include pumping of affected ground water and DNAPL in the Transmissive Zone inside the cutoff slurry wall, pumping of affected ground water in the Upper Chicot (UC-3) beneath the site, treatment and discharge onsite of the extracted ground water, offsite incineration of the extracted DNAPL, performance and compliance monitoring to ensure the remedial action continues to perform as planned, and maintenance of the cap, slurry wall, and onsite ground water treatment plant. The site is staffed with 3 operators (a minimum of one onsite 7 days/week, and on-call after hours), and the site is well-maintained.

Two issues were identified that do not currently affect the protectiveness of the site. In some areas of the cap, it appears that settlement has occurred, as evidenced by a lowering of the ground surface around LTRA well pads located on the cap. Also, a Texas Department of Transportation lift station has been installed near the site; this lift station was installed to control flooding, and has the effect of keeping ground water levels in check in the vicinity of the site. During periods of heavy rain, however, this may make it more difficult than it had been previously to maintain inward gradients across the wall.

In addition, there are currently two areas of the site where ground water concentrations sometimes exceed compliance monitoring standards outside the influence of the current extraction and migration-prevention system. One area is in the top zone of the Upper Chicot aquifer (UC-1), where indicator constituent bis(2-chloroethyl)ether has been detected at or above the compliance monitoring standard in 71 of 219 LTRA monitoring event samples collected since January 1997 (32%). The second area is in the Transmissive Zone (TZ) outside the cut-off slurry wall at monitoring well cluster M-5, where bis(2-chloroethyl)ether has been detected at or above the compliance monitoring standard in the TZ-2 well located outside the cutoff slurry wall (M5D), in 15 of 27 LTRA monitoring event samples collected since October 1995 (56%). Both issues are being monitored by EPA and MOTCO, and appear to be relatively stabilized (the concentrations are decreasing or do not seem to be increasing), and there does not appear to be a current risk of exposure. The need for additional response actions in these two areas should be re-evaluated at least annually, or if conditions change, and should be considered in the next five-year review. To help with the continuing evaluation of the TZ-2 at M-5, it is suggested that MOTCO reinstate quarterly sampling at M5D (the TZ2 well located inside the cutoff slurry wall, across from TZ2 well M5F).

Actions Needed

Continue site operations, maintenance and LTRA monitoring as currently defined, with special review at least annually of conditions in the UC-1 aquifer monitoring wells and in the TZ-2 monitoring wells at cluster M-5 where exceedances of compliance monitoring standards have been documented outside the cutoff slurry wall, and consider additional response actions if warranted or if conditions change.

Reinitiation of quarterly sampling at TZ-2 well M5D (located inside the cutoff slurry wall) is suggested to help with the ongoing evaluation of the TZ-2 exceedances outside the cutoff slurry wall at cluster M-5. Also, the settlement of the cap should be evaluated, addressed if necessary, and monitored.

Determinations

I have determined that the remedy for the MOTCO Superfund Site is protective of human health and the environment in the short term, and will remain so provided the action items identified in the Five-Year Review Report are addressed as described above.

Myron O. Knudson, P.E.
Director, Superfund Division
U.S. Environmental Protection Agency, Region 6

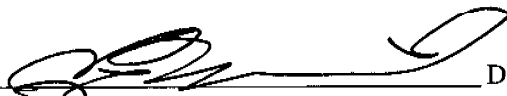
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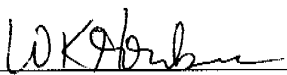


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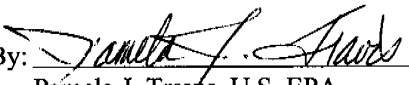
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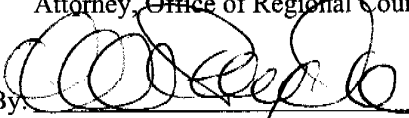
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MOTCO Superfund Site
EPA ID# TXD980629851

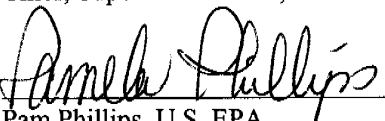
By:  Date: 17 Sep 2002
Earl Hendrick, U.S. EPA
Remedial Project Manager

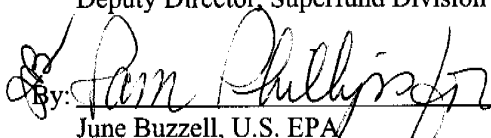
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List of Acronyms

AOC	Administrative Order on Consent
ARARs	Applicable or Relevant and Appropriate Requirements
bgs	below ground surface
CAA	Clean Air Act
CAP	Corrective Action Plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
C & I	Construction and Implementation
cm	centimeter
CWA	Clean Water Act
DNAPL	Dense Non-Aqueous Phase Liquid
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
FR	Federal Register
H.L.&P.	Houston Lighting and Power
IRM	Initial Remedial Measure
LNAPL	Light Non-Aqueous Phase Liquid
LTRA	Long Term Response Action
MCL	Maximum Contaminant Level
mg/l	milligrams per liter
MOM	Management of Migration
msl	mean sea level
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
OUs	Operable Units
PAHs	Polycyclic Aromatic Hydrocarbons
PCL	Protective Concentration Level
PCOR	Preliminary Close Out Report
ppb	parts per billion
ppm	parts per million
PRP	Potentially Responsible Parties
RAMP	Remedial Action Master Plan
RAP	Response Action Plan
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SDWA	Safe Drinking Water Act
SVOC	Semi-Volatile Organic Compound
TAG	Technical Assistance Grant

TBCs	To Be Considered
TCEQ	Texas Commission on Environmental Quality
TDS	Total Dissolved Solids
TDWR	Texas Department of Water Resources
TNRCC	Texas Natural Resource Conservation Commission
TRRP	Texas Risk Reduction Program
TWC	Texas Water Commission
TxDOT	Texas Department of Transportation
TZ	Transmissive Zone
UAO	Unilateral Administrative Order
UC	Upper Chicot (aquifer)
USCG	United States Coast Guard
VOC	Volatile Organic Compound

Executive Summary

The first five-year review of the MOTCO Superfund Site located in La Marque, Galveston County, Texas, was completed in September 2002. The results of the five-year review indicate that the remedy completed to-date is currently protective of human health and the environment in the short term. Overall, the remedial actions performed appear to be functioning as designed, and the site has been maintained appropriately. No deficiencies were noted that currently impact the protectiveness of the remedy, although several issues were identified that require further action to ensure the continued protectiveness of the remedy.

The U.S. Environmental Protection Agency (EPA) originally organized the work for this site into two Operable Units (OUs): Source Control; and Management of Migration (MOM). The Record of Decision (ROD) for the Source Control OU was signed in March 1985, to address onsite waste pits and their contents, and the ROD for the MOM OU was signed in September 1989, to address remediation of offsite soil and affected subsurface media, including ground water. Because the MOM OU ROD was signed after the Superfund Amendments and Reauthorization Act (SARA) in 1986, and because hazardous substances remain onsite above levels that allow for unrestricted use and unrestricted exposure, performance of the five-year review for the MOTCO site is required by statute.

The 1985 Source Control ROD selected offsite incineration of liquid organic pit contents, offsite treatment of contaminated pit water, and offsite landfilling of tars, sludges and soil. The ROD also provided for onsite incineration of all waste materials to be considered during the remedial design phase. In 1987, EPA entered into a partial consent decree with a number of Potentially Responsible Parties (PRPs), who agreed to perform the Source Control remediation using onsite incineration.

The 1989 MOM ROD selected excavation of shallow offsite soils and ditch sediments, placement of excavated materials onsite beneath a cap, extraction and treatment of contaminated shallow and deep ground water by the Best Available Technology (BAT), removal and incineration of Dense Non-Aqueous Phase Organic Liquids (DNAPL) to the extent feasible, long-term compliance monitoring, installation of deed restrictions or notices to prohibit land development, and installation of additional security fencing

around the site. The remedial design for the MOM OU, conditionally approved by EPA in September 1992, included a long-term ground water and DNAPL extraction and treatment system and construction of a cutoff slurry wall to enhance ground water recovery and to help control ground water flow.

As a result of information generated after selection of the Source Control and MOM remedies, EPA determined that a significant change to a component of the remedy selected in the Source Control ROD was necessary. Specifically, this change involved stabilization and capping of contaminated solids/soil onsite rather than offsite incineration or landfilling, with liquids, sludges, and tars still to be incinerated offsite. An Explanation of Significant Differences (ESD) was prepared and signed on January 13, 1993. The adjustment to the remedy was expected to decrease the time required for remediation and increase the cost-effectiveness of the remedy. EPA entered into a consent decree with the PRPs in June 1993 which provided for the combined implementation of the modified Source Control and MOM remedies. The combined remedy was designed and implemented, and EPA conducted the final site inspection for the site and issued the Preliminary Close Out Report in September 1997.

As of September 2002, the original onsite pits have been remediated (the solids/soil excavated, stabilized, and disposed in the excavated pits onsite, and the liquid/sludges/tars incinerated offsite). A cap is in place to isolate the disposed onsite wastes. A 55 foot deep cutoff slurry wall that forms a closed perimeter around the site is in place to help prevent migration of affected ground water from inside the wall, with inward and upward gradients across the wall maintained by a ground water extraction system. The Long-Term Response Action (LTRA) is ongoing; LTRA activities include pumping of affected ground water and DNAPL in the Transmissive Zone inside the cutoff slurry wall, pumping of affected ground water in the Upper Chicot (UC-3) aquifer beneath the site, treatment and discharge onsite of the extracted ground water, offsite incineration of the extracted DNAPL, performance and compliance monitoring to ensure the remedial action continues to perform as planned, and maintenance of the cap, slurry wall, and onsite ground water treatment plant. The site is currently staffed with 3 operators (a minimum of one onsite 7 days/week, and on-call after hours), and the site is well-maintained.

A total of 32,349 gallons of DNAPL have been recovered through calendar year 2001. The lowest average monthly recovery rate was for calendar year 2000 at a recovery rate of approximately 402 gallons per month. The highest DNAPL recovery rate was for the calendar year 2001 with an average recovery rate of approximately 570 gallons per month. Through 2001, a total of 11,841,001 gallons of ground water have been recovered from the Transmissive Zone (TZ) and a total of 31,177,573 gallons of ground water have been recovered from the Upper Chicot aquifer (UC-3).

During the five-year review, two issues were identified that do not currently affect the protectiveness of the site. In some areas of the cap, it appears that settlement has occurred, as evidenced by a lowering of the ground surface around LTRA well pads located on the cap. Also, a Texas Department of Transportation lift station has been installed near the site; this lift station was installed to control flooding, and has the effect of keeping ground water levels in check in the vicinity of the site. During periods of heavy rain, however, this may make it more difficult than it had been previously to maintain inward gradients across the wall so that any contaminated water would not leak from within the area surrounded by the slurry wall to the outside.

In addition, there are currently two areas of the site where ground water concentrations sometimes exceed compliance monitoring standards outside the influence of the current extraction and migration-prevention system. One area is in the top zone of the Upper Chicot aquifer (UC-1), where indicator constituent bis(2-chloroethyl)ether has been detected at or above the compliance monitoring standard in 71 of 219 LTRA monitoring event samples collected since January 1997 (32%). The second area is in the Transmissive Zone (TZ) outside the cut-off slurry wall at monitoring well cluster M-5, where bis(2-chloroethyl)ether has been detected at or above the compliance monitoring standard in the TZ-2 well located outside the cutoff slurry wall (M5D), in 15 of 27 LTRA monitoring event samples collected since October 1995 (56%). Both issues are being monitored by EPA and MOTCO, and appear to be relatively stabilized (the concentrations are decreasing or do not seem to be increasing), and there does not appear to be a current risk of exposure. The need for additional response actions in these two areas should be re-evaluated at least annually, or more frequently if conditions change, addressed if necessary, and should be considered in the next five-year review.

Recommended further actions include continue site operations, maintenance and LTRA monitoring as currently defined, with special review at least annually of conditions in the UC-1 aquifer monitoring wells and in the TZ-2 monitoring wells at cluster M-5 where exceedances of compliance monitoring standards have been documented, and consideration of additional response actions if warranted or if conditions change. To help with the continuing evaluation of the TZ-2 at M-5, it is suggested that MOTCO reinitiate quarterly sampling at M5D (the TZ2 well located inside the cutoff slurry wall, across from TZ2 well M5F). Also, the settlement of the cap should be evaluated and monitored. The next five-year review should be completed by September 2007.

Five-Year Review Summary Form		
SITE IDENTIFICATION		
Site name (from WasteLAN): MOTCO Trust Group		
EPA ID (from WasteLAN): TXD980629851		
Region: EPA Region 6	State: Texas	City/County: La Marque/Galveston County
SITE STATUS		
NPL Status: <input checked="" type="checkbox"/> Final <input type="checkbox"/> Deleted <input type="checkbox"/> Other (specify):		
Remediation status (choose all that apply): <input type="checkbox"/> Under Construction <input checked="" type="checkbox"/> Operating <input type="checkbox"/> Complete		
Multiple OUs? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Construction completion date: 1997	
Has site been put into reuse? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
REVIEW STATUS		
Reviewing agency: <input checked="" type="checkbox"/> EPA <input type="checkbox"/> State <input type="checkbox"/> Tribe <input type="checkbox"/> Other Federal Agency:		
Author: EPA Region 6, with support from RAC6 contractor CH2M HILL, Inc.		
Review period: June 1993 through September 2002		
Date(s) of site inspection: July 2, 2002		
Type of review: <input checked="" type="checkbox"/> Statutory <input type="checkbox"/> Policy <input type="checkbox"/> Post-SARA <input type="checkbox"/> Pre-SARA <input type="checkbox"/> NPL-Removal only <input type="checkbox"/> Non-NPL Remedial Action Site <input type="checkbox"/> NPL State/Tribe-lead <input type="checkbox"/> Regional Discretion		
Review number: <input checked="" type="checkbox"/> 1 (first) <input type="checkbox"/> 2 (second) <input type="checkbox"/> 3 (third) <input type="checkbox"/> Other (specify):		
Triggering action: <input checked="" type="checkbox"/> Actual RA Onsite Construction <input type="checkbox"/> Actual RA Start <input type="checkbox"/> Construction Completion <input type="checkbox"/> Recommendation of Previous <input type="checkbox"/> Other (specify): Request from State Five-Year Review Report		
Triggering action date (from WasteLAN): June 24, 1993 (date of entry of Consent Decree)		
Due date (five years after triggering action date): June 1998.		

Five-Year Review Summary Form

Issues: Two issues were identified that do not currently affect the protectiveness of the site. In some areas of the cap, it appears that settlement has occurred, as evidenced by a lowering of the ground surface around LTRA well pads located on the cap. Also, a Texas Department of Transportation lift station has been installed near the site; this lift station was installed to control flooding, and has the effect of keeping ground water levels in check in the vicinity of the site. During periods of heavy rain, however, this may make it more difficult than it had been previously to maintain inward gradients across the wall so that any contaminated water would not leak from within the area surrounded by the slurry wall to the outside.

In addition, there are currently two areas of the site where ground water concentrations sometimes exceed compliance monitoring standards outside the influence of the current extraction and migration-prevention system. One area is in the top zone of the Upper Chicot aquifer (UC-1), where indicator constituent bis(2-chloroethyl)ether has been detected at or above the compliance monitoring standard in 71 of 219 LTRA monitoring event samples collected since January 1997 (32%). The second area is in the Transmissive Zone (TZ) outside the cut-off slurry wall at monitoring well cluster M-5, where bis(2-chloroethyl)ether has been detected at or above the compliance monitoring standard in the TZ-2 well located outside the cutoff slurry wall (M5D), in 15 of 27 LTRA monitoring event samples collected since October 1995 (56%). Both issues are being monitored by EPA and MOTCO, and appear to be relatively stabilized (the concentrations are decreasing or do not seem to be increasing), and there does not appear to be a current risk of exposure. The need for additional response actions in these two areas should be re-evaluated at least annually, or more frequently if conditions change, addressed if necessary, and should be considered in the next five-year review.

Recommendations and Follow-up Actions: Continue site operations, maintenance and LTRA monitoring as currently defined, with special review at least annually of conditions in the UC-1 aquifer monitoring wells and in the TZ-2 monitoring wells at cluster M-5 where exceedances of compliance monitoring standards have been documented outside the cutoff slurry wall, and consider additional response actions if warranted or if conditions change. Reinitiation of quarterly sampling at TZ-2 well M5D (located inside the cutoff slurry wall) is suggested to help with the ongoing evaluation of the TZ-2 exceedances outside the cutoff slurry wall at cluster M-5. Also, the settlement of the cap should be evaluated, addressed if necessary, and monitored.

Protectiveness Statement(s): The remedy for the Source Control OU at the MOTCO site is considered protective of human health and the environment because the waste has been removed or contained and is protected from erosion. The remedy for the MOM OU is considered protective of human health and the environment in the short term because migration of contamination has been restricted, and the Long-Term Response Action is being implemented as planned to reduce the volume of contamination and to control migration. Ongoing implementation of performance and compliance monitoring will ensure migration of contamination continues to be restricted.

Other Comments: The site is well-maintained and effectively operated.

First Five-Year Review Report MOTCO Superfund Site

The United States Environmental Protection Agency (EPA) Region 6 has conducted a five-year review of the remedial actions implemented at the MOTCO Superfund Site for the period June 1993 through July 2002. The site is located approximately two miles southeast of the City of La Marque, in Galveston, County, Texas. The purpose of a five-year review is to determine whether the remedy at a site remains protective of human health and the environment, and to document the methods, findings, and conclusions of the five-year review in a Five-Year Review Report. Five-Year Review Reports identify issues found during the review, if any, and recommendations to address them. This Five-Year Review Report documents the results of the review for the MOTCO Superfund site, conducted in accordance with EPA guidance on five-year reviews. EPA RAC6 contractor CH2M HILL provided support for conducting this review and the preparation of this report.

EPA guidance on conducting five-year reviews is provided by OSWER Directive 9355.7-03B-P, *Comprehensive Five-Year Review Guidance (EPA, June 2001)* (replaces and supercedes all previous guidance on conducting five-year reviews). EPA and contractor personnel followed the guidance provided in this OSWER directive in conducting the five-year review performed for the MOTCO site.

1.0 Introduction

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) call for five-year reviews of certain remedial actions. The EPA policy also calls for a five-year review of remedial actions in some other cases. The statutory requirement to conduct a five-year review was added to CERCLA as part of the Superfund Amendments and Reauthorization Act of 1986 (SARA). The EPA classifies each five-year review as either “statutory” or “policy” depending on whether it is being required by statute or is being conducted as a matter of policy. The five-year review for the MOTCO site is required by statute.

As specified by CERCLA and the NCP, statutory reviews are required for sites where, after remedial actions are complete, hazardous substances, pollutants, or contaminants will remain onsite at levels that

will not allow for unrestricted use or unrestricted exposure. Statutory reviews are required for such sites if the ROD was signed on or after the effective date of the Superfund Amendments and Reauthorization Act of 1986 (SARA). CERCLA §121(c), as amended by SARA, states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented.

Under the NCP, the Code of Federal Regulations (CFR) states, in 40 CFR §300.430(f)(4)(ii):

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

The five-year review for the MOTCO site is required by statute because the Record of Decision (ROD) for the Management of Migration (MOM) Operable Unit (OU) at the site was signed in 1989, after the effective date of SARA, and because materials remain onsite above levels that allow for unlimited use and unrestricted exposure. This is the first five-year review for the MOTCO site. The triggering action for this review is the date the Consent Decree describing implementation of the combined remedy for the site was entered, on June 24, 1993.

2.0 Site Chronology

A chronology of significant site events and dates is included in [Table 1](#), provided at the end of the report text. Sources of this information are listed in [Attachment 1, List of Documents Reviewed](#).

