United States
Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R06-85/005
March 1985

Superfund Record of Decision:

MOTCO, TX

MOTCO, TEXAS

Record of Decision
Abstract

The MOTCO site is located about three miles southeast of the City of LaMarque, Texas and occupies approximately 11.3 acres near the junction of State Highway 3 and the Gulf Freeway. The site has been used for recycling styrene tars and disposal of industrial chemical wastes. Due to numerous complaints, the City of LaMarque passed an ordinance prohibiting disposal of liquid wastes in surface impoundments which forced the owners to close the site. Subsequent owners attempted to recycle the wastes in the lagoons but later abandoned the project.

The cost-effective remedial alternative selected for this site involves transport of surface water in the impoundments by pipeline to an industrial wastewater treatment plant, the incineration of PCB liquid organics at a TSCA permitted facility, the incineration of non-PCB liquid organics at a RCRA permitted or interim status facility, and off-site disposal of the tars/sludges and soils at a RCRA (double-lined) facility. The estimated total cost for this alternative is $42,300.

Record of Decision
Remedial Alternative Selection

SITE: MOTCO, LaMarque, Texas

DOCUMENTS REVIEWED

I am basing my decision on the following documents describing the analysis of cost effectiveness of remedial alternatives for the MOTCO site:

- MOTCO Remedial Investigation Reports: Initial Investigation, Secondary Investigation, Source Sampling.
- MOTCO Source Control Feasibility Study
- Summary of Remedial Alternative Selection
- Responsiveness Summary

DESCRIPTION OF SELECTED REMEDY

° Contaminated pit water - off-site biological treatment
° Organic liquids - off-site incineration *
° Sludges/tars - off-site landfill*
° Soils-off-site landfill

* On-site incineration alternative will continue to be considered into design phase.

DECLARATIONS

Consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), and the National Contingency Plan (40 CFR Part 300), I have determined that the selected remedy at the MOTCO site is a cost effective remedy and provides adequate protection of public health, welfare, and the environment. The State of Texas has been consulted and agrees with the approved remedy.

I have also determined that the action being taken is appropriate when balanced against the availability of Trust Fund monies for use at other sites. In addition, the off-site transport, storage, destruction, treatment, or secure disposition is more cost effective than other remedial action, and is necessary to protect public health, welfare or the environment.

The EPA is currently engaged in an additional Remedial Investigation/Feasibility Study to evaluate potential groundwater contamination remedies and residual soil cleanup.

March 15, 1985
Date

Dick Whittington, P.E.
Regional Administrator
Region VI

MOTCO Source Control Record of Decision Concurrences

The MOTCO Source Control Record of Decision has been reviewed and I concur:

Allyn M. Davis, Director
Air & Waste Management Division

Samuel L. Nott, Chief
Superfund Branch
Air & Waste Management Division

Barbara Greenfield, Chief
Solid Waste & Emergency Response Branch
Office of Regional Council

William Rhea, Chief
Hazardous Materials Branch
Air & Waste Management Division

TEXAS DEPARTMENT OF WATER RESOURCES
1700 N. Congress Avenue
Austin, Texas

RECEIVED
EPA REGION VI
1985 FEB 19 AM 11: 19
SUPERFUND BRANCH

February 14, 1985

Mr. Sam Nott, Chief
Superfund Branch
U. S. Environmental Protection Agency
Region VI
1201 Elm Street
Dallas, Texas 75270

Dear ~~Mr. Nott:~~ Sam.

Re: MOTCO Draft Record of Decision

We have reviewed the draft MOTCO Source Control Record of Decision which you sent for our comments on January 25, 1985. We have no objections with the alternatives selected and the rationale given for their selection. The choice of alternatives will be between Alternative 3 (off-site incineration) and Alternative 10 (on-site incineration).

We look forward to working with you on the Remedial Design and Remedial Action phase of this project.

Sincerely,

Bryan W. Dixon, P. E., Chief
Solid Waste and Spill Response Section
Enforcement and Field Operations Division

DLS:mtm

1836-1986

SUMMARY OF REMEDIAL ALTERNATIVE SELECTION
MOTCO
LA MARQUE, TEXAS
FEBRUARY, 1985

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TABLE A SUMMARY OF REMEDIAL ALTERNATIVES
MOTCO SOURCE-CONTROL REMEDIAL ACTION

Alternative	Remedial Action Cost (millions) Capital	O&M	Public Health Considerations	Environmental Considerations	Technical Considerations	Public Comment	O&M
1. Off-site incinerate [need permit] off-site landfill	34.5	NA	Eliminate immediate public health risks. Minimizes direct contact. Excavation/ transportation risks- volatiles release.	Waste destroyed or contained. Heat value recovery possible.	Evaluation needed to obtain permits. More capacity/less clean-up time. Minimal on-site staging. Reliable.	PRP support Public-mild opposition	None
2. Off-site incinerate [permit in-place] off-site landfill	42.3	NA	Same as 1.	Waste destroyed or contained.	Permits in place. Less capacity/more clean-up time. Minimal on-site staging. Reliable.	Mild opposition	None
3. On-site incinerate Off-site landfill	48.9	NA	Same as 1. Less risks of hazardous vapors.	Same as 2.	Difficult design/ construct. Considerable operations. Less reliable technologies.	Public choice	None
4. On-site incinerate on-site landfill	47.1	3.2	Same as 1. Minimal Excavation risks. No transportation risks. Minimal hazardous vapor risks.	Waste destroyed.	Same as 3. Poor location for landfill. Maximum on-site construction. Longest implementation time.	Not acceptable	Annual inspection. High Maintenance.
5. No Action [not retained]	NA	NA	Direct contact to residents of carcinogenic, volatile contaminants from air emissions or run-off. Continued groundwater contamination.	Exposures to biota of hazardous material.	Periodic emergency responses.	Not acceptable	Periodic emergency responses.

Note: Site in-place closure not technically feasible due to characteristics of organic wastes.

SUMMARY OF REMEDIAL ALTERNATIVE SELECTION

MOTCO

LA MARQUE, TEXAS

FEBRUARY, 1985

SITE LOCATION AND DESCRIPTION

The MOTCO site, located about 2 miles southeast of the City of LaMarque, Galveston County, Texas, is situated on an 11.3 acre tract of land near the junction of State Highway 3 and the Gulf Freeway (I-45/US-75) (Figure 1-3). The site is bounded on the east by State Highway 3, on the northwest by an abandoned trailer park, and on the southwest by the right-of-way for Houston Lighting and Power transmission lines (H.L.& P. R-O-W) (Figure 1-3).

The MOTCO site sits on the Gulf Coastal Plain at the edge of a coastal marsh system, and area surface topography slopes gently toward the Gulf of Mexico. At approximately +5 feet mean sea level (msl) elevation, the site is well within the 100-year tidal floodplain of +12 feet msl and subject to inundation. The seven waste pits are surrounded by an exterior dike which collects precipitation. Site security is provided by a 6-foot chain link fence, and site access is through locked gates.

In addition to site boundaries mentioned above, pertinent features in the vicinity of the site include:

° Water-filled borrow pits-150 ft. southwest across the H.L.& P. R-O-W.

° Central Freight Lines (truck terminal) and Dispos-all Company yard -500 ft. to the southeast.

° Gulf Freeway (I-45/US-75)-1000 ft. to the west-southwest.

° Omega Bay Subdivision-1500 ft. west-southwest.

° Bayou Vista Subdivision-1500-2000 ft. south-southwest.

° Private residence-2000 ft. northwest.

Approximately 3000 people live within a 1-mile radius of the site, and about 12,000 people live within a 3-mile radius.

The uppermost geologic unit beneath the site is the Beaumont Clay Formation composed of 800 to 1000+ ft. of interbedded clay, sand, and silt deposits.

Predominant near-surface geologic units are two channel sand/silt deposits at about 5-10 ft. deep and 20-30 ft. deep, and an additional bar finger deposit at about 40-50 ft. deep. These layers are separated by clayey silts and silty clays, and the upper two sand/silt deposits apparently intersect with unlined pits.

Seven unlined pits with a surface area of 4.6 acres and average depths of 15 feet are at the site. The pits contain four major types of wastes. The first layer of wastes consist of approximately 3 feet of water over the remaining waste in the pits. Treatment of up to 15 million gallons of water is expected to be required during the cleanup. Under the water, there exists seven million gallons of organic liquids of which five million gallons will require disposal in accordance with the Toxic Substances Control Act (TSCA) due to the presence of polychlorinated biphenyls (PCBs). Under the organic liquids, approximately 18,000 cubic yards of sludges and tars are present. Under the sludges and tars are an estimated 45,000 cubic yards of highly contaminated soil. For illustrative purposes, cross-sections indicating the various layers within pits 1, 2, 3, and 4 is provided in Figure 1-5.

