SECOND FIVE-YEAR REVIEW REPORT FOR MANY DIVERSIFIED INTERESTS, INC. SUPERFUND SITE HARRIS COUNTY, TEXAS

May 2018

2008

2016

Prepared by

U.S. Environmental Protection Agency
Region 6
Dallas, Texas

Executive Summary

The 35-acre Many Diversified Interests, Inc. Superfund site (the Site) is located 2 miles east of downtown Houston. Beginning in 1926, industrial actives at the Site contaminated soil and groundwater.

Site sampling suggested that air emissions from the former foundry, which contained particles of lead, may have contaminated on-site and off-site soils through air deposition of these particles. Foundry practices may have also contributed to on-site contamination of soil with lead. EPA listed the Site on the Superfund program's National Priorities List (NPL) in January 1999. The triggering action for this five-year review (FYR) was the signing of the previous FYR on September 12, 2012. The completion of this second five-year review was delayed due to impacts from Hurricane Harvey in late August 2017 and to allow time to complete a vapor intrusion evaluation at the Site.

The MDI Site is comprised of three Operable Units (OUs):

- OU 1 – On-site soils and groundwater
- OU 2 – Offsite Residential Yards and High-access Areas
- OU 3 – Residential Crawlspaces and Residential Areas Not Addressed under OU 2

OU 1 Summary:
In 2004, EPA selected an OU 1 remedy that included excavation and disposal of contaminated debris and soils, long-term groundwater monitoring, and implementation of institutional controls to prevent exposure to contaminated soil and groundwater. Throughout all site activities, EPA staff met regularly with the community to share site information and updates and to incorporate community feedback into the Superfund process. Through this process, EPA determined that residential land use was the reasonably anticipated future land use for the Site. Soil cleanup goals were established to prevent the potential exposure of any future resident. The OU 1 Record of Decision (ROD) also included institutional controls to prevent exposure to shallow groundwater and to potential contamination in soils at depths greater than 18 inches, monitored natural attenuation (MNA), and long-term groundwater monitoring.

Collaboration between EPA and a prospective purchaser resulted in the first-ever Agreed Order on Consent and Covenant Not to Sue between EPA and a non-liable party for the cleanup of a Superfund site. Beginning in 2007, the non-liable party performed removals of asbestos containing material, underground storage tanks, site debris (including non-hazardous wood, metal, concrete, masonry, sands, trees, ceramics, and refuse) foundry sand, slag, and contaminated soil. In total, 65,000 tons of contaminated soil and debris were removed from OU 1 and properly disposed. In August 2010, EPA deleted the soils portion and an 8-acre western groundwater portion of OU 1 from the National Priorities List (NPL).

Currently, OU 1 is undergoing groundwater monitoring to evaluate the effectiveness of MNA in remediating groundwater to cleanup goals, to monitor Contaminants of Concern (COC) concentration trends in groundwater and to verify that groundwater contamination has not migrated beyond the known limits. Groundwater sampling performed in August 2017 confirmed that the MNA remedy is remediating the groundwater and that the natural attention processes are limiting the migration of the contaminants so that there are no off-site impacts from the COCs. The MNA remedy will continue until the cleanup goals established in the OU 1 ROD are met.

OUs 2 and 3 Summary:
Cleanup of OU 2 and OU 3 involved the removal of lead-contaminated soils from neighboring residential and high access public areas through a series of removal actions. In 2009, EPA selected a "no further action" remedy for both OU 2 and OU 3, since the completed removal actions at locations for which EPA was granted access addressed all known contamination in these areas. Based on findings in the Preliminary Close Out Reports for OU 2 and OU 3, the residential and high access areas were cleaned up to levels that allow for unlimited use and unrestricted exposure. EPA believes that these removal actions addressed all of the residential yards and high-access areas that could have been affected by the air emissions of particulates containing lead from the former

foundry and for which the EPA was granted access for sampling.

This Five-Year Review finds that the remedial actions at the Site are protective of human health and the environment. At OU 1, excavation and off-site disposal of lead contaminated soils eliminated the threat of exposure to contaminated soils and institutional controls are in place to prevent exposure to contaminants in shallow groundwater. Based on available monitoring data, MNA appears to be effective in addressing B(a)P and TPH contamination in groundwater. At OUs 2 and 3, removal actions completely removed all lead contaminated soils in residential yards and high-access areas that could have been affected by the air emissions of particulates containing lead from the former foundry and for which the EPA was granted access for sampling.

Because the remedial actions at all OUs are protective, the Site is protective of human health and the environment.

SECOND FIVE-YEAR REVIEW REPORT
MANY DIVERSIFIED INTERESTS, INC. SUPERFUND SITE
EPA ID#: TXD008083404
HARRIS COUNTY, TEXAS

This memorandum documents the U.S. Environmental Protection Agency's performance, determinations and approval of the Many Diversified Interests, Inc. Superfund site (Site) second five-year review (FYR) under Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S. Code Section 9621(c), as provided in the attached second FYR Report.

Summary of the Second Five-Year Review Report

The Site's remedy included excavation and disposal of contaminated debris and soils, long-term groundwater monitoring, and implementation of institutional controls to prevent exposure to contaminated groundwater. Cleanup also removed lead-contaminated soils from neighboring residential and public areas through a series of removal actions. Groundwater monitoring is ongoing to determine the effectiveness of the monitored natural attenuation remedy. The Site is currently vacant, but there are future plans for residential redevelopment by the current owner. There are no known current exposures to contaminated media.

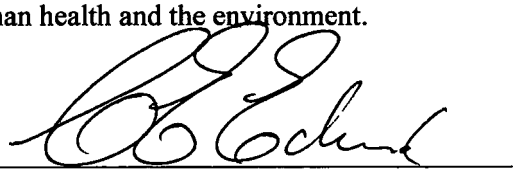
Human Exposure Status: Under Control
Contaminated Groundwater Status: Under Control
Site-Wide Ready for Anticipated Use: Yes

Actions Needed

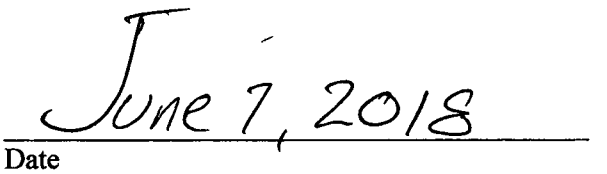
The following actions must be taken for the remedy to be protective in the long term: None.

Determination

I have determined that the remedy for the Many Diversified Interests, Inc. Superfund site is currently protective of human health and the environment.



Carl E. Edlund, P.E.
Director, Superfund Division
U.S. Environmental Protection Agency Region 6



Date

CONCURRENCES

SECOND FIVE-YEAR REVIEW REPORT
MANY DIVERSIFIED INTERESTS, INC. SUPERFUND SITE
EPA ID#: TXD008083404
HARRIS COUNTY, TEXAS

Stephen Pereira — 12/18/2017
Stephen Pereira
Remedial Project Manager
Date

Casey Luckett Snyder — 12/6/2017
Casey Luckett Snyder
Remedial Project Manager
Date

Carlos A. Sanchez — 1/18/18
Carlos A. Sanchez
Chief, AR/TX Section
Date

John C. Meyer — 1/19/18
John C. Meyer
Chief, Superfund Remedial Branch
Date

Jacob Piehl — 1/22/18
Jacob Piehl
Attorney, Office of Regional Counsel
Date

Mark A. Peycke — 05/25/18
Mark A. Peycke
Chief, Superfund Branch, Office of Regional Counsel
Date

FOR — 06/07/18
Pamela Phillips
Deputy Director, Superfund Division
Date

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ISSUES/RECOMMENDATIONS

SECOND FIVE-YEAR REVIEW REPORT
MANY DIVERSIFIED INTERESTS, INC. SUPERFUND SITE
EPA ID#: TXD008083404
HARRIS COUNTY, TEXAS

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the FYR:
OU 1, OU 2, OU 3

Issues and Recommendations Identified in the FYR:
None

Table of Contents

Tables

Figures

LIST OF ABBREVIATIONS & ACRONYMS

AOC	Agreed Order on Consent and Covenant Not to Sue
AMP	Attenuation Monitoring Point
ACM	Asbestos Containing Material
ARAR	Applicable or Relevant and Appropriate Requirement
BLL	Blood Lead Level
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Contaminant of Concern
EA	EA Engineering, Science, and Technology, Inc.
ENTACT	ENTACT Environmental Services
EPA	Environmental Protection Agency
FS	Feasibility Study
FYR	Five-Year Review
HHRA	Human Health Risk Assessment
HI	Hazard Indices
IC	Institutional Control
IEUBK	Integrated Exposure Biokinetic and Uptake
LNAPL	Light Non-Aqueous Phase Liquid
MCL	Maximum Contaminant Level
MDI	Many Diversified Interests, Inc.
mg/kg	Milligrams per Kilograms
mg/kg-day	Milligrams per Kilograms per Day
mg/L	Milligrams per Liter
MNA	Monitored Natural Attenuation
NCP	National Contingency Plan
NPL	National Priorities List
OU	Operable Unit
O&M	Operation and Maintenance
PCOR	Preliminary Close-Out Report
PCL	Protective Concentration Level
PMZ	Plume Management Zone
POC	Point of Compliance
PSH	Phase-Separated Hydrocarbons
RfD	Reference Dose
RA	Remedial Action
RAO	Remedial Action Objective
RI	Remedial Investigation
ROD	Record of Decision
RPM	Remedial Project Manager
SKA	SKA Consulting, L.P.
SWBZ	Shallow Water Bearing Zone
TCEQ	Texas Commission on Environmental Quality
TESCO	Texas Electric Steel Casting Company
TPH	Total Petroleum Hydrocarbons
TRRP	Texas Risk Reduction Program
µg/L	Microgram(s) per liter
µg/dL	Microgram(s) per deciliter
UST	Underground Storage Tank
UU/UE	Unlimited Use and Unrestricted Exposure
yd^3	Cubic yard

I. INTRODUCTION

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (NCP) (40 CFR Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the second FYR for the Many Diversified Interests, Inc. Superfund site (the Site). The triggering action for this statutory review is the signature date of September 12, 2012, for the first FYR for the Site. The FYR has been prepared due to the fact that hazardous substances, pollutants or contaminants remain at OU 1 above levels that allow for unlimited use and unrestricted exposure (UU/UE). This FYR also includes a discretionary review of OU 2 and OU 3. The completion of this second five-year review was delayed due to impacts from Hurricane Harvey in late August 2017 and to allow time to complete a vapor intrusion evaluation at the Site.

The Site consists of three operable units (OUs). OU 1 includes the on-site soils and groundwater. OU 2 includes off-site residential yards and high-access areas, including schools, child daycare centers, playgrounds and churches. OU 3 includes residential crawlspaces and residential areas not addressed under OU 2.

The remedy selected for OU 1 has been implemented and is on-going. The remedy selected for OU 2 was "no further action" because removal actions performed in 2003 and 2005 addressed unacceptable risks posed by lead contamination in nearby residences and high-access areas. The remedy selected for the crawlspaces in OU 3 is "no action warranted" since the Baseline Human Health Risk Assessment concluded that current or potential future Site conditions posed no unacceptable risks to human health or to the environment; therefore, no action or remedy is necessary to protect human health or the environment. The remedy selected for the residential yards in OU 3 is "no further action" since previous Removal Actions performed in 2006 and 2009 eliminated the existing and potential risks to human health and the environment; therefore, no further action or remedy is necessary to protect human health and the environment.

The FYR was led by EPA Remedial Project Managers (RPMs) Casey Luckett Snyder and Stephen Pereira. Other participants included Sherell Heidt of the Texas Commission on Environmental Quality (TCEQ) and Eric Marsh and Ryan Burdge of Skeo, EPA's FYR contractor. Relevant entities such as the Site's owner and developer were notified of the initiation of the FYR. The review began on 9/28/2016.

Documents reviewed for this FYR are listed in Appendix A. The site chronology is provided in Appendix B.

Site Background

The MDI Superfund Site occupies a 35-acre tract of land located at 3617 Baer Street, Houston, Texas. The Site is located about 2 miles east of downtown Houston and one block south of Interstate Highway 10, in an area of mixed industrial and residential use (Figures 1, Figure D-2). This part of Houston is known as the "Fifth Ward." Hare Street borders the Site to the north. The former National Vinegar Company property and Press Street border the Site to the east. The former Texas & New Orleans Railroad right-of-way borders the Site to the south. Bringhurst Street borders the Site to the west. Residential areas are adjacent to the west and north sides of the Site Industrial areas are adjacent to the south side of the Site. According to 2010 U.S. Census data, nearly 12,000 people live within a mile of the Site.

The Site was originally the Houston Brick Works brickyard. Blue clay found along the former Ingraham Gully, which crossed the center of the Site, was excavated and used for the manufacturing of bricks. Casting was done

in a facility located east of Bringhurst Street, north of Gillespie Street, and south of Baer Street. At that time, the eastern portion of the facility contained several residences. In 1926, the Texas Electric Steel Casting Company (TESCO) began operating a metal casting foundry on site. The foundry expanded operations north of Baer Street and south of Gillespie Street during World War II. A second foundry facility was built on the eastern part of the Site in 1970. During the mid-1980s, the southern part of the Site was leased to Can-Am Resource Group (Can-Am). Can-Am conducted a spent catalyst recycling operation using an experimental process. By 1988, Can-Am had ceased operations and drums of spent catalyst were abandoned on site. In 1990, MDI bought the TESCO note from Texas Commerce Bank. TESCO ceased operations in 1991 and MDI filed for bankruptcy the following year.

Site sampling suggested that air emissions from the former foundry, which contained particles of lead, may have contaminated on-site and off-site soils through air deposition of these particles. Foundry practices may have also contributed to on-site lead contamination of the soils. Other probable sources of lead contamination that may have impacted the on- and offsite soils include lead-based paint and historical deposition from vehicular lead-based fuel emissions, among other possible sources. EPA listed the Site on the Superfund National Priorities List (NPL) in January 1999.

Since the early 1990s, the Site has remained vacant, with the exception of cleanup activities. The current owner has plans for future residential use of the Site and continues to work with EPA to ensure that the remedy is protective for residential use. At the time of this Five-Year Review Report, no development had occurred, but work is underway to prepare the Site for redevelopment.

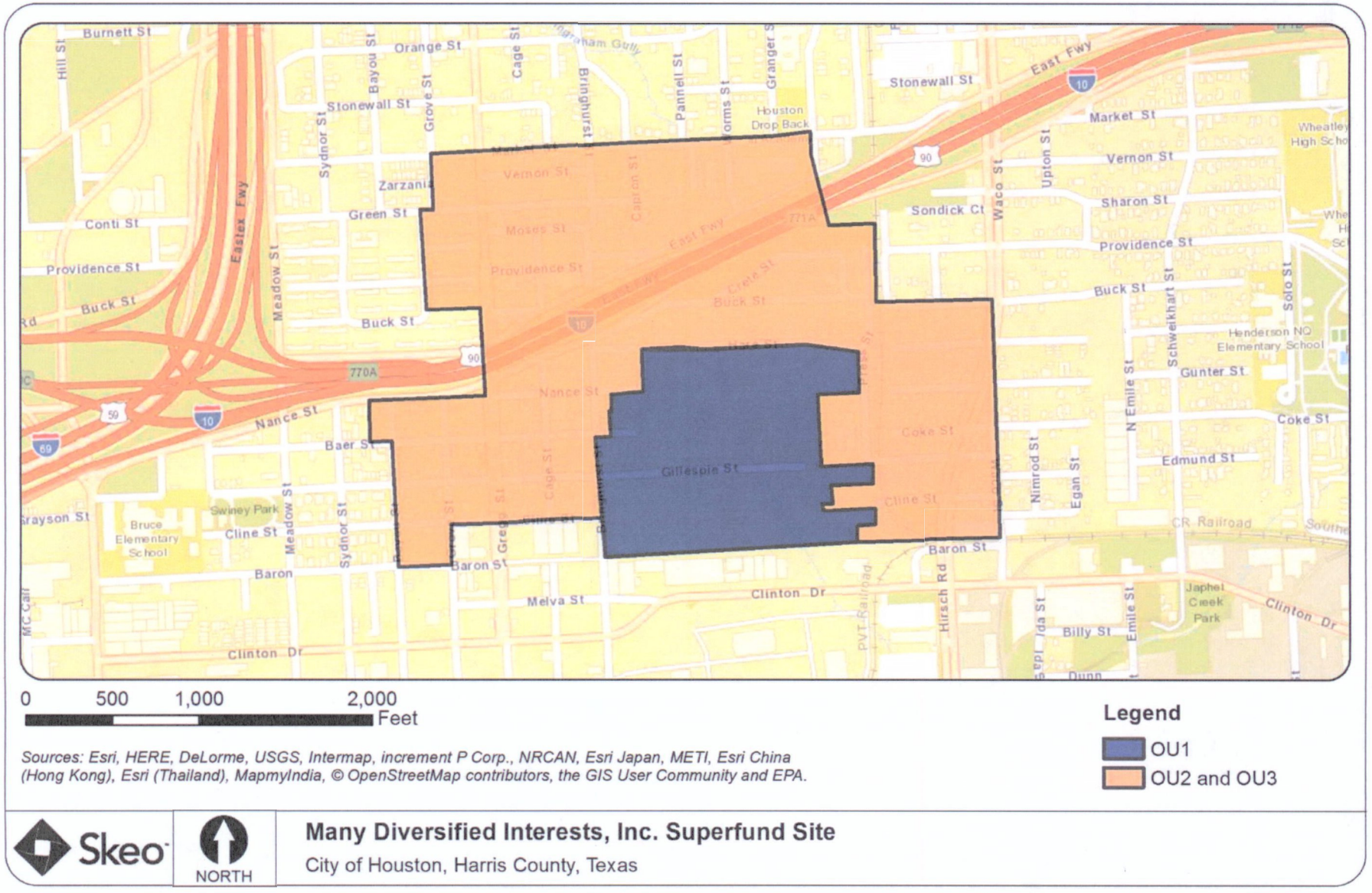
The shallow water bearing zone (SWBZ) beneath the Site is not a source of potable water. Residents near the Site receive potable water from the City of Houston's public water supply. Appendix C contains additional background information about the Site, including geology and hydrogeology. Figure D-1 in Appendix D shows the Site's location.

Operable Units

To manage the investigation and clean up the MDI Superfund Site, the EPA subdivided the Site and the surrounding residential area into three discrete areas, known as "operable units (OUs)". The following is a brief description of each OU:

- OU 1 (the On-site Soils and Groundwater) — Fenced boundary of the former 36-acre foundry located at 3617 Baer Street in Houston, Texas.
- OU 2 (the Offsite Residential Yards and High-access Areas) — Residential yards or properties and high-access areas that surround the east, west, and north fenced boundaries of the former foundry (OU 1), and located within the Modeled Air Deposition Area and East Blower Area (Study Area). High-access areas include schools, child daycare centers, playgrounds, and churches.
- OU 3 (the Residential Crawlspaces and those Residential Areas Not Addressed under OU 2) — Residential crawlspaces, residential yards or properties, and high-access areas located within the Modeled Air Deposition Area and East Blower Area (Study Area) that were not addressed during previous remedial investigation (RI) activities and removal actions conducted for MDI.

Figure 1: Site Area



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Many Diversified Interests, Inc.		
EPA ID:TXD008083404		
Region: 6	**State:** Texas	**City/County:** Houston/Harris
SITE STATUS		
NPL Status: Final		
Multiple OUs? Yes	**Has the site achieved construction completion?** Yes	
REVIEW STATUS		
Lead agency: EPA		
Author name: Casey Luckett Snyder, with additional support provided by Skeo		
Author affiliation: EPA Region 6		
Review period: 7/7/2016 - 5/22/2018		
Date of site inspection: 12/6/2016		
Type of review: Statutory		
Review number: 2		
Triggering action date: 9/12/2012		
Due date *(five years after triggering action date)*: 9/12/2017		

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

The main contaminants of concern (COCs) identified in the Record of Decision for OU 1 were lead, benzo(a)pyrene, manganese, molybdenum and petroleum hydrocarbons. Asbestos and polychlorinated biphenols (PCBs) were also identified in waste debris at the Site. The exposure pathways of greatest concern were exposure to lead in on-site soil through ingestion by a future resident child and exposure to contaminated groundwater through ingestion and dermal exposure routes for a future resident child and adult. Table 1 summarizes OU 1 COCs. These constituents were identified in surface soils, shallow groundwater, and waste debris.[1]

Table 1: OU 1 COCs, by Media

COC	Soil	Groundwater	Waste Debris
Asbestos and PCBs			X
Benzo(a)pyrene (B(a)P)	X	X	-
Total petroleum hydrocarbons (TPH)	X	X	-
Manganese	-	X	-
Molybdenum	-	X	-
Lead	X	-	-

Sampling during the 2003 OU 1 and OU 2 remedial investigation (RI) and feasibility study (FS) discovered 59 nearby residential areas, including high access areas, with soil lead concentrations equal to or greater than 500 milligrams per kilogram (mg/kg), which is the EPA screening value for lead in soils. During the OU 3 RI, completed in November 2008, EPA focused on residential crawlspaces, residential yards and properties not addressed during previous RI/FS activities and removal actions (see response actions below).

Table 2: OU 2 and OU 3 COC, by Media

COC	Soil	Groundwater
Lead	X	-

Response Actions

OU 1

In 1998 and 1999, the potentially responsible parties (PRPs) performed an extensive drum removal action with EPA's oversight. The PRPs removed over 4,000 drums from the Can-Am operation. The drums contained spent refinery and petrochemical catalysts. Visibly contaminated soils were also removed from OU 1.

The Record of Decision for OU 1 was issued on July 30, 2004. The major components of the Selected Remedy which were then implemented through a Remedial Action were:

[1] According to the 2004 OU 1 ROD, arsenic was detected above the MCL. The ROD states, "[i]n general, it appears that the arsenic contamination may be emanating from an off-site source east of the Site."

a. Excavation and treatment of soils with lead concentrations equal to or greater than 500 milligrams per kilogram (mg/kg) to a maximum depth of 1.5 feet below the ground's surface, and transportation and disposal (at a permitted off-site waste disposal facility) of the treated and untreated soils;

b. Transportation and disposal (at a permitted off-site waste disposal facility) of debris (nonhazardous debris, foundry sand, and slag), asbestos-containing material, and an underground storage tank;

c. Excavation and disposal (at a permitted off-site waste disposal facility) of soils contaminated with benzo(a)pyrene (or other organics), light nonaqueous-phase liquids, and Total Petroleum Hydrocarbons;

d. Implementation of "monitored natural attenuation" (MNA) for the groundwater and long-term monitoring to ensure that constituents above cleanup goals are naturally attenuating; and

e. Implementation of institutional controls for the groundwater to prevent exposure to contaminated groundwater in the shallow water-bearing zone. Implementation of institutional controls for the Site soils to prevent exposure to potential contamination remaining in soils at depths greater than 18 inches bgs.

Table 3 summarizes the cleanup goals established for groundwater and soil in the OU 1 ROD. Although the ROD specified the cleanup of ACM and PCB wastes as a remedy component, chemical-specific cleanup goals were not established for these wastes.[2]

Table 3: OU 1 ROD Cleanup Goals

COC	Groundwater	Soil
Lead	--	500 mg/kg[c]
B(a)P	0.0002 mg/L[a]	--
TPH	4.1 mg/L[b]	--

Notes:
a. Federal MCL
b. Site-specific critical TPH Protective Concentration Level (PCL) (4.1 mg/L) calculated in accordance with the Texas Risk Reduction Program (TRRP) rule in 30 Texas Administrative Code Chapter 350.
c. OU 1 ROD. "The cleanup goal for lead in soils at the Site has been set at 500 mg/kg, which is protective of human health based on IEUBK modeling of actual data from the Site."
-- = cleanup goal not required for this COC

The Remedial Action Objectives (RAOs) identified in the OU 1 ROD are:

- Remove ACM that has been stockpiled on the Site and left in an existing two-story building.
- Reduce the risk posed to residential receptors by remediating soils with lead concentrations equal to or greater than the cleanup goal for the Site (500 mg/kg).
- Remove soil visibly contaminated with waste oil near MW-3 and MW-20 that is acting as a potential continuing source of groundwater contamination.
- Remove soil visibly contaminated with waste oil near MW-11 that has the potential to act as an ongoing source of groundwater contamination.
- Remediate groundwater in the northwest corner of the Site, at MW-20, and remove the free product associated with the underground storage tank (UST) near MW-20.
- Mitigate the threat posed by exposure to groundwater throughout the rest of the Site. A combination of monitored natural attenuation, groundwater monitoring and implementation of institutional controls will be used to mitigate the groundwater threat.

[2] The ROD specified that the ACM cleanup would follow Chapter 40 of the code of federal regulations (CFR) Section 61 Subpart M, which establishes procedures for asbestos emission control during demolition and renovation activities. In addition, the ROD specified that the cleanup of PCB wastes and associated soils would follow the requirements of Chapter 40 CFR Part 761 for the disposal of PCB wastes.

OU 2 and OU 3

In 1998, prior to the EPA OU 1 and OU 2 RI/FS, the Texas Natural Resources Conservation Commission (TNRCC, now known as TCEQ), removed lead-contaminated soil from 89 nearby residential properties. TNRCC characterized, excavated and disposed of about 12,025 tons of soil at permitted landfills.

In 2003, EPA completed removal actions to address lead soil contamination at 56 properties identified during the 2003 OU 1/OU 2 RI/FS. The properties included Blanche Kelso Bruce Elementary School, the Fifth Ward Multi-Service Community Center and residential properties. During May and June 2005, a second EPA removal action was performed to address lead contaminated soils exceeding 500 milligrams per kilogram (mg/kg) at five properties not addressed in 2003.