3.0 Background

This section describes the physical setting of the site, including a description of the land use, resource use, and environmental setting. Finally, this section briefly describes the history of contamination associated with the site, the initial response actions taken at the site, and the basis for each action.

3.1 Physical Characteristics

The MOTCO Superfund Site is located in La Marque, Texas, in Galveston County, near the intersection of State Highway 3 and the Gulf Freeway (I-45/US-75). The site originally consisted of an 11.3 acre tract of land (which expanded somewhat during remediation to address offsite contamination). The site is bounded on the east and south by State Highway 3/146, on the north-northwest by vacant land, and on the west-southwest by the right-of-way for Houston Lighting and Power transmission lines (HL&P). An abandoned trailer park was formerly located on the northwest boundary of the site. The Gulf Freeway (I-45/US-75) is located approximately 1000 feet to the west-southwest, beyond the HL&P right of way. The Omega Bay Subdivision is located about 1500 feet to the west-southwest and the Bayou Vista Subdivision is located approximately 1500 to 2000 feet south-southwest (west of the Gulf Freeway) (**EPA 1989**).

The MOTCO site sits on the Gulf Coastal Plain at the edge of a coastal marsh system, and in the Highland Bayou drainage basin. Area topography slopes gently toward the Gulf of Mexico; Galveston Bay is approximately 2 miles south of the site. The Jones Bay/Trinity/San Jacinto estuary is about 1.5 miles to the south. Site drainage occurs through ditches located along the southwestern perimeter of the site, which drain to Jones Bay through offsite drainage ditches. Portions of the site are at an elevation of +5 feet above mean sea level (msl), which puts the site within the 100-year tidal flood plain of +12 feet above msl. Consequently, these areas are subject to inundation. In February 2001, a lift station was installed at the junction of US Highway 3 and Interstate Highway 45 by the Texas Department of Transportation (TxDOT). The lift station was constructed to prevent inundation of the roadways in the event that severe weather requires the evacuation of coastal communities served by these highways.

The MOTCO site was initially an approximately 11.3 acre tract of land that was purchased for the purpose of recycling styrene tars generated by local industry. After the recycling business was

discontinued in 1961, the pits on the site were then used for disposal of industrial chemical wastes. In 1976 the site was abandoned. Prior to remediation, the site consisted of seven unlined pits varying in depth from 15 to 20 feet with a total surface area of 4.6 acres (EPA, 1989). The pits have been remediated and capped, a cutoff slurry wall installed around the perimeter of the affected materials, and an onsite ground water treatment facility is operating under a long-term response action to extract and treat ground water and maintain hydraulic gradients around the site. The locations of these site features are shown on **Figure 1**. The surface of the site is now covered with planted grasses. Site security is provided by a chain link fence. Site access is controlled via locked gates.

The uppermost geologic unit beneath the site is the Beaumont Clay Formation, which is composed of 800 to 1000+ feet of interbedded clay, sand and silt deposits (EPA 1989). Predominant near-surface geologic units are two channel sand/silt deposits at about 5 to 10 feet below ground surface (bgs) and 20 to 30 feet bgs, and an additional bar finger deposit at about 40 to 50 feet bgs (EPA 1989). These layers are separated by clayey silts and silty clays. The upper two sand/silt deposits originally intersected the unlined pits, and became a conduit for dissolved contaminants and DNAPL from the pits.

Hydrogeologically, the site consists of a Transmissive Zone (TZ) and the Upper Chicot aquifer (UC). The TZ consists of the TZ-1 (approximately 0 to -5 feet msl), TZ-2 (approximately -18 to 28 feet msl) and TZ-3 (approximately -35 to -48 feet msl). These units vary in thickness, depth and continuity across the site. TZ-3 is the most homogeneous and areally extensive of the three units. TZ-2 appears to be the most permeable layer. All three units appear to be interconnected. Prior to remediation, horizontal flow in the TZ was generally in a south to southeast direction at a seepage velocity ranging from 0.2 to 10 feet per year. (EPA 1989).

Underlying the TZ is the Upper Chicot clay layer (UC-1 clay) that overlies the Upper Chicot aquifer. This clay varies in thickness from 20 to 48 feet across the site. Historical laboratory permeability tests and a field pumping test indicated that hydraulic conductivity of this clay layer ranged from a high of 1×10^{-4} cm/sec to a low of 8×10^{-8} cm/sec, and, based on an assumed average porosity of 20%, the velocity of ground water flow in the clay was estimated at 0.22 feet per year. These data indicate that the Upper Chicot Clay provides some degree of confinement between the TZ and the UC aquifer (EPA 1989).

The Upper Chicot aquifer is subdivided into three water bearing units beneath the site, referred to as Upper Chicot aquifer units UC-1, UC-2 and UC-3. The exact depths and thicknesses of these units vary across the site. However, the average depth for the Upper Chicot 1 (UC-1) is generally -90 to -105 feet msl; Upper Chicot 2 (UC-2) is -150 to -210 feet msl; and the Upper Chicot 3 (UC-3) is below -230 feet msl (EPA, 1989).

3.2 Land and Resource Use

The 1989 MOM ROD indicated that approximately 3,000 people lived within a 1-mile radius of the site, and about 12,000 people lived within a 3-mile radius. Residential neighborhoods identified in the vicinity of the site were the Omega Bay subdivision (approximately 1,500 feet west-southwest of the site), the village of Bayou Vista (1,500 feet south-southwest), and a single residence located about 2,000 feet northwest of the site (EPA, 1989).

Land use in the area is divided principally among industry, urban business, agriculture, and marsh covered tracts with abundant wildlife. Railroads, highways, pipelines, and power transmission systems cross the area. The nearby bay and estuary waters are used for commercial and sport fishing, recreation, transportation, and mineral production (EPA, 1989).

3.3 History of Contamination

The MOTCO site was purchased by U. T. Alexander in 1959 for the purpose of recycling styrene tars generated by local industry. Hurricane damage in 1961 caused discontinuation of the recycling business. The pits on the site were then used for disposal of industrial petro-chemical wastes. In 1963, Alexander transferred ownership of the site to Petro Processors, Inc., a Texas corporation, of which U.T. Alexander was president. In 1964 the site was permitted as a disposal facility by the State of Texas and it continued to operate until 1968. In 1968, due to numerous odor complaints, the City of La Marque passed an ordinance prohibiting disposal of liquid wastes in surface impoundments which effectively forced Petro Processors out of business. In 1969, the Mainland Bank foreclosed on the site.

Through a series of subsequent owners who did not operate the site, it eventually became the property of T. Holman, J.R. McDonald, and MOTCO, Inc., a Minnesota corporation. These owners unsuccessfully

attempted to recycle the wastes in the pits and abandoned the project. At some point in the time during the recycling attempts, MOTCO bought Holman's and McDonald's interest in the site. In 1976, the Texas Department of Water Resources (TDWR), later known as the Texas Water Commission (TWC), now known as the Texas Commission on Environmental Quality (TCEQ), canceled MOTCO's permit by means of an Administrative Order and required a closure plan. Shortly thereafter, MOTCO, Inc. forfeited its right to do business in the State of Texas (although it remained an active corporation on the Minnesota Secretary of State's records) (EPA, 1989). The site remained abandoned, the online pits filled with styrene tars and disposed petrochemical wastes, and several response actions were performed until the site investigation was complete and the final remedies for the site were selected and implemented.

3.4 Initial Response

The first response action on the site was made by the City of La Marque, when it passed the ordinance prohibiting disposal of liquid wastes in surface impoundments. This action effectively forced Petro Processors, the owner of the site at that time, out of business.

In 1976, the Texas Department of Water Resources (TDWR), now the Texas Commission on Environmental Quality (TCEQ), canceled MOTCO's permit by means of an Administrative Order, and required a closure plan. During the period of May to September 1980, the U.S. Coast Guard, with recommendations and technical assistance from EPA and TDWR, used Clean Water Act Section 311 funds to remove drums that had been stored in and around an abandoned service station building, extend and raise the perimeter dikes, and secure the site by erecting a 6-foot fence around the perimeter (EPA 1989).

In February 1981, a Response Action Plan for the site was issued by EPA. In 1981 through 1982 an initial site investigation (including Tankage Waste Inventory) and a secondary site investigation that included characterization of pit wastes, analysis of surface soils, sediments, and waters and a ground water monitoring program was completed. Contamination of shallow ground water was confirmed, but the areal and vertical extent and degree of contaminant migration were not determined (EPA, 1989).

Three emergency response actions were conducted by EPA in September 1981, March 1983, and September 1983, to treat and discharge excess pit surface water collected in the extended and upgraded dikes constructed by the USCG. These response actions were conducted following periods of heavy rainfall and/or storm surges to reduce the potential for release of contaminants from dike overtopping (EPA, 1989).

In July 1982, EPA Region 6 ranked the site for inclusion on the National Priorities List (NPL) of Superfund sites. In May 1983, a Remedial Action Master Plan (RAMP) and a Source-Control Feasibility Study were completed. Based on assessment of available data and information contained in the RAMP, specific additional data requirements were identified. A specialized sampling/analysis program was conducted from September to November 1983.

In early 1984, an Initial Remedial Measure (IRM) was conducted by EPA. This IRM included removal and offsite disposal of wastes in the nine above-ground tanks and demolition/removal of those tanks.

3.5 Basis for Taking Action

The purpose of the response actions conducted at the MOTCO site was to protect public health and welfare and the environment from releases or threatened releases of hazardous substances from the site. Exposure to affected soil, ground water, surface water and sediment was determined to be associated with human health risks higher than the acceptable range. The primary threats that the MOTCO site posed to public health and safety were: direct contamination of ground water supplies in the area; transport of onsite waste material to nearby populated areas by surface runoff from severe flooding; and hazardous emissions to the air from pit wastes resulting from transport during severe flooding, dike rupture, or removal of the waste pit surface water layer.

4.0 Remedial Actions

Remedial actions performed at the MOTCO site since 1991 are addressed in this first Five-Year Review for the site. This section provides a description of the remedy objectives, selection, and implementation. It also describes the ongoing O&M, and the overall progress made at the MOTCO site. As previously described, the site was initially divided into two OUs, Source Control and MOM.

4.1 Remedy Objectives

The specific remedial objectives of the Source Control remedial action were:

- Prevent further contamination of the shallow aquifer and eliminate the potential threat to nearby surface water from the pit wastes.
- Eliminate the threat to public health from potential air releases and runoff from the pit wastes.
- Control and minimize air quality impacts, during and after remedial actions, from release of hazardous volatiles.
- Mitigate the potential for release due to tidal flood surges for wastes remaining onsite, if any.
- Close the site in a manner sufficient to provide site drainage, divert rainfall run-on, minimize areas of ponded water, mitigate impacts on air, surface, and subsurface waters and soils from migration of residual contaminants.
- Cleanup criteria associated with each objective were not established since the goal of this action was source control; to contain/remove the material from the uncontrolled condition that existed at that time. This meant containing or removing the specific wastes in bulk.

The MOM remedial action was to address the wastes or contaminated environmental media that had migrated below the waste pits (waste sources) and beyond site boundaries in both the surface and subsurface environmental media. The objectives of the MOM remedial action were:

- Isolate, remove, treat, and/or dispose of environmental media contaminated by the waste source in order to remove or reduce a threat to public health and the environment.
- Prevent further contamination of these environmental media.

4.2 Remedy Selection

The Record of Decision (ROD) for the Source Control was issued in March 1985. The remedy for the Source Control OU dealt with the excavation of the onsite waste pits to the sludge/soil interface plus one foot and incineration of those wastes. The remedy for the MOM OU, the second or final of the two operable units at the site, addressed the subsurface beneath the pits and offsite contamination of the ground water, subsurface soils, surface soils and sediments. The scope of this review is for the work completed between June 1993, the date of the Consent Decree, through July 2002.

The original 1985 ROD remedy for the Source Control OU consisted of:

- Onsite or offsite incineration of organic liquids.
- Offsite landfill or onsite incineration of sludges/tars.
- Offsite landfill or onsite incineration of soils.

The major components of the remedy described in the ROD for the MOM OU, issued in September 1989, included:

- Extraction and treatment of contaminated shallow and deep ground water. The deep zone shall be treated to MCLs or appropriate levels to maintain 1×10^{-6} risk levels.
- Extraction, to the extent feasible, and incineration of Dense Non-Aqueous Phase organic Liquids (DNAPL).
- Excavation, consolidation and onsite containment of contaminated surface soils and sediments to a maximum depth of four feet. Vertical and lateral extent of excavation shall be determined by 1×10^{-6} risk levels.
- Installation of a ground water gradient control system to create upward ground water gradients to impede contaminant migration from the shallow ground water to the deep ground water.
- Implementation of ground water compliance monitoring of the shallow and deep ground water aquifers. In addition, the monitoring of the clay layer between the shallow and deep ground water aquifers shall be performed to detect any contaminants that may migrate to the deep aquifer. In the event that contaminants are detected in the clay layer (one-half of the MCL or appropriate health-based number), a more aggressive extraction program shall be implemented in the shallow ground water zone.
- Contaminated ground water extracted for treatment will be treated by the best available technology (BAT) to the applicable or relevant and appropriate State or Federal discharge standard, or sent to a permitted waste water treatment plant.
- Implementation of deed restrictions to prohibit land development. Also, installation of additional fencing around the site. To implement these controls, the Potentially Responsible Parties (PRPs) purchased additional land adjacent to the site. At a minimum, as a part of the annual monitoring

and maintenance of the site, there will be a verification that site conditions have not changed and that there has been no land use or development that may affect the remedial action. If any changes occur, the EPA will evaluate the changes and take appropriate action.

In January 1993, based on new information developed for the site, an Explanation of Significant Differences (ESD) revising the ROD-specified remedy was issued by EPA. For the modified remedy, described in the ESD, soil/solids would be capped onsite rather than transported offsite for disposal in a landfill, and the sludges and tars would be incinerated offsite. In order to expedite remediation of the site, EPA, with agreement of the Settling Defendants, combined the work to be performed for both the Source Control OU and the MOM OU in to a single project under a Consent Decree signed in June 1993 (**EPA, 1993**).

4.3 Remedy Implementation

The original remedial action contract was awarded in January 1988. Incinerators were constructed onsite and the trial burn was begun in May 1990. After treatment of 7,568 tons of oils, 283 tons of sludges/tars and 4,699 tons of soils, incineration was stopped in December 1991 when the remedial action contractor filed suit against the MOTCO Trust Group. The remedial action was redefined in the Consent Decree entered during June 1993, and remedial activities were reinitiated in October 1993. Installation of monitoring wells and DNAPL recovery wells began in April 1995, with completion of the Ground Water/DNAPL Treatment system in August 1995. DNAPL recovery wells began operation in October 1995. Excavation of affected offsite materials began in October 1995 and was completed in April 1997. The C&I Report for the excavation of affected offsite materials was submitted in May 1997. EPA conducted the final site inspection and issued the Preliminary Close Out Report in September 1997. The Construction and Implementation Report for the site was submitted in October 1997. This document addressed the following: closure of: Pond 1, Pond 2, Pond 3, Pit 4, Pit 5, Pit 6, Pit 7; installation of the cutoff slurry wall; construction of new dikes and strengthening of existing dikes; excavation of offsite materials; disposal of salt, slag, and ash; Area/Pit 7N; placement and consolidation of affected materials; construction of the consolidated source control cap; site drainage; and the onsite water treatment facility (**MOTCO 1997**).

4.4 Operations and Maintenance

Because hazardous materials remain onsite, access to the MOTCO site and the ground water monitoring wells are restricted appropriately. A long-term ground water monitoring program has been established. In addition, the vegetative cover and the capped area must be maintained. Regularly-scheduled inspections of the access controls, ground water monitoring wells, extraction wells, recovery wells, and the capped area are performed (**MOTCO 2002c**).

A revised, long-term O&M Manual for the Ground Water Treatment Plant was submitted to EPA on June 27, 2002. Required O&M activities at the site are specified in this document kept at the site.

The O&M activities include:

- Operation, maintenance, and monitoring of the gradient control/ground water recovery system.
- Operation and maintenance of the TZ oil/water separation system.
- Operation and maintenance of the ground water treatment system.
- Operation, maintenance, and monitoring of the UC aquifer ground water recovery system.
- Operation, maintenance, and monitoring of the DNAPL recovery system.
- Ground water sampling and monitoring.

Table 2 provides a listing of Compliance Monitoring Standards for indicator constituents identified for the site. MOTCO personnel are at the site daily during the week performing O&M activities. Daily and weekly inspections are conducted to verify the condition of the components of the ground water treatment plant. In addition to regularly scheduled maintenance for the ground water treatment plant (described in the O&M Manual), monthly inspections are performed and inspection reports are prepared to document conditions at the site. These inspections include the following: gates, fences, access roads, wells, the cap, the gas venting system, the slurry wall cap and drainage facilities. Ground water treatment plant operation is also monitored by computer, and the systems are capable of calling MOTCO personnel at home during non-working hours if a problem occurs.

During the site inspection, a MOTCO representative stated that operation costs for the period of January 1, 2000 through December 31, 2000 were \$673,882 and the costs for the period of January 1, 2001 through December 31, 2001 were \$743,902. Given the fact that operations at the site have varied from one year to the next and that MOTCO continues to investigate methods to enhance and optimize operations at the site, it is likely that annual O&M costs may continue to vary.

4.5 Progress Since Initiation of Remediation

EPA and TCEQ agree that source control remedial action construction is complete. The ground water and DNAPL pump and treatment system continues to operate under the LTRA. More than 32,300 gallons of DNAPL have been recovered through calendar year 2001. The lowest average monthly recovery rate through this period was for calendar year 2000 at a recovery rate of approximately 402 gallons per month. The highest DNAPL recovery rate was for the calendar year 2001 with an average recovery rate of approximately 570 gallons per month. Through 2001, a total of 11,841,001 gallons of ground water have been recovered from the TZ and treated and a total of 31,177,573 gallons of ground water have been recovered from the UC-3 aquifer and treated (**MOTCO, 2002b**).

5.0 Five-Year Review Process

This five-year review has been conducted in accordance with the EPA's Comprehensive Five-Year Review guidance, dated June 2001 (**EPA, 2001**). Interviews were conducted with relevant parties; a site inspection was conducted; and applicable data and documentation covering the period of the review were evaluated. The findings of the review are described in the following sections.

5.1 Administrative Components

The five-year review for this site was initiated by the EPA when EPA contractor CH2M HILL, Inc., was tasked to perform the technical components of the review. A public notice announcing initiation of the five-year review was published in the Texas City Sun and the Galveston County Daily News during June 2002. The review team was led by the EPA Remedial Project Manager (RPM) for this site, Mr. Earl Hendrick/ EPA Region 6. A TCEQ agency representative, Mr. James Feeley/ TCEQ, assisted the review team, providing information related to the MOTCO site and assistance during the MOTCO site inspection. The components of the review included community involvement, document review, data

review, a site inspection, interviews, and development of this five-year review report, as described in the following paragraphs.

5.2 Community Involvement

A public notice announcing initiation of the five-year review was published in the Texas City Sun and the Galveston County Daily News during June 2002. Upon signature, the five-year review report will be placed in the information repositories for the site, including the MOTCO site, the TCEQ office in Austin, Texas, and the EPA Region 6 office in Dallas, Texas. A notice will be published in the Texas City Sun and the Galveston County Daily News to summarize the findings of the review and announce the availability of the report at the information repositories. Copies of the two public notices are provided as [Attachment 6](#) to this report.

5.3 Document Review

This five-year review included a review of relevant site documents, including decision documents, construction and implementation reports, quarterly and annual operations reports, and related monitoring data. Documents that were reviewed are listed in [Attachment 1](#).