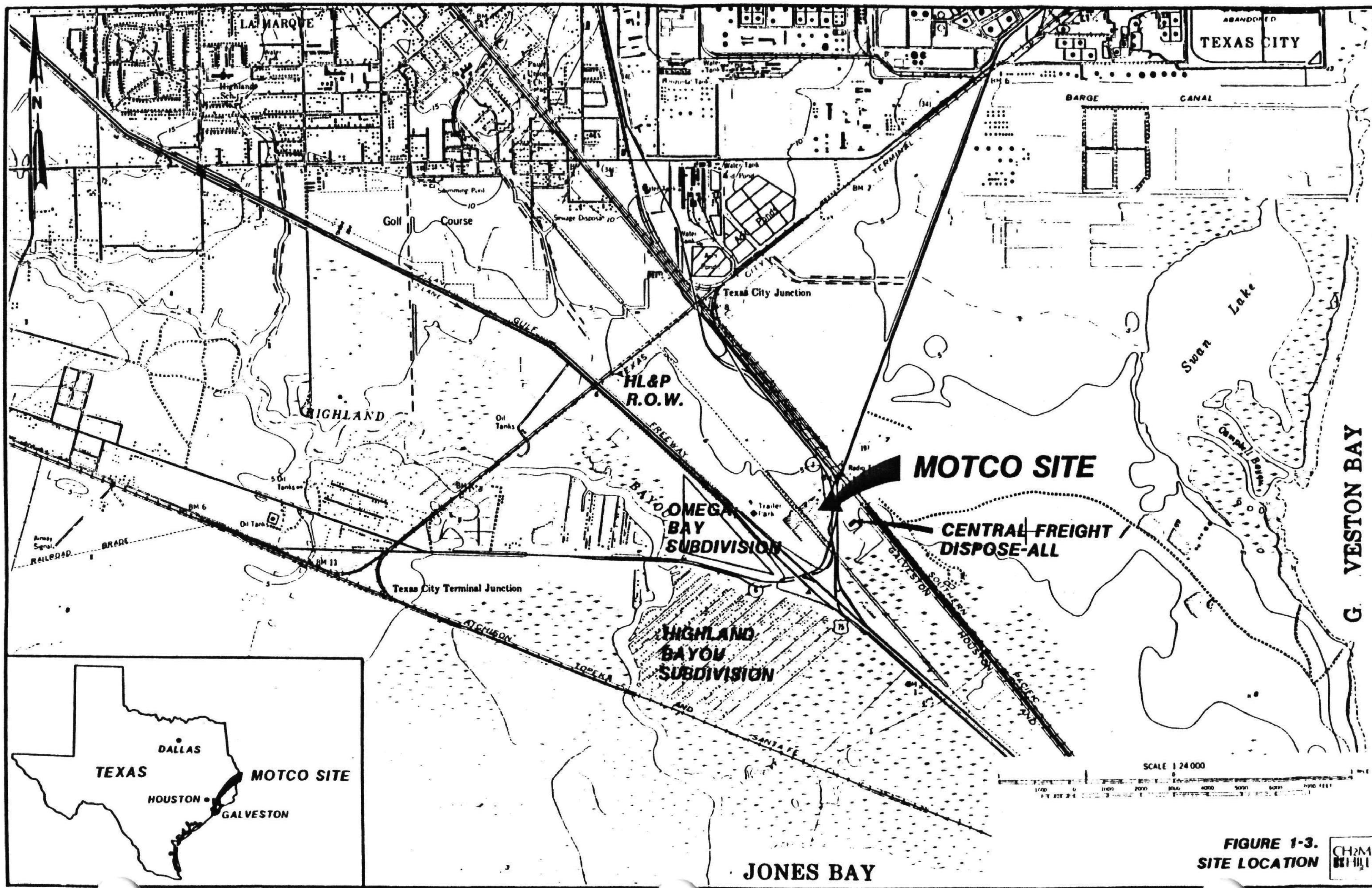


FIGURE 1-3.
SITE LOCATION

CH2M HILL

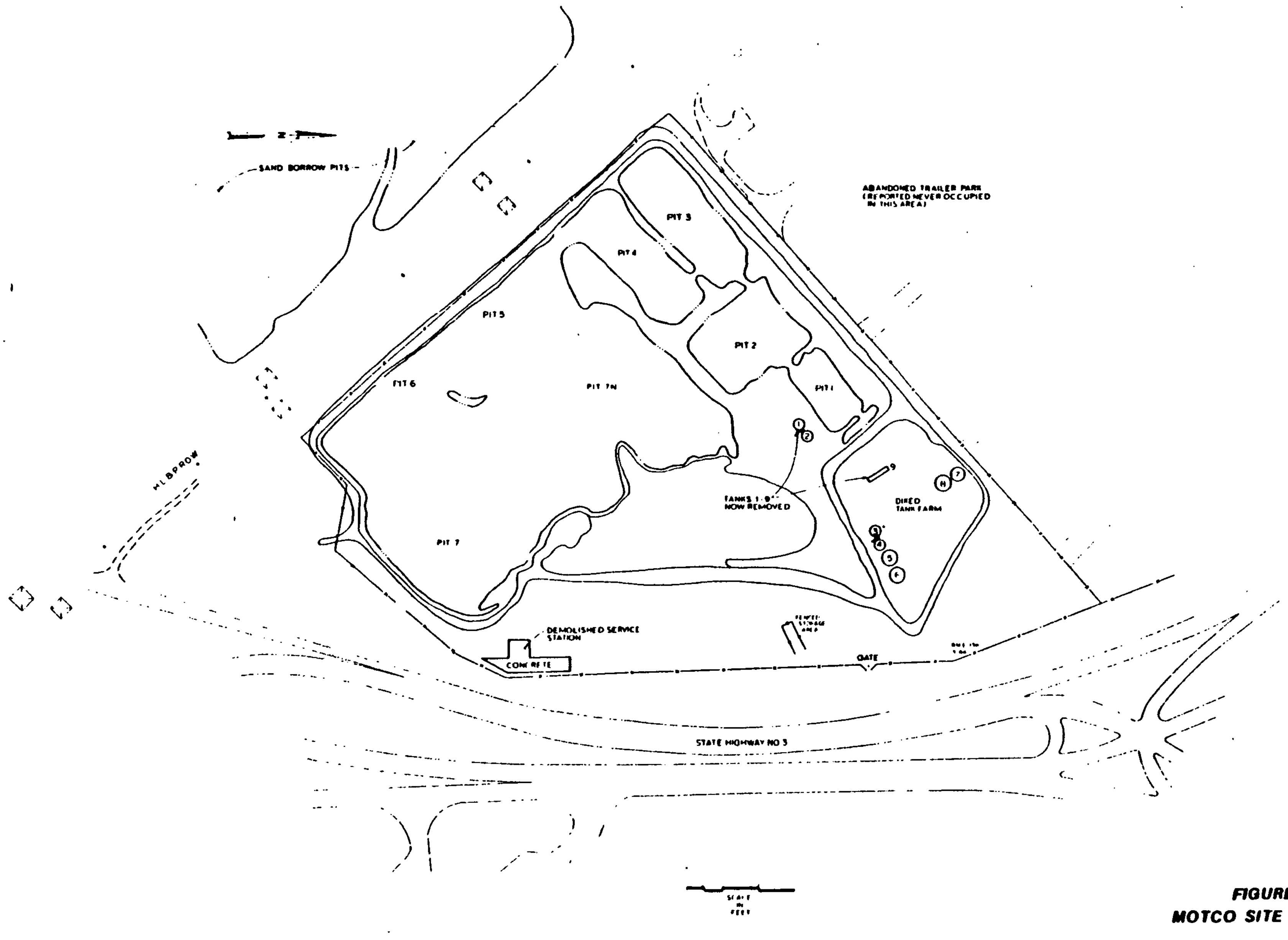
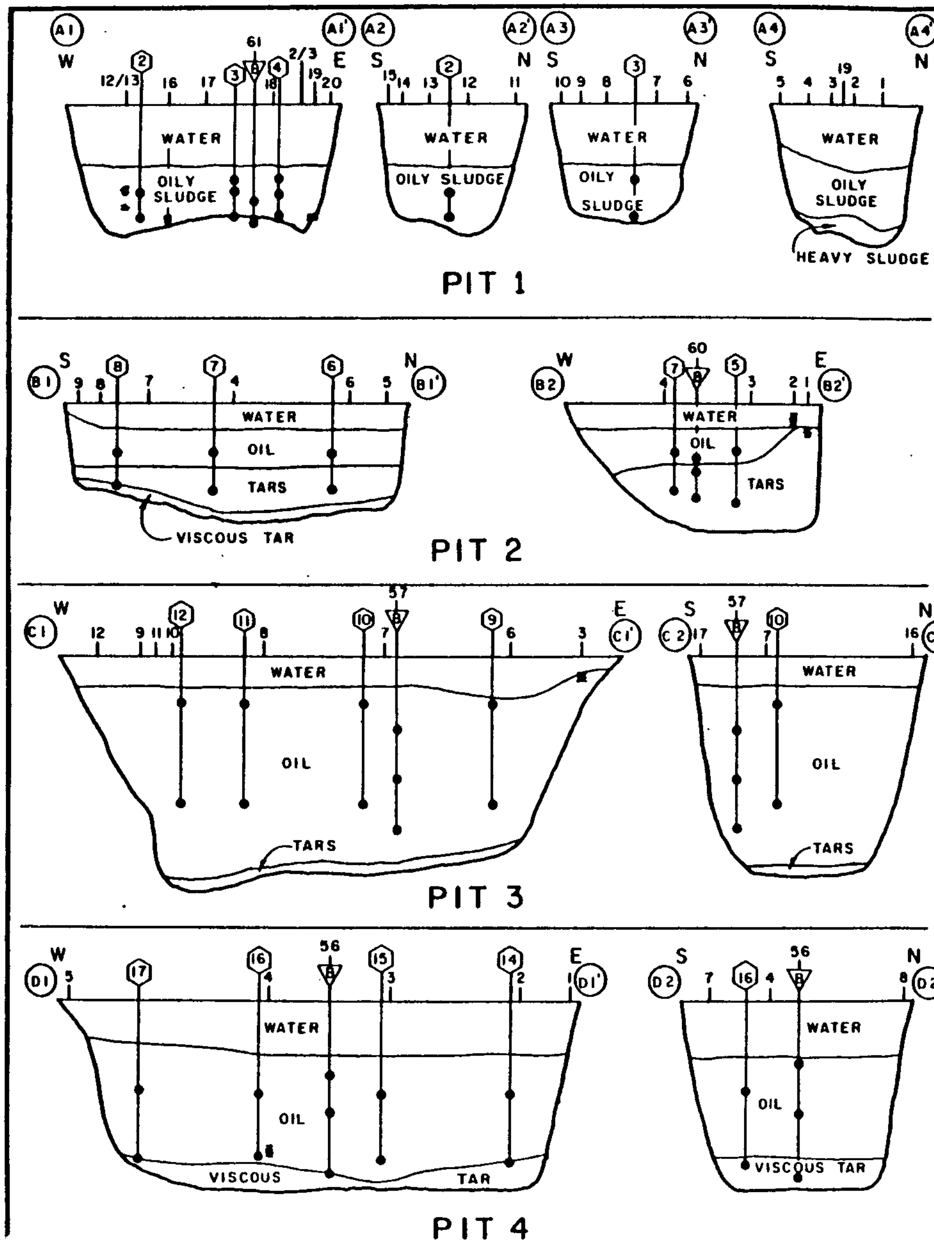


FIGURE 1-4
MOTCO SITE PLAN



LEGEND

- ② Location of Analytical Sampling Station
- 61 ▽ Location of Bulk (55 gal., 5 gal., 1 Liter) Sampling Station
- 10 ⊥ Location of Probing
- Location of Crust as Encountered
- ● Location of Sampling

NOTE:

For Location of Profiles, See Fig. 5.1

Layer designations are field descripti[ons]. For engineering descriptions, see Appendix D, Tables D-1 and D-2.

SCALE:
HORIZ. 1" = 50'
VERT. 1" = 10'

NAME	MOTCO SITE
FOR	MONSANTO COMPANY
	Woodward-Clyde Consultants
SCALE: NOTED	MADE BY: [illegible] DATE: 11-20-83; CHECKED BY: WSC DATE: 12-27-83; FILE No.: 83C173
PROFILES OF P… 2,3 & 4	FIGURE 5.2

SITE HISTORY

The MOTCO site was purchased by U.T. Alexander in 1959 for the purpose of recycling styrene tars generated by local industry. In 1961, damage from Hurricane Carla caused discontinuation of the recycling business. The pits on the site were then used for disposal of industrial 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 LaMarque, in which the site is located, 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 (including J.W. Yeatman and Associates and Wye Development Corporation), 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 lagoons and then abandoned the project. At some point in time during the recycling attempts, MOTCO bought Holman's and McDonald's interest in the site. In 1976, TDWR cancelled MOTCO's permit by means of an administrative order and required a closure plan. Shortly thereafter, MOTCO filed for bankruptcy and the trustee abandoned the site as a worthless asset. In 1977, MOTCO forfeited its right to do business in Texas, but remains an active corporation on the Minnesota Secretary of State's records. Attempts to contact MOTCO or its agent have been unsuccessful.

Summary of Response Actions

From May-September, 1980, the U.S. Coast Guard (USCG), 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 chain-link fence around the perimeter.

In February 1981, the Response Action Plan for the MOTCO Site was issued by EPA. In 1981-82, Black & Veatch Consulting Engineers completed an Initial Site Investigation (including Tankage Waste Inventory) and a Secondary Site Investigation. These efforts included characterization of pit wastes; analysis of surface soils, sediments, and waters; and a groundwater monitoring program. Contamination of the shallow groundwater was confirmed, but the areal and vertical extent and degree of contaminant migration were not determined.