At the conclusion of the 2003 and 2005 EPA actions, the EPA completed removals at a total of 59 residential and 2 high access properties, located to the east and north of the Site. The removal actions were conducted to remove surface soils with concentrations of lead that equaled or exceeded the 500 mg/kg action level to a maximum depth of 1.5 below ground surface for the purpose of reducing exposure of adults and children to lead.

In April 2006 and 2009, the EPA completed OU 3 removal actions at the northeastern portion of the Kelly Village Housing Complex and six additional residential yards of the Site. The removal action removed surface soils with concentrations of lead that equaled or exceeded the cleanup goal of 500 mg/kg to reduce the exposure of children and adults to lead in soils. The EPA believes that these removal actions addressed all of the Kelly Village areas and surrounding residential yards which could have been affected by site contamination from the former foundry for which EPA was granted access for sampling.

The ROD for OU 2 was issued on September 23, 2005. The EPA's final remedy for decision for OU 2 was "no further remedial action" since the previous removal actions described above eliminated the existing and potential risk to human health and the environment so that no further action was necessary.

The ROD for OU 3 was issued on August 31, 2009. The EPA's final remedy decision for the crawlspaces at OU 3 was "no action is warranted" since the Baseline Human Health Risk Assessment for the crawlspace concluded that current or potential future Site conditions posed no unacceptable risk to human health or the environment. The EPA's final remedy decision for the residential yards at OU 3 was "no further action" since the previous removal actions described above eliminated the existing and potential risk to human health and the environment so that no further action was necessary.

The August 2009 Preliminary Close Out Report (PCOR) documents that the Environmental Protection Agency (EPA) and the Texas Commission on Environmental Quality (TCEQ) completed, or provided oversight for completion of, construction activities for all operable units of the Many Diversified Interests, Inc., Superfund Site (MDI Site), including OU 1, OU 2, and OU 3 in accordance with "Close Out Procedures for National Priorities List Sites" (OSWER Directive 9320.2-09A-P).

Status of Implementation of Remedial Response Actions for OU 1

On March 22, 2005, the bankruptcy trustee for the MDI property auctioned the 35 acres of OU 1 property for a total sales price of $7,897,539. On May 26, 2006, the non-liable party (also known as "bona fide prospective purchaser") for the Site, Clinton Gregg Investments, Ltd., signed an "Agreed Order on Consent and Covenant Not to Sue" (AOC), which included a scope of work for the Remedial Design (RD) and Remedial Action (RA) for OU 1. This was the first-ever agreement in the nation by a non-liable party to clean up a Superfund Site. This agreement saved the EPA and taxpayers $6.6 million, which was the EPA's estimated cost to implement the

selected OU 1 remedy. The remedy consists of, among other actions, cleanup of the OU 1 soils to residential standards. The Agreed Order became final on September 29, 2006.[3]

As stated above, Clinton Gregg agreed to implement the remedy identified in the 2004 OU 1 ROD. ENTACT Environmental Services (ENTACT) conducted the remedial design and remedial action on behalf of Clinton Gregg. Remedial action started on February 12, 2007, and finished on June 5, 2008. Major components of Site cleanup included:

- Demolition: ENTACT undertook asbestos abatement, demolition and disposal of the building and other on-site structures in May 2007.
  - ➢ This action removed any threat of exposure to ACM on-site.
- Asbestos Management: ENTACT gathered and segregated ACM on-site. ACM debris was hauled off site and disposed of in July 2007.
  - ➢ This action removed any threat of exposure to ACM on-site.
- Non-hazardous Waste Management: ENTACT collected and recycled or disposed of non-hazardous debris comprised of wood, metal, concrete, masonry, slags, ceramics, sands and non-commercial refuse.
  - ➢ This action removed any threat of exposure to non-hazardous debris on-site.
- Surface Water Impoundments: ENTACT sampled 17 water impoundments and found them to be suitable for discharge under the City of Houston's publicly owned treatment works requirements. ENTACT decanted the settlement basin and solidified the underlying sludge materials to be disposed with other TPH-contaminated soils. Surface ponds were filled in using on-site soils.
  - ➢ This action safely discharged water from the Site and removed any threat of exposure to contaminated sludge by disposing of it offsite and backfilling the impoundment with clean on-site soils.
- Source Removal: In September 2007, ENTACT found a second UST in the northwest corner of the Site. ENTACT cleaned up soils contaminated with waste oil and organic contaminants near MW-03, MW-11 and MW-20, two on-site USTs, and two on-site water impoundments. In 2007 and 2008, 13,326 tons of soil contaminated with waste oil, PCBs and TPH were removed and disposed of at a permitted facility.
  - ➢ This action prevents current and future exposure of soils contaminated with waste oil and organic contaminants, such as TPH and benzene, by removing them from the Site.
- Cleanup of Soils Contaminated with Lead and Organics: Lead impacted soil at OU 1 was excavated and removed for disposal at appropriate landfill facilities. ENTACT excavated as deep as 48 inches in several lead-contaminated areas to remove soil exceeding the 458 mg/kg screening level. After sampling established that lead-impacted soil above cleanup goals had been removed, excavated areas were backfilled with clean fill as needed. ENTACT removed 34,146 tons of lead-contaminated soils and disposed of the soils off site. In the MW-03 location, the excavation uncovered a disconnected sewer line, which was re-installed with the assistance of the City of Houston, and the area backfilled. At the MW-20 location, the source was found to involve the UST, Lead Area 1, and the entire area surrounding MW-20. All material excavated was sampled and segregated into disposal classes for

[3] Under the Agreed Order, EPA's covenant not to sue Clinton Gregg Investments, Ltd. extends to any subsequent purchaser of the Property that is approved by EPA and that agrees to be bound by the provisions of the Agreed Order. On September 27, 2011, with EPA's permission, Fenway Development, Inc., a company affiliated with Clinton Gregg Investments, acquired the property and has continued to implement the remaining requirements of the Agreed Order, which consist of remedial action for the groundwater, under EPA's supervision. In addition, under the Agreed Order, EPA's covenant not to sue extends to any third-party transferee of a portion of the Property who acquires its portion after EPA certification of the completion of the soil remedy and the implementation of the institutional controls, who intends to use the acquired property for commercial or residential use, and who executes and satisfies all conditions in an Application for Extension of Covenant Not to Sue and Contribution Protection (Application). Such persons are referred to in the Agreed Order as Tract Buyers Any and all such Applications must be provided to EPA prior to the date the Tract Buyer acquires a portion of the Property, or begins tenancy at the Property.

TPH impacted soils. A total of 11,944 tons of TPH contaminated soils were removed and disposed of.

  - ➢ This action removed any threat of exposure to contamination in OU 1 soils. All on-site soils exceeding the soil cleanup goal for lead (500 mg/kg) in the OU 1 ROD were removed. For soils contaminated with organics (benzene, benzo(a)pyrene, and TPH) the OU 1 Remedial Design contained a determination of a risk-based clean up goal. All soils exceeding those cleanup goals for organics were excavated and disposed of properly.

- Plugging and Replacing Monitoring Wells: ENTACT plugged and abandoned MW-11 after source removal. MW-03 and MW-20 were removed to accommodate source removal. Plugged and abandoned wells were replaced with MW-03R and -20R, respectively. ENTACT added MW-26 and MW-27 as new wells to enhance the plume monitoring capability for MNA (see Figure D-2 in Appendix D).
  - ➢ The action provided for replacement wells and additional wells to ensure the adequacy of the MNA remedy and groundwater monitoring requirements.
- Implementing Institutional Controls: As required by the OU 1 ROD and AOC, TCEQ issued a restrictive covenant prohibiting exposure to contaminated groundwater on May 19, 2010.
  - ➢ This action prevents any exposure to contaminated groundwater at the Site. This action specifically prevents exposure to COCs molybdenum and manganese, which is the control specified in the OU 1 ROD. The 2009 PCOR determined that institutional controls are unnecessary for the OU 1 soils because the remedial action removed all areas of soil contamination in OU 1 that did not allow for unlimited use and unrestricted exposure.

EPA and ENTACT conducted pre-final inspection on June 25, 2008. A visual inspection at each remedial action location verified proper execution of the remedial design. EPA determined that the remedial action was properly executed.

The 2003 Human Health Risk Assessment (HHRA) identifies the potential for adverse cancer effects from exposure to the shallow groundwater at OU 1 contaminated with benzo(a)pyrene and TPH. The HHRA also identifies the potential for adverse non-cancer effects from exposure to the shallow groundwater contaminated with manganese and molybdenum. To address these identified exposure risks and contaminants of concern, the OU 1 ROD selects monitored natural attention (MNA) as the remedy for the benzo(a)pyrene and TPH in groundwater. The MNA remedy is ongoing. The OU 1 ROD also calls for the implementation of institutional controls to prohibit the use of groundwater which eliminates the exposure to all contaminants of concern, including manganese and molybdenum, in the shallow groundwater under OU 1. As stated above, TCEQ issued a restrictive covenant prohibiting exposure to contaminated groundwater on May 19, 2010.

On February 4, 2010, Clinton Gregg requested that EPA delete the soils portion and the 8-acre western groundwater portion of OU 1 from the NPL to facilitate redevelopment of the Site.[4] The Federal Register Notice, announcing the proposed partial deletion of the Site and providing for a 30-day public comment period, was published on June 15, 2010. EPA received no adverse comments on the proposed partial deletion, which became effective on August 16, 2010. On September 27, 2011, with EPA's permission, Fenway Development, Inc. (Fenway), a company affiliated with Clinton Gregg, acquired the property. Fenway continues to implement the remaining AOC requirements under EPA oversight.

EPA approved the interim groundwater remedial action, which included implementation of the institutional controls required by the AOC, on August 2, 2012. Periodic monitoring of the groundwater is ongoing.

[4] According to the 2010 Deletion Notice, "sampling data gathered from the groundwater monitoring wells located in the approximately 8-acre western portion of [OU 1] 1 indicated that the underlying groundwater had not been impacted by the hazardous substances."

Institutional Control (IC) Summary

Table 4 lists the institutional controls associated with the Site. Copies of the institutional control document is included in Appendix M. There is a restrictive covenant associated with OU 1. The restrictive covenant, filed on May 19, 2010, prohibits exposure to contaminated groundwater under the Site for any purpose until COCs no longer exceed their protective concentration levels (PCLs). All current groundwater plumes are contained within the institutional control boundary shown in Figure 2. The restrictive covenant will run with the land.

Table 4: Summary of Planned and/or Implemented Institutional Controls

Media, Engineered Controls and Areas that Do not Support UU/UE Based on Current Conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Groundwater	Yes	Yes	See Figure 1[a]	To prevent exposure to contaminated groundwater in the shallow water-bearing zone.	Restrictive Covenant # 20100206389 (issued May 19, 2010, Appendix M)
Soil	No	Yes	OU 1 soils	From the OU 1 ROD, "to prevent exposure to soil contamination above acceptable cleanup levels "	ICs not needed after soils were cleaned up to residential levels. PCOR documents this cleanup.

Notes:

a. When filed, the restrictive covenant applied to the non-deleted portion of the site parcel (about 26 acres). The Site is currently undergoing a subdivision process for future residential reuse. Subdivision will result in hundreds of new residential parcels that will be affected by the groundwater restrictions moving forward

Figure 2: Institutional Control Map

Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

Systems Operations/Operation & Maintenance (O&M)

Fenway's contractor conducts site O&M activities on a periodic basis, as required by the 2006 AOC. O&M activities for the Site include:

- Inspection of all monitoring wells for erosion of soils around foundation pads and to ensure that proper drainage slopes are established to prevent surface runoff from entering the wells through the well casings.
- Inspection of all monitoring well locking devices and all other well components to ensure proper functionality.
- Periodic groundwater monitoring and sampling, alternating with EPA, to evaluate the progress of MNA at the Site.

While groundwater monitoring has occurred since the previous FYR, sampling has not occurred once every 30 months, as required by the 2006 AOC. Two sampling events have occurred since the last FYR and the most recent groundwater monitoring sampling event was in August 2017.

Estimated annual O&M costs in the ROD and Preliminary Close-Out Report were $220,600. This cost estimate includes, but is not limited to, O&M activities, groundwater sampling and analysis, and consulting and reporting activities.

III. PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determinations and statements from the previous FYR as well as the recommendations from the last FYR and the current status of those recommendations.

Table 5: Protectiveness Determinations/Statements from the 2012 FYR

OU #	Protectiveness Determination	Protectiveness Statement
1	Protective	Based on the information available during the first five-year review, the selected remedy for OU 1 (On-site Soils and Groundwater) of the Many Diversified Interests, Inc. Superfund Site appears to be performing as intended. The Site is protective of human health and the environment.
Sitewide	Protective	Based on the information available during the first five-year review, the selected remedy for OU 1 (On-Site Soils and Groundwater) of the Many Diversified Interests, Inc. Superfund Site appears to be performing as intended. The Site is protective of human health and the environment.

Table 6: Status of Recommendations from the 2012 FYR

OU #	Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
1	Monitoring wells	Damaged wells MW-17 and MW-19 should be plugged and abandoned.	Completed	Wells MW-17 and MW-19 were plugged and abandoned in February 2012.	2/1/2012

OU #	Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
1	Oral reference dose for manganese in groundwater has changed	The noncarcinogenic risk for manganese in groundwater was determined using an oral RfD of 0.047 mg/kg-day. The current oral RfD for the noncarcinogenic risk for manganese in groundwater is 0.024 mg/kg-day, according to the EPA Region Screen Level Tables (EPA 2011). The noncarcinogenic risk for manganese in groundwater should be reevaluated to ensure that the remedy is protective of human health.	Completed	The OU 1 ROD selects groundwater ICs to ensure that the remedy is protective of human health. The TCEQ issued a restrictive covenant prohibiting exposure to contaminated groundwater on May 19, 2010. In addition, EPA reevaluated noncarcinogenic risk for manganese in April 2016. Based on the RfD change, EPA determined that the screening level to monitor concentration trends would change to 0.430 mg/L.	4/25/2016
1	Light Non-Aqueous Phase Liquids in MW-20R	MW-20R should continue to be monitored for LNAPL.	Completed	LNAPL/phase-separated hydrocarbons (PSH) were detected in well MW-20R above the water column during the January 2013 sampling event. Based on the 2013 Monitored Natural Attenuation Report No. 9, EPA and the site contractor will continue to monitor PSH in MW-20R.	1/25/2013
1	Institutional Controls	An IC, such as a deed notice, should be implemented for soil, as required by the ROD	Considered But Not Implemented	Based on soil cleanup as described in the 2008 Remedial Action Report, EPA determined that a soil IC is not needed for the Site. This was detailed in the August 2009 PCOR.	8/31/2009

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement & Site Interviews

A public notice in both Spanish and English was made available by press release in local papers distributed by the *Houston Chronicle*, including *The Examiner*, on November 23, 2016. It stated that the FYR was underway and invited the public to submit any comments to EPA (Appendix F). The results of the review and the report will be made available at the Site's information repository, Tuttle Neighborhood Library, located at 702 Kress Street in Houston.

During the FYR process, interviews were conducted to document any perceived problems or successes with the remedy implemented to date. Interviewees included a representative of the current site owner, representatives from the City of Houston Health Department and nearby residents. Interviews took place in person and via email. Results of the interviews are summarized below. Appendix J provides completed interview forms.

Overall, respondents had positive impressions of the project. The current site owner has generally favorable views of the project and has been kept informed of site activities through ongoing site maintenance work conducted by

the owner's O&M contractor. Three of seven nearby residents interviewed were aware of the Site and knew some of the Site's history. In general, nearby residents felt EPA could do a more consistent job of keeping nearby residents up to date regarding ongoing activities at the Site. No nearby residents interviewed had private wells. Several residents were aware of complaints about the Site, specifically relating to site upkeep (clearing/mowing vegetation) and ongoing problems with trash dumping on and near the Site. Several nearby residents also said that trespassing had been a problem on or near the Site.

The TCEQ project manager stated that the remedy is performing as designed but had concerns about the operations and maintenance of the Site, particularly with regards to frequent illegal dumping, lack of security and damage to monitoring wells. Additionally, the TCEQ project manager emphasized the need for adherence to the 30-month sampling schedule to ensure that the MNA remedy is functioning as intended and that the ICs continue to be protective. The TCEQ project manager was aware of several issues and complaints over the past five years. In 2016, the TCEQ addressed the city's concerns with unsecure and unkempt site conditions, as well as an inquiry from a nearby home buyer regarding the site. In 2017, the TCEQ project manager informed the EPA RPM about issues regarding the city's lack of maintenance of storm drains at the site due to their concerns about site contamination. The TCEQ project manager also expressed concerns about the potential off-site source of arsenic in the groundwater. In response to TCEQ's request and to continue to monitor arsenic levels in the groundwater at the Site, EPA sent a letter to the Respondent's contractor on February 9, 2018, stating that arsenic analysis should be included in all future MNA groundwater sampling events.

Representatives from the Houston Health Department were aware of the Site, dating back to when the Site was an active foundry. Interviewees stated that the Department was appropriately informed about ongoing activities at the Site after participating in the Site inspection. City representatives were not aware of any changes to local regulations in the past five years that might affect the protectiveness of the Site's remedy. They were also not aware of complaints about the Site or community concerns, but stated that the Department typically does not receive complaints about trespassing or trash dumping. Representatives from the City were also not aware of changes to future land use at the Site. City representatives did suggest that EPA could more consistently work to keep local governmental agencies informed about Superfund-related activities (status updates, fact sheets, up-to-date and complete website information), both for the Site and other Superfund sites located within city limits.

In response to the expressed a desire for increased communications from EPA regarding the status of the Site raised by the community and City interviewee, EPA will consider updating the Community Involvement Plan to increase communications about Site activities with stakeholders. Additionally, in 2018, EPA plans to issue a Superfund Ready for Reuse (RfR) determination for the Site. A RfR determination provides a technical determination that a site is "ready for reuse" and will remain protective for that use, so long as any use limitations established by EPA continue to be met. An RfR determination summarizes information about the site that supports the determination that all or a portion of a property at a site can support specified types of uses while remaining protective of human health and the environment.

Data Review

OU 1 Groundwater

The purpose of groundwater monitoring at the Site is to monitor the effectiveness of MNA in remediating groundwater to cleanup goals in the OU 1 ROD, to monitor COC concentration trends in groundwater and to verify that groundwater contamination has not migrated beyond known limits and restrictive covenant boundaries. Groundwater cleanup goals established in the OU 1 ROD are 0.0002 milligrams per liter (mg/L) for B(a)P and 4.1 mg/L for TPH.

The Remedial Action Monitored Natural Attenuation Plan identifies three plume management zones (PMZs), which were established (PMZ 1 through 3, see Figure D-2) in accordance with TRRP rules to monitor

groundwater contamination during MNA activities. PMZ-1 monitors the manganese and molybdenum concentrations in shallow groundwater under the central portion of OU 1 to ensure that the restrictive covenant boundaries are appropriate to prevent exposure to these contaminants. PMZ-2 addresses benzo(a)pyrene (B(a)P) concentrations in shallow groundwater under the northeastern portion of OU 1. PMZ-3 addresses TPH in shallow groundwater under the northwestern portion of OU 1.

Shallow groundwater for PMZ-1 flows generally toward the center of the Site and then north toward Hare Street. Groundwater flow for PMZ-2 is north toward Hare Street. Groundwater flow for PMZ-3 is west toward Nance Street. A map of the Site and its features, including active groundwater monitoring well locations, is provided in Figure D-2 in Appendix D. Many Site groundwater monitoring wells have been plugged and abandoned since 2012. These wells include MWs-02, 05, 07, 08, 10, 12, 14, 15, 16, 17, 18, 19, 21 and 22. These wells are not included in the discussion below.

There have been two groundwater monitoring sampling events since the previous FYR: one in January 2013 and one in August 2017 (Appendix I). Samples for both events were analyzed for Site COCs B(a)P and TPH, as well as manganese and molybdenum. The January 2013 samples were also analyzed for natural attenuation parameters, alkalinity, biological oxygen demand, carbon dioxide, chemical oxygen demand and total organic carbon.

PMZ-1
The OU 1 ROD states that EPA did not select MNA as a remedy for manganese and molybdenum. Instead, the ROD requires institutional controls to prevent exposure to contaminated groundwater at the Site. The restrictive covenant prohibiting the use of groundwater at the Site prevents exposure to contaminants in the groundwater, including manganese and molybdemum. Monitoring for PMZ-1 is only required until cleanup levels are reached for B(a)P and TPH in PMZs 2 and 3.

Appendix I includes groundwater data collected through August 2017. Monitoring data indicate that molybdenum and manganese contamination has not migrated off site.

PMZ-2 (B(a)P)
PMZ-2 contains two attenuation monitoring point (AMP) wells (MW-03R and MW-25) and two point of compliance (POC) wells (MW-04 and MW-24). Since 2010, B(a)P concentrations have exceeded the relevant cleanup goal only once, in well MW-03R, during the February 2010 sampling event (Table 7). B(a)P has not been detected in any other PMZ-2 wells since groundwater monitoring commenced at the Site. Based on available data, MNA appears effective at remediating B(a)P at the Site.

Table 7: B(a)P Concentrations (2010 to 2017)

Monitoring Well	B(a)P Concentration (mg/L) Cleanup Goal = 0.0002 mg/L						
	2010 (Feb)	2010 (Jun)	2010 (Oct)	2011 (Feb)	2012 (Jan)	2013 (Jan)	2017 (Aug)
MW-03R	**0.00029**	0 00018 J	0.00015 J	0 000083 J	0 000079 J	0.00015 J	<0.0001
MW-04	<0.000080	<0.000080	<0.000080	<0.000080	<0.000050	<0.000050	<0.0001
MW-24	<0.000080	<0.000080	<0.000080	<0.000080	<0.000050	<0.000050	<0.0001
MW-25	<0.000080	<0.000080	<0.000080	<0.000080	<0.000050	<0.000050	<0.0001
MW-29	NS	NS	NS	NS	NS	NS	<0.0001

Notes:
a. < denotes B(a)P not detected at the stated reporting or detection limit
b. Maximum result from primary and duplicate samples is shown.
Bold = exceeds cleanup goal
J = analyte detected below lab quantitation limit

NS = Not Sampled

PMZ-3 (TPH)

Appendix I includes groundwater data collected through August 2017. PMZ-3 contains two AMP wells (MW-01 and MW-20R) and two POC wells (MW-26 and MW-27R[5]). TPH has not been detected in wells MW-01, MW-26 or MW-27R since groundwater monitoring commenced (Table 8). MW-20R was not analyzed for TPH in 2013 due to the presence phase-separated hydrocarbons (PSH) in the well. In August 2017, approximately 0.17 foot of PSH was measured during the sampling event, as compared to 0.04 foot during the January 2013 event. The area around MW-20 (replaced by MW-20R after soil cleanup) was the location of source removal of petroleum-contaminated soils in 2007.

Table 8: TPH Concentrations (2010 to 2017)

Monitoring Well	TPH Concentration (mg/L) Cleanup Goal = 4.1 mg/L						
	2010 (Feb)	2010 (Jun)	2010 (Oct)	2011 (Feb)	2012 (Jan)	2013 (Jan)	2017 (Aug)
MW-01	<0.18	<0.19	<0.19	<0.19	<0.20	<0.19	<4.4
MW-20R	<0.18	**4.50**	2.30	3.00	NS[c]	NS[c]	<4.4[c]
MW-26	<0.18	<0.19	<0.19	<0.19	<0.19	<0.19	<4.4
MW-27	<0.18	<0.19	<0.19	<0.19	<0.19	<0.19	NS
MW-27R	NS	NS	NS	NS	NS	NS	<4.2
MW-28	NS	NS	NS	NS	NS	NS	<4.3

Notes:
a. < denotes TPH not detected at the stated reporting or detection limit
b. Maximum result from primary and duplicate samples is shown.
c. PSH present
Bold = exceeds cleanup goal
NS = not sampled

Site Inspection

The inspection of the Site was conducted on 12/6/2016. Site inspection participants included Stephen Pereira (EPA Region 6 RPM), Sherell Heidt (TCEQ), and Eric Marsh and Ian Penn (Skeo). The purpose of the inspection was to assess site conditions and the protectiveness of the remedy. The inspection began at the entrance to the Site, located on Hare Street, along the northern boundary of the Site. Participants located and examined all on-site and off-site monitoring wells, walked the site perimeter, and examined fencing around the Site.

When there are no site-related activities underway, the main entrance gate on the northern part of the Site is closed and locked, preventing vehicle access from Hare Street. Vehicles can access the Site from Baer Street and through the adjacent former National Vinegar property, located immediately east of the Site on Press Street. Warning signs in English and Spanish from EPA and the State of Texas are posted on fencing around the Site. Perimeter fencing extends around most of the Site. Fencing was missing at the former Baer Street entrance and the fence between the Site and the former National Vinegar property had been removed/torn down. Perimeter fencing was upright; some sections of fence were beginning to lean over due to vegetative growth. Barbed wire on the perimeter fencing was also missing in places. Vegetation across the Site appeared to be well established in general, with some vegetation over 6 feet tall. There was one area of distressed vegetation, in a ditch west of MW-

[5] MW-27 was plugged and abandoned in May 2014 and replaced with MW-27R.

23. There was stained soil and standing water, which appeared to contain oily residue, east of MW-23. There is evidence that oil filters were illegally disposed of in this area. See additional detail on this dumping event below.

All on- and off-site wells were located and inspected. Many wells have been plugged and abandoned since the 2012 FYR. All monitoring wells were locked, although locks had rusted shut and had to be cut open because of infrequent access over the past five years. Monitoring wells appeared in average condition. Two on-site wells (MW-25 and MW-26) were leaning to the side, and may have been hit or damaged. One off-site point-of-compliance (POC) well (MW-29) was not covered and was surrounded by thick vegetation. All wells were opened and well caps were inspected. Several well caps were removed by the EPA RPM to assess their integrity; they were in acceptable condition. Only one on-site well (MW-24) was labeled, with marker. New labels would help ensure easy identification of on-site wells. For the same reason, wells would also benefit from a fresh coat of paint. MW-23 was surrounded by significant brush and was difficult to find and access during the inspection. Keeping well areas clear of vegetation should be part of ongoing O&M activities.