5.4 Data Review

Performance and compliance monitoring data collected during the LTRA were reviewed as part of this five-year review. These data consist of ground water quality data, ground water level measurements, DNAPL level measurements and DNAPL recovery volumes. Since initiation of the LTRA, these data are collected quarterly, presented in quarterly effectiveness reports and compiled in annual Remedial Action Effectiveness Reports. [Attachment 5-1 through 5-9](#), included in [Attachment 5](#), present contaminant concentrations over time for selected wells. The data illustrated are for wells in which compliance monitoring standards have been shown to be exceeded outside the immediate influence of the groundwater recovery system (in the UC-1 wells and TZ wells in the M-5 monitoring well cluster outside the cutoff slurry wall).

Historical and LTRA data for the site indicate that bis(2-chloroethyl)ether is present in ground water samples collected from wells screened in the UC-1 aquifer, at concentrations that are sometimes higher

than the compliance monitoring standard. This standard is 0.03 µg/L, which represents a 1×10^{-6} risk level. The Consent Decree Statement of Work item V.F.4(a)(15) specifies that “if indicator constituents are detected in the UC-1 or UC-2 at or above the Compliance Monitoring Standard, Settling Defendants shall propose additional response actions pursuant to Section VIII of the Consent Decree.” These detections have been occurring off and on in the UC-1 wells since the time active remediation began, as illustrated in the graphs provided as [Attachments 5-1](#) and [5-1a](#).

Previously, EPA requested that MOTCO perform an evaluation of these detections, and MOTCO responded in a letter dated October 1, 1999, regarding “Evaluation of Bis(2-Chloroethyl)Ether Concentration in UC-1” (**MOTCO, 1999b**). In this document, based on data collected through July 1999, MOTCO concludes that with the exception of monitoring well M6B, all UC-1 wells either (1) demonstrate a decreasing trend in bis concentration, (2) do not conclusively demonstrate a trend, or (3) have not exhibited a detection of bis (with the exception of the April 1996 event in which several anomalous results were reported). The document also points out the Texas Risk Reduction Program’s (TRRP) residential ground water standard for bis(2-chloroethyl)ether, which is 0.83 µg/L (based on a 1×10^{-5} risk level), and suggests that in the event bis(2-chloroethyl)ether is detected during 3 consecutive quarterly sampling events at a concentration greater than the TRRP level of 0.83 µg/L, MOTCO will propose further action (**MOTCO, 1999b**).

[Attachments 5-1](#) and [5-1a](#) provide graphs of the UC-1 detections over time through April 2002, which includes eleven LTRA monitoring events conducted after the data presented in MOTCO’s 1999 evaluation. As a simple comparison, from January 1997 to July 1999, bis was detected above the compliance standard of 0.03 µg/L in 41 of 109 samples collected from the various UC-1 wells (or in 38% of the samples). From October 1999 through April 2002, bis was detected above the compliance standard of 0.03 µg/L in 30 of 110 samples collected from the various UC-1 wells (or 27%), a slight decrease in the frequency of detection. The graphs also show that the TRRP level of 0.83 µg/L has not been exceeded in UC-1 wells for the past several years.

In another area of the site, LTRA data indicate that bis(2-chloroethyl)ether has been detected at concentrations exceeding the compliance monitoring standard for the TZ at a well outside the cutoff

slurry wall at the M-5 well cluster. The compliance monitoring standard in the TZ is 2.4 mg/L, which is a Health-Based Number (HBN) defined for the site boundary. The Consent Decree Statement of Work item V.F.4(a)(8) specifies that “if compliance monitoring in TZ ground water demonstrates the presence of indicator constituents anywhere outside the slurry wall at or above the compliance monitoring standards, Settling Defendants shall propose additional response actions pursuant to Section VIII of the Consent Decree.” As shown in [Attachment 5-2](#), the concentration of bis(2-chloroethyl)ether detected in the TZ-2 monitoring well located outside the wall has exceeded the compliance monitoring standard in 15 out of 27 monitoring events since October 1995 (56%).

Currently no indicator constituents have been detected in a previously unaffected portion of the TZ. The Consent Decree Statement of Work item V.F.4(a)(8) specifies that “If compliance monitoring in TZ ground water outside the slurry wall during LTRA demonstrates detectable levels of site indicator constituents in a previously unaffected portion of the TZ, the frequency of such compliance monitoring shall be increased, upon EPA approval, in that area to aid in the evaluation of any trends. Additional response actions shall be proposed to EPA by Settling Defendants in accordance with Section VIII (Additional Response Actions) of the Consent Decree should the results of the increased sampling frequency of compliance monitoring indicate the need to do so.”

DNAPL is recovered with an oil/water separator in the Ground Water Treatment Facility as well as by manual recovery methods. More than 32,300 gallons of DNAPL have been recovered through calendar year 2001 (**MOTCO, 2002b**).

In 1995, MOTCO completed a soil boring program to delineate the possibility of DNAPL existing outside the slurry wall in the area around UC-3 monitoring well M1E (based on observations made in soil cores during drilling through the TZ). The investigation results indicated that there was no evidence of DNAPL or residual oil in any of the cores from the additional borings performed. To-date no indicator constituents have been detected in well UC-3 monitoring well M1E, or in the TZ wells of this monitoring well cluster.

5.5 Interviews

An interview was conducted with the site O&M manager during the site visit conducted on July 2, 2002. In addition, the EPA RPM and TCEQ representative each completed interviews for the site. An interview record form was also provided to the mayor's office in La Marque. The completed interview record forms, which document the interviews with representatives from EPA and TCEQ are presented in [Attachment 2](#).

The impressions from the interviews were that the remedies incorporated at the site are functioning as designed, work conducted at the site is professionally managed with proper attention both to systems operation and maintenance and to health and safety issues, and that ongoing operations at the site appear to have minimal impact on the surrounding community. There were no ongoing community concerns regarding the site identified during this five-year review.

5.6 Site Inspection

An inspection was conducted at the site on July 2, 2002. The completed site inspection checklist is provided in [Attachment 3](#). Photographs taken during the MOTCO site inspection are provided in [Attachment 4](#). The MOTCO site appears to be well maintained and there was no visible evidence of trespassing or vandalism. Vegetative cover consists primarily of bermuda grass ([Photograph Nos. 13-15, 24, 42, 49](#)). Security fencing and gates were secured and in good condition ([Photograph Nos. 21, 27, 28, 32](#)). Identification signs and were also posted at proper intervals on the perimeter fences ([Photograph Nos. 21, 27, 28, 32](#)). The location of the slurry wall is indicated by surface markers throughout the site [Photograph Nos. 19, 42, 51, 53, 56](#)).

All existing onsite ground water monitoring wells ([Photograph Nos. 17, 22, 24, 29, 31, 38](#)), extraction wells ([Photograph Nos. 18, 29 - 31, 37, 39, 44](#)), and DNAPL recovery wells ([Photograph Nos. 34, 45, 46, 48](#)) were located during the MOTCO site inspection. All surface completions were secure and in good condition. The capped area drainage layer outlet pipes ([Photograph Nos. 16, 35, 40, 52](#)) appeared to be in good condition. It appears that some settlement may have occurred at the capped area. Some vertical separation was visible between the concrete collar around the above ground well completions

and the surrounding concrete pads at some monitoring wells and DNAPL extraction wells ([Photograph Nos. 17, 45, 46](#)).

6.0 Technical Assessment

The five-year review must determine whether the remedy at a site is protective of human health and the environment. The EPA guidance describes three questions used to provide a framework for organizing and evaluating data and information and to ensure all relevant issues are considered when determining the protectiveness of a remedy. These questions are assessed for the site in the following paragraphs. At the end of the section is a summary of the technical assessment.

6.1 Question A: Is the Remedy Functioning as Intended by the Decision Documents?

The documents that detail the remedial decisions for the site are the September 1989 ROD, the January 1993 ESD to the Source Control ROD, and the 1993 Consent Decree. EPA and TCEQ have concurred that the construction portions of the Source Control and MOM OU remedy defined by the Consent Decree are complete. The LTRA is ongoing, and based on the data review, the site inspection, and interviews, it appears that the remedy is functioning as intended by the decision documents. Opportunities for optimization, early indicators of potential remedy problems, and institutional controls are described below.

Opportunities for Optimization. The site operators monitor the Ground Water Treatment Facility to identify potential opportunities for optimization. In one effort to optimize plant operation, the Photo Cat System (UV-OX) system was removed from the Ground Water Treatment Facility in January 2001. On February 11, 2002, the MOTCO Trust Group presented a proposal to adjust the frequency of the ground water sampling schedule for wells screened within the Transmissive Zone and to modify the number of QA/QC samples collected in conjunction with the ground water program. EPA concurred with this request, but indicated that monitoring must continue to confirm the existence of an inward lateral hydraulic gradient, and that if needed to meet site objectives, the sampling frequency for these wells and the number of QA/QC samples could be reinstated (**EPA, 2002**).

Early Indicators of Potential Remedy Problems. The recent installation of a TxDOT lift station south of the site, at the junction of State Highway 3 and Interstate Highway 45, may make it more difficult to meet the required inward gradients at the site. The lift station was constructed to prevent inundation of the highway junction as a result of heavy precipitation. These highways serve as evacuation routes for the nearby coastal communities and need to be kept clear. During heavy precipitation events, the lift station will provide a measure of control for ground water levels outside the cutoff slurry wall, which is beneficial to reduce the effects of flooding, while the ground water levels inside the wall remain controlled only by the ground water extraction system. If the lift station reduces ground water levels outside the wall below the ground water levels inside the wall, increased pumping inside the wall will be required to maintain inward gradients. This issue is monitored as part of the routine monitoring of inward and upward gradients for the site.

During the site inspection, it was observed that some settlement may have occurred in the cap. Some vertical separation was visible between the concrete collar around the above ground well completions and the surrounding concrete pads at some monitoring wells and DNAPL extraction wells. The cap appears to be in good condition otherwise, but the settlement issue should be evaluated and monitored.

In addition, there are currently two areas of the site where ground water concentrations sometimes exceed compliance monitoring standards outside the influence of the current extraction and migration-prevention system. One area is in the top zone of the Upper Chicot aquifer (UC-1), where indicator constituent bis(2-chloroethyl)ether has been detected at or above the compliance monitoring standard in 71 of 219 LTRA monitoring event samples collected since January 1997 (32%). The second area is in the Transmissive Zone (TZ) outside the cut-off slurry wall at monitoring well cluster M-5, where bis(2-chloroethyl)ether has been detected at or above the compliance monitoring standard in the TZ-2 well located outside the cutoff slurry wall (M5D), in 15 of 27 LTRA monitoring event samples collected since October 1995 (56%). Both issues are being monitored by EPA and MOTCO, and appear to be relatively stabilized (the concentrations are decreasing or do not seem to be increasing), and there does not appear to be a current risk of exposure.

Institutional Controls. The MOM OU ROD required deed restrictions to prohibit land development, provide for installation of additional fencing around the site, and annual verification that site conditions have not changed and that there has been no land use or development that may affect the remedial action (EPA, 1989). The site remains under the control of the MOTCO Trust Group, and access to the site and offsite wells is restricted.

6.2 Question B: Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives (RAOs) Used at the Time of the Remedy Selection Still Valid?

The purpose of this question is to evaluate the effects of any significant changes in standards or assumptions used at the time of remedy selection. Changes in promulgated standards or "to be considered" (TBCs) and assumptions used in the original definition of the remedial action may indicate an adjustment in the remedy is necessary to ensure the protectiveness of the remedy.

Changes in ARARs. ARARs for this site were identified in the MOM OU ROD dated September 1989. The five-year review for this site included identification of and evaluation of changes in the ROD-specified ARARs to determine whether such changes may affect the protectiveness of the selected remedy. The ARARs identified by the ROD for the MOTCO site include contaminant, action and location specific ARARs for air, ground water and soil. These ARARs are described below.

Air Pathway

Contaminant Specific Requirements:

1. National Ambient Air Quality Standards (NAAQS), 40 CFR Part 50
 - Sulfur Dioxide, 50.4 (a), (b), 50.5
 - Particulate Matter, 50.6 (a), (b)
 - Nitrogen Dioxide, 50.11
 - Carbon Monoxide, 50.8 (a) (1), (2)
 - Ozone, 50.9
 - Lead, 50.12
2. Nuisance, 31 T.A.C. Part 101.4
3. Particulate – Net Ground Level, 31 T.A.C. 111.52

4. SO₂ Ground Level Concentration, 31 T.A.C. 112.7

Action-Specific Requirements:

1. Hazardous Waste Incinerators, 40 CFR Part 264, Subpart O
2. Waste Analysis, 40 CFR §264.341, 270.62 (b) (2)
3. Performance Standards, 40 CFR Part 343
4. Trial Burn, 40 CFR Part 344, 40 CFR §270.62 (b) (6)
5. Start-up/Shut-down, 40 CFR Part 264.345 (c)
6. Fugitive Emissions Control, 40 CFR Part 264.345 (d)
7. Monitoring, 40 CFR §264.347 (a)
8. Automatic Cut Off, 40 CFR §264.345 (e), (f)
9. Closure, 40 CFR §264.351
10. Control of Air Pollution for New Construction-BACT, 31 T.A.C. 116.3 (a) (2), (3)
11. Opacity Criteria, 31 T.A.C. 111.21
12. Particulates, 31 T.A.C. 111.51
13. Vent Gas Streams, 31 T.A.C. 115.162
14. Cold Solvent Cleaning, 31 T.A.C. 115.172

Water Pathway

Contaminant-Specific Requirements:

1. Pollution Prohibition Texas Water Code, 25 T.A.C. 26.121
2. Texas Surface Water Quality Standards, 31 T.A.C. 307.4 (b) (1)
3. General Toxicity, 31 T.A.C. 307.4 (d)
4. Acute Toxicity, 31 T.A.C. 307.6 (b) (1)
5. Chronic Toxicity, 31 T.A.C. 307.6 (b) (2)
6. Human Toxicity, 31 T.A.C. 307.6 (b) (3)
7. Numerical Criteria for Toxics, 31 T.A.C. 307.6 (c)
8. LC50 Toxicity Criteria, 31 T.A.C. 307.6 (c) (10)
9. Site-Specific Uses and Criteria, 31 T.A.C. 307.7 (b) (5)
10. Intermittent Streams, 31 T.A.C. 307.4 (j)

Action-Specific Requirements:

1. National Pollutant Discharge Elimination System, 40 CFR Part 402
2. Conditions Applicable to All Permits, 40 CFR §122.41
3. Establishing Limitations, 40 CFR §122.44
4. Technology-Based Treatment Requirements in Permits, 40 CFR §125.3
5. Best Management Practices, 40 CFR §125.100
6. Effluent Limitations Guidelines, 40 CFR Parts 400 – 471
7. Pretreatment Standards, 40 CFR §403.5
8. Texas Hazardous Metal Discharge Limits, 31 T.A.C. 319.22
9. Executive Order on Floodplain Management, Executive Order No. 11,988, 40 CFR §6.302 (b), Appendix A

Ground Water Pathway

Contaminant-Specific Requirements:

1. Primary Drinking Water Standards (MCL), Safe Drinking Water Act, 40 CFR Part 141
2. State and Federal Surface Water Quality Standards
3. TCEQ PCLs, 30 T.A.C. 350

Action-Specific Requirements:

1. Closure, 31 T.A.C. 335.152 (a) (5)
2. Containers, 31 T.A.C. 335.152 (a) (9)
3. Tanks, 31 T.A.C. 335.152 (a) (8)
4. Incinerators, 31 T.A.C. 335.152 (a) (13)
5. OSHA Worker Protection, 40 CFR 300.38

Location-Specific Requirements:

1. Clean Water Act, 31 U.S.C. 1344, 40 CFR Parts 230, 231, 33 CFR Parts 320-330
2. Protection of Wetlands, Executive Order No. 11,990; 40 CFR §6.302 (a); and Appendix A
3. Floodplain Management, Executive Order No. 11,998; 40 CFR §6.302 (b); and Appendix A
4. Location Standards, 40 CFR §264.18

Soil Pathway

Contaminant-Specific Requirements:

1. General Facility Standards, 31 T.A.C. 335.152 (a) (1)
2. Closure, 31 T.A.C. 335.152 (a) (5)
3. Post-Closure, 31 T.A.C. 335.152 (a) (5)
4. Containers, 31 T.A.C. 335.152 (a) (9)
5. Tanks, 31 T.A.C. 335.152 (a) (8)
6. Land Treatment, 31 T.A.C. 335.125 (a) (11), 31 T.A.C. 335.171, 172
7. Landfill, 31 T.A.C. 335.152 (a) (12), 31 T.A.C. 335.173-.176
8. Incinerators, 31 T.A.C. 335.152 (a) (13)
9. OSHA Worker Protection, 40 CFR §300.38

The following standards are only applicable to incineration processes, and since incineration is no longer occurring on site, these standards are no longer applicable:

1. National Ambient Air Quality Standards (NAAQS), 40 CFR Part 50
 - Sulfur Dioxide, §50.4 (a), (b), §50.5
 - Nitrogen Dioxide, §50.11
 - Carbon Monoxide, §50.8 (a) (1), (2)
2. SO₂ Ground Level Concentration, 31 T.A.C. 112.7
3. Hazardous Waste Incinerators, 40 CFR Part 264, Subpart O
4. Waste Analysis, 40 CFR §§264.341, 270.62 (b) (2)
5. Performance Standards, 40 CFR Part 343
6. Trial Burn, 40 CFR Part 344, 40 CFR §270.62 (b) (6)
7. Start-up/Shut-down, 40 CFR §264.345 (c)
8. Fugitive Emissions Control, 40 CFR §264.345 (d)
9. Monitoring, 40 CFR §264.347 (a)
10. Automatic Cut Off, 40 CFR §264.345 (e), (f)
11. Closure, 40 CFR §264.351
12. Control of Air Pollution for New Construction-BACT, 31 T.A.C. 116.3 (a) (2), (3)
13. Opacity Criteria, 31 T.A.C. 111.21

14. Particulates, 31 T.A.C. 111.51
15. Vent Gas Streams, 31 T.A.C. 115.162
16. Cold Solvent Cleaning, 31 T.A.C 115.172

The TCEQ and the Federal RCRA regulations have not been revised to the extent that the effectiveness of the remedy at the site would be called into question. The Texas Administrative Code Title 31 is now codified under Title 30; however, no significant changes have been made that would question the site remedy effectiveness.

No new regulations have been issued by the State of Texas or the Federal government that would call into question the effectiveness of the remedy, although there have been new standards set for two of the ground water indicator constituents.

The MOM OU ROD required the ground water standard in the UC aquifer be MCLs or 1×10^{-6} risk level, in accordance with the drinking water ARARs. At the time the MOM OU ROD was signed, there were no MCLs for bis(2-chloroethyl)ether or 1,1,2-trichloroethane, and a 1×10^{-6} risk level was assigned as the recovery/compliance monitoring standard for these compounds. The compliance standard set for bis(2-chloroethyl)ether is 0.03 $\mu\text{g/L}$, and the compliance standard set for 1,1,2-trichloroethane was 0.6 $\mu\text{g/L}$. Since that time, there are two new regulations in effect that apply to these compounds. The TRRP, effective September 23, 1999, under the TCEQ, established a PCL for bis(2-chloroethyl)ether for ground water ingestion at 0.83 $\mu\text{g/L}$. In addition, a federal drinking water standard was established for 1,1,2-trichloroethane in 1994; the MCL is 5.0 $\mu\text{g/L}$, with a MCLG of 3.0 $\mu\text{g/L}$.