The EPA has conducted three emergency response actions (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 in 1980. These actions were conducted following periods of heavy rainfall and/or storm surges to reduce the potential for release of contaminants from dike overtopping.

In July, 1982 EPA Region VI ranked the MOTCO site using the Mitre Model for inclusion on the National Priority List of Superfund sites. A hazard ranking of 62.5, the highest ranking of any site in Texas, was assigned.

In early 1983, EPA issued concurrent work assignments to CH_2M HILL for a Remedial Action Master Plan (RAMP) and a Source-Control Feasibility Study. The draft RAMP was submitted in May, 1983. Based on a detailed assessment of available data and information in the RAMP, specific additional data requirements were identified, and a specialized sampling/analysis program was conducted September to November, 1983.

In early 1984, an Initial Remedial Measure (IRM) was conducted by CH_2M Hill, as contractor for EPA, and with Coastal Environmental Control as subcontractor. This IRM included removal and off-site disposal of wastes in the nine above-ground tanks, and demolition/removal of those tanks.

In accordance with the National Contingency Plan (NCP), Section 300.68, the EPA determined in late 1983 that offsite remedial actions may be necessary at the site. To this end, an additional investigation was begun in the summer of 1984. The results of that investigation indicate that the saline water table around the site is contaminated with constituents from the pits. Additionally, contamination at the ppb level was found in a potential drinking water aquifer, 175 feet below the site. This contamination may be attributable to leakage through an abandoned well located on the MOTCO site.

CURRENT SITE STATUS

Hazardous Substances Present

The wastes in the pits are stratified and the different strata have been identified and characterized in remedial investigations and other previously reported activities. While it is necessary and appropriate to categorize waste types, it should be recognized that complete separation of strata from each pit will not be possible, and some intermingling will occur upon removal. A brief description of the character, quantity, and other applicable information for each waste is presented in this section, and a summary of quantities is given in Table 1-1.

The water layer present on the pit surfaces fluctuates with seasonal rainfall and evaporation. The water has been found to represent a mass transfer barrier limiting the release of volatile organics present below the surface

Table 1-1. Onsite Waste Media Summary--MOTCO Site--Source Control

Media	Estimated Quantity	Brief Description
Pit Surface Water	15 million gal.	Acidic, contains metals and organics.
Organic Liquids		
Pits 1-6	5 million gal.	>50 ppm PCB, high fuel value.
Pits 7, 7N	2 million gal.	<50 ppm PCB, medium fuel value.
Sludges, Tars, and Solids		
Pits 5 & diked area sludges	2,100 cu.yd.	Very low fuel value, high content of moisture and inorganics, with some organics.
Pits 1-4, 6, 7, 7N	15,900 cu.yd.	Medium fuel value, varying moisture content, high organics and metals.
Contaminated Soils	45,000 cu.yd.	Clayey and sandy/clay soils with oil/tar/chlorinated organic and metals contamination.
Miscellaneous Debris	1,000 cu.yd.	Plastic extrusions, beads, flakes; concrete, tires, empty drums.
Buried Metals	500 cu.yd.	Abandoned gas station area (storage tanks) and other identified areas.

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water. Maintaining the pit surface water layer is essential as long as the organic liquids exist. However, as has been demonstrated by the need for three previous emergency actions the potential for release from overtopping exists. Therefore, a delicate water balance must be maintained over the pit. The data collected during the EPA actions revealed that pit surface water contamination levels increased as the water layer was reduced, apparently due to proximity with underlying organic liquids. Table 1-2 summarizes the ranges of selected parameters present in the surface water.

The organic liquids underlying the pit surface waters comprise the majority of waste on the site. These organic liquids can be generally characterized as ignitable (flashpoint <140 degrees F), medium viscosity, high molecular weight polymer (primarily styrene) intermediates with varying amounts of chlorinated hydrocarbons and other constituents. Though many similarities exist, organic liquid waste constituents and properties vary considerably from pit to pit. For example, pits 1-6 contain PCB contaminated organic liquids, while Pit 7 does not.

The presence of PCB in the liquid organic waste requires consideration of the treatment and disposal regulation of the Toxic Substances Control Act (TSCA). A further consideration is the presence of the volatile organics, such as vinyl chloride, in the liquids. The volatile organics represent health risk through air pollution along with a potential hazard from fire or explosion. Tables 1-3 and 1-4 summarize the ranges of selected parameters present in the liquid organics.

The sludges/tars/solids/soils represent the following specific wastes:

1. Bottom sludges and tars in all on-site waste pits.

2. Surface crust and interbedded solids layers in pit 7.

3. Residual sludge in the diked tank farm area resulting from settling of precipitates formed in emergency treatment and discharge actions.

4. Soils immediately beneath or adjacent to the pits.

For comparison with organic liquid constituents, characteristics of the tars/sludges are summarized in Table 1-4. The soil contamination is expected to be similiar, but at lesser levels, to those constituents identified in the previous media.

The hazard to human health that each waste parameter might pose is also listed Tables 1-3 and 1-4. While concentration levels, dosages, etc., have not been analyzed in order to pinpoint the exact health hazards posed by the waste, it is understood that millions of gallons of material in the present uncontrolled condition at MOTCO with the listed characteristics constitute a threat to public health.

Table 1-2. Pit Surface Water Character - Selected Parameters

Parameter	Concentration Minimum	Concentration Maximum
pH, S.U.	2	4
Conductivity, umhos/cm	2300	4700
Salinity, ppt	1.2	3.2
COD	30	150
TOC	40	250
Total Phenolics	Trace	42
Aluminum	10	130
Arsenic	Present	
Chromium	Trace	0.45
Copper	Trace	2.42
Cyanides	Trace	12.0
Iron	10	40
Lead	Trace	4.3
Mercury	Present	
Nickel	Trace	0.22
Zinc	0.3	1.84
Sodium	100	300
Calcium	30	100
Magnesium	10	50
Chloroform		0.065
1,1-dichloroethane		0.310
1,2-dichloroethane		5.400
1,1,2-trichloroethane		1.900
Vinyl Chloride		0.430
Methylene Chloride		0.350
Diphenyl acetamide		1.100
Bis-(2-chloroethyl)ether		0.112

NOTES:

1. All values in mg/l unless noted; some rounding was performed.
2. Summary includes all available prior data.
3. Wide variations between pits, with water depth in each pit, and over time.

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Table 1-3. Pit Waste Character - Selected Parameters

Parameter		Organic Liquids Minimum	Organic Liquids Maximum	Tars/Sludge Maximum
Viscosity, cps		20	4,000	40,000
Heat Value, Btu/lb		4000	16,200	12,000
Ash, wt %		0.2	10	>30
Total Sulfur, wt %		0.0	6	<1.0
Moisture, wt %		0.04	>40	>60
Flash Point, °F		<60 (immediate)	>180	>180
Halogens, wt %		0.50	18	2.0
Molecular wt. (no. avg.)		270	340	N/A
Carbon, wt %		30	83	30
Hydrogen, wt %		6	10	N/A
Nitrogen, wt %		0.05	2.3	N/A
Phosphorus, wt %		0.0	2.3	<0.2
Specific Gravity		1.0	1.15	1.3
pH, S.U.		1.0	4.0	N/A
Inorganics, mg/kg	**Hazard**			
Aluminum	--	2.0	5,000	12,000
Antimony	T,C	ND	3.0	--
Arsenic	T,C	ND	3.0	30
Barium	T,I	ND	10.0	200
Boron	T,I	ND	5.0	20
Cadmium	T,C,N	ND	920	920
Calcium	--	20	800	8,000
Chromium	T,C,N	ND	100	550
Cobalt	T,I	ND	10	10
Copper	C,M,I	3.0	500	45,000
Iron	--	40	400	>6,000
Lead	T,C,TE	ND	500	46,000
Lithium	R,TE	ND	1.0	55
Magnesium	--	ND	220	2,000
Mercury	T,N,I	ND	5.0	--
Molybdenum	--	ND	5.0	30
Nickel	I,C (airborne)	ND	15.0	150
Platinum	I	ND	1.0	6.0
Potassium	--	ND	500	4,000
Silicon	I (airborne)	10	30	320
Sodium	--	30	1,350	2,500
Strontium	--	ND	10	20

Table 1-3 Cont'd. Pit Waste Character - Selected Parameters

Inorganics, mg/kg (cont'd)	Hazard	Organic Liquids Minimum	Organic Liquids Maximum	Tars/Sludge Maximum
Tin	--	ND	20	600
Titanium	--	ND	50	200
Vanadium	I,T (compounds)	ND	5.0	22
Zinc	T,C (salts)	1.0	30	750
Zirconium	T (compounds)	ND	3.0	35

NOTES:

1. Summary includes all available prior data.

2. Wide variation between pits, and between strata in each pit; some rounding was performed.

3. ND - Not detected.
   N/A - Not applicable.
   -- - Not available.

4. Hazard: [33-35]

   R - Reactive
   T - Toxic
   C - Known or suspected carcinogen
   M - Known or suspected mutagen
   N - Known or suspected neoplastic
   TE - Known or suspected teratogen
   I - Irritant

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Table 1-4. Pit Wastes - Primary Organic Constituents

Volatiles	Hazard	Range (mg/kg)
Benzene	I,C,T	ND-5,440
Chlorobenzene	I,T	ND-400
Ethylbenzene	I,T	ND-6,000
Chloroform	C,T	ND-800
1,1-dichloroethane	I,T,TE	ND-3,200
1,2-dichloroethane	I,C,T,M,TE	38-41,500
1,1,2-trichloroethane	I,T,C	ND-61,000
1,1,1-trichloroethane	I,T	ND-220
1,1,2,2-tetrachloroethane	I,T,C	ND-4,000
1,1-dichloroethylene	I,T,C	ND-10,000
1,2-trans-dichloroethylene	I,T	ND-11,200
Trichloroethylene	I,T,C	ND-400
Methylene Chloride	I,T,C	ND-90
Toluene	I,T	ND-3,200
Vinyl Chloride	I,T,C	ND-7,600
1,2-dichloropropane	I,T	ND-300
1,3-dichloropropylene	T	ND-200
Tetrachloroethylene	I,T,C	ND-900
2-Chloropropane	-NHD	ND-25,700
Methyl Ethenyl Benzene	-NHD	ND-16,000
Hexane	-NHD	ND-1,800
Xylene	I,T	ND-3,000
Pesticide/PCB		
PCB (Total)	I,T,C,N	ND-100
Dieldrin	N,C	ND-17
Extractables		
Bis(2-chloroethyl ether)	T,C	ND-3,900
Bis(2-chloroisopropyl ether)	T,C,M	ND-500
Napthalene	I,T	ND-36,000
Acenapthalene	T	ND-6,000
Fluorene	-NHD	ND-4,500
Phenanthrene	T,C,N	ND-7,200
Anthracene	C(impurities)	ND-8,430
Fluoranthene	T,N	ND-1,300
Pyrene	I,C	ND-3,000
Benzo(a)anthracene	C,N	ND-3,000
Pentachlorophenol	T,N	ND-670
2-methyl napthalene	T	ND-4,000
Biphenyl	I,N	ND-5,000

Table 1-4 Cont'd. Pit Wastes - Primary Organic Constituents

Extractables (Cont'd)	Hazard	Range (mg/kg)
Styrene	I,T	ND-22,000
Methyl napthalene	-NHD	ND-18,000
Phenyl napthalene	-NHD	ND-7,000
Propylene benzene	-NHD	ND-11,000
Ethenylidene Bis benzene	-NHD	ND-8,000
n-Nitroso diphenylamine	T,C,N	ND-4,700

Notes:

1. ND - Not Detected.
2. Hazard: [33-36]

   -NHD - No Hazard Data
   I - Irritant
   T - Toxic
   C - Known or suspected carcinogen
   M - Known or suspected mutagen
   N - Known or suspected neoplastic
   TE - Known or suspected teratogen

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Affected Pathways

Groundwater

The MOTCO site is underlain by interbedded sands and clays of the Beaumont Formation. The sands are the primary water bearing units (aquifers), although the clays may also be capable of storing and yielding water because they have been fractured by swelling and shrinking. The Beaumont Clay is one of the five formations making up the Chicot Aquifer of the southern Texas Gulf Coast region.

