BEFORE THE POLLUTION CONTROL BOARD
OF THE STATE OF ILLINOIS

MARINE BANK SPRINGFIELD TRUST #53-0051	)	
	)	
Petitioner,	)	
	)	
v.	)	PCB 2024-081
	)	(LUST Appeal)
ILLINOIS ENVIRONMENTAL	)	
PROTECTION AGENCY,	)	
Respondent.	)	

NOTICE

Don Brown, Clerk
Illinois Pollution Control Board
60 E. Van Buren St., Ste. 630
Chicago, IL 60605
don.brown@illinois.gov

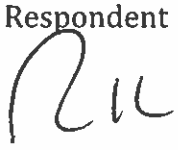
Carol Webb, Hearing Officer
Illinois Pollution Control Board
1021 North Grand Avenue East
P.O. Box 19274
Springfield, IL 62794-9274
carol.webb@illinois.gov

Patrick D. Shaw
Law Office of Patrick D. Shaw
80 Bellerive Road
Springfield, IL 62704
pdshaw1law@gmail.com

PLEASE TAKE NOTICE that I have today filed with the office of the Clerk of the Pollution Control Board an **APPEARANCE,** the **ADMINISTRATIVE RECORD,** and a **CERTIFICATE OF RECORD ON APPEAL,** copies of which are herewith served upon you.

Respectfully submitted,

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,
Respondent



Rich Kim
Assistant Counsel - Division of Legal Counsel
Special Assistant Attorney General
1021 North Grand Avenue, East
P.O. Box 19276
Springfield, Illinois 62794-9276
217/782-5544
866/273-5488 (TDD)
Dated: July 24, 2024

BEFORE THE POLLUTION CONTROL BOARD
OF THE STATE OF ILLINOIS

MARINE BANK SPRINGFIELD TRUST #53-0051	)	
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ILLINOIS ENVIRONMENTAL	)	
PROTECTION AGENCY,	)	
Respondent.	)	

APPEARANCE

The undersigned, as one of its attorneys, hereby enters his Appearance on behalf of the Respondent, the Illinois Environmental Protection Agency.

Respectfully submitted,

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,
Respondent

Rich Kim
Assistant Counsel - Division of Legal Counsel
Special Assistant Attorney General
1021 North Grand Avenue, East
P.O. Box 19276
Springfield, Illinois 62794-9276
217/782-5544
866/273-5488 (TDD)
richard.kim@illinois.gov
Dated: July 24, 2024

BEFORE THE POLLUTION CONTROL BOARD
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	)	
Petitioner,	)	
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ILLINOIS ENVIRONMENTAL	)	
PROTECTION AGENCY,	)	
Respondent.	)	

CERTIFICATE OF RECORD ON APPEAL

Pursuant to 35 Ill. Adm. Code 105.116(b) and 105.410, the following constitutes an index of documents comprising the record:

PAGES	DOCUMENT(S)	DATE
AR000001	Illinois HazMat Report	February 4, 2003
AR000002-AR000205	Corrective Action Plan & Budget	April 7, 2023
AR000206–AR000209	IEPA CAP/B response letter	August 1, 2023
AR000210-AR000424	Corrective Action Plan & Budget	February 2, 2024
AR000425-AR000430	IEPA Technical Review Notes	May 17, 2024
AR000431	Email received by IEPA	May 21-23, 2024
AR000432–AR000438	IEPA decision letter	May 28, 2024

I, Scott R. Rothering, certify on information and belief that the entire record of the Respondent's decision, as defined in 35 Ill. Adm. Code 105.410(b), is hereby enclosed.

By: 

Scott R. Rothering
Leaking Underground Storage Tank Section
Illinois Environmental Protection Agency

Date: 7/24/24

CERTIFICATE OF SERVICE

I, the undersigned attorney at law, hereby certify that on **July 24, 2024**, I served true and correct copies of an **APPEARANCE,** the **ADMINISTRATIVE RECORD,** and a **CERTIFICATE OF RECORD ON APPEAL,** via the Board's COOL system and email, upon the following named persons:

Don Brown, Clerk
Illinois Pollution Control Board
60 E. Van Buren St., Ste. 630
Chicago, IL 60605
Don.brown@illinois.gov

Carol Webb, Hearing Officer
Illinois Pollution Control Board
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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,
Respondent

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1670255005 - Sangamon RS
Marine Bank & Trust #530051
WST Tech

Incident

EM/2090
Incident Recorder

Illinois HazMat Report Incident #: H 20030135

Entered by Toni Watkins on 02/04 at 08:35

Incident Type: Illinois HazMat Report

Data Input Status: ( ) Open (●) Close

Incident Level: (●) Main Incident ( ) Sub-Incident

1. Caller: TOM MCNICHOLS	14. On Scene Contact: #1 On Scene Phone #: #2
2. Call back phone#: 217/726-0275	
3. Caller Represents: MARINE BANK, SPRINGFIELD TRUST # 530051	15. No. Injured: NONE Where Taken:
4. Type of Incident: LEAK OR SPILL	
5. Incident Location Street: 9520 STATE RT. 29 City: CANTRALL IN County: SANGAMON Milepost: Sec.: Twp.: Range:	16. Public health risks and/or precautions taken, including # evacuated: NONE 17. Assistance needed from State Agencies: NONE
6. Area Involved: FIXED FACILITY	
7. Material (s) Involved: GASOLINE Material Type: LIQUID CAS#: UNK UN/NA#: UNK Is this a 302 (a) Extremely Hazardous Substance? UNKNOWN Is this a RCRA Hazardous Waste? NO Is this a RCRA regulated facility? NO	18. Containment/cleanup actions and plans: CONTRACTOR HIRED CW3M COMPANY 19. Weather: NONE Temp.: deg. f/ Wind Dir. / Speed m.p.h.
8. Container: UNDERGROUND TANK Container Size: 3-500 GAL. 1-100 GAL.	20. Responsible Party: MARINE BANK, SPRINGFIELD, TRUST # 530051 Contact Person: #1 Phone #: #2 Mailing Address: 3050 WABASH AVE., SPRINGFIELD, IL 62704
9. Amount Released: UNK Rate of Release: /min.	
10. Cause of Release: UNK	
11. Estimated Spill Extent: UNK	Notifications: 0930 FAXED IEPA/SFM/REG.6/NRC
12. Occurred - Date: Time: Discovered - Date: 02/03/03 Time: 10:30	
13. Emergency Units Contacted - NONE Fire: - Police: - Sheriff: - ESDA: - Other -	On Scene - Fire: - Police: - Sheriff: - ESDA: - Other: -

RELEASABLE

FEB 10 2003

REVIEWER MD

CW M Company
Environmental Consulting Services

701 W. South Grand Avenue
Springfield, IL 62704

Phone: (217) 522-8001
Fax: (217) 522-8009

April 7, 2023

Mr. Scott Rothering, Project Manager
LUST Section, Bureau of Land
Illinois Environmental Protection Agency
1021 North Grand Avenue East
Springfield, Illinois 62794-9276

RE: LPC #1670255005—Sangamon County
Cantrall/Marine Bank Trust #53-0051
9520 Illinois State Route 29
Incident Number: 2003-0135
LUST Technical Reports—Corrective Action Plan and Budget Amendment

Dear Mr. Rothering:

On behalf of Marine Bank Trust #53-0051, the owner of the former underground storage tanks at the above-referenced site, we are submitting this proposed Amendment to the Corrective Action Plan (CAP) and Budget.

If you have any questions or require additional information, please contact Mr. Matthew Saladino or me at (217) 522-8001.

Sincerely,

Carol L. Rowe, P.G.
Senior Environmental Geologist

Enclosure

xc: Trust Officer, *Marine Bank Trust #53-0051*

CORRECTIVE ACTION PLAN & BUDGET AMENDMENT

MARINE BANK TRUST # 53-0051

CANTRALL, ILLINOIS
LPC # 1670255005— Sangamon County
Incident Number 2003-0135

Submitted to:
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
Leaking Underground Storage Tank Section, Bureau of Land
1021 North Grand Avenue East
Springfield, Illinois 62794-9276

Prepared by:
CW³M COMPANY, INC.

701 South Grand Avenue West
Springfield, Illinois
(217) 522-8001

400 West Jackson, Suite C
Marion, Illinois
(618) 997-2238

April 2023

TABLE OF CONTENTS

APPENDICES

TABLES

ACRONYMS AND ABBREVIATIONS

BETX	Benzene, Ethylbenzene, Toluene, Total Xylenes
bgs	Below Ground Surface
CAP	Corrective Action Plan
CUO	Clean-up Objective
CW^3M	CW^3M Company, Inc.
C_{sat}	Soil Saturation
ELUC	Environmental Land Use Controls
HAA	Highway Authority Agreement
IEMA	Illinois Emergency Management Agency
IEPA	Illinois Environmental Protection Agency
Ill. Adm. Code	Illinois Administrative Code
ISGS	Illinois State Geological Survey
ISWS	Illinois State Water Survey
LUST	Leaking Underground Storage Tank
mg/kg	Milligrams/kilograms
mg/L	Milligrams/Liter
MTBE	Methyl Tert-Butyl Ether
OSFM	Illinois Office of the State Fire Marshal
PID	Photoionization detector
PNA	Polynuclear Aromatic Hydrocarbon
PVC	Polyvinyl Chloride
ROW	Right-of-Way
SICR	Site Investigation Completion Report
SIP	Site Investigation Plan
SISR	Site Investigation Status Report
TACO	Tiered Approach to Corrective Action Objectives
USTs	Underground Storage Tanks
WCR	Well Completion Report

1. SITE HISTORY/EXECUTIVE SUMMARY

1.1 GENERAL

This proposed Corrective Action Plan (CAP) and Budget Amendment has been prepared in accordance with the requirements of the 35 Illinois Administrative Code (Ill. Adm. Code) 734. The Illinois Environmental Protection Agency (IEPA) Corrective Action Plan Form is included in this document as Appendix A.

Marine Bank Trust #53-0051, owner of the underground storage tanks (USTs) at 9520 Illinois State Route 29, Cantrall, Illinois, reported a release to the Illinois Emergency Management Agency (IEMA) and Incident Number 2003-0135 was assigned on February 4, 2003. The Marine Bank Trust Officer then requested that CW³M Company, Inc. (CW³M) proceed with the reporting and early action requirements of 415 ILCS 5/57-57.17.

The 20-Day Certification was submitted to the IEPA on February 5, 2003 (CW³M, 2003a). A 45-Day Report was submitted March 20, 2003 (CW³M, 2003b). An extension of the early action period through August 1, 2003 was approved by the IEPA on February 13, 2003 (IEPA, 2003a). A 45-Day Addendum Report was submitted to the IEPA on August 20, 2003 (CW³M, 2003c). The Site Investigation Plan (SIP) and Budget were prepared in accordance with the requirements of 415 ILCS 5/57-57.17 and submitted to the Agency on October 31, 2003 (CW³M, 2003d). The Agency approved the SIP with modifications on December 23, 2003 (IEPA, 2003b). On May 18, 2004, CW³M submitted a SIP Budget Amendment to the IEPA (CW³M, 2004a) and was approved by the Agency on June 7, 2004 (IEPA, 2004a). A Site Investigation Status Report (SISR) and budget was submitted to the IEPA on May 18, 2004 (CW³M, 2004b) and was approved by the Agency on June 7, 2004 (IEPA, 2004b).

A Site Investigation Completion Report (SICR) was submitted to the IEPA on April 8, 2005 (CW³M, 2005a) with additional information submitted on June 27, 2005 (CW³M, 2005b), which was denied by the Agency on August 29, 2005 (IEPA, 2005a). A revised SICR was submitted on September 14, 2005 (CW³M, 2005c) and was approved by the Agency on October 17, 2005 (IEPA, 2005b). A CAP and Budget was submitted on October 25, 2005 (CW³M, 2005d) and was denied by the Agency on February 21, 2006 (IEPA, 2006a). An Amended SIP Budget was submitted on November 2, 2005 (CW³M, 2005e) and was Approved by the Agency on December 2, 2005 (IEPA, 2005c). An amended SIP was submitted to the agency on February 28, 2006 (CW³M, 2006a) and was approved by the Agency on April 5, 2006 (IEPA, 2006b). A CAP and Budget was submitted on August 28, 2006 (CW³M, 2006b), which was rejected on October 23, 2006 (IEPA, 2006c). A response was submitted on November 17, 2006 (CW³M, 2006c) which was rejected on March 15, 2007 (IEPA, 2007). A CAP was submitted on November 14, 2008 (CW³M, 2008) and was approved by the Agency on March 10, 2009 (IEPA, 2009). A CAP and Budget Amendment was then submitted January 26, 2021 (CW³M, 2021) and was approved by the Agency on May 19, 2021 (IEPA, 2021).

The investigation was performed under the direction of an Illinois Licensed Professional Geologist and completed in accordance with the Professional Geologist Licensing Act and its Rules for Administration.

1.2 SITE LOCATION

The Marine Bank Trust #53-0051 property is located at 9520 Illinois State Route 29, Cantrall, Sangamon County, Illinois. The site is located in the SW ¼ of the SW ¼ of the NW ¼ of Section 9, Township 17 North of the Centralia Baseline, Range 5 West of the Third Principal Meridian. Site location maps are provided in Appendix B.

1.3 UNDERGROUND STORAGE TANK INFORMATION

A release was reported to the IEMA and Incident Number 2003-0135 was assigned to the notification. The Marine Bank Trust Officer then requested that CW³M proceed with the early action and reporting requirements of 415 ILCS 5/57-57.17.

On March 31, 2003, CW³M personnel were on site to initiate early action activities. Illinois Office of the State Fire Marshall (OSFM) Tank Specialist William Hurrelbrink was on site to supervise the removal of the USTs. The tanks were ventilated and the tanks and piping removed. A narrative of the tank removals and other Early Action activities was provided in the 45-Day Report Addendum (CW³M, 2003c).

Table 1-1. Underground Storage Tank Summary

Tank Number	Tank Volume (gallons)	Tank Contents	Incident Number	Release Information	Current Status
1	500	Gasoline	03-0135	Tank & Lines	Removed 3/31/03
2	1,000	Gasoline	03-0135	Tank & Lines	Removed 3/31/03
3	500	Diesel	03-0135	Tank & Lines	Removed 3/31/03
4	500	Used Oil	03-0135	Tank & Lines	Removed 3/31/03
5	150	Used Oil	03-0135	None	Removed 3/31/05

1.4 EARLY ACTION SUMMARY

During, and following, completion of the tank removal activities, transportation and disposal of contaminated backfill materials were conducted. CW³M Company personnel were on site through May 16, 2003 to complete early action activities.

Approximately 251.49 tons (128.27 cubic yards) of contaminated backfill materials was removed from the UST excavation and disposed of at Five Oaks Landfill in Taylorville, Illinois. Upon completion of the backfill removal, samples were collected along the walls of the excavation. The locations of the excavation samples are depicted in the April 8, 2005 SICR (CW³M, 2005a).

1.5 ADDITIONAL DRILLING

CW³M Company personnel were on site March 10, 2006 to complete the soil borings requested by the IEPA in its February 21, 2006 CAP and Budget rejection letter (IEPA 2006a). The five soil borings were advanced to further define and minimize the soil contamination plume. A table summarizing the results are included in Appendix G. The boring logs are included in Appendix F.

1.6 SITE INVESTIGATION SUMMARY

Gasoline, diesel fuel, and heating oil were released at this site; therefore, the soil was analyzed for the indicator contaminants benzene, ethylbenzene, toluene and total xylenes (BETX), methyl tert-butyl ether (MTBE) and polynuclear aromatic hydrocarbons (PNAs). Soil analytical results indicate that the Tiered Approach to Corrective Action Objectives (TACO) Tier I Residential Clean-Up Objectives (CUOs) were exceeded at the western property boundary for benzene, ethylbenzene, and naphthalene. It was determined the contamination did not exist on the adjacent property. As a result, the soil contamination plume was defined.

Groundwater analytical results indicate that groundwater contamination at the south, east, and west property boundaries have exceeded the Class I Groundwater CUOs. Groundwater analytical results depict the groundwater plume to not migrate onto the Cantrall Elementary School property to the west, the Village Park to the southwest, nor past the wells installed on the Lawson property to the south. As a result, the plume of contaminated groundwater has been defined.

1.6 CORRECTIVE ACTION EXECUTIVE SUMMARY

The result of corrective action activities to date indicate that the soil contamination plume has been further defined to remain on site. Previously, soil contamination was shown to migrate west into the Right-of-Way (ROW) of IL Route 29, but not onto off-site properties. Due to the length of time since site investigation took place, additional sampling was proposed to see if natural attenuation occurred from the release. The results confirmed that contamination along the site's property boundaries was below CUOs, therefore removing the need for a Highway Authority Agreement (HAA). A map depicting the soil contamination plume is included in Appendix B as Drawing 0003B

The results of site investigations and corrective action activities indicate that groundwater contamination is present on and off-site. The groundwater contamination plume is defined to remain onsite to the north. The groundwater plume is also defined off-site to the south into the ROW of Claypool Street, west into the ROW of IL Route 29, and east on into a neighboring property. The groundwater plume was demonstrated to not migrate onto the property to the west or to the south. A map depicting the groundwater contamination plume is included in Appendix B as Drawing 0004B. Well Completion Reports (WCRs) and soil boring logs are included in Appendix F for the corrective action activities. Analytical results are included in Appendix G

2. REMEDIATION OBJECTIVES

2.1 DETERMINATION OF CLEAN-UP OBJECTIVES

In accordance with 35 Ill. Adm. Code 734.410, remediation objectives were determined in accordance with 35 Ill. Adm. Code § 742. The site-specific physical parameters were determined as the following:

Hydraulic Conductivity (K): $1.17 * 10^{-4}$
Soil bulk density (ρ_b): 2.25 g/cm^3
Soil particle density (ρ_s): 2.65 g/cm^3
Moisture content (w): 0.195
Organic carbon content (f_{oc}): 0.000391

In order to determine the hydraulic conductivity, a slug test was performed. The test was performed by lowering a "slug" constructed of polyvinyl chloride (PVC) into a monitoring well. When the slug is lowered into the well, the groundwater is displaced by the volume of the slug. As the water within the well equilibrates, water depth changes are recorded in relation to the time interval that has passed since the test was initiated.

The hydraulic conductivity calculations are based on the total well depth, screen length and radius, initial water depth, and the water depth change over time. The depth-to-water changes over time were plotted on a semi-logarithmic graph and the curve was evaluated. The slope of the straight-line portion of the curve, along with the other slug test data, is used to calculate the hydraulic conductivity.

The remaining four parameters are determined by laboratory analysis of a soil sample, which was collected during drilling activities. Samples were collected in accordance with 35 Ill. Adm. Code 742. Analytical results were provided in the SICR (CW³M, 2005c).

It is due to note that correspondence was established with the Agency on the unusual results of the soil bulk density and soil particle density from the collected site-specific geotechnical sample. The unusually high value for the soil bulk density led to the use of the lowest default value for bulk density in the previous TACO calculations at 1.5 g/cm^3.

In addition, two monitoring wells/groundwater elevations were used for the hydraulic gradient within previous TACO calculations. This CAP has revised the calculations to include multiple points for the calculations. The hydraulic gradient of 0.06188 was found by using the IEPA provided calculator found at https://www3.epa.gov/ceampubl/learn2model/part-two/onsite/gradient4plus-ns.html, accessed on January 18, 2023. This calculation for the hydraulic gradient is referenced in Appendix E of this report.

2.2 SOIL AND GROUNDWATER OBJECTIVES

Soil analytical results were compared to the TACO Residential Tier 1 and current TACO Industrial/Commercial Tier 2 CUOs with the soil to groundwater pathway removed in milligrams per kilogram (parts per million) (mg/kg). The calculations of the Tier 2 CUOs are included in Appendix E of this CAP.

Table 2-1. Soil Remediation Objectives

Parameter	TACO Residential Tier 1 CUOs (mg/kg)	TACO Industrial/Commercial Tier 2 CUOs (mg/kg)
Benzene	0.03	3.95
Ethylbenzene	13.0	58.0
Toluene	12.0	440.01
Total Xylenes	5.6	59.95
MTBE	0.32	382.29
Acenaphthene	570	-
Acenaphytylene	30	-
Anthracene	12,000	-
Benzo(a)anthracene	0.9	-
Benzo(a)pyrene	0.09	-
Benzo(b)fluoranthene	0.9	-
Benzo(g,h,i)perylene	160	-
Benzo(k)fluoranthene	9.0	-
Chrysene	88.0	-
Dibenz(a,h)anthracene	0.09	-
Fluoranthene	3,100	-
Fluorene	560	-
Indeno(1,2,3-cd)pyrene	0.9	-
Naphthalene	1.8	2.00
Phenanthrene	280	-
Pyrene	2,300	-

CW³M will consider the groundwater at this site to be Class I unless demonstrated otherwise pursuant to 35 Ill. Adm. Code § 620.210. According to the Illinois Pollution Control Board, three Class III Groundwater contributing areas exist; however, they are located in McHenry, Monroe and St. Clair Counties in northern and western Illinois. Groundwater investigation sample results would be compared to the TACO Residential Tier 1 CUOs in milligrams per liter (mg/L).

Table 2-2. Groundwater Remediation Objectives

Parameter	TACO Residential Tier 1 CUOs (mg/L)
Benzene	0.005
Ethylbenzene	0.7
Toluene	1.0
Total Xylenes	10.0
MTBE	0.07
Acenaphthene	0.42
Acenaphtylene	0.01
Anthracene	2.1
Benzo(a)anthracene	0.00013
Benzo(a)pyrene	0.0002
Benzo(b)fluoranthene	0.00018
Benzo(g,h,i)perylene	0.00076
Benzo(k)fluoranthene	0.00017
Chrysene	0.0015
Dibenz(a,h)anthracene	0.0003
Fluoranthene	0.28
Fluorene	0.28
Indeno(1,2,3-cd)pyrene	0.00043
Naphthalene	0.14
Phenanthrene	0.0064
Pyrene	0.210

3. CORRECTIVE ACTION PLAN

Based upon the analytical data from the soil and groundwater samples collected to date, it is apparent that soil contamination exceeding various CUOs for multiple indicator contaminants remains from the release. Additionally, groundwater contamination for multiple indicator contaminants remains from the release. Site investigation details were presented in the SICR (CW³M, 2005c).

The following CAP and Budget has been prepared by CW³M Company, Inc., as their recommendation for the most appropriate approach to the remediation of the contamination at the Marine Bank Trust #53-0051 site in Cantrall, Illinois. Following the most recent corrective action activities, it was determined that soil contamination plume remains on site. The soil contamination present from the release exceeds both the current TACO Tier 2 Industrial/Commercial CUOs and the TACO Tier 1 Soil Saturation (C_{sat}) limits. Additionally, it is apparent that the groundwater contamination plume exists on and off-site, but is defined. This plan proposes additional soil borings to further define the above soil exceedances.

The sample location, SB-15, exceeding Tier 1 C_{sat} CUOs has not been fully vertically defined. Following a technical bulletin from the Agency, these Tier 1 C_{sat} exceedances must be fully defined prior to exclusion of any exposure route. SB-15 was previously collected within the 5-10 foot interval, with the groundwater table being encountered at a depth of approximately 9 feet below ground surface (bgs). Therefore, one additional boring is proposed at the location of SB-15 to a depth of 20 feet bgs. Soil samples will be collected within the 10-15 foot and 15-20 foot intervals for BETX, MTBE, and PNA analysis for a total of two (2) soil samples. If it is determined that contamination continues beyond 20 feet bgs, drilling will continue at greater depths with additional soil samples within each 5-foot interval until contamination is no longer present by visual or olfactory detection.

It is also proposed to collect an additional site-specific geotechnical soil sample while on site. As stated in the March 15, 2007 denial letter, the values generated for the site-specific physical parameters fails to meet requirements. Specifically, the soil bulk density and soil particle density did not meet requirements in accordance with 35 Ill. Adm. Code 742 (IEPA, 2007). The proposed soil boring will be advanced adjacent to a clean soil boring, SB-11. The sample will be collected at approximately 7 feet bgs and analyzed for site specific physical parameters. The TACO calculations will be updated to reflect site specific conditions once the analytical results return.

The incident currently depicts SB-7 with a concentration of benzene at 16.3 mg/kg. This concentration exceeds the present TACO Tier 2 Industrial/Commercial CUOs for benzene of 3.95 mg/kg. While the values of the TACO Tier 2 CUOs will change from the proposed resampling of the geotechnical sample, it is believed that SB-7 will still exceed TACO Tier 2 CUOs for benzene and will require additional remediation efforts. It is expected the contamination at SB-7 will need to be addressed by an engineered barrier. Therefore, three

(3) soil borings are proposed to potentially define and minimize the area requiring an engineered barrier surrounding SB-7. Samples will be collected in both the 0-5-foot and 5-10-foot interval above the groundwater table. A total of six (6) soil samples will be collected and analyzed for BETX, MTBE, and PNAs. The locations of the proposed soil borings are shown on Drawing 0007 in Appendix B. These borings will potentially reduce future costs by removing the need for a following CAP and Budget with a drilling minimum for these proposed samples.

Following IEPA's Leaking Underground Storage Tank (LUST) flowchart for vapor intrusion assessment, a vapor intrusion sampling will be required for this incident. Therefore, one vapor intrusion boring will be advanced at the location of highest contamination, SB-7, to a depth of 5 feet bgs. The soil-gas vapor results obtained will be compared to 35 Ill. Adm. Code 742 Appendix B, Table H to determine if further restrictions or remediation is required. A map showing the location of the proposed vapor intrusion boring is included in Appendix B as Drawing 0007.

Considering the current soil-to-groundwater and groundwater migration modeling, it is expected that the site will require Environmental Land Use Controls (ELUCs) from offsite properties. A groundwater ordinance may not be feasible for this site due to the location of the property being outside the village limits of Cantrall. It was discussed with Ted Stead, village president, that any of the properties east of Route 29 are not considered within the jurisdiction of the Village of Cantrall. It has been shown through current R-26 migration modeling that the groundwater contamination has a potential to migrate up to 329 feet east from the site. These modeling distances will be reevaluated after the proposed resampling for site specific properties.

In summary, this plan proposes:

- Re-drilling SB-15 to a depth of 20 feet with soil samples in the 10-15 and 15-20 foot intervals. Additional drilling will continue past 20 feet bgs if contamination exists at greater depths.
    - Two (2) soil samples will be analyzed for BETX, MTBE, and PNAs.
- One (1) site-specific geotechnical soil sample will be collected as per the Agency's request adjacent to SB-11.
    - One sample will be analyzed for site-specific physical parameters
- Three (3) new soil borings will be advanced surrounding soil boring location SB-7 to delineate the impending engineered barrier. These borings will be drilled to a depth of 10 feet bgs.
    - Six (6) soil samples will be analyzed for BETX, MTBE, and PNAs.
- One (1) vapor intrusion boring will be advanced to a depth of 5 feet bgs at SB-7.
    - One soil-gas vapor sample will be collected and analyzed.
- TACO calculations will be updated after analytical results return.

3.1 DRILLING METHOD

Five-foot continuous samplers are used to advance and characterize each boring. This method was selected to minimize the likelihood of gaps in the sample column. Augers were and will continue to be decontaminated with a pressure steam wash between borings to prevent cross-contamination. Soil boring logs have been and will continue to be prepared for all soil borings.

3.2 SOIL SAMPLING PROTOCOL

All samples are collected utilizing proper sampling protocol. Samplers wear new, disposable, latex gloves for each sampling event. Samples are collected from each five-foot interval from the area most contaminated; if an area of highest contamination cannot be determined or no apparent contamination is distinguished, samples are collected at the center of each five-foot sample tube. Each of the samples from the continuous sampler is screened using a photoionization detector (PID). Samples will be collected approximately every 2-3 feet and placed in sealed containers to record PID readings. This method provides the most reliable results as the samples are discrete. There is no interference with other depths and assurance that the meter zeroes out prior to reading the next sample, all while the core is left open to air. Proper sampling, decontamination and chain-of-custody procedures were employed. The sample containers were filled, labeled, and kept cool (to 6° C or below) until shipment to the laboratory for BETX, MTBE, PNA analysis. Sample descriptions were recorded on the boring log prepared for each boring. All soil samples will be analyzed by an accredited laboratory using test methods identified under 35 Ill. Adm. Code 186.180. As required by the LUST Section, Laboratory Certifications for Chemical Analyses accompanies each of the appropriate sample results that have been reported.

3.3 CURRENT AND PROJECTED USES OF THE SITE

The site is surrounded by an elementary school, residential, light commercial and agricultural properties. No detailed future plans exist for the property following its remediation.

3.4 INSTITUTIONAL CONTROLS PROPOSED

At this time, no institutional controls are being proposed until after all corrective action activities are completed. It is known that the site currently requires groundwater use restrictions, concrete replacement, engineered barriers, and construction worker inhalation caution areas. The size of those institutional controls may be determined following the proposed sampling from this CAP.

3.5 WATER SUPPLY WELL SURVEY

A survey of water supply wells for the purpose of identifying and locating all community water supply wells within 2,500 feet of the UST systems and all potable water supply wells within 200 feet of the UST systems was conducted. The Illinois State Geological Survey (ISGS), Illinois State Water Survey (ISWS) and the IEPA Division of Public Water Supplies data was accessed online on July 20, 2006 to update the original well survey based on the full extents of the plume.

The review indicated that twelve potable wells are located within 2,500 feet of the site. However, they are not located within the setback zone. Also, the review revealed that there are no community water supply wells located within 2,500 feet of the site. The IEPA was accessed online on July 20, 2006, to determine if there is a local ordinance or policy regulating the usage of potable water supply wells for the Village of Cantrall. There is no ordinance in effect. All wells found within 2,500 feet of the contaminant plume are listed in Table 3-2 below.

Table 3-1. Water Supply Well Information

Well ID	Type	Distance From Site (*feet*)	Setback Zone (*feet*)
*00210	ISGS	362	200
00565	ISGS	1,024	200
24621	ISGS	1,135	200
22982	ISGS	2,420	200
24639	ISGS	2,016	200
25029	ISGS	2,016	200
22498	ISGS	1,056	200
22472	ISGS	2,358	200
22983	ISGS	427	200
22430	ISGS	2,358	200
22984	ISGS	1,697	200
24431	ISGS	378	200

*The well ISGS has identified as 00210 belongs to the Athens Community Unit School District, Cantrall Elementary School. Cantrall Elementary School was contacted on June 10, 2003, and the school stated that they no longer use this well and currently obtain the village's water.

3.6 CLOSURE

Once the proposed sampling is completed, a CAP and Budget Amendment will be submitted to the IEPA detailing the results of the investigation. The CAP and Budget Amendment will contain results of the soil sampling, updated TACO calculations, updated CUOs, and the costs associated with addressing any TACO Tier 2 exceedances. This CAP and Budget Amendment will be accompanied by a certification from an Illinois Registered Professional Engineer.

4. REFERENCES

CW³M, 2003a. CW³M Company, Inc., *20-Day Certification,* Marine Bank Trust #53-0051, Cantrall, Illinois, February 5, 2003.

CW³M, 2003b. CW³M Company, Inc., *45-Day Report,* Marine Bank Trust #53-0051, Cantrall, Illinois, March 20, 2003.

CW³M, 2003c. CW³M Company, Inc., *45-Day Report Addendum,* Marine Bank Trust #53-0051, Cantrall, Illinois, August 20, 2003.

CW³M, 2003d. CW³M Company, Inc., *Site Investigation Plan and Budget,* Marine Bank Trust #53-0051, Cantrall, Illinois, October 31, 2003.

CW³M, 2004a. CW³M Company, Inc., *Site Investigation Plan and Budget Amendment,* Marine Bank Trust #53-0051, Cantrall, Illinois, May 18, 2004.

CW³M, 2004b. CW³M Company, Inc., *Site Investigation Status Report,* Marine Bank Trust #53-0051, Cantrall, Illinois, May 18, 2004.

CW³M, 2005a. CW³M Company, Inc., *Site Investigation Completion Report,* Marine Bank Trust #53-0051, Cantrall, Illinois, April 8, 2005.

CW³M, 2005b. CW³M Company, Inc., *Site Investigation Completion Report,* Marine Bank Trust #53-0051, Cantrall, Illinois, June 27, 2005.

CW³M, 2005c. CW³M Company, Inc., *Site Investigation Completion Report,* Marine Bank Trust #53-0051, Cantrall, Illinois, September 14, 2005.

CW³M, 2005d. CW³M Company, Inc., *Corrective Action Plan and Budget,* Marine Bank Trust #53-0051, Cantrall, Illinois, October 25, 2005.

CW³M, 2005e. CW³M Company, Inc., *Amended Site Investigation Plan Budget,* Marine Bank Trust #53-0051, Cantrall, Illinois, November 2, 2005.

CW³M, 2006a. CW³M Company, Inc., *Site Investigation Plan and Budget Amendment,* Marine Bank Trust #53-0051, Cantrall, Illinois, February 28, 2006.

CW³M, 2006b. CW³M Company, Inc., *Corrective Action Plan and Budget,* Marine Bank Trust #53-0051, Cantrall, Illinois, August 28, 2006.

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CW³M, 2008. CW³M Company, Inc., *Corrective Action Plan,* Marine Bank Trust #53-0051, Cantrall, Illinois, November 14, 2008.

CW³M, 2021. CW³M Company, Inc., *Corrective Action Plan and Budget,* Marine Bank Trust #53-0051, Cantrall, Illinois, January 26, 2021.

EPA.GOV, 2022. EPA on-Line Tools for SITE Assessment Calculation. EPA, Environmental Protection Agency, January 18, 2023, https://www3.epa.gov/ceampubl/learn2model/part-two/onsite/gradient4plus-ns.html.

IEPA, 2003a. Illinois Environmental Protection Agency, *20-Day Certification Correspondence,* Marine Bank Trust #53-0051, Cantrall, Illinois, February 13, 2003.

IEPA, 2003b. Illinois Environmental Protection Agency, *Site Investigation Plan and Budget Correspondence,* Marine Bank Trust #53-0051, Cantrall, Illinois, December 23, 2003.

IEPA, 2004a. Illinois Environmental Protection Agency, *Site Investigation Plan and Budget Correspondence,* Marine Bank Trust #53, Cantrall, Illinois, June 7, 2004.

IEPA, 2004b. Illinois Environmental Protection Agency, *Site Investigation Status Report and Budget Correspondence,* Marine Bank Trust #53-0051, Cantrall, Illinois, June 7, 2004.

IEPA, 2005a. Illinois Environmental Protection Agency, *Site Investigation Completion Report and Budget Correspondence,* Marine Bank Trust #53-0051, Cantrall, Illinois, August 29, 2005.

IEPA, 2005b. Illinois Environmental Protection Agency, *Site Investigation Completion Report and Budget Correspondence,* Marine Bank Trust #53-0051, Cantrall, Illinois, October 17, 2005.

IEPA, 2005c. Illinois Environmental Protection Agency, *Amended Site Investigation Plan Budget Correspondence,* Marine Bank Trust #53-0051, Cantrall, Illinois, December 2, 2005.

IEPA, 2006a. Illinois Environmental Protection Agency, *Corrective Action Plan and Budget Correspondence,* Marine Bank Trust #53-0051, Cantrall, Illinois, February 21, 2006.

IEPA, 2006b. Illinois Environmental Protection Agency, *Site Investigation Plan and Budget Correspondence,* Marine Bank Trust #53-0051, Cantrall, Illinois, April 5, 2006.

IEPA, 2006c. Illinois Environmental Protection Agency, *Corrective Action Plan and Budget Correspondence,* Marine Bank Trust #53-0051, Cantrall, Illinois, October 23, 2006.

IEPA, 2007. Illinois Environmental Protection Agency, *Corrective Action Plan and Budget Correspondence,* Marine Bank Trust #53-0051, Cantrall, Illinois, March 15, 2007.

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IEPA, 2021. Illinois Environmental Protection Agency, *Corrective Action Plan Correspondence,* Marine Bank Trust #53-0051, Cantrall, Illinois, May 19, 2021.

APPENDIX A

CORRECTIVE ACTION PLAN FORM

CORRECTIVE ACTION PLAN AND BUDGET AMENDMENT

MARINE BANK TRUST # 53-0051
CANTRALL, ILLINOIS

Illinois Environmental Protection Agency

1021 North Grand Avenue East • P.O. Box 19276 • Springfield • Illinois • 62794-9276 • (217) 782-3397

Leaking Underground Storage Tank Program
Corrective Action Plan

A. Site Identification

IEMA Incident # (6- or 8-digit): 20030135 IEPA LPC# (10-digit): 1670255005

Site Name: Marine Bank Trust #53-0051

Site Address (Not a P.O. Box): 9520 Illinois State Route 29

City: Cantrall County: Sangamon ZIP Code: 62625

B. Site Information

1. Will the owner or operator seek reimbursement from the Underground Storage Tank Fund? ☑ Yes ○ No
2. If yes, is the budget attached? ☑ Yes ○ No
3. Is this an amended plan? ☑ Yes ○ No
4. Identify the material(s) released: Gasoline, Diesel, and Used Oil
5. This Corrective Action Plan is submitted pursuant to:
   - ○ a. 35 Ill. Adm. Code 731.166
   - ○ b. 35 Ill. Adm. Code 732.404
   - ☑ c. 35 Ill. Adm. Code 734.335

C. Proposed Methods of Remediation

1. Soil TBD
2. Groundwater TBD

D. Soil and Groundwater Investigation Results

(for incidents subject to 35 Ill. Adm. Code 731 only or 732 that were classified using Method One or Two, if not previously provided)

Provide the following:

1. Description of investigation activities performed to define the extents of soil and/or groundwater contamination;
2. Analytical results, chain-of-custody forms, and laboratory certifications;
3. Tables comparing analytical results to applicable remediation objectives;

4. Boring logs;
5. Monitoring well logs; and
6. Site maps meeting the requirements of 35 Ill. Adm. Code 732.110(a) or 734.440 and showing:
    a. Soil sample locations;
    b. Monitoring well locations; and
    c. Plumes of soil and groundwater contamination.

E. Technical Information - Corrective Action Plan

Provide the following:

1. Executive summary identifying the objectives of the corrective action plan and the technical approach to be utilized to meet such objectives;
    a. The major components (e.g., treatment, containment, removal) of the corrective action plan;
    b. The scope of the problems to be addressed by the proposed corrective action; and
    c. A schedule for implementation and completion of the plan;
2. Identification of the remediation objectives proposed for the site;
3. A description of the remedial technologies selected:
    a. The feasibility of implementing the remedial technologies;
    b. Whether the remedial technologies will perform satisfactorily and reliably until the remediation objectives are achieved; and
    c. A schedule of when the technologies are expected to achieve the applicable remediation objectives;
4. A confirmation sampling plan that describes how the effectiveness of the corrective action activities will be monitored during their implementation and after their completion;
5. A description of the current and projected future uses of the site;
6. A description of engineered barriers or institutional controls that will be relied upon to achieve remediation objectives:
    a. an assessment of their long-term reliability;
    b. operating and maintenance plans;
    c. maps showing area covered by barriers and institutional controls;
    d. copies of the complete application(s) for planned Highway Authority Agreement(s); and
    e. draft groundwater ordinance(s) and Environmental Land Use Controls.
7. The water supply well survey:
    a. Map(s) showing locations of community water supply wells and other potable wells and the setback zone for each well;
    b. Map(s) showing regulated recharge areas and wellhead protection areas;
    c. Map(s) showing the current extent of groundwater contamination exceeding the most stringent Tier 1 remediation objectives;
    d. Map(s) showing the modeled extent of groundwater contamination exceeding the most stringent Tier 1 remediation objectives;
    e. Tables listing the setback zone for each community water supply well and other potable water supply wells;
    f. A narrative identifying each entity contacted to identify potable water supply wells, the name and title of each person contacted, and any field observations associated with any wells identified; and
    g. A certification from a Licensed Professional Engineer or Licensed Professional Geologist that the survey was conducted in accordance with the requirements and that documentation submitted includes information obtained as a result of the survey (certification of this plan satisfies this requirement);

8. Appendices:
    a. References and data sources report that are organized; and
    b. Field logs, well logs, and reports of laboratory analyses;
9. Site map(s) meeting the requirements of 35 Ill. Adm. Code 732.110(a) or 734.440;
10. Engineering design specifications, diagrams, schematics, calculations, manufacturer's specifications, etc.;
11. A description of bench/pilot studies;
12. Cost comparison between proposed method of remediation and other methods of remediation;
13. For the proposed Tier 2 or 3 remediation objectives, provide the following:
    a. The equations used;
    b. A discussion of how input variables were determined;
    c. Map(s) depicting distances used in equations; and
    d. Calculations; and
14. Provide documentation to demonstrate the following for alternative technologies:
    a. The proposed alternative technology has a substantial likelihood of successfully achieving compliance with all applicable regulations and remediation objectives;
    b. The proposed alternative technology will not adversely affect human health and safety or the environment;
    c. The owner or operator will obtain all Illinois EPA permits necessary to legally authorize use of the alternative technology;
    d. The owner or operator will implement a program to monitor whether the requirements of subsection (14)(a) have been met;
    e. Within one year from the date of Illinois EPA approval, the owner or operator will provide to the Illinois EPA monitoring program results establishing whether the proposed alternative technology will successfully achieve compliance with the requirements of subsection (14)(a); and
    f. Demonstration that the cost of alternative technology will not exceed the cost of conventional technology and is not substantially higher than at least two other alternative technologies, if available and technically feasible.

F. Exposure Pathway Exclusion

Provide the following:

1. A description of the tests to be performed in determining whether the following requirements will be met:
    a. Attenuation capacity of the soil will not be exceeded for any of the organic contaminants;
    b. Soil saturation limit will not be exceeded for any of the organic contaminants;
    c. Contaminated soils do not exhibit any of the reactivity characteristics of hazardous waste per 35 Ill. Adm. Code 721.123;
    d. Contaminated soils do not exhibit a pH $\leq$ 2.0 or $\geq$ 12.5; and
    e. Contaminated soils which contain arsenic, barium, cadmium, chromium, lead, mercury, or selenium (or their associated salts) do not exhibit any of the toxicity characteristics of hazardous waste per 35 Ill. Adm. Code 721.124.
2. A discussion of how any exposure pathways are to be excluded.

G. Signatures

All plans, budgets, and reports must be signed by the owner or operator and list the owner's or operator's full name, address, and telephone number.

UST Owner or Operator

Name Marine Bank Trust #53-0051
Contact Trust Dept.
Address 3050 West Wabash
City Springfield
State Illinois
Zip Code 62707
Phone 217-726-0600
Email trust@ibankmarine.com
Signature Cathy L. Overstreet, T.O
Date 3/16/23

Consultant

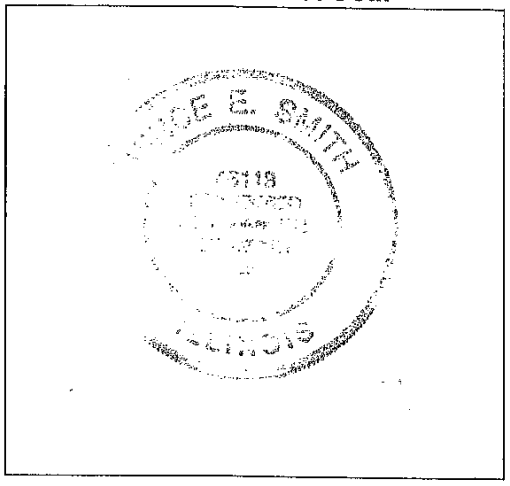
Company CWM Company, Inc.
Contact Carol Rowe
Address 701 South Grand Avenue West
City Springfield
State Illinois
Zip Code 62704
Phone 217-522-8001
Email cwm@cwmcompany.com
Signature
Date April 6, 2023

I certify under penalty of law that all activities that are the subject of this plan were conducted under my supervision or were conducted under the supervision of another Licensed Professional Engineer or Licensed Professional Geologist and reviewed by me; that this plan and all attachments were prepared under my supervision; that, to the best of my knowledge and belief, the work described in this plan has been completed in accordance with the Environmental Protection Act [415 ILCS 5], 35 Ill. Adm. Code 731, 732 or 734, and generally accepted standards and practices of my profession; and that the information presented is accurate and complete. I am aware there are significant penalties for submitting false statements or representations to the Illinois EPA, including but not limited to fines, imprisonment, or both as provided in Sections 44 and 57.17 of the Environmental Protection Act [415 ILCS 5/44 and 57.17].

Licensed Professional Engineer or Geologist

Name Vince E. Smith
Company CWM Company, Inc.
Address 701 South Grand Ave. West
City Springfield
State Illinois
Zip Code 62704
Phone 217-522-8001
Ill. Registration No. 062-046118
License Expiration Date 11/30/23
Signature
Date 4/6/23

L.P.E. or L.P.G. Seal



APPENDIX B

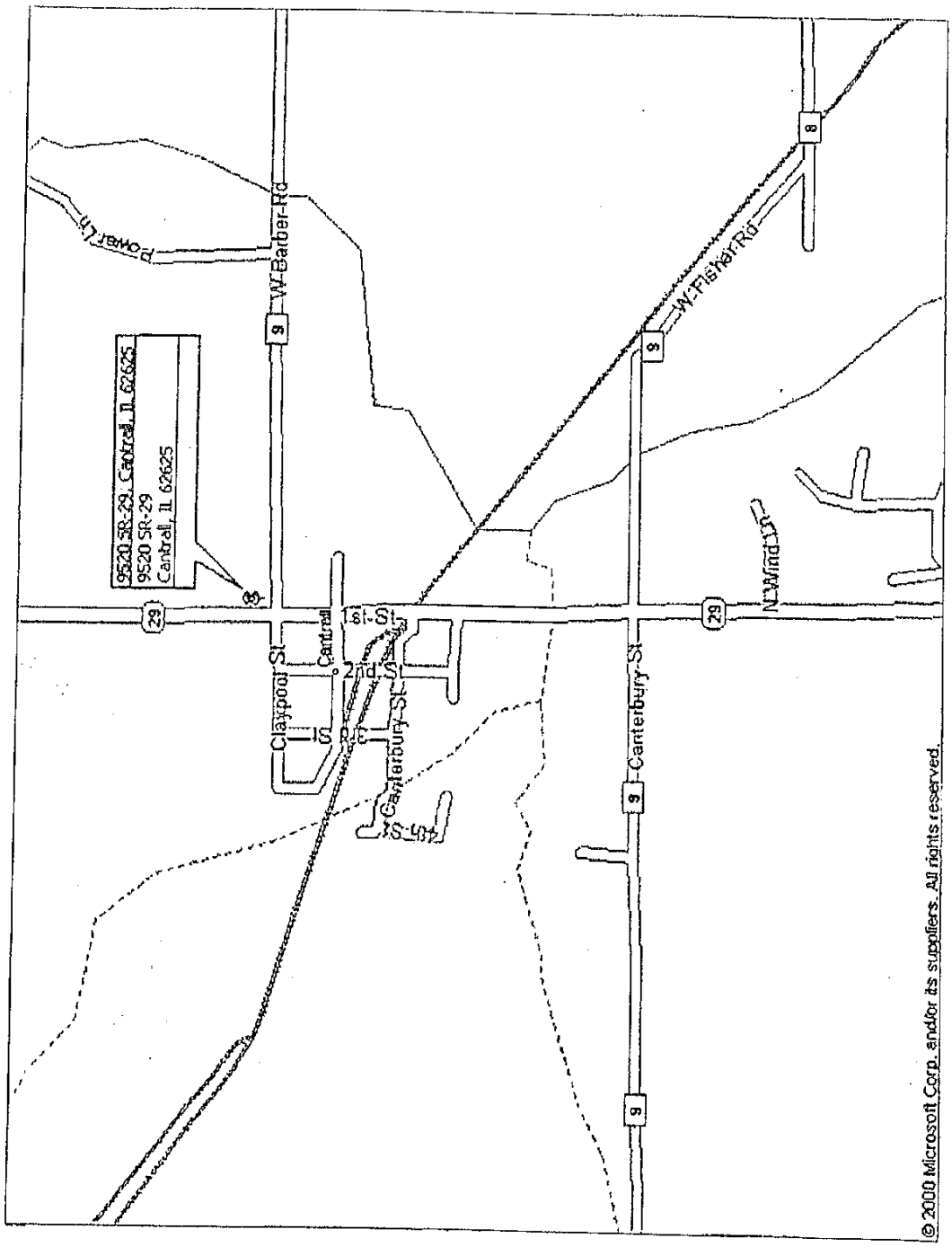
SITE MAPS AND ILLUSTRATIONS

CORRECTIVE ACTION PLAN AND BUDGET AMENDMENT

MARINE BANK TRUST # 53-0051
CANTRALL, ILLINOIS

INDEX OF DRAWINGS

Drawing Number	Description	File Name
0001	Site Location Map	Site1.vsd
0001A	Topographic Map	topo.vsd
0002	Site Map	Site.dwg
0003A	Soil Boring Location and Values Map	SBLocVal.dwg
0003B	Soil Contamination Plume Map	SPlume.dwg
0004A	Monitoring Well Locations and GW Values Map	MWLoc-GWVal.dwg
0004B	Groundwater Contamination Plume Map	GWPlume.dwg
0005	Groundwater Flow Map	GWFlow09-21.dwg
0006A	R-26 Modeling Map	R-26.dwg
0006B	R-26 Modeling Map (close)	R-26close.dwg
0007	Proposed Soil Boring Location Map	PSB.dwg

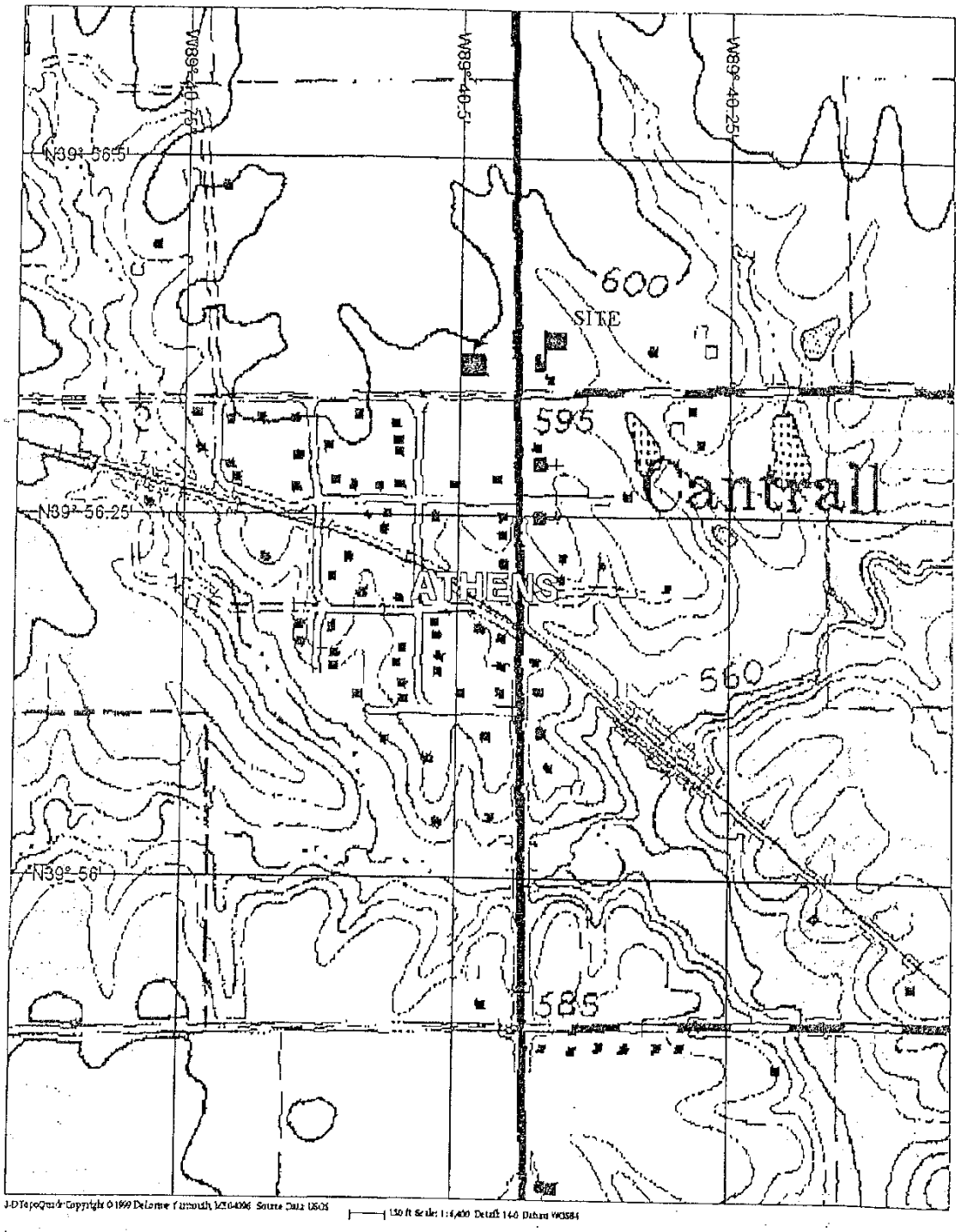


Site1.vsd
Drawing 0001

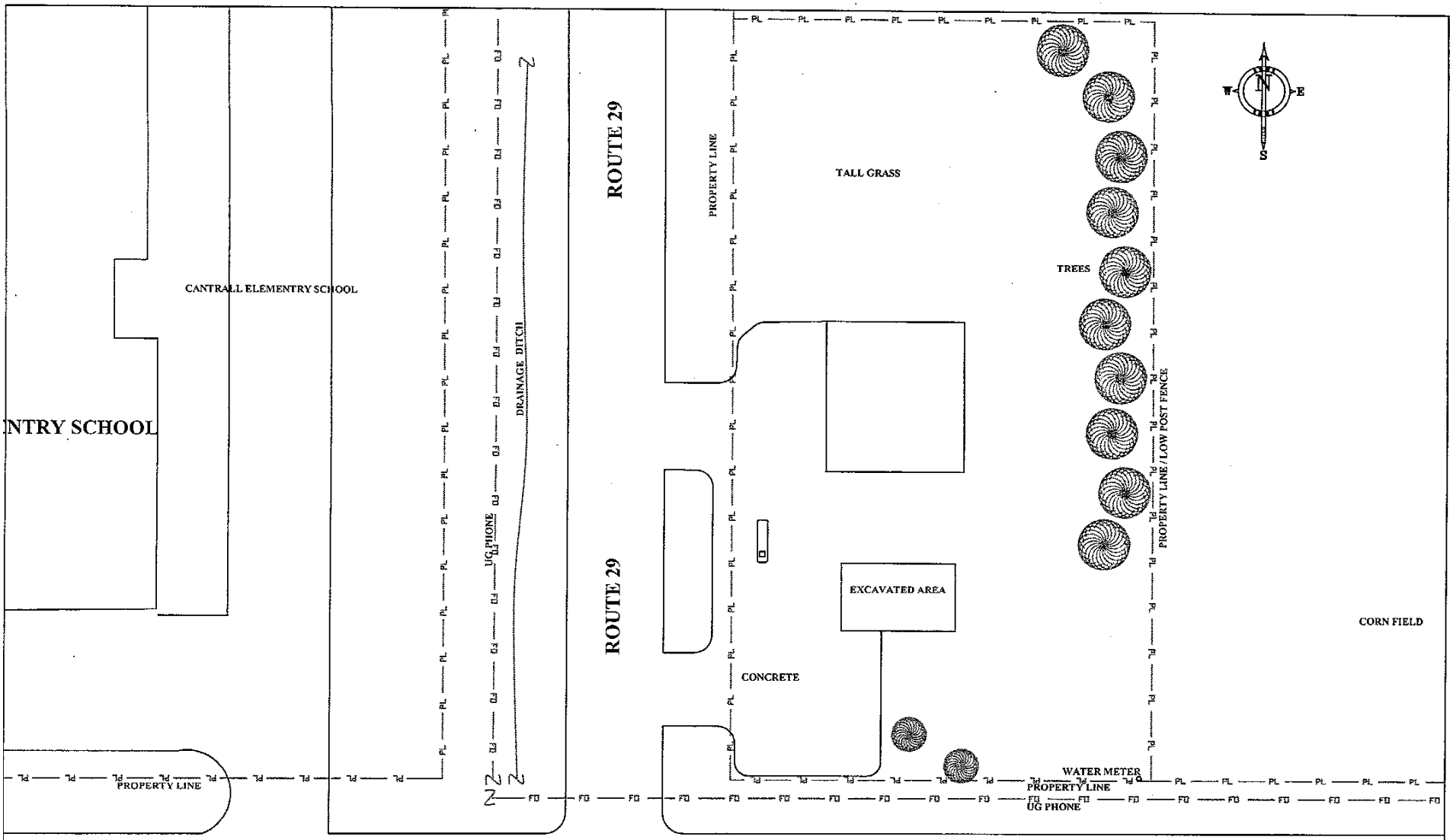
Site Location Map
Springfield Marine Bank, Trust #530051
Cantrall, Illinois