Changes in Exposure Pathways, Toxicity, and Other Contaminant Characteristics. There have been no changes in exposure pathways for the MOTCO site. As described above, new regulatory standards (one state and one federal) have been set for two compounds that were not regulated under the federal drinking water program at the time the MOM OU ROD was signed. These two compounds are bis(2-chloroethyl)ether and 1,1,2-trichloroethane. The TRRP, effective September 23, 1999, established a PCL for bis(2-chloroethyl)ether for ground water ingestion at 0.83 $\mu\text{g/L}$, and a federal drinking water

standard was established for 1,1,2-trichloroethane in 1994; the MCL is 5.0 µg/L, with a MCLG of 3.0 µg/L.

6.3 Question C: Has any Other Information Come to Light that Could Call into Question the Protectiveness of the Remedy

No other information, such as a potential future land use change in the vicinity of the site or other expected change in site conditions or exposure pathways, etc., that might call into question the protectiveness of the selected remedy has been identified as part of this five-year review.

6.4 Summary of the Technical Assessment

The technical assessment, based on the data review, site inspection, technical evaluation, and interviews, indicates the remedial actions selected for this site appear to have been implemented as intended by the decision documents. A lift station to control flooding has been installed near the site that may affect the maintenance of inward and upward gradients; this issue is monitored as part of the quarterly monitoring of gradients. During the site inspection, vertical separation was noted between the concrete well collar and the surrounding concrete pad. This may indicate that settlement has occurred in the capped area. Survey monuments should be installed and scheduled surveys performed to determine if settlement is occurring at the site that may affect the protectiveness of the remedy.

The only significant change in exposure assumptions or standards set for the site has been the TRRP, effective September 23, 1999, which established a PCL for ground water ingestion for bis(2-chloroethyl)ether at 0.83 µg/L; the compliance monitoring standard for bis at the site in the UC-1 is set at 0.03 µg/L. The TRRP standard may be considered when evaluating whether additional response actions are required to address ongoing bis detections in the UC-1. No new exposure pathways have been identified as a result of this five-year review.

7.0 Issues

Several issues are identified for this site, as described in the following paragraphs.

Ground Water. Historical and LTRA data for the site indicate that bis(2-chloroethyl)ether is present in ground water samples collected from wells screened in the UC-1 aquifer, at concentrations that are sometimes higher than the compliance monitoring standard. This standard is 0.03 µg/L, which represents a 1×10^{-6} risk level. The Consent Decree Statement of Work item V.F.4(a)(15) specifies that “if indicator constituents are detected in the UC-1 or UC-2 at or above the Compliance Monitoring Standard, Settling Defendants shall propose additional response actions pursuant to Section VIII of the Consent Decree.” These detections have been occurring off and on in the UC-1 wells since the time active remediation began, as illustrated in the graphs provided as [Attachments 5-1](#) and [5-1a](#).

Previously, EPA requested MOTCO perform an evaluation of these detections, and MOTCO responded in a letter dated October 1, 1999, regarding “Evaluation of Bis(2-Chloroethyl)Ether Concentration in UC-1” (**MOTCO, 1999b**). In this document, based on data collected through July 1999, MOTCO concludes that with the exception of monitoring well M6B, all UC-1 wells either (1) demonstrate a decreasing trend in bis concentration, (2) do not conclusively demonstrate a trend, or (3) have not exhibited a detection of bis (with the exception of the April 1996 event in which several anomalous results were reported). The document also points out the TRRP residential ground water standard for bis(2-chloroethyl)ether, which is 0.83 µg/L (based on a 1×10^{-5} risk level), and suggests that in the event bis(2-chloroethyl)ether is detected during 3 consecutive quarterly sampling events at a concentration greater than the TRRP level of 0.83 µg/L, MOTCO will propose further action (**MOTCO, 1999b**).

[Attachments 5-1](#) and [5-1a](#) provide graphs of the UC-1 detections over time through April 2002, which includes eleven LTRA monitoring events conducted after the data presented in MOTCO’s 1999 evaluation. As a simple comparison, from January 1997 to July 1999, bis was detected above the compliance standard of 0.03 µg/L in 41 of 109 samples collected from the various UC-1 wells (or in 38% of the samples). From October 1999 through April 2002, bis was detected above the compliance standard of 0.03 µg/L in 30 of 110 samples collected from the various UC-1 wells (or 27%), a slight decrease in the frequency of detection. The graphs also show that the TRRP level of 0.83 µg/L has not been exceeded in UC-1 wells for the past several years. There does not currently appear to be a risk of exposure or significant migration from these exceedances.

In another area of the site, LTRA data indicate that bis(2-chloroethyl)ether has been detected at concentrations exceeding the compliance monitoring standard for the TZ at a well outside the cutoff slurry wall at the M-5 well cluster. The compliance monitoring standard in the TZ is 2.4 mg/L, which is a Health-Based Number (HBN) defined for the site boundary. The Consent Decree Statement of Work item V.F.4(a)(8) specifies that “if compliance monitoring in TZ ground water demonstrates the presence of indicator constituents anywhere outside the slurry wall at or above the compliance monitoring standards, Settling Defendants shall propose additional response actions pursuant to Section VIII of the Consent Decree.” As shown in [Attachment 5-2](#), the concentration of bis(2-chloroethyl)ether detected in the TZ-2 monitoring well located outside the wall has exceeded the compliance monitoring standard in 15 out of 27 monitoring events since October 1995 (56%). There does not currently appear to be a risk of exposure or significant migration from these exceedances.

Maintenance of inward and upward gradients. On February 4, 2001, construction of a lift station, at the junction of Highway 3 and Interstate Highway 45, was completed for TxDOT. The lift station was constructed to prevent flooding of this highway junction which is an evacuation route for nearby coastal communities. TxDOT personnel indicated that the lift station sump extends to a depth of approximately 20 feet below the existing ground surface. Historically, the lift station has only had to pump water once or twice since completion of construction. However, if conditions warranted long-term operation, operation of the lift station could potentially affect the gradients established at the site for control of migration of contaminated ground water. The site ground water pumps currently maintain an upward and inward ground water gradient, which is monitored as part of the quarterly monitoring of gradients.

Settlement of the cap. During the site inspection, it was noted that the concrete pads of several wells constructed on the cap demonstrate vertical separation between the concrete collar around the well and concrete pad. In some cases there appears to be as much as 2 to 3 inches of vertical separation, with the collar higher than the surrounding pad. This may indicate that the well above-ground casing/collar has risen relative to the concrete pad or the pad has settled relative to the well above-ground casing/collar. Currently there are no survey monuments onsite in the capped area.

8.0 Recommendations and Follow-up Actions

During the five-year review, two issues were identified that do not currently affect the protectiveness of the site. In some areas of the cap, it appears that settlement has occurred, as evidenced by a lowering of the ground surface around LTRA well pads located on the cap. Also, a Texas Department of Transportation lift station has been installed near the site; this lift station was installed to control flooding, and has the effect of keeping ground water levels in check in the vicinity of the site. During periods of heavy rain, however, this may make it more difficult than it had been previously to maintain inward gradients across the wall so that any contaminated water would not leak from within the area surrounded by the slurry wall to the outside.

In addition, there are currently two areas of the site where ground water concentrations sometimes exceed compliance monitoring standards outside the influence of the current extraction and migration-prevention system. One area is in the top zone of the Upper Chicot aquifer (UC-1), where indicator constituent bis(2-chloroethyl)ether has been detected at or above the compliance monitoring standard in 71 of 219 LTRA monitoring event samples collected since January 1997 (32%). The second area is in the Transmissive Zone (TZ) outside the cut-off slurry wall at monitoring well cluster M-5, where bis(2-chloroethyl)ether has been detected at or above the compliance monitoring standard in the TZ-2 well located outside the cutoff slurry wall (M5D), in 15 of 27 LTRA monitoring event samples collected since October 1995 (56%). Both issues are being monitored by EPA and MOTCO, and appear to be relatively stabilized (the concentrations are decreasing or do not seem to be increasing), and there does not appear to be a current risk of exposure. The need for additional response actions in these two areas should be re-evaluated at least annually, or more frequently if conditions change, addressed if necessary, and should be considered in the next five-year review.

Recommended further actions include continue site operations, maintenance and LTRA monitoring as currently defined, with special review at least annually of conditions in the UC-1 aquifer monitoring wells and in the TZ-2 monitoring wells at cluster M-5 where exceedances of compliance monitoring standards have been documented, and consideration of additional response actions if warranted or if conditions change. To help with the continuing evaluation of the TZ-2 at M-5, it is suggested that

MOTCO reinstate quarterly sampling at M5D (the TZ2 well located inside the cutoff slurry wall, across from TZ2 well M5F). Also, the settlement of the cap should be evaluated and monitored.

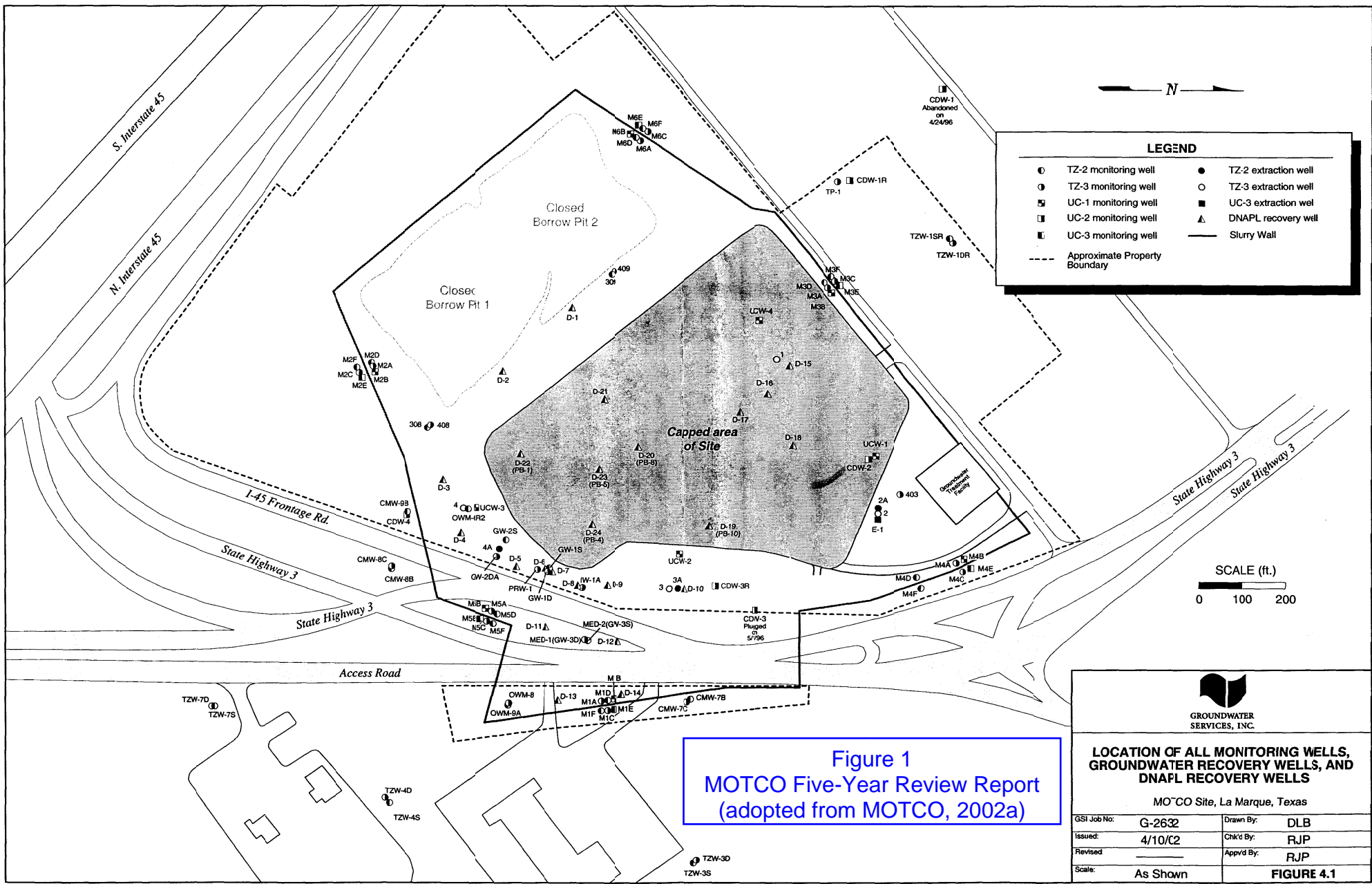
9.0 Protectiveness Statement

The remedy for the Source Control OU at the MOTCO site is considered protective of human health and the environment because the waste has been removed or contained and is protected from erosion. The remedy for the MOM OU is considered protective of human health and the environment in the short term because migration of contamination has been restricted, and the Long-Term Response Action is being implemented as planned to reduce the volume of contamination and to control migration. Ongoing implementation of performance and compliance monitoring will ensure that the migration of contamination continues to be restricted.

Because the completed remedial actions and monitoring program for the MOTCO site are considered protective for the short term, the remedy for the site, including both OUs, is protective of human health and the environment for the short term, and will continue to be protective if the action items identified in this five-year review are addressed.

10.0 Next Review


The next five-year review, the second for the site, should be completed during or before September 2007. Key issues to be considered, in addition to the ongoing performance of the LTRA, are the concentrations of bis(2-chloroethyl)ether in the UC-1, and in the TZ wells of the M-5 monitoring well cluster, and the status of settlement of the cap.



LEGEND

- TZ-2 monitoring well
- TZ-3 monitoring well
- UC-1 monitoring well
- UC-2 monitoring well
- UC-3 monitoring well
- TZ-2 extraction well
- TZ-3 extraction well
- UC-3 extraction well
- ▲ DNAPL recovery well
- Slurry Wall
- - - Approximate Property Boundary

Figure 1
MOTCO Five-Year Review Report
 (adopted from MOTCO, 2002a)


GROUNDWATER SERVICES, INC.

**LOCATION OF ALL MONITORING WELLS,
 GROUNDWATER RECOVERY WELLS, AND
 DNAPL RECOVERY WELLS**
 MOTCO Site, La Marque, Texas

GSI Job No: G-2632	Drawn By: DLB
Issued: 4/10/02	Chk'd By: RJP
Revised: _____	App'd By: RJP
Scale: As Shown	FIGURE 4.1

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Table 1
Chronology of Site Events
MOTCO Superfund Site
La Marque, Texas

Date	Event
1959	The site was purchased by U.T. Alexander for the purpose of recycling styrene tars.
1961	Flood tides associated with Hurricane Carla inundated the pits, and recycling operations ceased.
1961 to 1968	Onsite pits were used for disposal of chemical wastes from local petrochemical industries.
1963	U.T. Alexander transferred ownership to Petro Processors, Inc.
1964	The site was permitted as a disposal facility by the State of Texas (permit No. 01051)
1970s	Approximately 500,000 gallons of material were deposited, some were removed during attempts at waste recycling.
1968	Due to odor complaints, the City of La Marque passed an ordinance prohibiting disposal of liquid wastes in surface impoundments within city limits.
1969	Mainland Bank foreclosed on the site.
1974	MOTCO Inc. acquired ownership and established an operation to remove and market styrene tars.
1974	MOTCO, Inc. abandoned the site. Seven unlined pits remained with contamination migrating into the subsurface. Groundwater was heavily contaminated and migrating offsite.
1976	Texas Water Commission (subsequently Texas Natural Resource Conservation Commission) issued an Administrative Order that canceled Permit No. 01051 and required a closure plan. Shortly thereafter, MOTCO filed for bankruptcy. The trustee abandoned the site as a worthless asset.
1977	MOTCO, Inc. forfeited its right to do business in the State of Texas, but remains an active corporation on the Minnesota Secretary of State's records.
May to September 1980	U.S. Coast Guard (USCG) removed drums stored at the site and extended and raised perimeter dikes. A perimeter fence was erected around the site.

Table 1
Chronology of Site Events
MOTCO Superfund Site
La Marque, Texas

Date	Event
December 1980 to April 1985	EPA conducted four removal actions to stabilize the site
1981 to 1982	Initial Site Investigation and a Secondary Site Investigation was completed by Black & Veatch.
February 1981	EPA issued the Response Action Plan for the MOTCO site.
September 1981	EPA conducted an emergency response action.
July 1982	EPA ranked the site on the National Priorities List (NPL) of superfund sites.
Early 1983	EPA completed the Remedial Action Master Plan (RAMP)
1983	EPA published notice of completion of the Source Control Feasibility study
March 1983	EPA conducted an emergency response action.
September 1983	EPA conducted an emergency response action.
Early 1984	EPA conducted an Initial Remedial Measure (IRM)
Late 1984	EPA determined that off-site remedial actions would be necessary
March 1985	EPA signed the Record of Decision (ROD) for the Source Control Operable Unit.
January 1986	Original Proposed Plan Fact Sheets and Public meetings for source control
December 1986	Removal action was initiated to repair the dike damaged by heavy rains.
Early 1987	EPA negotiated a Consent Decree for the Source Control unit with 21 companies, the MOTCO Trust group to conduct the incineration remedy.
March 1987	Settling defendants entered into an Administrative Order of Consent to conduct a Remedial Investigation and feasibility Study (RI/FS) for the second operable unit for the site: the Management of Migration (MOM) operable unit.

Table 1
Chronology of Site Events
MOTCO Superfund Site
La Marque, Texas

Date	Event
April 1987	The MOTCO Trust Group entered into an Administrative Order on Consent (AOC) to conduct off-site and groundwater investigation.
Summer 1987	EPA began additional investigation at the site.
July 1987	The community involvement plan was developed.
July 1987	Original Proposed Plan Fact Sheets and Public meetings for MOM.
October 1987	EPA signed Source Control Mixed Funding Agreement with MOTCO Trust Group consisting of 20 PRPs.
January 1988	Remedial action contract was awarded by the PRPs
November 1988	EPA received a letter of intent requesting a Technical Assistance Grant (TAG)
Early 1989	The MOM Supplemental Feasibility Study Investigation (SFSI), Endangerment Assessment, and Feasibility Study Investigation was submitted to the EPA.
1989	The DNAPL Recovery Pilot Program Study was performed
September 1989	EPA signed the ROD for the MOM operable unit.
March 1989	The community involvement plan was revised.
April 1989	Milestone fact sheets prepared
July 1989	EPA published notice of completion of the MOM FS and the remedial alternatives identified therein.
September 1989	EPA issued the ROD for the second and final operable unit, MOM.
November 1989	Original ROD MOM fact sheets
April 1990	The negotiation Moratorium for implementation of the Remedial Design/Remedial action (RD/RA) ended.

Table 1
Chronology of Site Events
MOTCO Superfund Site
La Marque, Texas

Date	Event
May 1990	On-site incineration of pit liquids, sludge/tars and soil began.
June 1990	EPA issued an Unilateral Administrative Order (UAO) regarding the remedial design for the second OU (MOM).
June 1990	Milestone fact sheets prepared
November 1990	Open houses and work shops were conducted.
November 1990	Milestone fact sheets prepared
April 1991	Milestone fact sheets prepared
June 1991	EPA paid the MOTCO Trust \$2.8 million as part of the first Superfund Mixed Funding Agreement, for construction completion as part of the 1987 Source Control Consent Decree.
December 1991	Incineration was stopped.
1992	EPA issued a Unilateral Administrative Order (UAO)
February 1992	Milestone fact sheets prepared
July 1992	Consent Decree entered for recovery of past MOM costs for approximately \$300,000.
August 1992	Woodward Clyde issued the Assessment of Current site Conditions for the MOTCO site report.
October 1992	EPA issued a UAO for implementation of the MOM RA.
December 1992	EPA reissued the UAO for pre-construction work on the MOM operable unit.
January 1993	EPA prepared an Explanation of Significant Differences (ESD) to the ROD.
February 1993	Since February 1993, MOTCO conducted work under the 1993 UAO and the 1993 Consent Decree.