The Chicot Aquifer, the uppermost fresh water aquifer in this area, contains two principal sand aquifers: the Alta Loma Sand at its base and a higher unidentified sand. The Alta Loma Sand is 600 to 800 feet below the site and supplies water to many industrial, municipal, and private users in the area. The upper sand is not named nor described in the available literature. The sand layer 175 to 195 feet below the site may represent this upper sand. Both the Alta Loma Sand and the upper sand produce fresh water. The sands within the top 50 feet underlying the site produce highly brackish to saline water and are not used locally because of this high salt content.

The Alta Loma Sand and the upper fresh-water sand in the Chicot Aquifer are confined (under artesian conditions) and recharge from infiltration of precipitation. Recharge probably occurs well to the north and west of the site where the aquifers approach the surface and no saline water overlies them.

Pit surface elevations are generally 2-4 ft. higher than elevations of surrounding land and the shallow, highly saline groundwater. This localized mounding effect results in hydraulic gradients downward and away from the site, increasing migration of contaminants. The onsite waste pits are unlined, and intercepted by relatively transmissive layers of sandy silt and silty sands interbedded with silty clays and clay layers which are slickensided. Three relatively transmissive (10^{-2} to 10^{-4} cm/sec) zones are present: apparent sand channel deposits at 5-10 ft. and 20-30 ft., and a bar finger deposit at about 40-50 ft. Typical of deltaic deposits, these interbedded layers vary in thickness and depth, and may not be continuous or isolated.

Numerous site investigations have confirmed contamination of the shallow groundwater and subsurface soils, with particularly high levels of organic contamination in the immediate vicinity of the pits. Migration limits of material from the pits have been estimated, based on soil and groundwater sampling and analyses, at up to 300 feet laterally from the pits, and extending vertically to about 70 feet below the ground surface. Migration extends primarily to the south and west in the deeper transmissive strata, and to the northwest in the uppermost transmissive zone. Contamination in the sand 175 feet below the site has been found, but is probably due to material moving through an abandoned well and not due to migration of the wastes through the stratum to that depth. Wells located in the 600-800 ft. Alta Loma Sand near the site have been sampled and no contamination was found in the samples.

Migration mechanisms observed include direct movement through the more transmissive layers intercepting the pits, dispersion, and migration along fracture planes in the clays. Movement along fracture planes in the clays has been noted visually (oily discoloration), indicated from organic vapor readings, and confirmed through chemical analyses. Thus, shallow clay layers do not represent an effective barrier to migration, even with apparent water premeabilities up to 10^{-7} cm/sec.

These overlying clay deposits and differential hydraulic gradients provide some measure of protection to the deep aquifers from contamination by wastes at MOTCO. But migration through an abandoned well onsite, faults, and the ability of many organic compounds to penetrate clay represent potential continuing risk.

Levels and type of groundwater contamination vary widely, but generally contamination is highest near the pits. Present are aromatics, polynuclear aromatics, chlorinated hydrocarbons, and chlorinated ethers in levels ranging from at or below detection up to 3300 mg/l of bis (2-chloro ethyl) ether in OWM-5 sampled 9 November, 1981. Other typical constituents include benzene; 1,2-dichloroethane; 1,1,2-trichloroethane; vinyl chloride; styrene, napthalenes; methylene chloride; and indene.

Air Quality

Pit wastes contain hazardous volatile organics, some of which are identified carcinogens that are released at widely varying rates depending on the depth of the water layer, wind, and temperature. When pit wastes are undisturbed, concentrations of vinyl chloride at the site perimeter have been measured at up to 170 ppb on hot summer days, while on cold winter days measurements are very near or below detection. If disturbed, pit wastes release extremely high concentrations of volatile organics. Table 2-8 shows the results of previous air sampling.

In addition to the threat from direct contact with the wastes or inhalation of vapors, the volatile organics represent potential fire hazards, particularly in contained vapor headspace in transport and/or storage vessels.

Receptors of hazardous emissions depend largely upon wind directions, but include major public traffic (I-45 and intersecting roadways) and residential subdivisions nearby.

Table 2-8: Summary of Air Sampling By The Texas Air Control Board (TACB) At The MOTCO Site.

Date	VCM (ppb)	Sampling Point Location	Sampling Duration
5/5/78	12	Downwind of Pit 4.	Grab
5/5/78	0.5	Upwind of Pit 4	Grab
5/5/78	5	"Downwind all pits"	Grab
7/27/78	0.5	Trailer park	24-hr comp.
7/27/78	ND	Central Freight	24-hr comp.
7/27/78	0.1	"N-E"	3-hr comp.
7/30/78	0.1	Trailer park	24-hr comp.
7/30/78	14	Central Freight (not downwind)	24-hr comp.
7/31/78	30	Trailer park (downwind)	24-hr comp.
7/31/78	5	Central Freight	24-hr comp.
8/1/78	7	100 ft. north (downwind) of pits	3-hr comp.
8/1/78	17	100 ft. north (downwind) of pits	3-hr comp.
11/6/79	0.1	South of Pit 2 (wind from north or northeast)	Grab
11/6/79	19	South of Pit 2 (wind from north or northeast)	Grab
11/6/79	1*	South of Pit 4	Grab
11/7/79	3*	South of Pit 1	Grab
11/7/79	2*	South of Pit 7	Grab
11/7/79	6*	South of Pit 6	Grab
11/7/79	0.1*	South of Pit 2	Grab
11/7/79	0.1*	South of Pit 3	Grab
8/5/80	0-123 (avg. 44)	Onsite, various spots.	Eleven bag grab samples.
8/6/80	44-161 (avg. 95)	Onsite, various spots.	Nine bag grab samples.

*[illegible]posite charcoal/Tenax adsorbent tubes. All othe[illegible] aluminized Tedlar bag samples.

Surface Water and Soil/Sediment

Surface water and soil have been contaminated from the MOTCO pits when major storm events resulted in overtopping of the dike. At about +7 ft. msl, site perimeter dikes are well below the 100-year tidal floodplain elevation of +12 ft. msl, and would be inundated by major flood surges of 15-year to 20-year recurrence frequency. Nearby subdivisions and the southern edge of downtown LaMarque are within the 100-year tidal floodplain. Transport and redeposition of hazardous substances could be a significant health threat, particularly if failure or breach of the perimeter dike occurred. In the event of release of the pit surface water layer from a breached dike, the potential exists for widespread contaminant transport and significant public health impacts, especially considering high rates of release of hazardous organic volatiles.

Contaminant migration to surface water and soils also occurs from contact of normal runoff with tar seeps on the exterior of the perimeter dike.

Surface soils in the vicinity of MOTCO are contaminated at relatively low levels, based on results of numerous sampling programs. Most volatile contaminants are released from the soil surface, and residuals are most likely non-volatile organics and some metals. Particular contaminated areas near the site include the abandoned trailer park to the northwest, and drainage pathways.

The MOTCO Site is in the Highland Bayou drainage basin, and site drainage ultimately reaches Jones Bay. Major potential threats to these receptors would be caused by flood surge events, and release through surface drainage has occurred over the history of the site.

ENFORCEMENT ANALYSIS

Approximately 20 potentially responsible parties (PRPs) have been identified for the site. Monsanto Company has taken the lead in forming a coalition and has indicated an interest in conducting the remedy; however, it has not offered to conduct the remedy by itself. The coalition is currently having problems in agreeing to the apportionment of wastes between the parties. A neutral party is being sought to arbitrate the apportionment. Another unresolved issue is how to handle the wastes for which no party is identified.

EPA has discovered that records may exist on waste transported to the site. If there are records, then the chances of successful negotiations with the PRPs to implement the remedy will be greatly enhanced.

The remedy to be conducted at the site will be the ROD remedy. If negotiations are unsuccessful, EPA recommends that the fund be utilized for the cleanup of the site. Negotiations are currently in progress and EPA will discuss any offers up to 30 days after the ROD is signed. At that time, if a settlement is not reached, EPA will enter into a cooperative agreement with the State of Texas for the design and remedy.

ALTERNATIVES EVALUATION

A Source Control Feasibility Study was performed to determine what remedial actions, if any, would be appropriate at the MOTCO site. The purpose of the study was to propose source control remedial action to cost-effectively mitigate and minimize damage to, and provide adequate protection of, public health, welfare, and the environment, resulting from the presence and release of hazardous substance from the MOTCO site to the air, surface waters and soils, and subsurface groundwaters and soils.

A source control remedial action is necessary at the MOTCO site in accordance with 40 CFR Part 300.68 (e) (2) which states that, "Source control remedial actions may be appropriate if a substantial concentration of hazardous substances remain at or near the area where they were originally located and inadequate barriers exist to retard migration of substances into the environment".

The primary threats that the MOTCO site pose to the public health and safety are:

(1) Direct contamination of groundwater supplies in the area;

(2) Transport of the onsite waste material to populated areas from severe flooding;

(3) Hazardous emissions to the air from pit wastes resulting from transport during severe floodings, dike rupture, or removal of waste pit surface water layer.

Remedial Objectives

Specific objectives of the proposed source control remedial action are:

1. Prevent further contamination of the shallow aquifer and eliminate the potential threat to nearby surface water from the pit wastes.

2. Eliminate the threat to the public health from potential air releases and runoff from the pit wastes.

3. Control and minimize air quality impacts, during and after remedial actions, from release of hazardous volatiles.

4. Mitigate the potential for release due to tidal flood surges for wastes remaining onsite, if any.

5. 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

Clean up criteria associated with each objective were not established since the goal of this action is source control; that is, to contain/remove the material from the uncontrolled condition that now exists. This would mean containing or removing the specific wastes in bulk, i.e. tars, sludges, etc. In accordance with 40 CFR 300.68(e)(3), the contamination caused by the present waste is the subject of an ongoing off-site remedial investigation study. That project will gather the necessary information to better ascertain what is needed to determine "how clean is clean" for MOTCO with respect to residual soil and groundwater contamination. Meanwhile, the hazardous materials causing the shallow groundwater pollution and posing a threat to the public health, welfare, and the environment through potential air and surface water releases must be mitigated. To this end, 11 source control alternatives were considered including a no-action alternative.

To determine components of each of the 11 alternatives refer to Table 3-2. Note that Table 3-2 is organized with each alternative listed horizontally across the top of the table with the components designated by an 'X' vertically under the respective alternative.