Drawn By: AMB
Reviewed By: CLR

CW3M Company, Inc.
701 W South Grand Ave.
Springfield, Illinois 62704
217/522-8001

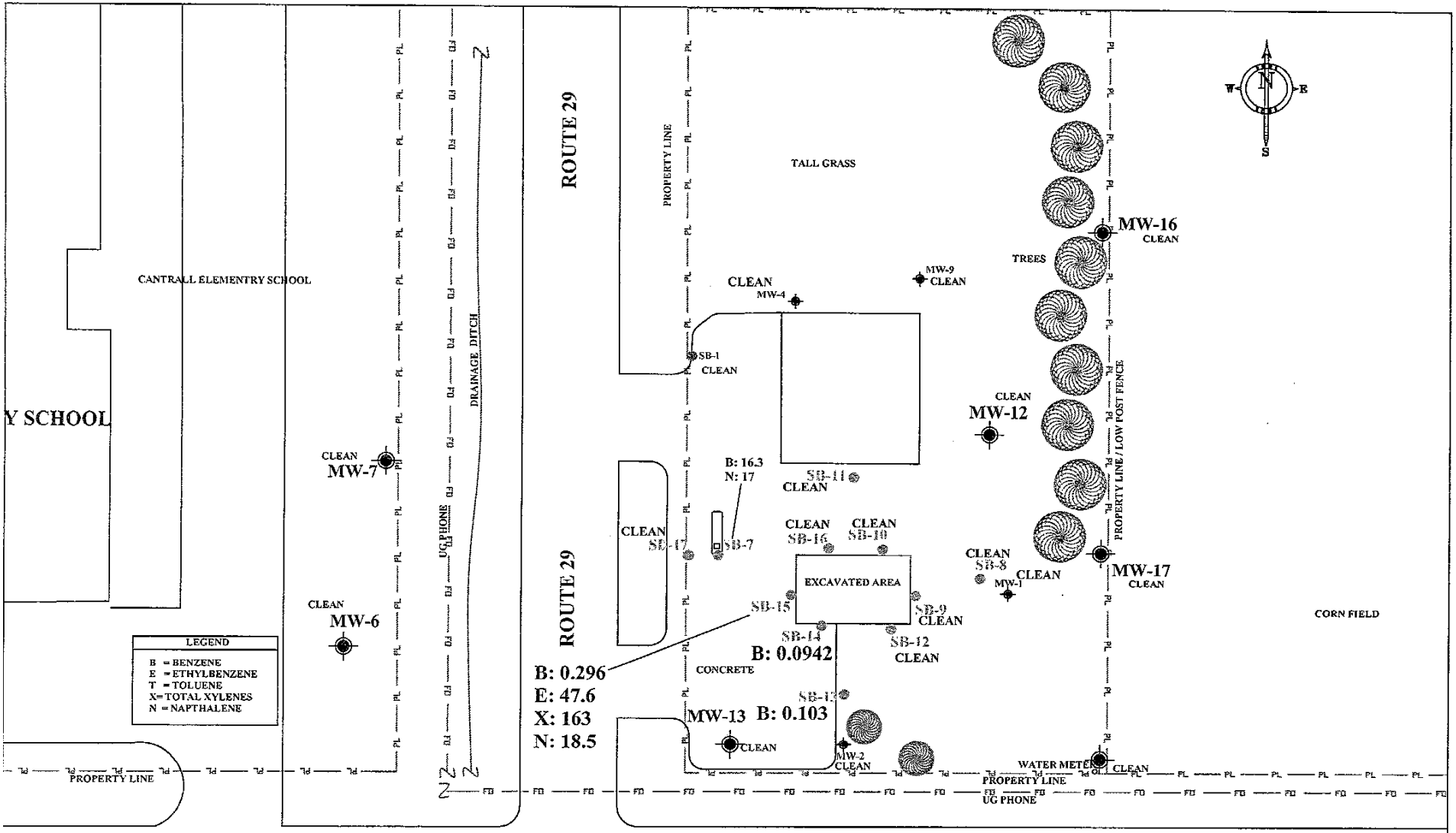


CW³M Company, Inc. 701 West South Grand Ave. Springfield, Illinois 62704 (217) 522-8001	Topographic Map Springfield Marine Bank, Trust #530051 Cantrail, Illinois	Drawn By: AMB Reviewed By: CLR Drawing 0001a topo.vsd



CW[M] COMPANY, INC. 701 W. SOUTH GRAND SPRINGFIELD, IL. 62704 (217) 522-8001	MARINE BANK TRUST #530051 CANTRALL, ILLINOIS INCIDENT #03-0135 SANGAMON COUNTY	SITE MAP	DATE: 9/23/2021 REVISED DATE: 1/23/2023 SCALE 1"=40' DRAWING: 0002	DRAWN BY: JKK REVISED BY: JKK REVIEWED BY: CLR Site.DWG

000029



CW M COMPANY, INC. 701 W. SOUTH GRAND SPRINGFIELD, IL. 62704 (217) 522-8001	MARINE BANK TRUST #530051 CANTRALL, ILLINOIS INCIDENT #03-0135 SANGAMON COUNTY	SOIL BORING LOCATION AND VALUES MAP	DATE: 9/23/2021 REVISED DATE: 1/11/2023 SCALE 1"=40' DRAWING: 0003A	DRAWN BY: JKK REVISED BY: JKK REVIEWED BY: CLR SBLocVal.DWG

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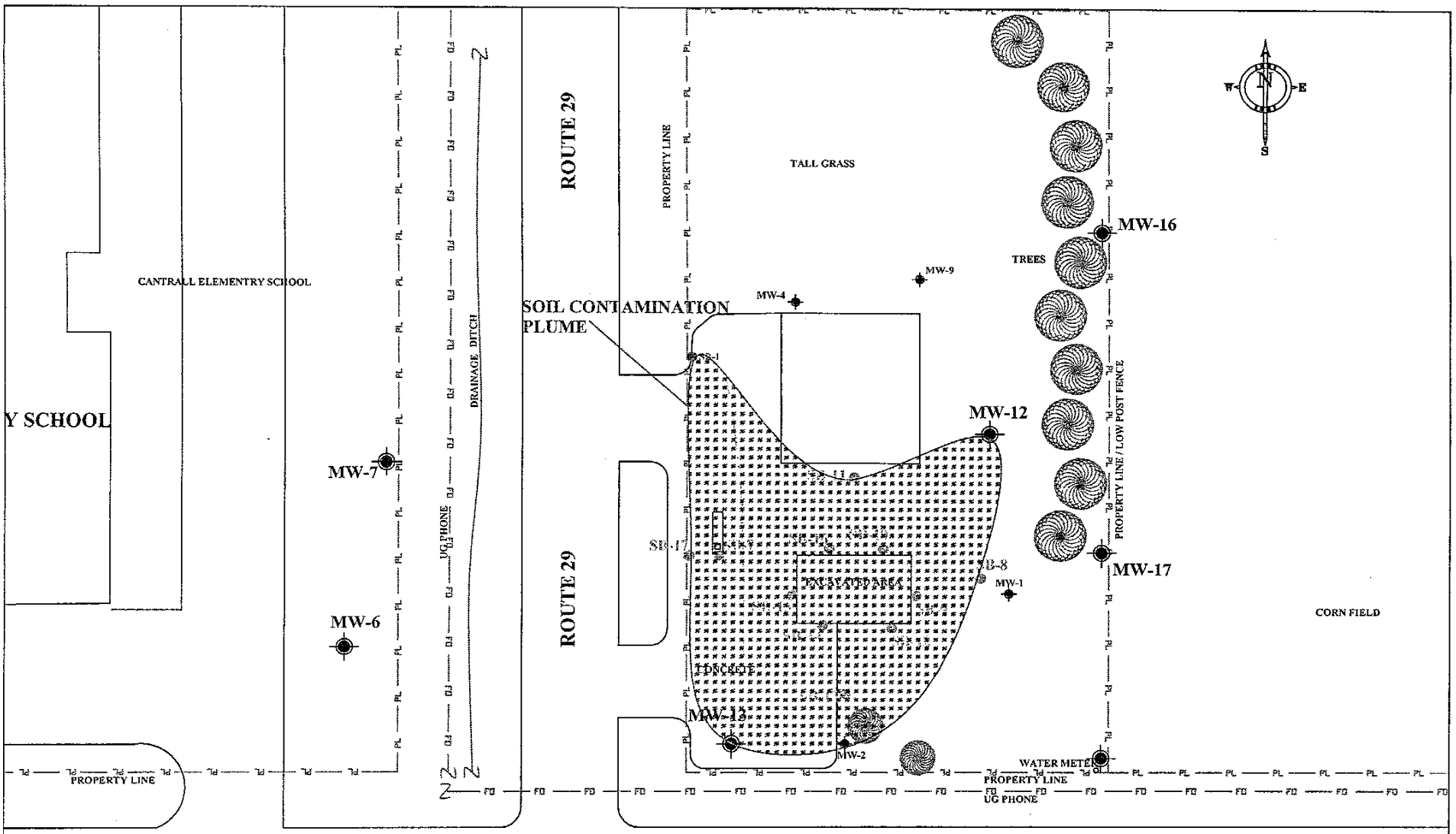

CW[illegible]M COMPANY, INC. 701 W. SOUTH GRAND SPRINGFIELD, IL. 62704 (217) 522-8001	MARINE BANK TRUST #530051 CANTRALL, ILLINOIS INCIDENT #03-0135 SANGAMON COUNTY	SOIL CONTAMINATION PLUME MAP	DATE: 1/23/2023 REVISED DATE: SCALE 1"=40' DRAWING: 0003B	DRAWN BY: JKK REVISED BY: REVIEWED BY: CLR SPlume.DWG

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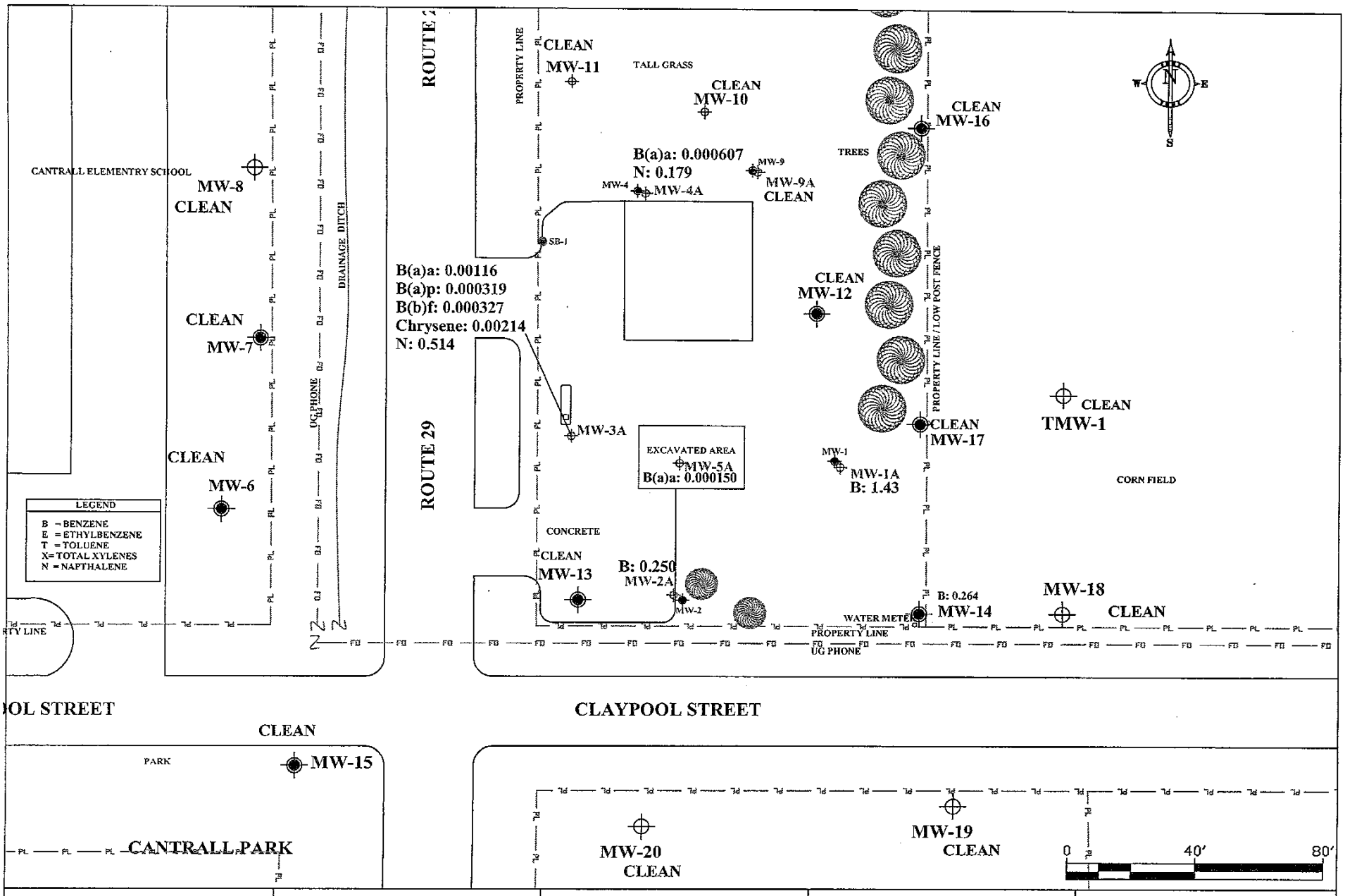

CW M COMPANY, INC. 701 W. SOUTH GRAND SPRINGFIELD, IL. 62704 (217) 522-8001	MARINE BANK TRUST #530051 CANTRALL, ILLINOIS INCIDENT #03-0135 SANGAMON COUNTY	MONITORING WELL LOCATIONS AND GW VALUES MAP	DATE: 9/23/2021 REVISED DATE: 1/11/2023 SCALE 1"=40' DRAWING: 0004A	DRAWN BY: JKK REVISED BY: JKK REVIEWED BY: CLR MWLoc-GWVal.DWG

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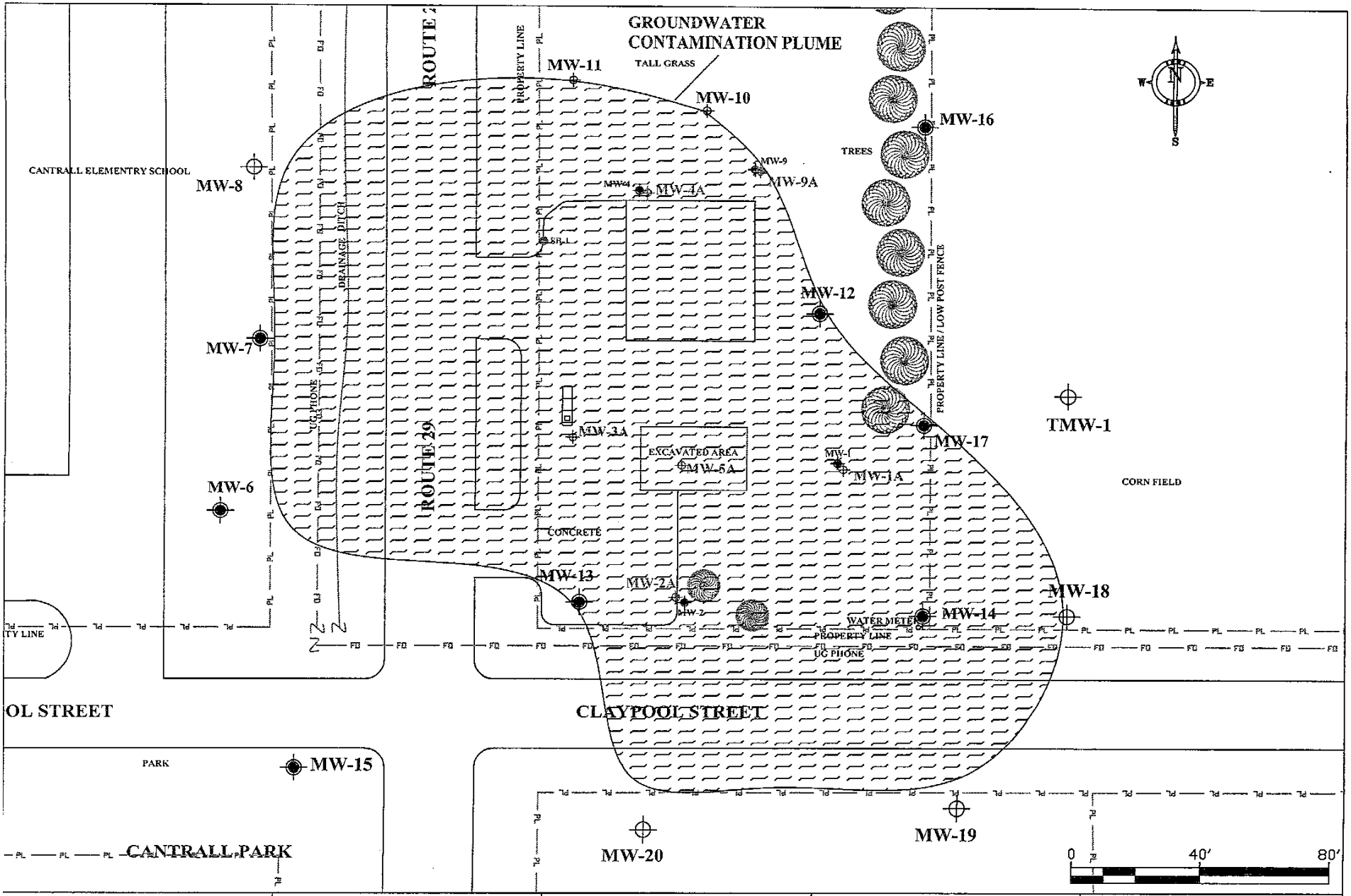
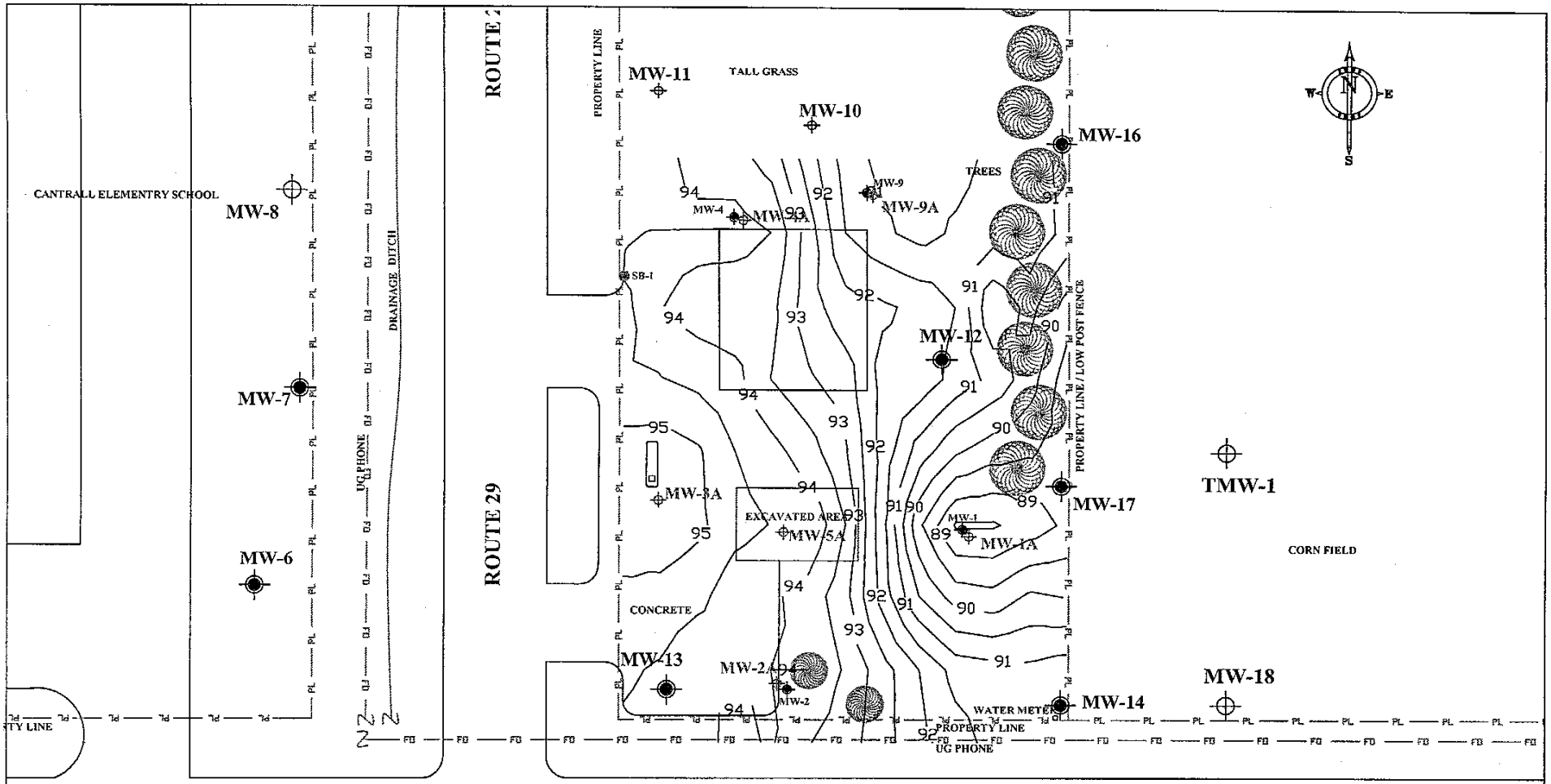


CWM COMPANY, INC. 701 W. SOUTH GRAND SPRINGFIELD, IL. 62704 (217) 522-8001	MARINE BANK TRUST #530051 CANTRALL, ILLINOIS INCIDENT #03-0135 SANGAMON COUNTY	GROUNDWATER CONTAMINAITON PLUME MAP	DATE: 1/23/2023 REVISED DATE: SCALE 1"=40' DRAWING: 0004B	DRAWN BY: JKK REVISED BY: REVIEWED BY: CLR GWPlume.DWG

000033



CWM COMPANY, INC. 701 W. SOUTH GRAND SPRINGFIELD, IL. 62704 (217) 522-8001	MARINE BANK TRUST #530051 CANTRALL, ILLINOIS INCIDENT #03-0135 SANGAMON COUNTY	GROUNDWATER FLOW MAP	DATE: 9/23/2021 REVISED DATE: SCALE 1"=40' DRAWING: 0005	DRAWN BY: JKK REVISED BY: REVIEWED BY: CLR GWFlow09-21.DWG

000034

ONE SINGULAR PARCEL

PIN: 06-09.0-100-001

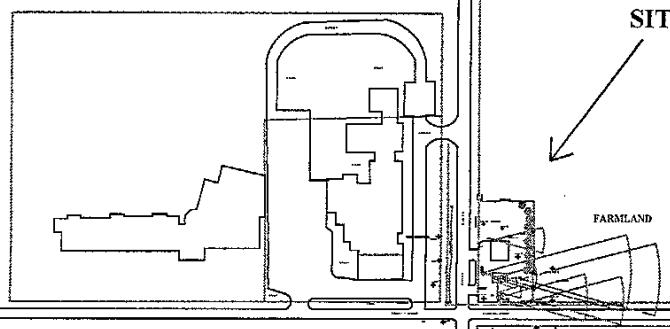
FARMLAND

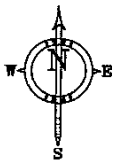
FARMLAND

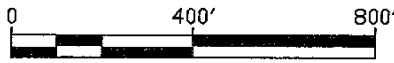
SITE

FARMLAND

FARMLAND







CW[M] COMPANY, INC. 701 W. SOUTH GRAND SPRINGFIELD, IL. 62704 (217) 522-8001	MARINE BANK TRUST #530051 CANTRALL, ILLINOIS INCIDENT #03-0135 SANGAMON COUNTY	R-26 MODELING MAP	DATE: 1/23/2023 REVISED DATE: SCALE 1"=400' DRAWING: 0006A	DRAWN BY: JKK REVISED BY: REVIEWED BY: CLR R-26.DWG

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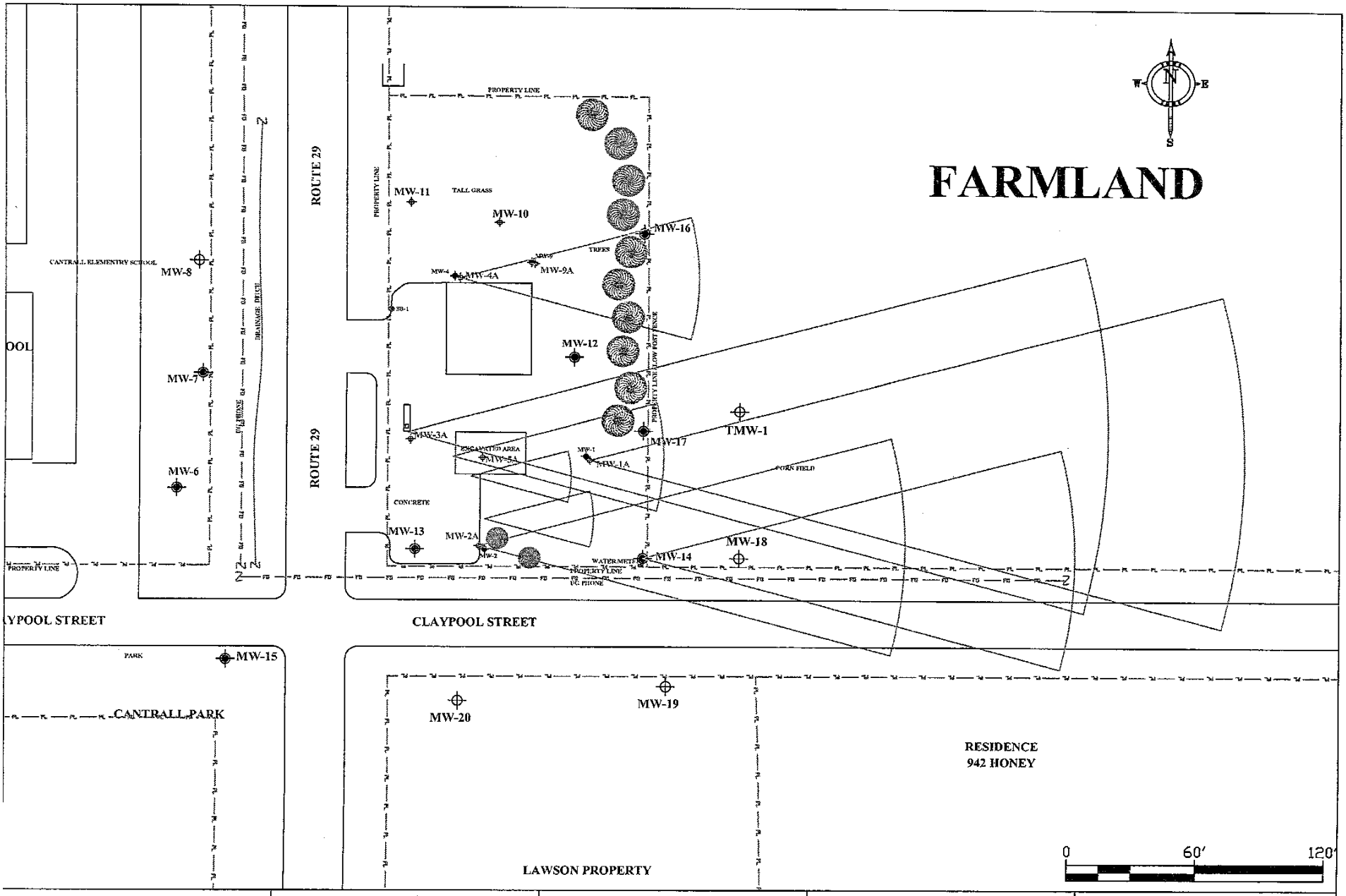

CWM COMPANY, INC. 701 W. SOUTH GRAND SPRINGFIELD, IL. 62704 (217) 522-8001	MARINE BANK TRUST #530051 CANTRALL, ILLINOIS INCIDENT #03-0135 SANGAMON COUNTY	R-26 MODELING MAP (CLOSE)	DATE: 9/23/2021 REVISED DATE: 1/23/2023 SCALE 1"=60' DRAWING: 0006B	DRAWN BY: JKK REVISED BY: JKK REVIEWED BY: CLR R-26close.DWG

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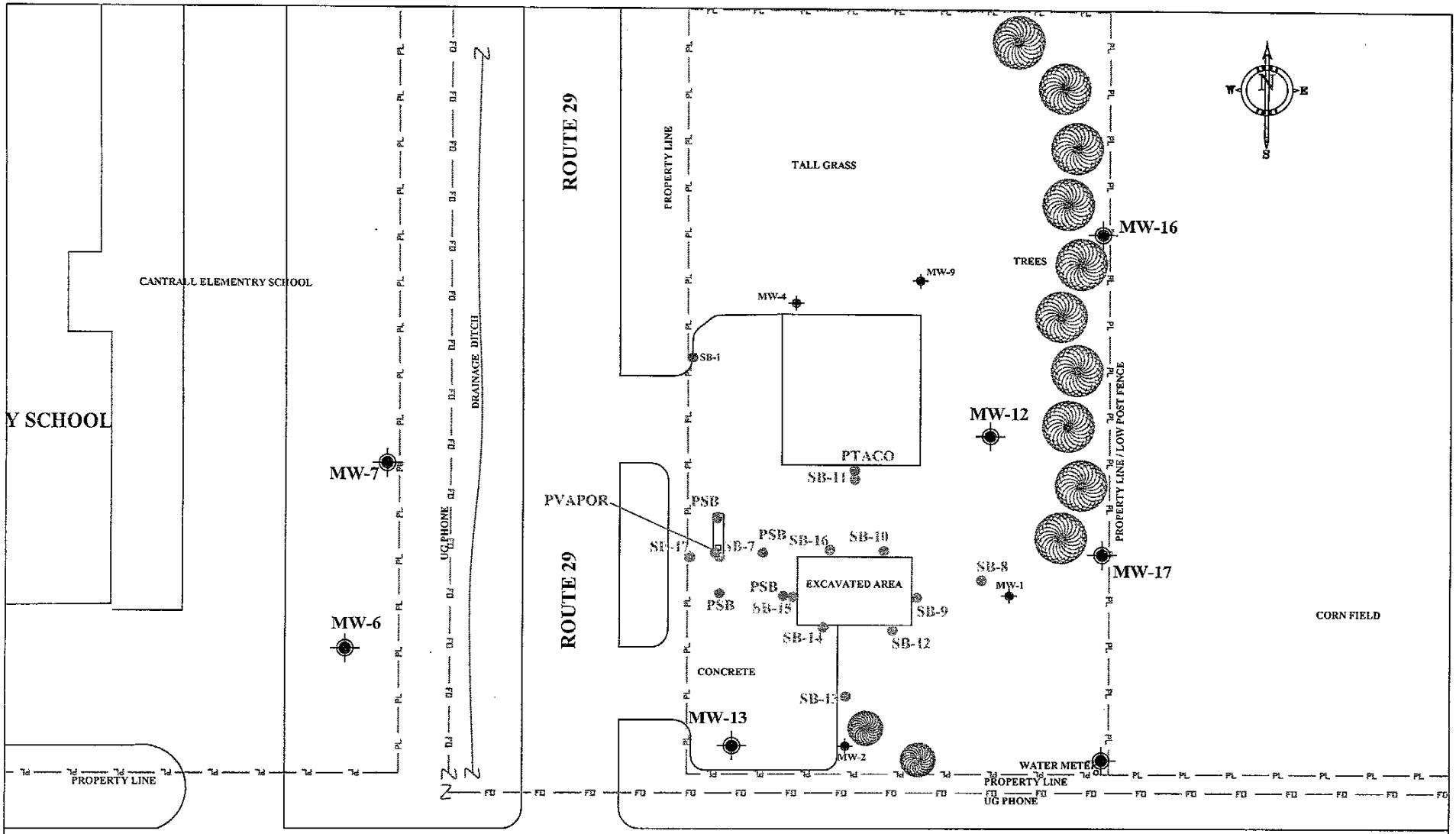


CWM COMPANY, INC. 701 W. SOUTH GRAND SPRINGFIELD, IL. 62704 (217) 522-8001	MARINE BANK TRUST #530051 CANTRALL, ILLINOIS INCIDENT #03-0135 SANGAMON COUNTY	PROPOSED SOIL BORING LOCATION MAP	DATE: 1/23/2023 REVISED DATE: SCALE 1"=40' DRAWING: 0007	DRAWN BY: JKK REVISED BY: REVIEWED BY: CLR PSB.DWG

000037

APPENDIX C

OSFM ELIGIBILITY DETERMINATION

CORRECTIVE ACTION PLAN AND BUDGET AMENDMENT

MARINE BANK TRUST # 53-0051
CANTRALL, ILLINOIS

Office of the Illinois
State Fire Marshal

General Office
217-785-0969
FAX
217-782-1062
Divisions
ARSON INVESTIGATION
217-782-9116
BOILER and PRESSURE
VESSEL SAFETY
217-782-2696
FIRE PREVENTION
217-785-4714
MANAGEMENT SERVICES
217-782-9889
INFIRS
217-785-5826
HUMAN RESOURCES
217-785-1026
PERSONNEL STANDARDS
and EDUCATION
217-782-4542
PETROLEUM and
CHEMICAL SAFETY
217-785-5878
PUBLIC INFORMATION
217-785-1021
WEB SITE
www.state.il.us/osfm

CERTIFIED MAIL - RECEIPT REQUESTED #7001 2510 0002 3296 7267

RECEIVED
JUN 18 2003
BY:

REVISED

June 16, 2003

Marine Bank Springfield Trust #53-0051
c/o CW3M Company
P.O. Box 571
Carlinville, IL 62626

In Re: Facility No. 5-040470
IEMA Incident No. 03-0135
Ray & Lillian Ford Property
9520 State Route 29
Cantrall, Sangamon Co., IL

Dear Applicant:

The Reimbursement Eligibility and Deductible Application received on May 13, 2003 for the above referenced occurrence has been reviewed. The following determinations have been made based upon this review.

It has been determined that you are eligible to seek payment of costs in excess of $15,000. The costs must be in response to the occurrence referenced above and associated with the following tanks:

Eligible Tanks

Tank 1 500 gallon Gasoline
Tank 2 500 gallon Used Oil
Tank 3 500 gallon Diesel
Tank 4 1,000 gallon Gasoline

You must contact the Illinois Environmental Protection Agency to receive a packet of Agency billing forms for submitting your request for payment.

An owner or operator is eligible to access the Underground Storage Tank Fund if the eligibility requirements are satisfied:

1. Neither the owner nor the operator is the United States Government,

2. The tank does not contain fuel which is exempt from the Motor Fuel Tax Law,

3. The costs were incurred as a result of a confirmed release of any of the following substances:

"Fuel", as defined in Section 1.19 of the Motor Fuel Tax Law

Aviation fuel

Heating oil

Kerosene

Used oil, which has been refined from crude oil used in a motor vehicle, as defined in Section 1.3 of the Motor Fuel Tax Law.

4. The owner or operator registered the tank and paid all fees in accordance with the statutory and regulatory requirements of the Gasoline Storage Act.

5. The owner or operator notified the Illinois Emergency Management Agency of a confirmed release, the costs were incurred after the notification and the costs were a result of a release of a substance listed in this Section. Costs of corrective action or indemnification incurred before providing that notification shall not be eligible for payment.

6. The costs have not already been paid to the owner or operator under a private insurance policy, other written agreement, or court order.

7. The costs were associated with "corrective action".

This constitutes the final decision as it relates to your eligibility and deductibility. We reserve the right to change the deductible determination should additional information that would change the determination become available. An underground storage tank owner or operator may appeal the decision to the Illinois Pollution Control Board (Board), pursuant to Section 57.9 (c) (2). An owner or operator who seeks to appeal the decision shall file a petition for a hearing before the Board within 35 days of the date of mailing of the final decision, (35 Illinois Administrative Code 105.102(a) (2)).

For information regarding the filing of an appeal, please contact:

Dorothy Gunn, Clerk
Illinois Pollution Control Board
State of Illinois Center
100 West Randolph, Suite 11-500
Chicago, Illinois 60601
(312) 814-3620

The following tanks are also listed for this site:

Tank 5 150 gallon Used Oil

Your application indicates that there has not been a release from these tanks under this incident number. You may be eligible to seek payment of corrective action costs associated with these tanks if it is determined that there has been a release from one or more of these tanks. Once it is determined that there has been a release from one or more of these tanks you may submit a separate application for an eligibility determination to seek corrective action costs associated with this/these tanks.

If you have any questions, please contact our Office at (217) 785-1020 or (217) 785-5878.

Sincerely,

Deanne Lock
Administrative Assistant
Division of Petroleum and Chemical Safety

cc: IEPA
Facility File

APPENDIX D

CORRECTIVE ACTION PLAN BUDGET AND CERTIFICATION

CORRECTIVE ACTION PLAN AND BUDGET AMENDMENT

MARINE BANK TRUST # 53-0051
CANTRALL, ILLINOIS

Owner/Operator and Licensed Professional Engineer/Geologist Budget Certification Form

I hereby certify that I intend to seek payment from the UST Fund for costs incurred while performing corrective action activities for Leaking UST incident 2003-0135. I further certify that the costs set forth in this budget are for necessary activities and are reasonable and accurate to the best of my knowledge and belief. I also certify that the costs included in this budget are not for corrective action in excess of the minimum requirements of 415 ILCS 5/57, no costs are included in this budget that are not described in the corrective action plan, and no costs exceed Subpart H: Maximum Payment Amounts, Appendix D Sample Handling and Analysis amounts, and Appendix E Personnel Titles and Rates of 35 Ill. Adm. Code 732 or 734. I further certify that costs ineligible for payment from the Fund pursuant to 35 Ill. Adm. Code 732.606 or 734.630 are not included in the budget proposal or amendment. Such ineligible costs include but are not limited to:

Costs associated with ineligible tanks.
Costs associated with site restoration (e.g., pump islands, canopies).
Costs associated with utility replacement (e.g., sewers, electrical, telephone, etc.).
Costs incurred prior to IEMA notification.
Costs associated with planned tank pulls.
Legal fees or costs.
Costs incurred prior to July 28, 1989.
Costs associated with installation of new USTs or the repair of existing USTs.

Owner/Operator: Marine Bank Trust #53-0051

Authorized Representative: Cathy G. Overstreet Title: T.O.

Signature: Cathy G. Overstreet Date: 3/16/23

Subscribed and sworn to before me the 16th day of March, 2023.

Seal: OFFICIAL SEAL STACY FOLI NOTARY PUBLIC, STATE OF ILLINOIS MY COMMISSION EXPIRES 12-13-2025

(Notary Public)

In addition, I certify under penalty of law that all activities that are the subject of this plan, budget, or report were conducted under my supervision or were conducted under the supervision of another Licensed Professional Engineer or Licensed Professional Geologist and reviewed by me; that this plan, budget, or report and all attachments were prepared under my supervision; that, to the best of my knowledge and belief, the work described in the plan, budget, or report has been completed in accordance with the Environmental Protection Act [415 ILCS 5], 35 Ill. Adm. Code 732 or 734, and generally accepted standards and practices of my profession; and that the information presented is accurate and complete. I am aware there are significant penalties for submitting false statements or representations to the Illinois EPA, including but not limited to fines, imprisonment, or both as provided in Sections 44 and 57.17 of the Environmental Protection Act [415 ILCS 5/44 and 57.17].

L.P.E./L.P.G.: Vince E. Smith L.P.E./L.P.G. Seal: VINCE E. SMITH 46113 REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS

L.P.E./L.P.G. Signature: Vince E. Smith Date: 4/6/23

Subscribed and sworn to before me the 6th day of April 2023.

Seal: OFFICIAL SEAL CAROL L. ROWE NOTARY PUBLIC, STATE OF ILLINOIS MY COMMISSION EXPIRES 03-18-2025

(Notary Public)

The Illinois EPA is authorized to require this information under 415 ILCS 5/1.1 Disclosure of this information is required. Failure to do so may result in the delay or denial of any budget or payment requested hereunder.

OFFICIAL SEAL CAROL L. ROWE NOTARY PUBLIC, STATE OF ILLINOIS MY COMMISSION EXPIRES 03-18-2025

Illinois Environmental Protection Agency

1021 North Grand Avenue East • P.O. Box 19276 • Springfield • Illinois • 62794-9276 • (217) 782-3397

General Information for the Budget and Billing Forms

LPC #: 1670255005 **County:** Sangamon

City: Cantrall **Site Name:** Marine Bank Trust #53-0051

Site Address: 9520 Illinois State Route 29

Date this form was prepared: Feb 22, 2023

List all IEMA Incident numbers associated with this package:

2003-1766

List all other incidents associated with this site that are not associated with this package:

This form is being submitted as a (check one, if applicable):

◯ Billing Package

⊘ Budget Amendment (Budget amendments must include only the costs over the previous budget.)

◯ Budget Proposal

Please provide the name(s) and date(s) of report(s) documenting the costs requested:

Name(s): _____ _____ _____

Date(s): _____ _____ _____

This package is being submitted for the site activities indicated below:

35 Ill. Adm. Code 734:

☐ Early Action

☐ Free Product Removal after Early Action

☐ Site Investigation . . . . . Stage 1: ☐ Stage 2: ☐ Stage 3: ☐

☑ Corrective Action

35 Ill. Adm. Code 732:

☐ Early Action

☐ Free Product Removal after Early Action

☐ Site Classification

☐ Low Priority Corrective Action

☐ High Priority Corrective Action

35 Ill. Adm. Code 731:

☐ Site Investigation

☐ Corrective Action

General Information for the Budget and Billing Forms

The following address will be used as the mailing address for checks and any final determination letters regarding payment from the Fund for this package.

Pay to the order of: Marine Bank Trust #53-0051

Send in care of: CWM Company, Inc.

Address: 701 South Grand Avenue West

City: Springfield State: IL Zip: 62704

The payee is the: Owner ☐ Operator ☐ (Check one or both.)

Cathy D. Overstreet, T.O. 3/16/23

Signature of the owner or operator of the UST(s) (required) **Date**

Cathy D. Overstreet

Printed name of the owner or operator of the UST(s) (required)

W-9 must be submitted.
Click here to print off a W-9 Form.

Email: cwm@cwmcompany.com

Number of petroleum USTs in Illinois presently owned or operated by the owner or operator; any subsidiary, parent or joint stock company of the owner or operator; and any company owned by any parent, subsidiary or joint stock company of the owner or operator:

Fewer than 101: ◯ 101 or more: ◯

Please list all tanks that have ever been located at the site and tanks that are presently located at the site.

Product Stored in UST	Size (gallons)	Did UST have a release?	Incident No.	Type of Release Tank Leak / Overfill / Piping Leak
Gasoline	500	Yes ⊘ No ◯	2003-0135	Overfill
Gasoline	1,000	Yes ⊘ No ◯	2003-0135	Overfill
Diesel	500	Yes ⊘ No ◯	2003-0135	Overfill
Used Oil	500	Yes ⊘ No ◯	2003-0135	Overfill
Used Oil	150	Yes ◯ No ⊘	None	
		Yes ◯ No ◯		
		Yes ◯ No ◯		
		Yes ◯ No ◯		

Budget Summary

Choose the applicable regulation: (•) 734 ( ) 732

734	Free Product	Stage 1 Site Investigation	Stage 2 Site Investigation	Stage 3 Site Investigation	Corrective Action
					Proposed
Drilling and Monitoring Well Costs Form	$	$	$	$	$ 1,690.83
Analytical Costs Form	$	$	$	$	$ 3,732.97
Remediation and Disposal Costs Form	$	$	$	$	$ 704.51
UST Removal and Abandonment Costs Form	$	$	$	$	$
Paving, Demolition, and Well Abandonment Costs Form	$	$	$	$	$
Consulting Personnel Costs Form	$	$	$	$	$ 12,962.66
Consultant's Materials Costs Form	$	$	$	$	$ 195.82
Handling Charges Form	Handling charges will be determined at the time a billing package is submitted to the Illinois EPA. The amount of allowable handling charges will be determined in accordance with the Handling Charges Form.				
Total	$	$	$	$	$ 19,286.79

Drilling and Monitoring Well Costs Form

1. Drilling

Number of Borings to Be Drilled	Type HSA/PUSH/ Injection	Depth (feet) of Each Boring	Total Feet Drilled	Reason for Drilling
1	PUSH	20.00	20.00	Vertical Delineation of TACO Tier 1 Csat
1	PUSH	10.00	10.00	Geotechnical Sample @ SB-11
3	PUSH	10.00	30.00	Engineered Barrier Area Delineation
1	PUSH	5.00	5.00	Vapor Intrustion Boring

☒ Subpart H minimum payment amount applies.

	Total Feet	Rate per Foot ($)	Total Cost ($)
Total Feet via HSA:		32.41	
Total Feet via PUSH:	65.00	25.36	1,648.40
Total Feet for Injection via PUSH:		21.14	
		Total Drilling Costs:	1,690.83 *

* adjusted to reflect Subpart H minimum payment amount

2. Monitoring / Recovery Wells

Number of Wells	Type of Well HSA / PUSH / 4" or 6" Recovery / 8" Recovery	Diameter of Well (inches)	Depth of Well (feet)	Total Feet of Wells to Be Installed ($)

Well Installation	Total Feet	Rate per Foot ($)	Total Cost ($)
Total Feet via HSA:		23.26	
Total Feet via PUSH:		17.61	
Total Feet of 4" or 6" Recovery:		35.23	
Total Feet of 8" or Greater Recovery:		57.77	
		Total Well Costs:	

Total Drilling and Monitoring Well Costs:	$1,690.83

Analytical Costs Form

Laboratory Analysis	Number of Samples		Cost ($) per Analysis		Total per Parameter
Chemical Analysis					
BETX Soil with MTBE EPA 8260	8	X	119.77	=	$958.16
BETX Water with MTBE EPA 8260		X		=	
COD (Chemical Oxygen Demand)		X		=	
Corrosivity		X		=	
Flash Point or Ignitability Analysis EPA 1010		X		=	
Fraction Organic Carbon Content (f_{oc}) ASTM-D 2974-00	1	X	53.53	=	$53.53
Fat, Oil, & Grease (FOG)		X		=	
LUST Pollutants Soil - analysis must include volatile, base/ neutral, polynuclear aromatics and metals list in Section 732. Appendix B and 734.Appendix B		X		=	
Dissolved Oxygen (DO)		X		=	
Paint Filter (Free Liquids)		X		=	
PCB / Pesticides (combination)		X		=	
PCBs		X		=	
Pesticides		X		=	
pH		X		=	
Phenol		X		=	
Polynuclear Aromatics PNA, or PAH SOIL EPA 8270	8	X	214.18	=	$1,713.44
Polynuclear Aromatics PNA, or PAH WATER EPA 8270		X		=	
Reactivity		X		=	
SVOC - Soil (Semi-Volatile Organic Compounds)		X		=	
SVOC - Water (Semi-Volatile Organic Compounds)		X		=	
TKN (Total Kjeldahl) "nitrogen"		X		=	
TPH (Total Petroleum Hydrocarbons)		X		=	
VOC (Volatile Organic Compounds) - Soil (Non-Aqueous)		X		=	
VOC (Volatile Organic Compounds) - Water		X		=	
Soil Gas Vapor (Syringe, Helium Shroud, canister, and analysis)	1	X	402.00	=	$402.00
		X		=	
		X		=	
		X		=	
		X		=	
Geo-Technical Analysis					
Soil Bulk Density (p_b) ASTM D2937-94	1	X	31.00	=	$31.00
Ex-situ Hydraulic Conductivity / Permeability		X		=	
Moisture Content (w) ASTM D2216-92 / D4643-93	1	X	16.91	=	$16.91
Porosity		X		=	
Rock Hydraulic Conductivity Ex-situ		X		=	
Sieve / Particle Size Analysis ASTM D422-63 / D1140-54	1	X	204.31	=	$204.31
Soil Classification ASTM D2488-90 / D2487-90		X		=	
Soil Particle Density (p_s) ASTM D854-92	1	X	100.00	=	$100.00
		X		=	
		X		=	
		X		=	

Analytical Costs Form

Metals Analysis					
Soil preparation fee for Metals TCLP Soil (one fee per soil sample)		X		=	
Soil preparation fee for Metals Total Soil (one fee per soil sample)		X		=	
Water preparation fee for Metals Water (one fee per water sample)		X		=	
Arsenic TCLP Soil		X		=	
Arsenic Total Soil		X		=	
Arsenic Water		X		=	
Barium TCLP Soil		X		=	
Barium Total Soil		X		=	
Barium Water		X		=	
Cadmium TCLP Soil		X		=	
Cadmium Total Soil		X		=	
Cadmium Water		X		=	
Chromium TCLP Soil		X		=	
Chromium Total Soil		X		=	
Chromium Water		X		=	
Cyanide TCLP Soil		X		=	
Cyanide Total Soil		X		=	
Cyanide Water		X		=	
Iron TCLP Soil		X		=	
Iron Total Soil		X		=	
Iron Water		X		=	
Lead TCLP Soil		X		=	
Lead Total Soil		X		=	
Lead Water		X		=	
Mercury TCLP Soil		X		=	
Mercury Total Soil		X		=	
Mercury Water		X		=	
Selenium TCLP Soil		X		=	
Selenium Total Soil		X		=	
Selenium Water		X		=	
Silver TCLP Soil		X		=	
Silver Total Soil		X		=	
Silver Water		X		=	
Metals TCLP Soil (a combination of all metals) RCRA		X		=	
Metals Total Soil (a combination of all metals) RCRA		X		=	
Metals Water (a combination of all metals) RCRA		X		=	
		X		=	
		X		=	
		X		=	
Two Seperate laboratories		X		=	
Other					
EnCore® Sampler, purge-and-trap sampler, or equivalent sampling device	8	X	14.09	=	$112.72
Sample Shipping per sampling event[1]	2	X	70.45	=	$140.90

[1]A sampling event, at a minimum, is all samples (soil and groundwater) collected in a calendar day.

Total Analytical Costs: $ 3,732.97

Remediation and Disposal Costs Form

A. Conventional Technology

Excavation, Transportation, and Disposal of contaminated soil and/or the 4-foot backfill material removal during early action activities:

Number of Cubic Yards	Cost per Cubic Yard ($)	Total Cost

Backfilling the Excavation:

Number of Cubic Yards	Cost per Cubic Yard ($)	Total Cost

Overburden Removal and Return:

Number of Cubic Yards	Cost per Cubic Yard ($)	Total Cost

B. Alternative Technology

Alternative Technology Selected:	
Number of Cubic Yards of Soil to Be Remediated	
Total Non-Consulting Personnel Costs Summary Sheet ($)	
Total Remediation Materials Costs Summary Sheet ($)	
Total Cost of the System	

Remediation and Disposal Costs Form

C. Groundwater Remediation and/or Free Product Removal System

Total Non-Consulting Personnel Costs Summary Sheet ($)	
Total Remediation Materials Costs Summary Sheet ($)	
Total Cost of the System	

D. Groundwater and/or Free Product Removal and Disposal

☐ Subpart H minimum payment amount applies.

Number of Gallons	Cost per Gallon ($)	Total Cost ($)

E. Drum Disposal

☒ Subpart H minimum payment amount applies.

Number of Drums of Solid Waste	Cost per Drum ($)	Total Cost ($)
1	352.26	352.26
Number of Drums of Liquid Waste	**Cost per Drum ($)**	**Total Cost ($)**
Total Drum Disposal Costs		704.52 *

* adjusted to reflect Subpart H minimum payment amount

Total Remediation and Disposal Costs:	$704.52

Consulting Personnel Costs Form

Employee Name	Personnel Title	Hours	Rate* ($)	Total Cost
Remediation Category	**Task**			
	Senior Project Manager	32.00	140.90	$4,508.80
CCAP	Amended Corrective Action Plan Development			
	Senior Draftperson/CAD	4.00	84.53	$338.12
CCAP	Drafting/Editing Maps for Plan Amendment			
	Senior Prof. Engineer	2.00	183.17	$366.34
CCAP	Amended Corrective Action Plan Review & Certification			
	Senior Admin. Assistant	2.00	63.41	$126.82
CCAP	Amended Corrective Action Plan Compilation, Assembly, and Distribution			
	Senior Project Manager	4.00	140.90	$563.60
TACO 2 or 3	TACO Tier 2 Calculations / Development of CUOs / GW Modeling			
	Senior Prof. Engineer	2.00	183.17	$366.34
CCAP-Budget	Amended Corrective Action Budget Review & Certification			
	Senior Project Manager	10.00	140.90	$1,409.00
CCAP-Budget	Amended Corrective Action Budget Development			

Employee Name	Personnel Title	Hours	Rate* ($)	Total Cost
Remediation Category	**Task**			
	Senior Project Manager	4.00	140.90	$563.60
CCA-Field	Scheduling, Arrangements/Coordination for Investigation Activities/JULIE/IEPA Notifications			
	Senior Project Manager	10.00	140.90	$1,409.00
CCA-Field	Field Prep / Drilling / Soil Sampling / Soil-Gas Vapor collection / Field Reports			
	Senior Technician	8.00	91.58	$732.64
CCA-Field	Drilling / Soil Sampling / Soil-Gas Vapor collection			
	Senior Project Manager	6.00	140.90	$845.40
CCA-Field	Review Analytical Results, Borelogs, Tabulation of Analytical			
	Senior Prof. Engineer	2.00	183.17	$366.34
CA-Pay	Corrective Action Reimbursement Review & Certification			
	Senior Acct. Technician	16.00	77.49	$1,239.84
CA-Pay	Corrective Action Reimbursement Preparation			
	Senior Admin. Assistant	2.00	63.41	$126.82
CA-Pay	Corrective Action Reimbursement Compilation / Assembly / Distribution			

*Refer to the applicable Maximum Payment Amounts document.