Table 1
Chronology of Site Events
MOTCO Superfund Site
La Marque, Texas

Date	Event
June 1993	EPA granted a three month extension.
July 1993	Due to the ESD and the completion of the MOM design, EPA negotiated a combined Consent Decree with MOTCO Trust Group for implementation of the revised Source Control remedy and the MOM remedy.
October 1993	Open houses and work shops were conducted.
April 1995	Installation of monitoring wells and DNAPL recovery wells begun
August 1995	Construction of Groundwater/ DNAPL Treatment System completed.
September 1995	C & I Report, Groundwater/DNAPL Treatment System submitted
October 1995	DNAPL Recovery wells began operation
October 1995	Excavation of Affected Off-site Materials was started
1995	EPA granted a 15 month extension.
May 1996	The Consolidated Remedial Design report was submitted
December 1996	EPA granted a four month extension.
April 1997	Excavation of Affected Off-site Materials was completed
May 1997	C&I Report for the Excavation of Affected Off-site Materials was submitted
September 1997	EPA conducted the final site inspection
September 1997	EPA issued the Preliminary Close Out Report
October 1997	C&I Report for the Consolidation of Affected Materials was submitted
October 1997	C&I Report for the Final Site Grading and Drainage was submitted
October 1997	Draft final C & I Report submitted

Table 1
Chronology of Site Events
MOTCO Superfund Site
La Marque, Texas

Date	Event
January 1998	MOTCO Trust Group submitted the 1997 MOTCO Remedial Action Annual Effectiveness Report
February 1998	Pre-Construction Work Report - Addendum 15, DNAPL Recovery Status Report issued
February 1999	MOTCO Trust Group submitted the 1998 MOTCO Remedial Action Annual Effectiveness Report
February 2000	The photo Cat System (UV-OX) was taken off-line at the groundwater treatment plant.
March 2000	MOTCO Trust Group submitted the 1999 MOTCO Remedial Action Annual Effectiveness Report
January 2001	The photo Cat System (UV-OX) was removed from the groundwater treatment plant.
February 2001	MOTCO Trust Group submitted the 2000 MOTCO Remedial Action Annual Effectiveness Report
October 2001	EPA, TNRCC and MOTCO met and verified that the cap is protective and that the water treatment system is operating satisfactorily.
February 2002	MOTCO Trust Group submitted the 2001 MOTCO Remedial Action Annual Effectiveness Report
April 2002	MOTCO Remedial Effectiveness Quarterly Report for 1 st Quarter 2002 submitted.
June 2002	MOTCO Trust Group submitted the Groundwater Treatment Plant-Revision 6 to the O&M Manual

Table 2		
Compliance/Performance Monitoring Standards		
<i>MOTCO Superfund Site</i>		
<i>La Marque, Texas</i>		
Transmissive Zone Compliance Monitoring Standards		
Constituent		HBN (mg/L)
benzene		39.0
bis(2-chloroethyl)ether		2.4
1,2-dichloroethane		39.0
1,1-dichloroethylene		54.0
naphthalene		744.5
1,1,2-trichloorethane		14000
vinyl chloride		16.0
UC-1 and UC-2 Compliance Monitoring Standards		
Constituent		Recovery Standard (mg/L)
benzene		0.005
bis(2-chloorethyl)ether		0.00003
1,2-dichoroethane		0.005
1,1-dichloroethylene		0.007
naphthalene		3.5
1,1,2-trichloroethane		0.0006
vinyl chloride		0.002
UC-3 Compliance Monitoring Standards		
Constituent		Recovery Standard (mg/L)
benzene		0.005
bis(2-chloorethyl)ether		0.00003
1,2-dichoroethane		0.005
1,1-dichloroethylene		0.007
naphthalene		3.5
1,1,2-trichloorethane		0.0006
vinyl chloride		0.002

Table 2 (continued) Compliance/Performance Monitoring Standards <i>MOTCO Superfund Site</i> <i>La Marque, Texas</i>		
UC-1 Clay Monitoring Standards		
Constituent	Compliance Standard (mg/L)	½ C.S. (mg/L)
benzene	0.005	0.0025
bis(2-chloorethyl)ether	0.00003	0.00003*
1,2-dichloroethane	0.005	0.0025
1,1-dichloroethylene	0.007	0.0035
naphthalene	3.5	1.75
1,1,2-trichloorethane	0.0006	0.0006*
vinyl chloride	0.002	0.001
Target Levels For Soil And Sediment		
Indicator Constituent		Target Level (µg/kg)
arsenic		20,000
benzene		16,000
benzo(a)anthracene		40
benzo(a)pyrene)		40
bis(2-chloroethyl)ether		420
chrysene		40
1,2-dichloroethane		5,300
1,1-dichloroethylene		840
1,1-2-trichloroethane		8,300
vinyl chloride		200

Notes:

HBN = Health-Based Number

UC = Upper Chicot aquifer

C.S.= Compliance Standard

* = The compliance standard for groundwater in the UC was set at the MCL or a 1x10⁻⁶ risk level in the absence of an MCL.

Attachment 1
Documents Reviewed

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Attachment 1 Documents Reviewed

MOTCO Trust Group, 1995. *Construction and Implementation Report, Groundwater/DNAPL Treatment System, September, 1995.*

MOTCO Trust Group, 1996a. *Consolidated Remedial Design.* May 1996.

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MOTCO Trust Group, 1998a. *1997 MOTCO Remedial Action Annual Effectiveness Report.* January, 1998.

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- U. S. Environmental Protection Agency (EPA), 1993. *Explanation of Significant Differences, MOTCO Superfund Site, La Marque, Texas*. January 13, 1993.
- U. S. Environmental Protection Agency (EPA), 2001. *Comprehensive Five-Year Review Guidance*. OSWER No. 9355.7-03B-P. June 2001.
- U. S. Environmental Protection Agency (EPA), 2002. *Proposal Modifications of Sampling Frequency and QA/QC Sample Collection*. 2002.

Attachment 2
Interview Record Forms

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Five-Year Review Interview Record MOTCO Superfund Site La Marque, Texas		Interviewee: Earl Hendrick/US EPA Region 6 Phone: (214) 665-8519 email: hendrick.earl@epa.com			
Site Name		EPA ID No.		Date of Interview	Interview Method
MOTCO Superfund Site		TXD980629851		8-27-2002	email
Interview Contacts	Organization	Phone	Email	Address	
Earl Hendrick	EPA Region 6	214-665-8519	hendrick.earl@epa.gov	1445 Ross Ave Dallas, Texas 75202-2733	
Margaret O'Hare	CH2M HILL, as rep of EPA	972-980-2170	mohare@ch2m.com	5339 Alpha Road Suite 300 Dallas, Texas 75240	
Bill Thomas	CH2M HILL, as rep of EPA	972-980-2170	bthomas@ch2m.com	5339 Alpha Road Suite 300 Dallas, Texas 75240	
Interview Questions (scope of the interview is from 1993 to present)					
<p>1. What is your overall impression of the work conducted at the site since the Consent Decree was entered in June 1993?</p> <p>Response: Work has been professionally executed; the threats to the environment and to human health has been removed. Current operations continue to maintain the site in a manner safe to the environment and human health.</p>					
<p>2. From your perspective, what effect have remedial operations at the site had on the surrounding community? Are you aware of any ongoing community concerns regarding the site or its operation and maintenance?</p> <p>Response: Current site operations appear to have no detrimental effects on the community. I am not aware of any site related community concerns.</p>					

3. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please describe purpose and results.

Response: Both the EPA and the TNRCC attend semi-annual meetings and site inspections. The PRP's issue quarterly reports about the site and the site operations.

4. Are you aware of any events, incidents, or activities that have occurred at the site such as dumping, vandalism, or anything that required emergency response from local authorities? If so, please give details.

Response: None that impair the environment or human health.

5. Have there been any complaints, violations, or other incidents related to the site that required a response by your office? If so, please give summarize the events and result.

Response: A cable driller did drill through the slurry wall located in the public right-of-way even though a warning sign was nearby.

6. Are you aware of any problems or difficulties encountered after the initiation of remedial action which impacted construction progress and implementability, or a change in O&M procedures? Please describe changes and impacts.

Response: No.

7. Have there been any changes in state or federal environmental standards since the Consent Decree was entered in 1993 which may call into question the protectiveness or effectiveness of the remedial action?

Response: No.

8. Do you know of opportunities to optimize the operation, maintenance, or sampling efforts at the site since the start of the long-term remedial action, and have such changes been adopted?

Response: Yes, ground water treatment equipment efficiency was improved.

9. Do you feel well-informed about the site's activities and progress?

Response: Yes.

10. Do you have any comments, suggestions, or recommendations regarding the site?

Response: None

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Five-Year Review Interview Record MOTCO Superfund Site La Marque, Texas		Interviewee: Jim Feeley/TNRCC Phone: (512) 239-2462 email: jfeeley@tnrcc.stste.tx.us			
Site Name		EPA ID No.		Date of Interview	Interview Method
MOTCO Superfund Site		TXD980629851		7-2-2002	written
Interview Contacts	Organization	Phone	Email	Address	
Earl Hendrick	EPA Region 6	214-665-8519	hendrick.earl@epa.gov	1445 Ross Ave Dallas, Texas 75202-2733	
Margaret O'Hare	CH2M HILL, as rep of EPA	972-980-2170	mohare@ch2m.com	5339 Alpha Road Suite 300 Dallas, Texas 75240	
Bill Thomas	CH2M HILL, as rep of EPA	972-980-2170	bthomas@ch2m.com	5339 Alpha Road Suite 300 Dallas, Texas 75240	
Interview Questions (scope of the interview is from 1993 to present)					
1. What is your overall impression of the work conducted at the site since the Consent Decree was entered in June 1993?					
Response: My experience with the site has been prior to 1993 or over the last several years. My impression of the site in recent years is that the work conducted at the site is professionally managed with proper attention both to systems operation and maintenance and to health and safety issues.					
2. From your perspective, what effect have remedial operations at the site had on the surrounding community? Are you aware of any ongoing community concerns regarding the site or its operation and maintenance?					
Response: Ongoing operations at the site appear to have minimal impact on the surrounding community. We are not aware of any community concerns regarding the site.					
3. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please describe purpose and results.					
Response: The TNRCC receives quarterly reports and participates in semi-annual meetings and inspections.					

4. Are you aware of any events, incidents, or activities that have occurred at the site such as dumping, vandalism, or anything that required emergency response from local authorities? If so, please give details.

Response:

From information provided by the MOTCO Trust, we know that there have been several wells in the right of way damaged by automobile accidents and that there have been occasional thefts from the site.

5. Have there been any complaints, violations, or other incidents related to the site that required a response by your office? If so, please give summarize the events and result.

Response:

Last year a fiber optic cable driller working in the right of way reported drilling through the slurry wall into the transmissive zone. The contractor alleged to the TNRCC that the area was not properly marked. Investigation revealed that the contractor had begun drilling less than 100 feet from a clearly visible warning marker.

6. Are you aware of any problems or difficulties encountered after the initiation of remedial action which impacted construction progress and implementability, or a change in O&M procedures? Please describe changes and impacts.

Response:

No.

7. Have there been any changes in state or federal environmental standards since the Consent Decree was entered in 1993 which may call into question the protectiveness or effectiveness of the remedial action?

Response:

No.

8. Do you know of opportunities to optimize the operation, maintenance, or sampling efforts at the site since the start of the long-term remedial action, and have such changes been adopted?

Response:

The UV-OX system was removed because it contributed marginally at best to system efficiency.

9. Do you feel well-informed about the site's activities and progress?

Response:

Yes

10. Do you have any comments, suggestions, or recommendations regarding the site?

Response:

No.

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Five-Year Review Interview Record MOTCO Superfund Site La Marque, Texas		Interviewee: Ray Saucier/MOTCO Phone: email:			
Site Name		EPA ID No.		Date of Interview	Interview Method
MOTCO Superfund Site		TXD980629851		7-2-2002	verbal
Interview Contacts	Organization	Phone	Email	Address	
Earl Hendrick	EPA Region 6	214-665-8519	hendrick.earl@epa.gov	1445 Ross Ave Dallas, Texas 75202-2733	
Margaret O'Hare	CH2M HILL, as rep of EPA	972-980-2170	mohare@ch2m.com	12377 Merit Drive 10 th Floor Dallas, Texas 75251	
Bill Thomas	CH2M HILL, as rep of EPA	972-980-2170	wthomas2@ch2m.com	12377 Merit Drive 10 th Floor Dallas, Texas 75251	
Interview Questions (scope of the interview is from July 1993 to present)					
1. What is your overall impression of the work conducted at the site (since remediation began)?					
Response:					
Very positive. The Community is generally pleased with the site condition.					
2. From your perspective, what effect have continued remedial operations at the site had on the surrounding community? Are you aware of any ongoing community concerns regarding the site or its operation and maintenance?					
Response:					
The community is pleased. Odors from the site prior to remediation were a source of complaints. Members of the community are pleased with MOTCO's quick and thorough response to its concerns.					
3. Are there routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by associated parties regarding the site (state, federal, local)? Please describe.					
Response:					
The EPA and TNRCC conduct semi-annual meetings. Quarterly and annual reports are prepared. There are no routinely scheduled community meetings.					

4. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, or anything that required emergency response from local authorities? If so, please briefly describe situation and outcome.

Response:

The site warehouse was broken into in January 2002. The perpetrators apparently climbed the fence. "Weedeaters" and other maintenance equipment was stolen. Bolt cutters taken from the warehouse were used to cut locks on the gates when the perpetrators left the site. The incident was reported to the police. Also, periodically, other items had been found to be missing, prompting the entry codes for the gates to be changed in March 2002.

5. Were any problems or difficulties encountered after the initiation of remedial action which impacted construction progress and implementability, or a change in O & M procedures? Please describe changes and impacts.

Response:

Odor problems from the Pit 7N excavation caused these remedial actions to be shut down. A sprayed material over the open pit was used to abate the odors. The UV/OX system was removed due to high maintenance costs and minimal increase in system efficiency. Several wells were changed over to DNAPL recovery wells and an oil/water separator was also installed.

6. Have there been opportunities to optimize the operation, maintenance, or sampling efforts at the site since the start of the long-term remedial action, and have such changes been adopted?

Response:

The UV/OX system was removed due to high maintenance costs and minimal increase in system efficiency. DNAPL recovery wells are no longer monitored for water quality. The MOTCO staff adheres to the following: 1) Safety first - no one gets hurt, 2) Maintain an inward and upward groundwater gradient, and 3) Discharge no dirty water.

7. Please describe the current O&M staff activities, and the date of the current O&M Plan. Are any updates to the O&M plan needed or planned?

Response:

The O&M Plan has just been revised, the current date of the Plan is June 6, 2002. The revision reflects the removal of the UV/OX system from the groundwater treatment system. The Site is staffed by three (3) persons with a minimum of two (2) persons onsite at all times Monday through Friday from 7:00 AM to 5:00 PM. For Saturday and Sunday one (1) person is onsite from 7:00 AM to 5:00 PM, only minimal activities are performed such as equipment/system monitoring and recording of system operating parameters. In the event of an after hours emergency the operator closest to the site is automatically called. If after three attempts there is no answer, calling cycle rolls over to the next person, followed by a call to Ray's home. This process is repeated until someone is contacted. A call attempt log is kept. In the event of equipment failure or damage, the affected and or pertinent equipment is shut down automatically.

8. Where are operations-related documents maintained (including Health and Safety Plans, Operations and Maintenance Plans, and other waste management/contingency Plans)? What procedures are in place to ensure compliance with these plans?

Response:

The public repository for these documents is onsite as of June 2001. Regular review of the O&M Plan and operations related documents is performed to ensure compliance with the referenced plans..

9. Have any activities been conducted to update/accelerate the remediation of the groundwater contamination at the site.

Response:

Changed DNAPL recovery wells over into ground water wells in 1996/1997.

10. Do you have any comments, suggestions, concerns, or recommendations regarding the site?

Response:

No

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Attachment 3
Site Inspection Checklist

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MOTCO, Inc, La Marque, Texas Five-Year Review Site Inspection Checklist

Please note that "O&M" is referred to throughout this checklist. At sites where Long-Term Response Actions are in progress, O&M activities may be referred to as "system operations" since these sites are not considered to be in the O&M phase while being remediated under the Superfund program. N/A means "not applicable."

I. SITE INFORMATION	
Site Name: MOTCO, Inc.	EPA ID: TXD980629851
City/State: La Marque, Galveston County, Texas	Date of Inspection: July 2, 2002
Agency Completing 5 Year Review: EPA	Weather/temperature: Sunny/ 90° F +
Remedy Includes: (Check all that apply) <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Landfill cover/containment <input checked="" type="checkbox"/> Access controls <input checked="" type="checkbox"/> Institutional controls <input checked="" type="checkbox"/> Groundwater pump and treatment <input type="checkbox"/> Surface water collection and treatment <input checked="" type="checkbox"/> Other: DNAPL recovery 	
Attachments: <input type="checkbox"/> Inspection team roster attached <input type="checkbox"/> Site map attached	
II. INTERVIEWS (Check all that apply)	
1. O&M site manager: Name: Ray Saucier Title: Date: 7/2/02 Interviewed: <input checked="" type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone Phone Number: <u>Problems, suggestions:</u> <input checked="" type="checkbox"/> Additional report attached (if additional space required).	
2. O&M staff: Name: Title: Date: Interviewed: <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone Phone Number: <u>Problems, suggestions:</u> <input type="checkbox"/> Additional report attached (if additional space required).	

3. Local regulatory authorities and response agencies (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency: TCEQ

Contact:

Name: Jim Feeley

Title:

Date: 7-2-02

Phone Number:

Problems, suggestions: Additional report attached (if additional space required).

Agency: USEPA Region 6

Contact:

Name: Earl Hendrick

Title:

Date: 8-27-02

Phone Number:

Problems, suggestions: Additional report attached (if additional space required).

Agency:

Contact:

Name:

Title:

Date:

Phone Number:

Problems, suggestions: Additional report attached (if additional space required).

Agency:

Contact:

Name:

Title:

Date:

Phone Number:

Problems, suggestions: Additional report attached (if additional space required).