While not part of the Site remedy, several uncovered and unsecured manholes and open stormwater infrastructure openings were seen on-site. Most of these holes were neither marked nor fenced off. They could be a potential health and safety hazard for on-site workers or potential trespassers.

There were signs of both trespassing and vandalism on-site. In terms of vandalism, an oily deposit was found in a drainage ditch east of MW-23 (see photo in Appendix G). The FYR team learned from the Houston Police Department's Environmental Investigation Unit that there was an illegal dumping event on the Site in August 2016 involving the disposal of automotive oil filters. The oil filters have been removed; they are presumed to be the cause of the oily deposit near MW-23.[6] No suspect has been identified.

There were also signs of trespassing on-site, primarily in the form of trash and other debris across the Site. There was a significant amount of trash near the fence line along Brighthurst and Nance Streets on the western boundary of the Site. Interviews with residents suggested that trespassing and trash dumping at the Site are both community concerns. A violation notice from the City of Houston was posted on the perimeter fence due to residents' complaints about the lack of maintenance (overgrown vegetation) and dumping at the Site.

Redevelopment plans for the Site call for several hundred townhomes to be built on site. Clearing of the Site has begun, primarily on the northern part of the Site. Site clearing operations were underway during the inspection. A redevelopment-related sign was located near the Site regarding a public hearing for the replatting of the site property for the purposes of creating 225 lots and three reserves supporting single-family residences.

After the Site inspection, the FYR team interviewed residents living near the Site. In-person interviews were conducted with six nearby residents and one business operator. The morning of December 7, 2016, the FYR team met with and interviewed officials from the City of Houston. Completed interview forms are in Appendix L.

On the afternoon of December 7, 2016, the FYR team conducted research at two of the three listed site repositories for the Site – the Fifth Ward Neighborhood Library and Bruce Elementary School. No site-related documents were found at the school library. The Fifth Ward Neighborhood Library has limited hours and was closed when the FYR team visited. Based on the challenge of gaining entrance to the elementary school and the limited hours of operation for the Fifth Ward Neighborhood Library, EPA established a permanent repository for the Site at Tuttle Neighborhood Library, which is located at 702 Kress Street, about 2 miles from the Site.

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[6] On December 21, 2016, SKA removed all impacted soil observed near MW-23. SKA excavated the drainage ditch until no visibly impacted soils were apparent. A total of 30 cubic yards (loose volume) of soil was excavated from the drainage ditch and disposed of off-site. Following the completion of excavation activities and confirmation sampling to ensure all impacted soils were removed, SKA re-contoured the earthen ditch utilizing surrounding soils to match the existing slope and function of the ditch.

Skeo staff also reviewed property records online using the Harris County website. Skeo staff located the groundwater restrictive covenant, filed with Harris County on May 19, 2010, in the county's online property records.

V. TECHNICAL ASSESSMENT

QUESTION A: Is the remedy functioning as intended by the decision documents?

Question A Summary:

The remedy is functioning as intended by site decision documents.

OU 1 Soil
Remedial construction activities for the soil remedy finished in 2008. The soil excavation and backfilling of OU 1 appears be working as intended to prevent exposure to lead-contaminated soils.

The 2004 OU 1 ROD also called for implementation of ICs to prevent exposure to soil contamination above acceptable cleanup level. The 2009 Preliminary Closeout Report for the Site determined that soil ICs are unnecessary for the OU 1 soils because the remedial action removed all areas of soil contamination in OU 1 that did not allow for unlimited use and unrestricted exposure.

OU 1 Groundwater
The groundwater remedy consists of MNA to remediate B(a)P and TPH and institutional controls to prevent exposure to contaminated groundwater in the shallow water-bearing zone. Groundwater monitoring has occurred since the previous FYR in 2013 and 2017. The 2017 MNA Report states that the analytical data indicate that B(a)P and TPH are being effectively controlled by the MNA program being implemented for OU 1 groundwater remedy and that plumes have not migrated laterally beyond the PMZs.

A restrictive covenant filed by TCEQ in 2010 prevents exposure to contaminated groundwater in the shallow aquifer. This restrictive covenant functions as the institutional control called for in the OU 1 decision document to prevent exposure to contaminants in shallow groundwater, including manganese and molybdenum. Additionally, the August 2017 sampling event verifies that both manganese and molybdenum contamination levels are well below the selected screening values at the point of compliance wells.

OU 2 and OU 3
EPA removal actions addressed all OU 2 and OU 3 residential property yards and high-access areas for which EPA received site-access and identified lead concentrations above 500 mg/kg. A total of 155 properties were remediated. The EPA believes that these removal actions addressed all of the residential yards and high-access areas that could have been affected by the air emissions of particulates containing lead from the former foundry and for which the EPA was granted access for sampling. EPA believes that the OU 2 and OU 3 removal actions have eliminated the existing and potential risks to human health and the environment so that no further action is necessary.

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?

Question B Summary:

Since the previous FYR, there have not been any changes to the ARARs established for Site COCs (Appendix H). The 2004 ROD established a chemical-specific ARAR for lead in soil of 500 mg/kg to comply with the 30 TAC 350 – Texas Risk Reduction Rule. The most current version of 30 TAC 350 was reviewed and the residential

concentration for lead has not changed. In addition, there have been no changes in site conditions that would suggest the presence of new exposure pathways and the RAOs remain valid. EPA is in the process of updating its lead policy based on recent studies, which indicate that lower blood lead levels may be associated with health effects. EPA Region 6 will continue to use the current EPA policy until the Agency finalizes and updates its policy.

PSH was observed in MW-20R during the 2012, 2013 and 2017 sampling events. As part of the second five-year review and due to the future residential development plans at the Site, EPA requested the Respondent perform an evaluation of the vapor intrusion (VI) pathway for a future residential land use scenario on the northwestern portion of the Site near MW-20R. The source of potential vapors is a light, non-aqueous phase liquid (LNAPL/PSH) which originated from a former underground storage tank and is in contact with the shallow groundwater bearing unit near monitoring well MW-20R.

On January 30, 2018, an LNAPL sample was collected from monitoring well MW-20R to further characterize the chemical nature of the LNAPL. The EPA evaluation of the analysis indicated a potential vapor intrusion concern and therefore EPA recommended the Respondent perform soil-vapor sampling to further evaluate the potential for vapor intrusion in the area around MW-20R. In March, 2018, soil-vapor sampling points were installed at four locations near MW-20R. Two of the sampling points were located near MW-20R and within the approximate boundaries of the former LNAPL plume. The other two sampling points were installed outside the approximate boundaries of the former LNAPL plume. At each of the four soil-vapor sampling locations, nested sampling points targeted both shallow soil-vapors and deep soil-vapors.

Using the sampling data collected in accordance with the EPA approved VI work plan and presented in the May 2018 Vapor Instrusion Evalution submitted by the Respondent, EPA performed an "Evaluation of the Vapor Intrusion Inhalation Risk to Potential Future Residents from Exposure to Volatile Contaminants in Groundwater and LNAPL at MDI OU1 Superfund site." (VI Risk Evaluation; Appendix K). The following paragraph summarizes EPA's evaluation and conclusions provided in the VI Risk Evaluation. Please refer to Appendix K for the complete EPA VI Risk Evaluation.

The EPA Vapor Intrusion Screening Level Calculator (VISL) was used to evaluate the potential LNAPL chemicals of potential concern (COPCs) contributions to indoor air concentrations in the area around MW-20R at the Site. The estimated excess cancer risk of the four carcinogenic COPCs (benzene, ethylbenzene, methyl tert-butyl ether (MTBE) and naphthalene) from the sampling locations within the boundary of the former LNAPL plume were within EPA's acceptable excess cancer risk range. The non-cancer hazard index (HI) from exposure to total petroleum hydrocarbons (TPH) was calculated to be less than one, which aligns with EPA's acceptable non-cancer risk level at a HI of less than one. In summary, EPA Region 6 concludes that there is no need to take any further action regarding vapor intrusion for the MDI OU1 site. The estimated risk values were below the EPA acceptable levels for both cancer and non-cancer health effects. Vapor intrusion should not present any health concern to inhabitants of buildings built in the future over the northwestern portion of the Site.

QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?

Question C Summary:

On September 9, 2017, groundwater and soil samples were collected and analyzed for metals to evaluate the potential effects from Hurricane Harvey at the Site. Post-Hurricane Harvey conditions of the groundwater and soil at the Site are consistent with conditions that existed before the hurricane made landfall.

There is no additional information about the Site at this time that would call into question the protectiveness of the Site's remedy.

OTHER FINDINGS

In addition, several findings and recommendations were identified during the FYR that do not affect current and/or future protectiveness:

- While not part of the remedy, the fencing should be repaired around OU 1 to prevent trespassing, illegal dumping, and vandalism of monitoring wells.
- While not part of the remedy, several uncovered and unsecured manholes and open stormwater infrastructure openings were seen on-site (see photos in Appendix G). They could serve as a health and safety hazard for on-site workers or potential trespassers. These should be fenced off and marked as long as the Site is vacant.
- Include vegetation control around well areas as part of ongoing site maintenance activities.
- Some of the groundwater samplers were surrounded by significant brush and were difficult to find and access during the 2017 Five Year Review inspection. Keeping wells areas clear of vegetation should be part of ongoing site maintenance activities.
- Laboratory reporting limits for TPH in the August 2017 groundwater samples exceeded the TPH cleanup goal. Sampling teams should work with the analytical laboratories to resolve the high reporting limits during future sampling events.
- In several of the FYR Interviews, the community and local government interviewees expressed a desire for increased communications from EPA regarding the status of the Site Consider updating the Community Involvement Plan to increase communications about Site activities with stakeholders.
- The groundwater monitoring schedule has not adhered to the 30-month interval detailed in the 2006 Agreed Order on Consent and Covenant Not to Sue (AOC) for the Site. Ensure that groundwater monitoring is performed at the required 30-month intervals as long as contaminants of concern (COCs) are detected above the OU 1 ROD cleanup goals.
- During the 2017 Five Year Review inspection in December 2016, it was noted that Wells MW-25 and MW-26 appeared to be damaged/pushed over. On June 30, 2017, SKA, on behalf of Fenway Development, submitted a letter to EPA documenting the repairs performed to MW-25 and MW-26. No additional action is necessary.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the FYR:
OU 1, OU 2, OU 3

VI. PROTECTIVENESS STATEMENT

Protectiveness Statement(s)	
Operable Unit: OU 1	*Protectiveness Determination:* Protective
Protectiveness Statement The OU 1 remedy is currently protective of human health and the environment. Excavation and off-site disposal of lead contaminated soils eliminated the threat of exposure to contaminated soils and institutional controls are in place to prevent exposure to contaminants in shallow groundwater. Based on available monitoring data, MNA appears to be effective in addressing B(a)P and TPH contamination in groundwater.	

Protectiveness Statement(s)	
Operable Unit: OU 2	*Protectiveness Determination.* Protective
Protectiveness Statement The OU 2 remedy is protective of human health and the environment. Removal actions addressed all of the residential yards and high -access areas that could have been affected by the air emissions of particulates containing lead from the former foundry and for which the EPA was granted access for sampling.	

Protectiveness Statement(s)	
Operable Unit OU 3	*Protectiveness Determination:* Protective
Protectiveness Statement The OU 3 remedy is protective of human health and the environment. Removal actions addressed all of the residential yards and high-access areas that could have been affected by the air emissions of particulates containing lead from the former foundry and for which the EPA was granted access for sampling.	

Sitewide Protectiveness Statement
Protectiveness Determination: Protective
Protectiveness Statement: Because the remedial actions at all OUs are protective, the Site is protective of human health and the environment.

VII. NEXT REVIEW

The next FYR Report for the Many Diversified Interests, Inc. Superfund site is required five years from the completion date of this review.

APPENDIX A – REFERENCE LIST

Agreed Order on Consent and Covenant Not to Sue, Many Diversified Interests, Inc. Superfund Site. Docket No. 06-12-05. United States Environmental Protection Agency. September 2006.

Feasibility Study Report for Operable Unit 1, Many Diversified Interests Superfund Site. United States Environmental Protection Agency Region 6. January 4, 2004.

Feasibility Study Report for Operable Unit 2, Many Diversified Interests Superfund Site. United States Environmental Protection Agency Region 6. July 2005.

First Five-Year Review Report for the Many Diversified Interests, Inc. Superfund Site. House, Harris County Texas. United States Environmental Protection Agency Region 6. September 12, 2012.

Human Health Risk Assessment for Operable Unit 1, Many Diversified Interests Superfund Site, Houston, Harris County, Texas, EPA ID No. TXD008083404. United States Environmental Protection Agency Region 6. December 2003.

Monitored Natural Attenuation Report No. 9. 2013 Second Annual Monitoring Event Many Diversified Interests, Inc. Superfund Site. SKA Consulting, L.P. (SKA). April 2013.

Monitored Natural Attenuation Report. Many Diversified Interests, Inc. Superfund Site. EA Engineering, Science, and Technology, Inc., PBC. August 2017.

Memorandum: Review of the First Five-Year Review Report for Many Diversified Interests, Inc. Superfund Site. United States Environmental Protection Agency Region 6. April 25, 2016.

Preliminary Close Out Report, Many Diversified Interests, Inc. Superfund Site, Houston, Texas, TXD008083404. United States Environmental Protection Agency Region 6. August 31, 2009.

Record of Decision, Operable Unit 1, Onsite Soils and Groundwater, Many Diversified Interests, Inc. Superfund Site, Houston, Texas. United States Environmental Protection Agency Region 6. September 2005.

Record of Decision, Many Diversified Interests Superfund Site, Operable Unit 2 (Off-Site Residential Yards and High-Access Areas). United States Environmental Protection Agency Region 6. September 25, 1990.

Record of Decision, Many Diversified Interests Superfund Site, Operable Unit 3 (Residential Crawlspaces and Residential Areas Not Addressed Under Operable Unit 2). United States Environmental Protection Agency Region 6. August 2009.

Remedial Action Data Evaluation Summary Report, Many Diversified Interests, Inc. Superfund Site, Operable Unit 1 (On-Site Soils and Groundwater). ENTACT. August 30, 2008.

Remedial Design Report Many Diversified Interests, Inc. Superfund Site Operable Unit 1 (On-Site Soils and Groundwater). United States Environmental Protection Agency Region 6. July 17, 2007.

Remedial Investigation Report for Operable Unit 1, Many Diversified Interests Superfund Site. United States Environmental Protection Agency Region 6. November 28, 2003.

Remedial Investigation Report for Operable Unit 2, Many Diversified Interests, Inc. Superfund Site. United States Environmental Protection Agency Region 6. July 2005.

Remedial Investigation, Many Diversified Interests, Inc. Superfund Site, Operable Unit 3. United States Environmental Protection Agency Region 6. April 2009.

Restrictive Covenant 2010020639, State of Texas, County of Harris. Texas Commission on Environmental Quality. May 19, 2010.

Texas Risk Reduction Program, Protective Concentration Levels. Texas Commission on Environmental Quality. March 2016.

APPENDIX B – SITE CHRONOLOGY

Table B-1: Site Chronology

Event	Date
TESCO began metal casting foundry operations at the Site	1926
TESCO built second foundry facility on the eastern portion of the Site	1970
TESCO leased southern portion of the Site to Can-Am for a spent catalyst recycling operation	Mid 1980s
Can-Am ceased operations and abandoned drums of spent catalyst on site	1988
MDI bought the TESCO mortgage loan from the Texas Commerce Bank	1990
TESCO ceased operations and MDI foreclosed the property	February 1991
MDI reopened as the San Jacinto Foundry (SJF) and began operating	March 1, 1991
MDI filed for bankruptcy in the U.S. Bankruptcy Court for the Southern District of Texas	May 20, 1992
SJF ceased foundry operations at the Site	June 1, 1992
MDI demolished on-site facilities as part of a salvage operation under order of the U.S. Bankruptcy Court for the Southern District of Texas	March 1995 – January 1996
EPA proposed the Site for listing on the Superfund program's National Priorities List (NPL)	September 29, 1998
Potentially responsible parties for the Site performed an extensive drum removal action under EPA oversight The Texas Natural Resources Conservation Commission conducted a removal and restoration of 89 residential yards west of the Site	1998 and 1999
EPA finalized Site's listing on the NPL	January 19, 1999
EPA issued Remedial Investigation (RI) Report for operable unit 1 (OU 1)	November 28, 2003
EPA conducted removal actions that addressed 59 residential areas east and north of the Site, including Blanche Kelso Bruce Elementary School and the Fifth Ward Multi-Service Center.	November 2003 and June 2005
EPA finalized OU 1 Feasibility Study Report	January 2004
EPA issued OU 1 Record of Decision (ROD)	July 30, 2004
EPA finalized RI and FS reports for OU 2	July 2005
EPA issued OU 2 ROD	September 23, 2005
EPA conducted removal cleanup at the Kelly Village Housing Authority property	February to April 2006
EPA finalized Agreed Order on Consent and Covenant Not to Sue with Clinton Gregg Investments, Ltd. (Clinton Gregg) Clinton Gregg agreed to implement the remedy identified in the OU 1 ROD	May 26, 2006
EPA published a Federal Register Notice that solicited public review and comment on EPA's agreement with the prospective purchaser	June 1, 2006
EPA finalized Agreed Order on Consent and Covenant Not to Sue with Clinton Gregg	September 29, 2006
Contractor to site owner (ENTACT Environmental Services) began soil cleanup on behalf on Clinton Gregg	February 2007
ENTACT began on-site physical construction (asbestos abatement) for OU 1	May 3, 2007
ENTACT completed site construction activities for OU 1	June 5, 2008
EPA issued RI for OU 3	February 2009
EPA performed removal action for OU 3	April 2009
EPA issued ROD for OU 3	August 31, 2009
EPA determined that Site's remedy achieved construction completion milestone	August 31, 2009
Clinton Gregg requested that EPA delete OU 1 soils and the 8-acre western portion of OU 1 groundwater from the NPL to facilitate redevelopment	February 4, 2010
EPA finalized partial deletion	August 16, 2010
TCEQ filed restrictive covenant for non-deleted groundwater portion of OU 1	May 19, 2010
EPA signed first FYR for the Site	September 12, 2012

APPENDIX C – SITE BACKGROUND

Historic Site Geology and Hydrogeology

Site investigations evaluated subsurface conditions to a depth of about 28 feet bgs, or two feet below the base of the SWBZ. Soils encountered are typically fine grained in nature, consisting primarily of low plasticity clays and silty fine sands. In addition to the native soils, the central portion of the Site is underlain by between 5 and 20 feet of foundry sands. The saturated foundry sands are the first unit encountered under the central portion of the Site. The former Ingraham Gully has been lined with a 12-foot-wide by 12-foot-high concrete box culvert backfilled with these foundry sands. In general, these materials are classified as silty sands, with the silt and clay fraction ranging between 9 and 49 percent, and are fine-grained, poorly graded and loose. The native sands are breached in the center of the Site where the box culvert transects the Site.

Groundwater flow at the Site is controlled by the interaction between the North Pond, the foundry sands and the native soils. The SWBZ is defined as the water table aquifer that occurs in both the native materials and within the foundry sand fill materials. The SWBZ occurs within native soils in the eastern and western thirds of the Site. The static water surface of the SWBZ is typically encountered at 16 to 18 feet bgs (within the second clay). The transmissive portion of the SWBZ is encountered between 22 and 26 feet bgs (below the second clay) and consists of silty sand to poorly graded fine sand.

Detailed lithologic logging and stratigraphic analysis during the RI found that, at some locations, the foundry sands are in contact with the transmissive native sands that comprise the SWBZ and there is no separation between these units. Groundwater in the SWBZ flows toward the box culvert from both the west and east sides of the Site, and then exits the Site to the north. The State of Texas classified the SWBZ as a groundwater resource due to the zone's capability to produce waters with a naturally occurring total dissolved solids content of less than 10,000 mg/L at a rate greater than 150 gallons per day. However, EPA does not expect that the SWBZ at the Site will be used as a potable source of water in the near future.

Site Surface Water Hydrology

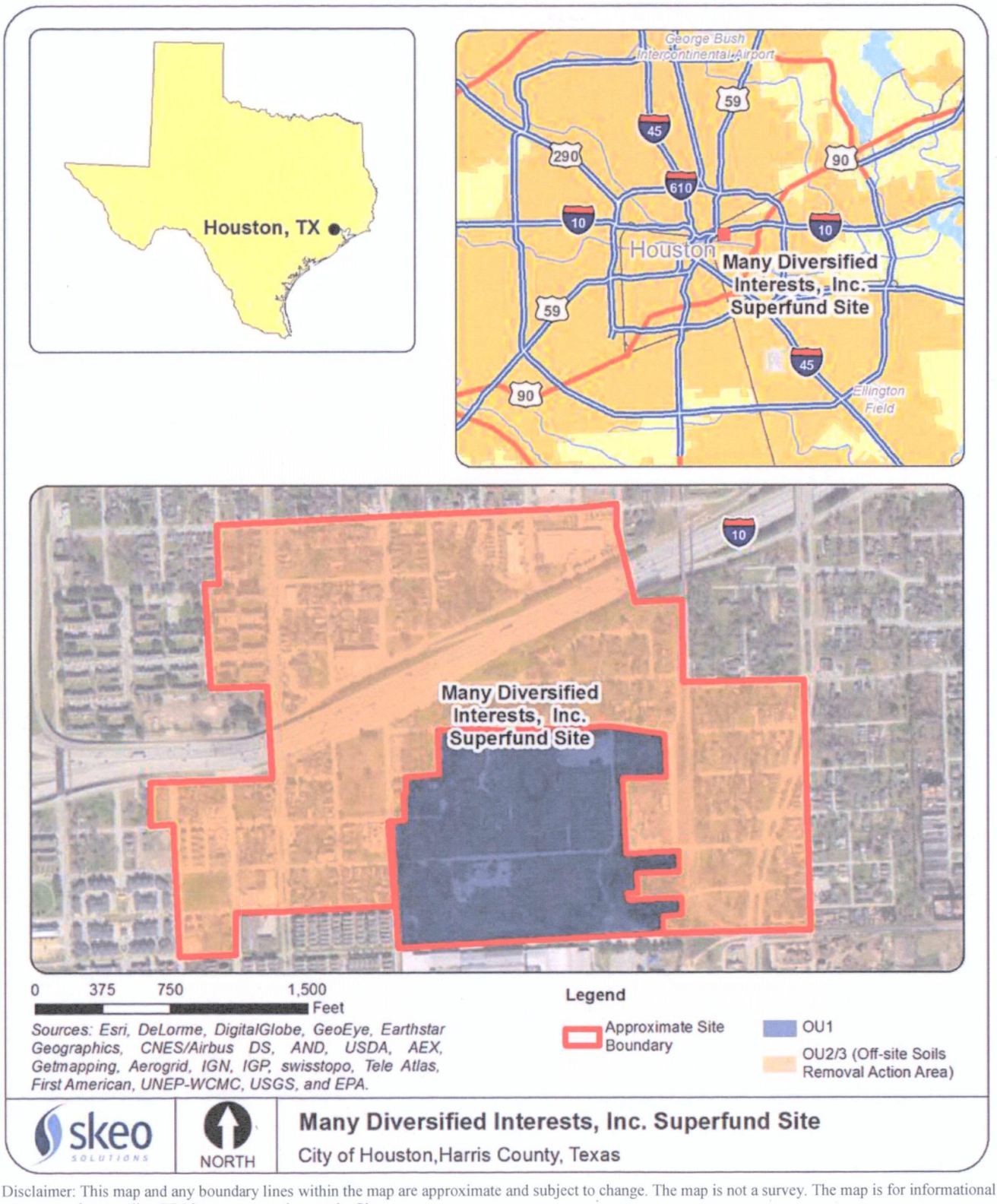
Surface water features at the Site included the North Pond and South Pond. These ponds were remnants of the old Ingraham Gully. Whereas standing water was prevalent in the South Pond, the North Pond was typically dry except immediately after a significant rainfall.

The only non-ephemeral source of standing water at the Site is the South Pond, which is a small pool about 160 feet (east-west) by 100 feet (north-south) dimensionally. The South Pond is located on the southern boundary of the Site in a depression within the foundry sands and fill deposits that were used as backfill for Ingraham Gully. The surface water expression of the pond is about 2,100 square feet. The depth of the water within the pond appears to be on the order of 1 to 2 feet, although confirmation measurements were not made within the center of the pond during the RI. Water in the pond resulted from the intersection of the SWBZ with the foundry sands.

The Site is essentially flat, with a gentle slope to the west. Topography at the Site is primarily a function of the distribution of stockpiled debris and foundry sands, resulting in topographic relief on the order of 20 feet. On the southern half of the Site, surface water flows towards the southeast corner. On the northern half of the Site, most surface water flows toward the center of the Site and north.