Total of Consulting Personnel Costs	**$12,962.66**

Consultant's Materials Costs Form

Materials, Equipment, or Field Purchase	Time or Amount Used	Rate ($)	Unit	Total Cost
Remediation Category	**Description/Justification**			
Postage	2.00	14.20	/each	$28.40
CCAP	Corrective Action Plan and Budget Amendment Distribution / Forms / Client Review			
Mileage	38.00	.59	/mile	$22.42
CCA-Field	1 Round Trip. (Springfield Office: Drilling & Sampling)			
PID Rental	1.00	75.00	/day	$75.00
CCA-Field	Detect VOC Levels in Soil Samples			
Water Level Indicator	1.00	24.00	/day	$24.00
CCA-Field	Measure Groundwater Levels for Drilling			
Sampling Supplies	1.00	25.00	/day	$25.00
CCA-Field	Gloves, Deionized Water, Bags, Misc Items (Soil Sampling)			
Postage	2.00	10.50		$21.00
CA-Pay	Distribution of Corrective Action Reimbursement Packages / Drafts / Forms			

Total of Consultant Materials Costs	$195.82

APPENDIX E

TACO VARIABLES AND EQUATIONS & HYDRAULIC CONDUCTIVITY CALCULATIONS

CORRECTIVE ACTION PLAN AND BUDGET AMENDMENT

MARINE BANK TRUST # 53-0051
CANTRALL, ILLINOIS

EPA On-line Tools for Site Assessment Calculation

Hydraulic Gradient -- Magnitude and Direction

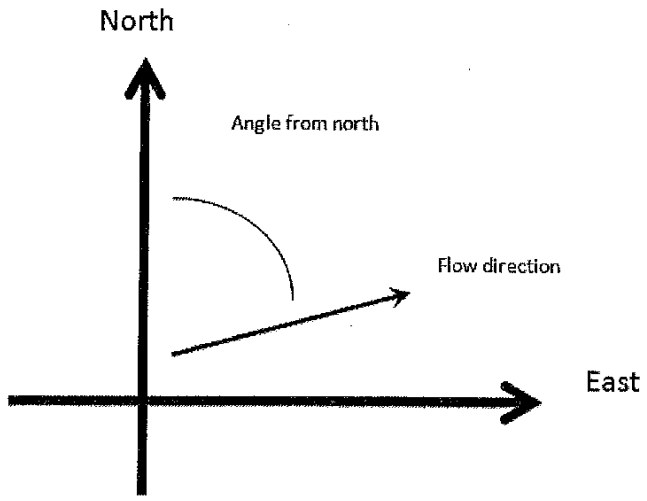
Gradient Calculation from fitting a plane to as many as thirty points

$$a x_1 + b y_1 + c = h_1$$
$$a x_2 + b y_2 + c = h_2$$
$$a x_3 + b y_3 + c = h_3$$
$$\dots$$
$$a x_{30} + b y_{30} + c = h_{30}$$

where (x_i,y_i) are the coordinates of the well and
h_i is the head

$i = 1,2,3, \dots , 30$
The coefficients a, b, and c are calculated by a least-squares fitting of the the data to a plane

The gradient is calculated from the square root of $(a^2 + b^2)$ and the angle from the arctangent of a/b or b/a depending on the quadrant



Inputs

Example Data Set 1 | Example Data Set 2 | Calculate | Clear
Save Data | Recall Data | Go Back
Site Name
Date | Current Date
Calculation basis: Head
Coordinates: ft

I.D.	x-coordinate	y-coordinate	head ft
1) MW-1A	672.5716	551.826	88.44
2) MW-2A	620.6628	511.1571	94
3) MW-3A	588.3949	561.6454	95.36
4) MW-4A	611.4933	638.4295	94.24
5) MW-5A	622.3478	552.9812	94.48
6) MW-9A	646.4769	645.5046	90.84
7) MW-14A	697.573	505.3283	91.41
8)			
9)			
10)			
11)			
12)			
13)			
14)			
15)			
16)			

17)
18)
19)
20)
21)
22)
23)
24)
25)
26)
27)
28)
29)
30)

Results

Number of Points Used in Calculation	7
Max. Difference Between Head Values	2.109
Gradient Magnitude (i)	0.06188
Flow direction as degrees from North (positive y axis)	77.79
Coefficient of Determination (R^2)	0.747

WCMS
Last updated on 8/31/2021

R-26 Input/Summary Sheet

Version: 3/26/2018

IEMA Incident # (6 or 8 digit)	20030135
IEPA LPC # (10 digit)	1670255005
Site Name:	Marine Bank Trust 53-0051
Site Address:	9520 State Route 29
City:	Cantrall
County:	Sangamon
Zip Code:	62625
SSL Equations Used:	S5,6,7,8,9,10,17,18,19,20,21,22,24
RBCA Equations Used:	R-1, R-2, R3
Contact Information for Individual who Performed Calculat	CWM, VES
Land Use:	Residential & Construction Worker
Objective from S17 used in R26:	No
Groundwater:	Class 1
Standard or Mass Limit Equations:	Standard Equations — If Mass Limit, then Specify Acres:
Square Feet of Plume for Mass Limit Eq.:	0.00 < use this # above
Date Data is Entered:	January 11, 2023

Entry	Description		
	Holcomb Bulk Density (pcf), or Shelby Tube Location:		
1.5	Dry Soil Bulk Density (g/cm³ or kg/L): 1.5, or Gravel =2.0, Sand = 1.8, Silt = 1.6, Clay = 1.7, or site specific		
2.65	ρs - Soil Particle Density	Reference	
0.434	Total Soil Porosity	0.434	0.434
0.279	Water Filled Porosity	0.279	0.279
0.155	Air Filled Porosity	0.155	0.155
0.430	θ_T - Total Soil Porosity (RBCA)	0.43 or; Gravel - 0.25; Sand = 0.32; Silt = 0.40; Clay = 0.36	
0.195	w - Average Soil Moisture Content	0.1, or; Subsurface Soil (top 1m) = 0.1; Subsurface Soil (below 1 m) =0.2; or Site Specific	
Silt Loam	USDA Soil Classification (Pick from List)		

Entry		
0.00390	Fractional Organic Carbon (foc) in g/g	Organic Matter (%):
		Organic Matter (mg/kg):
		Total Organic Carbon (g/g): 0.00391

1.17E-04	Average Hydraulic Conductivity (cm/sec)	Well Name	
1.17E-04	Falling Hydraulic Conductivity (cm/sec)	MW-4	
	Rising Hydraulic Conductivity (cm/sec)		
0.06188	Hydraulic Gradient (0.02 for sites with no groundwater)	Meters	
10	d_a - Aquifer Thickness (ft)	3.048 m	
10	d_s - Depth of Source (ft) (Vertical Thickness of Contamination)	3.048 m	
	X - Distance along the centerline of the groundwater plume emanating to setback zone or surface water from the source in the direction of groundwater flow (ft) (RBCA)	0 cm	
262	L - Source Length Parallel to Groundwater Flow (ft)	79.8576 m	
216	Sw: Source Width -horizontal plane (ft) (RBCA)	6583.68 cm	

Hydraulic Gradient Calculations

MW-1	93.70
MW-2	92.66
Distance:	127

$C_{(x)}$ - Concentration of Contaminant in groundwater at distance X from the source (mg/L)

Surface Water

Benzene	MTBE	
Toluene		
Ethylbenzene		
Total Xylenes		

Chemicals of Concern

Benzene	Naphthalene	
Toluene		Chrysene
Ethylbenzene		Benzo(k)fluoranthene
Total Xylenes		Indeno(1,2,3-cd)pyrene
MTBE		

SSL Equations Needed

- ☐ Mass Limit Equations
- ☑ Inhalation Equations
- ☑ Groundwater Ingestion Equations
- ☑ Csat Equations
- ☐ Fugitive Dust Equations
- ☑ Ingestion Equations

Text discussion for "I", L, d_a, d_s, S_w, S_d	
Hydraulic Gradient	The **Hydraulic Gradient (*I*)** was determined from an onsite survey of each of the groundwater monitoring wells. The riser elevations were determined and the depth to groundwater was noted in each well. This data was used to generate a potentiometric flow map with contour lines which show potentiometric head. A corresponding flow line, perpendicular to the contour lines, was determined between two known points of groundwater elevation. The hydraulic gradient was determined by the difference in elevation divided by the length of flow between the points.
Source Length	The **Source Length Parallel to Groundwater Flow (L)** was determined from the site map and analytical results. A value of 45.1104 m was used to encompass the length of contamination parallel to groundwater flow. This value is the distance between soil borings BH-1 and BH-2.
Aquifer Thickness	The **Aquifer Thickness (d_a)** is a site specific value determined by the length of the monitoring well screen. The Aquifer Thickness value used in the modeling equations was 3.048 meters.
Depth of Source	The **Depth of Source (d_s)** was determined from the analytical results and soil boring logs. A value of 3.048 m was used to encompass the vertical thickness of contamination based upon a clean soil sample at BH-1A, "hot" samples at BH-2B and BH-2C, and a clean soil sample at BH-2D. Thus the vertical thickness of soil contamination has been determined to be 3.048 m.
Source Width	**The source width perpendicular to groundwater flow direction in the Horizontal Plane (S_w)** was determined from the site map and analytical results. A value of 3566.16 cm was used to encompass the width of contamination in the horizontal plane. This value is the distance between clean wells MW-4 and and MW-6.
Source Depth	**The source width perpendicular to groundwater flow direction in the Vertical Plane (S_d)** was determined from the soil boring logs and analytical results. A value of 304.8 cm was used to encompass the width of contamination in the vertical plane based on the depths of contamination present and the PID readings from the bore logs.
Distance (X)	

BENZENE								
Soil Exceedances					Groundwater Exceedances			
Location	Soil Concentration (mg/kg)	X (ft)	Gw_{obj} (mg/L) R26 Csource	C(x) (mg/L)	Location	Groundwater Concentration (mg/L)	X (ft)	C(x) (mg/L)
SB-7	16.3	329	2.014	0.0050	MW-1	1.430	307	0.0050
SB-13	0.103	51	0.013	0.0050	MW-2	0.250	200	0.0050
SB-14	0.0942	47	0.012	0.0050	MW-14	0.264	203	0.0050
SB-15	0.296	99	0.037	0.0050				

Toluene								
Soil Exceedances					Groundwater Exceedances			
Location	Soil Concentration (mg/kg)	X (ft)	Gw_{obj} (mg/L) R26 Csource	C(x) (mg/L)	Location	Groundwater Concentration (mg/L)	X (ft)	C(x) (mg/L)

Ethylbenzene								
Soil Exceedances					Groundwater Exceedances			
Location	Soil Concentration (mg/kg)	X (ft)	Gw_{obj} (mg/L) R26 Csource	C(x) (mg/L)	Location	Groundwater Concentration (mg/L)	X (ft)	C(x) (mg/L)
SB-15	47.6	15	1.62182790	0.6811				

Total Xylenes								
Soil Exceedances					Groundwater Exceedances			
Location	Soil Concentration (mg/kg)	X (ft)	Gw_{obj} (mg/L) R26 Csource	C(x) (mg/L)	Location	Groundwater Concentration (mg/L)	X (ft)	C(x) (mg/L)
SB-15	163	1	4.614417744	4.4350				

MTBE								
Soil Exceedances					Groundwater Exceedances			
Location	Soil Concentration (mg/kg)	X (ft)	Gw_{obj} (mg/L) R26 Csource	C(x) (mg/L)	Location	Groundwater Concentration (mg/L)	X (ft)	C(x) (mg/L)

Naphthalene								
Soil Exceedances					Groundwater Exceedances			
Location	Soil Concentration (mg/kg)	X (ft)	Gw_{obj} (mg/L) R26 Csource	C(x) (mg/L)	Location	Groundwater Concentration (mg/L)	X (ft)	C(x) (mg/L)
SB-7	17	3	0.397559267	0.3364	MW-2A	0.178	5	0.1352
SB-15	18.5	3	0.433	0.3661	MW-3A	0.514	26	0.1399
					MW-4A	0.179	5	0.1359

Benzo[a]pyrene								
Soil Exceedances					Groundwater Exceedances			
Location	Soil Concentration (mg/kg)	X (ft)	Gw_{obj} (mg/L) R26 Csource	C(x) (mg/L)	Location	Groundwater Concentration (mg/L)	X (ft)	C(x) (mg/L)
					MW-3A	0.000319	36	0.000199

Dibenz[a,h]anthracene									
Soil Exceedances					Groundwater Exceedances				
Location	Soil Concentration (mg/kg)	X (ft)	Gw_{obj} (mg/L) R26 Csource	C(x) (mg/L)	Location	Groundwater Concentration (mg/L)	X (ft)	C(x) (mg/L)	

Lead				
Soil Exceedances				
Location	Soil Concentration (mg/kg)	X (ft)	Gw_{obj} (mg/L) R26 Csource	C(x) (mg/L)

Benz[a]anthracene								
Soil Exceedances					Groundwater Exceedances			
Location	Soil Concentration (mg/kg)	X (ft)	Gw_{obj} (mg/L) R26 Csource	C(x) (mg/L)	Location	Groundwater Concentration (mg/L)	X (ft)	C(x) (mg/L)
					MW-3A	0.00116	156	0.0001286
					MW-4A	0.000607	112	0.0001294
					MW-5A	0.00015	14	0.0001294

Acenaphthene								
Soil Exceedances					Groundwater Exceedances			
Location	Soil Concentration (mg/kg)	X (ft)	Gw_{obj} (mg/L) R26 Csource	C(x) (mg/L)	Location	Groundwater Concentration (mg/L)	X (ft)	C(x) (mg/L)

Marine Bank Trust 53-0051				
GROUNDWATER CLEAN-UP OBJECTIVES				
(mg/L)				
	Most Stringent	Class I	Class II	ADLs
Parameter	CUO	GW	GW	(U)
Benzene	**0.005**	**0.005**	0.025	<0.002
Ethylbenzene	**0.7**	**0.7**	1	<0.002
MTBE	**0.07**	**0.07**	**0.07**	<0.005
Toluene	**1.0**	**1.0**	2.5	<0.002
Total Xylenes	**10.0**	**10.0**	**10.0**	<0.005
Acenaphthene	**0.42**	**0.42**	2.1	<0.018
Acenaphthylene^	**0.21**	**0.21**	1.05	<0.010
Anthracene	**2.1**	**2.1**	10.5	<0.0066
Benzo(a)anthracene	**0.00013**	**0.00013**	0.00065	<0.00013
Benzo(a)pyrene	**0.0002**	**0.0002**	0.002	<0.0002
Benzo(b)fluoranthene	**0.00018**	**0.00018**	0.0009	<0.00018
Benzo(g,h,i)perylene^	**0.21**	**0.21**	1.05	<0.00076
Benzo(k)fluoranthene	**0.00017**	**0.00017**	0.00085	<0.00017
Chrysene	**0.0015**	**0.0015**	0.0075	<0.0015
Dibenz(a,h)anthracene	**0.0003**	**0.0003**	0.0015	<0.0003
Fluoranthene	**0.28**	**0.28**	1.4	<0.0021
Fluorene	**0.28**	**0.28**	1.4	<0.0021
Indeno(1,2,3-cd)pyrene	**0.00043**	**0.00043**	0.00215	<0.00043
Naphthalene	**0.14**	**0.14**	0.22	<0.010
Phenanthrene^	**0.21**	**0.21**	1.05	<0.0064
Pyrene	**0.21**	**0.21**	1.05	<0.0027
^Temporary Objectives from additional tables -- 10/1/04				
Updated 12/20/04				

Summary of Tier 2 Calculations
Marine Bank Trust 53-0051
20030135
01/11/23

Table 3

Tier 1 Objectives

		Benzene		Toluene		Ethylbenzene		Total Xylenes		Naphthalene		MTBE	
Residential	Ingestion	12	mg/kg	16,000	mg/kg	7,800	mg/kg	16,000	mg/kg	1,600	mg/kg	780	mg/kg
	Inhalation	0.8	mg/kg	650	mg/kg	400	mg/kg	320	mg/kg	170	mg/kg	8,800	mg/kg
	Migration Class 1	0.03	mg/kg	12	mg/kg	13	mg/kg	150	mg/kg	12	mg/kg	0.32	mg/kg
	Migration Class 2	0.17	mg/kg	29	mg/kg	19	mg/kg	150	mg/kg	18	mg/kg	0.32	mg/kg
Industrial/Commercial	Ingestion	100	mg/kg	410,000	mg/kg	200,000	mg/kg	410,000	mg/kg	41,000	mg/kg	20,000	mg/kg
	Inhalation	1.60	mg/kg	650	mg/kg	400	mg/kg	320	mg/kg	270	mg/kg	8,800	mg/kg
Construction Worker	Ingestion	2,300	mg/kg	410,000	mg/kg	20,000	mg/kg	41,000	mg/kg	4,100	mg/kg	2,000	mg/kg
	Inhalation	2.20	mg/kg	42	mg/kg	58	mg/kg	5.6	mg/kg	1.80	mg/kg	140	mg/kg
Soil Saturation		580	mg/kg	290	mg/kg	150	mg/kg	110	mg/kg	66.28	mg/kg	8,400	mg/kg

Tier 2 SSL Objectives

		Benzene	Equation	Toluene	Equation	Ethylbenzene	Equation	Total Xylenes	Equation	Naphthalene	Equation	MTBE	
Residential	Ingestion	11.64	S-2	6,257.14	S-1	7,821	S-1	15,643	S-1	2,564	S-1	782.1	S-1
	Inhalation	2.07	S-6	15,993.08	S-4	1.21	S-6	1,455.11	S-4	194.28	S-4	44,999.99	S-4
	Migration Mass-Limit Class 1	0.28	S-28	55.12	S-28	38.58	S-28	551.18	S-28	7.72	S-28	3.86	S-28
	Migration Class 1	0.040	S-17	16.60	S-17	20.54	S-17	353.24	S-17	5.99	S-17	0.33	S-17
Industrial-Commercial	Ingestion	104.06	S-2	1,635,200	S-1	204,400	S-1	408,800	S-1	40,880	S-1	20,440	S-1
	Inhalation	3.95	S-6	73,019.60	S-4	21.42	S-6	2,316.86	S-4	309.31	S-4	70,911.27	S-4
	Migration Mass-Limit Class 1	0.28	S-28	55.12	S-28	38.58	S-28	551.18	S-28	7.72	S-28	3.86	S-28
	Migration Class 1	0.040	S-17	16.60	S-17	20.54	S-17	353.24	S-17	5.99	S-17	0.33	S-17
Construction Worker	Ingestion	2,256.21	S-3	163,236	S-1	10,202.26	S-1	81,618	S-1	122,427	S-1	61,214	S-1
	Inhalation	5.55	S-7	272.38	S-5	30.13	S-7	59.95	S-5	2.00	S-5	382.29	S-5
Soil Saturation		728.58	S-29	440.01	S-29	249.47	S-29	194.28	S-29	66.28	S-29	11,900.36	S-29

all values are in mg/kg

Site Specific Value cannot exceed Soil Saturation Limit, otherwise Tier 2 Inhalation or Tier 2 Migration objectives are the Soil Saturation objective
Calculated value is less than Tier 1 Objective

Groundwater Contaminate Concentration Exceedances at Surface Water or Set Back Zone (mg/L)

	Benzene	Equation	Toluene	Equation	Ethylbenzene	Equation	Total Xylenes	Equation	Naphthalene	Equation	MTBE	
Result	#DIV/0!	R-26	#DIV/0!	R-26	#DIV/0!	R-26	#DIV/0!	R-26			#DIV/0!	R-26
Surface Water Objective	0.86		0.6		0.014		0.36					

Marine Bank Trust 53-0051 *20030135*

Math for R-26 Calculations
BENZENE MATH FOR VERTICAL SOIL MODELING AND R-26 MODELING OF VERTICAL MODELED SOIL (Attachment A)

Sample Location	C_w = (soil contamination at modeling point) / (Equation S-17)					$GW_{obj} = C_w / DF$					Conversion: 1 foot = 30.48 cm	
					C_w	C_w	/	DF	=	GW_{obj} (mg/L)	X (ft)	X (cm)
SB-7	16.3	/	0.405	=	40.270	40.270	/	20.000	=	2.01351	329	10027.92
SB-13	0.103	/	0.405	=	0.254	0.254	/	20.000	=	0.01272	51	1554.48
SB-14	0.0942	/	0.405	=	0.233	0.233	/	20.000	=	0.01164	47	1432.56
SB-15	0.296	/	0.405	=	0.731	0.731	/	20.000	=	0.03658	99	3017.52

Sample Location	R-16: $\alpha_x = 0.10 * X$					R-17: $\alpha_y = \alpha_x / 3$					R-18: $\alpha_z = \alpha_x / 20$				
	0.1	x	X (cm)	=	α_x (cm)	α_x (cm)	/	3	=	α_y (cm)	α_x (cm)	/	20	=	σ_z (cm)
SB-7	0.1	x	10027.92	=	1002.792	1002.792	/	3	=	334.264	1002.792	/	20	=	50.1396
SB-13	0.1	x	1554.48	=	155.448	155.448	/	3	=	51.816	155.448	/	20	=	7.7724
SB-14	0.1	x	1432.56	=	143.256	143.256	/	3	=	47.752	143.256	/	20	=	7.1628
SB-15	0.1	x	3017.52	=	301.752	301.752	/	3	=	100.584	301.752	/	20	=	15.0876

Sample Location	"Term 1" = [X / (2 * α_x)]							"Term 2" = {1 - SQRT[1 + (4 * λ * α_x) / (U)]}												
	X	/	2	x	α_x	=	"Term 1"	1	-	SQRT (	1	+ (	4	x	λ	x	α_x	)/	U	]=	"Term 2"
SB-7	10027.92	/	2	x	1002.792	=	5	1	-	SQRT (	1	+ (	4	x	0.0009	x	1002.792	)/	1.45473	]=	-0.8659
SB-13	1554.48	/	2	x	155.448	=	5	1	-	SQRT (	1	+ (	4	x	0.0009	x	155.448	)/	1.45473	]=	-0.1767
SB-14	1432.56	/	2	x	143.256	=	5	1	-	SQRT (	1	+ (	4	x	0.0009	x	143.256	)/	1.45473	]=	-0.1638
SB-15	3017.52	/	2	x	301.752	=	5	1	-	SQRT (	1	+ (	4	x	0.0009	x	301.752	)/	1.45473	]=	-0.3216

Sample Location	$\beta_1 = S_w / (4 * SQRT[\alpha_y * X])$											$\beta_2 = S_d / (2 * SQRT[\alpha_z * X])$										
	S_w	/(	4	x	SQRT	(	α_y	x	X	))=	β_1	S_d	/(	2	x	SQRT	(	α_z	x	X	))=	β_2
SB-7	6583.68	/(	4	x	SQRT	(	334.264	x	10027.92	))=	0.89900	304.8	/(	2	x	SQRT	(	50.1396	x	10027.92	))=	0.21493
SB-13	6583.68	/(	4	x	SQRT	(	51.816	x	1554.48	))=	5.79942	304.8	/(	2	x	SQRT	(	7.7724	x	1554.48	))=	1.38848
SB-14	6583.68	/(	4	x	SQRT	(	47.752	x	1432.56	))=	6.29298	304.8	/(	2	x	SQRT	(	7.1628	x	1432.56	))=	1.50448
SB-15	6583.68	/(	4	x	SQRT	(	100.584	x	3017.52	))=	2.98758	304.8	/(	2	x	SQRT	(	15.0876	x	3017.52	))=	0.71425

Sample Location	ERF(β_1)	ERF(β_2)	$C_{(x)} = C_{source} \times e^{(Term 1 \times Term 2)} \times erf(\beta_1) \times erf(\beta_2)$									
	Section 742 APPENDIX C: Table G		C_{source}	x e	("Term 1"	x	"Term 2")	x ERF(β_1)		x ERF(β_2)	=	mg/L
SB-7	0.790405	0.238835	2.01351	x e	5	x	[illegible]	x	0.790405	x 0.238835	=	0.00505
SB-13	1.000000	0.950096	0.01272	x e	5	x	[illegible]	x	1.000000	x 0.950096	=	0.00500
SB-14	1.000000	0.000035	0.01164	x e	5	x	[illegible]	x	1.000000	x 0.000035	=	0.00496
SB-15	0.000076	0.687553	0.03656	x e	5	x	[illegible]	x	0.000076	x 0.687553	=	0.00503

Marine Bank Trust 53-0051 *20030135*

R-28 Calculations
BENZENE MATH FOR R-28 MODELING OF GROUNDWATER (Attachment A)

Sample Location	GW Value	Conversion: 1 foot = 30.48 cm		R-16: α_x = 0.10 * X				R-17: α_y = α_x / 3				R-18: α_z = α_x / 20				"Term 1" = [X / (2 * α_x)]					"Term 2" = {1 - SQRT[1 + (4 * λ * α_x) / (U)]}							
		X (ft)	X (cm)	0.1	x	X (cm)	α_x (cm)	α_x (cm)	/	3	=	α_y (cm)	α_x (cm)	/	20	=	α_z (cm)	X	/	2	x	α_x	= "Term 1"	1 - SQRT[	1	+ (| 4 | x | λ | x | α_x |) /	U	] = "Term 2"
MW-1	1.43	307	9357.36	0.1	x	9357.36	= 935.736	935.736	/	3	=	311.912	935.736	/	20	=	46.7868	9357.36	/	2	x	935.736	= 5	1 - SQRT[	1	+ (| 4 | x | 0.0099 | x | 935.736 |) /	1.45473	] = -0.8269
MW-2	0.25	300	9186	0.1	x	9186	= 918.6	918.6	/	3	=	306.2	918.6	/	20	=	45.93	9186	/	2	x	918.6	= 5	1 - SQRT[	1	+ (| 4 | x | 0.0099 | x | 918.6 |) /	1.45473	] = -0.8838
MW-14	0.264	203	6187.44	0.1	x	6187.44	= 618.744	618.744	/	3	=	206.248	618.744	/	20	=	30.9372	6187.44	/	2	x	618.744	= 5	1 - SQRT[	1	+ (| 4 | x | 0.0099 | x | 618.744 |) /	1.45473	] = -0.8919

Sample Location	β_1 = S_w / (4 * SQRT[α_x * X])									β_2 = S_w / (2 * SQRT[α_x * X])										ERF(β_1) Section 742.APPENDIX C: Table G	ERF(β_2)	C_{gw} = C_{source} x $e^{("Term 1" x "Table 2")}$ x erf(β_1) x erf(β_2)								
	S_w	/ (	4	x	SQRT	(	α_x	x	X	)) =	β_1	S_w	/ (	2	x SQRT	(	α_x	x	X	)) =	β_2			C_{source}	x e	("Term 1" x "Table 2")		x	ERF(β_1)	x	ERF(β_2)	=	mg/L
MW-1	9569.66	/ (	4	x	SQRT	(	311.912	x	9357.36	)) =	0.95342	304.8	/ (	2	x SQRT	(	46.7868	x	9357.36	)) =	0.23033	0.826054	0.255374	1.43000	x e	-0.8269	=	x	0.826054	x	0.255374	=	0.00486
MW-2	9569.66	/ (	4	x	SQRT	(	306.2	x	9186	)) =	1.47895	304.8	/ (	2	x SQRT	(	45.93	x	9186	)) =	0.35355	0.903910	0.382025	0.26000	x e	-0.8838	=	x	0.903910	x	0.382025	=	0.00486
MW-14	9569.66	/ (	4	x	SQRT	(	206.248	x	6187.44	)) =	1.45700	304.8	/ (	2	x SQRT	(	30.9372	x	6187.44	)) =	0.34833	0.900850	0.377712	0.29400	x e	-0.8919	=	x	0.900850	x	0.377712	=	0.00469

Marine Bank Trust 53-0051 ***20030135***

Math for R-26 Calculations

ETHYLBENZENE MATH FOR VERTICAL SOIL MODELING AND R-26 MODELING OF VERTICAL MODELED SOIL (Attachment A)

Sample Location	C_w = (soil contamination at modeling point) / (Equation S-17)					$GW_{obj} = C_w / DF$					Conversion: 1 foot = 30.48 cm		R-16: $\alpha_x = 0.10 * X$					R-17: $\alpha_y = \alpha_x / 3$					R-18: $\alpha_z = \alpha_x / 20$				
					C_w	C_w	/	DF	=	GW_{obj} (mg/L)	X (ft)	X (cm)	0.1	x	X (cm)		α_x (cm)	α_x (cm)	/	3	=	α_y (cm)	α_x (cm)	/	20	=	α_z (cm)
SB-15	47.6	/	1.467	=	32.437	32.437	/	20.000	=	1.62183	15	457.2	0.1	x	457.2	=	45.72	45.72	/	3	=	15.24	45.72	/	20	=	2.286

Sample Location	"Term 1" = [X / (2 * α_x)]							"Term 2" = {1 - SQRT[1 + (4 * λ * α_x) / (U)]}												
	X	/	2	x	α_x	=	"Term 1"	1	-	SQRT [	1	+ (	4	x	λ	x	α_x	) /	U	] =	"Term 2"
SB-15	457.2	/	2	x	45.72	=	5	1	-	SQRT [	1	+ (	4	x	0.003	x	45.72	) /	1.45473	] =	-0.1735

Sample Location	$\beta_1 = S_w / (4 * SQRT[\alpha_y * X])$												$\beta_2 = S_d / (2 * SQRT[\alpha_z * X])$												$ERF(\beta_1)$	$ERF(\beta_2)$
	S_w	/ (	4	x	SQRT	(	α_y	x	X	)) =	β_1		S_d	/ (	2	x	SQRT	(	α_z	x	X	)) =	β_2		Section 742.APPENDIX C: Table G	
SB-15	6583.08	/ (	4	x	SQRT	(	15.24	x	457.2	)) =	19.71801		304.8	/ (	2	x	SQRT	(	2.286	x	457.2	)) =	4.71405		1.000000	1.000000

Sample Location	$C_{(x)} = C_{source} \times e^{(Term 1 \times Term 2)} \times erf(\beta_1) \times erf(\beta_2)$										
	C_{source}	x e	("Term 1"	x	"Term 2")	x $ERF(\beta_1)$		x $ERF(\beta_2)$		=	mg/L
SB-15	1.62183	x e	5	x	-0.1735	x	1.000000	x	1.000000	=	0.68111

Marine Bank Trust 53-0051 ***20030135***

Math for R-26 Calculations

TOTAL XYLENES MATH FOR VERTICAL SOIL MODELING AND R-26 MODELING OF VERTICAL MODELED SOIL (Attachment A)

Sample Location	C_w = (soil contamination at modeling point) / (Equation S-17)					$GW_{obj} = C_w / DF$					Conversion: 1 foot = 30.48 cm		R-16: $\alpha_x = 0.10 * X$					R-17: $\alpha_y = \alpha_x / 3$					R-18: $\alpha_z = \alpha_x / 20$					"Term 1" = [X / (2 * α_x)]							"Term 2" = {1 - SQRT[1 + (4 * λ * α_x) / (U)]}												
					C_w	C_w	/	DF	=	GW_{obj} (mg/L)	X (ft)	X (cm)	0.1	x	X (cm)		α_x (cm)	α_x (cm)	/	3	=	α_y (cm)	α_x (cm)	/	20	=	α_z (cm)	X	/	2	x	α_x	=	"Term 1"	1	-	SQRT[	1	+(	4	x	λ	x	α_x	)/	U	]= "Term 2"
SB-15	163	/	1.766	=	92.288	92.288	/	20.000	=	4.61442	1	30.48	0.1	x	30.48	=	3.048	3.048	/	3	=	1.016	3.048	/	20	=	0.1524	30.48	/	2	x	3.048	=	5	1	-	SQRT[	1	+(	4	x	0.0019	x	3.048	)/	1.45473	]= -0.0079

Sample Location	$\beta_1 = S_w / (4 * SQRT[\alpha_y * X])$											$\beta_2 = S_d / (2 * SQRT[\alpha_z * X])$											ERF(β_1)	ERF(β_2)	$C_{(x)} = C_{source} \times e^{(Term\ 1 \times Term\ 2)} \times erf(\beta_1) \times erf(\beta_2)$									
	S_w	/(	4	x	SQRT	(	α_y	x	X	))=	β_1	S_d	/(	2	x	SQRT	(	α_z	x	X	))=	β_2	Section 742.APPENDIX C: Table G		C_{source}	x e	("Term 1"	x	"Term 2")	x ERF(β_1)	x ERF(β_2)	=	mg/L
SB-15	6583.68	/(	4	x	SQRT	(	1.016	x	30.48	))=	295.77018	304.8	/(	2	x	SQRT	(	0.1524	x	30.48	))=	70.71068	1.000000	1.000000	4.61442	x e	5	x	-0.0079	x 1.000000	x 1.000000	=	4.43503

Marine Bank Trust 53-0051 ***20030135***

Math for R-29 Calculations

NAPTHALENE MATH FOR VERTICAL SOIL MODELING AND R-29 MODELING OF VERTICAL MODELED SOIL (Attachment A)

Sample Location	C_w = (soil contamination at modeling point) / (Equation R-17)			C_o	GW_{obs} = C_w / DF				Conversion: 1 foot = 30.48 cm		R-16: α_x = 0.10 * X				R-17: α_z = α_x / 3				R-18: α_y = α_x / 20				"Term 1" = [X / (2 * α_x)]					"Term 2" = [1 - SQRT(1 + (4 * λ * α_z) / (U))]								
				C_o		/	DF	=	GW_{obs} (mg/L)	X (ft)	X (cm)	0.1	x	X (cm)	=	α_x (cm)	α_x (cm)	/	3	=	α_z (cm)	α_y (cm)	/	20	=	α_y (cm)	X	/	2	x	α_x	=	"Term 1"	1 -	SQRT [	1	+ [	4	x	λ	x	α_z	] /	U	] =	"Term 2"
SB-7	17	/	2.136	=	7.961	7.961	/	20.000	=	0.39756	3	91.44	0.1	x	91.44	=	9.144	9.144	/	3	=	3.048	9.144	/	20	=	0.4572	91.44	/	2	x	9.144	=	5	1 -	SQRT [	1	+ [	4	x	0.0027	x	9.144	] /	1.45473	] =	-0.6334
SB-15	18.5	/	2.136	=	8.663	8.663	/	20.000	=	0.43264	3	91.44	0.1	x	91.44	=	9.144	9.144	/	3	=	3.048	9.144	/	20	=	0.4572	91.44	/	2	x	9.144	=	5	1 -	SQRT [	1	+ [	4	x	0.0027	x	9.144	] /	1.45473	] =	-0.6334

Sample Location	$\beta_x = S_x / (4 * SQRT[\alpha_x * X])$											$\beta_z = S_z / (2 * SQRT[\alpha_z * X])$											ERF(β_x)	ERF(β_z)	$C_{(d)} = C_{source} \times e^{[\text{"Term 1"} + \text{"Term 2"}]} \times erf(\beta_x) \times erf(\beta_z)$										
	S_x	/ [	4	x	SQRT	[	α_x	x	X	]] =	β_x	S_z	/ [	2	x	SQRT	[	α_z	x	X	]] =	β_z	Section 742 APPENDIX C: Table G		C_{source}	x e	["Term 1"	+	"Term 2"]	x	ERF(β_x)	x	ERF(β_z)	=	mg/L
SB-7	6563.68	/ [	4	x	SQRT	[	3.048	x	91.44	]] =	88.59668	304.8	/ [	2	x	SQRT	[	0.4572	x	91.44	]] =	23.57023	1.000000	1.000000	0.39756	x e	[	+	]	x	1.000000	x	1.000000	=	0.39644
SB-15	6563.68	/ [	4	x	SQRT	[	3.048	x	91.44	]] =	88.59668	304.8	/ [	2	x	SQRT	[	0.4572	x	91.44	]] =	23.57023	1.000000	1.000000	0.43264	x e	[	+	]	x	1.000000	x	1.000000	=	0.38612

Marine Bank Trust 53-0051 ***20030135***

R-26 Calculations

NAPTHALENE MATH FOR R-26 MODELING OF GROUNDWATER (Attachment A)

Sample Location	GW Value	Conversion: 1 foot = 30.48 cm		R-16: α_x = 0.10 * X					R-17: α_y = α_z / 3					R-18: α_z = α_z / 20					"Term 1" = [X / (2 * α_x)]							"Term 2" = [1 - SQRT[1 + (4 * A * α_z) / (U)]]									
		X (ft)	X (cm)	0.1	x	X (cm)	=	α_x (cm)	α_x (cm)	/	3	=	α_z (cm)	α_z (cm)	/	20	=	α_z (cm)	X	/	2	x	α_x	=	"Term 1"	1	-	SQRT[	1	+[	4	x	A	x	α_z	]/	U	]=	"Term 2"
MW-2A	0.178	5	152.4	0.1	x	152.4	=	15.24	15.24	/	3	=	5.08	15.24	/	20	=	0.762	152.4	/	2	x	15.24	=	5	1	-	SQRT[	1	+[	4	x	0.0027	x	15.24	]/	1.48473	]=	-0.0551
MW-3A	0.514	26	792.48	0.1	x	792.48	=	79.248	79.248	/	3	=	26.416	79.248	/	20	=	3.9624	792.48	/	2	x	79.248	=	5	1	-	SQRT[	1	+[	4	x	0.0027	x	79.248	]/	1.48473	]=	-0.2805
MW-4A	0.179	5	152.4	0.1	x	152.4	=	15.24	15.24	/	3	=	5.08	15.24	/	20	=	0.762	152.4	/	2	x	15.24	=	5	1	-	SQRT[	1	+[	4	x	0.0027	x	15.24	]/	1.48473	]=	-0.0551

Sample Location	$\beta_1 = S_w / (4 * SQRT[\alpha_x * X])$										$\beta_2 = S_w / (2 * SQRT[\alpha_z * X])$										ERF(β_1) Section 742.APPENDIX C, Table G	ERF(β_2)	$C_{avg} = C_{source} \times e^{(\text{"Term 1"} \times \text{"Term 2"})} \times erf(\beta_1) \times erf(\beta_2)$											
	S_w	/ [	4	x	SQRT	[	α_x	x	X	]] =	β_1	S_w	/ [	2	x SQRT	[	α_z	x	X	]] =	β_2			C_{source}	x e	("Term 1"	x	"Term 2")	x	ERF(β_1)	x	ERF(β_2)	=	mg/L
MW-2A	6583.68	/ [	4	x	SQRT	[	5.08	x	152.4	]] =	58.15404	304.8	/ [	2	x SQRT	[	0.762	x	152.4	]] =	14.14214	1.000000	1.000000	0.17600	x e	(	x	-0.0551	x	1.000000	x	1.000000	=	0.13617
MW-3A	6583.68	/ [	4	x	SQRT	[	26.416	x	792.48	]] =	11.37376	304.8	/ [	2	x SQRT	[	3.9624	x	792.48	]] =	2.71964	1.000000	0.998888	0.51400	x e	(	x	-0.2805	x	1.000000	x	0.998888	=	0.13868
MW-4A	6583.68	/ [	4	x	SQRT	[	5.08	x	152.4	]] =	58.15404	304.8	/ [	2	x SQRT	[	0.762	x	152.4	]] =	14.14214	1.000000	1.000000	0.17600	x e	(	x	-0.0551	x	1.000000	x	1.000000	=	0.13599

Marine Bank Trust 53-0051 **20030135**

R-26 Calculations

BENZO[a]PYRENE MATH FOR R-26 MODELING OF GROUNDWATER (Attachment A)

Sample Location	GW Value	Conversion: 1 foot = 30.48 cm		R-16: $\alpha_x = 0.10 * X$					R-17: $\alpha_y = \alpha_x / 3$					R-18: $\alpha_z = \alpha_x / 20$					"Term 1" = $[X / (2 * \alpha_x)]$							"Term 2" = $[1 - SQRT[1 + (4 * \lambda * \alpha_x) / (U)]]$													
		X (ft)	X (cm)	0.1	x	X (cm)		α_x (cm)	α_x (cm)	/	3	=	α_y (cm)	α_x (cm)	/	20	=	α_z (cm)	X	/	2	x	α_x	=	"Term 1"	1	-	SQRT [	1	+ (	4	x	λ	x	α_x	)/	U	]=	"Term 2"
MW-3A	0.000319	36	1097.28	0.1	x	1097.28	=	109.728	109.728	/	3	=	36.576	109.728	/	20	=	5.4864	1097.28	/	2	x	109.728	=	5	1	-	SQRT [	1	+ (	4	x	0.00065	x	109.729	)/	1.45473	]=	-0.0937

Sample Location	$\beta_1 = S_w / (4 * SQRT[\alpha_y * X])$											$\beta_2 = S_d / (2 * SQRT[\alpha_z * X])$											ERF(β_1)	ERF(β_2)	$C_{(x)} = C_{source} \times e^{(Term 1 \times Term 2)} \times erf(\beta_1) \times erf(\beta_2)$									
																							Section 742.APPENDIX C: Table G											
	S_w	/ (	4	x	SQRT	(	α_y	x	X	)) =	β_1	S_d	/ (	2	x SQRT	(	α_z	x	X	)) =	β_2			C_{source}	x e	("Term 1"	x	"Term 2")	x	ERF(β_1)	x	ERF(β_2)	= mg/L
MW-3A	6583.68	/ (	4	x	SQRT	(	36.576	x	1097.28	)) =	8.21664	304.8	/ (	2	x SQRT	(	5.4864	x	1097.28	)) =	1.98419	1.000000	0.994527	0.00032	x e	[illegible]	x	[illegible]	x	1.000000	x	0.994527	= 0.00020

Marine Bank Trust 53-0051 ***20030135***

R-26 Calculations

BenzfalAnthracene MATH FOR R-26 MODELING OF GROUNDWATER (Attachment A)

Sample Location	GW Value	Conversion: 1 foot = 30.48 cm		R-16: $\alpha_x = 0.10 * X$				R-17: $\alpha_z = \alpha_y / 3$				R-18: $\alpha_y = \alpha_x / 20$				"Term 1" = [X / (2 * α_x)]					"Term 2" = (1 - SQRT[1 + (4 * λ * α_x) / (U)²])								
		X (ft)	X (cm)	0.1	x	X (cm)	α_x (cm)	α_y (cm)	/	3	=	α_z (cm)	α_x (cm)	/	20	=	α_y (cm)	X	/	2	x	α_x	= "Term 1"	1 - SQRT[	1	+(| 4 | x | λ | x | α_x |)/	U	]= "Term 2"
MW-3A	0.00116	150	4754.88	0.1	x	4754.88	= 475.488	475.488	/	3	=	158.496	475.488	/	20	=	23.7744	4754.88	/	2	x	475.488	= 5	1 - SQRT[	1	+(| 4 | x | 0.00051 | x | 475.488 |)/	1.45473	]= -0.2910
MW-4A	0.000107	112	3413.76	0.1	x	3413.76	= 341.376	341.376	/	3	=	113.792	341.376	/	20	=	17.0688	3413.76	/	2	x	341.376	= 5	1 - SQRT[	1	+(| 4 | x | 0.00051 | x | 341.376 |)/	1.45473	]= -0.2160
MW-5A	0.00015	14	426.72	0.1	x	426.72	= 42.672	42.672	/	3	=	14.224	42.672	/	20	=	2.1336	426.72	/	2	x	42.672	= 5	1 - SQRT[	1	+(| 4 | x | 0.00051 | x | 42.672 |)/	1.45473	]= -0.0566

Sample Location	$\beta_x = S_x / (4 * SQRT[\alpha_x * X])$										$\beta_y = S_y / (2 * SQRT[\alpha_y * X])$										ERF(β_x)	ERF(β_y)	$C_{gw} = C_{source} \times e^{[Term 1 + Term 2]} \times erf(\beta_x) \times erf(\beta_y)$									
	S_x	/ (	4	x	SQRT	(	α_x	x	X	))=	β_x	S_y	/ (	2	x SQRT	(	α_y	x	X	))=	β_y	Section 742 APPENDIX C; Table G		C_{source}	x e	[Term 1	+ Term 2]	x	ERF(β_x)	x	ERF(β_y)	= mg/L
MW-3A	6583.68	/ (	4	x	SQRT	(	158.496	x	4754.88	))=	1.80598	304.8	/ (	2	x SQRT	(	23.7744	x	4754.88	))=	0.45227	0.992096	0.478404	0.00116	x e	-0.2910	+ -0.2160	x	0.992096	x	0.478404	= 0.00013
MW-4A	6583.68	/ (	4	x	SQRT	(	113.792	x	3413.76	))=	2.64081	304.8	/ (	2	x SQRT	(	17.0688	x	3413.76	))=	0.89135	0.999812	0.878056	0.00001	x e	-0.2160	+ -0.2160	x	0.999812	x	0.878056	= 0.00013
MW-5A	6583.68	/ (	4	x	SQRT	(	14.224	x	426.72	))=	21.12644	304.8	/ (	2	x SQRT	(	2.1336	x	426.72	))=	5.95076	1.000000	1.000000	0.00015	x e	-0.0566	+ -0.2160	x	1.000000	x	1.000000	= 0.00013

Illinois Enviromental Protection Agency
Leaking Underground Storage Tank Program
SSL Input Parameters for Use with Tier 2 Calculations

A. Site Identification

IEMA Incident # (6- or 8-digit): 20030135 IEPA LPC # (10-digit): 1670255005

Site Name: Marine Bank Trust 53-0051

Site Address (not a P.O. Box): 9520 State Route 29

City: Cantrall County: Sangamon Zip Code: 62625

Leaking UST Technical File

B. Tier 2 Calculation Information

Equation(s) Used (ex: S12,S17,S28): S5,6,7,8,9,10,17,18,19,20,21,22,24

Contact Information for Individual Who Performed Calculations:

CWM, VES

Land Use: Residential Soil Type: Silt Loam

Groundwater: [X] Class I [ ] Class II

Mass Limit: [ ] Yes [X] No If Yes, then Specify Acreage:

- Mass Limit Acreage other than defaults must always be rounded up.
- Failure to use site-specific parameters where allowed could affect payment from the UST Fund
- Maps depicting source width, plume dimensions, distance, etc. must also be submitted.
- Inputs must be submitted in the designated unit.

AT (Ingestion)	=	Residential = 6	yr
		Con. Worker = 0.115	yr
AT (inhalation)	=	Residential = 30	yr
		Con. Worker = 0.115	yr
AT_c	=	70	yr
BW	=	Res. (NonCarcinogen) = 15	kg
		Res. (Carcinogen) = 70	kg
		Con. Worker = 70	kg
C_{sat}	=	Benzene = 728.58	mg/kg
		Toluene = 440.007	mg/kg
		Ethylbenzene = 249.471	mg/kg
		Total Xylenes = 194.282	mg/kg
		MTBE = 11900.357	mg/kg
		Naphthalene = 66.279	mg/kg
			mg/kg
			mg/kg
			mg/kg
			mg/kg

d_a	=	3.048	m
d_s	=	3.048	m
DA	=	Benzene = 0.000357508596142774	cm^2/s
		Toluene = 0.00020284209944658 1	cm^2/s
		Ethylbenzene = 0.00011823711622498 8	cm^2/s
		Xylenes = 8.06069228299722E-05	cm^2/s
		MTBE = 7.74297246249364E-05	cm^2/s
		Naphthalene = 4.0694920147726E-06	cm^2/s
			cm^2/s
			cm^2/s
			cm^2/s
			cm^2/s

Incident # 20030135

C_w	=	Benzene = 0.1	mg/L
		Toluene = 20	mg/L
		Ethylbenzene = 20.544	mg/L
		Total Xylenes = 353.24	mg/L
		MTBE = 0.326	mg/L
		Naphthalene = 5.986	mg/L
			mg/L
			mg/L
			mg/L
			mg/L
			mg/L
d	=	11.401	m
ED (inhalation of carcinogens)	=	Residential = 30	yr
		Con. Worker = 1	yr
ED (ingestion of noncarcinogens)	=	Residential = 6	yr
		Con. Worker = 1	yr
ED (inhalation of noncarcinogens)	=	Residential = 30	yr
		Con. Worker = 1	yr
ED (ingestion of groundwater)	=	Residential = 30	yr
		Con. Worker = 1	yr
ED_{M-L}	=	70	yr
EF	=	Residential = 350	d/yr
		Con. Worker = 30	d/yr
F(x)	=	0.194	unitless
f_{oc}	=	0.0039	g/g
GW_{obj}	=	Benzene = 0.005	mg/L
		Toluene = 1	mg/L
		Ethylbenzene = 0.7	mg/L
		Total Xylenes = 10	mg/L
		MTBE = 0.07	mg/L
		Naphthalene = 0.14	mg/L
			mg/L
			mg/L
			mg/L
			mg/L
			mg/L
H'	=	Benzene = 0.23	unitless
		Toluene = 0.271	unitless
		Ethylbenzene = 0.324	unitless
		Total Xylenes = 0.271	unitless
		MTBE = 0.0241	unitless
		Naphthalene = 0.0198	unitless
			unitless
			unitless
			unitless
			unitless
i	=	0.06188	m/m
I	=	0.3	m/yr
I_{M-L}	=	0.18	m/yr
$IF_{soil-adj}$	=	114	(mg-yr)/(kg-d)
IR_{soil}	=	Residential = 200	mg/d
		Con. Worker = 480	mg/d

D_i	=	Benzene = 0.088	cm^2/s
		Toluene = 0.087	cm^2/s
		Ethylbenzene = 0.075	cm^2/s
		Total Xylenes = 0.0735	cm^2/s
		MTBE = 0.102	cm^2/s
		Naphthalene = 0.0000075	cm^2/s
			cm^2/s
			cm^2/s
			cm^2/s
			cm^2/s
			cm^2/s
D_w	=	Benzene = 0.0000102	cm^2/s
		Toluene = 0.0000086	cm^2/s
		Ethylbenzene = 0.0000078	cm^2/s
		Total Xylenes = 0.00000923	cm^2/s
		MTBE = 0.000011	cm^2/s
		Naphthalene = 0.0000075	cm^2/s
			cm^2/s
			cm^2/s
			cm^2/s
			cm^2/s
DF	=	2.08662718	unitless
ED (ingestion of carcinogens	=		yr
		Con. Worker = 1	yr
K_{oc}	=	Benzene = 50	cm^3/g or L/kg
		Toluene = 158	cm^3/g or L/kg
		Ethylbenzene = 320	cm^3/g or L/kg
		Total Xylenes = 398	cm^3/g or L/kg
		MTBE = 11.5	cm^3/g or L/kg
		Naphthalene = 500	cm^3/g or L/kg
			cm^3/g or L/kg
			cm^3/g or L/kg
			cm^3/g or L/kg
			cm^3/g or L/kg
K_s	=	120	m/yr
L	=	79.8576	m
PEF	=		m^3/kg
PEF'	=		m^3/kg
Q/C (VF equations)	=	Residential = 68.81	$(g/m^2\text{-}s)/(kg/m^3)$
		Con. Worker = 85.81	$(g/m^2\text{-}s)/(kg/m^3)$
Q/C (PEF equations)	=		$(g/m^2\text{-}s)/(kg/m^3)$

RfC (mg/m^3)		**Chronic**	**Subchronic**
Benzene	=	0.03	0.08
Toluene	=	5	5
Ethylbenzene	=	1	9
Total Xylenes	=	0.1	0.4
MTBE	=	3	2.5
Naphthalene	=	0.003	0.003
	=		NA
	=		NA
	=		NA
	=		NA

Incident # 20030135

IR_w	=	Residential = 2	L/d
K	=	36.89712	m/yr
K_d(non-ionizing organcis)	=	Benzene = 0.195	cm^3/g or L/kg
		Toluene = 0.6162	cm^3/g or L/kg
		Ethylbenzene = 1.248	cm^3/g or L/kg
		Total Xylenes = 1.5522	cm^3/g or L/kg
		MTBE = 0.04485	cm^3/g or L/kg
		Naphthalene = 1.95	cm^3/g or L/kg
			cm^3/g or L/kg
			cm^3/g or L/kg
			cm^3/g or L/kg
			cm^3/g or L/kg
K_d (ionizing organics)	=		cm^3/g or L/kg
K_d (inorganics)	=		cm^3/g or L/kg
VF'	=	Benzene = 508.615	m^3/kg
		Toluene = 675.233	m^3/kg
		Ethylbenzene = 884.414	m^3/kg
		Total Xylenes = 1071.14	m^3/kg
		MTBE = 1092.896	m^3/kg
		Naphthalene = 4767.191	m^3/kg
			m^3/kg
			m^3/kg
			m^3/kg
			m^3/kg
VM_{M-L}	=	#VALUE!	m^3/kg
		#VALUE!	m^3/kg
		#VALUE!	m^3/kg
		#VALUE!	m^3/kg
		#VALUE!	m^3/kg
		#VALUE!	m^3/kg
			m^3/kg
			m^3/kg
			m^3/kg
			m^3/kg
VF'_{M-L}	=	#VALUE!	m^3/kg
		#VALUE!	m^3/kg
		#VALUE!	m^3/kg
		#VALUE!	m^3/kg
		#VALUE!	m^3/kg
		#VALUE!	m^3/kg
			m^3/kg
			m^3/kg
			m^3/kg
			m^3/kg
			m^3/kg
η	=	0.434	L_{pore}/L_{soil}
θ_a	=	0.155	L_{air}/L_{soil}

RfD_o mg/(kg-d)		Chronic	Subchronic
Benzene	=	0.004	0.012
Toluene	=	0.08	0.8
Ethylbenzene	=	0.1	0.05
Total Xylenes	=	0.2	0.4
MTBE	=	0.01	0.3
Naphthalene	=	0.02	0.6
	=		0.2
	=		NA
	=		NA
	=		NA

S	=	Benzene = 1800	mg/L
		Toluene = 530	mg/L
		Ethylbenzene = 170	mg/L
		Total Xylenes = 110	mg/L
		MTBE = 51000	mg/L
		Naphthalene = 31	mg/L
			mg/L
			mg/L
			mg/L
			mg/L
SF_o	=	Benzene = 0.055	$(mg/kg-d)^{-1}$
		Toluene = NA	$(mg/kg-d)^{-1}$
		Ethylbenzene = 0.011	$(mg/kg-d)^{-1}$
		Total Xylenes = NA	$(mg/kg-d)^{-1}$
		MTBE = NA	$(mg/kg-d)^{-1}$
		Naphthalene = NA	$(mg/kg-d)^{-1}$
			$(mg/kg-d)^{-1}$
			$(mg/kg-d)^{-1}$
			$(mg/kg-d)^{-1}$
			$(mg/kg-d)^{-1}$
T	=	Residential = 9.5E08	s
		Con. Worker = 3.6×10^6	s
T_{M-L}	=	30	yr
THQ	=	1	unitless
TR	=	1.00E-06	unitless
U_m	=	4.69	m/s
URF	=	Benzene = 7.8×10^{-6}	$(\mu g/m^3)^{-1}$
U_t	=	11.32	m/s
V	=	0.5	unitless
VF	=	Benzene = 6625.424	m^3/kg
		Toluene = 8795.851	m^3/kg
		Ethylbenzene = 11520.73	m^3/kg
		Total Xylenes = 13953.101	m^3/kg
		MTBE = 14236.494	m^3/kg
		Naphthalene = 62099.317	m^3/kg
			m^3/kg
			m^3/kg
			m^3/kg
			m^3/kg

Incident # 20030135

θ_w	=	0.279	L_{water}/L_{soil}
ρ_b	=	1.5	kg/l or g/cm^3
ρ_s	=	2.65	g/cm^3
ρ_w	=	1	g/cm^3
1/(2b+3)	=	0.074	unitless

Illinois Enviromental Protection Agency
Leaking Underground Storage Tank Program
RBCA Input Parameters for Use with Tier 2 Calculations

A. Site Identification

IEMA Incident # (6- or 8-digit): 20030135 IEPA LPC # (10-digit): 1670255005

Site Name: Marine Bank Trust 53-0051

Site Address (not a P.O. Box): 9520 State Route 29

City: Cantrall County: Sangamon Zip Code: 62625

Leaking UST Technical File

B. Tier 2 Calculation Information

Equation(s) Used (ex: R12,R14,R26): R16, R17, R18,R19, R21, R22, R23, R24,R26

Contact Information for Individual Who Performed Calculations:

CWM, VES

Land Use: Residential Soil Type: Silt Loam

Groundwater: [X] Class I [ ] Class II

Mass Limit: [ ] Yes [X] No If Yes, then Specify Acreage:

Objective from S17 used in R26? [ ] Yes [X] No

If Yes, then Specify C_{source} from S17 See Attached mg/L.

- Mass Limit Acreage other than defaults must always be rounded up.
- Failure to use site-specific parameters where allowed could affect payment from the UST Fund
- Maps depicting source width, plume dimensions, distance, etc. must also be submitted.
- Inputs must be submitted in the designated unit.