4. Other interviews (optional) N/A Additional report attached (if additional space required).

Interview Record Forms are provided in Attachment 2 to the Five-Year Review Report.
Mr. Larry Crow, Mayor of La Marque (Interview form has not been received as of 9-3-02)

III. ONSITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)			
1. O&M Documents <input checked="" type="checkbox"/> O&M Manuals <input type="checkbox"/> As-Built Drawings <input type="checkbox"/> Maintenance Logs Remarks:	<input checked="" type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date	<input type="checkbox"/> N/A <input type="checkbox"/> N/A <input type="checkbox"/> N/A
2. Health and Safety Plan Documents <input checked="" type="checkbox"/> Site-Specific Health and Safety Plan <input checked="" type="checkbox"/> Contingency plan/emergency response plan Remarks: Public repository for these documents is now onsite since June 2001.	<input checked="" type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date <input type="checkbox"/> Up to date	<input type="checkbox"/> N/A <input type="checkbox"/> N/A
3. O&M and OSHA Training Records Remarks:	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input type="checkbox"/> N/A
4. Permits and Service Agreements <input type="checkbox"/> Air discharge permit <input type="checkbox"/> Effluent discharge <input type="checkbox"/> Waste disposal, POTW <input type="checkbox"/> Other permits Remarks:	<input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available <input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date <input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A <input checked="" type="checkbox"/> N/A
5. Gas Generation Records Remarks:	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
6. Settlement Monument Records Remarks: There are no onsite settlement monuments.	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input type="checkbox"/> N/A
7. Groundwater Monitoring Records Remarks:	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
8. Leachate Extraction Records Remarks:	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
9. Discharge Compliance Records Remarks:	<input type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A
10. Daily Access/Security Logs Remarks:	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A

IV. O&M Costs		<input type="checkbox"/> Applicable	<input type="checkbox"/> N/A
1. O&M Organization			
<input type="checkbox"/> State in-house	<input type="checkbox"/> Contractor for State		
<input checked="" type="checkbox"/> PRP in-house	<input type="checkbox"/> Contractor for PRP		
<input type="checkbox"/> Other:			
2. O&M Cost Records			
<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> Funding mechanism/agreement in place	
Original O&M cost estimate:		<input type="checkbox"/> Breakdown attached	
<u>Total annual cost by year for review period if available</u>			
From (Date):	To (Date):	Total cost:	<input type="checkbox"/> Breakdown attached
1/1/2000	12/31/2000	\$673,828	
From (Date):	To (Date):	Total cost:	<input type="checkbox"/> Breakdown attached
1/1/2001	12/31/2001	\$743,902	
From (Date):	To (Date):	Total cost:	<input type="checkbox"/> Breakdown attached
From (Date):	To (Date):	Total cost:	<input type="checkbox"/> Breakdown attached
From (Date):	To (Date):	Total cost:	<input type="checkbox"/> Breakdown attached
3. Unanticipated or Unusually High O&M Costs During Review Period <input checked="" type="checkbox"/> N/A			
<u>Describe costs and reasons:</u> Wells located on highway right-of-way were damaged by a dump truck. Repairs were made.			
V. ACCESS AND INSTITUTIONAL CONTROLS		<input type="checkbox"/> Applicable	<input type="checkbox"/> N/A
A. Fencing			
1. Fencing damaged <input checked="" type="checkbox"/> N/A			
<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Gates secured		
Remarks: Fencing and gates are secured and in good condition.			
B. Other Access Restrictions			
1. Signs and other security measures <input type="checkbox"/> N/A			
<input type="checkbox"/> Location shown on site map			
Remarks: Signs are attached to the fence. See site photographs.			

C. Institutional Controls			
1. Implementation and enforcement			
Site conditions imply ICs not properly implemented:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Site conditions imply ICs not being fully enforced:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Type of monitoring (e.g, self-reporting, drive by):			
Frequency:			
Responsible party/agency:			
Contact:			
Name:			
Title:			
Date:			
Phone Number:			
Reporting is up-to-date:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Reports are verified by the lead agency:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Specific requirements in deed or decision documents have been met:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Violations have been reported:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
<u>Other problems or suggestions:</u> <input type="checkbox"/> Additional report attached (if additional space required).			
2. Adequacy	<input checked="" type="checkbox"/> ICs are adequate	<input type="checkbox"/> ICs are inadequate	<input type="checkbox"/> N/A
<u>Remarks:</u>			
D. General			
1. Vandalism/trespassing			
	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No vandalism evident	
<u>Remarks:</u> The site warehouse was broken into in January 2002. The perpetrators apparently climbed the fence. "Weedeaters" and other maintenance equipment was stolen. Bolt cutters taken from the warehouse were used to cut locks on the gates when the perpetrators left the site. The incident was reported to the police. Also, periodically, other items had been found to be missing, prompting the entry codes for the gates to be changed in March 2002.			
2. Land use changes onsite			<input checked="" type="checkbox"/> N/A
<u>Remarks:</u>			
3. Land use changes offsite			<input checked="" type="checkbox"/> N/A
<u>Remarks:</u>			
VI. GENERAL SITE CONDITIONS			
A. Roads			
	<input checked="" type="checkbox"/> Applicable		<input type="checkbox"/> N/A
1. Roads damaged	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Roads adequate	<input type="checkbox"/> N/A
<u>Remarks:</u> Herbicides are used to control grass/weeds in roadways			
B. Other Site Conditions			
<u>Remarks:</u>			

VII. LANDFILL COVERS		<input type="checkbox"/> Applicable	<input type="checkbox"/> N/A
A. Landfill Surface			
1. Settlement (Low spots) Areal extent: Depth: <u>Remarks:</u> There are no settlement monuments onsite. Some monitoring/recovery wells on the cover show indications that some settlement may have occurred. These wells were constructed with a small concrete collar at the base of the protective casing. The concrete pad was then constructed around this. It appears that the pad has settled around the well. (See site photographs). No low spots were observed. Settlement, if it has occurred, appears to be relatively uniform.	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> Settlement not evident		
2. Cracks Lengths: Widths: Depths: <u>Remarks:</u>	<input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Cracking not evident		
3. Erosion Areal extent: Depth: <u>Remarks:</u>	<input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Erosion not evident		
4. Holes Areal extent: Depth: <u>Remarks:</u>	<input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Holes not evident		
5. Vegetative Cover <input checked="" type="checkbox"/> Cover properly established <input checked="" type="checkbox"/> No signs of stress <input checked="" type="checkbox"/> Grass <input type="checkbox"/> Trees/Shrubs <u>Remarks:</u> The grass on the cover is mowed once per quarter. The remainder of the site is mowed once per month. There is no vegetation present, such as trees or shrubs, that would have deep penetrating root systems.			
6. Alternative Cover (armored rock, concrete, etc.) <u>Remarks:</u>			<input checked="" type="checkbox"/> N/A
7. Bulges Areal extent: Height: <u>Remarks:</u>	<input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> Bulges not evident		
8. Wet Areas/Water Damage <input type="checkbox"/> Wet areas <input type="checkbox"/> Location shown on site map Areal extent: <input type="checkbox"/> Ponding <input type="checkbox"/> Location shown on site map Areal extent: <input type="checkbox"/> Seeps <input type="checkbox"/> Location shown on site map Areal extent: <input type="checkbox"/> Soft subgrade <input type="checkbox"/> Location shown on site map Areal extent: <u>Remarks:</u> .			<input checked="" type="checkbox"/> Wet areas/water damage not evident

<p>9. Slope Instability <input type="checkbox"/> Slides <input type="checkbox"/> Location shown on site map <input checked="" type="checkbox"/> No evidence of slope instability Areal extent: Remarks:</p>
<p>B. Benches <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)</p>
<p>1. Flows Bypass Bench <input type="checkbox"/> Location shown on site map <input type="checkbox"/> N/A or okay Remarks:</p>
<p>2. Bench Breached <input type="checkbox"/> Location shown on site map <input type="checkbox"/> N/A or okay Remarks:</p>
<p>3. Bench Overtopped <input type="checkbox"/> Location shown on site map <input type="checkbox"/> N/A or okay Remarks:</p>
<p>C. Letdown Channels <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A (Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)</p>
<p>1. Settlement <input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of settlement Areal extent: Depth: Remarks:</p>
<p>2. Material Degradation <input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of degradation Material type: Areal extent: Remarks:</p>
<p>3. Erosion <input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of erosion Areal extent: Depth: Remarks:</p>
<p>4. Undercutting <input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of undercutting Areal extent: Depth: Remarks:</p>
<p>5. Obstructions <input type="checkbox"/> Location shown on site map <input type="checkbox"/> N/A Type: Areal extent: Height: Remarks:</p>

6. Excessive Vegetative Growth <input type="checkbox"/> Evidence of excessive growth <input type="checkbox"/> Location shown on site map <u>Remarks:</u>		<input type="checkbox"/> No evidence of excessive growth <input type="checkbox"/> Vegetation in channels but does not obstruct flow Areal extent:	
D. Cover Penetrations		<input checked="" type="checkbox"/> Applicable	<input type="checkbox"/> N/A
1. Gas Vents <input type="checkbox"/> Active <input checked="" type="checkbox"/> Properly secured/locked <input type="checkbox"/> Evidence of leakage at penetration <u>Remarks:</u>		<input checked="" type="checkbox"/> Passive <input type="checkbox"/> Routinely sampled <input checked="" type="checkbox"/> Functioning <input type="checkbox"/> Needs O & M	<input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good condition
2. Gas Monitoring Probes <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Evidence of leakage at penetration <u>Remarks:</u>		<input type="checkbox"/> Functioning <input type="checkbox"/> Needs O&M	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> Good condition
3. Monitoring Wells (within surface area of landfill) <input checked="" type="checkbox"/> Routinely sampled <input checked="" type="checkbox"/> Properly secured/locked <input type="checkbox"/> Evidence of leakage at penetration <u>Remarks:</u>		<input checked="" type="checkbox"/> Functioning <input type="checkbox"/> Needs O&M	<input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good condition
4. Leachate Extraction Wells <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Evidence of leakage at penetration <u>Remarks:</u>		<input type="checkbox"/> Functioning <input type="checkbox"/> Needs O&M	<input type="checkbox"/> N/A <input type="checkbox"/> Good condition
5. Settlement Monuments <u>Remarks:</u> There are no settlement monuments onsite.		<input type="checkbox"/> Located <input type="checkbox"/> Routinely surveyed	<input checked="" type="checkbox"/> N/A
E. Gas Collection and Treatment		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1. Gas Treatment Facilities <input type="checkbox"/> Flaring <input type="checkbox"/> Good condition <u>Remarks:</u>		<input type="checkbox"/> Thermal destruction <input type="checkbox"/> Needs O & M	<input type="checkbox"/> Collection for reuse <input type="checkbox"/> N/A
2. Gas Collection Wells, Manifolds and Piping <input type="checkbox"/> Good condition <u>Remarks:</u>		<input type="checkbox"/> Needs O & M	<input type="checkbox"/> N/A

3. Gas Monitoring Facilities (e.g., gas monitoring of adjacent homes or buildings)		<input type="checkbox"/> N/A
<input type="checkbox"/> Good condition <input type="checkbox"/> Needs O& M Remarks:		
F. Cover Drainage Layer		<input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A
1. Outlet Pipes Inspected	<input checked="" type="checkbox"/> Functioning	<input type="checkbox"/> N/A
Remarks:		
2. Outlet Rock Inspected	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A
Remarks:		
G. Detention/Sedimentation Ponds		<input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A
1. Siltation	<input type="checkbox"/> Siltation evident	<input checked="" type="checkbox"/> N/A
Areal extent: Depth:		
Remarks:		
2. Erosion	<input type="checkbox"/> Erosion evident	<input checked="" type="checkbox"/> N/A
Areal extent: Depth:		
Remarks:		
3. Outlet Works	<input checked="" type="checkbox"/> Functioning	<input type="checkbox"/> N/A
Remarks:		
4. Dam	<input type="checkbox"/> Functioning	<input checked="" type="checkbox"/> N/A
Remarks:		
H. Retaining Walls		<input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A
1. Deformations	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Deformation not evident
Horizontal displacement: Vertical displacement: Rotational displacement:		
Remarks:		
2. Degradation	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Degradation not evident
Remarks:		
I. Perimeter Ditches/Off-site discharge		<input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A
1. Siltation	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Siltation not evident
Areal extent: Depth:		
Remarks:		

2. Vegetative Growth	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Vegetation does not impede flow
Areal extent:	Type:	
Remarks:		
3. Erosion	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Erosion not evident
Areal extent:	Depth:	
Remarks:		
4. Discharge Structure	<input checked="" type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A
<input checked="" type="checkbox"/> Functioning	<input checked="" type="checkbox"/> Good Condition	
Remarks:		
VIII. VERTICAL BARRIER WALLS		
	<input type="checkbox"/> Applicable	<input type="checkbox"/> N/A
1. Settlement	<input checked="" type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Settlement not evident
Areal extent:	Depth:	
Remarks:	Location of the slurry wall is marked by regularly placed, above ground markers.	
2. Performance Monitoring		<input type="checkbox"/> N/A
<input type="checkbox"/> Performance not monitored		
<input type="checkbox"/> Performance monitored	Frequency:	
<input type="checkbox"/> Evidence of breaching	Head differential:	
Remarks:		
IX. GROUNDWATER/SURFACE WATER REMEDIES		
	<input type="checkbox"/> Applicable	<input type="checkbox"/> N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines		
	<input type="checkbox"/> Applicable	<input type="checkbox"/> N/A
1. Pumps, Wellhead Plumbing, and Electrical		<input type="checkbox"/> N/A
<input checked="" type="checkbox"/> All required wells located	<input checked="" type="checkbox"/> Good condition	<input type="checkbox"/> Needs O& M
Remarks:		
2. Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances		<input type="checkbox"/> N/A
<input checked="" type="checkbox"/> System located	<input checked="" type="checkbox"/> Good condition	<input type="checkbox"/> Needs O& M
Remarks:		
3. Spare Parts and Equipment		<input type="checkbox"/> N/A
<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Good condition	
<input type="checkbox"/> Requires Upgrade	<input type="checkbox"/> Needs to be provided	
Remarks:		

B. Surface Water Collection Structures, Pumps, and Pipelines		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1. Collection Structures, Pumps, and Electrical		<input type="checkbox"/> N/A	
<input type="checkbox"/> Good condition <input type="checkbox"/> Needs O& M Remarks:			
2. Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances		<input type="checkbox"/> N/A	
<input type="checkbox"/> Good condition <input type="checkbox"/> Needs O& M Remarks:			
3. Spare Parts and Equipment		<input type="checkbox"/> N/A	
<input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires Upgrade <input type="checkbox"/> Needs to be provided Remarks:			
C. Treatment System		<input checked="" type="checkbox"/> Applicable	<input type="checkbox"/> N/A
1. Treatment Train (Check components that apply)			
<input type="checkbox"/> Metals removal <input checked="" type="checkbox"/> Oil/water separation <input type="checkbox"/> Bioremediation <input checked="" type="checkbox"/> Air stripping <input checked="" type="checkbox"/> Carbon adsorbers <input type="checkbox"/> Filters (list type): <input checked="" type="checkbox"/> Additive (list type, e.g., chelation agent, flocculent) <input type="checkbox"/> Others (list): Reverse Osmosis Plant <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs O&M <input checked="" type="checkbox"/> Sampling ports properly marked and functional <input type="checkbox"/> Sampling/maintenance log displayed and up to date <input checked="" type="checkbox"/> Equipment properly identified <input checked="" type="checkbox"/> Quantity of groundwater treated annually (list volume): about 43 million gallons recovered Oct 95 - Dec 2001. <input type="checkbox"/> Quantity of surface water treated annually (list volume): Remarks:			
2. Electrical Enclosures and Panels (properly rated and functional)		<input type="checkbox"/> N/A	
<input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs O& M Remarks:			
3. Tanks, Vaults, Storage Vessels		<input type="checkbox"/> N/A	
<input checked="" type="checkbox"/> Good condition <input checked="" type="checkbox"/> Proper secondary containment <input type="checkbox"/> Needs O&M Remarks:			
4. Discharge Structure and Appurtenances		<input type="checkbox"/> N/A	
<input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs O& M Remarks:			

<p>5. Treatment Building(s) <input checked="" type="checkbox"/> Good condition (esp. roof and doorways) <input checked="" type="checkbox"/> Chemicals and equipment properly stored <u>Remarks:</u></p>	<p><input type="checkbox"/> Needs Repair</p>	<p><input type="checkbox"/> N/A</p>
<p>6. Monitoring Wells (pump and treatment remedy) <input checked="" type="checkbox"/> All required wells located <input checked="" type="checkbox"/> Good condition <u>Remarks:</u></p>	<p><input checked="" type="checkbox"/> Properly secured/locked <input type="checkbox"/> Needs O&M <input checked="" type="checkbox"/> Functioning</p>	<p><input type="checkbox"/> Routinely sampled <input type="checkbox"/> N/A</p>
<p>D. Monitored Natural Attenuation <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A</p>		
<p>1. Monitoring Wells (natural attenuation remedy) <input type="checkbox"/> All required wells located <input type="checkbox"/> Good condition <u>Remarks:</u></p>	<p><input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Needs O&M <input type="checkbox"/> Functioning</p>	<p><input type="checkbox"/> Routinely sampled <input type="checkbox"/> N/A</p>
<p>X. OTHER REMEDIES <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A</p>		

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.)

The elements of the selected remedy are to: Remediate the onsite pits by excavating and stabilizing onsite, install a cap to protect the stabilized wastes, and install a 55 foot deep cutoff slurry wall to form a closed perimeter around the site to help prevent migration of affected ground water from inside the wall, with inward and upward gradients across the wall maintained by the ground water extraction system. Long-Term Response Action activities include pumping of affected ground water and DNAPL in the Transmissive Zone inside the cutoff slurry wall, pumping of affected ground water in the Upper Chicot (UC-3) beneath the site, treatment and discharge onsite of the extracted ground water, offsite incineration of the extracted DNAPL, performance and compliance monitoring to ensure the remedial action continues to perform as planned, and maintenance of the cap, slurry wall, and onsite ground water treatment plant.

Based on observations made during the site visit, the remedy appears to be functioning as designed.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

There are no survey monuments onsite. Survey monuments should be installed on the capped area and surveyed regularly to determine if settlement occurs.

C. Early Indicators of Potential Remedy Failure

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

None observed

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

None observed. Re-evaluate in next five-year review.