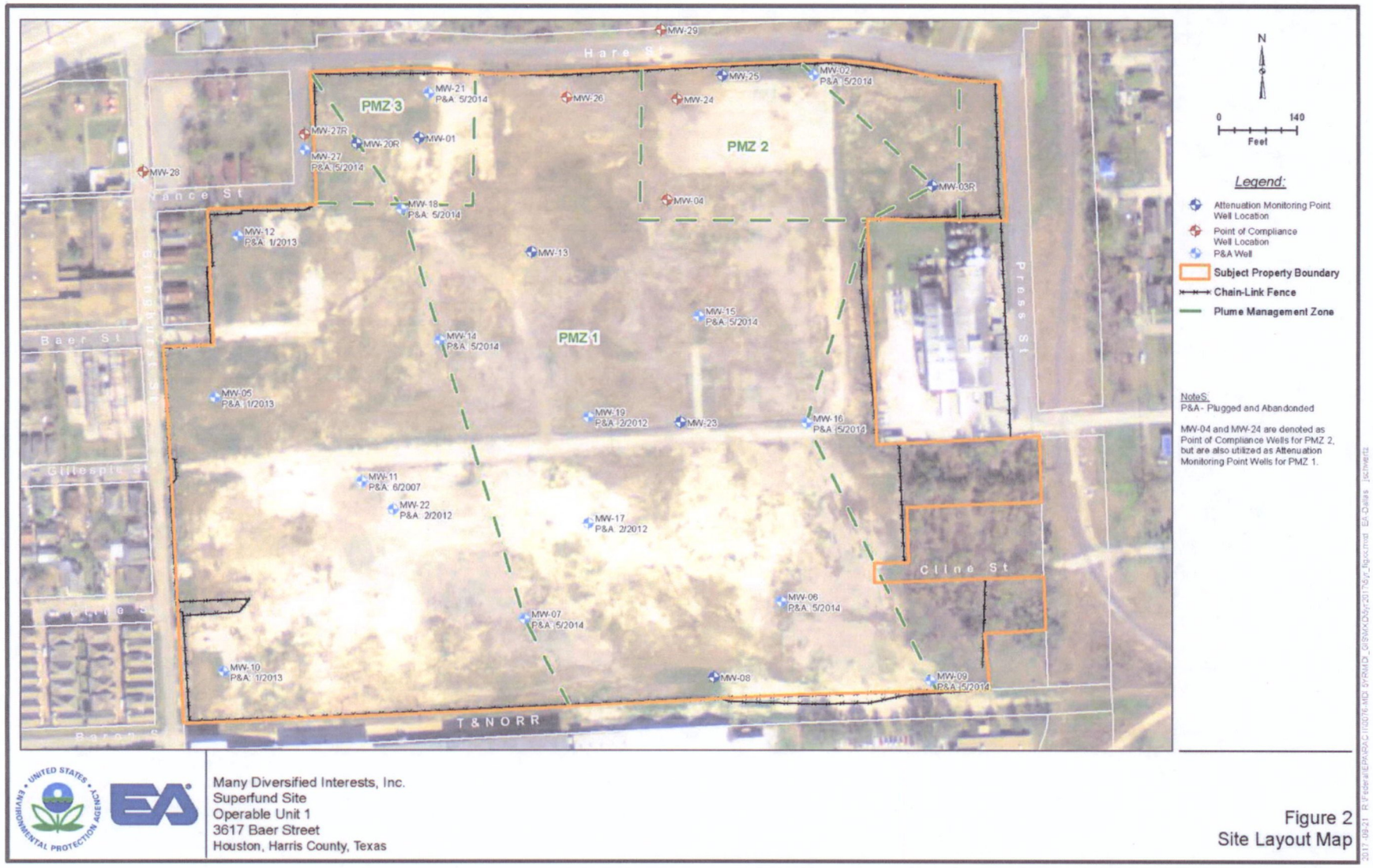
APPENDIX D – SITE MAPS

Figure D-1: Site Vicinity Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

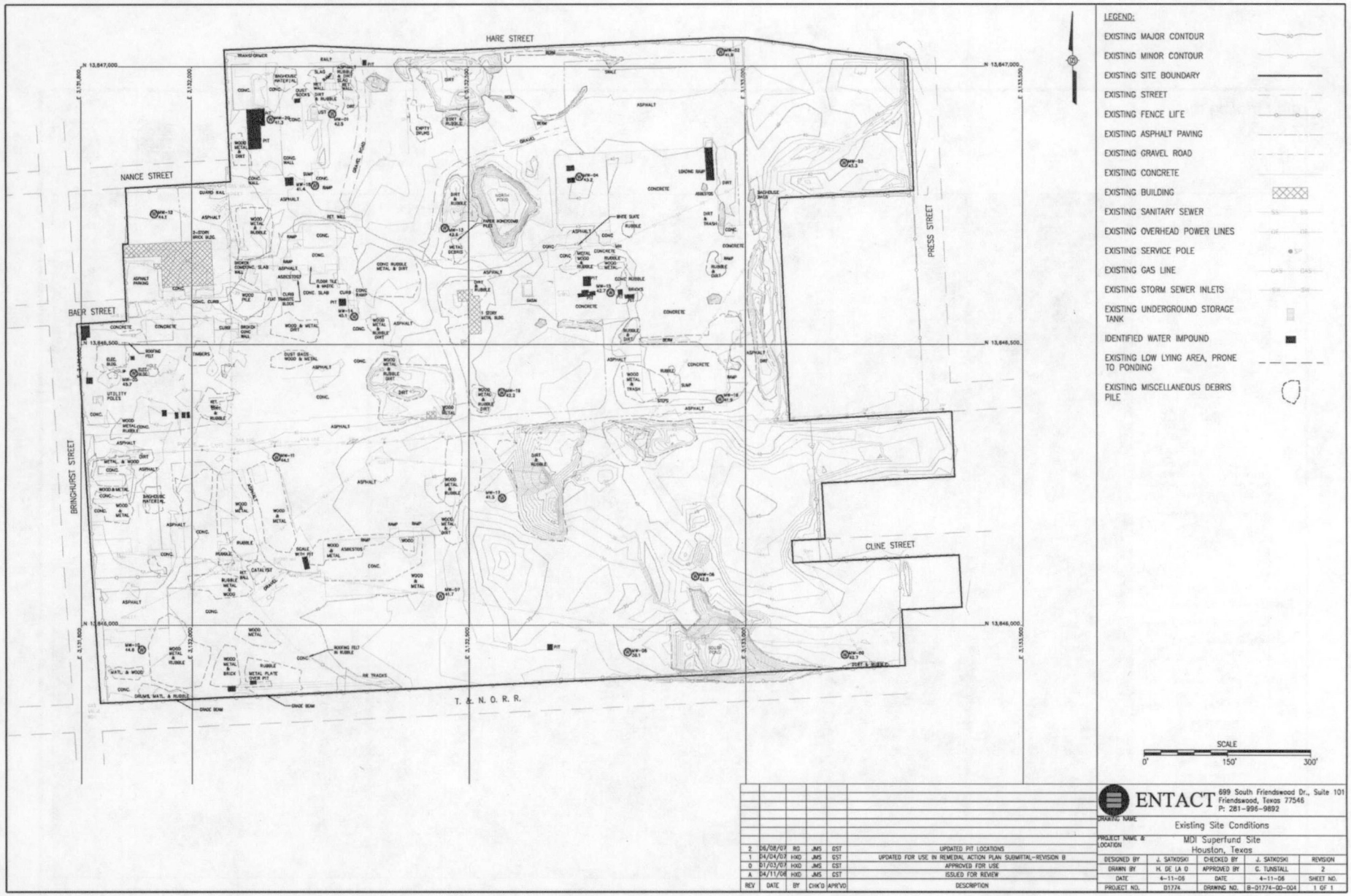
Figure D-2: Detailed OU 1 Map



Many Diversified Interests, Inc.
Superfund Site
Operable Unit 1
3617 Baer Street
Houston, Harris County, Texas

Figure 2
Site Layout Map

Figure D-3: Pre-Cleanup OU 1 Conditions Map (*source:* ENTACT)



APPENDIX E – SITE INSPECTION CHECKLIST

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site Name: Many Diversified Interests, Inc.	**Date of Inspection:** 12/6/2016
Location and Region: Houston, Texas 6	**EPA ID: TXD008083404**
Agency, Office or Company Leading the Five-Year Review: EPA	**Weather/Temperature:** Sunny, 70°F

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☒ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☐ Other: _____
- ☒ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (check all that apply)

1. **O&M Site Manager** _____ (Name) _____ (Title) _____ (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone Phone: _____
   Problems, suggestions ☐ Report attached: _____

2. **O&M Staff** _____ (Name) _____ (Title) _____ (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone Phone: _____
   Problems/suggestions ☐ Report attached: _____

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). Fill in all that apply.

   Agency Houston Health Department
   Contact Daisy D James (Name) | Bureau Chief Pollution Control & Prevention (Title) | 12/07/2016 (Date) | _____ (Phone No.)
   Problems/suggestions ☐ Report attached: yes

   Agency Houston Health Department
   Contact Isaac Desouza (Name) | Engineer (Title) | 12/12/2016 (Date) | _____ (Phone No.)
   Problems/suggestions ☐ Report attached: _____

   Agency _____
   Contact _____ (Name) _____ (Title) _____ (Date) _____ (Phone No.)
   Problems/suggestions ☐ Report attached: _____

   Agency _____
   Contact _____ (Name) _____ (Title) _____ (Date) _____ (Phone No.)

Problems/suggestions ☐ Report attached: _____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone No.
Problems/suggestions ☐ Report attached:_____

4. **Other Interviews** (optional) ☒ Report attached: yes

local residents, Site owner

III. ON-SITE DOCUMENTS AND RECORDS VERIFIED (check all that apply)

1. **O&M Documents**

☐ O&M manual	☐ Readily available	☐ Up to date	☒ N/A
☐ As-built drawings	☐ Readily available	☐ Up to date	☒ N/A
☐ Maintenance logs	☐ Readily available	☐ Up to date	☒ N/A

Remarks: _____

2. **Site-Specific Health and Safety Plan** ☐ Readily available ☐ Up to date ☒ N/A

☐ Contingency plan/emergency response plan ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

3. **O&M and OSHA Training Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

4. **Permits and Service Agreements**

☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A
☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A
☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A
☐ Other permits: _____	☐ Readily available	☐ Up to date	☒ N/A

Remarks: _____

5. **Gas Generation Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

6. **Settlement Monument Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

7. **Groundwater Monitoring Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

8. **Leachate Extraction Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

9. **Discharge Compliance Records**

☐ Air	☐ Readily available	☐ Up to date	☒ N/A
☐ Water (effluent)	☐ Readily available	☐ Up to date	☒ N/A

Remarks. _____

10. **Daily Access/Security Logs** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

IV. O&M COSTS

1. **O&M Organization**

☐ State in-house ☐ Contractor for state

☐ PRP in-house ☐ Contractor for PRP

☐ Federal facility in-house ☐ Contractor for Federal facility

☒ Contractor for site owner and EPA Region 6.

2. **O&M Cost Records**

☐ Readily available ☐ Up to date

☐ Funding mechanism/agreement in place ☒ Unavailable

Original O&M cost estimate: _____ ☐ Breakdown attached

Total annual cost by year for review period if available

From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From. _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From. _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached

3 **Unanticipated or Unusually High O&M Costs during Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing Damaged** ☐ Location shown on site map ☐ Gates secured ☐ N/A

Remarks: Fencing is intact around most of Site but shows signs of wear and tear Fencing is torn down along the eastern edge of the Site, between the site boundary and the former vinegar facility (see photo) Fencing is missing at the entrance to the Site off of Baer Street (see photo). Fencing in other areas is beginning to fall over or is being pushed over by trees and other vegetation. Main entrance gate off of Hare Street is secured with a lock.

B. Other Access Restrictions

1. **Signs and Other Security Measures** ☐ Location shown on site map ☐ N/A

Remarks: Warning signs from EPA and the State of Texas are still posted along the perimeter of the Site (see photos). These signs may no longer be necessary

C. Institutional Controls (ICs)

1. **Implementation and Enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☒ No ☐ N/A

Site conditions imply ICs not being fully enforced ☐ Yes ☒ No ☐ N/A

Type of monitoring (e.g., self-reporting, drive by): self reporting

Frequency: _____

Responsible party/agency: Site owner

Contact _____ _____ _____ _____

Name Title Date Phone no.

Reporting is up to date ☐ Yes ☐ No ☒ N/A

Reports are verified by the lead agency ☒ Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met ☐ Yes ☒ No ☐ N/A

Violations have been reported ☐ Yes ☐ No ☒ N/A

Other problems or suggestions: ☐ Report attached

Soil ICs not yet implemented.

2. **Adequacy** ☐ ICs are adequate ☒ ICs are inadequate ☐ N/A

Remarks: Soil ICs called for in the OU 1 ROD and AOC have not yet been implemented, were not found online in Harris County property records

D. General

1. **Vandalism/Trespassing** ☐ Location shown on site map ☐ No vandalism evident

Remarks. There are signs of both trespassing and vandalism at the Site. Garbage and other debris were found across the Site, and in particular along the Bringhurst Street side of the Site. Additionally, oil filters were apparently illegally dumped on site, leaving an oily residue in a ditch.

2 **Land Use Changes On Site** ☐ N/A

Remarks: Clearing of a portion of the Site for redevelopment is underway.

3 **Land Use Changes Off Site** ☐ N/A

Remarks: Surrounding land uses remain mixed use (residential and light industrial) as well as vacant land.

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. **Roads Damaged** ☐ Location shown on site map ☐ Roads adequate ☒ N/A

Remarks: Roads remain on site from time as a foundry. Roads appear to be passible but are not frequently used and are not part of site reuse planning.

B. Other Site Conditions

Remarks: Several open and unsecured manholes and stormwater-related access points were observed across the Site. These areas could serve as a potential threat to site workers or trespassers. See photos.

VII. LANDFILL COVERS ☐ Applicable ☒ N/A

A. Landfill Surface

1. **Settlement** (low spots) ☐ Location shown on site map ☐ Settlement not evident

Area extent: _____ Depth: _____

	Remarks: _____		
2.	**Cracks**	☐ Location shown on site map	☐ Cracking not evident
	Lengths: _____	Widths: _____	Depths: _____
	Remarks. _____		
3.	**Erosion**	☐ Location shown on site map	☐ Erosion not evident
	Area extent: _____		Depth: _____
	Remarks: _____		
4.	**Holes**	☐ Location shown on site map	☐ Holes not evident
	Area extent: _____		Depth: _____
	Remarks: _____		
5.	**Vegetative Cover**	☐ Grass	☐ Cover properly established
	☐ No signs of stress	☐ Trees/shrubs (indicate size and locations on a diagram)	
	Remarks· _____		
6.	**Alternative Cover** (e.g., armored rock, concrete)		☐ N/A
	Remarks: _____		
7.	**Bulges**	☐ Location shown on site map	☐ Bulges not evident
	Area extent: _____		Height: _____
	Remarks: _____		
8.	**Wet Areas/Water Damage**	☐ Wet areas/water damage not evident	
	☐ Wet areas	☐ Location shown on site map	Area extent· _____
	☐ Ponding	☐ Location shown on site map	Area extent: _____
	☐ Seeps	☐ Location shown on site map	Area extent: _____
	☐ Soft subgrade	☐ Location shown on site map	Area extent: _____
	Remarks: _____		
9.	**Slope Instability**	☐ Slides	☐ Location shown on site map
	☐ No evidence of slope instability		
	Area extent: _____		
	Remarks: _____		
B. Benches		☐ Applicable ☒ 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)		
1.	**Flows Bypass Bench**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		
2.	**Bench Breached**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		
3	**Bench Overtopped**	☐ Location shown on site map	☐ N/A or okay

Remarks: _____

C. Letdown Channels ☐ Applicable ☒ 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.)

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ No evidence of settlement
   Area extent: _____ Depth: _____
   Remarks: _____

2. **Material Degradation** ☐ Location shown on site map ☐ No evidence of degradation
   Material type:_____ Area extent: _____
   Remarks: _____

3. **Erosion** ☐ Location shown on site map ☐ No evidence of erosion
   Area extent: _____ Depth: _____
   Remarks: _____

4. **Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting
   Area extent: _____ Depth: _____
   Remarks: _____

5. **Obstructions** Type: _____ ☐ No obstructions
   ☐ Location shown on site map Area extent: _____
   Size: _____
   Remarks: _____

6. **Excessive Vegetative Growth** Type: _____
   ☐ No evidence of excessive growth
   ☐ Vegetation in channels does not obstruct flow
   ☐ Location shown on site map Area extent. _____
   Remarks: _____

D. Cover Penetrations ☐ Applicable ☒ N/A

1 **Gas Vents** ☐ Active ☐ Passive
   ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
   ☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A
   Remarks: _____

2. **Gas Monitoring Probes**
   ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
   ☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A
   Remarks: _____

3. **Monitoring Wells** (within surface area of landfill)
   ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A

Remarks: _____

4. **Extraction Wells Leachate**

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A

Remarks: _____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A

Remarks: _____

E. Gas Collection and Treatment ☐ Applicable ☒ N/A

1. **Gas Treatment Facilities**

☐ Flaring ☐ Thermal destruction ☐ Collection for reuse

☐ Good condition ☐ Needs maintenance

Remarks: _____

2. **Gas Collection Wells, Manifolds and Piping**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Gas Monitoring Facilities** (e.g., gas monitoring of adjacent homes or buildings)

☐ Good condition ☐ Needs maintenance ☐ N/A

Remarks: _____

F. Cover Drainage Layer ☐ Applicable ☒ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A

Remarks: _____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A

Remarks: _____

G. Detention/Sedimentation Ponds ☐ Applicable ☒ N/A

1. **Siltation** Area extent: _____ Depth: _____ ☐ N/A

☐ Siltation not evident

Remarks: _____

2. **Erosion** Area extent: _____ Depth: _____

☐ Erosion not evident

Remarks: _____

3. **Outlet Works** ☐ Functioning ☐ N/A

Remarks: _____

4. **Dam** ☐ Functioning ☐ N/A

Remarks: _____

H. Retaining Walls ☐ Applicable ☐ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident

Horizontal displacement: _____ Vertical displacement: _____

Rotational displacement: _____

Remarks: _____

2 **Degradation** ☐ Location shown on site map ☐ Degradation not evident

Remarks: _____

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable ☒ N/A

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident

Area extent: _____ Depth: _____

Remarks: _____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A

☐ Vegetation does not impede flow

Area extent: _____ Type: _____

Remarks: _____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident

Area extent: _____ Depth: _____

Remarks: _____

4. **Discharge Structure** ☐ Functioning ☐ N/A

Remarks: _____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident

Area extent: _____ Depth: _____

Remarks: _____

2. **Performance Monitoring** Type of monitoring: _____

☐ Performance not monitored

Frequency: _____ ☐ Evidence of breaching

Head differential: _____

Remarks: _____

IX. GROUNDWATER/SURFACE WATER REMEDIES ☒ Applicable ☐ N/A

A. Groundwater Extraction Wells, Pumps and Pipelines ☐ Applicable ☒ N/A

1. **Pumps, Wellhead Plumbing and Electrical**

☐ Good condition ☐ All required wells properly operating ☐ Needs maintenance ☐ N/A

Remarks: _____

2. **Extraction System Pipelines, Valves, Valve Boxes and Other Appurtenances**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Spare Parts and Equipment**

☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: _____

B. Surface Water Collection Structures, Pumps and Pipelines ☐ Applicable ☒ N/A

1. **Collection Structures, Pumps and Electrical**

☐ Good condition ☐ Needs maintenance

Remarks: _____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes and Other Appurtenances**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Spare Parts and Equipment**

☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: _____

C. Treatment System ☐ Applicable ☒ N/A

1. **Treatment Train** (check components that apply)

☐ Metals removal ☐ Oil/water separation ☐ Bioremediation

☐ Air stripping ☐ Carbon adsorbers

☐ Filters: _____

☐ Additive (e.g., chelation agent, flocculent): _____

☐ Others: _____

☐ Good condition ☐ Needs maintenance

☐ Sampling ports properly marked and functional

☐ Sampling/maintenance log displayed and up to date

☐ Equipment properly identified

☐ Quantity of groundwater treated annually: _____

☐ Quantity of surface water treated annually: _____

Remarks: _____

2. **Electrical Enclosures and Panels** (properly rated and functional)

☐ N/A ☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Tanks, Vaults, Storage Vessels**

☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs maintenance

Remarks: _____

4. **Discharge Structure and Appurtenances**

☐ N/A ☐ Good condition ☐ Needs maintenance

Remarks: _____

5. **Treatment Building(s)**

☐ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair

☐ Chemicals and equipment properly stored

Remarks: _____

6. **Monitoring Wells** (pump and treatment remedy)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ All required wells located ☐ Needs maintenance ☐ N/A

Remarks: _____

D. Monitoring Data

1. **Monitoring Data**

☐ Is routinely submitted on time ☒ Is of acceptable quality

2. **Monitoring Data Suggests:**

☐ Groundwater plume is effectively contained ☒ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

☒ Properly secured/locked ☒ Functioning ☐ Routinely sampled ☐ Good condition

☒ All required wells located ☒ Needs maintenance ☐ N/A

Remarks: All current wells were located. A number of wells included in the 2012 FYR and 2013 MNA Report were plugged and abandoned in May 2014, per the O&M contractor. January 2013 is the last known sampling event prior to the December 2016 site inspection The Site's AOC calls for sampling every 30 months. All well locks were intact. Given the lack of sampling frequency, locks were rusted and had to be cut off and were to be replaced after the inspection One off-site POC well, MW-29, was surrounded by brush and not properly covered during inspection (see photo). Two on-site wells appeared to be damaged (MW-25 and MW-26). Site wells could be repainted and relabeled to make them more easily identifiable. Only one on-site well, MW-24, was labeled during the site inspection.

X. OTHER REMEDIES

If there are remedies applied at the site and not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

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 designed to accomplish (e.g., to contain contaminant plume, minimize infiltration and gas emissions).

The Site's remedy included excavation and disposal of contaminated site debris and soils as well as removal actions to address lead contamination in nearby residential and commercial areas. It also included MNA and ICs to prevent exposure to contaminated soil and groundwater. The soil IC has not yet been implemented, but there is no reuse yet at the Site. The rest of the remedy appeared to be functioning as intended.

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.

No O&M Plan for the Site was provided as part of the FYR. Several items seen during the site inspection suggest that current O&M activities at the Site may not be adequate. Issues include groundwater monitoring wells not labeled, with rusted locks and several wells appearing to be damaged; areas of perimeter fence bent over by vegetative growth or trespassers; areas of fence missing along site border (Baer Street, along former National Vinegar property line); lack of consistent mowing and management of site vegetation (vegetation in the southwest corner of the Site was over 6 feet tall in places during the site inspection); signs of trespassing and vandalism, including trash found across the Site and evidence of

	illegal dumping on site; and unsecured and uncovered stormwater-related infrastructure and access points seen across the Site
C.	**Early Indicators of Potential Remedy Problems**
	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. Outside of potential damage to well MW-25 and MW-25, and the lack of an appropriate cover for POC well MW-29, there were no other current indicators of potential remedy problems.
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. N/A

APPENDIX F – PRESS NOTICES

nd Sun · Katy Rancher ★★

LEGAL NOTICE · LEGAL NOTICES

Many Diversified Interests, Inc. Superfund Site
Public Notice
U. S. Environmental Protection Agency, Region 6

November 2016

The U.S. Environmental Protection Agency (EPA) Region 6, in cooperation with the Texas Commission on Environmental Quality, will be conducting the Second five-year review of remedy implementation and performance at the Many Diversified Interests, Inc. Superfund site (Site) in Houston, Texas. From 1926 until the early 1990s, two metal casting foundries and a chemical recycling facility were located at the Site. Facilities included operations buildings, laboratories, warehouses and other structures used to manufacture specialty molded steel parts, including rail tracks and mining equipment. Site operations and waste materials contaminated soil and groundwater with lead and other metals.

The Site's remedy included excavation and disposal of contaminated debris and soils as well as removal actions to address lead contamination in nearby residential areas. It also included monitored natural attenuation and institutional controls to prevent exposure to contaminated soil and groundwater. Remedial action at the Site and adjacent residential properties finished in June 2008. EPA took part of the Site off the Superfund program's National Priorities List in 2010. Site maintenance and groundwater monitoring are ongoing. The five-year review will determine if the remedies are still protective of human health and the environment. The five-year review is scheduled for completion in September 2017.

The report will be made available to the public at the following local information repositories:

Blanche Kelso Bruce
Music Magnet Elementary
510 Jansen Drive
Houston, Texas 77020

Fifth Ward Multi-Service Center Branch Library
4014 Market Street
Houston, Texas 77020

Site status updates are available on the Internet at
https://www.epa.gov/superfund/mdi

All media inquiries should be directed
to the EPA Press Office at (214) 665-2200

For more information about the Site, contact:

Stephen Pereira /Remedial Project Manager
(214) 665-3137
or 1-800-533-3508 (toll-free)
or by email at pereira.stephen@epa.gov

Donn Walters/Community Involvement Coordinator
(214) 665-6483
or 1-800-533-3508 (toll-free)
or by email at walters.donn@epa.gov

Or by email at [redacted]

Sitio Superfund Muchos Intereses Diversificados, Inc.
Aviso Público
Región 6 de la Agencia de Protección Ambiental de los Estado Unidos

Noviembre 2016

La Región 6 de la Agencia de Protección Ambiental de los Estados Unidos (EPA, por sus siglas en inglés), en cooperación con la Comisión de Calidad Ambiental de Tejas, llevará a cabo la segunda revisión de cinco años de la implementación y rendimiento del plan de limpieza del sitio Superfund (sitio) Muchos Intereses Diversificados, Inc. en Houston, Tejas. A partir de 1926 hasta principios de 1990, dos instalaciones de fundición de metales y una instalación de reciclado químico operaban en el sitio. Las instalaciones incluyeron edificios de operaciones, laboratorios, almacenes y otras estructuras utilizadas para la fabricación de piezas especializadas de acero moldeado, incluyendo vías de tren y equipo de minería. Las operaciones del sitio y los materiales de desecho contaminaron los suelos y las aguas subterráneas con plomo y otros metales.

El remedio del sitio incluye la excavación y la eliminación de residuos y suelos contaminados, así como las acciones de remoción para tratar la contaminación por plomo en zonas residenciales cercanas. También incluye la atenuación natural monitoreada e implementación de controles institucionales para evitar que las personas sean expuestas a suelos y aguas subterráneas contaminados. Las medidas correctivas en el sitio y propiedades residenciales adyacentes terminaron en junio de 2008. La EPA eliminó parte del sitio de la Lista de Prioridades Nacionales del programa Superfund en 2010. El mantenimiento del sitio y el monitoreo de las aguas subterráneas están en curso. La revisión de cinco años determinará si los remedios siguen protegiendo la salud humana y el medio ambiente. La revisión de cinco años está prevista para septiembre de 2017.