Initial Screening of Alternatives

In accordance with Section 300.68 (g) of the NCP, treatment and disposal technologies for each waste type were grouped into components for assembly into a limited number of complete remedial action alternatives. Characteristics of the waste limited the types of proven technologies that could be considered and impacted on the number of alternatives that could be developed. As an example, the organic liquids are ignitable and contaminated with PCBs at approximately 70 ppm. Furthermore, the liquids are not conducive to solidification. The Toxic Substances Control Act (TSCA) will not allow the landfill of PCB laden ignitable liquids. With the waste incapable of being solidified, a landfill disposal option for the organic liquids is eliminated. Considerations such as these, outlined in detail in the Feasibility Study, led to the development of eleven alternatives for the initial screening process.

Table 3-2. Component Matrix of Initial Alternatives - MOTCO Site

Incinerate / Landfill — Media/Component	1 -- / -- "No Action"	2 Offsite / Offsite "Base Case"	3 Offsite / Offsite "RCRA/TSCA"	4 Offsite / Offsite	5 Offsite / Onsite "RCRA Alt."	6 Offsite / Offsite	7 Offsite / On/Off	8 Offsite / Onsite	9 Onsite / Offsite	10 Onsite / Offsite	11 Onsite / Onsite "RCRA/TSCA"
COMMON ELEMENTS		X	X	X	X	X	X	X	X	X	X
ORGANIC VAPORS											
Closed-System/Inert Gas		X	X	X	X	X	X	X			
MISC. DEBRIS											
Offsite Landfill		X	X	X		X			X	X	
Onsite Landfill					X		X	X			X
BURIED METALS											
Excavate/Dispose		X	X	X	X	X	X	X	X	X	X
PIT SURFACE WATER											
Offsite Biological Treatment		X	X		X	X	X	X			
Onsite Pretreat/Offsite Bio Treat.									X	X	
Onsite Complete Treatment				X							X
ORGANIC LIQUIDS											
Onsite Incineration											
- Liquid Injection									X(all)		
- Rotary Kiln										X(all)	X(all)
Offsite Incineration											
- Waste Incinerator			X(PCB)	X(all)	X(PCB)						
- Industrial Thermal		X(all)	X(non PCB)		X(non-PCB)	X(all)	X(all)	X(all)			
SLUDGES/TARS/SOLIDS											
Offsite Landfill		X	X	X			X		X		
Offsite Incinerate (R.Kiln)						X					
Onsite Incinerate (R. Kiln)										X	X
Onsite Landfill					X			X			
CONTAMINATED SOILS											
Offsite Landfill		X	X	X		X			X	X	
Onsite Landfill					X		X	X			X
VERTICAL BARRIERS											
Circum. Slurry Wall					X			X			
Temporary Sheet Pile		X	X	X		X	X		X	X	X
BACKFILL/SITE CLOSURE		X	X	X		X			X	X	

According to Section 300.68 (h) of the NCP, three broad criteria should be used in the initial screening of alternatives:

(1) Cost. For each alternative, the cost of installing or implementing the remedial action must be considered, including operation and maintenance costs. An alternative that far exceeds the costs of other alternatives evaluated and that does not provide substantially greater public health or environmental benefit should usually be excluded from further consideration.

(2) Effects of the Alternative. The effects of each alternative should be evaluated in two ways: (a) whether the alternative itself or its implementation has any adverse environmental effects; and (b) for source control remedial actions, whether the alternative is likely to achieve adequate control of source material, or for offsite remedial actions, whether the alternative is likely to effectively mitigate and minimize the threat of harm to public health, welfare or the environment. If an alternative has significant adverse effects, it should be excluded from further consideration. Only those alternatives that effectively contribute to protection of public health, welfare, or the environment should be considered further.

(3) Acceptable Engineering Practices. Alternatives must be feasible for the location and conditions of the release, applicable to the problem, and represent a reliable means of addressing the problem.

Eleven alternatives were screened in terms of the criteria of the NCP. The rationale for rejecting or selecting each alternative for further detailed evaluation follows.

Alternative 1 - No Action: 40 CFR 300.68(h)(2)(ii) sets forth one criteria for the rejection of a remedial alternative and one criteria for the acceptance of a remedial alternative. The criteria for the rejection of an alternative is the resulting of adverse effects due to the alternative. As documented previously, past releases of hazardous contaminants into the air, surface water and groundwater has occurred and is occurring. The no action alternative will allow this to continue. The continuing release of hazardous contaminants demonstrates inadequate isolation and control of the wastes at the MOTCO site indicating that the no action alternative fails the criteria for the acceptance of an alternative under the NCP. Resulting risks to the public health and the environment caused by the no action alternative are unacceptable and the no action alternative is rejected.

Alternative 2--Offsite Incineration/Offsite Landfill--Retained (Incineration of liquid organics at facilities currently not holding TSCA permit but would obtain a permit.)

Rationale:

Least comparative cost to implement incineration of organic liquids, the most hazardous media

All bulk wastes removed from site

Greater potential for cost reduciton for incineration of liquid organics

Maximum recovery of resources (fuel value and possibly sulfur)

Alternative 3--Commercial PCB/Industrial Non-PCB Incineration (TSCA/RCRA Alternative)--Retained (Incineration of PCB contaminated liquid organics at currently approved TSCA facilities and other liquid organics at RCRA approved facilities.)

Rationale:

Use of industrial thermal processes (furnaces) at significiant cost advantage for at least non-PCB organic liquids

Alternative 4--TSCA Facilities only--Rejected (All liquid organics destroyed at TSCA approved facility.)

Rationale:

Highest cost for offsite incineration of organic liquids--at least some non-PCB organic liquids could be processed at industrial thermal facilities.

Alternative 5--Offsite Incineration/Onsite Landfill --Rejected (Incineration per Alternative 3 and Onsite RCRA Landfill)

Rationale:

Wastes remain onsite

Continued release and threat of release of hazardous substances

Long term operation, maintenance, and monitoring required

Higher cost than alternate methods of disposal of sludges, tars, and soils without compensating advantages

Alternative 6--Offsite Incineration of Sludges/Tars--Rejected

Rationale:

Considerably higher cost for offsite incineration of sludges/tars than offsite landfill without comparable benefit

Alternative 7--Onsite Landfill of Contaminated Soils--Rejected

Rationale:

Wastes remain onsite--continued, though reduced, potential release

Long term operation, maintenance, and monitoring required

No cost advantage

Alternative 8--Onsite Landfill of Contaminated Soils and Sludge/Tars--Rejected

Rationale:

Wastes remain onsite

Continued release and threat of release of hazardous substances

Long term operations, maintenance, and monitoring required

No cost advantage

Alternative 9--Onsite Liquid Injection Incineration--Rejected

Rationale:

Considerable onsite facility construction required, though additional hazardous media (sludges/tars) must still be transported

No cost advantage, though costs comparable to other retained alternatives.

Alternative 10--Onsite Rotary Kiln Incineration--Retained

Rationale:

Eliminates offsite transport of most hazardous media--organic liquids and sludges/tars

Incremental cost of onsite incineration of sludges/tars potentially advantageous

Highly contaminated soils could also be incinerated onsite

All wastes removed from site--no long term threat of release

Alternative 11--Onsite Incineration/Onsite Landfill (RCRA Alternative)--Retained

Rationale:

Little or no transport required

No significant use of offsite facility capacity

Retained to provide comparsion of complete onsite facilities

Descriptions of Retained Alternatives

The following detailed descriptions are of the retained alternatives listed in Table 4-1. Cost estimates are listed in Table 4-2 at the end of this section.

Common Components

The following components are considered common to all alternatives. Thus, no further discussion or assessement of these components will be made in screening and evaluation of alternatives, although estimated costs are included in cost comparisons. These common elements include:

° Active Organic Vapor Control - Active control of organic vapors, using closed systems with inert gas blanketing, is considered essential for any remedial action involving organic liquids (the major source of hazardous substances at the MOTCO Site). Any alternatives without active organic vapor control represent a high risk of release which could easily exceed the risk of release for a no action alternative, and would be rejected per the NCP. It should be noted that for alternatives with onsite incineration, active control of organic vapors is included with incineration facilities at a greatly reduced cost since control during transport of organic liquids is not required. Thus, active control is included in all alternatives and is considered a common component.

° Buried Metals and Miscellaneous Debris - Handling of at least some miscellaneous debris will be required for any action alternative. Excavation/assessment/disposal of buried metals is desired to mitigate highly uncertain risk. Because the cost of remedial action for this debris is very small compared to total alternative costs, inclusion or rejection does not affect overall assessments. Therefore, these components are also considered common.

Alternative 2 (Base Case)--Offsite Incineration/Offsite Landfill

In addition to common components identified previously, offsite facilities would be utilized for incineration of organic liquids (industrial thermal); sludges, tars, and other solids would be solidified and landfilled; contaminated soils would be landfilled; the pit surface water would be treated and discharged. Temporary steel sheet piling vertical barriers would be placed where upper and middle transmissive zones intersect onsite pits to inhibit groundwater intrusion. After removal of all waste media, excavated areas would be closed and capped, including runoff diversion.

The elements are further described as follows:

Offsite Industrial Incineration-Organic Liquids

The key component of this alternative is offsite incineration of organic liquids in existing industrial thermal processes for recovery of fuel value and possibly sulfur content. Use of alternate destruction methods under TSCA would be pursued, thus EPA approval is required and a trial burn may be necessary. Incineration of non-PCB organic liquids could proceed, however. This option represents the least cost to implement incineration, and is the most applicable technology for organic liquids.

Pit surface water would remain until organic liquid layers were removed (by pumping), to minimize release of hazardous volatile organics. Any pumpable sludges/tars could also be removed and incinerated with organic liquids, particularly where the volatiles content is high and/or sludges/tars are of relatively low viscosity. All incineration ash will be disposed of per RCRA.

Offsite Biological Treatment of Pit Surface Water

A pump station and force-main pipeline would be constructed to convey pit waters to the nearest existing permitted biological treatment facility, operated by Gulf Coast Waste Disposal Authority (GCWDA). No treatment would be conducted onsite at MOTCO. A detailed assessment, including treatability testing, would be necessary to identify compatability with existing treatment processes, to project potential "pass-through" constituents, and to develop any pretreatment to be conducted at GCWDA. Due to seasonal capacity concerns, a storage/surge tank would be provided at either location. To allow receiving, treatment, and discharge of pit surface water from the MOTCO Site, some revisions to the existing GCWDA discharge permit may be necessary.

Sludges, Tars, and Other Solids

Sludges, tars, and other solids would be excavated and transported to offsite commercial facilities for solidification and landfill disposal. [The material must be compatible with the landfill and waste segregation by type must be practiced.] Solidification could also be practiced onsite prior to transport. Some risk of release of hazardous volatile organics is present. However, the organic volatiles content of this media is generally about an order of magnitude lower than the volatiles content of organic liquids. Some residual organic liquids will likely be present, resulting in increased risk and the need for additional care in handling and disposal.

Contaminated Soils

Contaminated soils, underlying or adjacent to the waste pits and in other areas identified as contaminated, would be excavated and transported to offsite commercial facilities for landfill disposal. Very highly contaminated soil could be handled as sludge/tar, with solidification prior to landfill disposal. No residual soil criteria is established for this source control action due to inadequate data. Information gathered during the offsite investigation and information gathered after removal of the bulk wastes are required to determine what levels of cleanup are needed. However, past sampling efforts have shown that a substantial amount of soil has been grossly contaminated. Soil which has been visually infiltrated by organic contamination and is structurally unstable to support capping for a final closeout is the target for removal/containment.