AT_c	=	70	yr
AT_n	=	Residential = 30 Con. Worker = 0.115	yr yr
BW	=	70	yr
C_{source}	=	See Attached	mg/L
$C_{(x)}$	=	See Attached	mg/L
d	=	100	cm

D^{air}	=	See Attached	cm^2/s
D^{water}	=	See Attached	cm^2/s
D_a^{eff}	=	See Attached	cm^2/s
ED	=	Residential = 30 Con. Worker = 1	yr yr
EF	=	Residential = 350 Con. Worker = 30	d/yr d/yr

erf	=	See Attached	unitless
f_{oc}	=	0.0039	g/g
GW_{comp}	=	See Attached	mg/L
GW_{source}	=	See Attached	mg/L
H'	=	See Attached	$cm3_{water}/cm^3_{air}$
I	=	0.06188	cm/cm
I	=	30	cm/yr
IR_{air}	=	20	m^3/d
IR_{soil}	=	Residential = 100 Con. Worker = 480	mg/d mg/d
IR_w	=	Residential = 2	L/d
K	=	10.109 3689.712	cm/d cm/yr
K_{oc}	=	See Attached	cm^3/g or L/kg
k_a (non-ionizing organics)	=	See Attached	cm^3_{water}/g_{soil}
k_a (ionizing organics)	=	Not Applicable	cm^3_{water}/g_{soil}
k_a (inorganics)	=	Not Applicable	cm^3_{water}/g_{soil}
L_s	=	100	cm
LF_{sw}	=	See Attached	$(mg/l_{water})/(mg/kg_{soil})$
M	=	.0.5	mg/cm^2
Pe	=	$6.9 \cdot 10^{-14}$	g/cm^2-s
RAF_d	=	0.5	unitless
α_x	=	See Attached	cm
α_y	=	See Attached	cm
α_z	=	See Attached	cm
λ	=	See Attached	d^{-1}
π	=	3.1416	
T	=	$9.46 \cdot 10^8$	s

RAF_d (PNAs)	=	0.05	unitless
RAF_d (Inorganics)	=	0	unitless
RAF_o	=	1	unitless
$RBSL_{air}$ (carcinoginic)	=	See Attached	$\mu g/m^3$
$RBSL_{air}$ (noncarcinoginic)	=	See Attached	$\mu g/m^3$
RfD_i	=	See Attached	mg/kg-d
SA	=	3,160	cm^2/d
S_d	=	200.0	cm
S_w	=	6,583.7	cm
SF_i	=	See Attached	$(mg/kg\text{-}d)^{-1}$
SF_o	=	See Attached	$(mg/kg\text{-}d)^{-1}$
THQ	=	1	unitless
TR	=	1.00E-06	unitless
U	=	1.4547	cm/d
U_{air}	=	225	cm/s
U_{gw}	=	3689.773	cm/y
VF_p	=	3.97133E-12	kg/m^3
VF_{samb}	=	See Attached	$(mg/m^3_{water})/mg/g_{soil}$ or kg/m
VF_{ss}	=	See Attached	kg/m3
W	=		cm
w	=	0.195	g_{water}/g_{soil}
δ_{air}	=	200	cm
δ_{gw}	=	200	cm
θ_{as}	=	0.1375	cm^3_{air}/cm^3_{soil}
θ_{ws}	=	0.2925	cm^3_{water}/cm^3_{soil}
θ_T	=	0.43	cm^3/cm^3_{soil}
ρ_b	=	1.5	g/cm^3
ρ_w	=	1	g/cm^3

	H'	λ	Koc
Benzene	0.23	0.0009	50
Toluene	0.271	0.011	158
Ethylbenzene	0.324	0.003	320
Total Xylenes	0.271	0.0019	398
MTBE	0.0241	0	11.5
Naphthalene	0.0198	0.0027	500

Benzene R26 Modeled Groundwater from Vertical Modeled Soils

Location	C_{source} from S17 (mg/L)	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $S_w/(4 \cdot \sqrt{[\alpha_y \cdot X]})$	erf: $S_w/(2 \cdot \sqrt{[\alpha_z \cdot X]})$
SB-7	2.014	0.005	10027.92	1002.792	334.264	50.1396	0.79640454	0.23883506
SB-13	0.013	0.005	1554.48	155.448	51.816	7.7724	1	0.95009581
SB-14	0.012	0.005	1432.56	143.256	47.752	7.1628	1	0.96663468
SB-15	0.037	0.005	3017.52	301.752	100.584	15.0876	0.99997611	0.6875531

Benzene R26 Modeled Groundwater

Location	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $S_w/(4 \cdot \sqrt{[\alpha_y \cdot X]})$	erf: $S_w/(2 \cdot \sqrt{[\alpha_z \cdot X]})$
MW-1	1.430	9357.36	935.736	311.912	46.7868	0.82695441	0.25537355
MW-2	0.250	6096	609.6	203.2	30.48	0.96350876	0.38292492
MW-14	0.264	6187.44	618.744	206.248	30.9372	0.96064956	0.37771241

Toluene R26 Modeled Groundwater from Vertical Modeled Soils								
Location	C_{source} from S17 (mg/L)	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $S_w / (4 \cdot \sqrt{[\alpha_y \cdot X]})$	erf: $S_w / (2 \cdot \sqrt{[\alpha_z \cdot X]})$

Toluene R26 Modeled Groundwater							
Location	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $S_w / (4 \cdot \sqrt{[\alpha_y \cdot X]})$	erf: $S_w / (2 \cdot \sqrt{[\alpha_z \cdot X]})$

Ethylbenzene R26 Modeled Groundwater from Vertical Modeled Soils								
Location	C_{source} from S17 (mg/L)	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $S_w / (4 \cdot \sqrt{[\alpha_y \cdot X]})$	erf: $S_w / (2 \cdot \sqrt{[\alpha_z \cdot X]})$
SB-15	1.6218	0.6811	457.2	45.72	15.24	2.286	1	1

Ethylbenzene R26 Modeled Groundwater							
Location	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	$\sqrt{[\alpha_y \cdot X]}$	$\sqrt{[\alpha_z \cdot X]}$

Total Xylenes R26 Modeled Groundwater from Vertical Modeled Soils								
Location	C_{source} from S17 (mg/L)	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $S_w / (4 \cdot \sqrt{[\alpha_y \cdot X]})$	erf: $S_w / (2 \cdot \sqrt{[\alpha_z \cdot X]})$
SB-15	4.6144	4.4350	30.48	3.048	1.016	0.1524	1	1

Total Xylenes R26 Modeled Groundwater							
Location	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $S_w / (4 \cdot \sqrt{[\alpha_y \cdot X]})$	erf: $S_w / (2 \cdot \sqrt{[\alpha_z \cdot X]})$

MTBE R26 Modeled Groundwater from Vertical Modeled Soils								
Location	C_{source} from S17 (mg/L)	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $S_w / (4 \cdot \sqrt{[\alpha_y \cdot X]})$	erf: $S_w / (2 \cdot \sqrt{[\alpha_z \cdot X]})$

MTBE R26 Modeled Groundwater							
Location	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $S_w / (4 \cdot \sqrt{[\alpha_y \cdot X]})$	erf: $S_w / (2 \cdot \sqrt{[\alpha_z \cdot X]})$

Naphthalene R26 Modeled Groundwater from Vertical Modeled Soils								
Location	C_{source} from S17 (mg/L)	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $S_w / (4 \cdot \sqrt{[\alpha_y \cdot X]})$	erf: $S_w / (2 \cdot \sqrt{[\alpha_z \cdot X]})$
SB-7	0.3976	0.3364	91.44	9.144	3.048	0.4572	1	1
SB-15	0.4326	0.3661	91.44	9.144	3.048	0.4572	1	1

Naphthalene R26 Modeled Groundwater							
Location	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $S_w / (4 \cdot \sqrt{[\alpha_y \cdot X]})$	erf: $S_w / (2 \cdot \sqrt{[\alpha_z \cdot X]})$
MW-2A	0.178	152.4	15.24	5.08	0.762	1	1
MW-3A	0.514	792.48	79.248	26.416	3.9624	1	0.99988001
MW-4A	0.179	152.4	15.24	5.08	0.762	1	1

Location	C_{source} from S17 (mg/L)	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $S_w / (4 \cdot \sqrt{[\alpha_y \cdot X]})$	erf: $S_w / (2 \cdot \sqrt{[\alpha_z \cdot X]})$

Location	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $S_w / (4 \cdot \sqrt{[\alpha_y \cdot X]})$	erf: $S_w / (2 \cdot \sqrt{[\alpha_z \cdot X]})$
MW-3A	0.001	4754.88	475.488	158.496	23.7744	0.99266624	0.47849398
MW-4A	0.001	3413.76	341.376	113.792	17.0688	0.99961203	0.62806632
MW-5A	0.000	426.72	42.672	14.224	2.1336	1	1

Location	C_{source} from S17 (mg/L)	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $s_w / (4 \cdot \sqrt{[\alpha_y \cdot X]})$	erf: $s_w / (2 \cdot \sqrt{[\alpha_z \cdot X]})$

Location	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $s_w / (4 \cdot \sqrt{[\alpha_y \cdot X]})$	erf: $s_w / (2 \cdot \sqrt{[\alpha_z \cdot X]})$
MW-3A	0.000	1097.28	109.728	36.576	5.4864	1	0.9945268

Tier 2 Industrial/Commercial Calculations for Benzene

Marine Bank Trust 53-0051
20030135

SSL | RBCA | SSL & RBCA | RIS/HEAST

Date Compiled: 01/11/23

Input Values

Holcomb's Bulk Density -->	0	Converted Value to be used in calculation sheet -->			–	USDA Soil Classification:	Silt Loam			
Organic Matter (%) -->	0	FOC % (0.58 conversion) -->	0.000	Organic Matter (mg/kg)	0	FOC mg/kg (0.58 conversion)	0.000	foc conversion to g/g:	0.000	

1.500	ρ_b - Dry Soil Bulk Density				1.5 or; Gravel = 2.0; Sand = 1.8; Silt = 1.6; Clay = 1.7; or Site Specific
2.65	ps - Soil Particle Density				2.65 or; Site Specific
0.155	Θ_a - Air Filled Soil Porosity	*0.155*	Value from S-21		Top 1 meter = 0.28; below 1 meter = 0.13; Gravel = 0.05; Sand = 0.14; Silt =0.24; Clay = 0.19; or Calculated Value (S21)
0.279	Θw - Water Filled Soil Porosity	*0.279*	Value from S-20		Top 1 meter = 0.15; below 1 meter = 0.30; Gravel = 0.20; Sand = 0.18; Silt =0.16; Clay = 0.17; or Calculated Value (S20)
0.434	n - SSL: Total Soil Porosity	*0.434*	Value from S-24		0.43 or; Gravel - 0.25; Sand = 0.32; Silt = 0.40; Clay = 0.36; or Calculated Value (S24)
0.06188	I - Hydraulic Gradient				Site Specific
0.004	foc - Total Organic Carbon (g/g)				Surface Soil = 0.006; Subsurface Soil = 0.002; or Site Specific
20.000	DF - Dilution Factor	*2.087*	Value from S-22		If calculated value for DF is less than 20, then 20 default is used, else calculated value is used
11.402	d - Mixing Zone (m)	11.402	Value from S-25		2; or calculated value
3.048	d_a - Depth of source (m)		feet = 10		Depth of Source (Vertical thickness of contamination)
36.90	K - Hydraulic Conductivity (m/yr)	cm/sec =	1.17E-04		Site Specific
79.858	L - Source Length Parallel to Groundwater Flow (m)		feet = 262		Site Specific (m)
3.048	d_a - Aquifer Thickness (m)		feet = 10		Site Specific (m)
0.3	I - Infiltration Rate (m/yr)				0.3 for Illinois
120	K_s - Saturated Hydraulic Conductivity				See Table K for Input Values
0.005	GW_{obj} - Groundwater Remediation Objective Class 1				0.025 GW_{obj} - Groundwater Remediation Objective Class 2
0.074	1/(2b+3) - Exponent for S20				See Table K for Input Values
70	BW - Body Weight				Residential = 70 (carcinogenic); 15 (non-carcinogenic); Industrial/Commercial = 70; Construction Worker = 70; RBCA = 70
114	$IF_{soil-adj}$ -Age Adjusted Soil Ingestion Factor for Carcinogens				114
50	IR_{soil} -Soil Ingestion Rate				Residential = 200; Industrial/Commercial = 50; Construction Worker = 480
0.055	SF_o -Oral Slope Factor				Benzene = 0.055
1	IR_w -Daily Water Ingestion Rate				Residential = 2; Industrial/Commercial = 1
1800	S - Solubility in Water				Benzene = 1750
1.0E-06	TR - Target Cancer Risk				Residential = 10^{-6}; Industrial/Commercial = 10^{-6}; Construction Worker = 10^{-6} at point of human exposure
70	AT_c -Average Time for Carcinogens				70
7.80E-06	URF - Inhalation Unit Risk Factor				Benzene = 7.8×10^{-6}
250	EF - Exposure Frequency				Residential = 350; Industrial/Commercial = 250; Construction Worker = 30
25	ED - Exposure Duration for Inhalation fo Carcinogens				Residential = 30; Industrial/Commercial = 25; Construction Worker = 1
68.81	C/C - Inverse of the mean concentration at the center of a square source				Residential = 68.81; Industrial/Commercial = 85.81; Construction Worker = 85.81; or Table H
7.90E+08	T - Exposure Interval				Residential = 9.5×10^8; Industrial/Commercial = 7.9×10^8; Construction Worker = 3.6×10^8
30	T_{M-L} - Exposure Interval for Mail Limit Volatilization Factor Equation S26				30
70	ED_{M-L} - Exposure Duration for Migration to Groundwater Mass-Limit Equation S28				70
0.18	I_{M-L} - Infiltration Rate for Migration to Groundwater Mass-Limit Equation S28				0.18
0.088	D_i - Diffusivity in Air				Benzene = 0.088
0.23	H' - Henry's Law Constant				Benzene = 0.228
1.02E-05	D_w - Diffusivity in Water				Benzene = 9.8×10^{-6}
50	K_{oc} - Organic Carbon Partition Coefficient				Benzene = 58.9

Industrial/Commercial Ingestion Tier II Benzene Objective

$$S\text{-}3 = \frac{TR \times BW \times AT_c \times 365}{Sf_o \times 10^{-6} \times EF \times ED \times IRsoil} = \frac{1.0E\text{-}06 \times 70 \times 70 \times 365}{0.055 \times 1.00E\text{-}06 \times 250 \times 25 \times 50} = \frac{1.8E+00}{1.72E\text{-}02} = 104.058 \text{ mg/kg}$$

Construction Worker Ingestion Tier II Benzene Objective

$$S\text{-}3 = \frac{TR \times BW \times AT_c \times 365}{Sf_o \times 10^{-6} \times EF \times IRsoil} = \frac{1.0E\text{-}06 \times 70 \times 70 \times 365}{0.055 \times 1.00E\text{-}06 \times 30 \times 480} = \frac{1.8E+00}{7.92E\text{-}04} = 2258.21 \text{ mg/kg}$$

Tier 2 Industrial/Commercial Calculations for Benzene

Marine Bank Trust 53-0051
20030135

Industrial Commercial Inhalation Tier II Objective

$$S\text{-}6 = \frac{TR \times ATc \times 365}{URF \times 1000 \times EF \times ED \times 1/VF} = \frac{1.0E\text{-}06 \times 70 \times 365}{7.80E\text{-}06 \times 1000 \times 250 \times 25 \times (1/\ 7.53E{+}03)} = \frac{0.02555}{6.47E\text{-}03} = 3.949 \text{ mg/kg}$$

Construction Worker Inhalation Tier II Objective

$$S\text{-}7 = \frac{TR \times ATc \times 365}{URF \times 1000 \times EF \times ED \times 1/VF} = \frac{1.0E\text{-}06 \times 70 \times 365}{7.80E\text{-}06 \times 1000 \times 30 \times 1 \times (1/\ 5.09E{+}01)} = \frac{0.02555}{4.60E\text{-}03} = 5.553 \text{ mg/kg}$$

RESIDENTIAL OR COMMERCIAL

$$S\text{-}8 = VF = \frac{Q}{C} \times \frac{(3.14 \times D_A \times T)^{1/2} \times 10^{-4}}{(2 \times \rho_b \times D_A)} = 85.81 \times \frac{(3.14 \times 3.58E\text{-}04 \times 7.90E{+}08)^{1/2} \times 0.0001}{(2 \times 1.5 \times 3.58E\text{-}04)} = \frac{8.0809}{0.0011} = 7534.4538$$

Construction Worker

$$S\text{-}8 = VF = \frac{Q}{C} \times \frac{(3.14 \times D_A \times T)^{1/2} \times 10^{-4}}{(2 \times \rho_b \times D_A)} = 85.81 \times \frac{(3.14 \times 3.58E\text{-}04 \times 3.60E{+}06)^{1/2} \times 0.0001}{(2 \times 1.5 \times 3.58E\text{-}04)} = \frac{0.5455}{0.0011} = 508.6154$$

Equation for Derivation of Volatilization Factor - Construction Worker

$$S\text{-}9 = VF' = \frac{VF}{10} = \frac{508.6154}{10} = 50.8615$$

Equation for Derivation of Apparent Diffusivity

$$S\text{-}10 = D_A = \frac{(\theta_a^{3.33} \times D_i \times H') + (\theta_w^{3.33} \times D_w)}{\eta^2} \times \frac{1}{(\rho_b \times K_d) + \theta_w + (\theta_a \times H')}$$

$$= \frac{(2.01E\text{-}03 \times 0.088 \times 0.230) + (0.0143 \times 1.02E\text{-}05)}{0.1884} \times \frac{1}{(1.5 \times 0.195) + 0.28 + (0.155 \times 0.230)} = 3.58E\text{-}04$$

Soil Component of the Migration to Groundwater Cleanup Objective (Class 1)

$$S\text{-}17 = C_w \times \left[K_d + \frac{(\theta_w + \theta_a \times H')}{\rho b} \right] = 0.1 \times \left[0.195 + \frac{(0.279 + 0.155 \times 0.230)}{1.5} \right] = 0.040 \text{ mg/kg}$$

Tier 2 Industrial/Commercial Calculations for Benzene

Marine Bank Trust 53-0051
20030135

Target Soil Leachate Concentration (Class 1)

S-18 = C_w = $DF \times GW_{obj}$ = 20.00 x 0.005 = 0.1

Soil-Water Partition Coefficient

S-19 = K_d = $K_{oc} \times f_{oc}$ = 50.00 x 0.004 = 0.195

Water-Filled Porosity

S-20 = Θ_w = $\eta \times \left(\frac{1}{K_s}\right)^{1/(2b+3)}$ = 0.43 x $\left[\frac{0.300}{120.000}\right]^{0.074}$ = 0.2786

Air-Filled Porosity

S-21 = Θ_a = $\eta - \Theta_w$ = 0.43 - 0.28 = 0.1550

Dilution Factor

S-22 = DF = $1 + \frac{K \times i \times d}{I \times L}$ = $\frac{36.90}{0.300} \times \frac{0.0619}{79.858} \times \frac{11.402}{} + 1$ = 2.0866

GW Ingestion

S-23 = $\frac{TR \times BW \times At_c \times 365}{SF_o \times IR_w \times EF \times ED}$ = $\frac{1.0E-06}{0.055} \times \frac{70}{1.000} \times \frac{70}{250} \times \frac{365}{25}$ = $\frac{1.8E+00}{343.75}$ = 0.0052 mg/L

Total Soil Porosity

S-24 = η = $1 - \frac{\rho_b}{\rho_s}$ = 1 - $\frac{1.5}{2.65}$ = 0.4340

Estimation of Mixing Zone Depth

S-25 = d = $(0.0112 \times L^2)^{0.5} + d_a\left[1 - \exp\frac{(-L \times I)}{(K \times i \times d_a)}\right]$

= (0.0112 x 79.858 ^{2})$^{0.5}$ +

3.048 x [1 - exp ($\frac{-79.858}{36.897}$ x $\frac{0.3}{0.0619}$ x $\frac{}{3.048}$)] = 11.402 m

Soil Saturation Limit

S-29 = $C_{sat} = \frac{S}{\rho_b} \times [(K_d \times \rho b) + \Theta w + (H' \times \theta a)]$ = $\frac{1800}{1.5}$ x [(0.195 x 1.5) + 0.279 + (0.230 x 0.155)] = 728.58 mg/kg

Soil Gas Outdoor Inhalation

S-30 = $ROs\,g = \frac{ROsoil \times H \times \rho b \times 1000}{H' \times \Theta a + \Theta w + Kd \times \rho b}$ = $\frac{3.949}{2.300E-01} \times \frac{0.230}{0.155} \times \frac{1.500}{0.279} \times \frac{1000}{0.195} \times \frac{}{1.500}$ = 2,243.84 mg/m^3

060000

Tier 2 Industrial/Commercial Calculations for Ethylbenzene

Marine Bank Trust 53-0051
20030135

SSL | SSL & RBCA
RBCA | IRIS/HEAST

Date Compiled: 01/11/23

Input Values

Holocomb's Bulk Density -->	0	Converted Value to be used in calculation sheet -->						USDA Soil Classification:	Silt Loam		
Organic Matter (%) -->	0	FOC % (0.58 conversion) -->	0.000			Organic Matter (mg/kg)	0	FOC mg/kg (0.58 conversion)	0.000	foc conversion to g/g:	0.000

1.500	ρ_b - Dry Soil Bulk Density			1.5 or; Gravel = 2.0; Sand = 1.8; Silt = 1.6; Clay = 1.7; or Site Specific
2.65	ps - Soil Particle Density			2.65 or; Site Specific
0.155	Θ_a - Air Filled Soil Porosity	*0.155*	Value from S-21	Top 1 meter = 0.28; below 1 meter = 0.13; Gravel = 0.05; Sand = 0.14; Silt =0.24; Clay = 0.19; or Calculated Value (S21)
0.279	Θ_w - Water Filled Soil Porosity	*0.279*	Value from S-20	Top 1 meter = 0.15; below 1 meter = 0.30; Gravel = 0.20; Sand = 0.18; Silt =0.16; Clay = 0.17; or Calculated Value (S20)
0.434	n - SSL: Total Soil Porosity	*0.434*	Value from S-24	0.43 on; Gravel - 0.25; Sand = 0.32; Silt = 0.40; Clay = 0.36; or Calculated Value (S24)
0.06188	I - Hydraulic Gradient			Site Specific
0.004	foc - Total Organic Carbon (g/g)			Surface Soil = 0.006; Subsurface Soil = 0.002; or Site Specific
20.000	DF - Dilution Factor	*2.087*	Value from S-22	If calculated value for DF is less than 20, then 20 default is used, else calculated value is used
11.402	d - Mixing Zone (m)	*11.402*	Value from S-25	2; or calculated value
3.048	d_a - Depth of source (m)		feet = 10	Depth of Source (Vertical thickness of contamination)
36.90	K - Hydraulic Conductivity (m/yr)	cm/sec =	1.17E-04	Site Specific 1.01E+01 cm/d 3.69E+03 cm/yr Use cm/d for R15, R19, & R26; cm/yr for R24
79.858	L - Source Length Parallel to Groundwater Flow (m)		feet = 262	Site Specific (m)
3.048	d_a - Aquifer Thickness (m)		feet = 10	Site Specific (m)
0.3	I - Infiltration Rate (m/yr)			0.3 for Illinois
120	K_s - Saturated Hydraulic Conductivity			See Table K for Input Values
0.700	GW_{obj} - Groundwater Remediation Objective Class 1			1 GW_{obj} - Groundwater Remediation Objective Class 2
0.074	1/(2b+3) - Exponent for S20			See Table K for Input Values
70	BW - Body Weight			Residential = 70 (carcinogenic); 15 (non-carcinogenic); Industrial/Commercial = 70; Construction Worker = 70; RBCA = 70
114	$IF_{soil-adj}$ -Age Adjusted Soil Ingestion Factor for Carcinogens			114
50	IR_{soil} -Soil Ingestion Rate			Residential = 200; Industrial/Commercial = 50; Construction Worker = 480
1	IR_w -Daily Water Ingestion Rate			Residential = 2; Industrial/Commercial = 1
170	S - Solubility in Water			Ethylbenzene = 169
1.0E-06	TR - Target Cancer Risk			Residential = 10^{-6}; Industrial/Commercial = 10^{-5}; Construction Worker = 10^{-5} at point of human exposure
250	EF - Exposure Frequency			Residential = 350; Industrial/Commercial = 250; Construction Worker = 30
25	ED - Exposure Duration for Inhalation for Non-Carcinogens			Residential = 30; Industrial/Commercial = 25; Construction Worker = 1
68.81	Q/C - Inverse of the mean concentration at the center of a square source			Residential = 68.81; Industrial/Commercial = 85.81; Construction Worker = 85.81; or Table H
7.90E+08	T - Exposure Interval			Residential = 9.5×10^8; Industrial/Commercial = 7.9×10^8; Construction Worker = 3.6×10^6
30	T_{ML} - Exposure Interval for Mall Limit Volatilization Factor Equation S26			30
70	ED_{ML} - Exposure Duration for Migration to Groundwater Mass-Limit Equation S28			70
0.18	I_{ML} - Infiltration Rate for Migration to Groundwater Mass-Limit Equation S28			0.18
0.075	D_i - Diffusivity in Air			Ethylbenzene = 0.075
0.324	H' - Henry's Law Constant			Ethylbenzene = 0.323
7.80E-06	D_w - Diffusivity in Water			Ethylbenzene = 7.8×10^{-6}
25	AT - Average Time for Non-Carcinogens in Ingestion Equation			Residential = 6; Industrial/Commercial = 25; Construction Worker = 0.115
25	AT - Average Time for Non-Carcinogens in Inhalation Equation			Residential = 30; Industrial/Commercial = 25; Construction Worker = 0.115
1	THQ - Target Hazard Quotient			1
0.1	RfC - Inhalation Reference Concentration			Chronic = 0.1; Subchronic = 0.86
0.1	RfD_o - Oral Reference Dose			Chronic = 0.1; Subchronic = 0.86
320.00	K_{oc} - Organic Carbon Partition Coefficient			Ethylbenzene = 363

Industrial/Commercial Ingestion Remediation Objectives for Non-Carcinogenic Contaminants

$$S\text{-}1 = \frac{THQ \times BW \times AT \times 365}{10^{-6} \times (1/RfD_o) \times EF \times ED \times IR_{soil}} = \frac{1 \times 70 \times 25 \times 365}{0.000001 \times 1/0.1 \times 250 \times 25 \times 50} = \frac{638750}{3.125} = 204400 \text{ mg/kg}$$

Construction Worker Ingestion Remediation Objectives for Non-Carcinogenic Contaminants

$$S\text{-}1 = \frac{THQ \times BW \times AT \times 365}{10^{-6} \times (1/RfD_o) \times EF \times ED \times IR_{soil}} = \frac{1 \times 70 \times 0.115 \times 365}{0.000001 \times 1/0.05 \times 30 \times 1 \times 480} = \frac{2938.25}{0.288} = 10202 \text{ mg/kg}$$

Industrial Commercial Inhalation

$$S\text{-}4 = \frac{THQ \times AT \times 365}{EF \times ED \times (1/RfC \times 1/VF)} = \frac{1 \times 25 \times 365}{250 \times 25 \times 1/1 \times 1/13101.41195} = \frac{9125}{0.477048} = 19128 \text{ mg/kg}$$

Tier 2 Inhalation Objective cannot exceed Soil Saturation Limit

Industrial Commercial Inhalation Objective (Carcinogen) — Tier 2 Inhalation Objective does not exceed Tier 1 Objective

$$S\text{-}6 = \frac{TR \times ATc \times 365}{URF \times 1000 \times EF \times ED \times (1/VF)} = \frac{0.000001 \times 70 \times 365}{2.5E\text{-}06 \times 1000 \times 250 \times 25.0000 \times 1/13101.4120} = \frac{0.02555}{0.001193} = 21.423 \text{ mg/kg}$$

Construction Worker Inhalation Objective (Carcinogen) — Tier 2 Inhalation Objective does not exceed Tier 1 Objective

$$S\text{-}7 = \frac{TR \times ATc \times 365}{URF \times 1000 \times EF \times ED \times (1/VF)} = \frac{0.000001 \times 70 \times 365}{2.5E\text{-}06 \times 1000 \times 30 \times 1.0000 * 1/88.4414} = \frac{0.02555}{0.000848} = 30.129 \text{ mg/kg}$$

Tier 2 Industrial/Commercial Calculations for Ethylbenzene

Marine Bank Trust 53-0051
20030135

Inhalation Non-Carcinogenic Construction Worker

$$S\text{-}5 = \frac{THQ \times AT \times 365}{EF \times ED \times (1/RfC \times 1/VF')} = \frac{1}{30} \times \frac{0.115}{1} \times \frac{365}{9 \times 1/\ 88.44144043} = \frac{41.975}{0.03769} = 1113.699 \text{ mg/kg}$$

Tier 2 Inhalation Objective cannot exceed Soil Saturation Limit

RESIDENTIAL OR COMMERCIAL

$$S\text{-}8 = VF = \frac{Q}{C} \times \frac{(3.14 \times D_A \times T)^{1/2} \times 10^{-4}}{(2 \times \rho_b \times D_A)} = 85.81 \times \frac{\left(\frac{3.14}{2} \times 1.18E\text{-}04 \times 7.90E+08\right)^{1/2} \times 0.0001}{1.18E\text{-}04} = \frac{4.6472}{3.55E\text{-}04} = 13101.4120$$

Construction Worker

$$S\text{-}8 = VF = \frac{Q}{C} \times \frac{(3.14 \times D_A \times T)^{1/2} \times 10^{-4}}{(2 \times \rho_b \times D_A)} = 85.81 \times \frac{\left(\frac{3.14}{2} \times 1.18E\text{-}04 \times 3.60E+06\right)^{1/2} \times 0.0001}{1.18E\text{-}04} = \frac{0.3137}{3.55E\text{-}04} = 884.4144$$

Equation for Derivation of Volatilization Factor - Construction Worker

$$S\text{-}9 = VF' = \frac{VF}{10} = \frac{884.4144}{10} = 88.4414$$

Equation for Derivation of Apparent Diffusivity

$$S\text{-}10 = D_A = \frac{(\theta_a^{3.33} \times D_i \times H') + (\theta_w^{3.33} \times D_w)}{\eta^2} \times \frac{1}{(\rho_b \times K_d) + \theta_w + (\theta_a \times H')}$$

$$= \frac{\left(2.01E\text{-}03 \times 0.075 \times 0.324\right)}{0.1884} + \left(0.0143 \times 7.80E\text{-}06\right) \times \frac{1}{\left(1.5 \times 1.248\right) + 0.28 + \left(0.155 \times 0.324\right)} = 1.18E\text{-}04$$

Soil Component of the Migration to Groundwater Cleanup Objective (Class 1)

$$S\text{-}17 = C_w \times \left[K_d + \frac{(\theta_w + \theta_a \times H')}{\rho b}\right] = 14 \times \left[1.248 + \frac{\left(0.279 + 0.155 \times 0.324\right)}{1.5}\right] = 20.545 \text{ mg/kg}$$

Target Soil Leachate Concentration (Class 1)

$$S\text{-}18 = C_w = DF \times GW_{obj} = 20.00 \times 0.700 = 14$$

Soil-Water Partition Coefficient

$$S\text{-}19 = K_d = K_{oc} \times f_{oc} = 320.00 \times 0.004 = 1.248$$

Water-Filled Porosity

$$S\text{-}20 = \theta_w = \eta \times \frac{1}{K_s}^{1/(2b+3)} = 0.43 \times \left[\frac{0.300}{120.000}\right]^{0.074} = 0.2786$$

Tier 2 Industrial/Commercial Calculations for Ethylbenzene

Marine Bank Trust 53-0051
20030135

Air-Filled Porosity

S-21 = $\Theta_a = \eta - \Theta_w$ = 0.43 - 0.28 = **0.1550**

Dilution Factor

S-22 = $DF = 1 + \frac{K \times I \times d}{I \times L}$ = $\frac{36.90}{0.300} \times \frac{0.0619}{79.858} \times \frac{11.402}{1}$ = **2.0866**

GW Ingestion

S-23 = $\frac{TR \times BW \times At_c \times 365}{SF_o \times IR_w \times EF \times ED}$ = $\frac{1.0E-06}{0.000} \times \frac{70}{1.000} \times \frac{0}{250} \times \frac{365}{25}$ = $\frac{0.0E+00}{0}$ = **#DIV/0!** mg/L

Total Soil Porosity

S-24 = $\eta = 1 - \frac{\rho_b}{\rho_s}$ = $1 - \frac{1.5}{2.65}$ = **0.4340**

Estimation of Mixing Zone Depth

S-25 = $d = (0.0112 \times L^2)^{0.5} + d_a \left[1 - \exp \frac{(-L \times I)}{(K \times i \times d_e)} \right]$

= (0.0112 × 79.858 ^{2})$^{0.5}$ +

3.048 × [1 - exp ($\frac{-79.858}{36.897} \times \frac{0.3}{0.0619} \times \frac{)}{3.048}$)] = **11.402** m

Soil Saturation Limit

S-29 = $C_{sat} = \frac{S}{\rho_b} \times [(K_d \times \rho b) + \Theta w + (H' \times \theta a)]$ = $\frac{170}{1.5} \times [(1.248 \times 1.5) + 0.279 + (0.324 \times 0.155)]$ = **249.47** mg/kg

Soil Gas Outdoor Inhalation

S-30 = $ROs\ g = \frac{ROsoil \times H \times \rho b \times 1000}{H' \times \Theta a + \Theta w + Kd \times \rho b}$ = $\frac{249.472}{3.240E-01} \times \frac{0.324}{0.155} \times \frac{1.500}{0.279} \times \frac{1000}{1.248} \times \frac{}{1.500}$ = **55,080.00** mg/m^3

Tier 2 Industrial/Commercial Calculations for Total Xylenes

Marine Bank Trust 53-0051
20030135

SSL | RBCA | SSL & RBCA | RISC/HEAST

Date Compiled: 01/11/23

Input Values

Holcomb's Bulk Density -->	0	Converted Value to be used in calculation sheet -->		—	USDA Soil Classification:	Silt Loam			
Organic Matter (%) -->	0	FOC % (0.58 conversion) -->	0.000	Organic Matter (mg/kg)	0	FOC mg/kg (0.58 conversion)	0.000	foc conversion to g/g:	0.000

1.500	ρ_b - Dry Soil Bulk Density				1.5 or; Gravel = 2.0; Sand = 1.8; Silt = 1.6; Clay = 1.7; or Site Specific
2.65	ps - Soil Particle Density				2.65 or; Site Specific
0.155	Θ_a - Air Filled Soil Porosity	*0.155*	Value from S-21		Top 1 meter = 0.28; below 1 meter = 0.13; Gravel = 0.05; Sand = 0.14; Silt =0.24; Clay = 0.19; or Calculated Value (S21)
0.279	Θw - Water Filled Soil Porosity	*0.279*	Value from S-20		Top 1 meter = 0.15; below 1 meter = 0.30; Gravel = 0.20; Sand = 0.18; Silt =0.16; Clay = 0.17; or Calculated Value (S20)
0.434	η - SSL- Total Soil Porosity	*0.434*	Value from S-24		0.43 or; Gravel - 0.25; Sand = 0.32; Silt = 0.40; Clay = 0.36; or Calculated Value (S24)
0.06188	i - Hydraulic Gradient				Site Specific
0.004	foc - Total Organic Carbon (g/g)				Surface Soil = 0.006; Subsurface Soil = 0.002; or Site Specific
20.000	DF - Dilution Factor	*2.087*	Value from S-22		If calculated value for DF is less than 20, then 20 default is used, else calculated value is used
11.402	d - Mixing Zone (m)	11.402	Value from S-25		2; or calculated value
3.048	d_a - Depth of source (m)		feet = 10		Depth of Source (Vertical thickness of contamination)
36.90	K - Hydraulic Conductivity (m/yr)	cm/sec =	1.17E-04		Site Specific 1.01E+01 cm/d 3.69E+03 cm/yr Use cm/d for R15, R19 & R26; cm/yr for R24
79.858	L - Source Length Parallel to Groundwater Flow (m)		feet = 262		Site Specific (m)
3.048	d_a - Aquifer Thickness (m)		feet = 10		Site Specific (m)
0.3	I - Infiltration Rate (m/yr)				0.3 for Illinois
120	K_s - Saturated Hydraulic Conductivity				See Table K for Input Values
10.000	GW_{obj} - Groundwater Remediation Objective Class 1				10 GW_{obj} - Groundwater Remediation Objective Class 2
0.074	1/(2b+3) - Exponent for S20				See Table K for Input Values
70	BW - Body Weight				Residential = 70 (carcinogenic); 15 (non-carcinogenic); Industrial/Commercial = 70; Construction Worker = 70; RBCA = 70
114	$IF_{soil-adj}$ -Age Adjusted Soil Ingestion Factor for Carcinogens				114
50	IR_{soil} -Soil Ingestion Rate				Residential = 200; Industrial/Commercial = 50; Construction Worker = 480
1	IR_w -Daily Water Ingestion Rate				Residential = 2; Industrial/Commercial = 1
110	S - Solubility in Water				Total Xylenes = 186
1.0E-06	TR - Target Cancer Risk				Residential = 10^{-6}; Industrial/Commercial = 10^{-5}; Construction Worker = 10^{-5} at point of human exposure
250	EF - Exposure Frequency				Residential = 350; Industrial/Commercial = 250; Construction Worker = 30
25	ED - Exposure Duration for Inhalation for Non-Carcinogens				Residential = 30; Industrial/Commercial = 25; Construction Worker = 1
68.81	Q/C - Inverse of the mean concentration at the center of a square source				Residential = 68.81; Industrial/Commercial = 85.81; Construction Worker = 85.81; or Table H
7.90E+08	T - Exposure Interval				Residential = 9.5×10^8; Industrial/Commercial = 7.9×10^8; Construction Worker = 3.6×10^8
30	T_{M-L} - Exposure Interval for Mall Limit Volatilization Factor Equation S26				30
70	ED_{M-L} - Exposure Duration for Migration to Groundwater Mass-Limit Equation S28				70
0.18	I_{M-L} - Infiltration Rate for Migration to Groundwater Mass-Limit Equation S28				0.18
0.074	D_i - Diffusivity in Air				Total Xylenes = 0.072
0.271	H' - Henry's Law Constant				Total Xylenes = 0.25
9.23E-06	D_w - Diffusivity in Water				Total Xylenes = 9.34×10^{-6}
25	AT - Average Time for Non-Carcinogens in Ingestion Equation				Residential = 6; Industrial/Commercial = 25; Construction Worker = 0.115
25	AT - Average Time for Non-Carcinogens in Inhalation Equation				Residential = 30; Industrial/Commercial = 25; Construction Worker = 0.115
1	THQ - Target Hazard Quotient				1
0.1	RfC - Inhalation Reference Concentration				Chronic = 0.1; Subchronic = 0.7
0.2	RfD_o - Oral Reference Dose				Chronic = 0.2; Subchronic = 0.4
398.00	K_{oc} - Organic Carbon Partition Coefficient				Total Xylenes = 260

Industrial/Commercial Ingestion Remediation Objectives for Non-Carcinogenic Contaminants

$$S\text{-}1 = \frac{THQ \times BW \times AT \times 365}{10^{-6} \times (1/RfD_o) \times EF \times ED \times IR_{soil}} = \frac{1 \times 70 \times 25 \times 365}{0.000001 \times 1/0.2 \times 250 \times 25 \times 50} = \frac{638750}{1.5625} = 408800 \text{ mg/kg}$$

Construction Worker Ingestion Remediation Objectives for Non-Carcinogenic Contaminants

$$S\text{-}1 = \frac{THQ \times BW \times AT \times 365}{10^{-5} \times (1/RfD_o) \times EF \times ED \times IR_{soil}} = \frac{1 \times 70 \times 0.115 \times 365}{0.000001 \times 1/0.4 \times 30 \times 1 \times 480} = \frac{2938.25}{0.036} = 81618 \text{ mg/kg}$$

Industrial Commercial Inhalation

$$S\text{-}4 = \frac{THQ \times AT \times 365}{EF \times ED \times (1/RfC \times 1/VF)} = \frac{1 \times 25 \times 365}{250 \times 25 \times 1/0.1 \times 1/15867.51238} = \frac{9125}{3.938865684} = 2316.657 \text{ mg/kg}$$

Tier 2 Inhalation Objective cannot exceed Soil Saturation Limit

Inhalation Non-Carcinogenic Construction Worker

$$S\text{-}5 = \frac{THQ \times AT \times 365}{EF \times ED \times (1/RfC \times 1/VF)} = \frac{1 \times 0.115 \times 365}{30 \times 1 \times 1/0.4 \times 1/107.1140772} = \frac{41.975}{0.70018808} = 59.948 \text{ mg/kg}$$

RESIDENTIAL OR COMMERCIAL

$$S\text{-}8 = VF = \frac{Q}{C} \times \frac{(3.14 \times D_A \times T)^{1/2} \times 10^{-4}}{(2 \times \rho_b \times D_A)} = 85.81 \times \left\{ \frac{3.14 \times 8.06E\text{-}05 \times 7.90E+08}{2 \times 1.5 \times 8.06E\text{-}05} \right\}^{1/2} \times 0.0001 = \frac{3.8371}{2.42E\text{-}04} = 15867.5124$$

Tier 2 Industrial/Commercial Calculations for Total Xylenes

Marine Bank Trust 53-0051
20030135

Construction Worker

$$S\text{-}8 = VF = \frac{Q}{C} \times \frac{(3.14 \times D_A \times T)^{1/2} \times 10^{-4}}{(2 \times \rho_b \times D_A)} = 85.81 \times \frac{(3.14 \times 8.06E\text{-}05 \times 3.60E+06)^{1/2} \times 0.0001}{(2 \times 1.5 \times 8.06E\text{-}05)} = \frac{0.2590}{2.42E\text{-}04} = 1071.1408$$

Equation for Derivation of Volatilization Factor - Construction Worker

$$S\text{-}9 = VF' = \frac{VF}{10} = \frac{1071.1408}{10} = 107.1141$$

Equation for Derivation of Apparent Diffusivity

$$S\text{-}10 = D_A = \frac{(\theta_a^{3.33} \times D_i \times H') + (\theta_w^{3.33} \times D_w)}{\eta^2} \times \frac{1}{(\rho_b \times K_d) + \theta_w + (\theta_a \times H')}$$

$$= \frac{(2.01E\text{-}03 \times 0.074 \times 0.271) + (0.0143 \times 9.23E\text{-}06)}{0.1884} \times \frac{1}{(1.5 \times 1.5522) + 0.28 + (0.155 \times 0.271)} = 8.06E\text{-}05$$

Soil Component of the Migration to Groundwater Cleanup Objective (Class 1)

$$S\text{-}17 = C_w \times \left[K_d + \frac{(\theta_w + \theta_a \times H')}{\rho b} \right] = 200 \times \left[1.5522 + \frac{(0.279 + 0.155 \times 0.271)}{1.5} \right] = 353.241 \text{ mg/kg}$$

Tier 2 Soil Component of GW Ingestion Objective cannot exceed Soil Saturation Limit

Target Soil Leachate Concentration (Class 1)

$$S\text{-}18 = C_w = DF \times GW_{obj} = 20.00 \times 10.000 = 200$$

Soil-Water Partition Coefficient

$$S\text{-}19 = K_d = K_{oc} \times f_{oc} = 398.00 \times 0.004 = 1.5522$$

Water-Filled Porosity

$$S\text{-}20 = \Theta_w = \eta \times \left(\frac{1}{K_s} \right)^{1/(2b+3)} = 0.43 \times \left[\frac{0.300}{120.000} \right]^{0.074} = 0.2786$$

Tier 2 Industrial/Commercial Calculations for Total Xylenes

Marine Bank Trust 53-0051
20030135

Air-Filled Porosity

S-21 = $\Theta_a = \eta - \Theta_w$ = 0.43 - 0.28 = 0.1550

Dilution Factor

S-22 = $DF = 1 + \frac{K \times i \times d}{I \times L}$ = $\frac{36.90}{0.300} \times \frac{0.0619}{79.658} \times 11.402 + 1$ = 2.0866

GW Ingestion

S-23 = $\frac{TR \times BW \times At_c \times 365}{SF_o \times IR_w \times EF \times ED}$ = $\frac{1.0E-06}{0.000} \times \frac{70}{1.000} \times \frac{0}{250} \times \frac{365}{25}$ = $\frac{0.0E+00}{0}$ = #DIV/0! mg/L

Total Soil Porosity

S-24 = $\eta = 1 - \frac{\rho_b}{\rho_s}$ = $1 - \frac{1.5}{2.65}$ = 0.4340

Estimation of Mixing Zone Depth

S-25 = $d = (0.0112 \times L^2)^{0.5} + d_a \left[1 - \exp \frac{(-L \times I)}{(K \times i \times d_a)} \right]$

= (0.0112 x 79.658 ^{2})$^{0.5}$ + 3.048 x [1 - exp (-79.658 x 0.3) / (36.897 x 0.0619 x 3.048)] = 11.402 m

Soil Saturation Limit

S-29 = $C_{sat} = \frac{S}{\rho_b} \times [(K_d \times pb) + \Theta w + (H' \times \theta a)]$ = $\frac{110}{1.5} \times [(1.5522 \times 1.5) + 0.279 + (0.271 \times 0.155)]$ = **194.28** mg/kg

Soil Gas Outdoor Inhalation

S-30 = $ROs\,g = \frac{ROsoil \times H \times pb \times 1000}{H' \times \Theta a + \Theta w + Kd \times pb}$ = $\frac{59.948}{2.710E-01} \times \frac{0.271}{0.155} \times \frac{1.500}{0.279} \times \frac{1000}{1.552} \times \frac{}{1.500}$ = **9,198.24** mg/m^3

960000

-C (Xylenes)

3

Tier 2 Industrial/Commercial Calculations for Naphthalene

Marine Bank Trust 53-0051
20030135

SSL RBCA | SSL & RBCA RISK/EAST

Date Compiled: 01/11/23

Input Values

Holcomb's Bulk Density -->	0	Converted Value to be used in calculation sheet -->					USDA Soil Classification:	Silt Loam		
Organic Matter (%) -->	0	foc % (0.58 conversion) -->	0.000	Organic Matter (mg/kg)	0	foc mg/kg (0.58 conversion)	0.000	foc conversion to g/g:	0.000	

1.500	ρ_b - Dry Soil Bulk Density			1.5 or; Gravel = 2.0; Sand = 1.8; Silt = 1.6; Clay = 1.7; or Site Specific
2.65	ρs - Soil Particle Density			2.65 or; Site Specific
0.155	Θ_a - Air Filled Soil Porosity	*0.155*	Value from S-21	Top 1 meter = 0.28; below 1 meter = 0.13; Gravel = 0.05; Sand = 0.14; Silt =0.24; Clay = 0.19; or Calculated Value (S21)
0.279	Θw - Water Filled Soil Porosity	*0.279*	Value from S-20	Top 1 meter = 0.15; below 1 meter = 0.30; Gravel = 0.20; Sand = 0.18; Silt =0.16; Clay = 0.17; or Calculated Value (S20)
0.434	n - SSL: Total Soil Porosity	*0.434*	Value from S-24	0.43 or; Gravel - 0.25; Sand = 0.32; Silt = 0.40; Clay = 0.36; or Calculated Value (S24)
0.06188	I - Hydraulic Gradient			Site Specific
0.004	foc - Total Organic Carbon (g/g)			Surface Soil = 0.006; Subsurface Soil = 0.002; or Site Specific
20.000	DF - Dilution Factor			If calculated value for DF is less than 20, then 20 default is used, else calculated value is used
11.402	d - Mixing Zone (m)			2; or calculated value
3.048	d_a - Depth of source (m)		feet = 10	Depth of Source (Vertical thickness of contamination)
36.90	K - Hydraulic Conductivity (m/yr)	cm/sec =	1.17E-04	Site Specific; 1.01E+01 cm/d; 3.69E+03 cm/yr; Use cm/d for R15, R19, & R26; cm/yr for R24
79.858	L - Source Length Parallel to Groundwater Flow (m)		feet = 262	Site Specific (m)
3.048	d_s - Aquifer Thickness (m)		feet = 10	Site Specific (m)
0.3	I - Infiltration Rate (m/yr)			0.3 for Illinois
120	K_s - Saturated Hydraulic Conductivity			See Table K for Input Values
0.140	GW_{obj} - Groundwater Remediation Objective Class 1			0.22 GW_{obj} - Groundwater Remediation Objective Class 2
0.074	1/(2b+3) - Exponent for S20			See Table K for Input Values
70	BW - Body Weight			Residential = 70 (carcinogenic); 15 (non-carcinogenic); Industrial/Commercial = 70; Construction Worker = 70; RBCA = 70
114	$IF_{soil-adj}$ -Age Adjusted Soil Ingestion Factor for Carcinogens			114
50	IR_{soil} -Soil Ingestion Rate			Residential = 200; Industrial/Commercial = 50; Construction Worker = 480
1	IR_w -Daily Water Ingestion Rate			Residential = 2; Industrial/Commercial = 1
31	S - Solubility in Water			Naphthalene = 31
1.0E-06	TR - Target Cancer Risk			Residential = 10^{-6}; Industrial/Commercial = 10^{-6}; Construction Worker = 10^{-6} at point of human exposure
250	EF - Exposure Frequency			Residential = 350; Industrial/Commercial = 250; Construction Worker = 30
25	ED - Exposure Duration for Inhalation for Non-Carcinogens			Residential = 30; Industrial/Commercial = 25; Construction Worker = 1
68.81	Q/C - Inverse of the mean concentration at the center of a square source			Residential = 68.81; Industrial/Commercial = 85.81; Construction Worker = 85.81; or Table H
7.90E+08	T - Exposure Interval			Residential = 9.5×10^8; Industrial/Commercial = 7.9×10^8; Construction Worker = 3.6×10^6
30	T_{M-L} - Exposure Interval for Mall Limit Volatilization Factor Equation S26			30
70	ED_{M-L} - Exposure Duration for Migration to Groundwater Mass-Limit Equation S28			70
0.18	I_{M-L} - Infiltration Rate for Migration to Groundwater Mass-Limit Equation S28			0.18
0.059	D_i - Diffusivity in Air			Naphthalene = 0.059
0.0198	H' - Henry's Law Constant			Naphthalene = 0.0198
7.50E-06	D_w - Diffusivity in Water			Naphthalene = 7.5×10^{-6}
25	AT - Average Time for Non-Carcinogens In Ingestion Equation			Residential = 6; Industrial/Commercial = 25; Construction Worker = 0.115
25	AT - Average Time for Non-Carcinogens In Inhalation Equation			Residential = 30; Industrial/Commercial = 25; Construction Worker = 0.115
1	THQ - Target Hazard Quotient			1
0.003	RfC - Inhalation Reference Concentration			Chronic = 0.003; Subchronic = 0.003
0.020	RfD_o - Oral Reference Dose			Chronic = 0.02; Subchronic = 0.6
500.00	K_{oc} - Organic Carbon Partition Coefficient			Naphthalene = 2,000

Industrial/Commercial Ingestion Remediation Objectives for Non-Carcinogenic Contaminants

$$S\text{-}1 = \frac{THQ \times BW \times AT \times 365}{10^{-6} \times (1/RfD_o) \times EF \times ED \times IR_{soil}} = \frac{1 \times 70 \times 25 \times 365}{0.000001 \times 1/0.02 \times 250 \times 25 \times 50} = \frac{638750}{15.625} = 40880 \text{ mg/kg}$$

Construction Worker Ingestion Remediation Objectives for Non-Carcinogenic Contaminants

$$S\text{-}1 = \frac{THQ \times BW \times AT \times 365}{10^{-6} \times (1/RfD_o) \times EF \times ED \times IR_{soil}} = \frac{1 \times 70 \times 0.115 \times 365}{0.000001 \times 1/0.6 \times 30 \times 1 \times 480} = \frac{2938.25}{0.024} = 122427 \text{ mg/kg}$$

Industrial Commercial Inhalation

$$S\text{-}4 = \frac{THQ \times AT \times 365}{EF \times ED \times (1/RfC \times 1/VF)} = \frac{1 \times 25 \times 365}{250 \times 25 \times 1/0.003 \times 1/70619.54525} = \frac{9125}{29.5008} = 309.314 \text{ mg/kg}$$

Inhalation Non-Carcinogenic Construction Worker

$$S\text{-}5 = \frac{THQ \times AT \times 365}{EF \times ED \times (1/RfC \times 1/VF)} = \frac{1 \times 0.115 \times 365}{30 \times 1 \times 1/0.003 \times 1/476.7191756} = \frac{41.975}{20.97671} = 2.001 \text{ mg/kg}$$

RESIDENTIAL OR COMMERCIAL

$$S\text{-}8 = VF = \frac{Q}{C} \times \frac{(3.14 \times D_A \times T)^{1/2} \times 10^{-4}}{(2 \times \rho_b \times D_A)} = 85.81 \times \frac{\left(3.14 \times 4.07E\text{-}06 \times 7.90E+08\right)^{1/2} \times 0.0001}{\left(2 \times 1.5 \times 4.07E\text{-}06\right)} = \frac{0.8622}{1.22E\text{-}05} = 70619.5452$$

000097

-C (Naphthalene)

1

Tier 2 Industrial/Commercial Calculations for Naphthalene

Marine Bank Trust 53-0051
20030136

Construction Worker

$$S\text{-}8 = VF = \frac{Q}{C} \times \frac{(3.14 \times D_A \times T)^{1/2} \times 10^{-4}}{(2 \times \rho_b \times D_A)} = 85.81 \times \frac{\left(\frac{3.14}{2} \times \frac{4.07E\text{-}06}{1.5} \times \frac{3.60E+06}{4.07E\text{-}06}\right)^{1/2} \times 0.0001}{1.22E\text{-}05} = \frac{0.0382}{1.22E\text{-}05} = 4767.1918$$

Equation for Derivation of Volatilization Factor - Construction Worker

$$S\text{-}9 = VF' = \frac{VF}{10} = \frac{4767.1918}{10} = 476.7192$$

Equation for Derivation of Apparent Diffusivity

$$S\text{-}10 = D_A = \frac{(\theta_a^{3.33} \times D_i \times H') + (\theta_w^{3.33} \times D_w)}{\eta^2} \times \frac{1}{(\rho_b \times K_d) + \theta_w + (\theta_a \times H')}$$

$$= \frac{\left(\frac{2.01E\text{-}03}{0.1884} \times 0.059 \times 0.020\right) + \left(0.0143 \times 7.50E\text{-}06\right)}{\left(1.5 \times 1.95\right) + 0.28 + \left(0.155 \times 0.020\right)} \times \frac{1}{} = 4.07E\text{-}06$$

Soil Component of the Migration to Groundwater Cleanup Objective (Class 1)

$$S\text{-}17 = C_w \times \left[K_d + \frac{(\theta_w + \theta_a \times H')}{\rho b}\right] = 2.8 \times \left[1.95 + \frac{0.279 + 0.155 \times 0.020}{1.5}\right] = 5.987 \text{ mg/kg}$$

Target Soil Leachate Concentration (Class 1)

$$S\text{-}18 = C_w = DF \times GW_{obj} = 20.00 \times 0.140 = 2.8$$

Soil-Water Partition Coefficient

$$S\text{-}19 = K_d = K_{oc} \times f_{oc} = 500.00 \times 0.004 = 1.95$$

Water-Filled Porosity

$$S\text{-}20 = \Theta_w = \eta \times \left(\frac{1}{K_s}\right)^{1/(2b+3)} = 0.43 \times \left[\frac{0.300}{120.000}\right]^{0.074} = 0.2786$$

Tier 2 Industrial/Commercial Calculations for Naphthalene

Marine Bank Trust 53-0051
20030135

Air-Filled Porosity

S-21 = $\Theta_a = \eta - \Theta_w$ = 0.43 - 0.28 = **0.1550**

Dilution Factor

S-22 = $DF = 1 + \frac{K \times i \times d}{I \times L}$ = $\frac{36.90}{0.300} \times \frac{0.0619}{79.858} \times 11.402 \div 1$ = **2.0866**

GW Ingestion

S-23 = $\frac{TR \times BW \times At_c \times 365}{SF_o \times IR_w \times EF \times ED}$ = $\frac{1.0E-06}{0.000} \times \frac{70}{1.000} \times \frac{0}{250} \times \frac{365}{25}$ = $\frac{0.0E+00}{0}$ = **#DIV/0!** mg/L

Total Soil Porosity

S-24 = $\eta = 1 - \frac{\rho_b}{\rho_s}$ = $1 - \frac{1.5}{2.65}$ = **0.4340**

Estimation of Mixing Zone Depth

S-25 = $d = (0.0112 \times L^2)^{0.5} + d_a\left[1 - \exp\frac{(-L \times I)}{(K \times i \times d_a)}\right]$

= $(0.0112 \times 79.858^2)^{0.5} + 3.048 \times \left[1 - \exp\frac{(-79.858 \times 0.3)}{(36.897 \times 0.0619 \times 3.048)}\right]$ = **11.402** m

Soil Saturation Limit

S-29 = $C_{sat} = \frac{S}{\rho_b} \times [(K_d \times \rho b) + \Theta w + (H' \times \theta a)]$ = $\frac{31}{1.5} \times [(1.95 \times 1.5) + 0.279 + (0.020 \times 0.155)]$ = **66.28** mg/kg