El informe se pondrá a disposición del público en los siguientes repositorios locales de información:

Blanche Kelso Bruce
Primaria de Música Imán
510 Jensen Drive
Houston, Tejas 77020

Biblioteca Central Multi-Servicio del Quinto Distrito
4014 Market Street
Houston, Tejas 77020

Actualizaciones del estado del sitio Superfund están disponibles en Internet en [redacted]

APPENDIX G – REMEDIAL ACTION AND SITE INSPECTION PHOTOS

BEFORE

Aerial photo of the Site, circa 1978 (*source:* Google Earth)


Cleanup activities at the Site in 2007-2008 (*source:* EPA)

Cleanup at the Site in 2007-2008 (*source:* EPA)


Air monitoring during 2007-2008 site cleanup activities (*source:* EPA)

Site Inspection Photos (December 2016)

Looking south across the Site

Looking north toward Hare Street

Looking west toward downtown Houston

Looking east toward the former National Vinegar property

Cap for MW-01

View of MW-03R

View of MW-04

View of MW-08

View of MW-13

View of MW-20R

View of MW-23, surrounded by vegetation

Checking cap for MW-24

MW-25 appears to be bent over or damaged

MW-26 appeared to have been hit or otherwise damaged. Cement foundation and casing leaning over.

View of POC well MW-27R

View of POC well MW-27R

View of POC well MW-29

Oily deposit observed in drainage ditch east of MW-23

Open, unsecured manhole on site

Open, unsecured, unmarked manhole on site

Open, unsecured stormwater access hole on site

Site vegetation being cleared near Baer Street entrance

Overgrown vegetation in southwest section of the Site

EPA warning sign posted along boundary fence

State warning sign posted along boundary fence


Fence along southern border of the Site, beginning to fall apart

Fence along Press Street and bordering former National Vinegar property

Tree leaning against fence near MW-03R

Vegetation crowding fence between the Site and adjacent former National Vinegar property

Knocked-down fence between the Site and adjacent former National Vinegar property

Tires dumped on adjacent former National Vinegar property

Evidence of dumping on site

Debris left on site

Site entrance off of Baer Street – dirt mound visible but no fence in place to restrict site access

Violation notice (dated November 2016) from City of Houston for lack of upkeep and maintenance

Notice of public hearing with the City of Houston Planning Department regarding site subdivision in preparation for planned residential redevelopment

APPENDIX H – DETAILED ARARs REVIEW

CERCLA Section 121(d)(1) requires that Superfund remedial actions attain "a degree of cleanup of hazardous substance, pollutants, and contaminants released into the environment and of control of further release at a minimum which assures protection of human health and the environment." The remedial action must achieve a level of cleanup that at least attains those requirements that are legally applicable or relevant and appropriate. In performing the FYR for compliance with ARARs, only those ARARs that address the protectiveness of the remedy are reviewed.

Groundwater ARARs

The 2004 OU 1 ROD established maximum contaminant levels (MCLs) as the chemical-specific ARARs for the Site's groundwater COCs specified under the Safe Drinking Water Act. In the absence of an MCL, the 2004 ROD listed the Tier 1 residential protective concentration limits established under TCEQ's Texas Risk Reduction Program (TRRP Tier 1 PCLs). The PCLs are health-based guidance levels and not enforceable standards. This review compared current federal MCLs to those used in the 2004 OU 1 ROD for the groundwater COCs. None of the MCLs have changed since the 2004 was published (Table G-1).

Table G-1: Previous and Current ARARs for Groundwater COCs

COC[a]	2004 ROD ARAR (mg/L)	Current Federal MCL (mg/L)	ARAR Change
Benzo(a)pyrene	0.0002	0.0002	none
Manganese	NA[b]	NA	none
Molybdenum	NA[b]	NA	none
TPH	NA[b]	NA	none

Notes:
a. COCs as identified in the Site's 2004 ROD.
b. The source for the National Primary Drinking Water MCLs is http://water.epa.gov/drink/contaminants/index.cfm (accessed on 10/19/2016).
NA = not applicable; MCLs have not been established for these COCs. Instead, residential health-based TRRP Tier 1 PCLs were developed.

Soil ARARs

The 2004 ROD established a to-be-considered (TBC) chemical-specific ARAR for lead in soil of 500 mg/kg to comply with the 30 TAC 350 – Texas Risk Reduction Rule. The most current version of 30 TAC 350 was reviewed; the ARAR for lead has not changed.[7] Chemical-specific ARARs were not identified as cleanup goals for PCBs or ACM. However, activity-based ARARs were established in the ROD. The ROD specified that the ACM cleanup would follow Chapter 40 of the code of federal regulations (CFR) Section 61 Subpart M, which establishes procedures for asbestos emission control during demolition and renovation activities. In addition, the ROD specified that the cleanup of PCB wastes and associated soils must comply with PCB waste disposal requirements specified in Chapter 40 CFR Part 761.

[7] https://www.tceq.texas.gov/assets/public/remediation/trrp/pcls.pdf

APPENDIX I – DATA TABLES

TABLE 2
CONSTITUENTS OF CONCERN ANALYTICAL DATA
MANY DIVERSIFIED INTEREST, INC. - OPERABLE UNIT 1
3617 BAER STREET
HOUSTON, HARRIS COUNTY, TEXAS

MW ID No.	Sample Date	Laboratory Report No.	Total Lead (mg/l)	Total Manganese (mg/l)	Total Molybdenum (mg/l)	BaP (mg/l)	TPH (mg/l)
Background			0.000665	0.1156	0.00305		
TRRP Tier I PCLs			0.015	1.15	0.12	0.0002	4.1
MW-1	RI 2003		0.0065	1.57J	0.0687 J	<0.00002	
	07/23/08	0807492					<0.19
	10/07/08	0810143					<0.19
	01/20/09	0901356					<0.47
	04/01/09		0.0576 / 0.0443	0.532	0.049		0
	02/15/10	1002475					<0.18
	06/10/10	1006400					<0.19
	10/19/10	1010705					<0.19
	02/02/11	1102097					<0.19
	01/30/12	1201947					<0.20
	01/28/13	1301956					<0.19
MW-2	RI 2003		<0.0013	0.0643 J	0.0099 J	<0.00002	
	07/23/08	0807538	<0.0012	0.0704	0.0152	<0.00008	
	10/06/08	0810143	<0.0012	0.0260	0.0142	0.00014 J	
	01/21/09	0901356	<0.0012	0.0217	0.0135	<0.00008	
	04/01/09		<0.0012	0.0238	0.0164	<0.00008	
MW-3	RI 2003		0.0019	1.98J	0.0074 J	0.000619	
MW-3R	07/24/08	0807538	<0.0012	0.529	0.0272	0.00087	
	10/07/08	0810143	<0.0012	2.06	0.1060	0.00017 J	
	01/21/09	0901356	<0.0012	2.07	0.0321	0.00013 J	
	04/01/09		<0.0012	1.59	0.0326	0.00015 J	
	02/15/10	10022475				0.00029	
	06/10/10	1006400				0.00018 J	
	10/19/10	1010705				0.00015 J	
	02/02/11	1102097				0.000083 J	
	01/30/12	1201947				0.000079 J	
	01/29/13	1301956				0.00015 J	
MW-4	RI 2003		0.00038 J	0.148 J	0.257	<0.00002	
	07/24/08	0807538	<0.0012	0.895	0.127	<0.00008	
	10/07/08	0810143	<0.0012	1.03	0.116	<0.00008	
	01/20/09	0901356	<0.0012	0.975	0.104	<0.00008	
	03/31/09		<0.0012	1.10	0.125		
	02/15/10	1002330		1.27 / 0.988	0.116 / 0.109	<0.000080	
	06/08/10	1006300		1.72 / 1.65	0.0960 / 0.0898	<0.000080	
	10/18/10	1010705		1.68 / 1.27	0.123 / 0.103	<0.000080	
	01/31/11	1102035		1.39 / 1.28	0.0992 / 0.100	<0.000080	
	01/30/12	1201947		0.945 / 0.890	0.0884 / 0.0935	<0.000050	
	01/29/13	1/28/13		1.73 / 1.79	0.201 / 0.210	<0.000050	
MW-5	RI 2003		0.00003 J	0.139 J	0.0034 J	<0.00002	
	03/30/09		<0.0012	0.0612	0.00337 J		
MW-6	RI 2003		0.0194	0.164 J	1.56	<0.00002	
	03/30/09		0.022 / <0.0004	0.0886	2.18 / 0.00263 J		
MW-7	RI 2003		0.0048	1.93J	0.283	0.000084	
	03/30/09		<0.0012	1.07	0.158 / 0.162		
MW-8	RI 2003		0.00009 J	2.32J	0.0374 J	<0.00002	
	03/30/09		<0.0012	0.00187 J	0.326 / 0.340		
	02/10/10	1002330		0.00514 / 0.00153 J	0.0859 / 0.0860		
	06/07/10	1006300		0.0508 / 0.0575	0.0322 / 0.0391		
	10/18/10	1010705		0.00322 J / 0.00395 J	0.201 / 0.203		
	01/31/11	1102035		0.00330 J / <0.00080	0.0758 / 0.0773		
	01/31/12	1201947		0.00316 J / <0.0025	0.119 / 0.114		
	01/28/13	1301956		<0.0025 / <0.0025	0.135 / 0.141		

TABLE 2
CONSTITUENTS OF CONCERN ANALYTICAL DATA
MANY DIVERSIFIED INTEREST, INC. - OPERABLE UNIT 1
3617 BAER STREET
HOUSTON, HARRIS COUNTY, TEXAS

MW ID No.	Sample Date	Laboratory Report No.	Total Lead (mg/l)	Total Manganese (mg/l)	Total Molybdenum (mg/l)	BaP (mg/l)	TPH (mg/l)
Background			0.000665	0.1156	0.00305		
TRRP Tier I PCLs			0.015	1.15	0.12	0.0002	4.1
MW-9	RI 2003		0.00018 J	0.129 J	0.0027 J	<0.00002	
	03/30/09		<0.0012	0.00438 J	0.00237 J		
MW-10	RI 2003		<0.0013	0.110 J	0.0017 J	<0.00002	
	03/30/09		<0.0012	0.124	0.00237 J		
MW-12	RI 2003		<0.0013	0.0922 J	0.0027 J	<0.00002	
	04/01/09		<0.0012	0.122	0.00399 J		
MW-13	RI 2003		0.115	0.295 J	0.525	<0.00002	
	07/24/08	0807538		0.231	0.268		
	10/07/08	0810153		0.112	0.471		
	01/20/09	0901356		0.243	0.828		
	03/31/09		0.0451	0.170	0.462		
	02/15/10	1002475		0.197 / 0.137	0.432 / 0.322		
	06/10/10	1006400		0.356 / 0.328	0.609 / 0.563		
	10/19/10	1010705		0.460 / 0.348	0.543 / 0.520		
	02/02/11	1102097		0.177 / 0.179	0.659 / 0.330		
	01/30/12	1201947		0.143 / 0.151	0.478 / 0.224		
	01/29/13	1301956		0.147 / 0.133	0.749 / 0.886		
MW-14	RI 2003		0.00033 J	0.250 J	0.0062 J	<0.00002	
	03/30/09		<0.0012	0.160	0.0129		
MW-15	RI 2003		0.00063 J	0.196 J	0.922 J	<0.00002	
	04/02/09		0.0047 J	0.466	0.243 / 0.263		
MW-16	RI 2003		0.00012 J	0.116 J	0.0089 J	0.0000633	
	03/31/09		<0.0012	0.489	0.00597		
MW-18	RI 2003		0.00027 J	2.97 J	0.0073 J	<0.00002	
	03/31/09		<0.0012	0.379	0.00762		
MW-20	RI 2003		0.0057	1.95 J	0.0046 J	<0.00002	
MW-20R	07/23/08	0807492					<0.18
	10/07/08	0810143					<0.19
	01/20/09	0901356					1.30
	04/02/09		0.0167 / <0.0004	1.74 / 1.46	0.0357		<0.19
	02/15/10	1002475					<0.18
	06/10/10						4.50
	10/19/10	1010705					2.30
	02/02/11	1102097					3.00
	01/30/12	NS					PSH*
	01/25/13	NS					PSH*
MW-21	RI 2003		0.0047	0.598	<0.05	<0.005	
	04/02/09		0.00586	0.538	0.0296		
MW-22	RI 2003		<0.003	0.12	<0.05		
	03/30/09		<0.0012	0.00313 J	0.004 J		
MW-23	RI 2003		<0.003	0.492	<0.05		
	03/31/09		<0.0012	0.363	0.114		
	02/10/10	1002330		0.340 / 0.331	0.184 / 0.188		
	06/07/10	1006300		0.367 / 0.386	0.152 / 0.162		
	10/18/10	1010705		0.427 / 0.399	0.146 / 0.137		
	01/31/11	1102035		0.388 / 0.381	0.104 / 0.106		
	01/31/12	1201947		0.452 / 0.399	0.0624 / 0.0595		
	01/29/13	1301956		0.437 / 0.449	0.0795 / 0.0807		
MW-24	RI 2003		<0.003	1.41	13.90	<0.005	
	07/23/08	0807538	0.00466 J	0.515	5.38	<0.00008	
	10/07/08	0810153	<0.0012	0.220	4.12	<0.00008	
	01/19/09	0901356	<0.0012	0.868	3.90	<0.00008	
	04/01/09		<0.0012	0.678	2.92		
	02/15/10	1002475		0.885 / 0.734	10.2 / 9.22	<0.00008	
	06/08/10	1006300		0.748 / 0.804	3.56 / 3.67	<0.00008	
	10/19/10	1010705		0.958 / 0.924	6.64 / 6.13	<0.00008	
	02/02/11	1102097		0.245 / 0.240	5.77 / 5.91	<0.00008	
	01/30/12	1201947		0.174 / 0.178	7.36 / 6.89	<0.00005	
	01/29/13	1301956		0.629 / 0.563	5.08 / 5.73	<0.00005	

TABLE 2
CONSTITUENTS OF CONCERN ANALYTICAL DATA
MANY DIVERSIFIED INTEREST, INC. - OPERABLE UNIT 1
3617 BAER STREET
HOUSTON, HARRIS COUNTY, TEXAS

MW ID No.	Sample Date	Laboratory Report No.	Total Lead (mg/l)	Total Manganese (mg/l)	Total Molybdenum (mg/l)	BaP (mg/l)	TPH (mg/l)
Background			0.000665	0.1156	0.00305		
TRRP Tier I PCLs			0.015	1.15	0.12	0.0002	4.1
MW-24D Duplicate	01/29/13	1301956		0.567 / 0.564	5.56 / 5.48	<0.00005	
MW-25	07/23/08	0807492	<0.0012	0.355	0.039	<0.00008	
	10/06/08	0810143	<0.0012	0.264	0.0295	<0.00008	
	01/20/09	0901356	<0.0012	0.466	0.0273	<0.00008	
	04/01/09		<0.0012	1.06	0.0232		
	02/10/10	1002330				<0.00008	
	06/08/10	1006300				<0.00008	
	10/18/10	1010705				<0.00008	
	01/31/11	1102035				<0.00008	
	01/30/12	1201947				<0.00005	
	01/28/13	1301956				<0.00005	
MW-26	07/23/08	0807492	<0.0012	0.191	0.00641	<0.00008	<0.19
	10/06/08	0810143	<0.0012	0.200	0.00668	<0.00008	<0.19
	01/19/09	0901356	<0.0012	0.163	0.00678	<0.00008	<0.47
	04/02/09		0.00783	0.0848	0.00633		
	02/10/10	1002330					<0.18
	06/08/10	1006300					<0.19
	10/18/10	1010705					<0.19
	02/02/11	1102097					<0.19
	01/31/12	1201947					<0.19
	01/28/13	1301956					<0.19
MW-26D Duplicate	07/23/08	0807492	<0.0012	0.191	0.00592	<0.00008	<0.18
	10/06/08	0810143	<0.0012	0.204	0.00678	<0.00008	<0.19
	01/19/09	0901356	<0.0012	0.162	0.00838	<0.00008	<0.47
MW-27	07/23/08	0807492					<0.19
	10/07/08	0810143					<0.19
	01/20/09	0901356					<0.48
	04/01/09		<0.0012	2.06 / 1.80	0.00267 J		
	02/10/10	1002330					<0.18
	06/10/10	1006400					<0.19
	10/18/10	1010705					<0.19
	01/31/11	1102035					<0.19
	01/31/12	1201947					<0.19
	01/28/13	1301956					<0.19
MW-28	2/10/2010	1002330		0.227 / 0.201	0.00203 J / 0.00248 J		
	6/7/2010	1006300		0.203 / 0.176	0.00271 J / 0.00164 J		
	10/18/2010	1010705		0.192 / 0.188	0.00158 J / 0.00165 J		
	1/31/2011	1102035		0.178 / 0.172	0.00135 J / 0.00156 J		
	1/31/2012	1201947		0.196 / 0.170	0.00353 J / 0.00178 J		
	1/28/2013	1301956		0.228 / 0.226	0.00185 / 0.00204		
MW-29	2/10/2010	1002330		0.161 / 0.122	0.00292 / 0.00406 J		
	6/8/2010	1006300		0.125 / 0.120 J	0.00348 J / 0.00315 J		
	10/18/2010	1010705		0.0744 / 0.0723	0.00372 J / 0.00361 J		
	1/31/2011	1102035		0.0883 / 0.0824	0.00294 J / 0.00324 J		
	1/31/2012	1201947		0.194 / 0.00580	0.00333 J / 0.0140		
	1/28/2013	1301956		0.0552 / 0.0535	0.00377 J / 0.00394		

Notes:
"J" indicates analyte was detected below the laboratory's sample quantitation limit.
Concentrations in red exceed TRRP Tier I Residential PCL.
2.06 / 1.80: Total result / Dissolved result (Lead, Manganese, and Molybdenum).
03/30/09-04/02/09 samples collected with 0.10-micron filter.
02/10/10-02/15/10 and subsequent samples collected with 0.45-micron filter.
PSH* - phase separated hydrocarbons observed in MW-20R

TABLE 3. SUMMARY OF COCS DETECTED IN OU 1 SHALLOW WATER-BEARING ZONE (AUGUST 2017)

Well ID	Sample ID	Sampling Date	COC Concentration (mg/L)					
			Arsenic	Lead	Manganese	Molybdenum	Benzo(a)pyrene	Total Petroleum Hydrocarbons
		Standard [a]	*0.01*	*0.015*	*1.15* [b]	*0.12* [b]	*0.0002* [b]	*4.1* [b]
MW-01	MW-01	9-Aug-17	---	---	---	---	---	<4.4
MW-03R	MW-03R	8-Aug-17	---	---	---	---	<0.00001	---
	MW-03R-D	8-Aug-17	---	---	---	---	<0.00001	---
MW-04	MW-04	8-Aug-17	***0.031***	<0.005	0.781	0.0913 B	<0.00001	---
	MW-04-F	8-Aug-17	***0.032***	<0.005	0.793	0.069	---	---
MW-08	MW-08	9-Aug-17	<0.005	<0.005	0.079	***0.133 B***	---	---
	MW-08-F	9-Aug-17	<0.005	<0.005	0.070	***0.131***	---	---
MW-13	MW-13	NS	NS	NS	NS	NS	NS	NS
MW-20R	MW-20R	9-Aug-17	---	---	---	---	---	<4.4 [c]
	MW-20R-D	9-Aug-17	---	---	---	---	---	<4.4 [c]
MW-23	MW-23	8-Aug-17	***0.011***	<0.005	0.386	0.0841 B	---	---
	MW-23-D	8-Aug-17	0.009	<0.005	0.393	0.085 B	---	---
	MW-23-F	8-Aug-17	0.007	<0.005	0.382	0.083	---	---
	MW-23-F-D	8-Aug-17	0.009	<0.005	0.377	0.086	---	---
MW-24	MW-24	8-Aug-17	<0.005	<0.005	0.486	***5.650***	<0.00001	---
	MW-24-F	8-Aug-17	<0.005	<0.005	0.473	***5.610***	---	---
MW-25	MW-25	8-Aug-17	---	---	---	---	<0.00001	---
MW-26	MW-26	9-Aug-17	---	---	---	---	---	<4.4
MW-27R	MW-27R	9-Aug-17	---	---	---	---	---	<4.2
MW-28	MW-28	9-Aug-17	0.009	<0.005	0.161	<0.005	---	<4.3
	MW-28-F	9-Aug-17	0.009	<0.005	0.132	<0.005	---	---
MW-29	MW-29	9-Aug-17	<0.005	<0.005	0.088	<0.005	<0.00001	---
	MW-29-F	9-Aug-17	<0.005	<0.005	0.096	<0.005	---	---

NOTES:

Bold yellow-highlighted values indicate an exceedance of the EPA Maximum Contaminant Level or TCEQ PCL.

[a] U.S. Environmental Protection Agency primary drinking water standard (Maximum Contaminant Level), unless otherwise noted.

[b] Texas Commission on Environmental Quality (TCEQ) TRRP Tier 1 Residential Ground Water Ingestion ($^{GW}GW_{Ing}$) Protective Concentration Level (PCL)

[c] Phase separated hydrocarbons detected

--- = Not analyzed

B = Blank related; the concentration found in the sample was less than 10 times the concentration found in the associated extraction, digestion, and/or analysis blank; therefore, presence in the sample is suspect.

COC = Constituent of concern

"-D" = Field duplicate sample

"-F" = Field-filtered sample for dissolved metals analysis

mg/L = Milligram(s) per liter

NS = Not sampled

OU = Operable Unit

Table I-1: Molybdenum Concentrations (2010 to 2017)

Monitoring Well	Molybdenum Concentration (mg/L)						
	Screening Level TRRP PCL= 0.12 mg/L[a]						
	2010 (Feb)	2010 (June)	2010 (Oct)	2011 (Jan)	2012 (Jan)	2013 (Jan)	2017 (Aug)[b]
MW-04	0.116	0.0960	**0.123**	0.100	0.0935	**0.210**	0.0913
MW-08	0.0859	0.0391	**0.203**	0.0773	0.119	**0.141**	**0.133 B**
MW-13	**0.432**	**0.609**	**0.543**	**0.659**	**0.478**	**0.866**	NS
MW-23	**0.188**	**0.162**	**0.146**	0.106	0.0624	0.0807	0.085 B
MW-24	**10.2**	**3.67**	**6.64**	**5.91**	**7.36**	**5.73**	**5.65**
MW-28	0.00248 J	0.00271 J	0.00165 J	0.00156 J	0.000140	0.00204	<0.005
MW-29	0.00406 J	0.00348 J	0.00372 J	0.00324 J	0.00333 J	0.00394	<0.005

Notes:
a. EPA did not select MNA as a remedy for molybdenum. However, sampling results have been compared to TRRP PCLs as a screening level.
b. Maximum result from primary and duplicate samples is shown.
c. < denotes molybdenum not detected at the stated reporting or detection limit
Bold = exceeds TRRP PCL
J = analyte detected below lab quantitation limit
B = concentration found in the sample was less than 10x the concentration found in the associated blank; presence in the sample is therefore suspect
NS = not sampled

Table I-2: Manganese Concentrations (2010 to 2017)

Monitoring Well	Manganese Concentration (mg/L) Revised EPA Screening Level = 0.43 mg/L[a]						
	2010 (Feb)	2010 (June)	2010 (Oct)	2011 (Feb)	2012 (Jan)	2013 (Jan)	2017 (Aug)
MW-04	**1.27**	**1.72**	**1.68**	**1.39**	**0.945**	**1.73**	**0.781**
MW-08	0.00514	**0.575**	0.00395 J	0.00330 J	0.00316 J	<0.0025	0.0792
MW-13	0.197	0.356	**0.460**	0.179	0.151	0.147	NS
MW-23	0.340	0.386	0.427	0.388	**0.452**	**0.449**	0.393
MW-24	**0.885**	**0.804**	**0.958**	0 245	0.178	**0.629**	**0.486**
MW-28	0.227	0.203	0.192	0.178	0.196	0.228	0.161
MW-29	0.161	0.125	0.0744	0.0883	0.194	0.0552	0.0884

Notes·
a. EPA did not select MNA as a remedy for manganese. However, sampling results have been compared to EPA's revised manganese screening level.
b. Maximum result from primary and duplicate samples is shown.
c. < denotes manganese not detected at the stated reporting or detection limit
Bold = exceeds EPA screening level
NS = not sampled

APPENDIX J – SCREENING LEVEL RISK REVIEW

Changes in Standards and To-Be-Considered Values (TBCs)
Since the last FYR, there have not been any changes to the MCLs for the OU 1 groundwater COCs with established MCLs (Appendix H).

Changes in Toxicity and Other Contaminant Characteristics
MCLs were not established for all groundwater COCs in OU 1. Therefore, EPA selected residential health-based Tier 1 PCLs established under TCEQ's Texas Risk Reduction Program (TRRP Tier 1 PCLs). Toxicity values for several COCs have changed since the ROD and EPA updated default exposure assumptions in 2014. To determine if the cleanup goals and screening levels for soil and groundwater remain protective for residential use the cleanup goals and screening levels were compared to EPA's 2016 regional screening levels (RSLs) because the RSLs incorporate current toxicity values and standard default exposure factors.

Under the current EPA Office of Land and Emergency Management policy, the soil lead screening level was established so that a typical child or similarly exposed group of children would have an estimated probability of no more than 5 percent of exceeding a blood lead level (BLL) of 10 micrograms per deciliter (µg/dL). The 10 µg/dL BLL target concentration is based (in part) on the 1991 Center for Disease Control's (CDC) blood lead "level of concern." In 2012, CDC accepted the recommendations of its Advisory Committee on Childhood Lead Poisoning Prevention that the "level of concern" be replaced by a reference value based on the 97.5th percentile of the National Health and Nutrition Examination Survey-generated BLL distribution in children 1-5 years old (currently 5 µg/dL).