Temporary Sheet Pile Vertical Barriers

As waste media are removed from the pits, surface water elevations will be reduced to below surrounding groundwater elevations. The primary purpose of temporary sheet pile vertical barriers would be to inhibit groundwater intrusion, though some site dewatering would probably still be required. Implementation of vertical barriers offers considerable cost reduction potential through improved construction methods, such as easier excavation techniques for contaminated soils; reduced water content in sludges/soils allowing easier handling, transport, and disposal; and possibly reduced quantities of water requiring treatment and disposal.

The pros and cons of alternative 2 including effects, cost, and acceptable engineering practices are listed below.

Table 4-1. Component Matrix of Retained Alternatives - MOTCO Site

Incinerate / Landfill / Media/Component	2 Offsite Offsite "Base Case"	3 Offsite Offsite "RCRA/ TSCA"	10 Onsite Offsite	11 Onsite Onsite "RCRA/ TSCA"
COMMON ELEMENTS	X	X	X	X
ORGANIC VAPORS				
Closed-System/Inert Gas	X	X		
MISC. DEBRIS				
Offsite Landfill	X	X	X	
Onsite Landfill				X
BURIED METALS				
Excavate/Dispose	X	X	X	X
PIT SURFACE WATER				
Offsite Biological Treatment	X	X		
Onsite Pretrt./Offsite Biotrt.			X	
Onsite Complete Treatment				X
ORGANIC LIQUIDS				
Onsite Incineration				
- Rotary Kiln			X(all)	X(all)
Offsite Incineration				
- Waste Incinerator		X(PCB)		
- Industrial Thermal	X(all)	X(non-PCB)		
SLUDGES/TARS/SOLIDS				
Offsite Landfill	X	X		
Onsite Incinerate (R. Kiln)			X	X
CONTAMINATED SOILS				
Offsite Landfill	X	X	X	
Onsite Landfill				X
VERTICAL BARRIERS				
Temporary Sheet Pile	X	X	X	X
BACKFILL/SITE CLOSURE	X	X	X	

jd/GAM2/019

Pros:

+ Least cost for disposal of organic liquids by incineration, which is the most applicable technology

+ Minimal onsite facility construction

+ No long-term operation, maintenance, or monitoring required

+ Overall cost minimization potential good

+ All waste media are removed from the site, and the most hazardous media (organic liquids) are thermally destroyed

+ Recovery of at least the heat value of waste in industrial processes

+ Removal and transport of non-PCB liquids could proceed very quickly pending resolution of PCB requirements

+ Commercial waste incineration capacity not consumed

Cons:

- TSCA permits and applicable State permits, possibly with trial burn, required

- Time of implementation limited to capacity of industrial thermal processes

- Risk during transport of organic liquids due to hazardous volatiles and, to a lesser extent, sludges/tars

- Pit surface water treatability study required--possible metals inhibition

- Probably GCWDA permit revision required

- Access agreement and easements for force-main pipeline required

- Risk of release of hazardous volatiles from sludges/tars during processing (solidification) and long-term (landfill)

- Medium technical uncertainty and cost growth potential for solidification of sludges/tars

Alternative 3--Commercial PCB/Industrial Non-PCB Incineration (TSCA/RCRA Alternative)

If PCB approval is either not pursued or not ultimately obtained for industrial thermal processes, then incineration of PCB wastes would be conducted at existing commercial hazardous waste facilities with PCB approval. Non-PCB organic liquids would be incinerated at industrial thermal processes with RCRA interim authorization or a RCRA permit due to cost considerations. All other components are identical to Alternative 2.

Pros:

+ Minimal onsite facility construction

+ No significant long-term operation, maintenance, or monitoring

+ All waste media are removed from the site, and the most hazardous media (organic liquids) are thermally destroyed

+ Removal and transport of both PCB and non-PCB liquids could be initiated very quickly--no additional permits or approvals are required

+ Commercial incineration of PCB wastes is well-demonstrated

Cons:

- Cost of permitted PCB-approved incineration substantially higher than costs for industrial thermal incineration

- Consumes offsite commercial incineration capacity

- Time of implementation limited to capacity of PCB-approved commercial incineration facilities

- Limited recovery of heat value or sulfur content

- Risk during transport of organic liquids due to hazardous volatiles and, to a lesser extent, sludges/tars

- Pit surface water treatability study, GCWDA permit revision, and possibly pipeline access agreements/easements required

Alternative 10--Onsite Rotary Kiln Incineration

Rotary kiln incineration facilities would be constructed onsite for incineration of organic liquids and sludges, tars, and other solids. Due to the lower chlorine content for sludges/tars, scrubber neutralization requirements would only be slightly increased compared to incineration of organic liquids alone. However, ash quantity generated will be increased about three-fold.

Pros:

+ No transport of sludges, tars, and other solids

+ Sludges, tars, and other solids are thermally destroyed, eliminating potential long term release

+ Rotary kiln incineration is reasonably well-demonstrated

+ Technical and cost uncertainties with solidification of sludges/tars are eliminated

+ Highly contaminated soils could be incinerated onsite

+ No transport of organic liquids, with associated risks of hazardous volatiles release, is necessary

+ Pit surface water could be directly discharged after pretreatment when TDWR effluent criteria are met

+ Substantial flexibility of pretreatment/discharge/transport to GCWDA for pit water

+ Liquid injection incineration well-demonstrated

+ Minimal ash generated

+ No off-site commercial incineration capacity is used.

Cons:

- Extensive onsite facility construction required, including utilities.

- Highly acidic scrubber water is generated

- No recovery of fuel value or sulfur content

- Time of implementation controlled by construction and operation of onsite incinerator

- Some air emissions will occur from operation

- Federal incineration permit technical standards must be met, State permits may be required.

Alternative 11--Onsite Incineration/Onsite Landfill

In this alternative, onsite rotary kiln facilities would be constructed for the incineration of liquid organics and sludges/tars as in Alternative 10, with complete onsite treatment of pit surface water and acidic scrubber water. Also, contaminated soils would be landfilled onsite.

Pros:

+ No transport of hazardous substances would be necessary

+ Additional backfill of excavated areas minimized, and need for additional site closure is eliminated

+ Organic liquids and sludges, tars, and other solids are thermally destroyed, eliminating long term potential release

+ Rotary kiln incineration is reasonably well-demonstrated

+ Essentially no offsite facility capacity is consumed

+ Highly contaminated soils could be incinerated onsite

+ Pit surface water could be directly discharged after pretreatment when TDWR effluent criteria are met

+ No transport to GCWDA required for pit water

° Anticipated costs to implement incineration are higher than Alternative 2 (industrial thermal) but less than Alternatives 3 and 4 (PCB approved commercial facilities only)

° Onsite incineration capacity could be selected based on trade-off of costs and time of implementation

Cons:

- Maximum onsite facility construction (all), requiring extensive staging and land areas not presently available on-site.

- Contaminated soils remain in onsite landfill

- Long term operation, maintenance, and monitoring required

- Some long term risk of release of hazardous substances from onsite landfill, particularly if below water table, but reduced risk compared to no action for soils

- Time of implementation dependent on onsite construction and operation

- Federal permit technical standards must be met, State permits may be needed

- No recovery of heat value or sulfur content
- Air emissions will occur onsite
- Highly acidic scrubber water, requiring neutralization, is generated
- Incinerator ash, potentially hazardous (EP Toxic) due to metals, is generated and probably requires solidification and offsite disposal in a secure landfill

COMMUNITY RELATIONS

The public comment period was held from November 12 to December 3, 1984. The public meeting took place on November 27, 1984, in La Marque, Texas. Ninety-five people were in attendance with thirteen statements made at the meeting by the public. Eight written statements were received during the period with three additional written comments received after the December 3 deadline. In the presentation on November 27, the EPA indicated a preference for Alternative 3 at a cost of $36.3 million as the remedial action. [NOTE: Double-liner costs were not available at the time of the public meeting.] The major point of this alternative consists of the destruction of the liquid organic waste at TSCA-permitted incineration facilities. The PRPs and local government officials disagreed with this choice. The PRPs would prefer Alternative 2, destruction of the liquid organics at facilities currently without TSCA approval, by way of a waiver or expedited TSCA approval of the facility. The local government advocated the destruction of the liquid organics by an onsite incinerator as in Alternative 10.

In addition to the public meeting, two briefings to different local officials took place during the public comment period. On November 16 the EPA Regional Site Project Officer (RSPO), Don Porter, met with Dr. Ed Ibert of the Galveston County Health District. Mr. Porter answered Dr. Ibert's questions about the various remedies. On November 27, a briefing was held for the Mayor and City Manager of La Marque. Attending for EPA were Sam Nott, Superfund Branch Chief; Don Porter, and two Community Relations staff members - Cyrena McMurry and Betty Reece. The CH_2M Hill consultant responsible for the development of the Feasibility Study (FS) was also in attendance. Questions about the CERCLA Program and specific concerns about MOTCO were answered by the EPA staff and consultant.

The "Responsiveness Summary" outlines the history of community relations activities at MOTCO and includes a summary of all comments received about the proposed source control work along with the EPA response to those comments.

CONSISTENCY WITH OTHER ENVIRONMENTAL LAWS

The EPA has determined that in instances where CERCLA cleanups involve on-site remedies the requirements of CERCLA supercede any requirements of other environmental laws. It is the EPA's policy, however, to comply with the substantive requirements of those other laws whenever possible. This policy has several major impacts on any remedial proposal for the MOTCO site.

The environmental laws which will impact upon the remedial actions at the MOTCO site include:

1. Toxic Substances Control Act (TSCA) regulations, 40 CFR Part 761, for PCB wastes,
2. Executive Order 11990, Protection of Wetlands for sites located in wetlands,
3. Executive Order 11988, Floodplain Management for sites located in floodplains,
4. Clean Air Act to determine if the remedial action conforms to a State Air Quality Implementation Plan (SIP).
5. Clean Water Act regulations, 40 CFR Part 122, for discharge of pollutants into navigable waters; and
6. Resource Conservation and Recovery Act (RCRA) substantive requirements, 40 CFR Part 264, for on-site alternatives and off-site transport and disposal.

The Toxic Substances Control Act (TSCA) specifically governs the disposal of the PCB contaminated ignitable liquid organics. These waste materials must be disposed of in one of the following ways: high temperature incineration, a chemical waste landfill, a high efficiency boiler or an approved alternate method of destruction.

Various limitations on disposal methods and locations result from the requirements of TSCA. The landfill option of TSCA is eliminated because of the ignitability of the waste in addition to the technical inability to stabilize the liquid organic material for such disposal. High efficiency boilers cannot dispose of the wastes because the waste is not transformer oil as required by regulation. Furthermore, the wastes have a high chlorine content rendering them unfit for use in a boiler. The disposal options left to consider are incineration methods and other alternative methods approved by the EPA. These other alternative methods may consist of industrial thermal processes such as furnaces and kilns.

Executive Orders 11990 and 11988 apply to the protection of wetlands and floodplain management, respectively. The MOTCO site is in a floodplain and these orders should be considered in the design phase of any permanent on site remedial measures. If an on-site disposal alternative is not implemented, these orders would not be applicable.