Soil Gas Outdoor Inhalation

S-30 = $ROs\ g = \frac{ROsoil \times H \times \rho b \times 1000}{H' \times \Theta a + \Theta w + Kd \times \rho b}$ = $\frac{2.001}{1.980E-02} \times \frac{0.020}{0.155} \times \frac{1.600}{0.279} \times \frac{1000}{1.950} \times \frac{}{1.500}$ = **18.53** mg/m³

660000

Tier 2 Industrial/Commercial Calculations for Benzo[a]pyrene

Marine Bank Trust 53-0051
20030135

SSL / RBCA | SSL & RBCA / IRIS/HEAST

Date Compiled: 01/11/23

Input Values

Holcomb's Bulk Density -->	0	Converted Value to be used in calculation sheet -->			--	USDA Soil Classification:	Silt Loam			
Organic Matter (%) -->	0	FOC % (0.58 conversion) -->	0.000		Organic Matter (mg/kg):	0	FOC mg/kg (0.58 conversion)	0.000	foc conversion to g/g:	0.000

1.5	ρ_b - Dry Soil Bulk Density				1.5 or; Gravel = 2.0; Sand = 1.8; Silt = 1.6; Clay = 1.7; or Site Specific
2.65	ps - Soil Particle Density				2.65 or; Site Specific
0.155	Θ_a - Air Filled Soil Porosity	*0.155*	Value from S-21		Top 1 meter = 0.28; below 1 meter = 0.13; Gravel = 0.05; Sand = 0.14; Silt =0.24; Clay = 0.19; or Calculated Value (S21)
0.279	Θw - Water Filled Soil Porosity	*0.279*	Value from S-20		Top 1 meter = 0.15; below 1 meter = 0.30; Gravel = 0.20; Sand = 0.18; Silt =0.16; Clay = 0.17; or Calculated Value (S20)
0.434	η- SSL: Total Soil Porosity	*0.434*	Value from S-24		0.43 or; Gravel - 0.25; Sand = 0.32; Silt = 0.40; Clay = 0.36; or Calculated Value (S24)
0.06188	I - Hydraulic Gradient				Site Specific
0.004	foc - Total Organic Carbon (g/g)				Surface Soil = 0.006; Subsurface Soil = 0.002; or Site Specific
20.000	DF - Dilution Factor	*2.087*	Value from S-22		If calculated value for DF is less than 20, then 20 default is used, else calculated value is used
11.402	d - Mixing Zone (m)	11.402	Value from S-25		2; or calculated value
36.90	K - Hydraulic Conductivity (m/yr)	cm/sec =	1.17E-04		Site Specific 1.01E+01 cm/d 3.69E+03 cm/yr [Use cm/d for R15, R19, & R26. cm/yr for R24
79.858	L - Source Length Parallel to Groundwater Flow (m)		feet = 262		Site Specific (m)
3.048	d_a - Aquifer Thickness (m)		feet = 10		Site Specific (m)
0.3	I - Infiltration Rate (m/yr)				0.3 for Illinois
120	K_s - Saturated Hydraulic Conductivity				See Table K for Input Values
0.005	GW_{obj} - Groundwater Remediation Objective Class 1				0.025 GW_{obj} - Groundwater Remediation Objective Class 2
0.074	1/(2b+3) - Exponent for S20				See Table K for Input Values
70	BW - Body Weight				Residential = 70 (carcinogenic); 15 (non-carcinogenic); Industrial/Commercial = 70; Construction Worker = 70; RBCA = 70
114	$IF_{soil-adj}$ -Age Adjusted Soil Ingestion Factor for Carcinogens				114
50	IR_{soil} -Soil Ingestion Rate				Residential = 200; Industrial/Commercial = 50; Construction Worker = 480
	SF_o -Oral Slop Factor				
1	IR_w -Daily Water Ingestion Rate				Residential = 2; Industrial/Commercial = 1
0.00162	S - Solubility in Water				Benzo[a]pyrene = 0.00162
1.0E-06	TR - Target Cancer Risk				Residential = 10^{-6}; Industrial/Commercial = 10^{-6}; Construction Worker = 10^{-6} at point of human exposure
70	AT_c -Average Time for Carcinogens				70
6.00E-04	URF - Inhalation Unit Risk Factor				
250	EF - Exposure Frequency				Residential = 350; Industrial/Commercial = 250; Construction Worker = 30
25	ED - Exposure Duration for Inhalation fo Carcinogens				Residential = 30; Industrial/Commercial = 25; Construction Worker = 1
85.81	Q/C - Inverse of the mean concentration at the center of a square source				Residential = 68.81; Industrial/Commercial = 85.81; Construction Worker = 85.81
9.50E+08	T - Exposure Interval				Residential = 9.5 x 10^8; Industrial/Commercial = 7.9 x 10^6; Construction Worker = 3.6 x 10^6
0.043	D_i - Diffusivity in Air				Benzo[a]pyrene = 0.043
4.63E-05	H' - Henry's Law Constant				Benzo[a]pyrene = 4.63 x 10^{-5}
9.00E-06	D_w - Diffusivity in Water				Benzo[a]pyrene = 9.00 x 10^{-6}
1020000	K_{oc} - Organic Carbon Partition Coefficient				Benzo[a]pyrene = 1,020,000

Industrial/Commercial Ingestion Tier II Objective

$$S\text{-}3 = \frac{TR \times BW \times AT_c \times 365}{Sf_o \times 10^{-6} \times EF \times ED \times IRsoil} = \frac{1.0E\text{-}06 \times 70 \times 70 \times 365}{1.000 \times 1.00E\text{-}06 \times 250 \times 25 \times 50} = \frac{1.8E+00}{3.13E-01} = 5.723 \text{ mg/kg}$$

Construction Worker Ingestion Tier II Objective

$$S\text{-}3 = \frac{TR \times BW \times AT_c \times 365}{Sf_o \times 10^{-6} \times EF \times IRsoil} = \frac{1.0E\text{-}06 \times 70 \times 70 \times 365}{1.000 \times 1.00E\text{-}06 \times 30 \times 480} = \frac{1.8E+00}{1.44E-02} = 124.20 \text{ mg/kg}$$

Industrial/Commercial Inhalation Tier II Objective

$$S\text{-}6 = \frac{TR \times ATc \times 365}{URF \times 1000 \times EF \times ED \times 1/VF} = \frac{1.0E\text{-}06 \times 70 \times 365}{6.00E\text{-}04 \times 1000 \times 250 \times 25 \times (1/\ 1.44E+07\ )} = \frac{0.02555}{2.60E-04} = 9.81E+01 \text{ mg/kg}$$

Tier 2 Industrial/Commercial Calculations for Benzo[a]pyrene

Marine Bank Trust 53-0051
20030135

Construction Worker Inhalation Tier II Objective

$$S\text{-}7 = \frac{TR \times ATc \times 365}{URF \times 1000 \times EF \times ED \times 1/VF'} = \frac{1.0E\text{-}06 \times 70 \times 365}{6.00E\text{-}04 \times 1000 \times 30 \times 1 \times (1/\ 8.86E+04)} = \frac{0.02555}{2.03E\text{-}04} = 1.26E+02 \text{ mg/kg}$$

RESIDENTIAL OR COMMERCIAL

$$S\text{-}8 = VF = \frac{Q}{C} \times \frac{(3.14 \times D_A \times T)^{1/2} \times 10^{-4}}{(2 \times \rho_b \times D_A)} = 85.81 \times \frac{\left(\frac{3.14 \times 1.18E\text{-}10 \times 9.50E+08}{2 \times 1.5 \times 1.18E\text{-}10}\right)^{1/2} \times 0.0001}{} = \frac{0.0051}{3.53E\text{-}10} = 14400861.2016$$

Construction Worker

$$S\text{-}8 = VF = \frac{Q}{C} \times \frac{(3.14 \times D_A \times T)^{1/2} \times 10^{-4}}{(2 \times \rho_b \times D_A)} = 85.81 \times \frac{\left(\frac{3.14 \times 1.18E\text{-}10 \times 3.60E+06}{2 \times 1.5 \times 1.18E\text{-}10}\right)^{1/2} \times 0.0001}{} = \frac{0.0003}{3.53E\text{-}10} = 8.86E+05$$

Equation for Derivation of Volatilization Factor - Construction Worker

$$S\text{-}9 = VF' = \frac{VF}{10} = \frac{886498.3107}{10} = 88649.8311$$

Equation for Derivation of Apparent Diffusivity

$$S\text{-}10 = D_A = \frac{(\theta_a^{3.33} \times D_i \times H') + (\theta_w^{3.33} \times D_w)}{\eta^2} \times \frac{1}{(\rho_b \times K_d) + \theta_w + (\theta_a \times H')}$$

$$= \frac{\left(\frac{2.01E\text{-}03 \times 0.043 \times 0.000}{0.1884}\right) + \left(0.0143 \times 9.00E\text{-}06\right)}{\left(1.5 \times 3978\right) + 0.28 + \left(0.155 \times 4.63E\text{-}05\right)} \times \frac{1}{} = 1.18E\text{-}10$$

Soil Component of the Migration to Groundwater Cleanup Objective (Class 1)

$$S\text{-}17 = C_w \times \left[K_d + \frac{(\theta_w + \theta_a \times H')}{\rho b}\right] = 0.1 \times \left[3978 + \left(\frac{0.279 + 0.155 \times 4.63E\text{-}05}{1.5}\right)\right] = 397.819 \text{ mg/kg}$$

Target Soil Leachate Concentration (Class 1)

$$S\text{-}18 = C_w = DF \times GW_{obj} = 20.00 \times 0.005 = 0.1$$

Soil-Water Partition Coefficient

$$S\text{-}19 = K_d = K_{oc} \times f_{oc} = 1.02E+06 \times 0.004 = 3978$$

Water-Filled Porosity

$$S\text{-}20 = \Theta_w = \eta \times \frac{1}{K_a}^{1/(2b+3)} = 0.43 \times \left[\frac{0.300}{120.000}\right]^{0.074} = 0.2786$$

Tier 2 Industrial/Commercial Calculations for Benzo[a]pyrene

Marine Bank Trust 53-0051

20030135

Air-Filled Porosity

S-21 = $\Theta_a = \eta - \Theta_w$ = 0.43 - 0.28 = **0.1550**

Dilution Factor

S-22 = $DF = 1 + \frac{K \times i \times d}{I \times L}$ = $\frac{36.90}{0.300} \times \frac{0.0619}{79.858} \times 11.402 + 1$ = **2.0866**

GW Ingestion

S-23 = $\frac{TR \times BW \times At_c \times 365}{SF_o \times IR_w \times EF \times ED}$ = $\frac{1.0E-06}{1.000} \times \frac{70}{1.000} \times \frac{70}{250} \times \frac{365}{25}$ = $\frac{1.8E+00}{6250}$ = **0.0003** mg/L

Total Soil Porosity

S-24 = $\eta = 1 - \frac{\rho_b}{\rho_s}$ = 1 - $\frac{1.5}{2.65}$ = **0.4340**

Estimation of Mixing Zone Depth

S-25 = $d = (0.0112 \times L^2)^{0.5} + d_a\left[1 - \exp\frac{(-L \times I)}{(K \times i \times d_a)}\right]$

= (0.0112 x 79.858 ^{2})$^{0.5}$ + 3.048 x [1 - exp ($\frac{-79.858}{36.897}$ x $\frac{0.3}{0.0619}$ x 3.048)] = **11.402** m

Soil Saturation Limit

S-29 = $C_{sat} = \frac{S}{\rho_b} \times [(K_d \times \rho b) + \Theta w + (H' \times \theta a)]$ = $\frac{1.62E-03}{1.5}$ x [(3978 x 1.5) + 0.279 + (4.63E-05 x 0.155)] = **6.44** mg/kg

Soil Gas Outdoor Inhalation

S-30 = $ROs\,g = \frac{ROsoil \times H \times \rho b \times 1000}{H' \times \Theta a + \Theta w + Kd \times \rho b}$ = $\frac{6.445}{4.630E-05} \times \frac{4.630E-05}{0.155} \times \frac{1.500}{0.279} \times \frac{1000}{3978.000} \times 1.500$ = **0.00008** mg/m^3

Tier 2 Industrial/Commercial Calculations for Benz[a]anthracene

Marine Bank Trust 53-0051
20030135

SSL: RBCA | SSL & RSCA: IRIS/HEAST

Date Compiled: 01/11/23

Input Values

Holcomb's Bulk Density -->	0	Converted Value to be used in calculation sheet -->			–	USDA Soil Classification:	Silt Loam			
Organic Matter (%) -->	0	FOC % (0.58 conversion) -->	0.000	Organic Matter (mg/kg)	0	FOC mg/kg (0.58 conversion)	0.000	foc conversion to g/g:	0.000	

1.5	ρ_b - Dry Soil Bulk Density				1.5 or; Gravel = 2.0; Sand = 1.8; Silt = 1.6; Clay = 1.7; or Site Specific
2.65	ps - Soil Particle Density				2.65 or; Site Specific
0.155	Θ_a - Air Filled Soil Porosity	*0.155*	Value from S-21		Top 1 meter = 0.28; below 1 meter = 0.13; Gravel = 0.05; Sand = 0.14; Silt =0.24; Clay = 0.19; or Calculated Value (S21)
0.279	Θ_w - Water Filled Soil Porosity	*0.279*	Value from S-20		Top 1 meter = 0.15; below 1 meter = 0.30; Gravel = 0.20; Sand = 0.18; Silt =0.16; Clay = 0.17; or Calculated Value (S20)
0.434	n - SSL: Total Soil Porosity	*0.434*	Value from S-24		0.43 or; Gravel - 0.25; Sand = 0.32; Silt = 0.40; Clay = 0.36; or Calculated Value (S24)
0.06186	I - Hydraulic Gradient				Site Specific
0.004	foc - Total Organic Carbon (g/g)				Surface Soil = 0.006; Subsurface Soil = 0.002; or Site Specific
20.000	DF - Dilution Factor	*2.087*	Value from S-22		If calculated value for DF is less than 20, then 20 default is used, else calculated value is used
11.402	d - Mixing Zone (m)	11.402	Value from S-25		2; or calculated value
36.90	K - Hydraulic Conductivity (m/yr)	cm/sec =	1.17E-04		Site Specific | 1.01E+01 cm/d | 3.69E+03 cm/yr | Use cm/d for R15, R19, & R26; cm/yr for R24
79.858	L - Source Length Parallel to Groundwater Flow (m)		feet = 262		Site Specific (m)
3.048	d_a - Aquifer Thickness (m)		feet = 10		Site Specific (m)
0.3	I - Infiltration Rate (m/yr)				0.3 for Illinois
120	K_s - Saturated Hydraulic Conductivity				See Table K for Input Values
0.005	GW_{obj} - Groundwater Remediation Objective Class 1			0.025	GW_{obj} - Groundwater Remediation Objective Class 2
0.074	1/(2b+3) - Exponent for S20				See Table K for Input Values
70	BW - Body Weight				Residential = 70 (carcinogenic); 15 (non-carcinogenic); Industrial/Commercial = 70; Construction Worker = 70; RBCA = 70
114	$IF_{soil-adj}$ -Age Adjusted Soil Ingestion Factor for Carcinogens				114
50	IR_{soil} -Soil Ingestion Rate				Residential = 200; Industrial/Commercial = 50; Construction Worker = 480
0.73	SF_o -Oral Slop Factor				
1	IR_w -Daily Water Ingestion Rate				Residential = 2; Industrial/Commercial = 1
0.0094	S - Solubility in Water				Benz[a]anthracene = 0.0094
1.0E-06	TR - Target Cancer Risk				Residential = 10^{-6}; Industrial/Commercial = 10^{-5}; Construction Worker = 10^{-5} at point of human exposure
70	AT_c -Average Time for Carcinogens				70
6.00E-05	URF - Inhalation Unit Risk Factor				
250	EF - Exposure Frequency				Residential = 350; Industrial/Commercial = 250; Construction Worker = 30
25	ED - Exposure Duration for Inhalation fo Carcinogens				Residential = 30; Industrial/Commercial = 25; Construction Worker = 1
85.81	Q/C - inverse of the mean concentration at the center of a square source				Residential = 68.81; Industrial/Commercial = 85.81; Construction Worker = 85.81
9.50E+08	T - Exposure Interval				Residential = 9.5×10^8; Industrial/Commercial = 7.9×10^8; Construction Worker = 3.6×10^8
0.051	D_i - Diffusivity in Air				Benz[a]anthracene = 0.051
1.37E-04	H' - Henry's Law Constant				Benz[a]anthracene = 1.37×10^{-4}
9.00E-06	D_w - Diffusivity in Water				Benz[a]anthracene = 9.00×10^{-6}
398000	K_{oc} - Organic Carbon Partition Coefficient				Benz[a]anthracene = 398,000

Industrial/Commercial Ingestion Tier II Objective

$$S\text{-}3 = \frac{TR \times BW \times AT_c \times 365}{Sf_o \times 10^{-6} \times EF \times ED \times IRsoil} = \frac{1.0E\text{-}06 \times 70 \times 70 \times 365}{0.100 \times 1.00E\text{-}06 \times 250 \times 25 \times 50} = \frac{1.8E+00}{3.13E\text{-}02} = 57.232 \text{ mg/kg}$$

Construction Worker Ingestion Tier II Objective

$$S\text{-}3 = \frac{TR \times BW \times AT_c \times 365}{Sf_o \times 10^{-6} \times EF \times ED \times IRsoil} = \frac{1.0E\text{-}06 \times 70 \times 70 \times 365}{0.100 \times 1.00E\text{-}06 \times 30 \times 480} = \frac{1.8E+00}{1.44E\text{-}03} = 1242.01 \text{ mg/kg}$$

Industrial/Commercial Inhalation Tier II Objective

$$S\text{-}6 = \frac{TR \times ATc \times 365}{URF \times 1000 \times EF \times ED \times 1/VF} = \frac{1.0E\text{-}06 \times 70 \times 365}{6.00E\text{-}05 \times 1000 \times 250 \times 25 \times (1/\ 8.67E+06)} = \frac{0.02555}{4.32E\text{-}06} = 5.91E+02 \text{ mg/kg}$$

Tier 2 Industrial/Commercial Calculations for Benz[a]anthracene

Marine Bank Trust 53-0051

20030135

Construction Worker Inhalation Tier II Objective

$$S\text{-}7 = \frac{TR \times AT_c \times 365}{URF \times 1000 \times EF \times ED \times 1/VF'} = \frac{1.0E\text{-}06 \times 70 \times 365}{6.00E\text{-}05 \times 1000 \times 30 \times 1 \times (1/\ 5.34E+04)} = \frac{0.02555}{3.37E\text{-}05} = 7.58E+02 \text{ mg/kg}$$

RESIDENTIAL OR COMMERCIAL

$$S\text{-}8 = VF = \frac{Q}{C} \times \frac{(3.14 \times D_A \times T)^{1/2} \times 10^{-4}}{(2 \times \rho_b \times D_A)} = 85.81 \times \frac{(3.14 \times 3.25E\text{-}10 \times 9.50E+08)^{1/2} \times 0.0001}{(2 \times 1.5 \times 3.25E\text{-}10)} = \frac{0.0084}{9.74E\text{-}10} = 8672296.4141$$

Construction Worker

$$S\text{-}8 = VF = \frac{Q}{C} \times \frac{(3.14 \times D_A \times T)^{1/2} \times 10^{-4}}{(2 \times \rho_b \times D_A)} = 85.81 \times \frac{(3.14 \times 3.25E\text{-}10 \times 3.60E+06)^{1/2} \times 0.0001}{(2 \times 1.5 \times 3.25E\text{-}10)} = \frac{0.0005}{9.74E\text{-}10} = 5.34E+05$$

Equation for Derivation of Volatilization Factor - Construction Worker

$$S\text{-}9 = VF' = \frac{VF}{10} = \frac{533855.3030}{10} = 53385.5303$$

Equation for Derivation of Apparent Diffusivity

$$S\text{-}10 = D_A = \frac{(\theta_a^{3.33} \times D_i \times H') + (\theta_w^{3.33} \times D_w)}{\eta^2} \times \frac{1}{(\rho_b \times K_d) + \theta_w + (\theta_a \times H')}$$

$$= \frac{(2.01E\text{-}03 \times 0.051 \times 0.000) + (0.0143 \times 9.00E\text{-}06)}{0.1884} \times \frac{1}{(1.5 \times 1552.2) + 0.28 + (0.155 \times 1.37E\text{-}04)} = 3.25E\text{-}10$$

Soil Component of the Migration to Groundwater Cleanup Objective (Class 1)

$$S\text{-}17 = C_w \times \left[K_d + \frac{(\theta_w + \theta_a \times H')}{\rho b} \right] = 0.1 \times \left[1552.2 + \frac{(0.279 + 0.155 \times 1.37E\text{-}04)}{1.5} \right] = 155.239 \text{ mg/kg}$$

Target Soil Leachate Concentration (Class 1)

$$S\text{-}18 = C_w = DF \times GW_{obj} = 20.00 \times 0.005 = 0.1$$

Soil-Water Partition Coefficient

$$S\text{-}19 = K_d = K_{oc} \times f_{oc} = 3.98E+05 \times 0.004 = 1552.2$$

Water-Filled Porosity

$$S\text{-}20 = \Theta_w = \eta \times \frac{I}{K_s}^{1/(2b+3)} = 0.43 \times \left[\frac{0.300}{120.000} \right]^{0.074} = 0.2786$$

Tier 2 Industrial/Commercial Calculations for Benz[a]anthracene

Marine Bank Trust 53-0051
20030135

Air-Filled Porosity

S-21 = $\Theta_a = \eta - \Theta_w = 0.43 - 0.28 = 0.1550$

Dilution Factor

S-22 = $DF = 1 + \frac{K \times i \times d}{I \times L} = \frac{36.90}{0.300} \times \frac{0.0619}{79.858} \times 11.402 + 1 = 2.0866$

GW Ingestion

S-23 = $\frac{TR \times BW \times At_c \times 365}{SF_o \times IR_w \times EF \times ED} = \frac{1.0E-06}{0.100} \times \frac{70}{1.000} \times \frac{70}{250} \times \frac{365}{25} = \frac{1.8E+00}{625} = 0.0029$ mg/L

Total Soil Porosity

S-24 = $\eta = 1 - \frac{\rho_b}{\rho_s} = 1 - \frac{1.5}{2.65} = 0.4340$

Estimation of Mixing Zone Depth

S-25 = $d = (0.0112 \times L^2)^{0.5} + d_a\left[1 - \exp\frac{(-L \times I)}{(K \times i \times d_a)}\right]$

$= (0.0112 \times 79.858 \,^{2})^{0.5} + 3.048 \times \left[1 - \exp\left\{\frac{-79.858}{36.897} \times \frac{0.3}{0.0619} \times \frac{)}{3.048}\right\}\right] = 11.402$ m

Soil Saturation Limit

S-29 = $C_{sat} = \frac{S}{\rho_b} \times [(K_d \times \rho b) + \Theta w + (H' \times \theta a)] = \frac{9.40E-03}{1.5} \times [(1552.2 \times 1.5) + 0.279 + (1.37E-04 \times 0.155)] = 14.59$ mg/kg

Soil Gas Outdoor Inhalation

S-30 = $ROs\ g = \frac{ROsoil \times H \times \rho b \times 1000}{H' \times \Theta a + \Theta w + Kd \times \rho b} = \frac{14.592}{1.370E-04} \times \frac{1.370E-04}{0.155} \times \frac{1.500}{0.279} \times \frac{1000}{1552.200} \times \frac{}{1.500} = 0.00129$ mg/m^3

Marine Bank Trust 53-0051
20030135

Appendix C - Table K
Parameter Estimates for Calculating Water - Filled Soil Porosity (Ow)

Soil Texture	Saturated Hydraulic Conductivity (Ks) (m/yr)	1/ (2b+3)
Sand	1830	0.09
Loamy Sand	540	0.085
Sandy Loam	230	0.08
Silt Loam	**120**	**0.074**
Loam	60	0.073
Sandy Clay Loam	40	0.058
Silt Clay Loam	13	0.054
Clay Loam	20	0.05
Sandy Clay	10	0.042
Silt Clay	8	0.042
Clay	5	0.039

Version: 3/26/2018

APPENDIX F

BORE LOGS AND WELL COMPLETION REPORTS

CORRECTIVE ACTION PLAN AND BUDGET AMENDMENT

MARINE BANK TRUST # 53-0051
CANTRALL, ILLINOIS

Illinois Environmental Protection Agency

CW³M COMPANY, INC.
DRILLING BOREHOLE LOG

Page 1 of 1

LUST INCIDENT #: 03-0135	**BOREHOLE NUMBER:** SB-7
SITE NAME: Marine Bank Trust #530051	**BORING LOCATION:** 51'N & 41'W of SW Tree
SITE ADDRESS: 9520 State Route 29 Cantrall, Illinois	**RIG TYPE:** Truck Mounted Drill Rig
DATE/TIME STARTED: 8/12/2021 9:30	**DRILLING/SAMPLE METHOD:** Push
DATE/TIME FINISHED: 8/12/2021 8:40	**BACKFILL:** Grout/Cuttings

DEPTH (FEET)	SOIL AND ROCK DESCRIPTION	USCS CLASS	Sample Recovery	PID (ppm)	Sample Type	SAMPLE NUMBER	REMARKS: (Odor, Color, Moisture, Penetrometer, etc.)
0	Asphalt						
1	Subbase						
2	Black Silty Clay	CL		0.0			
3			95%	51.0			Strong Odor and Discoloration
4	Black/Green Silty Clay	CL					
5				88.0			
6				260.0	Grab	SB-7	BETX, MTBE & PNA's
7							
8			90%	580.0			
9				499.0			Wet
10							
11	End of boring 10'						
12							
13							
14							
15							

Stratification lines are approximate, in-situ transition between soil types may be gradual.

NOTES: Sampled @ 6' per IEPA approved plan

Manway / Surface Elevation:

▼ **Groundwater Depth While Drilling:**	~8'	**Auger Depth:**	10'	**Driller:**	CW³M
▽ **Groundwater Depth After Drilling:**		**Rotary Depth:**		**Geologist:**	MJS/KTR

Illinois Environmental Protection Agency

CW³M COMPANY, INC.
DRILLING BOREHOLE LOG

LUST INCIDENT #: 03-0135	**BOREHOLE NUMBER:** SB-8
SITE NAME: Marine Bank Trust #530051	**BORING LOCATION:** 43'N & 32'E of SW Tree
SITE ADDRESS: 9520 State Route 29 Cantrall, Illinois	**RIG TYPE:** Truck Mounted Drill Rig
DATE/TIME STARTED: 8/12/2021 11:10	**DRILLING/SAMPLE METHOD:** Push
DATE/TIME FINISHED: 8/12/2021 11:20	**BACKFILL:** Grout/Cuttings

DEPTH (FEET)	SOIL AND ROCK DESCRIPTION	USCS CLASS	Sample Recovery	PID (ppm)	Sample Type	SAMPLE NUMBER	REMARKS: (Odor, Color, Moisture, Penetrometer, etc.)
0	Grass						
1	Topsoil						No Odor and Discoloration Throughout
2	Black Silty Clay	CL		0.0			
3			100%	0.0			
4	Brown Silty Clay	CL					
5				0.0			
6				0.0			
7							
8			80%	0.0			
9	Brown Silty Clay w/ Fine Grained Sand	CL		0.0	Grab	SB-8	BETX, MTBE & PNA's Wet
10							
11	End of boring 10'						
12							
13							
14							
15							

Stratification lines are approximate, in-situ transition between soil types may be gradual.

NOTES: Sampled @ 9' per IEPA approved plan

Manway / Surface Elevation:

▼ **Groundwater Depth While Drilling:**	~9'	**Auger Depth:**	10'	**Driller:**	CW³M
▽ **Groundwater Depth After Drilling:**		**Rotary Depth:**		**Geologist:**	MJS/KTR

Illinois Environmental Protection Agency

CW³M COMPANY, INC.
DRILLING BOREHOLE LOG

LUST INCIDENT #: 03-0135	**BOREHOLE NUMBER:** SB-9
SITE NAME: Marine Bank Trust #530051	**BORING LOCATION:** 38'N & 13'E of SW Tree
SITE ADDRESS: 9520 State Route 29 Cantrall, Illinois	**RIG TYPE:** Truck Mounted Drill Rig
DATE/TIME STARTED: 8/12/2021 11:20	**DRILLING/SAMPLE METHOD:** Push
DATE/TIME FINISHED: 8/12/2021 11:30	**BACKFILL:** Grout/Cuttings

DEPTH (FEET)	SOIL AND ROCK DESCRIPTION	USCS CLASS	Sample Recovery	PID (ppm)	Sample Type	SAMPLE NUMBER	REMARKS: (Odor, Color, Moisture, Penetrometer, etc.)
0	Grass						
1	Topsoil						No Odor and Discoloration Throughout
2	Brown Silty Clay	CL		0.0			
3			90%	0.0			
4							
5				0.0			
6				0.0	Grab	SB-9	BETX, MTBE & PNA's
7							
8	Brown Silty Clay w/ Fine Grained Sand	CL	80%	0.0			
9				0.0			
10							Wet
11	End of boring 10'						
12							
13							
14							
15							

Stratification lines are approximate, in-situ transition between soil types may be gradual.

NOTES: Sampled @ 6' per IEPA approved plan

Manway / Surface Elevation:

▼ **Groundwater Depth While Drilling:**	~9'	**Auger Depth:**	10'	**Driller:**	CW³M
▽ **Groundwater Depth After Drilling:**		**Rotary Depth:**		**Geologist:**	MJS/KTR

Illinois Environmental Protection Agency

CW³M COMPANY, INC.
DRILLING BOREHOLE LOG

Page 1 of 1

LUST INCIDENT #: 03-0135	**BOREHOLE NUMBER:** SB-10
SITE NAME: Marine Bank Trust #530051	**BORING LOCATION:** 52'N & 4'E of SW Tree
SITE ADDRESS: 9520 State Route 29 Cantrall, Illinois	**RIG TYPE:** Truck Mounted Drill Rig
DATE/TIME STARTED: 8/12/2021 11:30	**DRILLING/SAMPLE METHOD:** Push
DATE/TIME FINISHED: 8/12/2021 11:40	**BACKFILL:** Grout/Cuttings

DEPTH (FEET)	SOIL AND ROCK DESCRIPTION	USCS CLASS	Sample Recovery	PID (ppm)	Sample Type	SAMPLE NUMBER	REMARKS: (Odor, Color, Moisture, Penetrometer, etc.)
0	Concrete						
1	Subbase						No Odor and Discoloration Throughout
2	Dark Brown Silty Clay	CL		0.0			
3			80%	0.0			
4	Brown Silty Clay	CL					
5				0.0			
6				0.0	Grab	SB-10	BETX, MTBE & PNA's
7							
8	Brown Silty Clay w/ Fine Grained Sand	CL	95%	0.0			
9				0.0			
10							Wet
11	End of boring 10'						
12							
13							
14							
15							

Stratification lines are approximate, in-situ transition between soil types may be gradual.

NOTES: Sampled @ 6' per IEPA approved plan

Manway / Surface Elevation:

▼	**Groundwater Depth While Drilling:** ~9'	**Auger Depth:** 10'	**Driller:**	CW³M
▽	**Groundwater Depth After Drilling:**	**Rotary Depth:**	**Geologist:**	MJS/KTR

Illinois Environmental Protection Agency

CW³M COMPANY, INC.
DRILLING BOREHOLE LOG

Page 1 of 1

LUST INCIDENT #: 03-0135	**BOREHOLE NUMBER:** SB-11
SITE NAME: Marine Bank Trust #530051	**BORING LOCATION:** 73'N & 5'W of SW Tree
SITE ADDRESS: 9520 State Route 29 Cantrall, Illinois	**RIG TYPE:** Truck Mounted Drill Rig
DATE/TIME STARTED: 8/12/2021 13:55	**DRILLING/SAMPLE METHOD:** Push
DATE/TIME FINISHED: 8/12/2021 14:05	**BACKFILL:** Grout/Cuttings

DEPTH (FEET)	SOIL AND ROCK DESCRIPTION	USCS CLASS	Sample Recovery	PID (ppm)	Sample Type	SAMPLE NUMBER	REMARKS: (Odor, Color, Moisture, Penetrometer, etc.)
0	Concrete						
1	Subbase						No Odor and Discoloration Throughout
2	Black Silty Clay	CL	95%	0.0			
3				0.0			
4	Brown Silty Clay	CL					
5				0.0			
6				0.0	Grab	SB-11	BETX, MTBE & PNA's
7							
8	Brown Silty Clay w/ Fine Grained Sand	CL	95%	0.0			
9				0.0			
10							Wet
11	End of boring 10'						
12							
13							
14							
15							

Stratification lines are approximate, in-situ transition between soil types may be gradual.

NOTES: Sampled @ 6' per IEPA approved plan

Manway / Surface Elevation:

Groundwater Depth While Drilling:	~9'	**Auger Depth:**	10'	**Driller:**	CW³M
Groundwater Depth After Drilling:		**Rotary Depth:**		**Geologist:**	MJS/KTR

Illinois Environmental Protection Agency

CW³M COMPANY, INC.
DRILLING BOREHOLE LOG

LUST INCIDENT #: 03-0135
SITE NAME: Marine Bank Trust #530051
SITE ADDRESS: 9520 State Route 29
Cantrall, Illinois
DATE/TIME STARTED: 8/12/2021 14:05
DATE/TIME FINISHED: 8/12/2021 14:15

BOREHOLE NUMBER: SB-12
BORING LOCATION: 29'N & 7'W of SW Tree
RIG TYPE: Truck Mounted Drill Rig
DRILLING/SAMPLE METHOD: Push
BACKFILL: Grout/Cuttings

DEPTH (FEET)	SOIL AND ROCK DESCRIPTION	USCS CLASS	Sample Recovery	PID (ppm)	Sample Type	SAMPLE NUMBER	REMARKS: (Odor, Color, Moisture, Penetrometer, etc.)
0	Grass						
1	Topsoil	OM					No Odor and Discoloration Throughout
2	Dark Brown Silty Clay	CL		0.0			
3			100%	0.0			
4	Brown Silty Clay	CL					
5				0.0			
6				0.0	Grab	SB-12	BETX, MTBE & PNA's
7							
8	Brown Silty Clay w/ Fine Grained Sand	CL	95%	0.0			
9				0.0			
10							Wet
11	End of boring 10'						
12							
13							
14							
15							

Stratification lines are approximate, in-situ transition between soil types may be gradual.

NOTES: Sampled @ 6' per IEPA approved plan

Manway / Surface Elevation:

Groundwater Depth While Drilling: ~9'
Groundwater Depth After Drilling:

Auger Depth: 10'
Rotary Depth:

Driller: CW³M
Geologist: MJS/KTR

Illinois Environmental Protection Agency

CW³M COMPANY, INC.
DRILLING BOREHOLE LOG

Page 1 of 1

LUST INCIDENT #: 03-0135	**BOREHOLE NUMBER:** SB-13
SITE NAME: Marine Bank Trust #530051	**BORING LOCATION:** 9'N & 6'W of SW Tree
SITE ADDRESS: 9520 State Route 29 Cantrall, Illinois	**RIG TYPE:** Truck Mounted Drill Rig
DATE/TIME STARTED: 8/12/2021 14:15	**DRILLING/SAMPLE METHOD:** Push
DATE/TIME FINISHED: 8/12/2021 14:25	**BACKFILL:** Grout/Cuttings

DEPTH (FEET)	SOIL AND ROCK DESCRIPTION	USCS CLASS	Sample Recovery	PID (ppm)	Sample Type	SAMPLE NUMBER	REMARKS: (Odor, Color, Moisture, Penetrometer, etc.)
0	Grass						
1	Topsoil	OM					No Odor and Discoloration
2	Black Silty Clay	CL		0.0			
3			100%	0.0			
4	Brown Silty Clay	CL					
5				0.0			
6				0.0			
7							Strong Odor and Discoloration
8	Brown Silty Clay w/ Fine Grained Sand	CL	90%	41.0			
9				350.0	Grab	SB-13	BETX, MTBE & PNA's
10							Wet
11	End of boring 10'						
12							
13							
14							
15							

Stratification lines are approximate, in-situ transition between soil types may be gradual.

NOTES: Sampled @ 9' per IEPA approved plan

Manway / Surface Elevation:

▼ **Groundwater Depth While Drilling:**	~9'	**Auger Depth:**	10'	**Driller:**	CW³M
▽ **Groundwater Depth After Drilling:**		**Rotary Depth:**		**Geologist:**	MJS/KTR

Illinois Environmental Protection Agency

CW³M COMPANY, INC.
DRILLING BOREHOLE LOG

Page 1 of 1

LUST INCIDENT #: 03-0135	**BOREHOLE NUMBER:** SB-14
SITE NAME: Marine Bank Trust #530051	**BORING LOCATION:** 29'N & 13'W of SW Tree
SITE ADDRESS: 9520 State Route 29 Cantrall, Illinois	**RIG TYPE:** Truck Mounted Drill Rig
DATE/TIME STARTED: 8/12/2021 14:25	**DRILLING/SAMPLE METHOD:** Push
DATE/TIME FINISHED: 8/12/2021 14:35	**BACKFILL:** Grout/Cuttings

DEPTH (FEET)	SOIL AND ROCK DESCRIPTION	USCS CLASS	Sample Recovery	PID (ppm)	Sample Type	SAMPLE NUMBER	REMARKS: (Odor, Color, Moisture, Penetrometer, etc.)
0	Grass						
1	Topsoil	OM					No Odor and Discoloration
2	Black Silty Clay	CL		0.0			
3			90%	0.0			
4	Brown Silty Clay	CL					
5				100.0			Strong Odor and Discoloration
6				999.0	Grab	SB-14	BETX, MTBE & PNA's
7							
8	Brown Silty Clay w/ Fine Grained Sand	CL	90%	850.0			
9				713.0			
10							Wet
11	End of boring 10'						
12							
13							
14							
15							

Stratification lines are approximate, in-situ transition between soil types may be gradual.

NOTES: Sampled @ 6' per IEPA approved plan

Manway / Surface Elevation:

▼ **Groundwater Depth While Drilling:**	~9'	**Auger Depth:**	10'	**Driller:**	CW³M
▽ **Groundwater Depth After Drilling:**		**Rotary Depth:**		**Geologist:**	MJS/KTR

Illinois Environmental Protection Agency

CW³M COMPANY, INC.
DRILLING BOREHOLE LOG

Page 1 of 1

LUST INCIDENT #: 03-0135	**BOREHOLE NUMBER:** SB-15
SITE NAME: Marine Bank Trust #530051	**BORING LOCATION:** 38'N & 20'W of SW Tree
SITE ADDRESS: 9520 State Route 29 Cantrall, Illinois	**RIG TYPE:** Truck Mounted Drill Rig
DATE/TIME STARTED: 8/12/2021 14:35	**DRILLING/SAMPLE METHOD:** Push
DATE/TIME FINISHED: 8/12/2021 14:45	**BACKFILL:** Grout/Cuttings

DEPTH (FEET)	SOIL AND ROCK DESCRIPTION	USCS CLASS	Sample Recovery	PID (ppm)	Sample Type	SAMPLE NUMBER	REMARKS: (Odor, Color, Moisture, Penetrometer, etc.)
0	Concrete						
1	Subbase						Strong Odor and Discoloration Throughout
2	Black/Green Silty Clay	CL		300.0			
3			80%	410.0			
4							
5				406.0			
6				851.0	Grab	SB-15	BETX, MTBE & PNA's
7							
8			100%	603.0			
9				716.0			
10							Wet
11	End of boring 10'						
12							
13							
14							
15							

Stratification lines are approximate, in-situ transition between soil types may be gradual.

NOTES: Sampled @ 6' per IEPA approved plan

Manway / Surface Elevation:

▼	**Groundwater Depth While Drilling:** ~9'	**Auger Depth:** 10'	**Driller:**	CW³M
▽	**Groundwater Depth After Drilling:**	**Rotary Depth:**	**Geologist:**	MJS/KTR

Illinois Environmental Protection Agency

CW³M COMPANY, INC.
DRILLING BOREHOLE LOG

LUST INCIDENT #: 03-0135
SITE NAME: Marine Bank Trust #530051
SITE ADDRESS: 9520 State Route 29
Cantrall, Illinois
DATE/TIME STARTED: 8/12/2021 14:45
DATE/TIME FINISHED: 8/12/2021 15:00

BOREHOLE NUMBER: SB-16
BORING LOCATION: 52'N & 11'W of SW Tree
RIG TYPE: Truck Mounted Drill Rig
DRILLING/SAMPLE METHOD: Push
BACKFILL: Grout/Cuttings

DEPTH (FEET)	SOIL AND ROCK DESCRIPTION	USCS CLASS	Sample Recovery	PID (ppm)	Sample Type	SAMPLE NUMBER	REMARKS: (Odor, Color, Moisture, Penetrometer, etc.)
0	Concrete						
1	Subbase						No Odor and Discoloration Throughout
2	Black Silty Clay	CL		0.0			
3	Brown Silty Clay	CL	80%	0.0			
4							
5				0.0			
6				0.0	Grab	SB-16	BETX, MTBE & PNA's
7							
8	Brown Silty Clay w/ Fine Grained Sand	CL	90%	0.0			
9				0.0			Wet
10							
11	End of boring 10'						
12							
13							
14							
15							

Stratification lines are approximate, in-situ transition between soil types may be gradual.

NOTES: Sampled @ 6' per IEPA approved plan

Manway / Surface Elevation:

Groundwater Depth While Drilling: ~9'
Groundwater Depth After Drilling:

Auger Depth: 10'
Rotary Depth:
Driller: CW³M
Geologist: MJS/KTR

Illinois Environmental Protection Agency

CW³M COMPANY, INC.
DRILLING BOREHOLE LOG

LUST INCIDENT #: 03-0135
SITE NAME: Marine Bank Trust #530051
SITE ADDRESS: 9520 State Route 29
Cantrall, Illinois
DATE/TIME STARTED: 8/12/2021 15:00
DATE/TIME FINISHED: 8/12/2021 15:10

BOREHOLE NUMBER: SB-17
BORING LOCATION: 51'N & 48'W of SW Tree
RIG TYPE: Truck Mounted Drill Rig
DRILLING/SAMPLE METHOD: Push
BACKFILL: Grout/Cuttings

DEPTH (FEET)	SOIL AND ROCK DESCRIPTION	USCS CLASS	Sample Recovery	PID (ppm)	Sample Type	SAMPLE NUMBER	REMARKS: (Odor, Color, Moisture, Penetrometer, etc.)
0	Asphalt						
1	Subbase						Strong Odor and Discoloration Throughout
2	Black/Green Silty Clay	CL		502.0			
3		CL	100%	655.0			
4							
5				612.0			
6				899.0	Grab	SB-17	BETX, MTBE & PNA's
7							
8		CL	95%	409.0			
9				801.0			Wet
10							
11	End of boring 10'						
12							
13							
14							
15							

Stratification lines are approximate, in-situ transition between soil types may be gradual.

NOTES: Sampled @ 6' per IEPA approved plan

Manway / Surface Elevation:

Groundwater Depth While Drilling: ~9'
Groundwater Depth After Drilling:

Auger Depth: 10'
Rotary Depth:

Driller: CW³M
Geologist: MJS/KTR

Illinois Environmental Protection Agency

CW³M COMPANY, INC.
DRILLING BOREHOLE LOG

LUST INCIDENT #: 03-0135
SITE NAME: Marine Bank Trust #530051
SITE ADDRESS: 9520 State Route 29
Cantrall, Illinois
DATE/TIME STARTED: 8/12/2021 8:45
DATE/TIME FINISHED: 8/12/2021 9:30

BOREHOLE NUMBER: MW-1A
BORING LOCATION: 39'N & 43'E of SW Tree
RIG TYPE: Truck Mounted Drill Rig
DRILLING/SAMPLE METHOD: Hollow Stem Auger
BACKFILL: N/A Set Well

DEPTH (FEET)	SOIL AND ROCK DESCRIPTION	USCS CLASS	Sample Recovery	PID (ppm)	Sample Type	SAMPLE NUMBER	REMARKS: (Odor, Color, Moisture, Penetrometer, etc.)
0	Asphalt						
1	Subbase						
2	Black Silty Clay	CL					
3							
4	Brown Silty Clay	CL					
5							
6							
7							
8							
9	Brown Silty Clay w/ Fine Grained Sand	CL					Wet
10							
11							
12							
13							
14							
15	End of Boring - 15'						

Stratification lines are approximate, in-situ transition between soil types may be gradual.

NOTES: No Soil Samples Taken - Well Set Only

Manway / Surface Elevation:

Groundwater Depth While Drilling: ~8'
Groundwater Depth After Drilling:

Auger Depth: 15'
Rotary Depth:

Driller: CW³M
Geologist: MJS/KTR

Illinois Environmental Protection Agency

CW³M COMPANY, INC.
DRILLING BOREHOLE LOG

Page 1 of 1

LUST INCIDENT #: 03-0135	**BOREHOLE NUMBER:** MW-2A
SITE NAME: Marine Bank Trust #530051	**BORING LOCATION:** 5'S & 6'W of SW Tree
SITE ADDRESS: 9520 State Route 29 Cantrall, Illinois	**RIG TYPE:** Truck Mounted Drill Rig
DATE/TIME STARTED: 8/12/2021 9:40	**DRILLING/SAMPLE METHOD:** Hollow Stem Auger
DATE/TIME FINISHED: 8/12/2021 10:25	**BACKFILL:** N/A Set Well

DEPTH (FEET)	SOIL AND ROCK DESCRIPTION	USCS CLASS	Sample Recovery	PID (ppm)	Sample Type	SAMPLE NUMBER	REMARKS: (Odor, Color, Moisture, Penetrometer, etc.)
0	Asphalt						
1	Subbase						
2	Black Silty Clay	CL					
3							
4	Brown Silty Clay	CL					
5							
6							
7							
8	Brown Silty Clay w/ Fine Grained Sand	Cl					Wet
9							
10							
11							
12							
13							
14							
15	End of Boring - 15'						

Stratification lines are approximate, in-situ transition between soil types may be gradual.

NOTES: No Soil Samples Taken - Well Set Only

Manway / Surface Elevation:

▼ **Groundwater Depth While Drilling:**	~8'	**Auger Depth:**	15'	**Driller:**	CW³M
▽ **Groundwater Depth After Drilling:**		**Rotary Depth:**		**Geologist:**	MJS/KTR

Illinois Environmental Protection Agency

CW³M COMPANY, INC.
DRILLING BOREHOLE LOG

Page 1 of 1

LUST INCIDENT #: 03-0135	**BOREHOLE NUMBER:** MW-3A
SITE NAME: Marine Bank Trust #530051	**BORING LOCATION:** 47'N & 42'W of SW Tree
SITE ADDRESS: 9520 State Route 29 Cantrall, Illinois	**RIG TYPE:** Truck Mounted Drill Rig
DATE/TIME STARTED: 8/12/2021 10:25	**DRILLING/SAMPLE METHOD:** Hollow Stem Auger
DATE/TIME FINISHED: 8/12/2021 11:10	**BACKFILL:** N/A Set Well

DEPTH (FEET)	SOIL AND ROCK DESCRIPTION	USCS CLASS	Sample Recovery	PID (ppm)	Sample Type	SAMPLE NUMBER	REMARKS: (Odor, Color, Moisture, Penetrometer, etc.)
0	Grass						
1	Topsoil	OM					
2	Black Silty Clay	CL					
3							
4	Black/Green Silty Clay	CL					
5							
6							
7							
8							
9							Wet
10							
11							
12							
13							
14							
15	End of Boring - 15'						

Stratification lines are approximate, in-situ transition between soil types may be gradual.

NOTES: No Soil Samples Taken - Well Set Only

Manway / Surface Elevation:

▼	**Groundwater Depth While Drilling:** ~8'	**Auger Depth:** 15'	**Driller:**	CW³M
▽	**Groundwater Depth After Drilling:**	**Rotary Depth:**	**Geologist:**	MJS/KTR

Illinois Environmental Protection Agency

CW³M COMPANY, INC.
DRILLING BOREHOLE LOG

Page 1 of 1

LUST INCIDENT #: 03-0135	**BOREHOLE NUMBER:** MW-4A
SITE NAME: Marine Bank Trust #530051	**BORING LOCATION:** 123'N & 21'W of SW Tree
SITE ADDRESS: 9520 State Route 29 Cantrall, Illinois	**RIG TYPE:** Truck Mounted Drill Rig
DATE/TIME STARTED: 8/12/2021 11:40	**DRILLING/SAMPLE METHOD:** Hollow Stem Auger
DATE/TIME FINISHED: 8/12/2021 12:25	**BACKFILL:** N/A Set Well

DEPTH (FEET)	SOIL AND ROCK DESCRIPTION	USCS CLASS	Sample Recovery	PID (ppm)	Sample Type	SAMPLE NUMBER	REMARKS: (Odor, Color, Moisture, Penetrometer, etc.)
0	Concrete						
1	Subbase						
2	Black Silty Clay	CL					
3							
4	Brown Silty Clay	CL					
5							
6							
7							
8	Brown Silty Clay w/ Fine Grained Sand	CL					
9							Wet
10							
11							
12							
13							
14							
15	End of Boring - 15'						

Stratification lines are approximate, in-situ transition between soil types may be gradual.

NOTES: No Soil Samples Taken - Well Set Only

Manway / Surface Elevation:

▼	**Groundwater Depth While Drilling:** ~8'	**Auger Depth:** 15'	**Driller:**	CW³M
▽	**Groundwater Depth After Drilling:**	**Rotary Depth:**	**Geologist:**	MJS/KTR

Illinois Environmental Protection Agency

CW³M COMPANY, INC.
DRILLING BOREHOLE LOG

Page 1 of 1

LUST INCIDENT #: 03-0135	**BOREHOLE NUMBER:** MW-5A
SITE NAME: Marine Bank Trust #530051	**BORING LOCATION:** 38'N & 11'W of SW Tree
SITE ADDRESS: 9520 State Route 29 Cantrall, Illinois	**RIG TYPE:** Truck Mounted Drill Rig
DATE/TIME STARTED: 8/12/2021 12:25	**DRILLING/SAMPLE METHOD:** Hollow Stem Auger
DATE/TIME FINISHED: 8/12/2021 13:10	**BACKFILL:** N/A Set Well

DEPTH (FEET)	SOIL AND ROCK DESCRIPTION	USCS CLASS	Sample Recovery	PID (ppm)	Sample Type	SAMPLE NUMBER	REMARKS: (Odor, Color, Moisture, Penetrometer, etc.)
0	Grass						
1	Topsoil	OM					
2	Black Silty Clay	CL					
3							
4	Brown Silty Clay	CL					
5							
6							
7							
8	Brown Silty Clay w/ Fine Grained Sand	CL					Wet
9							
10							
11							
12							
13							
14							
15	End of Boring - 15'						

Stratification lines are approximate, in-situ transition between soil types may be gradual.

NOTES: No Soil Samples Taken - Well Set Only

Manway / Surface Elevation:

▼	**Groundwater Depth While Drilling:** ~8'	**Auger Depth:** 15'	**Driller:**	CW³M
▽	**Groundwater Depth After Drilling:**	**Rotary Depth:**	**Geologist:**	MJS/KTR

Illinois Environmental Protection Agency

CW³M COMPANY, INC.
DRILLING BOREHOLE LOG

Page 1 of 1

LUST INCIDENT #: 03-0135	**BOREHOLE NUMBER:** MW-9A
SITE NAME: Marine Bank Trust #530051	**BORING LOCATION:** 131'N & 18'E of SW Tree
SITE ADDRESS: 9520 State Route 29 Cantrall, Illinois	**RIG TYPE:** Truck Mounted Drill Rig
DATE/TIME STARTED: 8/12/2021 13:10	**DRILLING/SAMPLE METHOD:** Hollow Stem Auger
DATE/TIME FINISHED: 8/12/2021 13:55	**BACKFILL:** N/A Set Well

DEPTH (FEET)	SOIL AND ROCK DESCRIPTION	USCS CLASS	Sample Recovery	PID (ppm)	Sample Type	SAMPLE NUMBER	REMARKS: (Odor, Color, Moisture, Penetrometer, etc.)
0	Grass						
1	Topsoil	OM					
2	Black Silty Clay	CL					
3							
4	Brown Silty Clay	CL					
5							
6							
7							
8	Brown Silty Clay w/ Fine Grained Sand	CL					
9							Wet
10							
11							
12							
13							
14							
15	End of Boring - 15'						

Stratification lines are approximate, in-situ transition between soil types may be gradual.