EPA is in the process of updating its policy based on recent studies. The most recent scientific literature on lead toxicology and epidemiology provide evidence that adverse health effects are associated with BLL less than 10 µg/dL and there is no apparent threshold level for adverse effects. EPA's 2013 Integrated Science Assessment for Lead established a causal relationship for decreased IQ in children with blood lead levels below 10 µg/dL. In particular, it found clear evidence of cognitive function decrements (as measured by Full Scale IQ, academic performance, and executive function) in young children (4 to 11 years old) with mean or group blood lead levels measured at various life stages and time periods between 2 and 8 µg/dL. EPA Region 6 will continue to use the current EPA policy, until the Agency finalizes and updates its policy. As redevelopment progresses, EPA will monitor any changes related to lead to ensure that the redevelopment progresses in a protective manner suitable for residential reuse.

The evaluation of OU 1 surface soil cleanup levels (Table J-1) showed that the lead cleanup goal exceeded the residential RSL of 400 mg/kg. Lead is unique in that there are no cancer or noncancer toxicity values established for lead; instead, EPA evaluates lead exposures using blood-lead models. The RSL of 400 mg/kg was derived by EPA based on the blood-lead model for children; further EPA guidance on lead exposure requires comparisons of the average concentration of residual lead to the default screening level of 400 mg/kg. The removal actions conducted for lead at the residential areas of the Site removed soil to a maximum depth of 1.5 feet bgs with concentrations of lead that equaled or exceeded 500 mg/kg (the residential cleanup level). *The cleanup goal for lead remains valid because the excavated areas were then backfilled with clean fill, which would further reduce the average residual lead concentrations or eliminate exposure to subsurface lead altogether.*

Table J-1: Health Evaluation of OU 1 Soil Cleanup Goal and Screening Levels

COC	Cleanup Goal/Screening Level (mg/kg)	Residential RSL[a] (mg/kg)		Cancer Risk[b]	Noncancer HQ[c]
		1×10^{-6} Risk	HQ = 1.0		
B(a)P	0.56	0.016	NA	3.5×10^{-5}	--
Benzene	0.026	1.2	82	2.2×10^{-8}	0.0003

COC	Cleanup Goal/Screening Level (mg/kg)	Residential RSL[a] (mg/kg)		Cancer Risk[b]	Noncancer HQ[c]
		1 x 10^{-6} Risk	HQ = 1.0		
Lead	500	400[e]		RSL > cleanup goal	
TPH	1,600 (aromatic fractions C6-C12)	NA	1,600[d]	--	1.0
	2,300 (aromatic fractions C12-C28, C12-C35, and C28-C35)	NA	2,300[d]	--	1.0

Notes:

a. Current EPA RSLs, dated May 2016, are available at http://www2.epa.gov/risk/risk-based-screening-table-generic-tables (accessed 12/14/2016).

b. The cancer risks were calculated using the following equation, based on the fact that RSLs are derived based on 1 x 10^{-6} risk:
cancer risk = (cleanup level – cancer-based RSL) × 10^{-6}

c. The noncancer hazard quotient (HQ) was calculated using the following equation:
HQ = cleanup level – noncancer-based RSL

d. In the 2007 Remedial Design Report, EPA accepted the TRRP Tier 1 residential PCLs as cleanup goals for aromatic fraction-specific TPHs (C12-C28, C12-C35 and C28-C35). Thus, the most current TRRP Tier 1 PCLs (revised in March 2016) were identified since RSLs have not been established for these TPH fractions. The March 2016 PCLs are available at https://www.tceq.texas.gov/assets/public/remediation/trrp/pcls.pdf (accessed 12/14/16).

e. EPA has no consensus on toxicity values for lead, so it is not possible to calculate RSLs as done for other chemicals. Therefore, EPA evaluates lead exposure using blood-lead modeling for residential areas where average lead concentrations exceed 400 mg/kg.

NA = toxicity values not established by EPA.

-- = cancer risk or noncancer HQ could not be calculated; toxicity values not established.

The evaluation of groundwater screening levels indicates that the screening level for manganese exceeds the hazard quotient (HQ) of 1.0 (Table J-2). The methodology used to derive the manganese oral noncancer toxicity value as the basis for the 2004 screening level is no longer consistent with EPA's current recommended methodology. The manganese oral RfD used in the Human Health Risk Assessment (HHRA) was 0.047 milligram per kilogram per day (mg/kg-day); EPA recommends using an oral RfD for tap water of 0.024 mg/kg-day.[8]

Table J-2: Health Evaluation of OU 1 Groundwater COC Cleanup Goals and Screening Levels

COC	Cleanup Goal/Screening Level (µg/L)	Tap Water RSL[a] (µg/L)		Cancer Risk[b]	Noncancer HQ[c]
		1 x 10^{-6} Risk	HQ = 1.0		
Pesticides/Herbicides					
B(a)P	0 2	0.0034	NA	5.9 x 10^{-5}	--

[8] The Regional Screening Level User's Guide November 2015 section 5 makes the following recommendation for the development of an appropriate toxicity value for manganese in water: "The IRIS RfD (0.14 mg/kg-day) includes manganese from all sources, including diet. The author of the IRIS assessment for manganese recommended that the dietary contribution from the normal U.S. diet (an upper limit of 5 mg/day) be subtracted when evaluating non-food (e.g., drinking water or soil) exposures to manganese, leading to an RfD of 0.071 mg/kg-day for non-food items. The explanatory text in IRIS further recommends using a modifying factor of 3 when calculating risks associated with non-food sources due to a number of uncertainties that are discussed in the IRIS file for manganese, leading to a RfD of 0.024 mg/kg-day."

COC	Cleanup Goal/Screening Level (µg/L)	Tap Water RSL[a] (µg/L)		Cancer Risk[b]	Noncancer HQ[c]
		1 x 10^{-6} Risk	HQ = 1.0		
Lead	15	15 action level		< action level	
Molybdenum	120	NA	120	--	1.0
Manganese	1,150	NA	480	--	**2.4**
TPH	4,100	NA	NA	--	--

Notes:

a. Current EPA RSLs, dated May 2016, are available at http://www2.epa.gov/risk/risk-based-screening-table-generic-tables (accessed 12/14/2016). RSLs are based on ingestion exposure consistent with the 2004 ROD.

b. The cancer risks were calculated using the following equation, based on the fact that RSLs are derived based on 1 x 10^{-6} risk:
cancer risk = (Cleanup Level − cancer-based RSL) × 10^{-6}

c. The noncancer HQ was calculated using the following equation:
HQ = cleanup level − noncancer-based RSL

NA = toxicity values not established by EPA.

-- = cancer risk or noncancer HQ could not be calculated; toxicity values not established.

Bold = noncancer HQ exceeds 1 0.

APPENDIX K – VAPOR INTRUSION RISK EVALUATION

MEMORANDUM

May 17, 2018

SUBJECT: Evaluation of the Vapor Intrusion Inhalation Risk to Potential Future Residents from Exposure to Volatile Contaminants in Groundwater and LNAPL at MDI OU1 Superfund site.

FROM: Ghassan Khoury, MSPH, Sc.D.

Risk & Site Assessment Section (6SF-TR)

TO: Casey Luckett, RPM — LA/NM/OK Section (6SF-RL)

Stephen Pereira, RPM — AR/TX Section (6SF-RA

EPA region 6 concludes that there is no need to take any further action regarding vapor intrusion concerns for the MDI OU1 site. EPA based its decision on the screening risk assessment developed below and on the recent monitoring natural attenuation results.

The vacant land at the Many Diversified Interests, Inc. Superfund site (MDI) OU1 might be developed into a residential housing project. A concern was raised regarding the plan for building new houses over contaminated groundwater might present potential adverse health impact to future residents from exposure to volatile chemicals through the inhalation route of intake. It is known that volatile contaminants in groundwater could migrate from groundwater into the indoor air of these houses through the vapor intrusion transport mechanisms. EPA region 6 evaluated the risk from exposure to volatile organic chemicals of potential concern through the inhalation route of intake in a potential future residential exposure scenario.

A review of the baseline human health risk assessment (BHHRA) prepared by Tetra Tech EM Inc. in October of 2003 show that groundwater was extensively sampled and analyzed for a whole suite of hazardous chemicals including volatile organic chemicals (See Attachment A). The 2003 baseline human health risk assessment (BHHRA) reported that three volatile chemicals (benzene, chloroform, and isopropylbenzene (cumene)) are the volatile chemicals of concern in groundwater. Benzene was detected in 18 of 27 ground water samples collected from the shallow water-bearing zone wells. The maximum detected concentration for benzene was 5.1 µg/L which exceeded the EPA 2002 target ground water screening value (1.4 µg/L) and is slightly above the MCL (5 µg/L). Chloroform, detected in 12 of 27 ground water samples, was detected at a maximum concentration of 1.4 µg/L, which exceeded the EPA,

2002 calculated target ground water concentration (0.7 µg/L). The maximum detected concentration of isopropylbenzene (24 µg/L) exceeded its EPA, 2002 target ground water concentration (8.4 µg/L). Isopropylbenzene was detected in 4 of 27 ground water samples.

The 2003 BHHRA calculations of target groundwater concentrations were based on "OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) November 2002 (EPA530-D-02-004). Since then, EPA updated the draft guidance and provided Subsurface Vapor Intrusion Screening Level (VISL) calculator (November, 2015) to facilitate screening out chemicals that do not present a significant risk to exposed individuals using conservative input parameter assumptions.

The new target groundwater screening values differed slightly from the 2003 values for benzene (1.6 µg/L instead of 1.4 µg/L) and for chloroform (0.81 µg/L instead of 0.7 µg/L). But, for isopropylbenzene (cumene) there was a major discrepancy in the two values (890 µg/L instead of 8.4 µg/L) (See table 1). The equation used for the target groundwater concentration (C_{gw}) is:

$$C_{gw} = C_{ia,target} * 1/AF_{gw} * m^3/1000\ L * 1/HLC$$

Where:

$C_{ia,target}$ = is the target indoor air concentrations (µg/m3).

AF_{gw} = is the generic attenuation factor for groundwater (default value = 0.001) which is generally, a reasonable upper bound (95%)

HLC = Henry's Law Constant

Applying this equation for isopropylbenzene (cumene):

C_{gw} = 420 µg/m3 * 1/0.001 * m^3/1000 L* 1/0.47 = 890 µg/L

Therefore, the target groundwater concentration for isopropylbenzene is 890 µg/L and is used in this risk evaluation.

Table 1. VISL calculator Target Groundwater and Target Indoor Air Concentration associated with excess cancer risk of 1E-06 and a HQ =1.				
Chemical Name	Target Indoor Air Concentration at 1E-06 Cancer Risk ($\mu g/m^3$)	Target Indoor Air Concentration at HQ =1 ($\mu g/m^3$)	Target Groundwater Concentration at 1E-06 Cancer Risk ($\mu g/L$)	Target Groundwater Concentration at HQ =1 ($\mu g/L$)
Benzene	0.36		1.6	
Chloroform	0.12		0.81	
Isopropylbenzene (Cumene)		420		890
VISL = Vapor Intrusion Screening Level HQ = Hazard Quotient				

Cancer risk and non-cancer hazard quotients were calculated using the VISL calculator. The maximum concentration in groundwater samples of all volatile chemical of potential concern including the three chemicals of concern (benzene, chloroform and isopropylbenzene) were input in the calculator. Table 2 below provides the results of the VISL calculator. It shows that the cumulative inhalation excess cancer risk for a residential scenario is estimated at 5.7E-06 which falls within EPA's generally accepted excess cancer risk range of one in a million to one in ten thousand (1E-06 to 1E-04). The cumulative noncancer risk or hazard index (HI) is estimated at 0.097 which falls below the EPA accepted hazard index (HI) of one.

Monitoring Natural Attenuation (MNA):

Multiple natural attenuation water quality parameters, including pH, dissolved oxygen, and oxidation-reduction potential (ORP), were monitored in the field to evaluate the effectiveness of natural attenuation at OU 1. Data collected during the August 2017 indicate that MNA is working as planned. The analytical data collected during the August 2017 ground water monitoring event indicates that benzo(a)pyrene (BAP) and total petroleum hydrocarbons (TPH) are being effectively controlled by the MNA program being implemented for OU1. BAP appears to have trended downward with an analytical reporting limit of 0.00001 mg/L that is well below its Texas Risk Reduction Program (TRRP) Tier 1 $_{GW}GW_{Ing}$ PCL of 0.0002 mg/L. As such, this MNA program appears to remain an effective remedial action for plume management zone (PMZ 2). Recent and

historical analytical data collected from the points of compliance (POC) wells within PMZ 3 indicate that TPH concentrations remain non-detectable in these wells.

Although volatile organic chemicals are not used to measure the effectiveness of the MNA remedial action for OU1 and therefore is not tested for in groundwater samples, it is expected that the concentrations of benzene, chloroform and isopropylbenzene in groundwater would also be trending down similar to BAP and TPH if not faster.

Table 2. Results of VISL calculator Groundwater to Indoor Air Concentration and Risk Calculations

Chemical Name	MDI Site Maximum Groundwater concentration (µg/L)	Calculated Indoor Air Concentration (µg/m^3)	VI Carcinogenic Risk	VI Hazard (HQ)
Acetone	21	0.03	No IUR	9.3E-07
Benz[a]anthracene	1.4	0.000687	7.5E-08	NO RFC
Benzene	5.1	1.16	3.2E-06	3.7E-02
Bromoform	0.091	0.00199	7.8E-10	NO RFC
Carbon Disulfide	1.1	0.648	NO IUR	8.9E-04
Chlorobenzene	0.048	0.0061	NO IUR	1.2E-04
Chloroform	1.4	0.21	1.7E-06	2.1E-03
Chloromethane	0.051	0.0184	NO IUR	2.0E-04
Isopropylbenzene (Cumene)	24	11.3	NO IUR	2.7E-02
Cyclohexane	2.8	17.2	NO IUR	2.7E-03
Dichloroethylene, 1,1-	0.43	0.459	NO IUR	2.2E-03
Dichloropropene, 1,3-	0.11	0.016	2.3E-08	7.7E-04
Ethylbenzene	2.2	0.709	6.3E-07	6.8E-04
Methyl tert-Butyl Ether (MTBE)	0.67	0.0161	1.5E-09	5.1E-06
Styrene	0.063	0.00708	NO IUR	6.8E-06
Toluene	1.7	0.461	NO IUR	8.9E-05
Trichloroethylene	0.032		2.7E-08	6.2E-03
Xylenes	6.4		NO IUR	1.7E-02
		Total	5.7E-06	9.7E-02

VISL = Vapor Intrusion Screening Level calculator November 2015. MDI = Many Diversified Interest Inc. Superfund site name.

VI = Vapor Intrusion.

IUR = Inhalation Unit Risk

Evaluation of Risk due to Exposure to Potential Vapor Intrusion of Volatile Petroleum Hydrocarbons into Future Buildings from LNAPL Observed in well MW-20R.

Phase-separated hydrocarbons (PSH) was first observed in well MW-20R in January 2012, and approximately 0.17 foot of PSH was measured during the August 2017 sampling event, as compared to 0.04 foot during the January 2013 event. According to SKA, a contractor for the respondent, the presence of PSH may be attributable to drought conditions experienced during 2011 and 2012, which likely lowered the water table below the top of the screen and allowed PSH trapped in adjacent strata to flow into the screened interval.

The U.S. EPA requested the evaluation of the vapor intrusion (VI) pathway for the light non-aqueous phase liquid (LNAPL) as part of their second five-year review for the land property adjacent to MW-20R. Currently the land is vacant, but there are plans to develop it into a residential development. Therefore, EPA requested that VI evaluation be developed for a future residential land use scenario on the northwestern portion of the subject property from LNAPL in contact with the uppermost groundwater bearing unit associated with monitoring well MW-20R. According to the November 2003 Remedial Investigation report prepared for the subject property, the LNAPL originated from a nearby cutting-oil underground storage tank.

On January 30, 2018, LNAPL sample was collected from monitoring well MW-20R to further characterize the chemical nature of LNAPL. The sample was tested for TPH using TCEQ TX method 1005 and then followed by TPH speciation TCEQ TX method 1006. Data from TPH speciation using TCEQ Method 1006 were input into the TCEQ TPH VI calculator. The results indicated a potential vapor intrusion concern. Soil vapor sampling was recommended to evaluate the potential for vapor intrusion. On March 26, 2018, SKA installed soil-vapor sampling points at four locations on the northwestern portion of the subject property, which is considered as a "hot spot" area next to MW-20R. Two of the soil-vapor sampling point locations were installed within the approximate extent of the former LNAPL plume, one near monitoring well MW-20R (SV-1) and one located approximately 40 feet northeast of monitoring well MW-20R (SV-2). The other two soil-vapor sampling locations were located near monitoring wellsMW-01 and MW-13 (SV-3 and SV-4, respectively) situated outside the approximate extent of the former LNAPL plume. At each soil- vapor sampling location, nested soil-vapor sampling points targeting shallow soil-vapors (SV-1S, SV-2S, SV-3S, and SV-4S) and deep (near-source) soil-vapors (SV-1D, SV-2D, SV-3D, and

SV-4D) were installed. SKA collected soil-vapor samples from these sampling points in accordance with the soil-vapor sampling procedures reported in the EPA-approved VI Work Plan. Soil-vapor samples collected from 4 sampling points (SV-1S, SV-1D, SV-2S, and SV-2D) were analyzed for 18 target chemicals of potential concern (COPCs) in accordance with the VI Work Plan.

In accordance with the EPA 2015 petroleum vapor intrusion (PVI) Guidance, the soil- vapor samples were also analyzed for methane, carbon dioxide, and oxygen. The analytical results for these compounds were utilized for assessment of biodegradation. While the analytical results for methane, carbon dioxide, and oxygen did not provide evidence that bioremediation of the remaining LNAPL is occurring, decreasing COPC concentrations between soil-vapor sample SV-1D, collected near the source of the remaining LNAPL, and soil vapor sample SV-1S, collected near the ground surface, indicate that natural attenuation of the remaining LNAPL could be occurring at this location. However, we could not say the same for the remaining LNAPL at the location where SV-2S and its nested SV-2D were collected. This is because the surface soil gas sample (SV-2S) had higher COPC concentrations by almost twice the levels seen at the deep soil gas sample SV-2D. Therefore, clear evidence for biodegradation activity is not confirmed. Monitoring natural attenuation is still needed to understand whether biodegradation is still taking place as part of the natural attenuation process.

The results from the LNAPL sample indicates that 95 % of all LNAPL is mostly high carbon chain hydrocarbon, mostly carbon chains greater than 16 to 35 carbons (see table 1). These high hydrocarbon chain chemicals tend to be more resistant to biodegradation and have much less volatility than the short chained hydrocarbons. The remaining 5% of all LNAPL are short chained hydrocarbons and are mostly aromatic hydrocarbons. The short chained hydrocarbons tend to biodegrade and volatile easily.

Table 1: TPH Speciation TX 1006 Method (mg/L)			
Chemical	(mg/L)	(mg/L)	% Total
C6 Aliphatics	<2.31	2.31*	0.066
>C6-C8 Aliphatics	<2.31	2.31	0.066
>C8-C10 Aliphatics	<2.53	2.53	0.072
>C10-C12 Aliphatics	<2.42	2.42	0.069
>C12-C16 Aliphatics	5.24	5.24	0.150
>C16-C21 Aliphatics	285	285	8.133
>C21-C35 Aliphatics	3,050	3,050	87.043
>C7-C8 Aromatics	2.55	2.55	0.073
>C8-C10 Aromatics	6.71	6.71	0.191
>C10-C12 Aromatics	9.25	9.25	0.264
>C12-C16 Aromatics	1.83	1.83	0.052
>C16-C21 Aromatics	10.6	10.6	0.302
>C21-C35 Aromatics	133	133	3.796
C6-C35 Aliphatic and Aromatic Fractions	3,504		100

*Reported at the detection limit.

Data from TPH speciation using TCEQ Method 1006 were input into the TCEQ TPH calculator. The results indicated a potential vapor intrusion concern. To understand the impact of the short chained hydrocarbons on human health through the inhalation route of intake, soil gas samples were collected and tested for specific aromatic and aliphatic hydrocarbons with carbon chains containing less than 12 carbons. Soil gas samples were analyzed for 17 chemicals and one total petroleum hydrocarbon (low fraction) for a total of 18 chemicals (see table 2).

Table 2: Soil vapor sample results for surface (S=5 feet bgs) and Deep (D=11 feet bgs near source)				
	SV-1S ($\mu g/m^3$)	SV-1D $\mu g/m^3$)	SV-2S ($\mu g/m^3$)	SV-2D ($\mu g/m^3$)
Benzene	2.90	10.80	19.70	1.04
Cyclohexane	0.69	1.83	3.98	4.08
Ethylbenzene	1.56	3.79	3.19	0.87
4-Ethyltoluene (1-Ethyl-4-methyl benzene)	2.55	3.49	3.85	0.98
Heptane	9.90	112.00	24.60	13.60
n-Hexane	24.70	290.00	71.10	23.40
Isopropylbenzene (Cumene)	0.98	0.98	0.98	0.98

Methyl tert-butyl ether (MTBE)	0.72	0.72	0.72	0.72
Naphthalene	3.30	3.30	3.30	4.60
Propene	58.30	465.00	774.00	56.40
Styrene	0.85	0.85	1.16	0.85
Toluene	3.81	4.82	12.70	2.28
TPH (Low Fraction)	454.00	1560.00	963.00	554.00
1,2,4-Trimethylbenzene	2.33	3.43	4.12	1.78
1,3,5-Trimethylbenzene	2.58	2.48	2.89	0.98
2,2,4-Trimethylpentane	0.93	2.22	6.09	1.22
m&p-Xylene	2.20	5.66	6.27	1.73
o-Xylene	0.95	2.75	2.41	0.87
Oxygen	17.9%	17.6%	17.8%	16.9%
Carbon Dioxide	<0.500%	<0.500%	<0.500%	<0.500%
Methane	<0.400%	<0.400%	<0.400%	<0.400%

The EPA Vapor Intrusion Screening Level Calculator was used to evaluate the potential LNAPL COPC contributions to indoor air concentrations on the subject property. The property is still a vacant land but there are plans to develop the area as a residential development with houses built on top of the land. Houses built in the area are typically constructed with slab-on- grade foundations without basements. The results of the two soil gas samples collected near the surface (SV-1S and SV-2S) were assumed to be sub-slab samples and used to develop a screening risk assessment for future residents living in houses built on top of these two sampling points. The soil gas concentrations for each of the 18 chemicals were input into the VISL calculator and the estimated cumulative excess cancer risk and hazard index were reported (see tables 3 and 4). The estimated excess cancer risk from four carcinogenic COPC (benzene, ethylbenzene, methyl tert-butyl ether (MTBE) and naphthalene) for SV-1S and SV-2S were 1.5E-06 and 2.9E-06 respectively. These levels are within EPA's generally accepted excess cancer risk range of 1E-06 and 1E-04. The estimated non-cancer or hazard index were calculated at 0.04 and 0.07 from exposure to all COPC for SV-1S and SV-2S respectively. The total petroleum hydrocarbon (TPH) (low fraction) were evaluated using the VISL calculator separately from the other COPC to avoid double counting. TPH (low fraction) was assumed to exist as 50% aromatic low fraction hydrocarbons and 50% as aliphatic low fraction hydrocarbons. The non-cancer hazard index from exposure to TPH (low fraction) was estimated by VISL calculator to be 0.23 and 0.49 for SV-1S and SV-2S respectively. The HI from exposure to all COPC were calculated to be less than the EPA's acceptable level at a HI of less than one. The risks estimated for future residents from exposure to COPC through the inhalation route of intake are minimal and should not present a health concern for future residents.