The Clean Air Act will govern the possible release of volatile organic compounds. Provisions and necessary site safety precautions are to be implemented regardless of the alternative action selected. On-site activities will comply with technical requirements of the Clean Air Act eliminating the need for Federal permits.

The Clean Water Act (CWA) governs the discharge of pollutants into navigable waters. When disposing of the contaminated pit water at MOTCO, the CWA will be complied with by using a permitted facility for off-site disposal or by complying with the discharge requirements of the CWA for any on-site solution.

RCRA requires that off-site wastes must go to a RCRA approved facility. Substantive disposal requirements of RCRA will govern any on-site landfill construction and hazardous waste incineration.

The primary RCRA technical requirements of concern for on-site solutions are those governing landfill construction and hazardous waste incineration. Before discussing the RCRA requirements, it must be understood that the liquid organics at the MOTCO site are the pivotal waste; any site solution revolves around the handling of this waste. The liquid organics can only be disposed of by incineration or by an alternative method of destruction under the TSCA regulations, in this case, by a furnace process. An on-site remedy fulfilling the TSCA requirements would call for incineration of the liquid organics. This incinerator, to be cost-effective, should be used to destroy the sludges/tars per the RCRA requirements. An on-site RCRA landfill might then be the solution to contain the incinerator ash, the contaminated soil and the miscellaneous debris. This scenario of legal and technical requirements was considered for the remedial action at the MOTCO site in Alternative 11.

Alternative 11, as outlined previously, is the second most expensive solution of the feasible choices to the MOTCO disposal problem. The expense revolves around the cost for the construction of the rotary kiln and the RCRA landfill. The on-site incineration of the liquid organics and the sludges/tars would cost an estimated $33.3 million. In comparison, the use of off-site permitted facilities would require $23.92 million to dispose of these wastes. The construction of a RCRA double-lined landfill to contain the incineration ash and contaminated soils requires $7.95 million versus disposing of the waste at an off-site permitted facility at a cost of $7.01 million. In total, the on-site solution costs $4.9 million more to implement than an off-site solution.

RECOMMENDED ALTERNATIVE

As required by the National Contingency Plan, 40 CFR Part 300.68 (j), the cost-effective alternative for the remedy to the source control action at the MOTCO site has been determined. This choice is Alternative 3 (see Tables 4-2 and 4-2D.) The major parts of this complete offsite treatment and disposal alternative consist of the transport of the pit surface water by pipeline to an industrial wastewater treatment plant, the incineration of the PCB liquid organics at TSCA permitted facilities, the incineration of the non-PCB liquid organics at RCRA permitted or interim status facilities, and the offsite landfill of the tars/sludges and soils at RCRA permitted (double-lined) facilities.

The requirement for double-lined landfill facilities was implemented after the development of the cost data for the Feasibility Study. The added cost of the double-liner requirement is shown in Table 4-2D. The cost figures used to develop Table 4-2D are based upon factors applied to previous single-liner disposal costs. With the implementation of additional waste-end taxes from CERCLA reauthorization and probable increase of commercial disposal costs, the costs for future landfill disposal could double. The absence of cost information for double-lined facilities makes the estimation of off-site disposal difficult, but for 1985 estimates the figures in Table 4-2D are the best available. The cost for on-site construction of a double-lined facility is adjusted from the figures of the Feasibility Study by using an economic model developed for the Economics Analysis Branch of the Waste Management and Economic Division, Office of Solid Waste and Emergency Response.

At this time, Alternative 3 is the lowest cost alternative that is technologically feasible under 40 CFR Part 300.68 (j). The technologies used for all elements of the action are proven through past experience. This past experience also provides for a high degree of confidence in the cost data available to assess the alternative. Protection of the health, safety and welfare of the public and the environment is ensured by the use of existing facilities of proven capability to either treat or dispose of the waste.

The selection of Alternative 3 does not preclude the implementation of Alternative 10, the onsite incineration alternative, as the final remedy for the source-control action. Because of the rapid development of the technology of onsite incinerators in terms of efficiency and capacity, coupled with the rising costs and shortage of capacity with existing facilities, the use of mobile units for incineration may be cost competitive with existing facilities in the very near future. To eliminate consideration of an inplace incinerator, mobile or permanent, at the MOTCO site at this time is premature in view of the dynamics of the market for incineration of hazardous wastes. While Alternative 3 currently appears to be the cost-effective choice, it is the intention of the EPA to pursue evaluation of both Alternative 3 and Alternative 10 into the design phase. Detailed cost estimates, based upon conceptual designs of the two alternatives, will allow the design team to determine which of the two alternatives is most

Table 4-2. Summary of Estimated Costs of Retained Alternatives by Component - MOTCO Site

Incinerate / Landfill Media/Component	[Appendix B Cost Table]	2 Offsite / Offsite Base Case	3 Offsite / Offsite "RCRA/ TSCA"	10 Onsite / Offsite	11 Onsite / Onsite "RCRA/ TSCA"
COMMON ELEMENTS	[B-1]	1,800	1,800	1,800	1,800
ORGANIC VAPORS					
Closed-System/Inert Gas	[B-2]	912	912	[B-6.1]	[B-6.1]
MISC. DEBRIS					
Offsite Landfill	[B-3]	149	149	149	
Onsite Landfill					[B-8.2]
BURIED METALS					
Excavate/Dispose	[B-4]	190	190	190	190
PIT SURFACE WATER					
Offsite Biological Treatment	[B-5.1]	795	795		
Onsite Pretrt./Offsite Biotrt.	[B-5.2]			1,750	
Onsite Complete Treatment	[B-5.3]				1,740
ORGANIC LIQUIDS					
Onsite Incineration					
- Rotary Kiln	[B-6.1]			33,300	33,300
Offsite Incineration					
- Waste Incinerator	[B-6.2]		19,800		
- Industrial Thermal	[B-6.2]	12,000	[B-6.2]		
SLUDGES/TARS/SOLIDS					
Offsite Landfill	[B-7]	4,120	4,120		
Onsite Incinerate (R. Kiln)				[B-6.1]	[B-6.1]
CONTAMINATED SOILS					
Offsite Landfill	[B-8.1]	4,000	4,000	4,000	
Onsite Landfill	[B-8.2]				7,350
VERTICAL BARRIERS					
Temporary Sheet Pile	[B-9]	1,450	1,450	1,450	1,450
BACKFILL/SITE CLOSURE	[B-10]	3,090	3,090	3,090	
PW of Annual O&M	[B-8.3]				716
TOTALS		$28,506	36,306	45,729	46,546
ROUNDED (1984 $1000)		28,500	36,300	45,700	46,500
Cost Rank		1	2	3	4
% of Alt. 2		100	127	160	163
Est. Implementation Time (yrs.)		3	4	4	5 +25 yrs. O&M

Table 4-2D Double-Liner Cost - MOTCO Site

	Alternatives			
	2	3	10	11
Estimated ($K)	28,500	36,300	45,700	46,500
Double-Liner Adjustment	6,000	6,000	3,200	700
New Total	34,500	42,300	48,900	47,200
Change	+21%	+17%	+7%	+1%

Adjustments to Feasibility Study-Appendix B Cost Tables:

	Original ($K)	with Double-Liner ($K)
Table B-3	149	224
Table B-4	190	236
Table B-7	4,120	7,700
Table B-8.1	4,000	7,010
Table B-8.2	7,350	7,950

promising with respect to cost-effectiveness, and implement that alternative. If the two alternatives prove to be equally cost-effective, then both alternatives should be bid upon. This will allow the market to determine which of the alternatives is cost-effective.

Comparisons between the chosen alternative and the remaining alternatives are summarized in Tables 5-3 and 5-4. A discussion of the critical differences and the process used to choose the alternative follow.

Alternative 11, the complete on-site solution, is the second most costly alternative. Alternative 11 consists of on-site treatment of the pit water, construction on the MOTCO site of a rotary kiln unit to destroy the liquid organics and sludges/tars waste, and construction of a double-lined landcell at the site to contain the highly contaminated soils. The water treatment and incinerator are environmentally effective methods of waste disposal,but a RCRA landfill constructed at the MOTCO site is not cost-effective or an environmentally sound method of waste disposal. The landfill would have to be constructed above the contaminated water table. Further, it was determined during the preliminary evaluation of alternatives, that the cost of building a landfill above the 100-year floodplain at the MOTCO location was prohibitive. The landfill would have to be built at grade, above the water table, but below the 100-year floodplain level, to be competitive in cost with other alternatives. Additionally, the construction requirements of this alternative are more substantive than the other alternatives and has more extensive operations and maintenance requirements than the other alternatives. With all these restrictions, Alternative 11 would be competitive in costs with the other alternatives, but provide little advantage over any other alternative. Alternative 11 is not a good choice for the source-control action at MOTCO.

The comparison between Alternative 2, Alternative 3 and Alternative 10 is a discussion of the dynamics of the hazardous waste incineration market. Alternative 3 is the status quo solution to the disposal of the wastes at MOTCO and merits description first before discussing the remaining alternatives and the respective solutions to the problems presented by Alternative 3.

The major problems with Alternative 3 are the cost and availability of incinerator capacity at currently permitted facilities. At feed rates of only 7500 gallons per day, the time involved in the clean-up of the MOTCO site becomes drawnout using only currently permitted facilities. The increase in the time required to perform the cleanup also means an increase in the number of low-risk actions associated with such a cleanup. Transportation accidents, loading spills, etc., are bound to occur as the time of cleanup increases. The same problem of incineration availability also causes the price of incineration to be unstable. Substantial cost increases can be expected for incinerating PCB wastes in the future. Quotes from vendors for incinerating portions of the material at the MOTCO site have increased 20 percent between the completion of the Feasibility Study and the development of this Record of Decision. Such an increase over the last four months illustrates the potential problem with Alternative 3.