NOTES: No Soil Samples Taken - Well Set Only

Manway / Surface Elevation:

▼ **Groundwater Depth While Drilling:**	~8'	**Auger Depth:**	15'	**Driller:**	CW³M
▽ **Groundwater Depth After Drilling:**		**Rotary Depth:**		**Geologist:**	MJS/KTR

Illinois Environmental Protection Agency — **LUST Well Completion Report**

Incident No.	03-0135	**Well No.**	MW-1A
Site Name	Marine Bank Trust #530051	**Date Drilled**	8/12/2021
Drilling Contractor	AEDC	**Date Completed**	8/12/2021
Driller	AEDC	**Geologist**	MJS/KTR
Drilling Method	Hollow Stem Auger	**Drilling Fluids**	N/A

Annular Space Details

Type of Surface Seal	Concrete
Type of Annular Sealant	Bentonite
Type of Bentonite	High-Yield
Type of Sand Pack	Coarse 20-20

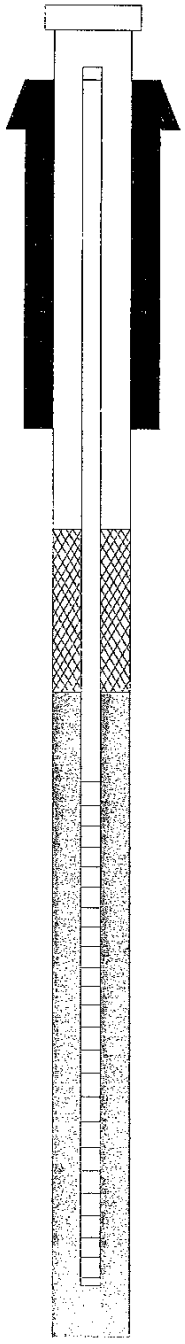
Well Construction Materials

	Stainless Steel Type	PVC Specify Type	Other Specify Type
Riser Coupling Joint			
Riser Pipe Above w.t.		Sched.-40	
Riser Pipe Below w.t.			
Screen		Sched.-40	
Coupling Joint Screen to Riser		Sched.-40	
Protective Casing			Steel

Measurements

Riser Pipe Length	4.25 ft.
Screen Length	10.0 ft.
Screen Slot Size	10-slot
Protective Casing Length	N/A
Depth to Water	~8' ft. while drilling
Depth to Water	88.44 ft. static
Free Product Thickness	N/A
Gallons removed (develop)	Approximately 1 gallon
Gallons removed (purge)	Approximately 1 gallon
Other	

Completed by: JKK



		Top of Protective
99.54	ft.	Casing
99.29	ft.	Top of riser pipe
99.54	ft.	Ground surface
		Top of Annular
99.04	ft.	Sealant
N/A		Casing Stickup
99.04	ft.	Top of Seal
3.00	ft.	Total Seal interval
96.04	ft.	Top of Sand
95.04	ft.	Top of Screen
		Total Screen
10.0	ft.	Interval
		Bottom of
85.04	ft.	Screen
		Bottom of
84.54	ft.	Borehole

Illinois Environmental Protection Agency — **LUST Well Completion Report**

Incident No.	03-0135	**Well No.**	MW-2A
Site Name	Marine Bank Trust #530051	**Date Drilled**	8/12/2021
Drilling Contractor	AEDC	**Date Completed**	8/12/2021
Driller	AEDC	**Geologist**	MJS/KTR
Drilling Method	Hollow Stem Auger	**Drilling Fluids**	N/A

Annular Space Details

Type of Surface Seal	Concrete
Type of Annular Sealant	Bentonite
Type of Bentonite	High-Yield
Type of Sand Pack	Coarse 20-20

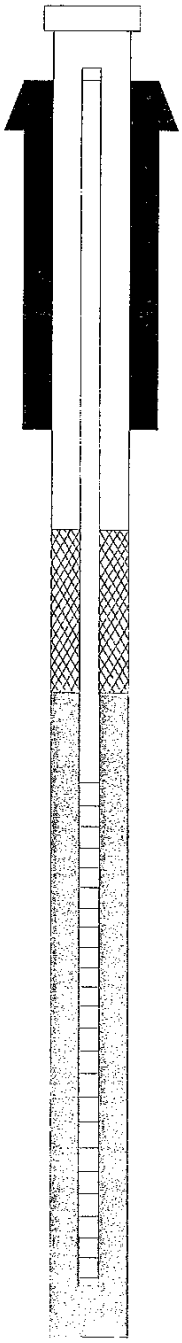
Well Construction Materials

	Stainless Steel Type	PVC Specify Type	Other Specify Type
Riser Coupling Joint			
Riser Pipe Above w.t.		Sched.-40	
Riser Pipe Below w.t.			
Screen		Sched.-40	
Coupling Joint Screen to Riser		Sched.-40	
Protective Casing			Steel

Measurements

Riser Pipe Length	4.25 ft.
Screen Length	10.0 ft.
Screen Slot Size	10-slot
Protective Casing Length	N/A
Depth to Water	~8' ft. while drilling
Depth to Water	94.00 ft. static
Free Product Thickness	N/A
Gallons removed (develop)	Approximately 1 gallon
Gallons removed (purge)	Approximately 1 gallon
Other	

Completed by: JKK



99.16	ft.	Top of Protective Casing
98.91	ft.	Top of riser pipe
99.16	ft.	Ground surface
98.66	ft.	Top of Annular Sealant
N/A		Casing Stickup
98.66	ft.	Top of Seal
3.00	ft.	Total Seal interval
95.66	ft.	Top of Sand
94.66	ft.	Top of Screen
10.0	ft.	Total Screen Interval
84.66	ft.	Bottom of Screen
84.16	ft.	Bottom of Borehole

Illinois Environmental Protection Agency — **LUST Well Completion Report**

Incident No.	03-0135	**Well No.**	MW-3A
Site Name	Marine Bank Trust #530051	**Date Drilled**	8/12/2021
Drilling Contractor	AEDC	**Date Completed**	8/12/2021
Driller	AEDC	**Geologist**	MJS/KTR
Drilling Method	Hollow Stem Auger	**Drilling Fluids**	N/A

Annular Space Details

Type of Surface Seal	Concrete
Type of Annular Sealant	Bentonite
Type of Bentonite	High-Yield
Type of Sand Pack	Coarse 20-20

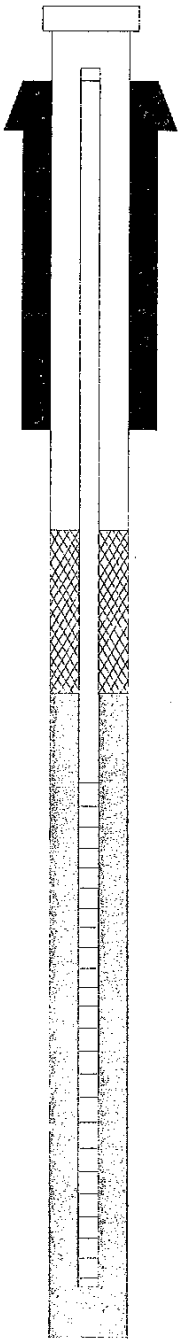
Well Construction Materials

	Stainless Steel Type	PVC Specify Type	Other Specify Type
Riser Coupling Joint			
Riser Pipe Above w.t.		Sched.-40	
Riser Pipe Below w.t.			
Screen		Sched.-40	
Coupling Joint Screen to Riser		Sched.-40	
Protective Casing			Steel

Measurements

Riser Pipe Length	4.25 ft.
Screen Length	10.0 ft.
Screen Slot Size	10-slot
Protective Casing Length	N/A
Depth to Water	~8' ft. while drilling
Depth to Water	95.36 ft. static
Free Product Thickness	N/A
Gallons removed (develop)	Approximately 1 gallon
Gallons removed (purge)	Approximately 1 gallon
Other	

Completed by: JKK



100.00 ft.	Top of Protective Casing
99.75 ft.	Top of riser pipe
100.00 ft.	Ground surface
99.50 ft.	Top of Annular Sealant
N/A	Casing Stickup
99.50 ft.	Top of Seal
3.00 ft.	Total Seal interval
96.50 ft.	Top of Sand
95.50 ft.	Top of Screen
10.0 ft.	Total Screen Interval
85.50 ft.	Bottom of Screen
85.00 ft.	Bottom of Borehole

Illinois Environmental Protection Agency — **LUST Well Completion Report**

Incident No.	03-0135	**Well No.**	MW-4A
Site Name	Marine Bank Trust #530051	**Date Drilled**	8/12/2021
Drilling Contractor	AEDC	**Date Completed**	8/12/2021
Driller	AEDC	**Geologist**	MJS/KTR
Drilling Method	Hollow Stem Auger	**Drilling Fluids**	N/A

Annular Space Details

Type of Surface Seal	Concrete
Type of Annular Sealant	Bentonite
Type of Bentonite	High-Yield
Type of Sand Pack	Coarse 20-20

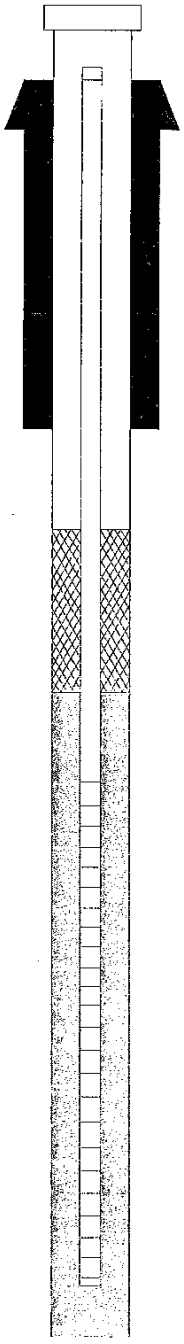
Well Construction Materials

	Stainless Steel Type	PVC Specify Type	Other Specify Type
Riser Coupling Joint			
Riser Pipe Above w.t.		Sched.-40	
Riser Pipe Below w.t.			
Screen		Sched.-40	
Coupling Joint Screen to Riser		Sched.-40	
Protective Casing			Steel

Measurements

Riser Pipe Length	4.25 ft.
Screen Length	10.0 ft.
Screen Slot Size	10-slot
Protective Casing Length	N/A
Depth to Water	~8' ft. while drilling
Depth to Water	94.24 ft. static
Free Product Thickness	N/A
Gallons removed (develop)	Approximately 1 gallon
Gallons removed (purge)	Approximately 1 gallon
Other	

Completed by: JKK



	Top of Protective
100.62 ft.	Casing
100.37 ft.	Top of riser pipe
100.62 ft.	Ground surface
	Top of Annular
100.12 ft.	Sealant
N/A	Casing Stickup
100.12 ft.	Top of Seal
3.00 ft.	Total Seal interval
97.12 ft.	Top of Sand
96.12 ft.	Top of Screen
	Total Screen
10.0 ft.	Interval
	Bottom of
86.12 ft.	Screen
	Bottom of
85.62 ft.	Borehole

Illinois Environmental Protection Agency — **LUST Well Completion Report**

Incident No.	03-0135	**Well No.**	MW-5A
Site Name	Marine Bank Trust #530051	**Date Drilled**	8/12/2021
Drilling Contractor	AEDC	**Date Completed**	8/12/2021
Driller	AEDC	**Geologist**	MJS/KTR
Drilling Method	Hollow Stem Auger	**Drilling Fluids**	N/A

Annular Space Details

Type of Surface Seal	Concrete
Type of Annular Sealant	Bentonite
Type of Bentonite	High-Yield
Type of Sand Pack	Coarse 20-20

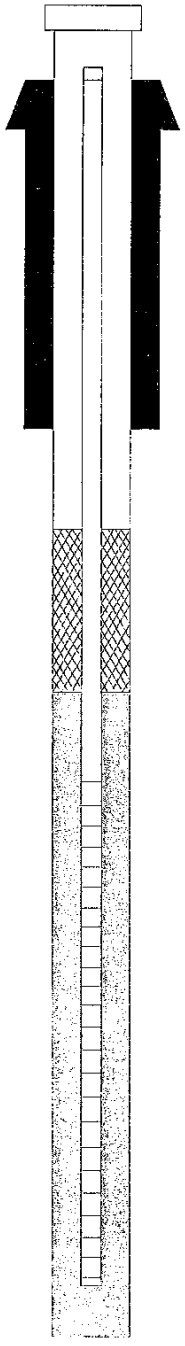
Well Construction Materials

	Stainless Steel Type	PVC Specify Type	Other Specify Type
Riser Coupling Joint			
Riser Pipe Above w.t.		Sched.-40	
Riser Pipe Below w.t.			
Screen		Sched.-40	
Coupling Joint Screen to Riser		Sched.-40	
Protective Casing			Steel

Measurements

Riser Pipe Length	4.25 ft.
Screen Length	10.0 ft.
Screen Slot Size	10-slot
Protective Casing Length	N/A
Depth to Water	~8' ft. while drilling
Depth to Water	94.48 ft. static
Free Product Thickness	N/A
Gallons removed (develop)	Approximately 1 gallon
Gallons removed (purge)	Approximately 1 gallon
Other	

Completed by: JKK



99.75	ft.	Top of Protective Casing
99.50	ft.	Top of riser pipe
99.75	ft.	Ground surface
99.25	ft.	Top of Annular Sealant
N/A		Casing Stickup
99.25	ft.	Top of Seal
3.00	ft.	Total Seal interval
96.25	ft.	Top of Sand
95.25	ft.	Top of Screen
10.0	ft.	Total Screen Interval
85.25	ft.	Bottom of Screen
84.75	ft.	Bottom of Borehole

Illinois Environmental Protection Agency — **LUST Well Completion Report**

Incident No.	03-0135	**Well No.**	MW-9A
Site Name	Marine Bank Trust #530051	**Date Drilled**	8/12/2021
Drilling Contractor	AEDC	**Date Completed**	8/12/2021
Driller	AEDC	**Geologist**	MJS/KTR
Drilling Method	Hollow Stem Auger	**Drilling Fluids**	N/A

Annular Space Details

Type of Surface Seal	Concrete
Type of Annular Sealant	Bentonite
Type of Bentonite	High-Yield
Type of Sand Pack	Coarse 20-20

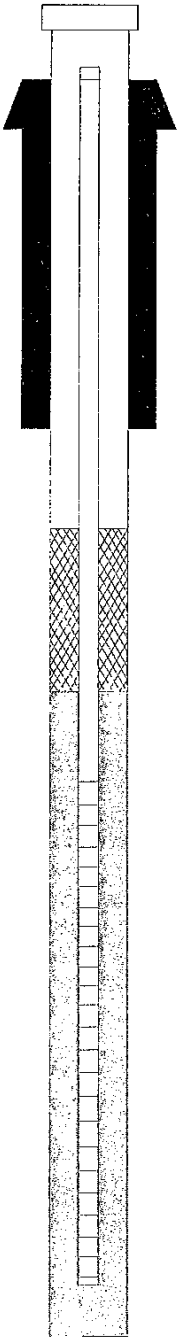
Well Construction Materials

	Stainless Steel Type	PVC Specify Type	Other Specify Type
Riser Coupling Joint			
Riser Pipe Above w.t.		Sched.-40	
Riser Pipe Below w.t.			
Screen		Sched.-40	
Coupling Joint Screen to Riser		Sched.-40	
Protective Casing			Steel

Measurements

Riser Pipe Length	4.25 ft.
Screen Length	10.0 ft.
Screen Slot Size	10-slot
Protective Casing Length	N/A
Depth to Water	~8' ft. while drilling
Depth to Water	90.84 ft. static
Free Product Thickness	N/A
Gallons removed (develop)	Approximately 1 gallon
Gallons removed (purge)	Approximately 1 gallon
Other	

Completed by: JKK



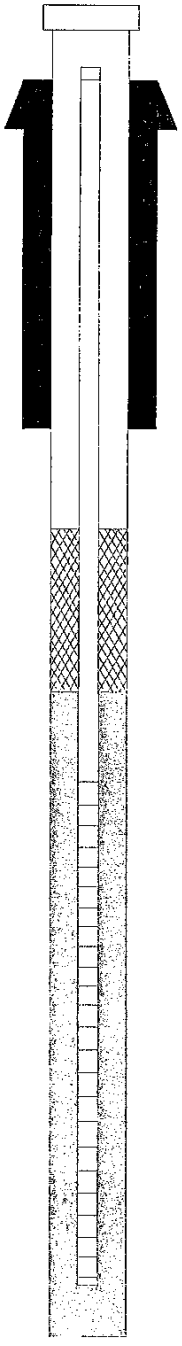
100.80 ft.	Top of Protective Casing
100.55 ft.	Top of riser pipe
100.80 ft.	Ground surface
100.30 ft.	Top of Annular Sealant
N/A	Casing Stickup
100.30 ft.	Top of Seal
3.00 ft.	Total Seal interval
97.30 ft.	Top of Sand
96.30 ft.	Top of Screen
10.0 ft.	Total Screen Interval
86.30 ft.	Bottom of Screen
85.80 ft.	Bottom of Borehole

Illinois Environmental Protection Agency — **LUST Well Completion Report**

Incident No.	03-0135	**Well No.**	MW-14
Site Name	Marine Bank Trust #530051	**Date Drilled**	8/12/2021
Drilling Contractor	AEDC	**Date Completed**	8/12/2021
Driller	AEDC	**Geologist**	MJS/KTR
Drilling Method	Hollow Stem Auger	**Drilling Fluids**	N/A

Annular Space Details

Type of Surface Seal	Concrete
Type of Annular Sealant	Bentonite
Type of Bentonite	High-Yield
Type of Sand Pack	Coarse 20-20



98.47	ft.	Top of Protective Casing
98.22	ft.	Top of riser pipe
98.47	ft.	Ground surface
97.97	ft.	Top of Annular Sealant
N/A		Casing Stickup
97.97	ft.	Top of Seal
3.00	ft.	Total Seal interval
94.97	ft.	Top of Sand
93.97	ft.	Top of Screen
10.0	ft.	Total Screen Interval
83.97	ft.	Bottom of Screen
83.47	ft.	Bottom of Borehole

Well Construction Materials

	Stainless Steel Type	PVC Specify Type	Other Specify Type
Riser Coupling Joint			
Riser Pipe Above w.t.		Sched.-40	
Riser Pipe Below w.t.			
Screen		Sched.-40	
Coupling Joint Screen to Riser		Sched.-40	
Protective Casing			Steel

Measurements

Riser Pipe Length	4.25 ft.
Screen Length	10.0 ft.
Screen Slot Size	10-slot
Protective Casing Length	N/A
Depth to Water	~8' ft. while drilling
Depth to Water	91.41 ft. static
Free Product Thickness	N/A
Gallons removed (develop)	Approximately 1 gallon
Gallons removed (purge)	Approximately 1 gallon
Other	

Completed by: JKK

APPENDIX G

ANALYTICAL RESULTS

CORRECTIVE ACTION PLAN AND BUDGET AMENDMENT

MARINE BANK TRUST # 53-0051
CANTRALL, ILLINOIS

Marine Bank- Cantrall
Site Assessment Data

EA Lust App. B

	Location		N-1	
	Date		5/15/2003	
Parameter	Tier I CUO	PH Specific CUO		
Arsenic	5.2	30	13.2	
Barium	122.0	1800.0	76.1	
Cadmium	0.5	59.0	0.826	
Chromium	13.0	32.0	13.1	
Lead	20.9	20.9*	13.9	
Mercury	0.05	6.4	<0.111	
Selenium	0.37	3.3	<0.555	
PH Specific values from 742 Appendix A, Table G				
* - Value from 742 Appendix B, Table C				
BOLD & SHADING = Exceeds the TACO Tier 1 Most Stringent Soil Clean-up Objective.				
Results are in mg/Kg				

Marine Bank- Cantrall
Site Assessment Data

EA Soil

	Location	E	S-1	S-2	W	N-1	N-2
	Depth	6'	6'	6'	6'	6'	6'
	Date	5/15/2003	5/15/2003	5/15/2003	5/15/2003	5/15/2003	5/15/2003
Parameter	Tier I CUO	*	*	*	*	*	*
Benzene	0.03	**0.035**	**0.711**	**0.17**	**3.4**	**0.983**	**0.971**
Ethylbenzene	13.0	0.139	11.1	**14.**	**47.8**	**112.**	**75.4**
Toluene	12.0	0.009	0.023	0.02	**89.7**	**30.3**	**43.6**
Total Xylenes	5.6	0.23	**25.4**	**32.6**	**186.**	**418.**	**291.**
MTBE	0.32	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthene	570.0	<1.200	<1.200	<1.200	<1.200	<1.200	<1.200
Acenaphtylene	15.0	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660
Anthracene	12,000.0	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660
Benzo(a)anthracene	0.9	<0.0087	<0.0087	<0.0087	<0.0087	<0.0087	<0.0087
Benzo(a)pyrene	0.09	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Benzo(b)fluoranthene	0.9	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(g,h,i)perylene	2,300.0	<0.051	<0.051	<0.051	<0.051	<0.051	<0.051
Benzo(k)fluoranthene	9.0	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Chrysene	88.0	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Dibenz(a,h)anthracene	0.09	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Fluoranthene	4,300.0	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660
Fluorene	560.0	<0.140	<0.140	<0.140	<0.140	<0.140	<0.140
Indeno(1,2,3-cd)pyrene	0.9	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029
Naphthalene	1.8	<0.660	1.57	0.666	<0.660	<0.660	**6.59**
Phenanthrene	140.0	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660
Pyrene	2,300.0	<0.180	<0.180	<0.180	<0.180	<0.180	<0.180
Numbers not bold indicate actual quantities, but are below the TACO Tier 1 Most Stringent Soil Clean-up Objective.							
BOLD & SHADING – Exceeds the TACO Tier 1 Most Stringent Soil Clean-up Objective.							
Results are in mg/Kg							
*Resampled							

Marine Bank-Cantrall
Site Assessment Data

Soil 1-15-04

	Location	MW-1	MW-2	MW-3	MW-4		
	Date	1/15/2004	1/15/2004	1/15/2004	1/15/2004		
	Depth	9'	9'	6'	9'		
Parameter	Tier I CUO			*			
Benzene	**0.03**	0.005	0.016	**11.2**	0.00492		
Ethylbenzene	**13.0**	0.013	0.037	3.19	0.00391		
Toluene	**12.0**	0.012	0.009	0.419	0.0103		
Total Xylenes	**5.6**	0.043	0.02	**9.49**	0.0093		
MTBE	**0.32**	<0.005	<0.005	<0.005	<0.005		
Acenaphthene	**570.0**	<1.200	<1.200	<1.200	<1.060		
Acenaphtylene	**15.0**	<0.660	<0.660	<0.660	<0.582		
Anthracene	**12,000.0**	<0.660	<0.660	<0.660	<0.582		
Benzo(a)anthracene	**0.9**	0.063	<0.0087	<0.0087	<0.00767		
Benzo(a)pyrene	**0.09**	<0.015	<0.015	<0.015	<0.0132		
Benzo(b)fluoranthene	**0.9**	<0.011	<0.011	<0.011	<0.00970		
Benzo(g,h,i)perylene	**2,300.0**	<0.051	<0.051	<0.051	<0.0450		
Benzo(k)fluoranthene	**9.0**	<0.011	<0.011	<0.011	<0.00970		
Chrysene	**88.0**	<0.100	<0.100	<0.100	<0.0882		
Dibenz(a,h)anthracene	**0.09**	<0.020	<0.020	<0.020	<0.0176		
Fluoranthene	**4,300.0**	<0.660	<0.660	<0.660	<0.582		
Fluorene	**560.0**	<0.140	<0.140	1.25	<0.123		
Indeno(1,2,3-cd)pyrene	**0.9**	<0.029	<0.029	<0.029	<0.0256		
Naphthalene	**1.8**	<0.660	<0.660	**3.08**	<0.582		
Phenanthrene	**140.0**	<0.660	<0.660	2.03	<0.582		
Pyrene	**2,300.0**	<0.180	<0.180	0.452	<0.159		
Numbers not bold indicate actual quantities, but are below the TACO Tier 1 Most Stringent Soil Clean-up Objective.							
BOLD & SHADING -- Exceeds the TACO Tier 1 Most Stringent Soil Clean-up Objective.							
Results are in mg/Kg							
*Resampled							

Marine Bank-Cantrall
Site Assessment Data

Soil August 2004

	Location	MW-6	MW-7	MW-9	SB-1	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17
	Depth	6'	6'	9'	9'	6'	6'	6'	6'	9'	6'
Date		8/5/2004	8/5/2004	8/5/2004	8/5/2004	8/6/2004	8/30/2004	8/30/2004	8/30/2004	8/30/2004	8/30/2004
Parameter	Tier I CUO										
Benzene	**0.03**	0.002	0.0092	0.00426	0.002	<0.002	0.004	<0.002	0.003	0.006	0.003
Ethylbenzene	**13.0**	0.011	0.0057	0.00307	0.002	0.003	0.003	<0.002	0.003	0.013	0.003
Toluene	**12.0**	0.00218	0.0307	0.00814	0.004	<0.002	0.007	0.004	0.006	0.033	0.006
Total Xylenes	**5.6**	<0.00338	0.0221	0.00670	<0.005	0.01	0.007	<0.005	0.006	0.059	0.006
MTBE	**0.32**	<0.00338	<0.00351	<0.00384	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthene	**570.0**	<1.200	<1.200	<1.200	<1.200	<1.200	<1.200	<1.200	<1.200	<1.200	<1.200
Acenaphtylene	**15.0**	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660
Anthracene	**12,000.0**	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660
Benzo(a)anthracene	**0.9**	<0.0087	<0.0087	<0.0087	<0.0087	<0.0087	<0.0087	<0.0087	<0.0087	<0.0087	<0.0087
Benzo(a)pyrene	**0.09**	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Benzo(b)fluoranthene	**0.9**	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(g,h,i)perylene	**2,300.0**	<0.051	<0.051	<0.051	<0.051	<0.051	<0.051	<0.051	<0.051	<0.051	<0.051
Benzo(k)fluoranthene	**9.0**	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Chrysene	**88.0**	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Dibenz(a,h)anthracene	**0.09**	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Fluoranthene	**4,300.0**	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660
Fluorene	**560.0**	<0.140	<0.140	<0.140	<0.140	<0.140	<0.140	<0.140	<0.140	<0.140	<0.140
Indeno(1,2,3-cd)pyrene	**0.9**	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029
Naphthalene	**1.8**	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660
Phenanthrene	**140.0**	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660
Pyrene	**2,300.0**	<0.180	<0.180	<0.180	<0.180	<0.180	<0.180	<0.180	<0.180	<0.180	<0.180
Numbers not bold indicate actual quantities, but are below the TACO Tier 1 Most Stringent Soil Clean-up Objective.											
BOLD & SHADING -- Exceeds the TACO Tier 1 Most Stringent Soil Clean-up Objective.											
Results are in mg/Kg											

Marine Bank-Cantrall
Site Assessment Data

Groundwater

	Location	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-12	MW-13
	Date	2/27/04	2/27/04	2/27/04	2/27/04	2/27/04	8/11/04	8/11/04	8/11/04	8/11/04	8/11/04	8/11/04	9/30/04	9/1/04
Parameter	Class I CUO	*	*	*	*	*				*				
Benzene	**0.005**	**0.067**	**0.069**	**3.51**	**0.008**	**1.66**	<0.002	<0.002	<0.002	**0.014**	<0.002	<0.002	<0.002	0.002
Ethylbenzene	**0.7**	0.139	0.008	**2.82**	**1.86**	**8.92**	<0.002	<0.002	<0.002	0.147	<0.002	<0.002	<0.002	<0.002
Toluene	**1.0**	0.014	<0.002	0.052	0.015	**1.2**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Xylenes	**10.0**	0.539	0.01	4.19	3.01	**25.**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MTBE	**0.07**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthene	**0.42**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Acenaphtylene	**0.210**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Anthracene	**2.1**	<0.0066	<0.0066	<0.0066	<0.0066	<0.0066	<0.0066	<0.0066	<0.0066	<0.0066	<0.0066	<0.0066	<0.0066	<0.0066
Benzo(a)anthracene	**0.00013**	<0.00013	<0.00013	**0.0014**	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013
Benzo(a)pyrene	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Benzo(b)fluoranthene	**0.00018**	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018
Benzo(g,h,i)perylene	**0.21**	<0.00076	<0.00076	<0.00076	<0.00076	<0.00076	<0.00076	<0.00076	<0.00076	<0.00076	<0.00076	<0.00076	<0.00076	<0.00076
Benzo(k)fluoranthene	**0.00017**	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017
Chrysene	**0.0015**	<0.0015	<0.0015	0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015
Dibenz(a,h)anthracene	**0.0003**	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Fluoranthene	**0.28**	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	0.0003
Fluorene	**0.28**	<0.0021	<0.0021	0.0473	0.013	0.019	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021
Indeno(1,2,3-cd)pyrene	**0.00043**	<0.00043	<0.00043	<0.00043	<0.00043	<0.00043	<0.00043	<0.00043	<0.00043	<0.00043	<0.00043	<0.00043	<0.00043	<0.00043
Naphthalene	**0.14**	0.026	<0.010	**0.451**	0.14	**0.782**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Phenanthrene	**0.21**	<0.0064	<0.0064	0.0567	0.019	0.022	<0.0064	<0.0064	<0.0064	<0.0064	<0.0064	<0.0064	<0.0064	<0.0064
Pyrene	**0.21**	<0.0027	<0.0027	0.0157	0.005	0.005	<0.0027	<0.0027	<0.0027	<0.0027	<0.0027	<0.0027	<0.0027	<0.0027

Numbers not bold indicate actual quantities, but are below the TACO Tier 1 Most Stringent Soil Clean-up Objective.

BOLD & SHADING – Exceeds the TACO Tier 1 Most Stringent Soil Clean-up Objective.

Results are in mg/L

*Resampled

Marine Bank-Cantrall
Site Assessment Data

Groundwater

	Location	MW-14	MW-15	MW-16	MW-17	MW-18	TMW-1	MW-19	MW-20
	Date	9/1/04	9/1/04	9/1/04	9/30/04	1/24/05	1/24/05	8/9/05	8/9/05
Parameter	Class I CUO	*							
Benzene	0.005	0.822	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002
Ethylbenzene	0.7	1.08	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Toluene	1.0	0.023	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Xylenes	10.0	2.47	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MTBE	0.07	0.016	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthene	0.42	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.0164	<0.0164
Acenaphtylene	0.210	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.00909	<0.00909
Anthracene	2.1	<0.0066	<0.0066	<0.0066	<0.0066	<0.0066	<0.0066	<0.000600	<0.000600
Benzo(a)anthracene	0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.000118	<0.000118
Benzo(a)pyrene	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.000182	<0.000182
Benzo(b)fluoranthene	0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.000164	<0.000164
Benzo(g,h,i)perylene	0.21	<0.00076	0.003	<0.00076	<0.00076	<0.00076	<0.00076	<0.000691	<0.000691
Benzo(k)fluoranthene	0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.000155	<0.000155
Chrysene	0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.00136	<0.00136
Dibenz(a,h)anthracene	0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.000273	<0.000273
Fluoranthene	0.28	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.00191	<0.00191
Fluorene	0.28	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.00191	<0.00191
Indeno(1,2,3-cd)pyrene	0.00043	<0.00043	<0.00043	<0.00043	<0.00043	<0.00043	<0.00043	<0.000391	<0.000391
Naphthalene	0.14	0.16	<0.010	<0.010	<0.010	<0.010	<0.010	<0.00909	<0.00909
Phenanthrene	0.21	<0.0064	<0.0064	<0.0064	<0.0064	<0.0064	<0.0064	<0.00582	<0.00582
Pyrene	0.21	<0.0027	<0.0027	<0.0027	<0.0027	<0.0027	<0.0027	<0.00245	<0.00245
Numbers not bold indicate actual quantities, bu									
BOLD & SHADING – Exceeds the TACO Ti									
Results are in mg/L									
*Resampled									

Marine Bank- Cantrall
Site Assessment Data

Soil 3-10-06

	Location	SB-2	SB-3	SB-4	SB-5		
	Depth	9'	6'	9'	9'		
Date		3/10/2006	3/10/2006	3/10/2006	3/10/2006		
Parameter	Tier I CUO	*	*	*	*		
Benzene	0.03	0.871	9.55	0.082	0.612		
Ethylbenzene	13.0	0.055	119.	0.358	0.106		
Toluene	12.0	0.013	0.58	0.019	0.03		
Total Xylenes	150.0	0.026	105.	0.289	0.178		
MTBE	0.32	<0.005	<0.005	<0.005	<0.005		
Acenaphthene	570.0	<1.200	<1.200	<1.200	<1.200		
Acenaphtylene	15.0	<0.660	<0.660	<0.660	<0.660		
Anthracene	12,000.0	<0.660	<0.660	<0.660	<0.660		
Benzo(a)anthracene	0.9	<0.0087	<0.0087	<0.0087	<0.0087		
Benzo(a)pyrene	0.09	<0.015	<0.015	<0.015	<0.015		
Benzo(b)fluoranthene	0.9	<0.011	<0.011	<0.011	<0.011		
Benzo(g,h,i)perylene	2,300.0	<0.051	<0.051	<0.051	<0.051		
Benzo(k)fluoranthene	9.0	<0.011	<0.011	<0.011	<0.011		
Chrysene	88.0	<0.100	<0.100	<0.100	<0.100		
Dibenz(a,h)anthracene	0.09	<0.020	<0.020	<0.020	<0.020		
Fluoranthene	4,300.0	<0.660	<0.660	<0.660	<0.660		
Fluorene	560.0	<0.140	0.483	<0.140	<0.140		
Indeno(1,2,3-cd)pyrene	0.9	<0.029	<0.029	0.046	<0.029		
Naphthalene	1.8	<0.660	1.91	<0.660	<0.660		
Phenanthrene	140.0	<0.660	1.09	<0.660	<0.660		
Pyrene	2,300.0	<0.180	0.164	<0.180	<0.180		
Numbers not bold indicate actual quantities, but are below the TACO Tier 1 Most Stringent Soil Clean-up Objective.							
BOLD & SHADING -- Exceeds the TACO Tier 1 Most Stringent Soil Clean-up Objective.							
Results are in mg/Kg							
*Resampled							

Marine Bank- Cantrall
Site Assessment Data

Soil 8-12-2021
Analytical Results

	Location	SB-7	SB-8	SB-9	SB-10	SB-11	SB-12	SB-13	SB-14	SB-15	SB-16	SB-17
	Date	8/12/2021	8/12/2021	8/12/2021	8/12/2021	8/12/2021	8/12/2021	8/12/2021	8/12/2021	8/12/2021	8/12/2021	8/12/2021
	Resampled @:	MW-3	SB-5	E	N2	SB-4	S1	SB-2	S2	W	N1	SB-3
	Depth	6'	9'	6'	6'	6'	6'	9'	6'	6'	6'	6'
Parameter	Tier I CUO											
Benzene	0.03	**16.3**	<0.0452	<0.0121	<0.0133	<0.0162	<0.0134	**0.103**	**0.0942**	**0.296**	<0.0138	<0.0131
Ethylbenzene	13.0	7.41	<0.0514	<0.0484	<0.0532	<0.0649	<0.0534	0.226	<0.0572	**47.6**	<0.0551	<0.0523
Toluene	12.0	0.613	<0.0514	<0.0514	<0.0532	<0.0649	<0.0534	<0.0493	<0.0572	0.277	<0.0551	<0.0523
Total Xylenes	150.0	7.24	<0.103	<0.0967	<0.106	<0.130	<0.107	<0.109	<0.114	**163.**	<0.110	<0.105
MTBE	0.32	<0.0463	<0.0514	<0.0514	<0.0532	<0.0649	<0.0534	<0.0493	<0.0572	<0.0519	<0.0551	<0.0523
Acenaphthene	570.0	1.34	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	<0.0493	<0.0519	0.0674	<0.0503	<0.0529
Acenaphtylene	15.0	0.548	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	<0.0493	<0.0519	<0.0516	<0.0503	<0.0529
Anthracene	12,000.0	1.23	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	<0.0493	<0.0519	<0.0516	<0.0503	<0.0529
Benzo(a)anthracene	0.9	<0.0493	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	<0.0493	<0.0519	<0.0516	<0.0503	<0.0529
Benzo(a)pyrene	0.09	<0.0493	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	<0.0493	<0.0519	<0.0516	<0.0503	<0.0529
Benzo(b)fluoranthene	0.9	<0.0493	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	<0.0493	<0.0519	<0.0516	<0.0503	<0.0529
Benzo(g,h,i)perylene	2,300.0	<0.0493	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	<0.0493	<0.0519	<0.0516	<0.0503	<0.0529
Benzo(k)fluoranthene	9.0	<0.0493	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	<0.0493	<0.0519	<0.0516	<0.0503	<0.0529
Chrysene	88.0	0.153	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	<0.0493	<0.0519	<0.0516	<0.0503	<0.0529
Dibenz(a,h)anthracene	0.09	<0.0493	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	<0.0493	<0.0519	<0.0516	<0.0503	<0.0529
Fluoranthene	4,300.0	0.298	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	<0.0493	<0.0519	<0.0516	<0.0503	<0.0529
Fluorene	560.0	3.13	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	<0.0493	<0.0519	0.109	<0.0503	<0.0529
Indeno(1,2,3-cd)pyrene	0.9	<0.0493	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	<0.0493	<0.0519	<0.0516	<0.0503	<0.0529
Naphthalene	1.8	**17.**	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	0.0990	0.0937	**18.5**	<0.0503	0.0584
Phenanthrene	140.0	10.6	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	<0.0493	<0.0519	0.195	<0.0503	<0.0529
Pyrene	2,300.0	1.5	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	<0.0493	<0.0519	<0.0516	<0.0503	<0.0529

Numbers not bold indicate actual quantities, but are below the TACO Tier 1 Most Stringent Soil Clean-up Objective.

BOLD & SHADING -- Exceeds the TACO Tier 1 Most Stringent Soil Clean-up Objective.

Results are in mg/Kg

Marine Bank-Cantrall
Site Assessment Data

Groundwater 2021
Analytical Results

	Location	MW-1A	MW-2A	MW-3A	MW-4A	MW-5A	MW-9A	MW-14A
	Date	9/7/2021	9/7/2021	9/7/2021	9/7/2021	9/7/2021	9/7/2021	9/7/2021
Parameter	Class I CUO							
Benzene	**0.005**	**1.43**	**0.250**	<0.00100	<0.00100	<0.00100	0.00291	**0.264**
Ethylbenzene	**0.7**	0.2	0.0400	<0.00100	0.471	0.0122	0.0913	0.00912
Toluene	**1.0**	0.0176	0.00608	<0.00100	<0.00100	<0.00100	0.00604	0.00374
Total Xylenes	**10.0**	0.331	0.0148	<0.00200	0.0582	0.0569	0.0837	0.00592
MTBE	**0.07**	0.0136	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	0.0167
Acenaphthene	**0.42**	0.000216	0.00258	0.0194	0.00451	0.00104	0.000994	<0.000100
Acenaphtylene	**0.210**	<0.000100	0.000328	0.00720	0.00208	0.000589	0.000368	<0.000100
Anthracene	**2.1**	<0.000100	0.00294	0.0141	0.00337	0.000718	<0.000152	<0.000100
Benzo(a)anthracene	**0.00013**	<0.000100	<0.000100	**0.00116**	**0.000607**	**0.000150**	<0.000152	<0.000100
Benzo(a)pyrene	**0.0002**	<0.000100	<0.000100	**0.000319**	0.000132	<0.000100	<0.000152	<0.000100
Benzo(b)fluoranthene	**0.00018**	<0.000100	<0.000100	**0.000327**	0.000104	<0.000100	<0.000152	<0.000100
Benzo(g,h,i)perylene	**0.21**	<0.000100	<0.000100	0.000268	0.000127	<0.000100	<0.000152	<0.000100
Benzo(k)fluoranthene	**0.00017**	<0.000100	<0.000100	0.000140	<0.000100	<0.000100	<0.000152	<0.000100
Chrysene	**0.0015**	<0.000100	<0.000100	**0.00214**	0.000879	0.000156	<0.000152	<0.000100
Dibenz(a,h)anthracene	**0.0003**	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000152	<0.000100
Fluoranthene	**0.28**	<0.000100	0.000206	0.00464	0.00158	0.000337	<0.000152	<0.000100
Fluorene	**0.28**	0.000194	0.00258	0.0447	0.00915	0.00202	0.00159	<0.000100
Indeno(1,2,3-cd)pyrene	**0.00043**	<0.000100	<0.000100	0.000141	<0.000100	<0.000100	<0.000152	<0.000100
Naphthalene	**0.14**	0.00621	**0.178**	**0.514**	**0.179**	0.0382	0.0935	0.00167
Phenanthrene	**0.21**	<0.000100	0.00170	0.131	0.0314	0.00385	0.00156	<0.000100
Pyrene	**0.21**	<0.000100	0.000202	0.0178	0.00519	0.000825	0.000168	<0.000100
Numbers not bold indicate actual quantities, but are below the TACO Tier 1 Most Stringent Soil Clean-up Objective.								
BOLD & SHADING = Exceeds the TACO Tier 1 Most Stringent Soil Clean-up Objective.								
Results are in mg/L								

SUBURBAN LABORATORIES, Inc.

1950 S. Batavia Ave., Suite 150 Geneva, Illinois 60134
Tel. (708) 544-3260 • Toll Free (800) 783-LABS
Fax (708) 544-8587
www.suburbanlabs.com

August 25, 2021

Carol Rowe
CWM Company, Inc
701 West South Grand
Springfield, IL 62704

Workorder: 2108F20

TEL: (217) 522-8001
FAX: (217) 522-8009
RE: Marine Bank 2003 - D135 Cantrall

Dear Carol Rowe:

Suburban Laboratories, Inc. received 11 sample(s) on 8/13/2021 for the analyses presented in the following report.

All data for the associated quality control (QC) met EPA, method, or internal laboratory specifications except where noted in the case narrative. If you are comparing these results to external QC specifications or compliance limits and have any questions, please contact us.

This final report of laboratory analysis consists of this cover letter, case narrative, analytical report, dates report, and any accompanying documentation including, but not limited to, chain of custody records, raw data, and letters of explanation or reliance. This report may not be reproduced, except in full, without the prior written approval of Suburban Laboratories, Inc.

If you have any questions regarding these test results, please call me at (708) 544-3260.

Sincerely,

Keith Sinon
Project Manager
708-544-3260 ext 212
keith@suburbanlabs.com

Suburban Laboratories, Inc.
1950 S. Batavia Ave., Suite 150, Geneva, IL 60134 (708) 544-3260

Case Narrative

Client: CWM Company, Inc
Project: Marine Bank 2003 - D135 Cantrall
WorkOrder: 2108F20
Temperature of samples upon receipt at SLI: 5 C

Date: August 25, 2021
PO #:
QC Level:
Chain of Custody #:

General Comments:
- All results reported in wet weight unless otherwise indicated. (dry = Dry Weight)
- Sample results relate only to the analytes of interest tested and to sample as received by the laboratory.
- Environmental compliance sample results meet the requirements of 35 IAC Part 186 unless otherwise indicated.
- Waste water analysis follows the rules set forth in 40 CFR part 136 except where otherwise noted.
- Accreditation by the State of Illinois is not an endorsement or a guarantee of the validity of data generated.
- For more information about the laboratories' scope of accreditation, please contact us at (708) 544-3260 or the Agency at (217) 782-6455.
- All radiological results are reported to the 95% confidence level.

Abbreviations:
- Reporting Limit: The concentration at which an analyte can be routinely detected on a day to day basis, and which also meets regulatory and client needs.
- Quantitation Limit: The lowest concentration at which results can be accurately quantitated.
- J: The analyte was positively identified above our Method Detection Limit and is considered detectable and usable; however, the associated numerical value is the approximate concentration of the analyte in the sample.
- ATC: Automatic Temperature Correction. - TNTC: Too Numerous To Count
- TIC: Tentatively Identified Compound (GCMS library search identification, concentration estimated to nearest internal standard).
- SS (Surrogate Standard): Quality control compound added to the sample by the lab.

Method References:
For a complete list of method references please contact us.
- E: USEPA Reference methods
- SW: USEPA, Test Methods for Evaluating Solid Waste (SW-846)
- M: Standard Methods for the Examination of Water and Wastewater
- USP: Latest version of United States Pharmacopeia

Workorder Specific Comments:

Suburban Laboratories, Inc.
1950 S. Batavia Ave., Suite 150, Geneva, IL 60134 (708) 544-3260

Laboratory Results

Client ID: CWM Company, Inc
Project Name: Marine Bank 2003 - D135 Cantrall

Report Date: August 25, 2021
Workorder: 2108F20

Client Sample ID: SB-7
Lab ID: 2108F20-001 **Date Received:** 08/13/2021 11:35 AM

Matrix: SOIL
Collection Date: 08/12/2021 9:40 AM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
VOLATILE ORGANIC COMPOUNDS		Method: EPA-8260B-Rev 2, Dec-96				Analyst: RY	
Benzene	16.3	0.0232		mg/Kg-dry	75.28	08/17/2021 11:59 AM	R137437
Ethylbenzene	7.41	0.0463		mg/Kg-dry	37.64	08/16/2021 2:06 PM	R137370
m,p-Xylene	7.02	0.0927		mg/Kg-dry	37.64	08/16/2021 2:06 PM	R137370
Methyl tert-butyl ether	ND	0.0463		mg/Kg-dry	37.64	08/16/2021 2:06 PM	R137370
o-Xylene	0.222	0.0463		mg/Kg-dry	37.64	08/16/2021 2:06 PM	R137370
Total Xylenes	7.24	0.0927		mg/Kg-dry	37.64	08/16/2021 2:06 PM	R137370
Toluene	0.613	0.0463		mg/Kg-dry	37.64	08/16/2021 2:06 PM	R137370
Internal Quality Control Compounds							
SS: 4-Bromofluorobenzene	99.8	80-130		%Rec	37.64	08/16/2021 2:06 PM	R137370
SS: Dibromofluoromethane	91.7	76.1-120		%Rec	37.64	08/16/2021 2:06 PM	R137370
SS: Toluene-d8	90.9	85-115		%Rec	37.64	08/16/2021 2:06 PM	R137370
SEMIVOLATILE ORGANICS, BY GCMS SIM		Method: EPA-8270C-Rev 3, Dec-96				Analyst: RHY	
Acenaphthene	1.34	0.0493		mg/Kg-dry	1	08/23/2021 3:12 PM	75991
Acenaphthylene	0.548	0.0493		mg/Kg-dry	1	08/23/2021 3:12 PM	75991
Anthracene	1.23	0.0493		mg/Kg-dry	1	08/23/2021 3:12 PM	75991
Benzo(a)anthracene	ND	0.0493		mg/Kg-dry	1	08/23/2021 3:12 PM	75991
Benzo(a)pyrene	ND	0.0493		mg/Kg-dry	1	08/23/2021 3:12 PM	75991
Benzo(b)fluoranthene	ND	0.0493		mg/Kg-dry	1	08/23/2021 3:12 PM	75991
Benzo(g,h,i)perylene	ND	0.0493		mg/Kg-dry	1	08/23/2021 3:12 PM	75991
Benzo(k)fluoranthene	ND	0.0493		mg/Kg-dry	1	08/23/2021 3:12 PM	75991
Chrysene	0.153	0.0493		mg/Kg-dry	1	08/23/2021 3:12 PM	75991
Dibenzo(a,h)anthracene	ND	0.0493		mg/Kg-dry	1	08/23/2021 3:12 PM	75991
Fluoranthene	0.298	0.0493		mg/Kg-dry	1	08/23/2021 3:12 PM	75991
Fluorene	3.13	0.0493		mg/Kg-dry	1	08/23/2021 3:12 PM	75991
Indeno(1,2,3-cd)pyrene	ND	0.0493		mg/Kg-dry	1	08/23/2021 3:12 PM	75991
Naphthalene	17.0	0.246		mg/Kg-dry	5	08/24/2021 6:38 PM	75991
Phenanthrene	10.6	0.246		mg/Kg-dry	5	08/24/2021 6:38 PM	75991
Pyrene	1.50	0.0493		mg/Kg-dry	1	08/23/2021 3:12 PM	75991
Internal Quality Control Compounds							
SS: 2-Fluorobiphenyl	54.7	72.1-138	S	%Rec	1	08/23/2021 3:12 PM	75991
SS: 4-Terphenyl-d14	74.6	45.3-152		%Rec	1	08/23/2021 3:12 PM	75991
SS: Nitrobenzene-d5	86.4	62.6-144		%Rec	1	08/23/2021 3:12 PM	75991
PERCENT MOISTURE		Method: ASTM-D2216-Rev 2005				Analyst: JNG	
Percent Moisture	19	1.0	c	wt%	1	08/19/2021 2:14 PM	R137536

Suburban Laboratories, Inc.
1950 S. Batavia Ave., Suite 150, Geneva, IL 60134 (708) 544-3260

Laboratory Results

Client ID: CWM Company, Inc
Project Name: Marine Bank 2003 - D135 Cantrall

Report Date: August 25, 2021
Workorder: 2108F20

Client Sample ID: SB-8
Lab ID: 2108F20-002 **Date Received:** 08/13/2021 11:35 AM

Matrix: SOIL
Collection Date: 08/12/2021 11:20 AM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
VOLATILE ORGANIC COMPOUNDS		Method: EPA-8260B-Rev 2, Dec-96				Analyst: RY	
Benzene	0.0452	0.0128		mg/Kg-dry	41.64	08/17/2021 12:25 PM	R137437
Ethylbenzene	ND	0.0514		mg/Kg-dry	41.64	08/17/2021 12:25 PM	R137437
m,p-Xylene	ND	0.103		mg/Kg-dry	41.64	08/17/2021 12:25 PM	R137437
Methyl tert-butyl ether	ND	0.0514		mg/Kg-dry	41.64	08/17/2021 12:25 PM	R137437
o-Xylene	ND	0.0514		mg/Kg-dry	41.64	08/17/2021 12:25 PM	R137437
Total Xylenes	ND	0.103		mg/Kg-dry	41.64	08/17/2021 12:25 PM	R137437
Toluene	ND	0.0514		mg/Kg-dry	41.64	08/17/2021 12:25 PM	R137437
Internal Quality Control Compounds							
SS: 4-Bromofluorobenzene	96.5	80-130		%Rec	41.64	08/17/2021 12:25 PM	R137437
SS: Dibromofluoromethane	97.7	76.1-120		%Rec	41.64	08/17/2021 12:25 PM	R137437
SS: Toluene-d8	98.1	85-115		%Rec	41.64	08/17/2021 12:25 PM	R137437
SEMIVOLATILE ORGANICS, BY GCMS SIM		Method: EPA-8270C-Rev 3, Dec-96				Analyst: RHY	
Acenaphthene	ND	0.0490		mg/Kg-dry	1	08/23/2021 3:49 PM	75991
Acenaphthylene	ND	0.0490		mg/Kg-dry	1	08/23/2021 3:49 PM	75991
Anthracene	ND	0.0490		mg/Kg-dry	1	08/23/2021 3:49 PM	75991
Benzo(a)anthracene	ND	0.0490		mg/Kg-dry	1	08/23/2021 3:49 PM	75991
Benzo(a)pyrene	ND	0.0490		mg/Kg-dry	1	08/23/2021 3:49 PM	75991
Benzo(b)fluoranthene	ND	0.0490		mg/Kg-dry	1	08/23/2021 3:49 PM	75991
Benzo(g,h,i)perylene	ND	0.0490		mg/Kg-dry	1	08/23/2021 3:49 PM	75991
Benzo(k)fluoranthene	ND	0.0490		mg/Kg-dry	1	08/23/2021 3:49 PM	75991
Chrysene	ND	0.0490		mg/Kg-dry	1	08/23/2021 3:49 PM	75991
Dibenzo(a,h)anthracene	ND	0.0490		mg/Kg-dry	1	08/23/2021 3:49 PM	75991
Fluoranthene	ND	0.0490		mg/Kg-dry	1	08/23/2021 3:49 PM	75991
Fluorene	ND	0.0490		mg/Kg-dry	1	08/23/2021 3:49 PM	75991
Indeno(1,2,3-cd)pyrene	ND	0.0490		mg/Kg-dry	1	08/23/2021 3:49 PM	75991
Naphthalene	ND	0.0490		mg/Kg-dry	1	08/23/2021 3:49 PM	75991
Phenanthrene	ND	0.0490		mg/Kg-dry	1	08/23/2021 3:49 PM	75991
Pyrene	ND	0.0490		mg/Kg-dry	1	08/23/2021 3:49 PM	75991
Internal Quality Control Compounds							
SS: 2-Fluorobiphenyl	83.6	72.1-138		%Rec	1	08/23/2021 3:49 PM	75991
SS: 4-Terphenyl-d14	77.9	45.3-152		%Rec	1	08/23/2021 3:49 PM	75991
SS: Nitrobenzene-d5	86.7	62.6-144		%Rec	1	08/23/2021 3:49 PM	75991
PERCENT MOISTURE		Method: ASTM-D2216-Rev 2006				Analyst: JNG	
Percent Moisture	19	1.0	c	wt%	1	08/19/2021 2:14 PM	R137536

Suburban Laboratories, Inc.
1950 S. Batavia Ave., Suite 150, Geneva, IL 60134 (708) 544-3260

Laboratory Results

Client ID: CWM Company, Inc
Project Name: Marine Bank 2003 - D135 Cantrall

Report Date: August 25, 2021
Workorder: 2108F20

Client Sample ID: SB-9
Lab ID: 2108F20-003
Date Received: 08/13/2021 11:35 AM
Matrix: SOIL
Collection Date: 08/12/2021 11:30 AM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
VOLATILE ORGANIC COMPOUNDS		Method: EPA-8260B-Rev 2, Dec-96				Analyst: RY	
Benzene	ND	0.0121		mg/Kg-dry	38.97	08/16/2021 2:58 PM	R137370
Ethylbenzene	ND	0.0484		mg/Kg-dry	38.97	08/16/2021 2:58 PM	R137370
m,p-Xylene	ND	0.0967		mg/Kg-dry	38.97	08/16/2021 2:58 PM	R137370
Methyl tert-butyl ether	ND	0.0484		mg/Kg-dry	38.97	08/16/2021 2:58 PM	R137370
o-Xylene	ND	0.0484		mg/Kg-dry	38.97	08/16/2021 2:58 PM	R137370
Total Xylenes	ND	0.0967		mg/Kg-dry	38.97	08/16/2021 2:58 PM	R137370
Toluene	ND	0.0484		mg/Kg-dry	38.97	08/16/2021 2:58 PM	R137370
Internal Quality Control Compounds							
SS: 4-Bromofluorobenzene	96.8	80-130		%Rec	38.97	08/16/2021 2:58 PM	R137370
SS: Dibromofluoromethane	102	76.1-120		%Rec	38.97	08/16/2021 2:58 PM	R137370
SS: Toluene-d8	97.2	85-115		%Rec	38.97	08/16/2021 2:58 PM	R137370
SEMIVOLATILE ORGANICS, BY GCMS SIM		Method: EPA-8270C-Rev 3, Dec-96				Analyst: RHY	
Acenaphthene	ND	0.0489		mg/Kg-dry	1	08/23/2021 4:26 PM	75991
Acenaphthylene	ND	0.0489		mg/Kg-dry	1	08/23/2021 4:26 PM	75991
Anthracene	ND	0.0489		mg/Kg-dry	1	08/23/2021 4:26 PM	75991
Benzo(a)anthracene	ND	0.0489		mg/Kg-dry	1	08/23/2021 4:26 PM	75991
Benzo(a)pyrene	ND	0.0489		mg/Kg-dry	1	08/23/2021 4:26 PM	75991
Benzo(b)fluoranthene	ND	0.0489		mg/Kg-dry	1	08/23/2021 4:26 PM	75991
Benzo(g,h,i)perylene	ND	0.0489		mg/Kg-dry	1	08/23/2021 4:26 PM	75991
Benzo(k)fluoranthene	ND	0.0489		mg/Kg-dry	1	08/23/2021 4:26 PM	75991
Chrysene	ND	0.0489		mg/Kg-dry	1	08/23/2021 4:26 PM	75991
Dibenzo(a,h)anthracene	ND	0.0489		mg/Kg-dry	1	08/23/2021 4:26 PM	75991
Fluoranthene	ND	0.0489		mg/Kg-dry	1	08/23/2021 4:26 PM	75991
Fluorene	ND	0.0489		mg/Kg-dry	1	08/23/2021 4:26 PM	75991
Indeno(1,2,3-cd)pyrene	ND	0.0489		mg/Kg-dry	1	08/23/2021 4:26 PM	75991
Naphthalene	ND	0.0489		mg/Kg-dry	1	08/23/2021 4:26 PM	75991
Phenanthrene	ND	0.0489		mg/Kg-dry	1	08/23/2021 4:26 PM	75991
Pyrene	ND	0.0489		mg/Kg-dry	1	08/23/2021 4:26 PM	75991
Internal Quality Control Compounds							
SS: 2-Fluorobiphenyl	95.5	72.1-138		%Rec	1	08/23/2021 4:26 PM	75991
SS: 4-Terphenyl-d14	79.1	45.3-152		%Rec	1	08/23/2021 4:26 PM	75991
SS: Nitrobenzene-d5	90.7	62.6-144		%Rec	1	08/23/2021 4:26 PM	75991
PERCENT MOISTURE		Method: ASTM-D2216-Rev 2005				Analyst: JNG	
Percent Moisture	19	1.0	c	wt%	1	08/19/2021 2:14 PM	R137536

AUG 2 5 2021

Created: 8/25/2021 4:48:03 PM

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Laboratory Results

Client ID: CWM Company, Inc
Project Name: Marine Bank 2003 - D135 Cantrall

Report Date: August 25, 2021
Workorder: 2108F20

Client Sample ID: SB-10
Lab ID: 2108F20-004 **Date Received:** 08/13/2021 11:35 AM

Matrix: SOIL
Collection Date: 08/12/2021 11:40 AM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
VOLATILE ORGANIC COMPOUNDS		Method: EPA-8260B-Rev 2, Dec-96				Analyst: RY	
Benzene	ND	0.0133		mg/Kg-dry	42.34	08/16/2021 3:23 PM	R137370
Ethylbenzene	ND	0.0532		mg/Kg-dry	42.34	08/16/2021 3:23 PM	R137370
m,p-Xylene	ND	0.106		mg/Kg-dry	42.34	08/16/2021 3:23 PM	R137370
Methyl tert-butyl ether	ND	0.0532		mg/Kg-dry	42.34	08/16/2021 3:23 PM	R137370
o-Xylene	ND	0.0532		mg/Kg-dry	42.34	08/16/2021 3:23 PM	R137370
Total Xylenes	ND	0.106		mg/Kg-dry	42.34	08/16/2021 3:23 PM	R137370
Toluene	ND	0.0532		mg/Kg-dry	42.34	08/16/2021 3:23 PM	R137370
Internal Quality Control Compounds							
SS: 4-Bromofluorobenzene	94.5	80-130		%Rec	42.34	08/16/2021 3:23 PM	R137370
SS: Dibromofluoromethane	100	76.1-120		%Rec	42.34	08/16/2021 3:23 PM	R137370
SS: Toluene-d8	98.1	85-115		%Rec	42.34	08/16/2021 3:23 PM	R137370
SEMIVOLATILE ORGANICS, BY GCMS SIM		Method: EPA-8270C-Rev 3, Dec-96				Analyst: RHY	
Acenaphthene	ND	0.0503		mg/Kg-dry	1	08/23/2021 5:04 PM	75991
Acenaphthylene	ND	0.0503		mg/Kg-dry	1	08/23/2021 5:04 PM	75991
Anthracene	ND	0.0503		mg/Kg-dry	1	08/23/2021 5:04 PM	75991
Benzo(a)anthracene	ND	0.0503		mg/Kg-dry	1	08/23/2021 5:04 PM	75991
Benzo(a)pyrene	ND	0.0503		mg/Kg-dry	1	08/23/2021 5:04 PM	75991
Benzo(b)fluoranthene	ND	0.0503		mg/Kg-dry	1	08/23/2021 5:04 PM	75991
Benzo(g,h,i)perylene	ND	0.0503		mg/Kg-dry	1	08/23/2021 5:04 PM	75991
Benzo(k)fluoranthene	ND	0.0503		mg/Kg-dry	1	08/23/2021 5:04 PM	75991
Chrysene	ND	0.0503		mg/Kg-dry	1	08/23/2021 5:04 PM	75991
Dibenzo(a,h)anthracene	ND	0.0503		mg/Kg-dry	1	08/23/2021 5:04 PM	75991
Fluoranthene	ND	0.0503		mg/Kg-dry	1	08/23/2021 5:04 PM	75991
Fluorene	ND	0.0503		mg/Kg-dry	1	08/23/2021 5:04 PM	75991
Indeno(1,2,3-cd)pyrene	ND	0.0503		mg/Kg-dry	1	08/23/2021 5:04 PM	75991
Naphthalene	ND	0.0503		mg/Kg-dry	1	08/23/2021 5:04 PM	75991
Phenanthrene	ND	0.0503		mg/Kg-dry	1	08/23/2021 5:04 PM	75991
Pyrene	ND	0.0503		mg/Kg-dry	1	08/23/2021 5:04 PM	75991
Internal Quality Control Compounds							
SS: 2-Fluorobiphenyl	95.1	72.1-138		%Rec	1	08/23/2021 5:04 PM	75991
SS: 4-Terphenyl-d14	78.1	45.3-152		%Rec	1	08/23/2021 5:04 PM	75991
SS: Nitrobenzene-d5	90.3	62.6-144		%Rec	1	08/23/2021 5:04 PM	75991
PERCENT MOISTURE		Method: ASTM-D2216-Rev 2005				Analyst: JNG	
Percent Moisture	20	1.0	c	wt%	1	08/19/2021 2:14 PM	R137536