Table 3: Resident Vapor Intrusion Risk Using EPA's VISL Calculator
MDI OU 1 Soil Vapor Sample SV-1S

Chemical	CAS Number	Site Sub-Slab or Near-source Soil Gas Concentration C_{sg} (µg/m³)	Site Indoor Air Concentration C_{IA} (µg/m³)	VI Carcinogenic Risk CR	VI Hazard HQ
Benzene	71-43-2	2 9	8 70E-02	2 42E-07	2 78E-03
Benzene, Ethylmethyl	25550-14-5	2 55			
Cumene	98-82-8	0 982	2 95E-02		7 06E-05
Cyclohexane	110-82-7	0 689	2 07E-02		3 30E-06
Ethylbenzene	100-41-4	1 56	4 68E-02	4 17E-08	4 49E-05
Heptane, N-	142-82-5	9 9	2 97E-01		7 12E-04
Hexane, N-	110-54-3	24 7	7 41E-01		1 02E-03
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0 721	2 16E-02	2 00E-09	6 91E-06
Propylene	115-07-1	58 3	1 75E+00		5 59E-04
Naphthalene	91-20-3	3 3	9 90E-02	1 20E-06	3 16E-02
Styrene	100-42-5	0 851	2 55E-02		2 45E-05
Toluene	108-88-3	3 81	1 14E-01		2 19E-05
Trimethylbenzene, 1,2,4-	95-63-6	2 33	6 99E-02		1 12E-03
Trimethylbenzene, 1,3,5-	108-67-8	2 58	7 74E-02		1 24E-03
Trimethylpentane, 2,2,4-	540-84-1	0 934			
Xylene, P-	106-42-3	2 2	6 60E-02		6 33E-04
Xylene, m-	108-38-3	2 2	6 60E-02		6 33E-04
Xylene, o-	95-47-6	0 946	2 84E-02		2 72E-04
**Sum*				*1.48E-06*	*4.08E-02*

Chemical	CAS Number	Site Sub-Slab or Near-source Soil Gas Concentration C_{sg} (µg/m³)	Site Indoor Air Concentration C_{IA} (µg/m³)	VI Carcinogenic Risk CR	VI Hazard HQ
Total Petroleum Hydrocarbons (Aliphatic Low)	NA	227	6 81E+00		1 09E-02
Total Petroleum Hydrocarbons (Aromatic Low)	NA	227	6 81E+00		2 18E-01
**Sum*					*2 29E-01*

Table 4: Resident Vapor Intrusion Risk Using EPA's VISL Calculator
MDI OU 1 Soil Vapor Sample SV-2S

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Chemical	CAS Number	Site Sub-Slab or Near-source Soil Gas Concentration C_{sg} (µg/m³)	Site Indoor Air Concentration C_{ia} (µg/m³)	VI Carcinogenic Risk CR	VI Hazard HQ
Benzene	71-43-2	19 7	5 91E-01	1 64E-06	1 89E-02
Benzene, Ethylmethyl	25550-14-5	3 85			
Cumene	98-82-8	0 983	2 95E-02		7 07E-05
Cyclohexane	110-82-7	3 98	1 19E-01		1 91E-05
Ethylbenzene	100-41-4	3 19	9 57E-02	8 52E-08	9 18E-05
Heptane, N-	142-82-5	24 6	7 38E-01		1 77E-03
Hexane, N-	110-54-3	71 1	2 13E+00		2 92E-03
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0 721	2 16E-02	2 00E-09	6 91E-06
Propylene	115-07-1	774	2 32E+01		7 42E-03
Naphthalene	91-20-3	3 3	9 90E-02	1 20E-06	3 16E-02
Styrene	100-42-5	1 16	3 48E-02		3 34E-05
Toluene	108-88-3	12 7	3 81E-01		7 31E-05
Trimethylbenzene, 1,2,4-	95-63-6	4 12	1 24E-01		1 98E-03
Trimethylbenzene, 1,3,5-	108-67-8	2 89	8 67E-02		1 39E-03
Trimethylpentane, 2,2,4-	540-84-1	6 09			
Xylene, P-	106-42-3	6 27	1 88E-01		1 80E-03
Xylene, m-	108-38-3	6 27	1 88E-01		1 80E-03
Xylene, o-	95-47-6	2 41	7 23E-02		6 93E-04
**Sum*				*2 93E-06*	*7.06E-02*

Chemical	CAS Number	Site Sub-Slab or Near-source Soil Gas Concentration C_{sg} (µg/m³)	Site Indoor Air Concentration C_{ia} (µg/m³)	VI Carcinogenic Risk CR	VI Hazard HQ
Total Petroleum Hydrocarbons (Aliphatic Low)	NA	481 5	1 44E+01		2 31E-02
Total Petroleum Hydrocarbons (Aromatic Low)	NA	481 5	1 44E+01		4 62E-01
**Sum*					*4.85E-01*

Conclusion:

EPA evaluated the adverse health impact to potential future resident from exposure to volatile chemicals in groundwater. Only the risk through inhalation route of intake in a vapor intrusion mode of transport was considered. Exposure through other routes of intake (ingestion, dermal or inhalation during showering) are not evaluated in this report. EPA used the latest version of the VISL model calculator in estimating the risk values. The estimated risk values were below the EPA acceptable levels for both cancer and non-cancer health effects. As such, EPA region 6 believes that there is no need to do further vapor intrusion analysis for OU1.

Petroleum hydrocarbons rarely pose a health threat due to vapor intrusion, because petroleum hydrocarbons biodegrade so readily in soils overlying groundwater and LNAPL plumes, which soils get oxygen from ambient air infiltration. Test of the LNAPL composition indicated that high molecular weights and large carbon chain TPHs comprised 95% of the LNAPL sample. High molecular weight and high carbon chain hydrocarbon chemicals tend to resist biodegradation and do not volatile easily. However, data from TPH speciation using TCEQ Method 1006 indicated a potential vapor intrusion concern. To confirm this concern, soil gas sampling, both near ground surface and near source of contamination were collected and tested for short chain hydrocarbon (< 12 carbons). A screening risk assessment was developed using EPA's VISL calculator. The calculator estimated the cumulative excess cancer risks from exposure to COPC in indoor air at below the mid-range (1E-05) of the EPA's acceptable excess cancer risk range of 1E-06 and 1E-04. The non-cancer or hazard indexes were also below EPA's acceptable level. Although monitoring natural attenuation could not be confirmed at this location, it is expected that it is working at the site. This present an additional support to the conclusion that vapor intrusion is not of concern for the site. It is expected that the concentrations of volatile chemicals continue declining and therefore, the risks from exposure to these volatile organic chemicals are also expected to be much lower than is estimated in this risk evaluation.

Therefore, further-action is not necessary or needed. Vapor intrusion should not present any health concern to inhabitants of buildings built in the future over the northwestern portion of the subject property.

APPENDIX L – INTERVIEW FORMS

Many Diversified Interests, Inc. Superfund Site — Five-Year Review Interview Form

Site Name: Many Diversified Interests, Inc. **EPA ID No.:** TXD008083404

Interviewer Name: Eric Marsh **Affiliation:** Skeo
Subject Name: Sherell Heidt **Affiliation:** TCEQ
Subject Contact Information: Optional Line
Time: **Date:** 08/15/2017
Interview Location: Location Information Here

Interview Format (circle one): In Person Phone Mail Other: email

Interview Category: State Agency

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

   The remedy implemented on-site included remedial actions which ensured that the soils on-site do not present an unacceptable risk to human health Three plume management zones (PMZs) were established on-site to prevent exposure to contaminated groundwater. A Monitored Natural Attenuation (MNA) program was implemented on plume management zones 2 and 3. MNA activities include monitoring and evaluating the natural attenuation processes occurring in the shallow water bearing zone by collecting and analyzing samples from point of compliance wells and attenuation monitoring point wells.

   During several site visits, the TCEQ observed overgrown vegetation on-site and posted property violation signage on fencing surrounding the site property. On a site visit conducted on January 14, 2016, the TCEQ observed three drums on-site, several piles of trash, and soil piles. In March of 2016, the TCEQ observed trash piles and property violation signage on-site. During the Five-Year Review site walk conducted on December 6, 2016, the TCEQ observed maintenance of the overgrown vegetation on-site being performed. During a site visit conducted on August 9-10, 2017 the TCEQ observed that the site entrance gates were not operational; therefore, the site was unsecured The TCEQ observed that the vegetation on-site was maintained.

   During the Five-Year Review site walk, the TCEQ observed three damaged monitor wells, MW-25, MW-26, and MW-29. During a site visit conducted on August 9-10, 2017, the TCEQ observed that these wells were repaired.

   Although the site is not currently being reused, the TCEQ was informed that there are plans to install the infrastructure and wastewater detention facilities to serve 544 townhomes on-site in the near future. The TCEQ is supportive of the potential future reuse of the site that does not negatively impact the implemented site remedy.

2. What is your assessment of the current performance of the remedy in place at the Site?

   The implemented remedy on-site is performing as designed. As of August 2017, there has not been any evidence of violations of the Restrictive Covenant issued for the site.

The TCEQ believes that it is imperative that the wells on-site are routinely sampled within the scheduled 30-month intervals to remain in compliance with the applicable or relevant and appropriate Federal and State environmental siting laws and regulations

3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years?

   Yes. On February 29, 2016, an inspector with the City of Houston contacted the TCEQ with regard to a nuisance complaint pertaining trash, debris, and overgrown vegetation located on-site. Also in 2016, a citizen contacted the TCEQ with regard to concerns about the whether it was safe to buy a home within the vicinity of the site. TCEQ referred both of these issues to the EPA and informed the EPA of the referral.

   In January 2017, the TCEQ Region 12 office was notified by a concerned complainant who stated that the City of Houston would not clean out the storm drains around the site because of contamination from the MDI site. The TCEQ Project Manager referred the EPA RPM to the TCEQ Region 12 storm water investigator. The EPA RPM confirmed with the TCEQ Region 12 investigator that there were no issues that would prevent the City of Houston from unclogging the storm water drains surrounding the site and informed her of the final Notice of Deletion of the soils of Operable Unit 1.

   The City of Houston representative informed the TCEQ Region 12 investigator that they plan to extend the sewer line under the MDI superfund site. The City of Houston also indicated that they had not cleared any of the lines since September 1998 because they believed the lines were clogged with sediment from the MDI Superfund site. The City of Houston informed the TCEQ Region 12 investigator that their storm sewers are deeper than the 18 inches of contaminated soils that were removed from the site and contamination may still be present. The City of Houston later informed the TCEQ Region 12 investigator that they collected samples from the storm sewers and that no contaminants were detected above the toxic characteristic leaching procedure Also, the City of Houston stated that they cleaned some of the storm sewers in preparation to televise the line.

4. Has your office conducted any site-related activities or communications in the past five years apart from routine activities? If so, please describe the purpose and results of these activities.

   No.

5. Are you aware of any changes to state laws in the past five years that might affect the protectiveness of the Site's remedy?

   No.

6. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues?

   Yes.

7. Do you feel that the recommendations from the 2012 Five-Year Review have been adequately addressed? Please explain.

   Three recommendations and follow-up actions were made during the 2012 Five-Year Review, which were generally addressed In 2016, the noncarcinogenic risk for manganese in groundwater was

reevaluated and resulted in a determination that monitor wells MW-1, MW-7, MW-4, MW-15, MW-16, and MW-21 manganese levels exceeded the new screening level for manganese in water. The TCEQ agrees with the EPAs findings that these wells need to be assessed in order to determine if any further action or decisions need to be enacted upon.

As suggested in the 2012 Five-Year Review, monitor wells MW-17 and MW-19 were plugged and abandoned in 2012.

The 2012 Five-Year Review recommended that monitor well MW-20R continue to be monitored for Light Non-Aqueous Phase Liquid (LNAPL). LNAPL was not measured in monitor well MW-20R during the required 30-month interval sampling date of January 2015. Monitor well MW-20R was sampled in August 2017. The TCEQ recommends that the LNAPL in well MW-20R be measured within the required 30-month intervals.

8. Are you aware of any changes in projected land use(s) at the Site?

Yes. The selected remedy was implemented with the intention of potential future residential land development. The TCEQ has been made aware that construction activities of the utilities, wastewater detention ponds, and public streets are projected to begin sometime within the next few years. The TCEQ encourages future development and land use of the site that does not impair the objective of the remedy to protect human health and the environment.

9. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?

Necessary groundwater monitoring activities are required to occur in 30-month intervals. Groundwater monitoring was conducted at the site August 7-9, 2017. Prior to this sampling event, the site had not been sampled since January 2013. It is imperative that routine groundwater monitoring is conducted at the site to confirm that the remedy, including the institutional controls, continues to protect human health and the environment and the integrity of the groundwater remedy design by evaluating remedy effectiveness and system performance.

According to the Record of Decision for Operable Unit 1 issued on July 30, 2004, arsenic was detected in 23 of 24 monitor wells on-site and appeared to be originate from an off-site source east of the Site. The established PMZs on-site and implemented MNA at the site do not address the arsenic plume. Although arsenic is not a listed chemical of concern, the implemented restrictive covenant on-site prevents exposure to contaminated groundwater to protect human health and the environment. The EPA has issued several 104e information request letters with regard to this potential off-site source property without receiving a response. Samples were collected from this potential off-site source; however, the samples were not collected under the direction of the EPA or TCEQ The TCEQ recommends that this potential off-site source be brought to a conclusion

During the Five Year Review site visits conducted December 6-7, 2016, the TCEQ observed darkened soils that emanated a hydrocarbon odor. These soils were located in the ditch adjacent to and north of the east/west paved road in the central area of the site. According to a Houston Police Department report dated August 16, 2016 and a conversation with a Houston Police Department Environmental Investigator, engine oil filters were illegally placed by unknown person(s) in the disturbed area in August of 2016 The responsible party sampled this area and disposed of the contaminated soils in early 2017. During the Five-Year Review site walk, the TCEQ observed two separate areas aloof-site source of arsenic and ng the ditch that showed distressed vegetation. The TCEQ has been informed by various parties that frequent dumping occurs on-site and within the vicinity of the site.

The TCEQ recommends that any site changes that have the potential to affect the implemented site remedy or pose a potential negative impact to human health and the environment be communicated to the TCEQ Project Manager.

10. Do you give permission for the following to be included in the Five-Year Review Report and appendices, which becomes a public document? Please initial below.
    1) Your name? Yes __SH____ No _____
    2) Your affiliation? Yes __SH____ No _____
    3) Your responses? Yes __SH___ No _____

Many Diversified Interests, Inc. Superfund Site **Five-Year Review Interview Form**

Site Name:	**Many Diversified Interests, Inc.**	**EPA ID No.:**	**TXD008083404**
Interviewer Name:	**Eric Marsh**	**Affiliation:**	**Skeo**
Subject Name:	**Daisy D. James**	**Affiliation:**	**Houston Health Dept. City of Houston**
Subject Contact Information:			
Time:	**9:00 a.m.**	**Date:**	**12/07/2016**
Interview Location:	**Houston Health Dept. Office**		
Interview Format (circle one):	**In Person**	**Phone**	**Mail** **Other:**

Interview Category: **Local Government**

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?

   After looking at EPA's website yesterday, I realized it was the TESCO site. I remember conducting environmental inspections there in the 1980s or 1990s. I received complaints out there before it was a Superfund site.

2. Do you feel well-informed regarding the Site's activities and remedial progress? If not, how might EPA convey site-related information in the future?

   Yes, I do, based on co-worker Mr. Desouza's findings from the site inspection the day before.

3. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing in the past five years?

   No, we don't typically receive anything related to vandalism We don't have the Site's address in our complaint system. Complaints we do receive are for ambient air, indoor air, chemical waste, surface water and groundwater

4. Are you aware of any changes to state laws or local regulations in the past five years that might affect the protectiveness of the Site's remedy?

   Not aware of any.

5. Are you aware of any changes in projected land use(s) at the Site?

   No.

6. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site?

   There are a number of EPA Superfund sites within the city limits and it would be good to keep local programs informed. We have several sites we are focused on and I know there are some we may not have as much information about.

   How can EPA best provide site-related information in the future?

Keep lines of communication open. Maybe send out a public notice and informational flyer to council members in that area. Also, providing frequent status updates, even annually, would be good.

7. Do you have any comments, suggestions or recommendations regarding the project?

   Would be helpful to provide updates on all Superfund sites in Houston. Copy us on an email with updates.

8. Do you give permission for the following to be included in the Five-Year Review Report and appendices, which becomes a public document? Please initial below.

   a) Your name? Yes __X__ No _____
   b) Your affiliation? Yes __X__ No _____
   c) Your responses? Yes __X__ No _____

Many Diversified Interests, Inc. Superfund Site **Five-Year Review Interview Form**

Site Name: Many Diversified Interests, Inc. **EPA ID No.:** TXD008083404

Interviewer Name: Eric Marsh **Affiliation:** Skeo
Subject Name: Isaac H DeSouza **Affiliation:** Houston Health Dept. City of Houston

Subject Contact Information: Optional
Time: 11:00 a.m. **Date:** 12/12/2016
Interview Location: Houston Health Dept. Office

Interview Format (circle one): In Person Phone Mail **Other: Email**

Interview Category: Local Government

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?

   I became aware of the TESCO Superfund site after reviewing the information at the EPA website on 12/6/2016.

2. Do you feel well-informed regarding the Site's activities and remedial progress? If not, how might EPA convey site-related information in the future?

   Yes I do, after visiting the Superfund site and reviewing the site information at the EPA website.

3. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing in the past five years?

   No, I am not aware of any problems at the Site, we usually don't receive any complaints related to vandalism.

4. Are you aware of any changes to state laws or local regulations in the past five years that might affect the protectiveness of the Site's remedy?

   I am not aware of any regulations that may affect the protectiveness of the Site's remedy.

5. Are you aware of any changes in projected land use(s) at the Site?

   No.

6. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site?

   We may not have as much information about some of the sites we are focused on in the Houston area.

   How can EPA best provide site-related information in the future?

   We would like to be updated on all Superfund sites in the Houston metropolitan area.

7. Do you have any comments, suggestions or recommendations regarding the project?

We would like to get email updates regarding the status of this project.

8. Do you give permission for the following to be included in the Five-Year Review Report and appendices, which becomes a public document? Please initial below.
    a) Your name? Yes __X__ No _____
    b) Your affiliation? Yes __X__ No _____
    c) Your responses? Yes __X__ No _____

Many Diversified Interests, Inc. Superfund Site — Five-Year Review Interview Form

Site Name: Many Diversified Interests, Inc. **EPA ID No.:** TXD008083404
Interviewer Name: Eric Marsh **Affiliation:** Skeo
Subject Name: _____ **Affiliation:**
Subject Contact Information:
Time: 10:00 a.m. **Date:** 12/07/2016
Interview Location: Neighborhood near site (Houston Fifth Ward)
Interview Format (circle one): (In Person) Phone Mail Other:

Interview Category: **Residents, Businesses and Other Organizations**

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?

   Don't know about it.

2. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

3. What have been the effects of the Site on the surrounding community, if any?

4. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing in the past five years?

   Haven't seen anything.

5. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site? How can EPA best provide site-related information in the future?

   I would like to get more information.

6. Do you own a private well in addition to or instead of accessing city/municipal water supplies? If so, for what purpose(s) is your private well used?

   No

7. Do you have any comments, suggestions or recommendations regarding any aspects of the project?

   Is anything going to be built out there?

8. Do you give permission for the following to be included in the Five-Year Review Report and appendices, which becomes a public document? Please initial below.
   a) Your name? Yes _____ No __X__
   b) Your affiliation? Yes _____ No __X__
   c) Your responses? Yes __X__ No _____

Many Diversified Interests, Inc. Superfund Site — Five-Year Review Interview Form

Site Name: Many Diversified Interests, Inc. **EPA ID No.:** TXD008083404
Interviewer Name: Eric Marsh **Affiliation:** Skeo
Subject Name: _____ **Affiliation:**
Subject Contact Information:
Time: 10:10 a.m. **Date:** 12/07/2016
Interview Location: Neighborhood near site (Houston Fifth Ward)
Interview Format (circle one): (In Person) Phone Mail Other:

Interview Category: Residents, Businesses and Other Organizations

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?

   Not really. They use it as a dump site.

2. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

3. What have been the effects of the Site on the surrounding community, if any?

   There are negative effects when people are throwing trash there, such as Zika. It's a problem

4. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing in the past five years?

   Illegal dumping.

5. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site?

   No

   How can EPA best provide site-related information in the future?

   Would like to get information.

6. Do you own a private well in addition to or instead of accessing city/municipal water supplies? If so, for what purpose(s) is your private well used?

   No. Haven't heard of other people nearby having private wells either.

7. Do you have any comments, suggestions or recommendations regarding any aspects of the project?

   No I don't know much about it.

8. Do you give permission for the following to be included in the Five-Year Review Report and appendices, which becomes a public document? Please initial below.
   a) Your name? Yes _____ No __X__
   b) Your affiliation? Yes _____ No __X__
   c) Your responses? Yes __X__ No _____

Many Diversified Interests, Inc. Superfund Site — Five-Year Review Interview Form

Site Name:	Many Diversified Interests, Inc.	**EPA ID No.:**	TXD008083404
Interviewer Name:	Eric Marsh	**Affiliation:**	Skeo
Subject Name:	_____	**Affiliation:**	
Subject Contact Information:			
Time:	10:20 a.m.	**Date:**	12/07/2016
Interview Location:	Neighborhood near site (Houston Fifth Ward)		

Interview Format (circle one): (In Person) Phone Mail Other:

Interview Category: Residents, Businesses and Other Organizations

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?

   Pretty calm now. Steel facility was there. It was cleaned up. Back then they said our air was polluted. They cleaned up the dirt

2. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

   Pretty much they did what they had to do.

3. What have been the effects of the Site on the surrounding community, if any?

   There are people that leave their trash back there – their boats, stripped cards, etc. They leave their trash in the dark.

4. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing in the past five years?

   Illegal dumping – back then perhaps a body but now since cleanup crime is reduced

5. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site? How can EPA best provide site-related information in the future?

   Provide information via regular mail. People around here are "old school."

6. Do you own a private well in addition to or instead of accessing city/municipal water supplies? If so, for what purpose(s) is your private well used?

   No wells.

7. Do you have any comments, suggestions or recommendations regarding any aspects of the project?

   Fifteen years ago, I heard they were planning on putting a Wal-Mart on the Site.

8. Do you give permission for the following to be included in the Five-Year Review Report and appendices, which becomes a public document? Please initial below.

a) Your name? Yes _____ No __X____
b) Your affiliation? Yes _____ No __X____
c) Your responses? Yes _X____ No _____

Many Diversified Interests, Inc. Superfund Site — Five-Year Review Interview Form

Site Name: Many Diversified Interests, Inc. **EPA ID No.:** TXD008083404
Interviewer Name: Eric Marsh **Affiliation:** Skeo
Subject Name: _____ **Affiliation:**
Subject Contact Information:
Time: 10:30 a.m. **Date:** 12/07/2016
Interview Location: Neighborhood near site (Houston Fifth Ward)

Interview Format (circle one): (In Person) Phone Mail Other:

Interview Category: Residents, Businesses and Other Organizations

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?

   Yes, but did not get any money from this. Went to meetings.

2. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

   I guess they did alright. I don't know. I really couldn't tell you.

3. What have been the effects of the Site on the surrounding community, if any?

   Not that I know of recently.

4. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing in the past five years?

   Illegal dumping.

5. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site?

   No.

   How can EPA best provide site-related information in the future?

   Regular mail.

6. Do you own a private well in addition to or instead of accessing city/municipal water supplies? If so, for what purpose(s) is your private well used?

   No.

7. Do you have any comments, suggestions or recommendations regarding any aspects of the project?

   Not really.

8. Do you give permission for the following to be included in the Five-Year Review Report and appendices, which becomes a public document? Please initial below.

a) Your name? Yes _____ No __X____
b) Your affiliation? Yes _____ No __X____
c) Your responses? Yes __X___ No _____

Many Diversified Interests, Inc. Superfund Site — Five-Year Review Interview Form

Site Name: Many Diversified Interests, Inc. **EPA ID No.:** TXD008083404
Interviewer Name: Eric Marsh **Affiliation:** Skeo
Subject Name: _____ **Affiliation:**
Subject Contact Information:
Time: 10:40 a.m. **Date:** 12/07/2016
Interview Location: Neighborhood near site (Houston Fifth Ward)
Interview Format (circle one): (In Person) Phone Mail Other:

Interview Category: Residents, Businesses and Other Organizations

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?

   No.

2. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

3. What have been the effects of the Site on the surrounding community, if any?

   Not a problem to me.

4. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing in the past five years?

   I see a lot of illegal dumping there. Sometimes see trucks there dumping their loads It's also a place for sex/prostitution.

5. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site?

   No.

   How can EPA best provide site-related information in the future?

   Regular mail

6. Do you own a private well in addition to or instead of accessing city/municipal water supplies? If so, for what purpose(s) is your private well used?

   Am on city water.

7. Do you have any comments, suggestions or recommendations regarding any aspects of the project?

   No – I was thinking they were going to develop there.

8. Do you give permission for the following to be included in the Five-Year Review Report and appendices, which becomes a public document? Please initial below.

a) Your name? Yes _____ No __X__
b) Your affiliation? Yes _____ No __X__
c) Your responses? Yes __X___ No _____

Many Diversified Interests, Inc. Superfund Site — Five-Year Review Interview Form

Site Name: Many Diversified Interests, Inc. **EPA ID No.:** TXD008083404
Interviewer Name: Eric Marsh **Affiliation:** Skeo
Subject Name: _____ **Affiliation:**
Subject Contact Information:
Time: 10:50 a.m. **Date:** 12/07/2016
Interview Location: Neighborhood near site (Houston Fifth Ward)
Interview Format (circle one): (In Person) Phone Mail Other:

Interview Category: Residents, Businesses and Other Organizations

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?

   I know the area a little bit – I heard about the cleanup.

2. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

   No impressions.

3. What have been the effects of the Site on the surrounding community, if any?

   Not aware of any negative effects.

4. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing in the past five years?

   Not for a while – not really

5. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site?

   No.

   How can EPA best provide site-related information in the future?

   Not that interested

6. Do you own a private well in addition to or instead of accessing city/municipal water supplies? If so, for what purpose(s) is your private well used?

   No – not aware of any other neighbors having private wells

7. Do you have any comments, suggestions or recommendations regarding any aspects of the project?

   I was really curious what they are planning to do.

8. Do you give permission for the following to be included in the Five-Year Review Report and appendices, which becomes a public document? Please initial below.

a) Your name? Yes _____ No __X__
b) Your affiliation? Yes _____ No __X__
c) Your responses? Yes __X___ No _____

Many Diversified Interests, Inc. Superfund Site **Five-Year Review Interview Form**

Site Name:	Many Diversified Interests, Inc.	**EPA ID No.:**	TXD008083404
Interviewer Name:	Ian Penn	**Affiliation:**	Skeo/ EPA
Subject Name:	Janice Gorman	**Affiliation:**	Asset Manager for Owner
Subject Contact Information:	Optional Line –		
Time:	1:12 pm	**Date:**	11/29/2016
Interview Location:	Site, Office of ownership entity		

Interview Format (circle one): **In Person** **Phone** **Mail** **Other:** Email

Interview Category: **Site Owner/Developer**

1. What is your overall impression of the remedial activities at the Site? All soil remediation complete to residential standards and long-term groundwater monitoring is in progress.

2 What have been the effects of this Site on the surrounding community, if any? Not aware of any effects.

3 What is your assessment of the current performance of the remedy in place at the Site? It is functional and should not affect site redevelopment plans

4. Are you aware of any complaints or inquiries regarding environmental issues or the remedial action from residents in the past five years? Not aware of any.