Table 5-3. Alternative Evaluation - Environmental Effects/Remedial Response Objectives - MOTCO Site

Alternative	Description	Key Criteria/Rationale
2	Offsite Industrial Incineration Offsite Biotrt. Offsite Landfill Backfill/Site Closure	All media removed from site Site effectively closed Risk of Release during transport of liquids can be mitigated Short-term and long-term release of organics from sludges/tars
3	Offsite Commercial PCB Incin. Offsite Industrial Non-PCB Incin. Offsite Biotrt. Offsite Landfill Backfill/Site Closure	Similar to Alternative 2 except: Anticipated longer implementation time increases period of potential release onsite and during transport
10	Onsite Rotary Kiln Onsite Pretrt. Offsite Landfill Backfill/Site Closure	Probable least risk of release of hazardous vapors: Transport of most hazardous media not required Simpler requirements for control of organic vapor onsite Sludges/tars incinerated--potential long term release eliminated and short term release reduced Highly contaminated soils could be incinerated onsite All identified waste media removed from site Most hazardous media are thermally destroyed Site effectively closed Ash, scrubber water, and air emissions generated by onsite rotary kiln are manageable
11	Onsite Rotary Kiln Onsite Complete Trt. Onsite Landfill	Similar to Alternative 10 except: Contaminated soils remain onsite Continued long-term potential release Effectiveness of site closure depends on long term operation and maintenance

Table 5-4. Alternative Evaluation - Engineering Assessments - MOTCO Site

Alternative	Description	Key Criteria/Rationale
2	Offsite Industrial Incineration Offsite Biotrt. Offsite Biotrt. Offsite Landfill Backfill/Site Closure	Most likely minimum implementation time based on capacity alone Some permitting and PCB approval probably required, with potential for delay Minimal onsite construction and staging Technologies reasonably well-demonstrated and available Site effectively closed--all media removed No long term operation, maintenance, or monitoring Recovery of heat value and possibly sulfur
3	Offsite Commercial PCB Incineration Offsite Industrial Non-PCB Incin. Offsite Biotrt. Offsite Landfill Backfill/Site Closure	Similar to Alternative 2 except: Limited offsite commercial PCB capacity available, possibly resulting in extended implementation time No recovery of heat value or sulfur content Cost escalation likely Could begin immediately--no further permits or approvals required
10	Onsite Rotary Kiln Incin. Onsite Pretrt. Offsite Landfill Backfill/Site Closure	Extensive onsite construction and staging Onsite implementation of rotary kiln less demonstrated than commercial or industrial incineration Eliminates transport of most hazardous media Eliminates technical and cost uncertainties for solidification/landfill of sludges/tars
11	Onsite Rotary Kiln Incineration Onsite Complete Trt. Onsite Landfill	Similar to Alternative 10 except: Maximum onsite construction and staging Longest implementation time Long-term operation, maintenance, and monitoring

A minor problem with Alternative 3 is the transportation risks associated with the removal of the liquid organics. Approximately 1450 trucks over the course of 2 to 3 years are needed to complete the job. Safety measures to load the trucks and attention to driver safety will be needed to control the situation.

Recognizing the cost and safety problems with Alternative 3, other methods of incinerating the liquid organics were examined. An initial survey for an alternative that would satisfy the TSCA requirements of alternative PCB destruction processes [40 CFR 761.60 (e)] revealed the availability of different industrial thermal processes (predominantly furnaces) in the Galveston Bay area. These processes might be capable of destroying the waste, protecting the environment, providing a cost savings and also allow the currently permitted PCB incinerators to continue to serve private industry's needs. Cost estimates were then prepared based on the use of industrial thermal processes. These estimates revealed a substantial cost savings that could be available through the use of these processes. This cost savings is the difference between Alternative 2 and 3.

The lack of TSCA permits and the difficulty of forecasting the willingness of the facilities to obtain permits and become eligible for burning of the MOTCO wastes are the drawbacks to Alternative 2. It is EPA policy to require compliance with other environmental laws during CERCLA off-site response actions. Since the State of Texas or the EPA has no legal way of guaranteeing a permit to a facility currently without TSCA approval prior to the signing of the Cooperative Agreement and subsequent award of the bid, Alternative 2 serves the purpose of demonstrating the benefits of an increased number of facilities, but cannot be the alternative advocated by the EPA. If any of the facilities did obtain the necessary State and TSCA permits, the resultant increase of competition would be expected to bring the cost of the cleanup down and Alternative 2 would thus be implemented as Alternative 3.

In the area of transportation risks, Alternative 2 gives no advantage over Alternative 3. The removal and transportation of the liquid organics would be the same procedure in either remedial action.

The solution to the problems of off-site incineration is manifest in Alternative 10 in the form of on-site incineration. The rotary kiln unit proposed in Alternative 10 is advantageous over Alternative 3 because of the elimination of the transportation of the material from the MOTCO site. The complete elimination of transportation risk is not found in Alternative 10 because some hazardous material in the form of incinerator feed fuel would have to be moved onto the site in order to destroy the lower BTU material. A minor lessening of risk is obtained in Alternative 10 at an expensive price. The $9.4 million increase of Alternative 10 over Alternative 3 is not justifiable based upon a minor increase in transportation safety. Measures to improve transportation safety in Alternative 3 can be implemented at little cost in the form of contractual requirements upon the transportation company winning the award to include extensive equipment checks and review of driver safety records.

The cost of Alternative 10 is the obvious disadvantage in comparison to Alternative 3. In the same manner as the costs of Alternative 3 are unstable, on-site incineration is equally dynamic. As the market for destruction of hazardous waste by incineration expands, the economics of on-site incineration becomes favorable in comparison to utilizing off-site facilities. This was aptly illustrated in the cost sensitivity analysis done in the Feasibility Study. As Table 5-1 indicates, a best case situation for Alternative 10 was equal to the best case for Alternative 3, adequate indication that the market for incineration is soft, making estimation temporal. By the time the implementation of a remedial action is performed at MOTCO, on-site incineration may be very competitive in costs. While implementation of an on-site remedy is difficult from the standpoint of design and construction, the cost benefits may be there to supplement the environmental benefits and yield a favorable alternative.

The cost impact of the requirement for waste disposal at double-lined landfills is an unknown factor. Indications are that the double-liner regulation will compound the cost increase for off-site disposal and as seen by the estimate in Table 4-2D, close the gap between the cost difference of Alternative 3 and Alternative 10. Alternative 3 relies on off-site landfill as a disposal method moreso than Alternative 10 and is impacted to a greater extent by cost increases due to the double-liner requirements. Alternative 3 is effected by two unstable markets while Alternative 10 is less vulnerable to the cost surge of incineraton and landfill disposal methods.

The analysis of the alternatives produces the following conclusions. Off-site biological treatment is the best solution for the pit water. Incineration of the liquid organics, on-site or off-site, is the optimum for that waste. The handling of the sludges/tars/solids would be contingent on the treatment of the liquid organic, where on-site incineration would provide for destruction of the sludges/tars/solids while off-site incineration of the liquid organics would mean off-site land disposal as the cost-effective choice. The contaminated soils would be handled by disposing of that material in an off-site facility. All offsite facilities will be in full compliance with applicable laws at the time of disposal.

The cost-effective alternative at the time of completion of the Feasibility Study is Alternative 3. This alternative is the remedy of choice by the EPA. However, due to the uncertainty of costs and capacity at TSCA permitted incineration facilities and the expected rise in costs for off-site landfill, Alternative 10 is to be pursued into the design stage and possibly into the bid stage where the alternative which is bid the lowest, while meeting the environmental requirements of all applicable laws, would be implemented.

Table 5-1. Summary of Significant Results of Cost Sensitivity Analyses - MOTCO Site

Alternative Incinerate Landfill Variation	2 Offsite Offsite Base Case	3 Offsite Offsite "RCRA/TSCA"	10 Onsite Offsite	11 Onsite Onsite "RCRA/TSCA"
Base Costs (Ref. Table 4-2)	$28.5	$36.3	$45.7	$46.5
Rank	1	2	3	4
Organic Liquids				
Low/High Costs	$24.9/34.5	$36.3/45.8	$35.7/62.4	$36.6/63.2
% of Base Costs, low/high	87%/121%	100%/126%	78%/136%	79%/136%
Rank, low/high	1/1	3/2	2/3	4/4
"Best Case/Worst Case"				
Low/High Costs	$16.5/41.1	$27.9/52.4	$27.8/66.2	$29.8/67.0
% of Base Costs, low/high	60%/144%	77%/144%	60%/145%	64%/144%
Rank, low/high	1/1	3/2	2/3	4/4

NOTES: 1. All costs in 1984 $ million.
2. Variations for organic liquids are independent and different between alternatives.
3. Variations for best case/worst case mixture of independent and common.

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This arrangement will cause more expense for design and bid document preparation, but has the potential for large cost savings in implementation. The end result is the implementation of the most cost-effective and environmentally sound remedy at the MOTCO site.

FUTURE ACTIONS

As described on page 4, Summary of Response Actions, the Agency is conducting an off-site remedial investigation in order to evaluate the need for remedial measures with respect to the groundwater contamination at the MOTCO site. In addition to the groundwater evaluation, the extent of residual contamination in the soil around the MOTCO site is also a part of this study. The investigation report will be finalized in March 1985, and the Feasibility Study, if needed, will be completed in the Fall 1985.

Immediate attention will be required at the MOTCO site to determine the proper action for an abandoned well located on the site. Recent sampling of the well is currently in analysis with results available by May, 1985. At that time, the EPA will decide, in conjunction with the State of Texas, on the proper course of action concerning the well.

An additional investigation is recommended for the MOTCO site once the highly contaminated soils are removed, but before site closure. The purpose of this investigation would be to determine the extent of contamination remaining at the site after the removal of the source of the contamination. The reasoning for this recommendation is as follows:

1. Cleanup time - The estimated clean up time for the recommended alternative is 4 years. A determination of "how clean is clean" is better made at the end of this time period than at the beginning.

2. Changing site conditions - The lengthy clean-up period, along with the removal of the source, will impact upon the site conditions in a manner which cannot be predicted. Localized groundwater gradients will be affected by the clean up and might very well be used to help in site closure. For example, allowing the groundwater to re-enter the MOTCO pits upon removal of the visibly contaminated soil, determining the characteristics of the water, and treating the water in the pit, might allow for removal of less soil because of the cleansing of the contaminants from the soil by the groundwater.

3. Potential cost-savings - The cost figures for site closure can only be considered the roughest of any possible estimate. Stopping the project for a short time period, 3 to 6 months, in order to study the changes made to the area by the removal of the gross contamination might allow for a much clearer estimate and more economical solution to the site closure. Furthermore, the the data gathered with the ongoing off-site investigation could be supplemented with 1988-1989 data to yield a better informed closure plan.

The cost for such an investigation would be minimal in comparison to the total project or even the closure costs. An estimate for the cost of this closure investigation might be set at $300,000 (1985 dollars) based on past investigation costs at the site. The contingencies built into the recommended alternative estimate should be able to pay for the closure investigation.

SCHEDULE

° Source Control Record of Decision (ROD) Signed	March 1985
° Cooperative Agreement for Design Signed	March 1985
° Design Completed	June 1986
° Bid Award	August 1986
° Construction Begins	September 1986

Record of Decision
Remedial Alternative Selection

SITE: MOTCO, LaMarque, Texas

DOCUMENTS REVIEWED

I am basing my decision on the following documents describing the analysis of cost effectiveness of remedial alternatives for the MOTCO site:

- MOTCO Remedial Investigation Reports: Initial Investigation, Secondary Investigation, Source Sampling.
- MOTCO Source Control Feasibility Study
- Summary of Remedial Alternative Selection
- Responsiveness Summary

DESCRIPTION OF SELECTED REMEDY

- ° Contaminated pit water - off-site biological treatment
- ° Organic liquids - off-site incineration *
- ° Sludges/tars - off-site landfill*
- ° Soils-off-site landfill

* On-site incineration alternative will continue to be considered into design phase.

DECLARATIONS

Consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), and the National Contingency Plan (40 CFR Part 300), I have determined that the selected remedy at the MOTCO site is a cost effective remedy and provides adequate protection of public health, welfare, and the environment. The State of Texas has been consulted and agrees with the approved remedy.

I have also determined that the action being taken is appropriate when balanced against the availability of Trust Fund monies for use at other sites. In addition, the off-site transport, storage, destruction, treatment, or secure disposition is more cost effective than other remedial action, and is necessary to protect public health, welfare or the environment.

The EPA is currently engaged in an additional Remedial Investigation/Feasibility Study to evaluate potential groundwater contamination remedies and residual soil cleanup.

March 15, 1985
Date

Dick Whittington, P.E.
Regional Administrator
Region VI