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Laboratory Results

Client ID: CWM Company, Inc
Project Name: Marine Bank 2003 - D135 Cantrall

Report Date: August 25, 2021
Workorder: 2108F20

Client Sample ID: SB-11
Lab ID: 2108F20-005 **Date Received:** 08/13/2021 11:35 AM

Matrix: SOIL
Collection Date: 08/12/2021 2:05 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
VOLATILE ORGANIC COMPOUNDS		Method: EPA-8260B-Rev 2, Dec-96				Analyst: RY	
Benzene	ND	0.0162		mg/Kg-dry	52.25	08/16/2021 3:49 PM	R137370
Ethylbenzene	ND	0.0649		mg/Kg-dry	52.25	08/16/2021 3:49 PM	R137370
m,p-Xylene	ND	0.130		mg/Kg-dry	52.25	08/16/2021 3:49 PM	R137370
Methyl tert-butyl ether	ND	0.0649		mg/Kg-dry	52.25	08/16/2021 3:49 PM	R137370
o-Xylene	ND	0.0649		mg/Kg-dry	52.25	08/16/2021 3:49 PM	R137370
Total Xylenes	ND	0.130		mg/Kg-dry	52.25	08/16/2021 3:49 PM	R137370
Toluene	ND	0.0649		mg/Kg-dry	52.25	08/16/2021 3:49 PM	R137370
Internal Quality Control Compounds							
SS: 4-Bromofluorobenzene	95.4	80-130		%Rec	52.25	08/16/2021 3:49 PM	R137370
SS: Dibromofluoromethane	102	76.1-120		%Rec	52.25	08/16/2021 3:49 PM	R137370
SS: Toluene-d8	98.1	85-115		%Rec	52.25	08/16/2021 3:49 PM	R137370
SEMIVOLATILE ORGANICS, BY GCMS SIM		Method: EPA-8270C-Rev 3, Dec-96				Analyst: RHY	
Acenaphthene	ND	0.0497		mg/Kg-dry	1	08/23/2021 5:41 PM	75991
Acenaphthylene	ND	0.0497		mg/Kg-dry	1	08/23/2021 5:41 PM	75991
Anthracene	ND	0.0497		mg/Kg-dry	1	08/23/2021 5:41 PM	75991
Benzo(a)anthracene	ND	0.0497		mg/Kg-dry	1	08/23/2021 5:41 PM	75991
Benzo(a)pyrene	ND	0.0497		mg/Kg-dry	1	08/23/2021 5:41 PM	75991
Benzo(b)fluoranthene	ND	0.0497		mg/Kg-dry	1	08/23/2021 5:41 PM	75991
Benzo(g,h,i)perylene	ND	0.0497		mg/Kg-dry	1	08/23/2021 5:41 PM	75991
Benzo(k)fluoranthene	ND	0.0497		mg/Kg-dry	1	08/23/2021 5:41 PM	75991
Chrysene	ND	0.0497		mg/Kg-dry	1	08/23/2021 5:41 PM	75991
Dibenzo(a,h)anthracene	ND	0.0497		mg/Kg-dry	1	08/23/2021 5:41 PM	75991
Fluoranthene	ND	0.0497		mg/Kg-dry	1	08/23/2021 5:41 PM	75991
Fluorene	ND	0.0497		mg/Kg-dry	1	08/23/2021 5:41 PM	75991
Indeno(1,2,3-cd)pyrene	ND	0.0497		mg/Kg-dry	1	08/23/2021 5:41 PM	75991
Naphthalene	ND	0.0497		mg/Kg-dry	1	08/23/2021 5:41 PM	75991
Phenanthrene	ND	0.0497		mg/Kg-dry	1	08/23/2021 5:41 PM	75991
Pyrene	ND	0.0497		mg/Kg-dry	1	08/23/2021 5:41 PM	75991
Internal Quality Control Compounds							
SS: 2-Fluorobiphenyl	91.7	72.1-138		%Rec	1	08/23/2021 5:41 PM	75991
SS: 4-Terphenyl-d14	79.5	45.3-152		%Rec	1	08/23/2021 5:41 PM	75991
SS: Nitrobenzene-d5	91.8	62.6-144		%Rec	1	08/23/2021 5:41 PM	75991
PERCENT MOISTURE		Method: ASTM-D2216-Rev 2005				Analyst: JNG	
Percent Moisture	20	1.0	c	wt%	1	08/19/2021 2:14 PM	R137536

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Laboratory Results

Client ID: CWM Company, Inc
Project Name: Marine Bank 2003 - D135 Cantrall

Report Date: August 25, 2021
Workorder: 2108F20

Client Sample ID: SB-12
Lab ID: 2108F20-006 **Date Received:** 08/13/2021 11:35 AM

Matrix: SOIL
Collection Date: 08/12/2021 2:15 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
VOLATILE ORGANIC COMPOUNDS		Method: EPA-8260B-Rev 2, Dec-96				Analyst: RY	
Benzene	ND	0.0134		mg/Kg-dry	41.64	08/16/2021 4:14 PM	R137370
Ethylbenzene	ND	0.0534		mg/Kg-dry	41.64	08/16/2021 4:14 PM	R137370
m,p-Xylene	ND	0.107		mg/Kg-dry	41.64	08/16/2021 4:14 PM	R137370
Methyl tert-butyl ether	ND	0.0534		mg/Kg-dry	41.64	08/16/2021 4:14 PM	R137370
o-Xylene	ND	0.0534		mg/Kg-dry	41.64	08/16/2021 4:14 PM	R137370
Total Xylenes	ND	0.107		mg/Kg-dry	41.64	08/16/2021 4:14 PM	R137370
Toluene	ND	0.0534		mg/Kg-dry	41.64	08/16/2021 4:14 PM	R137370
Internal Quality Control Compounds							
SS: 4-Bromofluorobenzene	97.1	80-130		%Rec	41.64	08/16/2021 4:14 PM	R137370
SS: Dibromofluoromethane	99.8	76.1-120		%Rec	41.64	08/16/2021 4:14 PM	R137370
SS: Toluene-d8	96.9	85-115		%Rec	41.64	08/16/2021 4:14 PM	R137370
SEMIVOLATILE ORGANICS, BY GCMS SIM		Method: EPA-8270C-Rev 3, Dec-96				Analyst: RHY	
Acenaphthene	ND	0.0507		mg/Kg-dry	1	08/23/2021 6:18 PM	75991
Acenaphthylene	ND	0.0507		mg/Kg-dry	1	08/23/2021 6:18 PM	75991
Anthracene	ND	0.0507		mg/Kg-dry	1	08/23/2021 6:18 PM	75991
Benzo(a)anthracene	ND	0.0507		mg/Kg-dry	1	08/23/2021 6:18 PM	75991
Benzo(a)pyrene	ND	0.0507		mg/Kg-dry	1	08/23/2021 6:18 PM	75991
Benzo(b)fluoranthene	ND	0.0507		mg/Kg-dry	1	08/23/2021 6:18 PM	75991
Benzo(g,h,i)perylene	ND	0.0507		mg/Kg-dry	1	08/23/2021 6:18 PM	75991
Benzo(k)fluoranthene	ND	0.0507		mg/Kg-dry	1	08/23/2021 6:18 PM	75991
Chrysene	ND	0.0507		mg/Kg-dry	1	08/23/2021 6:18 PM	75991
Dibenzo(a,h)anthracene	ND	0.0507		mg/Kg-dry	1	08/23/2021 6:18 PM	75991
Fluoranthene	ND	0.0507		mg/Kg-dry	1	08/23/2021 6:18 PM	75991
Fluorene	ND	0.0507		mg/Kg-dry	1	08/23/2021 6:18 PM	75991
Indeno(1,2,3-cd)pyrene	ND	0.0507		mg/Kg-dry	1	08/23/2021 6:18 PM	75991
Naphthalene	ND	0.0507		mg/Kg-dry	1	08/23/2021 6:18 PM	75991
Phenanthrene	ND	0.0507		mg/Kg-dry	1	08/23/2021 6:18 PM	75991
Pyrene	ND	0.0507		mg/Kg-dry	1	08/23/2021 6:18 PM	75991
Internal Quality Control Compounds							
SS: 2-Fluorobiphenyl	97.6	72.1-138		%Rec	1	08/23/2021 6:18 PM	75991
SS: 4-Terphenyl-d14	76.3	45.3-152		%Rec	1	08/23/2021 6:18 PM	75991
SS: Nitrobenzene-d5	89.3	62.6-144		%Rec	1	08/23/2021 6:18 PM	75991
PERCENT MOISTURE		Method: ASTM-D2216-Rev 2005				Analyst: JNG	
Percent Moisture	22	1.0	c	wt%	1	08/19/2021 2:14 PM	R137536

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Laboratory Results

Client ID: CWM Company, Inc
Project Name: Marine Bank 2003 - D135 Cantrall

Report Date: August 25, 2021
Workorder: 2108F20

Client Sample ID: SB-13
Lab ID: 2108F20-007 **Date Received:** 08/13/2021 11:35 AM

Matrix: SOIL
Collection Date: 08/12/2021 2:25 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
VOLATILE ORGANIC COMPOUNDS		Method: EPA-8260B-Rev 2, Dec-96				Analyst: RY	
Benzene	0.103	0.0136		mg/Kg-dry	43.49	08/16/2021 4:40 PM	R137370
Ethylbenzene	0.226	0.0543		mg/Kg-dry	43.49	08/16/2021 4:40 PM	R137370
m,p-Xylene	ND	0.109		mg/Kg-dry	43.49	08/16/2021 4:40 PM	R137370
Methyl tert-butyl ether	ND	0.0543		mg/Kg-dry	43.49	08/16/2021 4:40 PM	R137370
o-Xylene	ND	0.0543		mg/Kg-dry	43.49	08/16/2021 4:40 PM	R137370
Total Xylenes	ND	0.109		mg/Kg-dry	43.49	08/16/2021 4:40 PM	R137370
Toluene	ND	0.0543		mg/Kg-dry	43.49	08/16/2021 4:40 PM	R137370
Internal Quality Control Compounds							
SS: 4-Bromofluorobenzene	96.9	80-130		%Rec	43.49	08/16/2021 4:40 PM	R137370
SS: Dibromofluoromethane	97.4	76.1-120		%Rec	43.49	08/16/2021 4:40 PM	R137370
SS: Toluene-d8	97.3	85-115		%Rec	43.49	08/16/2021 4:40 PM	R137370
SEMIVOLATILE ORGANICS, BY GCMS SIM		Method: EPA-8270C-Rev 3, Dec-96				Analyst: RHY	
Acenaphthene	ND	0.0493		mg/Kg-dry	1	08/23/2021 6:55 PM	75991
Acenaphthylene	ND	0.0493		mg/Kg-dry	1	08/23/2021 6:55 PM	75991
Anthracene	ND	0.0493		mg/Kg-dry	1	08/23/2021 6:55 PM	75991
Benzo(a)anthracene	ND	0.0493		mg/Kg-dry	1	08/23/2021 6:55 PM	75991
Benzo(a)pyrene	ND	0.0493		mg/Kg-dry	1	08/23/2021 6:55 PM	75991
Benzo(b)fluoranthene	ND	0.0493		mg/Kg-dry	1	08/23/2021 6:55 PM	75991
Benzo(g,h,i)perylene	ND	0.0493		mg/Kg-dry	1	08/23/2021 6:55 PM	75991
Benzo(k)fluoranthene	ND	0.0493		mg/Kg-dry	1	08/23/2021 6:55 PM	75991
Chrysene	ND	0.0493		mg/Kg-dry	1	08/23/2021 6:55 PM	75991
Dibenzo(a,h)anthracene	ND	0.0493		mg/Kg-dry	1	08/23/2021 6:55 PM	75991
Fluoranthene	ND	0.0493		mg/Kg-dry	1	08/23/2021 6:55 PM	75991
Fluorene	ND	0.0493		mg/Kg-dry	1	08/23/2021 6:55 PM	75991
Indeno(1,2,3-cd)pyrene	ND	0.0493		mg/Kg-dry	1	08/23/2021 6:55 PM	75991
Naphthalene	0.0990	0.0493		mg/Kg-dry	1	08/23/2021 6:55 PM	75991
Phenanthrene	ND	0.0493		mg/Kg-dry	1	08/23/2021 6:55 PM	75991
Pyrene	ND	0.0493		mg/Kg-dry	1	08/23/2021 6:55 PM	75991
Internal Quality Control Compounds							
SS: 2-Fluorobiphenyl	95.8	72.1-138		%Rec	1	08/23/2021 6:55 PM	75991
SS: 4-Terphenyl-d14	77.8	45.3-152		%Rec	1	08/23/2021 6:55 PM	75991
SS: Nitrobenzene-d5	95.6	62.6-144		%Rec	1	08/23/2021 6:55 PM	75991
PERCENT MOISTURE		Method: ASTM-D2216-Rev 2005				Analyst: JNG	
Percent Moisture	20	1.0	c	wt%	1	08/19/2021 2:14 PM	R137536

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Laboratory Results

Client ID: CWM Company, Inc
Project Name: Marine Bank 2003 - D135 Cantrall

Report Date: August 25, 2021
Workorder: 2108F20

Client Sample ID: SB-14
Lab ID: 2108F20-008 **Date Received:** 08/13/2021 11:35 AM

Matrix: SOIL
Collection Date: 08/12/2021 2:35 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
VOLATILE ORGANIC COMPOUNDS		Method: EPA-8260B-Rev 2, Dec-96				Analyst: RY	
Benzene	0.0492	0.0143		mg/Kg-dry	44.12	08/16/2021 5:06 PM	R137370
Ethylbenzene	ND	0.0572		mg/Kg-dry	44.12	08/16/2021 5:06 PM	R137370
m,p-Xylene	ND	0.114		mg/Kg-dry	44.12	08/16/2021 5:06 PM	R137370
Methyl tert-butyl ether	ND	0.0572		mg/Kg-dry	44.12	08/16/2021 5:06 PM	R137370
o-Xylene	ND	0.0572		mg/Kg-dry	44.12	08/16/2021 5:06 PM	R137370
Total Xylenes	ND	0.114		mg/Kg-dry	44.12	08/16/2021 5:06 PM	R137370
Toluene	ND	0.0572		mg/Kg-dry	44.12	08/16/2021 5:06 PM	R137370
Internal Quality Control Compounds							
SS: 4-Bromofluorobenzene	122	80-130		%Rec	44.12	08/16/2021 5:06 PM	R137370
SS: Dibromofluoromethane	97.0	76.1-120		%Rec	44.12	08/16/2021 5:06 PM	R137370
SS: Toluene-d8	95.4	85-115		%Rec	44.12	08/16/2021 5:06 PM	R137370
SEMIVOLATILE ORGANICS, BY GCMS SIM		Method: EPA-8270C-Rev 3, Dec-96				Analyst: RHY	
Acenaphthene	ND	0.0519		mg/Kg-dry	1	08/23/2021 7:31 PM	75991
Acenaphthylene	ND	0.0519		mg/Kg-dry	1	08/23/2021 7:31 PM	75991
Anthracene	ND	0.0519		mg/Kg-dry	1	08/23/2021 7:31 PM	75991
Benzo(a)anthracene	ND	0.0519		mg/Kg-dry	1	08/23/2021 7:31 PM	75991
Benzo(a)pyrene	ND	0.0519		mg/Kg-dry	1	08/23/2021 7:31 PM	75991
Benzo(b)fluoranthene	ND	0.0519		mg/Kg-dry	1	08/23/2021 7:31 PM	75991
Benzo(g,h,i)perylene	ND	0.0519		mg/Kg-dry	1	08/23/2021 7:31 PM	75991
Benzo(k)fluoranthene	ND	0.0519		mg/Kg-dry	1	08/23/2021 7:31 PM	75991
Chrysene	ND	0.0519		mg/Kg-dry	1	08/23/2021 7:31 PM	75991
Dibenzo(a,h)anthracene	ND	0.0519		mg/Kg-dry	1	08/23/2021 7:31 PM	75991
Fluoranthene	ND	0.0519		mg/Kg-dry	1	08/23/2021 7:31 PM	75991
Fluorene	ND	0.0519		mg/Kg-dry	1	08/23/2021 7:31 PM	75991
Indeno(1,2,3-cd)pyrene	ND	0.0519		mg/Kg-dry	1	08/23/2021 7:31 PM	75991
Naphthalene	0.0937	0.0519		mg/Kg-dry	1	08/23/2021 7:31 PM	75991
Phenanthrene	ND	0.0519		mg/Kg-dry	1	08/23/2021 7:31 PM	75991
Pyrene	ND	0.0519		mg/Kg-dry	1	08/23/2021 7:31 PM	75991
Internal Quality Control Compounds							
SS: 2-Fluorobiphenyl	86.9	72.1-138		%Rec	1	08/23/2021 7:31 PM	75991
SS: 4-Terphenyl-d14	77.8	45.3-152		%Rec	1	08/23/2021 7:31 PM	75991
SS: Nitrobenzene-d5	96.4	62.6-144		%Rec	1	08/23/2021 7:31 PM	75991
PERCENT MOISTURE		Method: ASTM-D2216-Rev 2005				Analyst: JNG	
Percent Moisture	23	1.0	c	wt%	1	08/19/2021 2:14 PM	R137536

AUG 2 5 2021

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Laboratory Results

Client ID: CWM Company, Inc
Project Name: Marine Bank 2003 - D135 Cantrall

Report Date: August 25, 2021
Workorder: 2108F20

Client Sample ID: SB-15
Lab ID: 2108F20-009 **Date Received:** 08/13/2021 11:35 AM

Matrix: SOIL
Collection Date: 08/12/2021 2:45 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
VOLATILE ORGANIC COMPOUNDS		Method: EPA-8260B-Rev 2, Dec-96				Analyst: RY	
Benzene	0.296	0.0130		mg/Kg-dry	40.28	08/16/2021 5:31 PM	R137370
Ethylbenzene	47.6	0.519		mg/Kg-dry	402.75	08/17/2021 12:51 PM	R137437
m,p-Xylene	137	1.04		mg/Kg-dry	402.75	08/17/2021 12:51 PM	R137437
Methyl tert-butyl ether	ND	0.0519		mg/Kg-dry	40.28	08/16/2021 5:31 PM	R137370
o-Xylene	26.2	0.519		mg/Kg-dry	402.75	08/17/2021 12:51 PM	R137437
Total Xylenes	163	1.04		mg/Kg-dry	402.75	08/17/2021 12:51 PM	R137437
Toluene	0.277	0.0519		mg/Kg-dry	40.28	08/16/2021 5:31 PM	R137370
Internal Quality Control Compounds							
SS: 4-Bromofluorobenzene	87.8	80-130		%Rec	40.28	08/16/2021 5:31 PM	R137370
SS: Dibromofluoromethane	95.1	76.1-120		%Rec	40.28	08/16/2021 5:31 PM	R137370
SS: Toluene-d8	83.0	85-115	S	%Rec	40.28	08/16/2021 5:31 PM	R137370
SEMIVOLATILE ORGANICS, BY GCMS SIM		Method: EPA-8270C-Rev 3, Dec-96				Analyst: RHY	
Acenaphthene	0.0674	0.0516		mg/Kg-dry	1	08/23/2021 8:08 PM	75991
Acenaphthylene	ND	0.0516		mg/Kg-dry	1	08/23/2021 8:08 PM	75991
Anthracene	ND	0.0516		mg/Kg-dry	1	08/23/2021 8:08 PM	75991
Benzo(a)anthracene	ND	0.0516		mg/Kg-dry	1	08/23/2021 8:08 PM	75991
Benzo(a)pyrene	ND	0.0516		mg/Kg-dry	1	08/23/2021 8:08 PM	75991
Benzo(b)fluoranthene	ND	0.0516		mg/Kg-dry	1	08/23/2021 8:08 PM	75991
Benzo(g,h,i)perylene	ND	0.0516		mg/Kg-dry	1	08/23/2021 8:08 PM	75991
Benzo(k)fluoranthene	ND	0.0516		mg/Kg-dry	1	08/23/2021 8:08 PM	75991
Chrysene	ND	0.0516		mg/Kg-dry	1	08/23/2021 8:08 PM	75991
Dibenzo(a,h)anthracene	ND	0.0516		mg/Kg-dry	1	08/23/2021 8:08 PM	75991
Fluoranthene	ND	0.0516		mg/Kg-dry	1	08/23/2021 8:08 PM	75991
Fluorene	0.109	0.0516		mg/Kg-dry	1	08/23/2021 8:08 PM	75991
Indeno(1,2,3-cd)pyrene	ND	0.0516		mg/Kg-dry	1	08/23/2021 8:08 PM	75991
Naphthalene	18.5	0.258		mg/Kg-dry	5	08/24/2021 7:16 PM	75991
Phenanthrene	0.195	0.0516		mg/Kg-dry	1	08/23/2021 8:08 PM	75991
Pyrene	ND	0.0516		mg/Kg-dry	1	08/23/2021 8:08 PM	75991
Internal Quality Control Compounds							
SS: 2-Fluorobiphenyl	86.2	72.1-138		%Rec	1	08/23/2021 8:08 PM	75991
SS: 4-Terphenyl-d14	76.7	45.3-152		%Rec	1	08/23/2021 8:08 PM	75991
SS: Nitrobenzene-d5	92.1	62.6-144		%Rec	1	08/23/2021 8:08 PM	75991
PERCENT MOISTURE		Method: ASTM-D2216-Rev 2005				Analyst: JNG	
Percent Moisture	22	1.0	c	wt%	1	08/19/2021 2:14 PM	R137536

AUG 2 6 2021

Suburban Laboratories, Inc.
1950 S. Batavia Ave., Suite 150, Geneva, IL 60134 (708) 544-3260

Laboratory Results

Client ID: CWM Company, Inc
Project Name: Marine Bank 2003 - D135 Cantrall

Report Date: August 25, 2021
Workorder: 2108F20

Client Sample ID: SB-16
Lab ID: 2108F20-010 **Date Received:** 08/13/2021 11:35 AM

Matrix: SOIL
Collection Date: 08/12/2021 3:00 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
VOLATILE ORGANIC COMPOUNDS		Method: EPA-8260B-Rev 2, Dec-96				Analyst: RY	
Benzene	ND	0.0138		mg/Kg-dry	43.62	08/17/2021 1:16 PM	R137437
Ethylbenzene	ND	0.0551		mg/Kg-dry	43.62	08/17/2021 1:16 PM	R137437
m,p-Xylene	ND	0.110		mg/Kg-dry	43.62	08/17/2021 1:16 PM	R137437
Methyl tert-butyl ether	ND	0.0551		mg/Kg-dry	43.62	08/17/2021 1:16 PM	R137437
o-Xylene	ND	0.0551		mg/Kg-dry	43.62	08/17/2021 1:16 PM	R137437
Total Xylenes	ND	0.110		mg/Kg-dry	43.62	08/17/2021 1:16 PM	R137437
Toluene	ND	0.0551		mg/Kg-dry	43.62	08/17/2021 1:16 PM	R137437
Internal Quality Control Compounds							
SS: 4-Bromofluorobenzene	96.5	80-130		%Rec	43.62	08/17/2021 1:16 PM	R137437
SS: Dibromofluoromethane	95.5	76.1-120		%Rec	43.62	08/17/2021 1:16 PM	R137437
SS: Toluene-d8	98.2	85-115		%Rec	43.62	08/17/2021 1:16 PM	R137437
SEMIVOLATILE ORGANICS, BY GCMS SIM		Method: EPA-8270C-Rev 3, Dec-96				Analyst: RHY	
Acenaphthene	ND	0.0503		mg/Kg-dry	1	08/23/2021 11:48 PM	75991
Acenaphthylene	ND	0.0503		mg/Kg-dry	1	08/23/2021 11:48 PM	75991
Anthracene	ND	0.0503		mg/Kg-dry	1	08/23/2021 11:48 PM	75991
Benzo(a)anthracene	ND	0.0503		mg/Kg-dry	1	08/23/2021 11:48 PM	75991
Benzo(a)pyrene	ND	0.0503		mg/Kg-dry	1	08/23/2021 11:48 PM	75991
Benzo(b)fluoranthene	ND	0.0503		mg/Kg-dry	1	08/23/2021 11:48 PM	75991
Benzo(g,h,i)perylene	ND	0.0503		mg/Kg-dry	1	08/23/2021 11:48 PM	75991
Benzo(k)fluoranthene	ND	0.0503		mg/Kg-dry	1	08/23/2021 11:48 PM	75991
Chrysene	ND	0.0503		mg/Kg-dry	1	08/23/2021 11:48 PM	75991
Dibenzo(a,h)anthracene	ND	0.0503		mg/Kg-dry	1	08/23/2021 11:48 PM	75991
Fluoranthene	ND	0.0503		mg/Kg-dry	1	08/23/2021 11:48 PM	75991
Fluorene	ND	0.0503		mg/Kg-dry	1	08/23/2021 11:48 PM	75991
Indeno(1,2,3-cd)pyrene	ND	0.0503		mg/Kg-dry	1	08/23/2021 11:48 PM	75991
Naphthalene	ND	0.0503		mg/Kg-dry	1	08/23/2021 11:48 PM	75991
Phenanthrene	ND	0.0503		mg/Kg-dry	1	08/23/2021 11:48 PM	75991
Pyrene	ND	0.0503		mg/Kg-dry	1	08/23/2021 11:48 PM	75991
Internal Quality Control Compounds							
SS: 2-Fluorobiphenyl	80.8	72.1-138		%Rec	1	08/23/2021 11:48 PM	75991
SS: 4-Terphenyl-d14	89.8	45.3-152		%Rec	1	08/23/2021 11:48 PM	75991
SS: Nitrobenzene-d5	92.0	62.6-144		%Rec	1	08/23/2021 11:48 PM	75991
PERCENT MOISTURE		Method: ASTM-D2216-Rev 2005				Analyst: JNG	
Percent Moisture	21	1.0	c	wt%	1	08/19/2021 2:14 PM	R137536

Suburban Laboratories, Inc.
1950 S. Batavia Ave., Suite 150, Geneva, IL 60134 (708) 544-3260

Laboratory Results

Client ID: CWM Company, Inc
Project Name: Marine Bank 2003 - D135 Cantrall

Report Date: August 25, 2021
Workorder: 2108F20

Client Sample ID: SB-17
Lab ID: 2108F20-011
Date Received: 08/13/2021 11:35 AM
Matrix: SOIL
Collection Date: 08/12/2021 3:10 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
VOLATILE ORGANIC COMPOUNDS		Method: EPA-8260B-Rev 2, Dec-96				Analyst: RY	
Benzene	ND	0.0131		mg/Kg-dry	39.6	08/16/2021 6:23 PM	R137370
Ethylbenzene	ND	0.0523		mg/Kg-dry	39.6	08/16/2021 6:23 PM	R137370
m,p-Xylene	ND	0.105		mg/Kg-dry	39.6	08/16/2021 6:23 PM	R137370
Methyl tert-butyl ether	ND	0.0523		mg/Kg-dry	39.6	08/16/2021 6:23 PM	R137370
o-Xylene	ND	0.0523		mg/Kg-dry	39.6	08/16/2021 6:23 PM	R137370
Total Xylenes	ND	0.105		mg/Kg-dry	39.6	08/16/2021 6:23 PM	R137370
Toluene	ND	0.0523		mg/Kg-dry	39.6	08/16/2021 6:23 PM	R137370
Internal Quality Control Compounds							
SS: 4-Bromofluorobenzene	95.3	80-130		%Rec	39.6	08/16/2021 6:23 PM	R137370
SS: Dibromofluoromethane	100	76.1-120		%Rec	39.6	08/16/2021 6:23 PM	R137370
SS: Toluene-d8	97.5	85-115		%Rec	39.6	08/16/2021 6:23 PM	R137370
SEMIVOLATILE ORGANICS, BY GCMS SIM		Method: EPA-8270C-Rev 3, Dec-96				Analyst: NJ	
Acenaphthene	ND	0.0529		mg/Kg-dry	1	08/24/2021 6:01 PM	75991
Acenaphthylene	ND	0.0529		mg/Kg-dry	1	08/24/2021 6:01 PM	75991
Anthracene	ND	0.0529		mg/Kg-dry	1	08/24/2021 6:01 PM	75991
Benzo(a)anthracene	ND	0.0529		mg/Kg-dry	1	08/24/2021 6:01 PM	75991
Benzo(a)pyrene	ND	0.0529		mg/Kg-dry	1	08/24/2021 6:01 PM	75991
Benzo(b)fluoranthene	ND	0.0529		mg/Kg-dry	1	08/24/2021 6:01 PM	75991
Benzo(g,h,i)perylene	ND	0.0529		mg/Kg-dry	1	08/24/2021 6:01 PM	75991
Benzo(k)fluoranthene	ND	0.0529		mg/Kg-dry	1	08/24/2021 6:01 PM	75991
Chrysene	ND	0.0529		mg/Kg-dry	1	08/24/2021 6:01 PM	75991
Dibenzo(a,h)anthracene	ND	0.0529		mg/Kg-dry	1	08/24/2021 6:01 PM	75991
Fluoranthene	ND	0.0529		mg/Kg-dry	1	08/24/2021 6:01 PM	75991
Fluorene	ND	0.0529		mg/Kg-dry	1	08/24/2021 6:01 PM	75991
Indeno(1,2,3-cd)pyrene	ND	0.0529		mg/Kg-dry	1	08/24/2021 6:01 PM	75991
Naphthalene	0.0584	0.0529		mg/Kg-dry	1	08/24/2021 6:01 PM	75991
Phenanthrene	ND	0.0529		mg/Kg-dry	1	08/24/2021 6:01 PM	75991
Pyrene	ND	0.0529		mg/Kg-dry	1	08/24/2021 6:01 PM	75991
Internal Quality Control Compounds							
SS: 2-Fluorobiphenyl	93.7	72.1-138		%Rec	1	08/24/2021 6:01 PM	75991
SS: 4-Terphenyl-d14	85.3	45.3-152		%Rec	1	08/24/2021 6:01 PM	75991
SS: Nitrobenzene-d5	93.3	62.6-144		%Rec	1	08/24/2021 6:01 PM	75991
PERCENT MOISTURE		Method: ASTM-D2216-Rev 2005				Analyst: JNG	
Percent Moisture	24	1.0	c	wt%	1	08/19/2021 2:14 PM	R137536

AUG 2 5 2021

CR

Suburban Laboratories, Inc.
1950 S. Batavia Ave., Suite 150, Geneva, IL 60134 (708) 544-3260

PREP DATES REPORT

Client: CWM Company, Inc
Project: Marine Bank 2003 - D135 Cantrall

Report Date: August 25, 2021
Lab Order: 2108F20

Sample ID	Collection Date	Batch ID	Prep Test Name	TCLP Date	Prep Date
2108F20-001A	8/12/2021 9:40:00 AM	75916	CLOSED SYSTEM P&T VOC Prep		8/17/2021
2108F20-001B		75991	SOLID PREP SONICATION: BNA		8/19/2021
2108F20-002A	8/12/2021 11:20:00 AM	75916	CLOSED SYSTEM P&T VOC Prep		8/17/2021
2108F20-002B		75991	SOLID PREP SONICATION: BNA		8/19/2021
2108F20-003A	8/12/2021 11:30:00 AM	75916	CLOSED SYSTEM P&T VOC Prep		8/17/2021
2108F20-003B		75991	SOLID PREP SONICATION: BNA		8/19/2021
2108F20-004A	8/12/2021 11:40:00 AM	75916	CLOSED SYSTEM P&T VOC Prep		8/17/2021
2108F20-004B		75991	SOLID PREP SONICATION: BNA		8/19/2021
2108F20-005A	8/12/2021 2:05:00 PM	75916	CLOSED SYSTEM P&T VOC Prep		8/17/2021
2108F20-005B		75991	SOLID PREP SONICATION: BNA		8/19/2021
2108F20-006A	8/12/2021 2:15:00 PM	75916	CLOSED SYSTEM P&T VOC Prep		8/17/2021
2108F20-006B		75991	SOLID PREP SONICATION: BNA		8/19/2021
2108F20-007A	8/12/2021 2:25:00 PM	75916	CLOSED SYSTEM P&T VOC Prep		8/17/2021
2108F20-007B		75991	SOLID PREP SONICATION: BNA		8/19/2021
2108F20-008A	8/12/2021 2:35:00 PM	75916	CLOSED SYSTEM P&T VOC Prep		8/17/2021
2108F20-008B		75991	SOLID PREP SONICATION: BNA		8/19/2021
2108F20-009A	8/12/2021 2:45:00 PM	75916	CLOSED SYSTEM P&T VOC Prep		8/17/2021
2108F20-009B		75991	SOLID PREP SONICATION: BNA		8/19/2021
2108F20-010A	8/12/2021 3:00:00 PM	75916	CLOSED SYSTEM P&T VOC Prep		8/17/2021
2108F20-010B		75991	SOLID PREP SONICATION: BNA		8/19/2021
2108F20-011A	8/12/2021 3:10:00 PM	75916	CLOSED SYSTEM P&T VOC Prep		8/17/2021
2108F20-011B		75991	SOLID PREP SONICATION: BNA		8/19/2021

Suburban Laboratories, Inc.
1950 S. Batavia Ave., Suite 150, Geneva, IL 60134 (708) 544-3260

Qualifier Definitions

WO#: **2108F20**
Date: **8/25/2021**

Qualifiers:

*/x	Value exceeds Maximum Contaminant Level
B	Analyte detected in the associated Method Blank
C	Value is below Minimum Concentration Limit
c	Analyte not in SLI scope of accreditation
E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments
H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)
N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit
P	Present
Q	Accreditation is not available from Wisconsin
R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits
T	Analyte detected in sample trip blank
V	EPA requires field analysis/filtration. Lab analysis would be considered past hold time.
WI	This sample was ran at the Wisconsin Laboratory, WI DNR Certified #246179890

SUBURBAN LABORATORIES, Inc.

1950 S. Batavia Ave. Ste. 150 Geneva, IL 60134 Tel. 708.544.3260 login@suburbanlabs.com www.suburbanlabs.com

CHAIN OF CUSTODY RECORD

Company Name: CWM Company, Inc.
Company Address: 701 S. Grand Ave W.
City: Springfield State: IL Zip: 62704
Office / Mobile / Fax: (217) 522-8001 / / 8009
Email Address: cwm@cwmcompany.com
Project ID / Location: Marine Bank 2003-0135 / Cantrall
Project Manager (Report to): Carol Rowe
Sample Collector(s): MJS / KTR

TURNAROUND TIME REQUESTED
[X] Normal [ ] RUSH*
* Must be pre-approved and surcharges apply. Checking this box indicates your approval of surcharges.
Date and Time Report Needed:

Specify Regulatory Program: [ ] None/Info Only
[X] LUST [ ] SRP [ ] SDWA
[ ] 503 Sludge [ ] NPDES [ ] MWRDGC
[ ] Disposal [ ] CCDD [ ] OTHER - Specify Below

ANALYSIS & METHOD REQUESTED
Enter an "X" in box below for request

Page 1 of 1
PO #
Report Type [ ] Normal [ ] Special*
* Additional charges apply for QC reports and raw data. Specify in comments section
Shipping Method

LAB USE ONLY
Work Order # 2108F20
Temperature of Received Samples: 5.4 °C
Received within 24 hours of collection? [ ] No [ ] Yes

	SAMPLE IDENTIFICATION (Use 1 line per container type)	COLLECTION DATE	COLLECTION TIME	MATRIX	GRAB/ COMP.	CONTAINERS Qty	CONTAINERS SIZE & TYPE	PRESERVATIVE	BETX/MTBE	PNAs	Lab Comment	LAB #
1	SB-7	8/12/21	9:40	S	G	3/3	40mL/4oz	MeOH/None	X	X		
2	SB-8		11:20									
3	SB-9		11:30									
4	SB-10		11:40									
5	SB-11		14:05									
6	SB-12		14:15									
7	SB-13		14:25									
8	SB-14		14:35									
9	SB-15		14:45									
10	SB-16		15:00									
11	SB-17	↓	15:10	↓	↓	↓	↓	↓	↓	↓		
12												

MATRIX: Drinking Water (DW), Soil (S), Waste Water (WW), Surface Water(SW), Ground Water (GW), Solid Waste (WA), Sludge (U), Wipe (P) CONTAINER: 2oz, 4oz, 8oz, 40ml Vial, 500ml, Liter (L), Tube, Glass (G), Plastic (P) PRESERVATIVE: H_2SO_4, HCl, HNO_3, Methanol (MeOH) NaOH, Sodium Bisulfate (NaBS), NaThio

COMMENTS & SPECIAL INSTRUCTIONS:

AUG 2 6 2021

1. Relinquished By	Date	2. Relinquished By	Date	3. Relinquished By	Date	4. Relinquished By	Date
	8/13/21		8/13/21				
Received By	Time	Received By	Time	Received By	Time	Received By	Time
[ ] Ice	8	[ ] Ice	11:05	[ ] Ice		[ ] Ice	

THIS FORM MUST BE FILLED OUT COMPLETELY BY THE SAMPLE COLLECTOR OR SUBMITTER AND ORIGINAL FORM MUST ACCOMPANY SAMPLES AT ALL TIMES. Rev 2/17

000157

Illinois Environmental Protection Agency

Bureau of Land • 1021 N. Grand Avenue E. • P.O. Box 19276 • Springfield • Illinois • 62794-9276

The Agency is authorized to require this information under Section 4 and Title XVI of the Environmental Protection Act (415 ILCS 5/4, 5/57 – 57.17). Failure to disclose this information may result in a civil penalty of not to exceed $50,000.00 for the violation and an additional civil penalty of not to exceed $10,000.00 for each day during which the violation continues (415 ILCS 5/42). Any person who knowingly makes a false material statement or representation, orally or in writing, in any label, manifest, record, report, permit, or license, or other document filed, maintained or used for the purpose of compliance with Title XVI commits a Class 4 felony. Any second or subsequent offense after conviction hereunder is a Class 3 felony (415 ILCS 5/44 and 57.17). This form has been approved by the Forms Management Center.

Leaking Underground Storage Tank Program
Laboratory Certification for Chemical Analysis

A. Site Identification

IEMA Incident # (6- or 8-digit): 20030135 IEPA LPC# (10-digit): 1670255005

Site Name: Marine Bank Trust # 53-0051

Site Address (Not a P.O. Box): 9520 State Rt. 29

City: Cantrall, County: Sangamon ZIP Code: 62625

Leaking UST Technical File

B. Sample Collector

I certify that:

1. Appropriate sampling equipment/methods were utilized to obtain representative samples. MJS (Initial)
2. Chain-of-custody procedures were followed in the field. MJS (Initial)
3. Sample integrity was maintained by proper preservation. MJS (Initial)
4. All samples were properly labeled. MJS (Initial)

SEP - 7 2021

BY: RH

C. Laboratory Representative

I certify that:

1. Proper chain-of-custody procedures were followed as documented on the chain-of-custody forms (Initial)
2. Sample integrity was maintained by proper preservation. (Initial)
3. All samples were properly labeled. (Initial)
4. Quality assurance/quality control procedures were established and carried out. (Initial)
5. Sample holding times were not exceeded. (Initial)

6. SW-846 Analytical Laboratory Procedure (USEPA) methods were used for the analyses. (Initial)

7. An accredited lab performed quantitative analysis using test methods identified in 35 IAC 186.180 (for samples collected on or after January 1, 2003). (Initial)

D. Signatures

I hereby affirm that all information contained in this form is true and accurate to the best of my knowledge and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sample Collector

Name Matthew Saladino
Title Environmental Engineer
Company CWM Company, Inc.
Address 701 South Grand Ave. West
City Springfield
State IL
Zip Code 62704
Phone 217-522-8001
Signature
Date 8/27/21

Laboratory Representative

Name Keith Sinon
Title Project Manager
Company Suburban Laboratories, Inc.
Address 1950 S. Batavia Ave., Suite 150
City Geneva
State IL
Zip Code 60134
Phone 708-544-3260
Signature
Date 8/30/21

SEP - 7 2021
BY: KH

SUBURBAN LABORATORIES, Inc.

1950 S. Batavia Ave., Suite 150 Geneva, Illinois 60134
Tel. (708) 544-3260 • Toll Free (800) 783-LABS
Fax (708) 544-8587
www.suburbanlabs.com

September 17, 2021

Carol Rowe
CWM Company, Inc
701 West South Grand
Springfield, IL 62704

TEL: (217) 522-8001
FAX: (217) 522-8009
RE: Marine Bank Trust #53-0051

Workorder: 2109977

Dear Carol Rowe:

Suburban Laboratories, Inc. received 7 sample(s) on 9/10/2021 for the analyses presented in the following report.

All data for the associated quality control (QC) met EPA, method, or internal laboratory specifications except where noted in the case narrative. If you are comparing these results to external QC specifications or compliance limits and have any questions, please contact us.

This final report of laboratory analysis consists of this cover letter, case narrative, analytical report, dates report, and any accompanying documentation including, but not limited to, chain of custody records, raw data, and letters of explanation or reliance. This report may not be reproduced, except in full, without the prior written approval of Suburban Laboratories, Inc.

If you have any questions regarding these test results, please call me at (708) 544-3260.

Sincerely,

Keith Sinon
Project Manager
708-544-3260 ext 212
keith@suburbanlabs.com

Suburban Laboratories, Inc.
1950 S. Batavia Ave., Suite 150, Geneva, IL 60134 (708) 544-3260

Case Narrative

Client: CWM Company, Inc
Project: Marine Bank Trust #53-0051
WorkOrder: 2109977
Temperature of samples upon receipt at SLI: 2 C

Date: September 17, 2021
PO #:
QC Level:
Chain of Custody #:

General Comments:
- All results reported in wet weight unless otherwise indicated. (dry = Dry Weight)
- Sample results relate only to the analytes of interest tested and to sample as received by the laboratory.
- Environmental compliance sample results meet the requirements of 35 IAC Part 186 unless otherwise indicated.
- Waste water analysis follows the rules set forth in 40 CFR part 136 except where otherwise noted.
- Accreditation by the State of Illinois is not an endorsement or a guarantee of the validity of data generated.
- For more information about the laboratories' scope of accreditation, please contact us at (708) 544-3260 or the Agency at (217) 782-6455.
- All radiological results are reported to the 95% confidence level.

Abbreviations:
- Reporting Limit: The concentration at which an analyte can be routinely detected on a day to day basis, and which also meets regulatory and client needs.
- Quantitation Limit: The lowest concentration at which results can be accurately quantitated.
- J: The analyte was positively identified above our Method Detection Limit and is considered detectable and usable; however, the associated numerical value is the approximate concentration of the analyte in the sample.
- ATC: Automatic Temperature Correction. - TNTC: Too Numerous To Count
- TIC: Tentatively Identified Compound (GCMS library search identification, concentration estimated to nearest internal standard).
- SS (Surrogate Standard): Quality control compound added to the sample by the lab.

Method References:
For a complete list of method references please contact us.
- E: USEPA Reference methods
- SW: USEPA, Test Methods for Evaluating Solid Waste (SW-846)
- M: Standard Methods for the Examination of Water and Wastewater
- USP: Latest version of United States Pharmacopeia

Workorder Specific Comments:

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Laboratory Results

Client ID: CWM Company, Inc
Project Name: Marine Bank Trust #53-0051

Report Date: September 17, 2021
Workorder: 2109977

Client Sample ID: MW-1
Lab ID: 2109977-001 **Date Received:** 09/10/2021 11:05 AM

Matrix: GROUNDWATER
Collection Date: 09/07/2021 12:10 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
VOLATILE ORGANIC COMPOUNDS		Method: EPA-SW8260B-Rev 2, Dec-96				Analyst: RY	
Benzene	1.43	0.0100		mg/L	10	09/15/2021 4:10 PM	R138769
Ethylbenzene	0.200	0.0100		mg/L	10	09/15/2021 4:10 PM	R138769
m,p-Xylene	0.306	0.00200		mg/L	1	09/14/2021 4:04 PM	R138706
Methyl tert-butyl ether	0.0136	0.00100		mg/L	1	09/14/2021 4:04 PM	R138706
o-Xylene	0.0254	0.00100		mg/L	1	09/14/2021 4:04 PM	R138706
Total Xylenes	0.331	0.00200		mg/L	1	09/14/2021 4:04 PM	R138706
Toluene	0.0176	0.00100		mg/L	1	09/14/2021 4:04 PM	R138706
Internal Quality Control Compounds							
SS: 4-Bromofluorobenzene	93.9	80-130		%Rec	1	09/14/2021 4:04 PM	R138706
SS: Dibromofluoromethane	95.4	76.1-120		%Rec	1	09/14/2021 4:04 PM	R138706
SS: Toluene-d8	98.3	85-115		%Rec	1	09/14/2021 4:04 PM	R138706
SEMIVOLATILE ORGANICS, BY GCMS SIM		Method: EPA-8270C-Rev 3, Dec-96				Analyst: RHY	
Acenaphthene	0.000216	0.000100		mg/L	1	09/14/2021 7:31 PM	76590
Acenaphthylene	ND	0.000100		mg/L	1	09/14/2021 7:31 PM	76590
Anthracene	ND	0.000100		mg/L	1	09/14/2021 7:31 PM	76590
Benzo(a)anthracene	ND	0.000100		mg/L	1	09/14/2021 7:31 PM	76590
Benzo(a)pyrene	ND	0.000100		mg/L	1	09/14/2021 7:31 PM	76590
Benzo(b)fluoranthene	ND	0.000100		mg/L	1	09/14/2021 7:31 PM	76590
Benzo(g,h,i)perylene	ND	0.000100		mg/L	1	09/14/2021 7:31 PM	76590
Benzo(k)fluoranthene	ND	0.000100		mg/L	1	09/14/2021 7:31 PM	76590
Chrysene	ND	0.000100		mg/L	1	09/14/2021 7:31 PM	76590
Dibenzo(a,h)anthracene	ND	0.000100		mg/L	1	09/14/2021 7:31 PM	76590
Fluoranthene	ND	0.000100		mg/L	1	09/14/2021 7:31 PM	76590
Fluorene	0.000194	0.000100		mg/L	1	09/14/2021 7:31 PM	76590
Indeno(1,2,3-cd)pyrene	ND	0.000100		mg/L	1	09/14/2021 7:31 PM	76590
Naphthalene	0.00621	0.000100		mg/L	1	09/14/2021 7:31 PM	76590
Phenanthrene	ND	0.000100		mg/L	1	09/14/2021 7:31 PM	76590
Pyrene	ND	0.000100		mg/L	1	09/14/2021 7:31 PM	76590
Internal Quality Control Compounds							
SS: 2-Fluorobiphenyl	66.3	26.8-113		%Rec	1	09/14/2021 7:31 PM	76590
SS: 4-Terphenyl-d14	48.5	31.3-152		%Rec	1	09/14/2021 7:31 PM	76590
SS: Nitrobenzene-d5	71.8	13.8-115		%Rec	1	09/14/2021 7:31 PM	76590

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Created: 9/17/2021 5:31:15 PM

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Laboratory Results

Client ID: CWM Company, Inc
Project Name: Marine Bank Trust #53-0051

Report Date: September 17, 2021
Workorder: 2109977

Client Sample ID: MW-2
Lab ID: 2109977-002 **Date Received:** 09/10/2021 11:05 AM

Matrix: GROUNDWATER
Collection Date: 09/07/2021 12:20 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
VOLATILE ORGANIC COMPOUNDS		Method: EPA-SW8260B-Rev 2, Dec-96				Analyst: RY	
Benzene	0.250	0.0100		mg/L	10	09/15/2021 4:36 PM	R138769
Ethylbenzene	0.0400	0.0100		mg/L	10	09/15/2021 4:36 PM	R138769
m,p-Xylene	0.0138	0.00200		mg/L	1	09/14/2021 4:30 PM	R138706
Methyl tert-butyl ether	ND	0.00100		mg/L	1	09/14/2021 4:30 PM	R138706
o-Xylene	0.00100	0.00100		mg/L	1	09/14/2021 4:30 PM	R138706
Total Xylenes	0.0148	0.00200		mg/L	1	09/14/2021 4:30 PM	R138706
Toluene	0.00608	0.00100		mg/L	1	09/14/2021 4:30 PM	R138706
Internal Quality Control Compounds							
SS: 4-Bromofluorobenzene	101	80-130		%Rec	1	09/14/2021 4:30 PM	R138706
SS: Dibromofluoromethane	90.4	76.1-120		%Rec	1	09/14/2021 4:30 PM	R138706
SS: Toluene-d8	92.9	85-115		%Rec	1	09/14/2021 4:30 PM	R138706
SEMIVOLATILE ORGANICS, BY GCMS SIM		Method: EPA-8270C-Rev 3, Dec-96				Analyst: RHY	
Acenaphthene	0.00258	0.000100		mg/L	1	09/14/2021 8:06 PM	76590
Acenaphthylene	0.000328	0.000100		mg/L	1	09/14/2021 8:06 PM	76590
Anthracene	0.000294	0.000100		mg/L	1	09/14/2021 8:06 PM	76590
Benzo(a)anthracene	ND	0.000100		mg/L	1	09/14/2021 8:06 PM	76590
Benzo(a)pyrene	ND	0.000100		mg/L	1	09/14/2021 8:06 PM	76590
Benzo(b)fluoranthene	ND	0.000100		mg/L	1	09/14/2021 8:06 PM	76590
Benzo(g,h,i)perylene	ND	0.000100		mg/L	1	09/14/2021 8:06 PM	76590
Benzo(k)fluoranthene	ND	0.000100		mg/L	1	09/14/2021 8:06 PM	76590
Chrysene	ND	0.000100		mg/L	1	09/14/2021 8:06 PM	76590
Dibenzo(a,h)anthracene	ND	0.000100		mg/L	1	09/14/2021 8:06 PM	76590
Fluoranthene	0.000206	0.000100		mg/L	1	09/14/2021 8:06 PM	76590
Fluorene	0.00258	0.000100		mg/L	1	09/14/2021 8:06 PM	76590
Indeno(1,2,3-cd)pyrene	ND	0.000100		mg/L	1	09/14/2021 8:06 PM	76590
Naphthalene	0.178	0.00500		mg/L	50	09/15/2021 1:11 PM	76590
Phenanthrene	0.00170	0.000100		mg/L	1	09/14/2021 8:06 PM	76590
Pyrene	0.000202	0.000100		mg/L	1	09/14/2021 8:06 PM	76590
Internal Quality Control Compounds							
SS: 2-Fluorobiphenyl	57.8	26.8-113		%Rec	1	09/14/2021 8:06 PM	76590
SS: 4-Terphenyl-d14	35.3	31.3-152		%Rec	1	09/14/2021 8:06 PM	76590
SS: Nitrobenzene-d5	66.5	13.8-115		%Rec	1	09/14/2021 8:06 PM	76590

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Laboratory Results

Client ID: CWM Company, Inc
Project Name: Marine Bank Trust #53-0051

Report Date: September 17, 2021
Workorder: 2109977

Client Sample ID: MW-3
Lab ID: 2109977-003 **Date Received:** 09/10/2021 11:05 AM

Matrix: GROUNDWATER
Collection Date: 09/07/2021 12:30 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
VOLATILE ORGANIC COMPOUNDS		Method: EPA-SW8260B-Rev 2, Dec-96				Analyst: RY	
Benzene	ND	0.00100		mg/L	1	09/14/2021 4:57 PM	R138706
Ethylbenzene	ND	0.00100		mg/L	1	09/14/2021 4:57 PM	R138706
m,p-Xylene	ND	0.00200		mg/L	1	09/14/2021 4:57 PM	R138706
Methyl tert-butyl ether	ND	0.00100		mg/L	1	09/14/2021 4:57 PM	R138706
o-Xylene	ND	0.00100		mg/L	1	09/14/2021 4:57 PM	R138706
Total Xylenes	ND	0.00200		mg/L	1	09/14/2021 4:57 PM	R138706
Toluene	ND	0.00100		mg/L	1	09/14/2021 4:57 PM	R138706
Internal Quality Control Compounds							
SS: 4-Bromofluorobenzene	96.7	80-130		%Rec	1	09/14/2021 4:57 PM	R138706
SS: Dibromofluoromethane	89.1	76.1-120		%Rec	1	09/14/2021 4:57 PM	R138706
SS: Toluene-d8	95.1	85-115		%Rec	1	09/14/2021 4:57 PM	R138706
SEMIVOLATILE ORGANICS, BY GCMS SIM		Method: EPA-8270C-Rev 3, Dec-96				Analyst: RHY	
Acenaphthene	0.0194	0.000581		mg/L	5	09/15/2021 2:59 PM	76590
Acenaphthylene	0.00720	0.000116		mg/L	1	09/14/2021 8:42 PM	76590
Anthracene	0.0141	0.000581		mg/L	5	09/15/2021 2:59 PM	76590
Benzo(a)anthracene	0.00116	0.000116		mg/L	1	09/14/2021 8:42 PM	76590
Benzo(a)pyrene	0.000319	0.000116		mg/L	1	09/14/2021 8:42 PM	76590
Benzo(b)fluoranthene	0.000327	0.000116		mg/L	1	09/14/2021 8:42 PM	76590
Benzo(g,h,i)perylene	0.000268	0.000116		mg/L	1	09/14/2021 8:42 PM	76590
Benzo(k)fluoranthene	0.000140	0.000116		mg/L	1	09/14/2021 8:42 PM	76590
Chrysene	0.00214	0.000116		mg/L	1	09/14/2021 8:42 PM	76590
Dibenzo(a,h)anthracene	ND	0.000116		mg/L	1	09/14/2021 8:42 PM	76590
Fluoranthene	0.00464	0.000116		mg/L	1	09/14/2021 8:42 PM	76590
Fluorene	0.0447	0.000581		mg/L	5	09/15/2021 2:59 PM	76590
Indeno(1,2,3-cd)pyrene	0.000141	0.000116		mg/L	1	09/14/2021 8:42 PM	76590
Naphthalene	0.514	0.0116		mg/L	100	09/15/2021 1:48 PM	76590
Phenanthrene	0.131	0.0116		mg/L	100	09/15/2021 1:48 PM	76590
Pyrene	0.0178	0.000581		mg/L	5	09/15/2021 2:59 PM	76590
Internal Quality Control Compounds							
SS: 2-Fluorobiphenyl	16.7	26.8-113	S	%Rec	1	09/14/2021 8:42 PM	76590
SS: 4-Terphenyl-d14	16.9	31.3-152	S	%Rec	1	09/14/2021 8:42 PM	76590
SS: Nitrobenzene-d5	609	13.8-115	ES	%Rec	1	09/14/2021 8:42 PM	76590