5 Do you feel well-informed regarding the Site's activities and remedial progress? If not, how might EPA convey site-related information in the future? We are informed enough and our environmental consultant keeps in contact with EPA on our behalf.

6 Do you feel that the recommendations from the 2012 Five-Year Review have been adequately addressed? Please explain. As far as we know.

7 Is redevelopment construction currently ongoing at the Site? If so, can you provide additional details on the current redevelopment status of the Site as well as anticipated future construction? Site redevelopment for residential use is pending

8 Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy? None

9 Do you give permission for the following to be included in the Five-Year Review Report and appendices, which becomes a public document? Please initial below.

a) Your name? Yes ✓ No _____
b) Your affiliation? Yes ✓ No _____
c) Your responses? Yes ✓ No _____

APPENDIX M – INSTITUTIONAL CONTROLS

Groundwater Restrictive Covenant for Site

11
Rest
40.00
C

RESTRICTIVE COVENANT

20100206389
05/19/2010 RP2 $96.00

STATE OF TEXAS §
§
COUNTY OF HARRIS §

This Restrictive Covenant is filed to provide information concerning certain environmental conditions and use limitations pursuant to the Texas Commission on Environmental Quality (TCEQ) Texas Risk Reduction Program Rule (TRRP) found at 30 Texas Administrative Code (TAC), Chapter 350, and affects the real property (Property) described as a 25.8967-acre property on Exhibit A attached hereto and incorporated herein by reference.

Portions of the groundwater of the Property contain certain identified chemicals of concern causing those portions of the Property to be considered an Affected Property as that term is defined in the TRRP. The portion considered to be Affected Property is described as a 25.8967-acre property on Exhibit A attached hereto and incorporated herein by reference. The identified chemicals of concern in shallow groundwater beneath the Property are molybdenum, manganese, benzo(a)pyrene, and total petroleum hydrocarbons.

This Restrictive Covenant is required for the following reasons:

The Affected Property is subject to the TRRP requirements for properties with an area overlying a TCEQ-approved plume management zone. A plume management zone is defined as an area of groundwater containing concentrations of chemicals of concern exceeding the TCEQ-approved protective concentration levels, plus any additional area allowed by the TCEQ in accordance with 30 TAC §350.33(f)(4). A plume management zone was established so that the chemicals of concern in the groundwater are managed such that human exposure is prevented and other groundwater resources are protected. The attached Exhibit B provides the location and extent of the plume management zone and Exhibit C describes the monitoring and maintenance required. This monitoring and maintenance must be implemented unless and until TCEQ approves some modification of those requirements.

RP 07-26-1949

As of the date of this Restrictive Covenant, the record owner of fee title to the Property is Clinton Gregg Investments, Ltd. (Owner) with an address of 1520 Oliver Street, Houston, Texas 77007.

In consideration of the Response Actions by Clinton Gregg Investments, Ltd. (Respondent) and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Owner has agreed to place the following restrictions on the Property in favor of the TCEQ and the State of Texas, to-wit:

1. Exposure to the groundwater underlying the Affected Property for any purpose is prohibited until such time when all the chemicals of concern no longer exceed their respective protective concentration levels. The maintenance and monitoring described in Exhibit B is required. Any modification of this restrictive covenant is prohibited without prior approval of TCEQ.

2. These restrictions shall be a covenant running with the land.

For additional information, contact:

TCEQ
Central Records
12100 Park 35 Circle, Building E
Austin, Texas 78753

Mail: TCEQ
P O Box 13087
Austin, Texas 78711-3087

TCEQ Program and Identifier No.: State Superfund ID No. SUP042

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A Site Repository that provides the public a location near their community to review and copy background and current information about the Site is located at:

Fifth Ward Multi-Service Center/Library
4041 Market Street
Houston, Texas 77020

Phillis Wheatley High School/Library
4900 Market Street
Houston, Texas 77020

Blanche Kelso Bruce Music Magnet Elementary School
510 Jensen Drive
Houston, Texas 77020

This Restrictive Covenant may be rendered of no further force or effect only by a release executed by the TCEQ or its successor agencies and filed in the same Real Property Records as those in which this Restrictive Covenant is filed.

Executed this 5th day of April, 2010.

Clinton Gregg Investments, Ltd.
by Crosby 2100 GP, LLC its General Partner

By: John Jennings

Name: John Jennings

Title: Vice President

Accepted as Third Party Beneficiary this 20 day of April 2010.

Texas Commission on Environmental Quality

By: _____

Name: _____

Title: _____

RP 09-15-1959

SKA Consulting, L.P.
Consulting Engineers, Scientists, and Geologists

Trent McDaniel, P.G.
Project Manager

1515 Witte Road, Ste 150
Houston, Texas 77080
713 266.6056 Main 832.255.5552 Direct
713.266 0996 Fax 832.867.8413 Cell
trent.mcdaniel@skaconsulting com

STATE OF TEXAS
(HARRIS) COUNTY

BEFORE ME, on this the 5th day of April 2010, personally appeared John Jennings, Vice President of Crosby 2100 GP, LLC, General Partner of Clinton Gregg Investments, Ltd., known to me to be the person whose name is subscribed to the foregoing instrument, and they acknowledged to me that they executed the same for the purposes and consideration therein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 5th day of April, 2010.

Travis Brandenburg
Notary Public, State of Texas
My Commission Expires:
June 10, 2010

Notary Public in and for the State of Texas,
County of Harris.

My Commission Expires: 6-10-2010

STATE OF TEXAS
(TRAVIS) COUNTY

BEFORE ME, on this the 20th day of April 2010 personally appeared Bob Patton Jr, _____, of the Texas Commission on Environmental Quality, known to me to be the person whose name is subscribed to the foregoing instrument, and they acknowledged to me that they executed the same for the purposes and in the capacity herein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 20th day of April, 2010

LINDA BOLDING
Notary Public
STATE OF TEXAS
Commission Exp. 01-29-2014
Notary without Bond

Notary Public in and for the State of Texas,
County of Travis.

My Commission Expires: 1-29-2014

EXHIBIT A

METES AND BOUNDS DESCRIPTION
25.8967 ACRES / 1,128,060 SQUARE FEET OF LAND
DARIUS GREGG SURVEY, A-283
HARRIS COUNTY, TEXAS
February 18, 2010

Description of 25.8967 acre, (1,128,060 square feet) of land, being a portion of a called 34.7804 acre tract described by deed to Clinton Gregg Investments, Ltd., recorded under Harris County Clerk's File Number 20060136950 and also being all of a called 2.1978 acre tract of land described by deed to Texas Electrical Steel Casting Company, located in the Darius Gregg Survey, Abstract Number 283, Harris County, Texas. Said 25.8967 acre tract being more particularly described as follows with all bearings being referenced to the Texas State Plane Coordinate System, South Central Zone, NAD 1983 (1993 adjustment);

COMMENCING at 5/8-inch iron rod with plastic cap stamped "CARTER & BURGESS" found in the north right-of-way line of a tract of land described by deed to Texas and New Orleans Railroad Company (herein referred to as T. & N. O. Railroad), recorded under Volume 148, Page 490 of the Harris County Deed Records, also being in the east right-of-way line of Bringhurst Drive and also being the southwest corner of said called 34.7804 acre tract;

THENCE, North 87 degrees 39 minutes 07 seconds East, with the north line of said Texas and New Orleans Railroad Company tract and the south line of said called 34.7804 acre tract, a distance of 445.60 feet to a 5/8-inch iron rod with plastic cap stamped "JACOBS" found for the **POINT OF BEGINNING** of the here described tract;

THENCE, North 03 degrees 40 minutes 14 seconds West, a distance of 902.56 feet to a Monitoring Well Number 18;

THENCE, North 87 degrees 20 minutes 42 seconds West, a distance of 152.41 feet to a 5/8-inch iron rod with plastic cap stamped "CARTER & BURGESS" found for the southeast right-of-way corner of Capron Street (40-foot wide right-of-way), as described by instrument recorded in Volume 355, Page 543, of the Harris County Deed Records and also being in the west line of said called 34.7804 acre tract;

THENCE, North 02 degrees 46 minutes 04 seconds West, with the east right-of-way line of said Capron Street and the west line of said called 34.7804 acre tract, a distance of 237.42 feet to a

5/8-inch iron rod found bent on the south line of Hare Street (60-foot wide right-of-way), as described by instrument recorded in Volume 8370, Page 538 of the Harris County Deed Records;

THENCE, with the north line of said called 34.7804 acre tract, the north line of said 2.19780 acre tract and the south right-of-way line of said Hare Street the following seven, (7) courses and distances:

1. North 87 degrees 21 minutes 22 seconds East, a distance of 160.00 feet to an "X" scribed in concrete found for the beginning of a curve to the right;

2. southeasterly, with the arc of said curve to the right having a radius of 588.00 feet, a central angle of 10 degrees 19 minutes 16 seconds, a chord bearing of South 87 degrees 29 minutes 00 seconds East, a chord distance of 105.78 feet, and an arc length of 105.92 feet to a 5/8-inch iron rod found for point of reverse curvature;

3. southeasterly, with the arc of a curve to the left having a radius of 648.00 feet, a central angle of 10 degrees 19 minutes 13 seconds, a chord bearing of South 87 degrees 28 minutes 59 seconds East, a chord distance of 116.56 feet, and an arc length of 116.72 feet to a 5/8-inch iron rod with plastic cap stamped "CARTER & BURGESS" found for point of tangency of said curve;

4. North 87 degrees 21 degrees 22 seconds East, a distance of 513.29 feet to a 5/8-inch iron rod found for the beginning of a curve to the right;

5. southeasterly, with the arc of said curve to the right having a radius of 588.00 feet, a central angle of 15 degrees 48 minutes 56 seconds, a chord bearing of South 84 degrees 43 minutes 54 seconds East, a chord distance of 161.79 feet, and an arc length of 162.31 feet to a 3/4-inch iron rod found for point of tangency of said curve;

6. South 76 degrees 49 minutes 40 seconds East, a distance of 24.44 feet to a 5/8-inch iron rod found for the beginning of a non-tangent curve to the left;

7. southeasterly, with the arc of said non-tangent curve to the left having a radius of 648.00 feet, a central angle of 13 degrees 47 minutes 01 second, a chord bearing of South 83 degrees 42 minutes 51 seconds East, a chord distance of 155.51 feet, and an arc length of 155.89 feet to a 5/8-inch iron rod found for the northeast corner of said called 2.19780

acre tract of land, also being in the west right-of-way line of Press Street, (50-foot wide right-of-way) as described by instrument recorded in Volume 7979, Page 470 and Volume 8370, Page 538, of the Harris County Deed Records and also being the non-tangent end of said curve;

THENCE, South 02 degrees 36 minutes 36 seconds East, with the common line of said called 2.19780 acre tract and Press Street, a distance of 236.99 feet to a 5/8-inch iron rod found for the most easterly southeast corner of said 2.19780 acre tract and also being the northeast corner of a called 3.803 acre tract described by deed to Alex Wolff, et ux, recorded under Volume 1463, Page 649 of the Harris County Deed Records;

THENCE, South 86 degrees 46 minutes 30 seconds West, with the common line of said called 2.19780 acre tract and said 3.803 acre tract, a distance of 243.44 feet to a 3/4-inch iron rod found for the northwest corner of said 3.803 acre tract and also being an interior corner of said 2.19780 acre tract;

THENCE, South 02 degrees 43 minutes 25 seconds East, with the common line of said 2.19780 acre tract and said 3.803 acre tract, a distance of 399.52 feet to a 5/8-inch iron rod with cap stamped "Windrose Land Services" found for the southwest corner of said 3.803 acre tract and the southern southeast corner of said 2.19780 acre tract;

THENCE, North 86 degrees 42 minutes 15 seconds East, with the common line of said called 34.7804 acre tract and said 3.803 acre tract, a distance of 284.48 feet to a 5/8-inch iron rod with cap stamped "CARTER & BURGESS" found in the west line of a called tract of land described by deed to San Antonio & Aransas Pass Railway Company (113.9-foot wide right-of-way), recorded under Volume 122, Page 611 of the Harris County Deed Records;

THENCE, South 02 degrees 40 minutes 01 second East, with the west line of said tract described to San Antonio & Aransas Pass Railway Company, a distance of 116.18 feet to a 5/8-inch iron rod with cap stamped "CARTER & BURGESS" found in the north line of Block 6, of MORNINGSIDE ADDITION, a subdivision as shown on the plat thereof recorded in Volume 67, Page 162, and Volume 211, Page 322 of the Harris County Deed Records;

THENCE, South 87 degrees 18 minutes 28 seconds West, with the common line of said called 34.7804 acre tract and said Block 6, a distance of 231.56 feet to a 5/8-inch iron rod found for the northwest corner of said Block 6;

THENCE, South 03 degrees 10 minutes 33 seconds East, with the common line of said called 34.7804 acre tract and said Block 6, a distance of 100.00 feet to a 5/8-inch iron rod found on the south line of said Block 6, same being on the north line of Cline Street (40-foot wide right-of-way);

THENCE, South 87 degrees 18 minutes 00 seconds West, with the common line of said called 34.7804 acre tract and said Cline Street, a distance of 60.00 feet to a 5/8-inch iron rod with cap stamped "CARTER & BURGESS" found in the north line of Cline Street;

THENCE, South 03 degrees 10 minutes 33 seconds East, with the common line of said called 34.7804 acre tract and said Cline Street a distance of 40.00 feet to a 5/8-inch iron rod with cap stamped "CARTER & BURGESS" found in the south line of Cline Street;

THENCE, North 86 degrees 51 minutes 16 seconds East, with the common line of said called 34.7804 acre tract and said Cline Street, a distance of 290.33 feet to a 5/8-inch iron rod found bent on the west line of said tract described to San Antonio & Aransas Pass Railway Company);

THENCE, South 02 degrees 40 minutes 01 second East, with the west line of said tract described to San Antonio & Aransas Pass Railway Company, a distance of 94.45 feet to a point for the northeast corner of a tract of land described to A.J. Real Estate Investments, recorded under Harris County Clerk's File Number Y097276, from which a 5/8-inch iron rod found bears South 87 degrees 19 minutes 59 seconds West, 0.54 feet;

THENCE, South 87 degrees 25 minutes 04 seconds West, with the common line of said called 34.7804 acre tract and said tract described to A.J. Real Estate Investments, a distance of 98.48 feet to a 5/8-inch iron rod found for the northwest corner of said tract described to A.J. Real Estate Investments;

THENCE, South 02 degrees 34 minutes 57 seconds East, with the common line of said called 34.7804 acre tract and said tract described to A.J. Real Estate Investments, a distance of 102.06 feet to a 5/8-inch iron rod with cap stamped "CARTER & BURGESS" found for the southwest

25.8967 ACRES
Page 5 of 5 Pages
February 18, 2010

corner of said tract described to A.J. Real Estate Investments and also being in the north right-of-way line of said tract described to T. & N. O. Railroad;

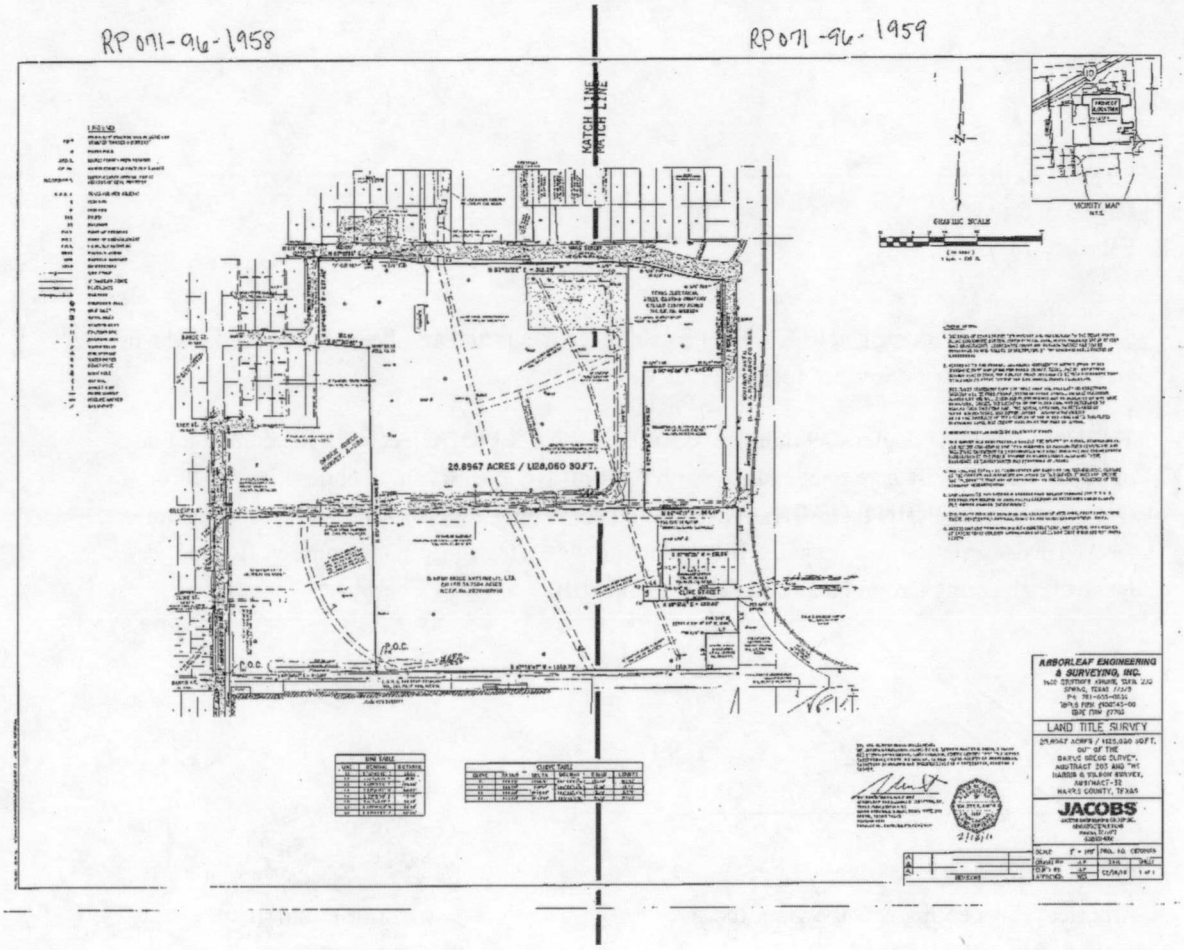
THENCE, South 87 degrees 39 minutes 07 seconds West, 1,006.70 feet, with the common line of said called 34.7804 acre tract and the north right-of-way line of said tract described to T. & N. O. Railroad to the **POINT OF BEGINNING** and containing 25.8967 acre, (1,128,060 square feet). This description was prepared in conjunction with a Category 1B, Condition II map by Jacobs Engineering Group Inc. dated February 18, 2010.

Walter E. Smith, RPLS 1982
Arborleaf Engineering & Surveying, Inc.
TBPLS Firm #100543-00
16000 Steubner Airline Road, Suite 200
Spring, Texas 77379
713-550-4931
Project No. CB700968.901.1.0001

STATE OF TEXAS REGISTERED WALTER E. SMITH 1982 PROFESSIONAL LAND SURVEYOR
2/18/10

RP071-96-1958

RP071-96-1959



RP 071-96-1960

EXHIBIT B

RP0711-96-1961

RP0711-96-1962

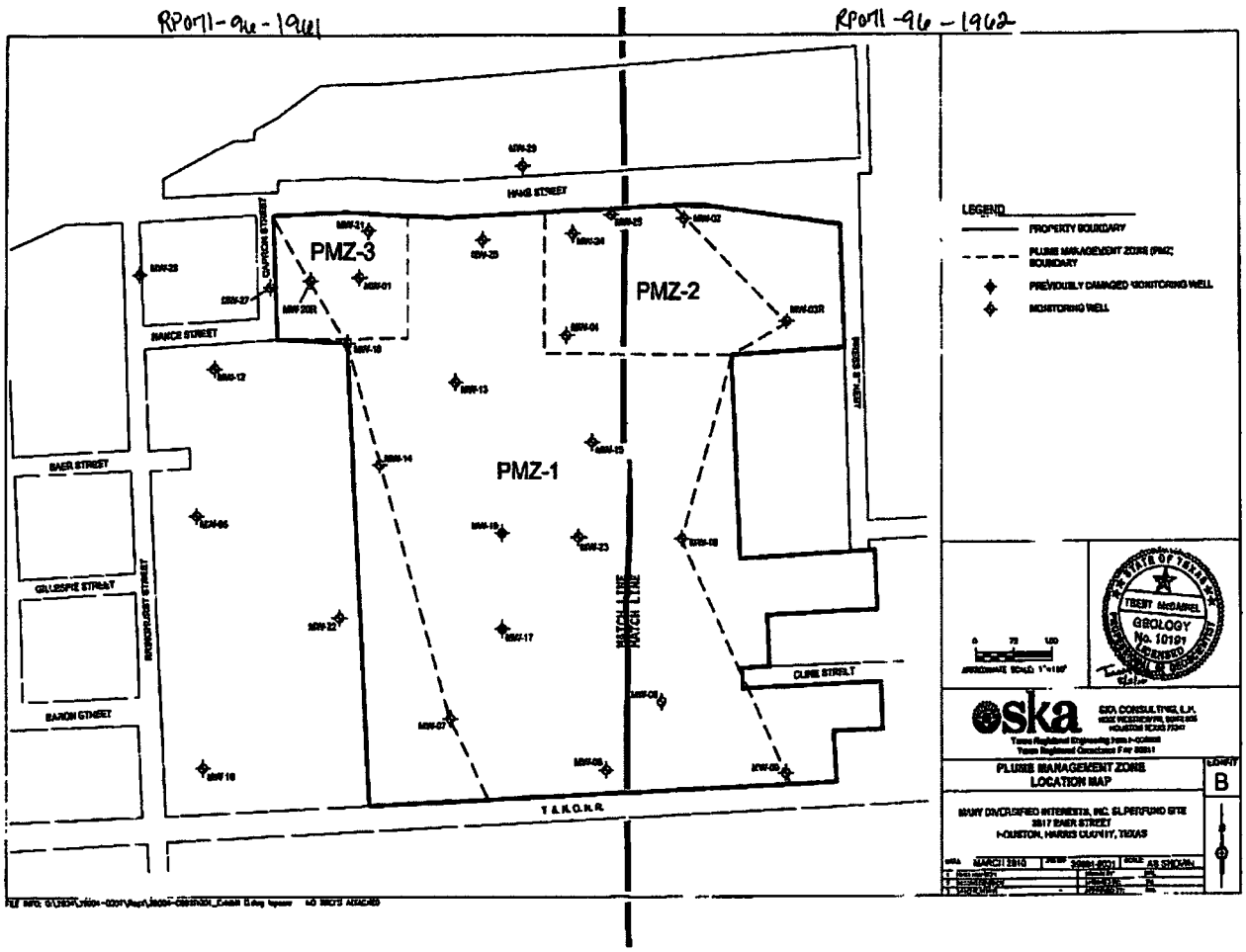


Exhibit "C"
Monitoring and Maintenance
TCEQ Superfund ID No. SUP042

The following monitoring and maintenance applies to the Property described in the attached exhibits where contamination has been released at the former Many Diversified Interests, Inc. site.

Monitoring

Chemicals of concern identified in the groundwater beneath the Property shall be monitored during the implementation of the Reponses Action pursuant to the Agreed Order on Consent and the Reponses Action Monitored Natural Attenuation (MNA) Plan. The groundwater shall be monitored on a quarterly basis for no less that two years after the groundwater plumes have been fully delineated, but the monitoring frequency may be reduced to a semiannual or annual basis upon the Environmental Protection Agency's (EPA's) determination that the contaminant levels are stable or decreasing. The reduced monitoring frequency shall apply until no earlier than the end of the fifth year following the full delineation of the groundwater plumes. Once contaminant levels have been demonstrated to be stable or decreasing, as determined by the EPA, and once the initial five-year monitoring period has ended, MNA monitoring shall be performed at 30 month intervals. The Groundwater Response Action shall be complete when EPA has determined that the groundwater-related Remedial Action has been fully performed and the concentrations of chemicals of concern in the groundwater have reached the cleanup levels established in the Record of Decision for the Property.

Maintenance

The purpose of this maintenance is to perform the activities necessary to protect the integrity of the groundwater remedy designed for the Property and to evaluate system performance. The operation and maintenance activities will be conducted for the Property pursuant to the Scope of Work of the Agreed Order on Consent and outlined in the Operations and Maintenance Manual for the Property. Operation and maintenance activities included normal operation and maintenance tasks and operation and maintenance tasks that will be required on an as needed basis.

These conditions may be modified or discontinued only when the TCEQ or its successor agencies have provided proper written consent and when such a document is filed in the same Real Property Records as those in which these conditions are filed.

RECORDER'S MEMORANDUM:
At the time of recordation, this instrument was found to be inadequate for the best photographic reproduction because of illegibility, carbon or photo copy, discolored paper, etc. All blackouts, additions and changes were present at the time the instrument was filed and recorded.

ANY PROVISION HEREIN WHICH RESTRICTS THE SALE, RENTAL, OR USE OF THE DESCRIBED REAL PROPERTY BECAUSE OF COLOR OR RACE IS INVALID AND UNENFORCEABLE UNDER FEDERAL LAW.
THE STATE OF TEXAS
COUNTY OF HARRIS
I hereby certify that this instrument was FILED in the number Sequence on the date and at the time stamped hereon by me; and was duly RECORDED, in the Official Public Records of Real Property of Harris County, Texas on

MAY 19 2010

COUNTY CLERK
HARRIS COUNTY, TEXAS

FILED
2010 MAY 19 AM 10 08

COUNTY CLERK
HARRIS COUNTY, TEXAS

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