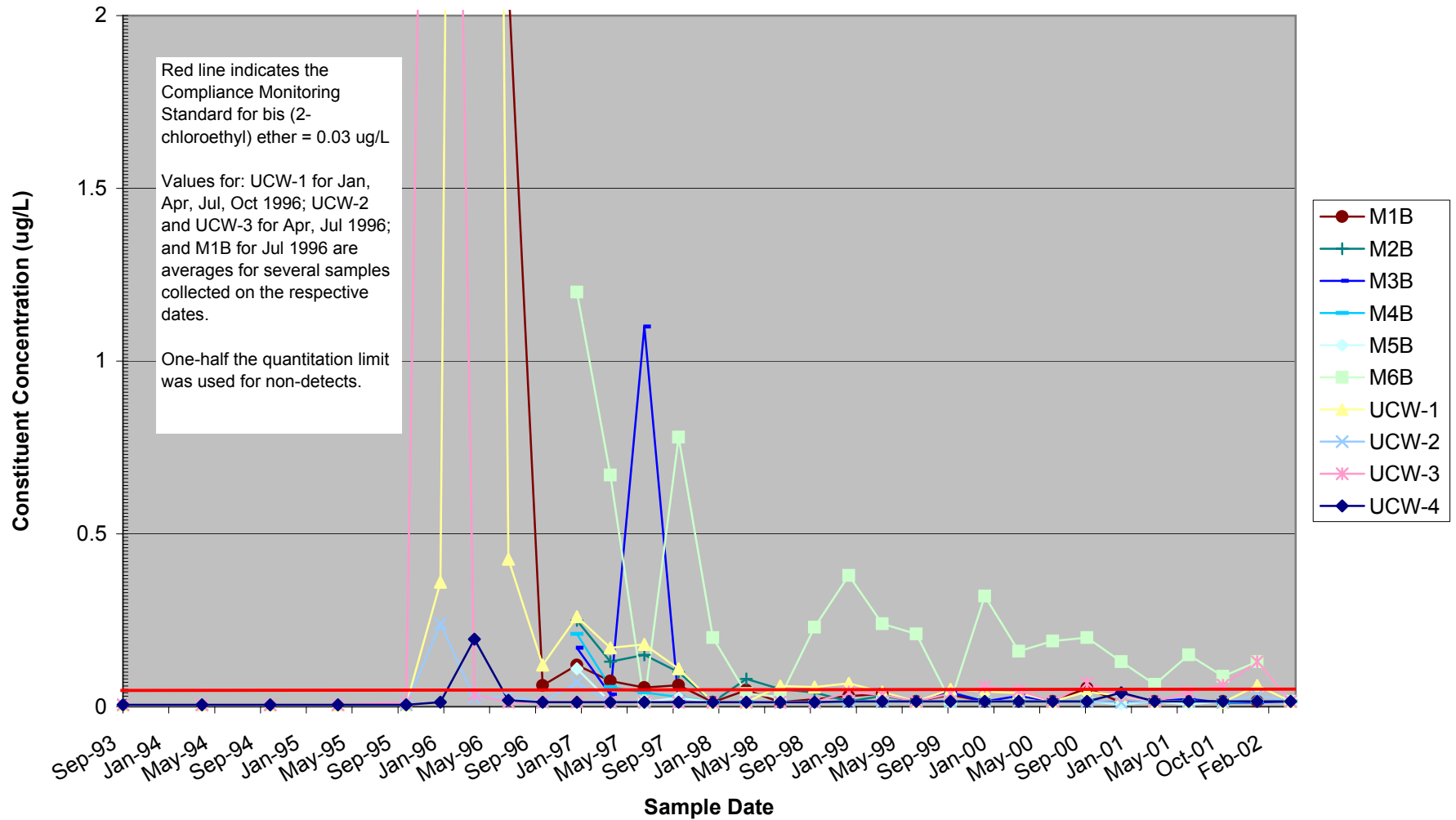
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Attachment 5
Concentration Graphs for Indicators in UC-1 and the M5 Well Cluster

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Attachment 5-1 Results of LTRA Groundwater Sampling Bis (2-chloroethyl) Ether Concentration Over Time

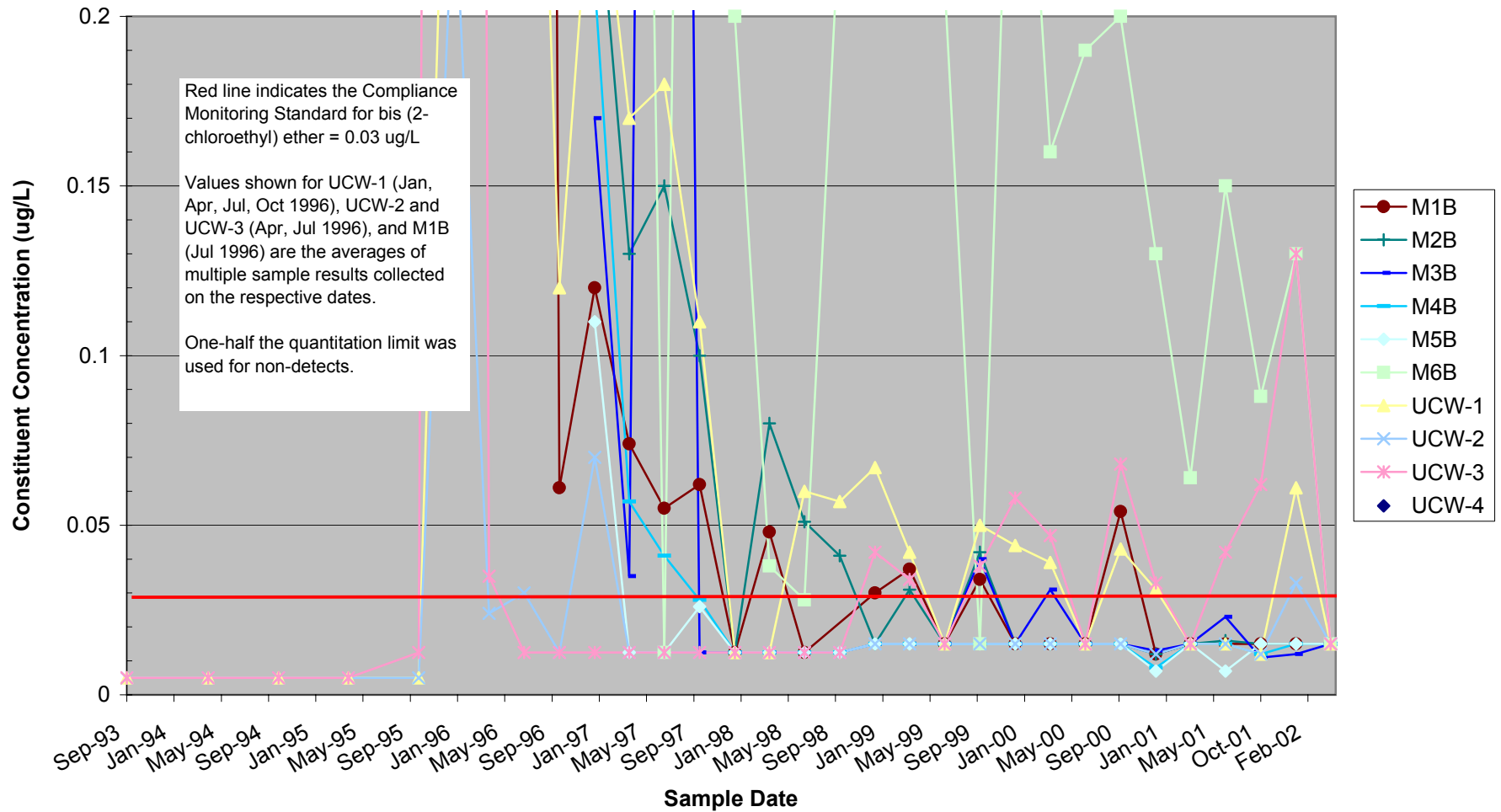
Upper Chicot (UC-1) Wells



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Attachment 5-1a
Results of LTRA Groundwater Sampling
Bis (2-chloroethyl) Ether Concentration Over Time
(lower concentration range)

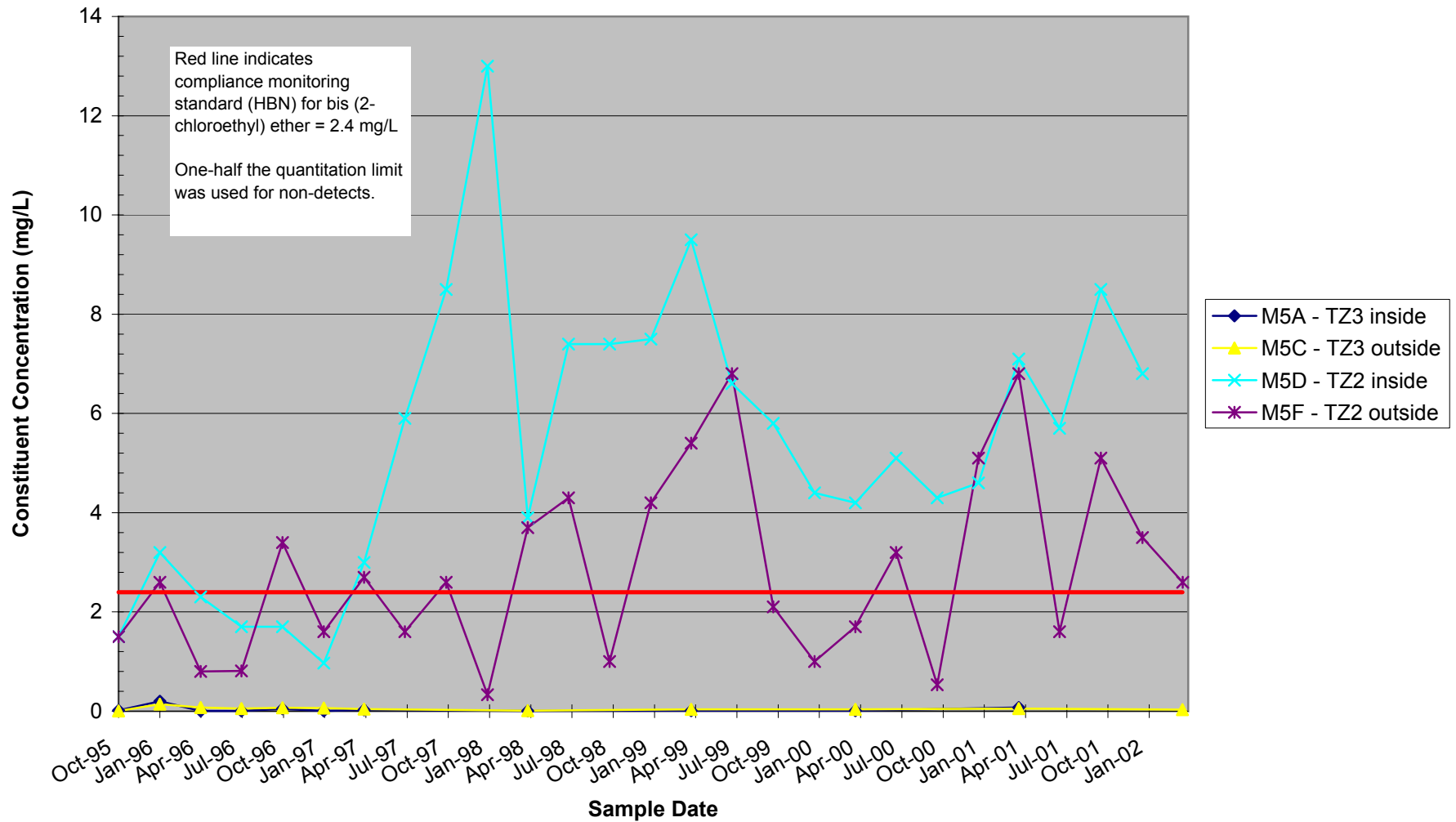
Upper Chicot (UC-1) Wells



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Attachment 5-2
Results of LTRA Groundwater Sampling
Bis (2-chloroethyl) Ether Concentration Over Time

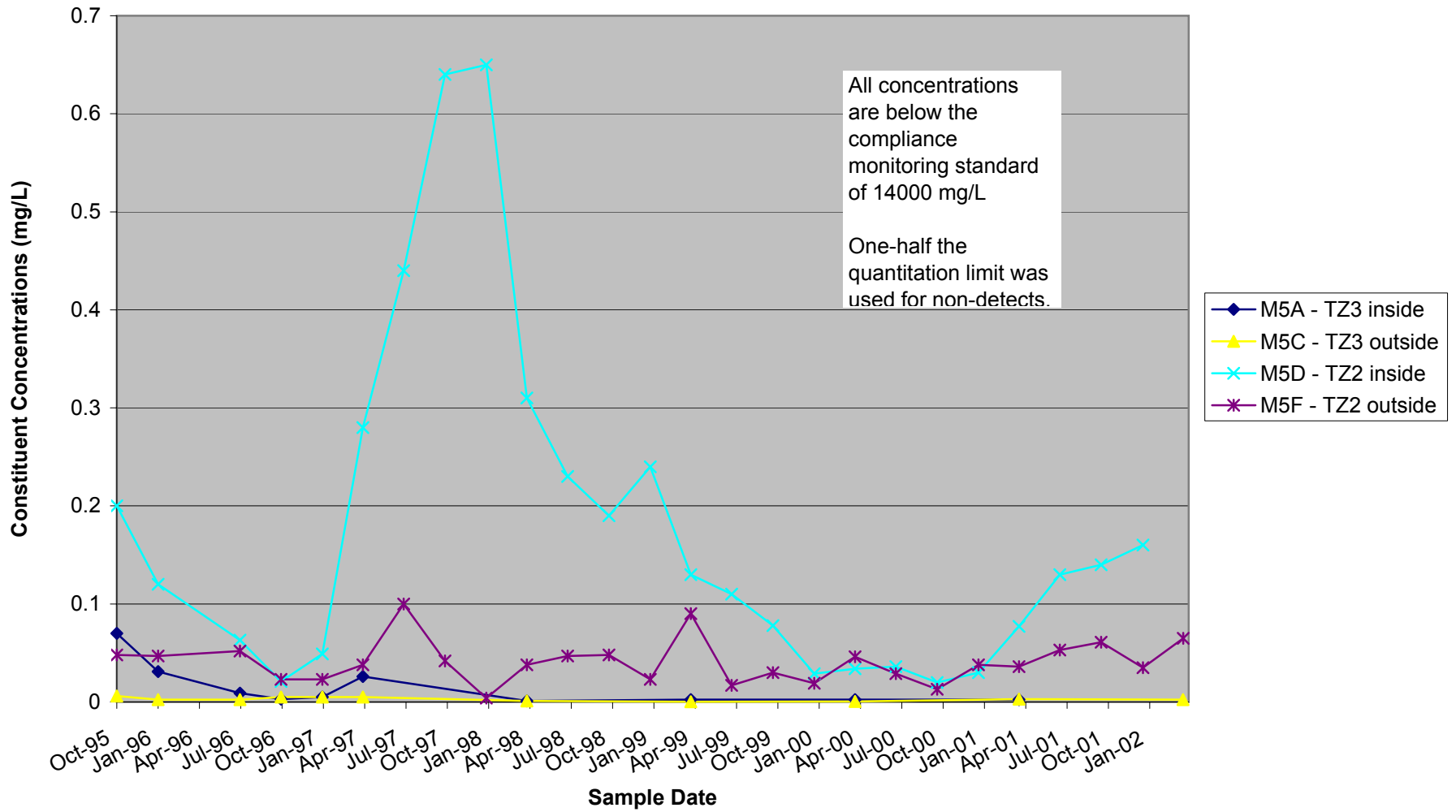
TZ-2 and TZ-3 Wells at the M-5 Well Cluster



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**Attachment 5-3
Results of LTRA Groundwater Sampling
1,1,2-Trichloroethane Concentrations Over Time**

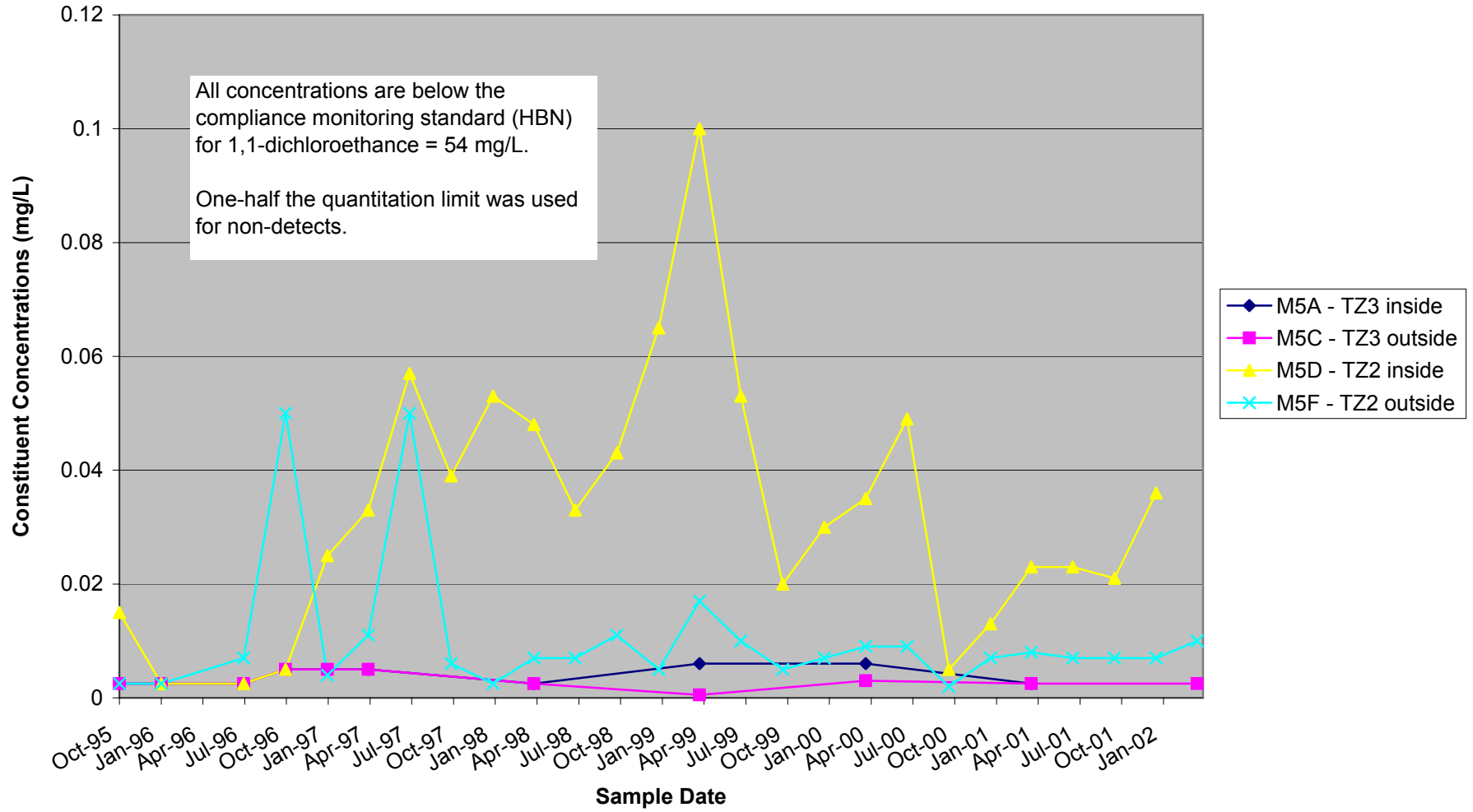
TZ-2 and T-3 Wells at the M-5 Well Cluster



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Attachment 5-4
Results of LTRA Groundwater Sampling
1,1-Dichloroethene Concentration Over Time

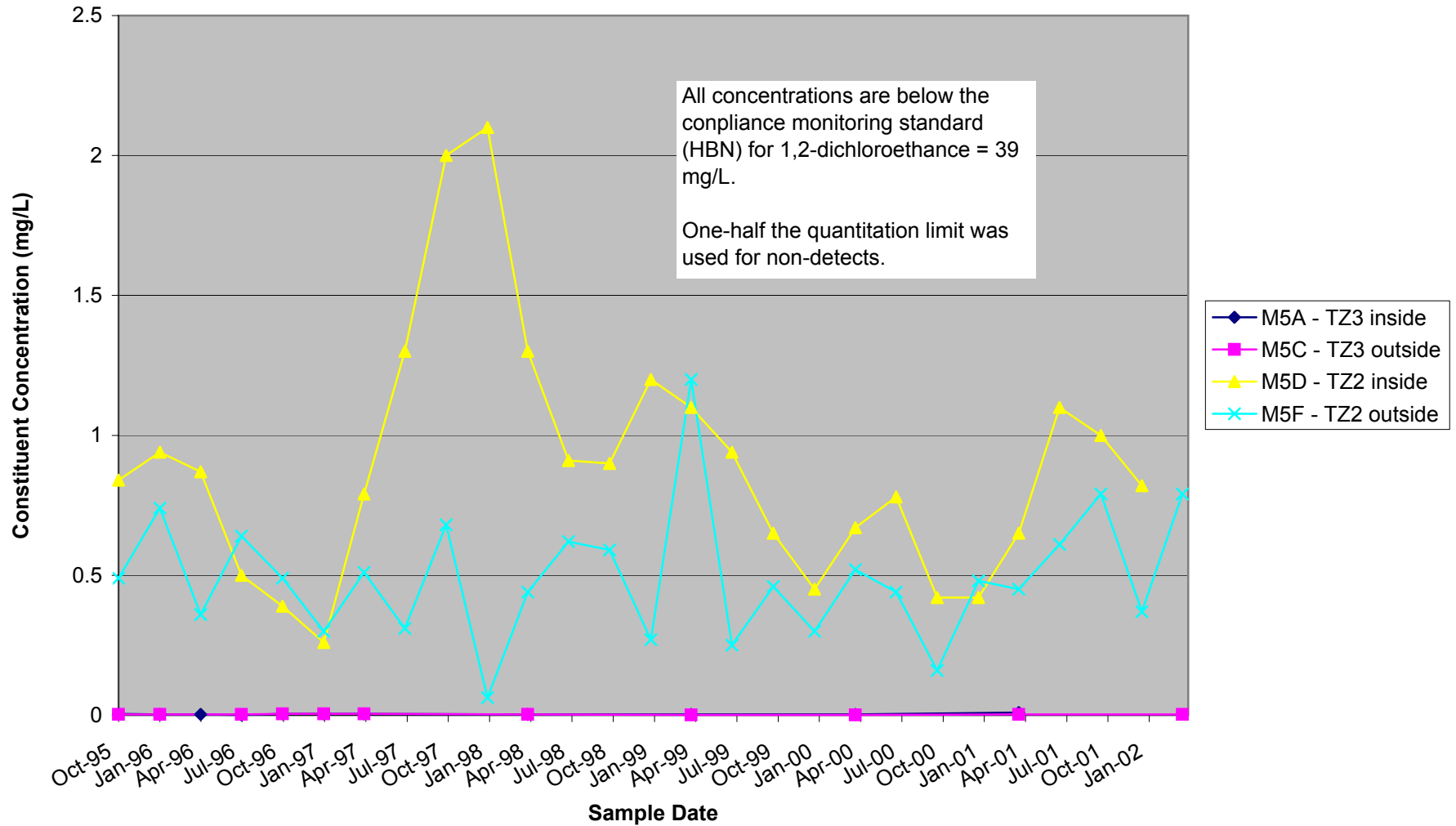
TZ-2 and T-3 Wells at the M-5 Well Cluster



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Attachment 5-5 Results of LTRA Groundwater Sampling 1,2-Dichloroethane Concentration Over Time

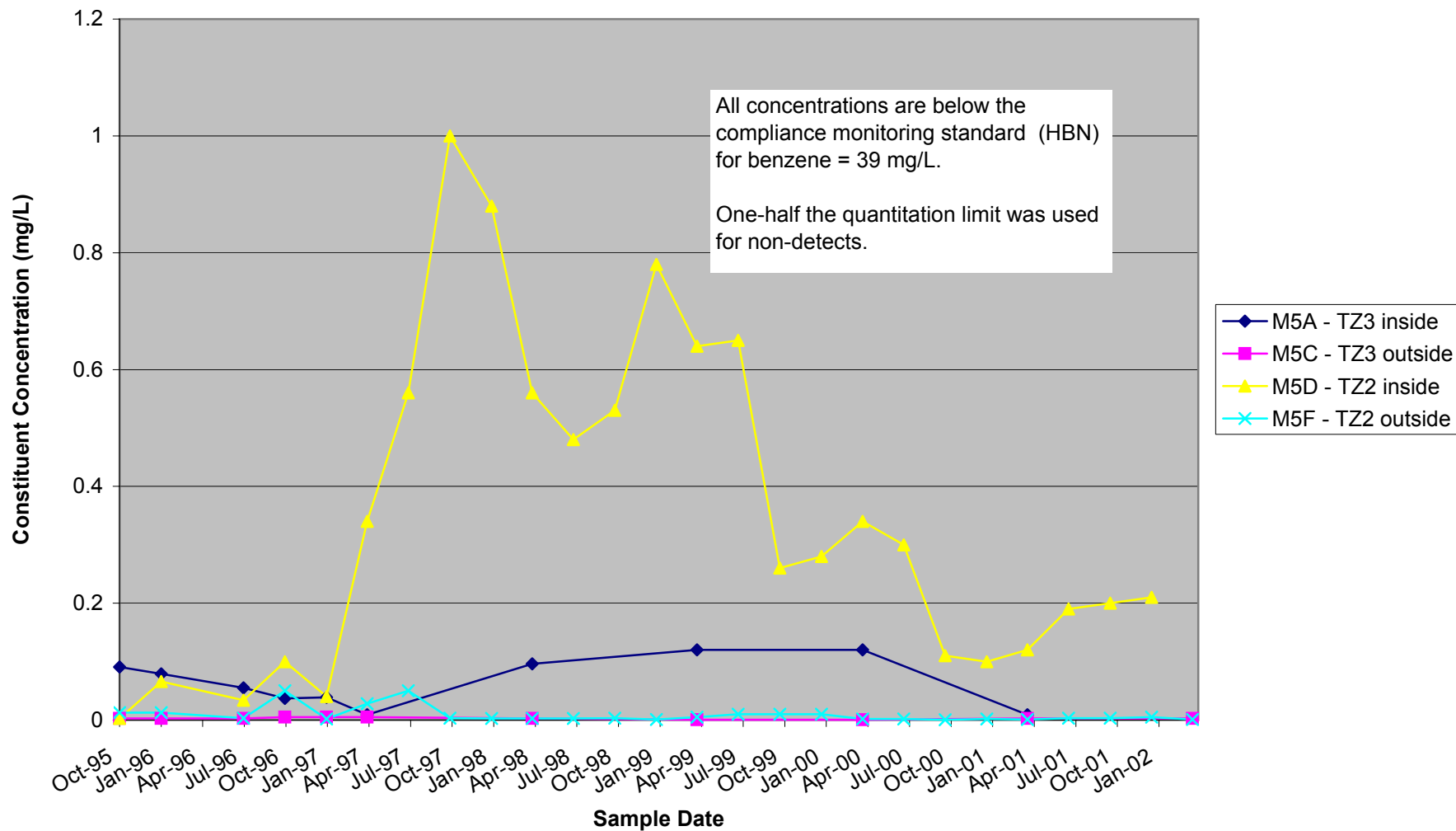
TZ-2 and TZ-3 Wells at the M-5 Well Cluster



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Attachment 5-6 Results of LTRA Groundwater Sampling Benzene Concentration Over Time

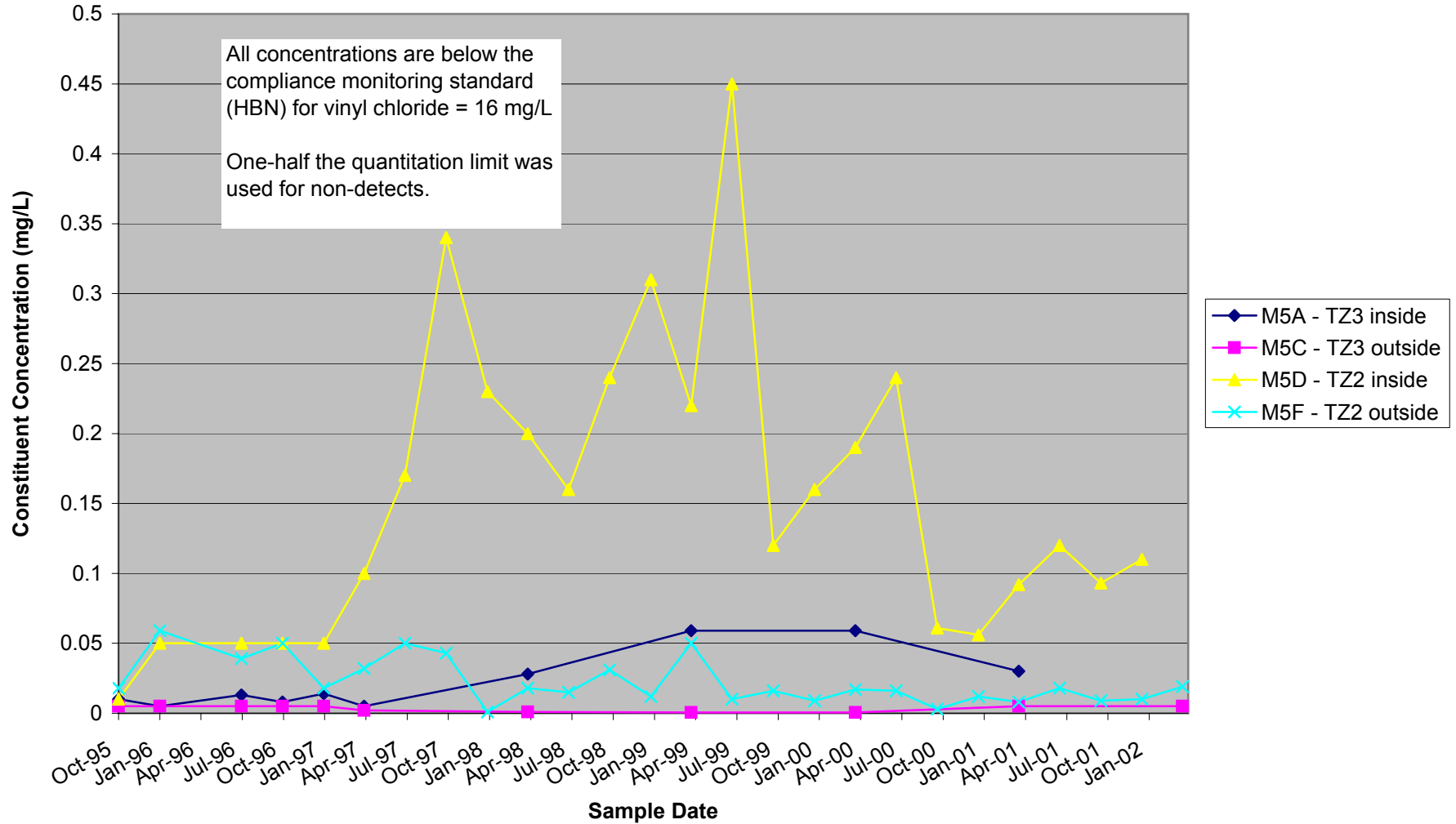
TZ-2 and TZ-3 Wells at the M-5 Well Cluster



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Attachment 5-7 Results of LTRA Groundwater Sampling Vinyl Chloride Concentration Over Time

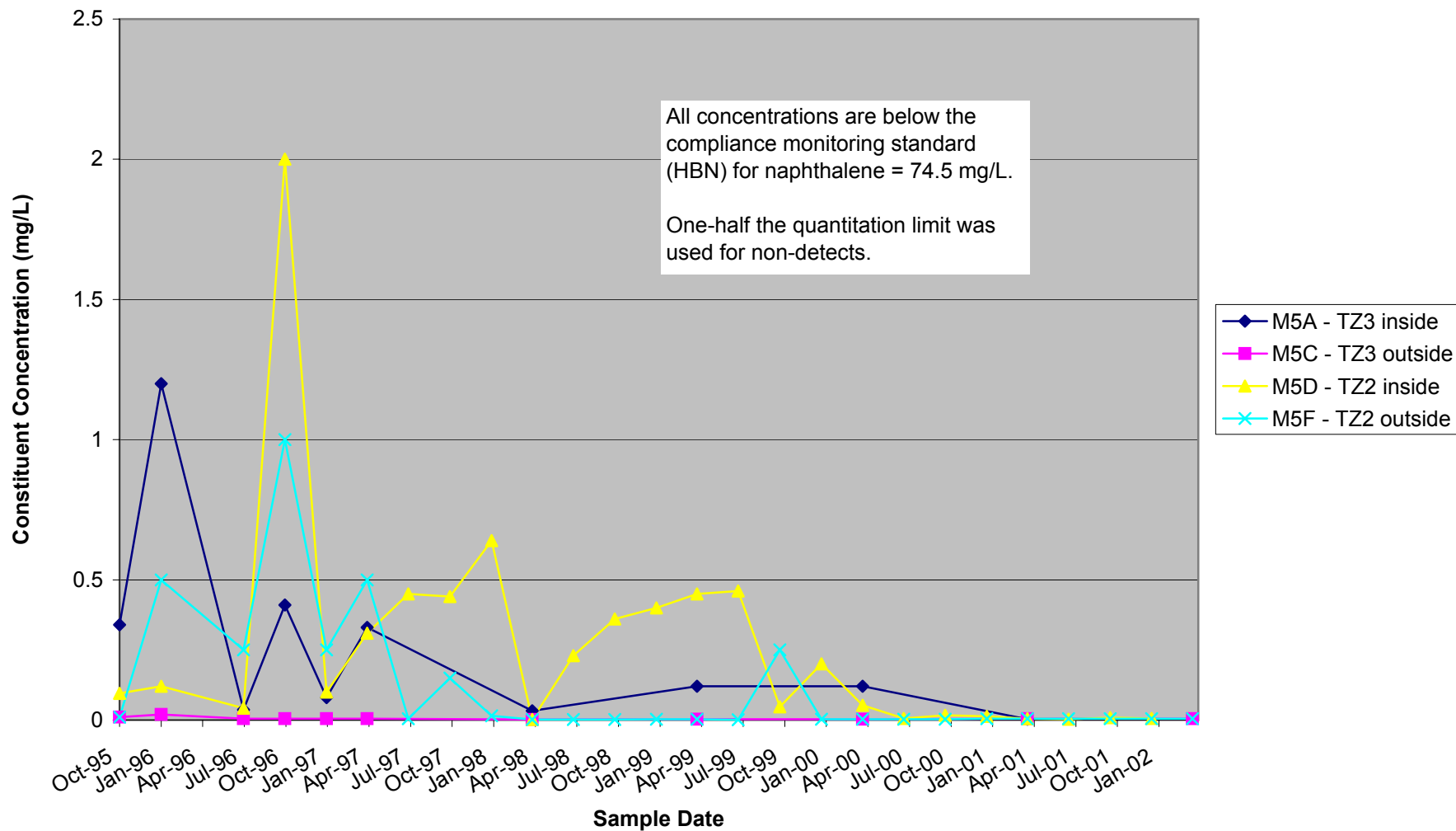
TZ-2 and TZ-3 Wells at the M-5 Well Cluster



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Attachment 5-8 Results of LTRA Groundwater Sampling Naphthalene Concentration Over Time

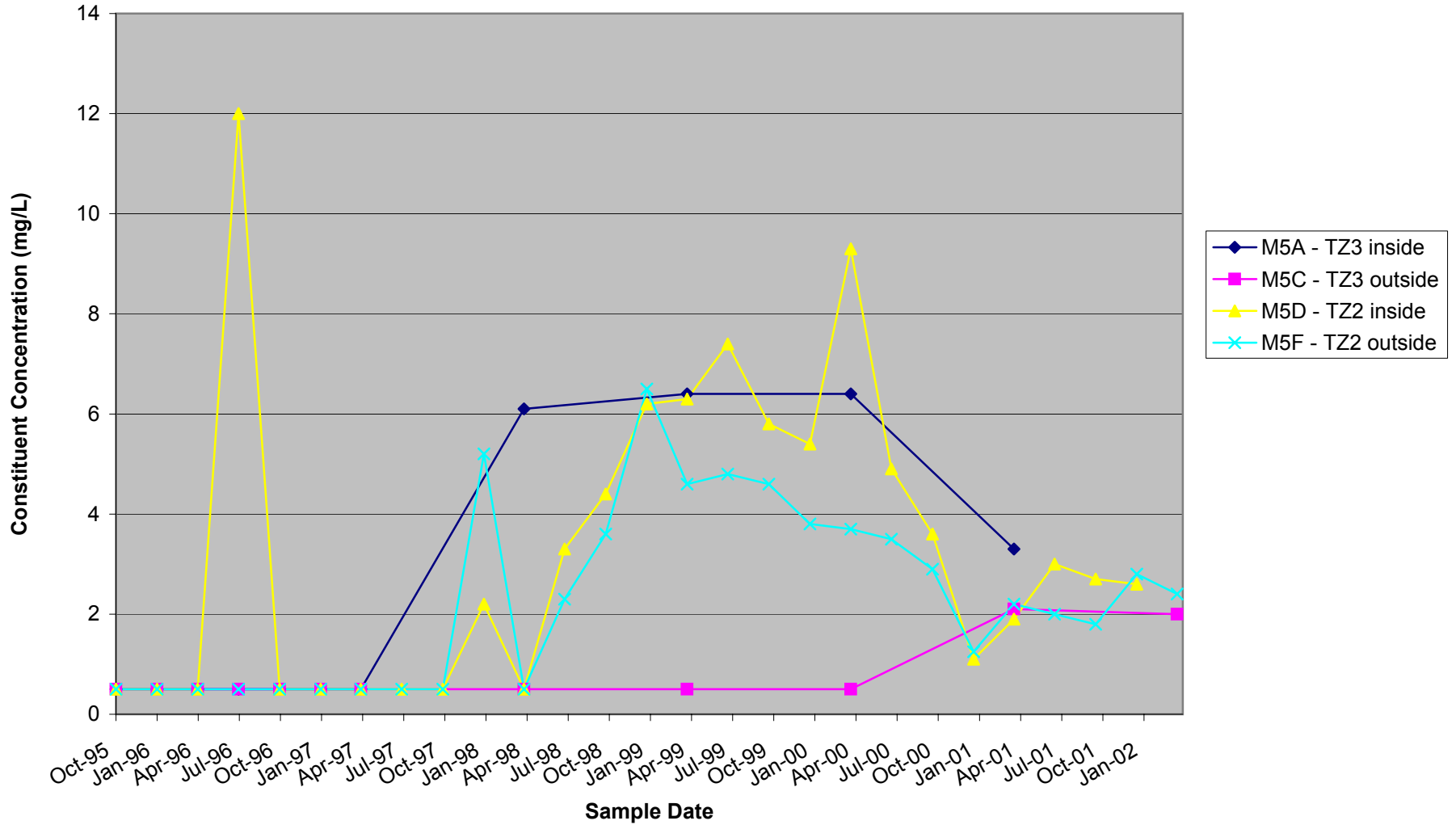
TZ-2 and T-3 Wells at the M-5 Well Cluster



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**Attachment 5-9
Results of LTRA Groundwater Sampling
TOC Concentration Over Time**

TZ-2 and TZ-3 Wells at the M-5 Well Cluster



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Attachment 6
Notices to the Public Regarding the Five-Year Review

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**MOTCO, Inc. Superfund Site
PUBLIC NOTICE
U.S. EPA Region 6 Begins
Five-Year Review of Site Remedy**



The U.S. Environmental Protection Agency Region 6 (EPA) has begun a Five-Year Review of the remedy for the MOTCO, Inc., Superfund site in La Marque, Galveston County, Texas. The review will evaluate the ability of the remedy to correct contamination problems and protect public health and the environment. The site is located two miles southeast of La Marque at the intersection of Interstate 45 and State Highway 3.

Once completed, the results of the Five-Year Review will be made available to the public at the following Information Repository:

**MOTCO, Inc. Site Office
2917 Highway 3
La Marque, Texas 77568**

Information about the MOTCO, Inc., site also is available on the Internet at www.epa.gov/region6/superfund. For more information about the MOTCO Site contact Earl Hendrick at (214) 665-8519 or 1-800-533-3508 (toll-free) or by e-mail at hendrick.earl@epa.gov.

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CH2M HILL/Bernard Hodes
972-980-2170, ext 238 or 234

MOTCO, Inc. Superfund Site Public Notice

U.S. EPA Region 6 Completes Five-Year Review of Site Remedy



The U.S. Environmental Protection Agency Region 6 (EPA) has completed a Five-Year Review of the remedy for the MOTCO, Inc. Superfund Site in La Marque, Galveston County, Texas. The review evaluated the implementation and performance of the remedy in terms of its ability to protect human health and the environment. The site is located on the southeast side of La Marque, near the intersection of State Highway 3 and the Gulf Freeway (I-45/US-75).

FIVE-YEAR REVIEW RESULTS

The results of the Five-Year Review indicate that the remedy and ongoing operation and maintenance activities continue to be protective of human health and the environment. The site is staffed full-time, and has been well-maintained. The review identified three areas of interest to continue to be evaluated under the Long Term Response Action, and considered at the time of the next five-year review.

These issues are possible settlement of the cap, the affects of the recently-installed flood-control lift station on maintenance of the required site gradients, and minor exceedances of some compliance monitoring standards in the ground water in two areas of the site outside the influence of the cutoff slurry wall. These issues are already being monitored, and do not currently affect the protectiveness of the remedy.

The results of the Five-Year Review are available at the following information repository:

MOTCO, Inc. Site Office
2917 Highway 3
La Marque, Texas 77568

Information about the MOTCO, Inc., site also is available on the Internet at www.epa.gov/region6/superfund. For more information about the MOTCO Site contact Earl Hendrick at (214) 665-8519 or 1-800-533-3508 (toll-free) or by e-mail at hendrick.earl@epa.gov.

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