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Laboratory Results

Client ID: CWM Company, Inc
Project Name: Marine Bank Trust #53-0051

Report Date: September 17, 2021
Workorder: 2109977

Client Sample ID: MW-4
Lab ID: 2109977-004 **Date Received:** 09/10/2021 11:05 AM

Matrix: GROUNDWATER
Collection Date: 09/07/2021 12:40 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
VOLATILE ORGANIC COMPOUNDS		Method: EPA-SW8260B-Rev 2, Dec-96				Analyst: RY	
Benzene	ND	0.00100		mg/L	1	09/14/2021 5:23 PM	R138706
Ethylbenzene	0.471	0.0100		mg/L	10	09/15/2021 5:02 PM	R138769
m,p-Xylene	0.0477	0.00200		mg/L	1	09/14/2021 5:23 PM	R138706
Methyl tert-butyl ether	ND	0.00100		mg/L	1	09/14/2021 5:23 PM	R138706
o-Xylene	0.00509	0.00100		mg/L	1	09/14/2021 5:23 PM	R138706
Total Xylenes	0.0528	0.00200		mg/L	1	09/14/2021 5:23 PM	R138706
Toluene	ND	0.00100		mg/L	1	09/14/2021 5:23 PM	R138706
Internal Quality Control Compounds							
SS: 4-Bromofluorobenzene	132	80-130	S	%Rec	1	09/14/2021 5:23 PM	R138706
SS: Dibromofluoromethane	82.8	76.1-120		%Rec	1	09/14/2021 5:23 PM	R138706
SS: Toluene-d8	83.0	85-115	S	%Rec	1	09/14/2021 5:23 PM	R138706
SEMIVOLATILE ORGANICS, BY GCMS SIM		Method: EPA-8270C-Rev 3, Dec-96				Analyst: RHY	
Acenaphthene	0.00451	0.000100		mg/L	1	09/14/2021 9:17 PM	76590
Acenaphthylene	0.00208	0.000100		mg/L	1	09/14/2021 9:17 PM	76590
Anthracene	0.00337	0.000100		mg/L	1	09/14/2021 9:17 PM	76590
Benzo(a)anthracene	0.000607	0.000100		mg/L	1	09/14/2021 9:17 PM	76590
Benzo(a)pyrene	0.000132	0.000100		mg/L	1	09/14/2021 9:17 PM	76590
Benzo(b)fluoranthene	0.000104	0.000100		mg/L	1	09/14/2021 9:17 PM	76590
Benzo(g,h,i)perylene	0.000127	0.000100		mg/L	1	09/14/2021 9:17 PM	76590
Benzo(k)fluoranthene	ND	0.000100		mg/L	1	09/14/2021 9:17 PM	76590
Chrysene	0.000879	0.000100		mg/L	1	09/14/2021 9:17 PM	76590
Dibenzo(a,h)anthracene	ND	0.000100		mg/L	1	09/14/2021 9:17 PM	76590
Fluoranthene	0.00158	0.000100		mg/L	1	09/14/2021 9:17 PM	76590
Fluorene	0.00915	0.000100		mg/L	1	09/14/2021 9:17 PM	76590
Indeno(1,2,3-cd)pyrene	ND	0.000100		mg/L	1	09/14/2021 9:17 PM	76590
Naphthalene	0.179	0.00500		mg/L	50	09/15/2021 3:35 PM	76590
Phenanthrene	0.0314	0.00500		mg/L	50	09/15/2021 3:35 PM	76590
Pyrene	0.00519	0.000100		mg/L	1	09/14/2021 9:17 PM	76590
Internal Quality Control Compounds							
SS: 2-Fluorobiphenyl	35.4	26.8-113		%Rec	1	09/14/2021 9:17 PM	76590
SS: 4-Terphenyl-d14	41.4	31.3-152		%Rec	1	09/14/2021 9:17 PM	76590
SS: Nitrobenzene-d5	160	13.8-115	S	%Rec	1	09/14/2021 9:17 PM	76590

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Laboratory Results

Client ID: CWM Company, Inc
Project Name: Marine Bank Trust #53-0051

Report Date: September 17, 2021
Workorder: 2109977

Client Sample ID: MW-5
Lab ID: 2109977-005 **Date Received:** 09/10/2021 11:05 AM

Matrix: GROUNDWATER
Collection Date: 09/07/2021 12:50 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
VOLATILE ORGANIC COMPOUNDS		Method: EPA-SW8260B-Rev 2, Dec-96				Analyst: RY	
Benzene	ND	0.00100		mg/L	1	09/14/2021 5:49 PM	R138706
Ethylbenzene	0.0122	0.00100		mg/L	1	09/14/2021 5:49 PM	R138706
m,p-Xylene	0.0569	0.00200		mg/L	1	09/14/2021 5:49 PM	R138706
Methyl tert-butyl ether	ND	0.00100		mg/L	1	09/14/2021 5:49 PM	R138706
o-Xylene	ND	0.00100		mg/L	1	09/14/2021 5:49 PM	R138706
Total Xylenes	0.0569	0.00200		mg/L	1	09/14/2021 5:49 PM	R138706
Toluene	ND	0.00100		mg/L	1	09/14/2021 5:49 PM	R138706
Internal Quality Control Compounds							
SS: 4-Bromofluorobenzene	103	80-130		%Rec	1	09/14/2021 5:49 PM	R138706
SS: Dibromofluoromethane	88.8	76.1-120		%Rec	1	09/14/2021 5:49 PM	R138706
SS: Toluene-d8	90.7	85-115		%Rec	1	09/14/2021 5:49 PM	R138706
SEMIVOLATILE ORGANICS, BY GCMS SIM		Method: EPA-8270C-Rev 3, Dec-96				Analyst: RHY	
Acenaphthene	0.00104	0.000100		mg/L	1	09/14/2021 9:53 PM	76590
Acenaphthylene	0.000589	0.000100		mg/L	1	09/14/2021 9:53 PM	76590
Anthracene	0.000718	0.000100		mg/L	1	09/14/2021 9:53 PM	76590
Benzo(a)anthracene	0.000150	0.000100		mg/L	1	09/14/2021 9:53 PM	76590
Benzo(a)pyrene	ND	0.000100		mg/L	1	09/14/2021 9:53 PM	76590
Benzo(b)fluoranthene	ND	0.000100		mg/L	1	09/14/2021 9:53 PM	76590
Benzo(g,h,i)perylene	ND	0.000100		mg/L	1	09/14/2021 9:53 PM	76590
Benzo(k)fluoranthene	ND	0.000100		mg/L	1	09/14/2021 9:53 PM	76590
Chrysene	0.000156	0.000100		mg/L	1	09/14/2021 9:53 PM	76590
Dibenzo(a,h)anthracene	ND	0.000100		mg/L	1	09/14/2021 9:53 PM	76590
Fluoranthene	0.000337	0.000100		mg/L	1	09/14/2021 9:53 PM	76590
Fluorene	0.00202	0.000100		mg/L	1	09/14/2021 9:53 PM	76590
Indeno(1,2,3-cd)pyrene	ND	0.000100		mg/L	1	09/14/2021 9:53 PM	76590
Naphthalene	0.0382	0.00100		mg/L	10	09/15/2021 4:48 PM	76590
Phenanthrene	0.00385	0.000100		mg/L	1	09/14/2021 9:53 PM	76590
Pyrene	0.000825	0.000100		mg/L	1	09/14/2021 9:53 PM	76590
Internal Quality Control Compounds							
SS: 2-Fluorobiphenyl	50.0	26.8-113		%Rec	1	09/14/2021 9:53 PM	76590
SS: 4-Terphenyl-d14	36.8	31.3-152		%Rec	1	09/14/2021 9:53 PM	76590
SS: Nitrobenzene-d5	82.9	13.8-115		%Rec	1	09/14/2021 9:53 PM	76590

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Laboratory Results

Client ID: CWM Company, Inc
Project Name: Marine Bank Trust #53-0051

Report Date: September 17, 2021
Workorder: 2109977

Client Sample ID: MW-9
Lab ID: 2109977-006 **Date Received:** 09/10/2021 11:05 AM

Matrix: GROUNDWATER
Collection Date: 09/07/2021 1:00 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
VOLATILE ORGANIC COMPOUNDS		Method: EPA-SW8260B-Rev 2, Dec-96				Analyst: RY	
Benzene	0.00291	0.00100		mg/L	1	09/14/2021 6:15 PM	R138706
Ethylbenzene	0.0913	0.00100		mg/L	1	09/14/2021 6:15 PM	R138706
m,p-Xylene	0.0730	0.00200		mg/L	1	09/14/2021 6:15 PM	R138706
Methyl tert-butyl ether	ND	0.00100		mg/L	1	09/14/2021 6:15 PM	R138706
o-Xylene	0.0107	0.00100		mg/L	1	09/14/2021 6:15 PM	R138706
Total Xylenes	0.0837	0.00200		mg/L	1	09/14/2021 6:15 PM	R138706
Toluene	0.00604	0.00100		mg/L	1	09/14/2021 6:15 PM	R138706
Internal Quality Control Compounds							
SS: 4-Bromofluorobenzene	94.6	80-130		%Rec	1	09/14/2021 6:15 PM	R138706
SS: Dibromofluoromethane	89.9	76.1-120		%Rec	1	09/14/2021 6:15 PM	R138706
SS: Toluene-d8	94.6	85-115		%Rec	1	09/14/2021 6:15 PM	R138706
SEMIVOLATILE ORGANICS, BY GCMS SIM		Method: EPA-8270C-Rev 3, Dec-96				Analyst: RHY	
Acenaphthene	0.000994	0.000152		mg/L	1	09/14/2021 10:28 PM	76590
Acenaphthylene	0.000368	0.000152		mg/L	1	09/14/2021 10:28 PM	76590
Anthracene	ND	0.000152		mg/L	1	09/14/2021 10:28 PM	76590
Benzo(a)anthracene	ND	0.000152		mg/L	1	09/14/2021 10:28 PM	76590
Benzo(a)pyrene	ND	0.000152		mg/L	1	09/14/2021 10:28 PM	76590
Benzo(b)fluoranthene	ND	0.000152		mg/L	1	09/14/2021 10:28 PM	76590
Benzo(g,h,i)perylene	ND	0.000152		mg/L	1	09/14/2021 10:28 PM	76590
Benzo(k)fluoranthene	ND	0.000152		mg/L	1	09/14/2021 10:28 PM	76590
Chrysene	ND	0.000152		mg/L	1	09/14/2021 10:28 PM	76590
Dibenzo(a,h)anthracene	ND	0.000152		mg/L	1	09/14/2021 10:28 PM	76590
Fluoranthene	ND	0.000152		mg/L	1	09/14/2021 10:28 PM	76590
Fluorene	0.00159	0.000152		mg/L	1	09/14/2021 10:28 PM	76590
Indeno(1,2,3-cd)pyrene	ND	0.000152		mg/L	1	09/14/2021 10:28 PM	76590
Naphthalene	0.0935	0.00152		mg/L	10	09/15/2021 5:24 PM	76590
Phenanthrene	0.00156	0.000152		mg/L	1	09/14/2021 10:28 PM	76590
Pyrene	0.000168	0.000152		mg/L	1	09/14/2021 10:28 PM	76590
Internal Quality Control Compounds							
SS: 2-Fluorobiphenyl	48.0	26.8-113		%Rec	1	09/14/2021 10:28 PM	76590
SS: 4-Terphenyl-d14	18.2	31.3-152	S	%Rec	1	09/14/2021 10:28 PM	76590
SS: Nitrobenzene-d5	68.8	13.8-115		%Rec	1	09/14/2021 10:28 PM	76590

SEP 21 2021

Suburban Laboratories, Inc.
1950 S. Batavia Ave., Suite 150, Geneva, IL 60134 (708) 544-3260

Laboratory Results

Client ID: CWM Company, Inc
Project Name: Marine Bank Trust #53-0051

Report Date: September 17, 2021
Workorder: 2109977

Client Sample ID: MW-14
Lab ID: 2109977-007 **Date Received:** 09/10/2021 11:05 AM

Matrix: GROUNDWATER
Collection Date: 09/07/2021 1:15 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
VOLATILE ORGANIC COMPOUNDS		Method: EPA-SW8260B-Rev 2, Dec-96				Analyst: RY	
Benzene	0.264	0.0100		mg/L	10	09/15/2021 5:28 PM	R138769
Ethylbenzene	0.00912	0.00100		mg/L	1	09/14/2021 6:41 PM	R138706
m,p-Xylene	0.00592	0.00200		mg/L	1	09/14/2021 6:41 PM	R138706
Methyl tert-butyl ether	0.0167	0.00100		mg/L	1	09/14/2021 6:41 PM	R138706
o-Xylene	ND	0.00100		mg/L	1	09/14/2021 6:41 PM	R138706
Total Xylenes	0.00592	0.00200		mg/L	1	09/14/2021 6:41 PM	R138706
Toluene	0.00374	0.00100		mg/L	1	09/14/2021 6:41 PM	R138706
Internal Quality Control Compounds							
SS: 4-Bromofluorobenzene	93.9	80-130		%Rec	1	09/14/2021 6:41 PM	R138706
SS: Dibromofluoromethane	92.8	76.1-120		%Rec	1	09/14/2021 6:41 PM	R138706
SS: Toluene-d8	97.9	85-115		%Rec	1	09/14/2021 6:41 PM	R138706
SEMIVOLATILE ORGANICS, BY GCMS SIM		Method: EPA-8270C-Rev 3, Dec-96				Analyst: RHY	
Acenaphthene	ND	0.000100		mg/L	1	09/14/2021 11:04 PM	76590
Acenaphthylene	ND	0.000100		mg/L	1	09/14/2021 11:04 PM	76590
Anthracene	ND	0.000100		mg/L	1	09/14/2021 11:04 PM	76590
Benzo(a)anthracene	ND	0.000100		mg/L	1	09/14/2021 11:04 PM	76590
Benzo(a)pyrene	ND	0.000100		mg/L	1	09/14/2021 11:04 PM	76590
Benzo(b)fluoranthene	ND	0.000100		mg/L	1	09/14/2021 11:04 PM	76590
Benzo(g,h,i)perylene	ND	0.000100		mg/L	1	09/14/2021 11:04 PM	76590
Benzo(k)fluoranthene	ND	0.000100		mg/L	1	09/14/2021 11:04 PM	76590
Chrysene	ND	0.000100		mg/L	1	09/14/2021 11:04 PM	76590
Dibenzo(a,h)anthracene	ND	0.000100		mg/L	1	09/14/2021 11:04 PM	76590
Fluoranthene	ND	0.000100		mg/L	1	09/14/2021 11:04 PM	76590
Fluorene	ND	0.000100		mg/L	1	09/14/2021 11:04 PM	76590
Indeno(1,2,3-cd)pyrene	ND	0.000100		mg/L	1	09/14/2021 11:04 PM	76590
Naphthalene	0.00167	0.000100		mg/L	1	09/14/2021 11:04 PM	76590
Phenanthrene	ND	0.000100		mg/L	1	09/14/2021 11:04 PM	76590
Pyrene	ND	0.000100		mg/L	1	09/14/2021 11:04 PM	76590
Internal Quality Control Compounds							
SS: 2-Fluorobiphenyl	54.9	26.8-113		%Rec	1	09/14/2021 11:04 PM	76590
SS: 4-Terphenyl-d14	37.3	31.3-152		%Rec	1	09/14/2021 11:04 PM	76590
SS: Nitrobenzene-d5	51.4	13.8-115		%Rec	1	09/14/2021 11:04 PM	76590

SEP 21 2021

Suburban Laboratories, Inc.
1950 S. Batavia Ave., Suite 150, Geneva, IL 60134 (708) 544-3260

PREP DATES REPORT

Client: CWM Company, Inc
Project: Marine Bank Trust #53-0051

Report Date: September 17, 2021
Lab Order: 2109977

Sample ID	Collection Date	Batch ID	Prep Test Name	TCLP Date	Prep Date
2109977-001B	9/7/2021 12:10:00 PM	76590	AQUEOUS PREP SEP FUNNEL: BNA		9/14/2021
2109977-002B	9/7/2021 12:20:00 PM	76590	AQUEOUS PREP SEP FUNNEL: BNA		9/14/2021
2109977-003B	9/7/2021 12:30:00 PM	76590	AQUEOUS PREP SEP FUNNEL: BNA		9/14/2021
2109977-004B	9/7/2021 12:40:00 PM	76590	AQUEOUS PREP SEP FUNNEL: BNA		9/14/2021
2109977-005B	9/7/2021 12:50:00 PM	76590	AQUEOUS PREP SEP FUNNEL: BNA		9/14/2021
2109977-006B	9/7/2021 1:00:00 PM	76590	AQUEOUS PREP SEP FUNNEL: BNA		9/14/2021
2109977-007B	9/7/2021 1:15:00 PM	76590	AQUEOUS PREP SEP FUNNEL: BNA		9/14/2021

SEP 2 1 2021
BY: CR

Suburban Laboratories, Inc.
1950 S. Batavia Ave., Suite 150, Geneva, IL 60134 (708) 544-3260

Qualifier Definitions

WO#: **2109977**
Date: **9/17/2021**

Qualifiers:

*/x	Value exceeds Maximum Contaminant Level
B	Analyte detected in the associated Method Blank
C	Value is below Minimum Concentration Limit
c	Analyte not in SLI scope of accreditation
E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments
H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)
N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit
P	Present
Q	Accreditation is not available from Wisconsin
R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits
T	Analyte detected in sample trip blank
V	EPA requires field analysis/filtration. Lab analysis would be considered past hold time.
WI	This sample was ran at the Wisconsin Laboratory, WI DNR Certified #246179890

SUBURBAN LABORATORIES, Inc.

1950 S. Batavia Ave. Ste. 150 Geneva, IL 60134 Tel. 708.544.3260 login@suburbanlabs.com www.suburbanlabs.com

CHAIN OF CUSTODY RECORD

Company Name: CWM Co, Inc.
Company Address: 701 W. South Grand Ave.
City: Springfield State: IL Zip: 62704
Office: 217-522-8001 Mobile: / Fax: 8009
Email Address: CWM@CWMCompany.com
Project ID / Location: Morine Bank Trust #55-0051
Project Manager (Report to): Carol L. Rowe
Sample Collector(s): KTR / JKK

TURNAROUND TIME REQUESTED
[X] Normal [ ] RUSH*
* Must be pre-approved and surcharges apply. Checking this box indicates your approval of surcharges.
Date and Time Report Needed:

Specify Regulatory Program: [ ] None/Info Only
[X] LUST [ ] SRP [ ] SDWA
[ ] 503 Sludge [ ] NPDES [ ] MWRDGC
[ ] Disposal [ ] CCDD [ ] OTHER - Specify Below

ANALYSIS & METHOD REQUESTED
Enter an "X" in box below for request

	SAMPLE IDENTIFICATION (Use 1 line per container type)	COLLECTION DATE	COLLECTION TIME	MATRIX	GRAB/ COMP.	CONTAINERS Qty	CONTAINERS SIZE & TYPE	PRESERVATIVE	BETX	MTBE	PNAs
1	MW-1	9-7-21	12:10	GW	Grab	1/3	Liter / 40ml	NA / HCl	X	X	X
2	MW-2		12:20								
3	MW-3		12:30								
4	MW-4		12:40								
5	MW-5		12:50								
6	MW-9		13:00								
7	MW-14		13:15								
8											
9											
10											
11											
12											

Page 1 of 1
PO #
Report Type: [X] Normal [ ] Special*
* Additional charges apply for QC reports and raw data. Specify in comments section
Shipping Method

LAB USE ONLY
Work Order # 2109977
Temperature of Received Samples: 2.3 °C
Received within 24 hours of collection? [ ] No [ ] Yes

Lab Comment	LAB #

MATRIX: Drinking Water (DW), Soil (S), Waste Water (WW), Surface Water(SW), Ground Water (GW), Solid Waste (WA), Sludge (U), Wipe (P) CONTAINER: 2oz, 4oz, 8oz, 40ml Vial, 500ml, Liter (L), Tube, Glass (G), Plastic (P) PRESERVATIVE: H_2SO_4, HCl, HNO_3, Methanol (MeOH) NaOH, Sodium Bisulfate (NaS), NaThio

COMMENTS & SPECIAL INSTRUCTIONS:

SEP 2 1 2021
CR

1. Relinquished By	Date	2. Relinquished By	Date	3. Relinquished By	Date	4. Relinquished By	Date
	9/10/21		9-10-21				
Received By [X] Ice	Time 8:00	Received By	Time 17:55	Received By [ ] Ice	Time	Received By [ ] Ice	Time

THIS FORM MUST BE FILLED OUT COMPLETELY BY THE SAMPLE COLLECTOR OR SUBMITTER AND ORIGINAL FORM MUST ACCOMPANY SAMPLES AT ALL TIMES. Rev 2/17

000171

Illinois Environmental Protection Agency

Bureau of Land • 1021 N. Grand Avenue E. • P.O. Box 19276 • Springfield • Illinois • 62794-9276

The Agency is authorized to require this information under Section 4 and Title XVI of the Environmental Protection Act (415 ILCS 5/4, 5/57 – 57.17). Failure to disclose this information may result in a civil penalty of not to exceed $50,000.00 for the violation and an additional civil penalty of not to exceed $10,000.00 for each day during which the violation continues (415 ILCS 5/42). Any person who knowingly makes a false material statement or representation, orally or in writing, in any label, manifest, record, report, permit, or license, or other document filed, maintained or used for the purpose of compliance with Title XVI commits a Class 4 felony. Any second or subsequent offense after conviction hereunder is a Class 3 felony (415 ILCS 5/44 and 57.17). This form has been approved by the Forms Management Center.

Leaking Underground Storage Tank Program
Laboratory Certification for Chemical Analysis

A. Site Identification

IEMA Incident # (6- or 8-digit): 20030135 IEPA LPC# (10-digit): 1670255005

Site Name: Marine Bank Trust # 53-0051

Site Address (Not a P.O. Box): 9520 State Rt. 29

City: Cantrall County: Sangamon ZIP Code: 62625

Leaking UST Technical File

B. Sample Collector

I certify that:

1. Appropriate sampling equipment/methods were utilized to obtain representative samples. JKK (Initial)
2. Chain-of-custody procedures were followed in the field. JKK (Initial)
3. Sample integrity was maintained by proper preservation. JKK (Initial)
4. All samples were properly labeled. JKK (Initial)

RECEIVED OCT 01 2021 EZ: RT

C. Laboratory Representative

I certify that:

1. Proper chain-of-custody procedures were followed as documented on the chain-of-custody forms (Initial)
2. Sample integrity was maintained by proper preservation. (Initial)
3. All samples were properly labeled. (Initial)
4. Quality assurance/quality control procedures were established and carried out. (Initial)
5. Sample holding times were not exceeded. (Initial)

6. SW-846 Analytical Laboratory Procedure (USEPA) methods were used for the analyses. (Initial)

7. An accredited lab performed quantitative analysis using test methods identified in 35 IAC 186.180 (for samples collected on or after January 1, 2003). (Initial)

D. Signatures

I hereby affirm that all information contained in this form is true and accurate to the best of my knowledge and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sample Collector

Name John Kuta
Title Project Manager
Company CWM Company, Inc.
Address 701 South Grand Ave. West
City Springfield
State IL
Zip Code 62704
Phone 217-522-8001
Signature John Kuta
Date 9-7-21

Laboratory Representative

Name Keith Sinon
Title Project Manager
Company Suburban Laboratories, Inc.
Address 1950 S. Batavia Ave., Suite 150
City Geneva
State IL
Zip Code 60134
Phone 708-544-3260
Signature
Date 9/28/21

[illegible] 2021
BY: RH

APPENDIX H

PLA DOCUMENTATION

CORRECTIVE ACTION PLAN AND BUDGET AMENDMENT

MARINE BANK TRUST # 53-0051
CANTRALL, ILLINOIS

Project Labor Agreement Form.

The purpose of this form is to provide information with regard to Project Labor Agreement criteria.

Project Labor Agreements potentially apply under the following circumstances: (a) approval is requested of a Corrective Action Plan; (b) the plan involves field work activities; (c) the field work activities would be performed by a subcontractor (as opposed to the consultant); (d) an approval letter would be issued by the Illinois EPA on or after July 25, 2013; and (e) reimbursement would be sought from the Illinois Underground Storage Tank Fund. Project Labor Agreement determinations are required by Section 57.7(c)(3) of the Illinois Environmental Protection Act.

The field work activities which are proposed in the Corrective Action Plan (Advancement of soil borings and collection of soil samples) may potentially be subject to the use of a Project Labor Agreement.

Please answer the following questions either "yes" or "no", and please discuss the basis for each answer:

1. Will the use of a Project Labor Agreement advance the state's interest in reducing project costs paid from the Illinois Underground Storage Tank Fund?

   ☐ Yes ☒ No

   Discussion:
   The original intent of PLAs was for large scale construction projects. These projects would include multiple trades working together or in conjunction with one another and could make disputes between parties a potential liability as the project might last a few years. However, LUST sites differ in that one to two trades are typically necessary to complete the work. The "teams" that work together on hazardous sites, such as LUST sites, train together and develop cohesive relationships. Only a handful of workers are necessary to conduct the work; jurisdictional disputes are non-existent as the parties work in harmony.

   Further, the number of trades on this work is minimal as well; the work will be done by separate contractors without a mix of union and non-unionized work force. The site's small project will easily more than double the cost of the project with a PLA required, contradicting the idea to minimize site remediation cost.

2. Will the use of a Project Labor Agreement advance the state's interest in efficiency, timeliness, and quality of project work, based upon the overall size, scope, complexity, and remediation objectives of the project?

   ☐ Yes ☒ No

   Discussion:
   PLAs were first used in Illinois for large scale, large cost, and long duration highway development projects. All LUST work, no matter size or scope, is deemed small in comparative size to work normally prescribed a PLA. Collective bargaining agreements are unneeded as the number of facets required for any work does not reach a quantity warranting these agreements.

   Specifically, the Marine Bank Trust # 53-0051 site in Cantrall, Illinois requires a minimal amount of work to be completed during the corrective action stage. Drilling soil borings and collection of soil and vapor samples comprise the entirety of this proposed plan. This should take no more than a day.

3. Does the project present safety concerns, including but not limited to the threat to human health and the environment? Will the use of a Project Labor Agreement advance the state's interest in promoting safety?

   ☐ Yes ☒ No

   Discussion:
   LUST sites do not typically involve working within roadways unless the Corrective Action is within rights-of-way, on ingress / egress creates roadway issues which is not commonplace. Specifically, the Marine Bank Trust # 53-0051 site in Cantrall, Illinois is located on a moderately traveled road. Drilling activities should take no more than a day and therefore the length of time that safety of the traveling public as an issue is null. As for safety, consultants co-train teams in OSHA HAZWOPER to ensure not only worker safety, but safety for those who may enter or be near the work environment.

4. Will the use of a Project Labor Agreement advance the state's interest in labor continuity and stability in completing the project work in accordance with the plan approved by the Illinois EPA?

☐ Yes ☒ No

Discussion:
The timetable for the work to be performed at the Marine Bank Trust # 53-0051 site is no more than a day; not exceeding or coming remotely close to 110 days in duration. On a scale of a day, labor force continuity and stability does not arise as an issue to complete the project as it does not span the duration of collective bargaining agreements. Simply put, the scale of time and scope of work is so small that a labor agreement would not expire, causing workers to walk out of the job.

5. Will the use of a Project Labor Agreement advance the state's interest in performance of the project work by a skilled labor force, thereby achieving the remediation objectives of the project?

☐ Yes ☒ No

Discussion:
Attracting workers from a union hall for non-sequential days of work puts them at a disadvantage for the bulk of the time, and is not an enticing option to union workers. Simply put, small LUST projects are not going to attract the workforce that would conduct "efficient" and "safe" work. A PLA, then, does not guarantee skilled workers.

Because of the small scope of work, the bidding process would significantly increase the cost of activities at the Marine Bank Trust # 53-0051 site in Cantrall, Illinois. This would only increase the hardship of the owner and solely be detrimental to the efficiency of the project, which is the opposite of the objective put in place to push the project along towards closure.

6. Will the use of a Project Labor Agreement provide timely completion of the project work, thereby reducing the threat to human health and the environment that would result from delays in achieving the remediation objectives?

☐ Yes ☒ No

Discussion:
With only its consultant and local contractors present at the Marine Bank Trust # 53-0051 site during the "construction event", which will last a day, there are not multiple trades with closely or paralleled functions to create a work stoppage. The work will be completed within a day for the drilling soil borings and collection of soil samples.

7. Will the use of a Project Labor Agreement advance the state's interest of advancing minority owned and women owned businesses and minority and female employment?

☐ Yes ☒ No

Discussion:
By applying a PLA to a project, the Agency may in fact directly negate one of its primary objectives, as stated to advance disadvantaged businesses. The Agency has provided no basis or discussion as to how the PLA will actually increase WBE participation. We believe that the opposite effect will occur.

Furthermore, IEPA correspondence approving PLAs for various projects states that a "PLA will advance the State's interest of advancing minority-owned and women-owned business and minority and female employment". A PLA only requires that if a minority or woman employee or business is used for the project, then additional reports are required. In the competitive bidding process, it is unlikely that all bidders are female or minority; or it is far-fetched to think that all one-day construction projects with one to two workers will have either a female or minority represented in the workforce on site. There are no incentives to entice disadvantaged business participation.

In this instance, the box should not be checked if there are no incentives to hire minority workers, for example, the apprenticeship program offers $10.00/hour back to prime contractors when minority participation is required. Use of this screening criteria needs understood and not used loosely. If in fact any disadvantaged businesses are utilized under a PLA, their reporting costs are increased, increasing the project costs.

SCREENING CRITERIA

With the lack of detailed screening criteria from the IEPA for deciding which projects require the use of a PLA, CW³M has followed screening criteria that IDOT uses for government funded programs in their department as that State Agency follows the executive orders of Illinois Governors Blagojevich and Quinn, and President Obama. Attached at the end of this appendix is a copy of the IDOT PLA Determination screening criteria and it lists twelve seemingly ubiquitous standards used to determine the applicability of PLA for construction projects. It has been included for your reference but will be used herein as a systematic way to show how each criterion has been evaluated for applicability for 'yes/no' answers and whether or not the use of a PLA should be considered. CW³M recognizes that these standards may not be the same standards IEPA uses to determine the applicability of PLA for LUST sites, but IEPA correspondence issuing PLA for various sites appears to have very closely matched various IDOT screening criterion as determined in LUST Incidents 2002-0851, 2006-0366, 2009-1397, 2009-0202, 2009-0203, 2011-0859, 2012-0382, 2012-0695, 2013-0906, and 2013-1123.

1. *The project is being awarded and administered by a governmentally funded program.*

   The "project" is privately contracted, a similar means as when a party secures legal counsel and other services. A contract is in place between a private company or citizen and a consultant or contractor who may also serve as a general contractor. That consultant will interface with governmental agencies on their behalf. They will submit claims for reimbursement after the completion of work, budgets and plan approval, and review of claims. The LUST Fund is a motor fuel tax collected by petroleum distributors, for reimbursement of LUST claims managed by the IEPA, so the answer to this question is "no". The IEPA administers the LUST Program to process claims and review technical plans and budgets not to award or administer the actual work done. As indicated on the PLA documents, the prime contractor is to secure the PLA. There is no "award" or "payment guarantee".

2. *The project is being constructed using state or local funds.*

   The project is constructed using private funds, which ultimately may or may not be reimbursed with state funds. The current rates that the IEPA grants for LUST work have not been modified to reflect the recent changes regarding mandated payment of prevailing wages. That disport is placed on the owner/operator and their contractors. UST owners/operators collect sales tax into the LUST Fund for reimbursement of remediation work; thus, it is no longer a clear "yes" answer and the owner/operator pays

a deductible and is then reimbursed for "eligible" costs. The legislative intent of Public Act was for the IPCB to remedy rates to pay prevailing wages and rectify costs of PLAs and attorney fees.

3. *The overall size, scope, sequencing, logistics, or other aspects of the project make it particularly challenging to manage, and use of a PLA is expected to help assure that the construction work is performed properly and efficiently under the circumstances.*

As stated, PLAs were first used in Illinois for large scale, large cost, and long duration highway development projects. All LUST work, no matter size or scope, is deemed small in comparative size to work normally prescribed a PLA, therefore disqualifying it from any PLA consideration. Collective bargaining agreements are unneeded as the number of facets required for any work does not reach a quantity warranting these agreements.

Specifically, the Marine Bank Trust # 53-0051 site in Cantrall, Illinois requires a minimal amount of work to be completed during the corrective action stage. Drilling of soil boings and collecting soil and gas-vapor samples comprise the entirety of this proposed plan. This can and will be done in a day.

4. *The duration of construction activity on the project is expected to exceed one construction season (110 or more working days), or the nature of the project results in a heightened need for labor force continuity and stability over a substantial period of time.*

The timetable for the work to be performed at the Marine Bank Trust # 53-0051 site is no more than a day; not exceeding or coming remotely close to 110 days in duration. On a scale of a day, labor force continuity and stability does not arise as an issue to complete the project as it does not span the duration of collective bargaining agreements. Simply put, the scale of time and scope of work is so small that a labor agreement would not expire, causing workers to walk out of the job.

5. *There is a firm construction completion date established for the project thereby increasing the adverse consequences of any work stoppage or other labor disruption.*

It is on the discretion of the consultant as to how quickly a plan is implemented once it is approved. With the Agency having 120 days to approve, modify, or deny a plan, consultants cannot pre-plan or schedule the work until approved. Once approved, they

coordinate with owners/operators and any subcontractors necessary with weather contingencies. Therefore, adverse consequences of labor disruptions or work stoppage are non-existent on a job that lasts a few hours to a day for corrective action for actual remediation to complete. Many contractors can perform remediation services in-house or from a pool of reliable subcontractors, with easily adjustable start dates; however, it is fiscally advantageous for the consultant to complete the work as quickly as possible with fewer workers.

The norm on small projects like this is to solicit contractors who provide estimates as to how much the cost to complete each individual task after the contract is awarded. Because this process cannot be completed, prices will ultimately change and push the project into being "stuck" as the costs cannot be met.

6. *The time required to complete the project is expected to extend beyond the expiration date of one or more existing collective bargaining agreements covering trades likely to be involved in the project, thereby increasing the likelihood of work stoppages or other labor disruptions during construction of the project.*

With only its consultant and local contractors present at the Marine Bank Trust # 53-0051 site during the "construction event", which will last a day, there are not multiple trades with closely or paralleled functions to create a work stoppage. The time required to complete the project will in no way come close to extending beyond the expiration of any existing collective bargaining agreements covering any of the trades.

7. *In the absence of a PLA, there is an increased likelihood of jurisdictional disputes among unions or of conflict between unionized and non-unionized workers on the project that could have a potentially material adverse effect on the time, cost, or quality of work performed on the project.*

As stated, the original intent of PLAs was for large scale construction projects. These projects would include multiple trades working together or in conjunction with one another and could make disputes between parties a potential liability as the project might last a few years. However, LUST sites differ in that one to two trades are typically necessary to complete the work. The "teams" that work together on hazardous sites, such as LUST sites, train together and develop cohesive relationships. Only a handful of workers are necessary to conduct the work; jurisdictional disputes are non-existent as the parties work in harmony.

Further, the number of trades on this work is minimal as well; the work will be done by separate contractors without a mix of union and non-unionized work force.

8. *The project presents specific safety concerns to the travelling public and a PLA will ensure labor force continuity and stability, decreasing the length of the safety concern.*

   LUST sites do not typically involve roads unless the Corrective Action is within rights-of-way, on ingress / egress creates roadway issues which is not commonplace. Specifically, the Marine Bank Trust # 53-0051 site in Cantrall, Illinois is located on a moderately traveled road to one site, but the work will be conducted on the property. As stated, construction activities will take day and therefore the length of time that safety of the traveling public as an issue is null. As for safety, consultants co-train teams in OSHA HAZWOPER to ensure not only worker safety, but safety for those who may enter or be near the work environment.

9. *Use of the PLA is expected to result in improved access to skilled labor, improved efficiency, or improved safety performance on the project.*

   Attracting workers from a union hall for only a day to a partial day of work puts them at a disadvantage for the bulk of the time, and is not an enticing option to union workers. Simply put, small LUST projects are not going to attract the workforce that would conduct "efficient" and "safe" work. A PLA, then, does not guarantee skilled workers.

   Because of the small scope of work, the bidding process would significantly increase the cost of activities at the Marine Bank Trust # 53-0051 site in Cantrall, Illinois. This would only increase the hardship of the owner and solely be detrimental to the efficiency of the project, which is the opposite of the objective put in place to push the project along towards closure.

10. *Use of the PLA on the project is not expected to have a material adverse effect on the competitive bidding process.*

    The use of a PLA on the project does have a material adverse effect on bidding, financing and completion of the project. The contract award process takes place long before the work or construction ever begins. As stated, budgets are approved or modified at the discretion of the IEPA Project Managers and pre-approved IEPA rates. Competitive bidding is an option when work cannot be performed at the Agency's approved rates.

The key factor here is financing. No owner can afford to pay cash for work that is bid on that they would pay double, wait months or even years to get paid for nominal handling charges, no payment guarantee (below what contractors outside of LUST get paid), and be responsible for the extra business costs of the PLA. They are not banks and NATLUST realized very quickly that having an approved budget meant nothing for security of payment, folded its tent, leaving owner/operators no other option than to pay or let contractors carry the burden. The legislative intent was to adjust the rates paid every day to the mandated prevailing wage rate and make the use of PLA's limited in scope.

11. *Use of a PLA on the project is not expected to have an adverse material effect on the ability of the Department to achieve other Departmental goals, (e.g. utilization of disadvantaged business, utilization of Illinois domiciled businesses, development of competitive vendor alternatives over time, etc.).*

By applying a PLA to a project, the Agency may in fact directly negate one of its primary objectives, as stated to advance disadvantaged businesses. The Agency has provided no basis or discussion as to how the PLA will actually increase WBE participation. We believe that the opposite effect will occur.

Furthermore, IEPA correspondence approving PLAs for various projects states that a "PLA will advance the State's interest of advancing minority-owned and women-owned business and minority and female employment". A PLA only requires that if a minority or woman employee or business is used for the project, then additional reports are required. In the competitive bidding process, it is unlikely that all bidders are female or minority; or it is far-fetched to think that all day construction projects with one to two workers will have either a female or minority represented in the workforce on site. There are no incentives to entice disadvantaged business participation.

In this instance, the box should not be checked if there are no incentives to hire minority workers, for example, the apprenticeship program offers $10.00/hour back to prime contractors when minority participation is required. Use of this screening criteria needs understood and not used loosely. If in fact any disadvantaged businesses are utilized under a PLA, their reporting costs are increased, increasing the project costs.

12. *There are other material considerations favoring or disfavoring use of a PLA on this project as follows:*

- The total cost for current corrective action field activities involving skilled labor totals an estimated $ 1,690.83 for drilling soil borings, not warranting a PLA in any program.

- The site's small project will easily increase the cost of the project with a PLA required, contradicting the idea to minimize site remediation cost.

- No reason was given by the IEPA for the implementation of a PLA on what may and should be the final step to gain closure on site; this will only further delay the goal of the Agency: closing the project, which the client is eager to finish.

- The common goal of the Agency and owner/operators is closure. A PLA on an extremely small plan will delay or indefinitely stall closure when closure is within the grasp of all parties involved.

Contract Number
County

IDOT PROJECT LABOR AGREEMENT DETERMINATION

To:

From:

Date:

Re:

In accordance with Executive Order 2003-13 (Blagojevich), it is recommended that a project labor agreement (PLA) be utilized for the above-captioned Project. This recommendation is based on the considerations indicated below.

1) The Project is being awarded and administered by IDOT (i.e., not by another governmental agency).

2) The Project is being constructed using state or local funds only (i.e., no federal funds).

3) The overall size, scope, sequencing, logistics or other aspects of the Project make it particularly challenging to manage, and use of a PLA is expected to help assure that the construction work is performed properly and efficiently under the circumstances.

4) The duration of construction activity on the Project is expected to exceed one construction season (i.e., 110 or more working days), or the nature of the Project results in a heightened need for labor force continuity and stability over a substantial period of time.

5) There is a firm construction completion date established for the Project thereby increasing the adverse consequences of any work stoppage or other labor disruption.

6) The time required to complete the Project is expected to extend beyond the expiration date of one or more existing collective bargaining agreements covering trades likely to be involved in the Project, thereby increasing the likelihood of work stoppage(s) or other labor disruption(s) during construction of the Project.

7) In the absence of a PLA, there is an increased likelihood of jurisdictional disputes among unions or of conflict between unionized and non-unionized workers on the Project that could have a potentially material adverse effect on the time, cost, or quality of work performed on the Project.

Contract Number
County

8) This project presents specific safety concerns to the traveling public and a PLA, will ensure labor force continuity and stability, decreasing the length of the safety concern.

9) Use of a PLA is expected to result in improved access to skilled labor, improved efficiency, or improved safety performance on the Project.

10) Use of a PLA on the Project is not expected to have a material adverse effect on the competitive bidding process.

11) Use of a PLA on the Project is not expected to have a material adverse effect on the ability of the Department to achieve other Departmental goals (e.g., utilization of disadvantaged businesses, utilization of Illinois domiciled businesses, development of competitive vendor alternatives over time, etc.).

12) There are other material considerations favoring or disfavoring use of a PLA on this Project as follows:

_____

_____

_____

Based upon the identified considerations, we recommend that you approve use of a PLA on this Project. Upon your approval, the Department shall undertake to negotiate in good faith a PLA with the relevant labor organization(s), and shall include in all necessary bid specifications and other documents information regarding the actual or form of PLA that is binding upon all contractors and their employees.

Agreed: _____
{Division Chief} (Date)

Agreed: _____
{Bureau of Design & Environment} (Date)

Agreed: _____
{Regional Engineer} (Date)

Approved: _____
Gary Hannig, Secretary (Date)

FHWA concurrence in the PLA for the above mentioned contract.

_____
Division Administrator FHWA (Date)

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

Ann L. Schneider, Secretary

PROJECT LABOR AGREEMENTS

Illinois Department of Transportation

Revised 01/01/13

TABLE OF CONTENTS

STATE OF ILLINOIS
PROJECT LABOR AGREEMENTS

- **Definition of (Project Labor Agreement)** – A Project Labor Agreement is a comprehensive pre-hire collective bargaining agreement that is negotiated between a project's owner (a state for example) and an appropriate labor organization (an area or state building and construction trades council) which sets out the basic terms and work conditions for that particular project.

- **Intent of a Project Labor Agreement** – A Project Labor Agreement's intent is to ensure the efficient, timely and most cost-effective completion of a construction project.

- **General Provisions Contained in a Project Labor Agreement**

  - A skilled and trained workforce is available through the craft's hiring halls.
  - Work schedules and general terms for labor are made uniform among the crafts.
  - Monthly meetings established throughout the project with the trade unions and contractors to help coordinate manpower and settle disputes.
  - Dispute resolution procedures are put into place addressing contractual and jurisdictional disputes.
  - Ensures a timely completion of the project with no work stoppages.
  - Levels the playing field for potential bidders.
  - Prevailing wage laws are applied to wage rates and fringe benefits.

- **History of the Project Labor Agreement** – Project Labor Agreements (PLAs) have a long history of use in the construction industry dating back before World War II. PLAs have been used on federal construction projects since the 1930s. Some examples include the Grand Coulee Dam 1937-1938, Kennedy Space Center and Nuclear missile sites.

  In February of 1993, President Clinton signed Executive Order 12836, which revoked Executive Order 12818 issued in October of 1992 by President Bush that prohibited the use of PLAs on federal construction contracts. In June of 1997, President Clinton issued a presidential memorandum for the Heads of Executive Departments and Agencies expressing his support for the use of PLAs and encouraging their use within the federal government. President Clinton asked department heads to consider their use on a project-by-project basis for use on large scale projects where cost savings, efficiency and quality could be advanced.

  On February 6, 2009, President Obama signed Executive Order 13502 allowing the use of PLAs by Executive Agencies on projects where federal funds will be obligated in excess of $25 million. This order revokes Executive Orders 13202 and 13208, signed by President George W. Bush in 2001, and which prohibited the use of PLAs on federally-funded construction projects. President Obama's Executive Order lists the same advantages and the same requirements for a PLA that IDOT has recognized and required for many years. Importantly, the use of PLAs is not precluded for projects receiving federal financial assistance. Illinois received the first PLA granted on a federal-aid project under the Obama administration. (See Attachments A-E for complete text of Executive Orders referenced herein.)

- **History of the Project Labor Agreement in Illinois** – Project Labor Agreements have been used on a limited basis since 1992. The first agreement was implemented on the Supermax Prison project in Tamms, Illinois. The agreement was negotiated by the Building & Construction Trades Council, the Builder's Association and the Capital Development Board (state of Illinois). The agreements have been used on a project-by-project basis when they meet the criteria for their use.

  In May of 2003, the Governor issued an executive order on Project Labor Agreements. The executive order allows a state department, agency, authority, board or instrumentality, which is under the control of the Governor, to include a PLA on a public works project where said department, agency, authority, board or instrumentality has determined that such agreement advances the state's interests of cost, efficiency, quality, safety, timeliness, skilled labor force, labor stability or the state's policy to advance minority- and female-owned businesses and minority and female employment.

  After months of experience with Executive Order 2003-13, it became apparent that a statewide PLA committee needed to be established to provide better communication and efficiency between the state of Illinois and Labor. As a result, beginning February 25, 2005 an Illinois AFL-CIO Statewide Project Labor Agreement Committee was created.

  On March 31, 2010, Executive Order 2010-03 was issued by Governor Pat Quinn which supersedes Executive Order 2003-13.

  The Project Labor Agreements Act (30 ILCS 571) became effective July 27, 2011. Additional diversity language and reporting provisions were included.

- **Criteria for Use of a Project Labor Agreement**

  - project size
  - complexity
  - length of project
  - disruption to the public
  - impact on quality of life
  - availability of skilled workforce
  - history of workforce harmony
  - cost savings from use of a PLA
  - geographical area (benefit to the state for keeping payrolls within the state)
  - request by Using Agencies
  - other factors as determined by the department

- **Strategy for Use of Project Labor Agreements**

  - Continue to meet with the 21 Building and Construction Trades Councils promoting the use of PLAs on projects that meet the criteria for their use.

  - Meet with AFL-CIO and other labor organizations at their quarterly meetings.

  - Meet with other Using Agencies including the Capital Development Board to share language and discuss the benefits of PLAs.

ILLINOIS AFL-CIO BUILDING & CONSTRUCTION TRADES STATEWIDE PROJECT LABOR AGREEMENT COMMITTEE

On May 7, 2003 Executive Order 2003-13 was signed allowing the use of Project Labor Agreements on a project-by-project basis for a state department, an agency, an authority, a board or instrumentality, which is under the control of the Governor. The Governor ordered that Project Labor Agreements should be utilized on a public works project where said department, agency, authority, board or instrumentality had determined that such agreement advances the state's interests.

After months of experience with Executive Order 2003-13, it became apparent that a statewide PLA committee needed to be established to provide better communication and efficiency between the state of Illinois and Labor.

As a result, beginning February 25, 2005 an Illinois AFL-CIO Statewide Project Labor Agreement Committee was created. The PLA committee members will:

- Meet as determined by the Illinois AFL-CIO. The meeting will be chaired by an officer (or their designee) of the Illinois AFL-CIO.
- Be comprised of one authorized representative from each craft from the Illinois Building and Construction Trades.
- Seek input from and work in concert with the twenty-one (21) Illinois Building and Construction Trades councils.
- Will have full authority and responsibility to attend statewide PLA committee meetings and to negotiate PLAs with the state of Illinois; to sign PLAs with the state of Illinois; and, to have decision-making capabilities on any and all matters which may arise regarding Executive Order 2003-13 on behalf of their respective craft.
- Promulgate PLA committee procedures and rules as necessary in order to conduct business in an efficient and respectful manner and to bring a unified bargaining team to the PLA negotiating process.

On March 31, 2010, Executive Order 2003-13 was superseded by Executive Order 2010-03.

The Project Labor Agreements Act (30 ILCS 571) became effective July 27, 2011. Additional diversity language and reporting provisions were included.

FINANCE

(30 ILCS 571/) Project Labor Agreements Act.

(30 ILCS 571/1)

Sec. 1. Short title. This Act may be cited as the Project Labor Agreements Act. (Source: P.A. 97-199, eff. 7-27-11.)

(30 ILCS 571/5)

Sec. 5. Findings.

(a) The State of Illinois has a compelling interest in awarding public works contracts so as to ensure the highest standards of quality and efficiency at the lowest responsible cost.

(b) A project labor agreement, which is a form of pre-hire collective bargaining agreement covering all terms and conditions of employment on a specific project, can ensure the highest standards of quality and efficiency at the lowest responsible cost on appropriate public works projects.

(c) The State of Illinois has a compelling interest that a highly skilled workforce be employed on public works projects to ensure lower costs over the lifetime of the completed project for building, repairs, and maintenance.

(d) Project labor agreements provide the State of Illinois with a guarantee that public works projects will be completed with highly skilled workers.

(e) Project labor agreements provide for peaceful, orderly, and mutually binding procedures for resolving labor issues without labor disruption, preventing significant lost-time on construction projects.

(f) Project labor agreements allow public agencies to predict more accurately the actual cost of the public works project.

(g) The use of project labor agreements can be of particular benefit to complex construction projects.

(Source: P.A. 97-199, eff. 7-27-11; 97-813, eff. 7-13-12.)

(30 ILCS 571/10)

Sec. 10. Public works projects. On a project-by-project basis, a State department, agency, authority, board, or instrumentality that is under the control of the Governor shall include a project labor agreement on a public works project when that department, agency, authority, board, or instrumentality has determined that the agreement advances the State's interests of cost, efficiency, quality, safety, timeliness, skilled labor force, labor stability, or the State's policy to advance minority-owned and women-owned businesses and minority and female employment.

(Source: P.A. 97-199, eff. 7-27-11.)

(30 ILCS 571/15)

Sec. 15. Public works projects funded with federal funds. When it has been determined that a project labor agreement is appropriate, and in furtherance of the President's Executive Order 13502, the State department, agency, authority, board, or instrumentality responsible for awarding the project may include a project labor agreement on a public works project funded in whole or in part with federal funds.

(Source: P.A. 97-199, eff. 7-27-11.)

(30 ILCS 571/20)

Sec. 20. Negotiation of agreement. When it has been determined that a project labor agreement is appropriate for a particular public works project, the State department, agency, authority, board, or instrumentality responsible for awarding the project shall in good faith negotiate a project

labor agreement with labor organizations engaged in the construction industry. If the State department, agency, authority, board, or instrumentality and the labor organizations engaged in the construction industry ("the parties") cannot agree to the terms of the project labor agreement, the Governor shall appoint a designee to assist the parties in reaching an agreement.
(Source: P.A. 97-199, eff. 7-27-11.)

(30 ILCS 571/25)
Sec. 25. Contents of agreement. Pursuant to this Act, any project labor agreement shall:
(a) Set forth effective, immediate, and mutually binding procedures for resolving jurisdictional labor disputes and grievances arising before the completion of work.
(b) Contain guarantees against strikes, lockouts, or similar actions.
(c) Ensure a reliable source of skilled and experienced labor.
(d) For minorities and females as defined under the Business Enterprise for Minorities, Females, and Persons with Disabilities Act, set forth goals for apprenticeship hours to be performed by minorities and females and set forth goals for total hours to be performed by underrepresented minorities and females.
(e) Permit the selection of the lowest qualified responsible bidder, without regard to union or non-union status at other construction sites.
(f) Bind all contractors and subcontractors on the public works project through the inclusion of appropriate bid specifications in all relevant bid documents.
(g) Include such other terms as the parties deem appropriate.
(Source: P.A. 97-199, eff. 7-27-11.)

(30 ILCS 571/30)
Sec. 30. Publicly disclosed finding. Any decision to use a project labor agreement in connection with a public works project by a State department, agency, authority, board, or instrumentality shall be supported by a written, publicly disclosed finding by the department, agency, authority, board, or instrumentality, setting forth the justification for use of the project labor agreement.
(Source: P.A. 97-199, eff. 7-27-11.)

(30 ILCS 571/35)
Sec. 35. Compliance. All State departments, agencies, authorities, boards, and instrumentalities shall ensure that all public works projects are implemented in a manner consistent with the terms of this Act and are in full compliance with all statutes, regulations, and Executive Orders.
(Source: P.A. 97-199, eff. 7-27-11.)

(30 ILCS 571/37)
Sec. 37. Quarterly report; annual report. A State department, agency, authority, board, or instrumentality that has a project labor agreement in connection with a public works project shall prepare a quarterly report that includes workforce participation under the agreement by minorities and

females as defined under the Business Enterprise for Minorities, Females, and Persons with Disabilities Act. These reports shall be submitted to the Illinois Department of Labor. The Illinois Department of Labor shall submit to the General Assembly and the Governor an annual report that details the number of minorities and females employed under all public labor agreements within the State.
(Source: P.A. 97-199, eff. 7-27-11.)

(30 ILCS 571/40)
Sec. 40. Severability. Nothing in this Act shall be construed to contravene any state or federal law or to jeopardize the State's entitlement to federal funding. If any provision of this Act or its application to any person or circumstance is held invalid by any court of competent jurisdiction, this invalidity does not affect any other provision or application of this Act that can be given effect without the invalid provision or application. To achieve this purpose, the provisions of this Act are declared to be severable.
(Source: P.A. 97-199, eff. 7-27-11.)

(30 ILCS 571/45)
Sec. 45. (Amendatory provisions; text omitted).
(Source: P.A. 97-199, eff. 7-27-11; text omitted.)

(30 ILCS 571/99)
Sec. 99. Effective date. This Act takes effect upon becoming law.
(Source: P.A. 97-199, eff. 7-27-11.)

EXECUTIVE ORDER ON PROJECT LABOR AGREEMENTS (2010-03)

WHEREAS, the State of Illinois has a compelling interest in awarding public works contracts so as to ensure the highest standards of quality and efficiency at the lowest responsible cost; and

WHEREAS, a project labor agreement, which is a form of pre-hire collective bargaining agreement covering all terms and conditions of employment on a specific project, can ensure the highest standards of quality and efficiency at the lowest responsible cost on appropriate public works projects; and

WHEREAS, the State of Illinois has a compelling interest that a highly skilled workforce be employed on public works projects to ensure lower costs over the lifetime of the completed project for building, repairs and maintenance; and

WHEREAS, project labor agreements provide the State of Illinois with a guarantee that public works projects will be completed with highly skilled workers; and

WHEREAS, project labor agreements provide for peaceful, orderly and mutually binding procedures for resolving labor issues without labor disruption, preventing significant lost-time on construction projects; and

WHEREAS, project labor agreements allow public agencies to predict more accurately the actual cost of the public works project; and

WHEREAS, the use of project labor agreements can be of particular benefit to complex construction projects; and

THEREFORE, I, Pat Quinn, Governor of the State of Illinois, pursuant to the supreme executive authority of the Governor as set forth in Article V, Section 8 of the Illinois Constitution, do hereby order as follows:

1. On a project-by-project basis, a State department, agency, authority, board or instrumentality, which is under the control of the Governor, shall include a project labor agreement on a public works project where said department, agency, authority, board or instrumentality has determined that such agreement advances the State's interests of cost, efficiency, quality, safety, timeliness, skilled labor force, labor stability or the State's policy to advance minority- and women-owned businesses and minority and female employment.
2. Where it has been determined that a project labor agreement is appropriate, and in furtherance of the President's Executive Order 13502, the State department, agency, authority, board or instrumentality responsible for awarding the project may include a project labor agreement on a public works project funded in whole or in part with Federal funds.
3. Where it has been determined that a project labor agreement is appropriate for a particular public works project, the State department, agency, authority, board or instrumentality responsible for awarding the project shall in good faith negotiate a project labor agreement with labor organizations engaged in the construction industry. In the event that the State department, agency, authority, board or instrumentality and the labor organizations engaged in the construction industry ("the parties") cannot agree to the terms of the project labor agreement, the Governor shall appoint a designee to assist the parties in reaching an agreement.
4. Pursuant to this Order, any project labor agreement:
   a. shall set forth effective, immediate and mutually binding procedures for resolving jurisdictional labor disputes and grievances arising before the completion of work;
   b. shall contain guarantees against strikes, lockouts, or similar actions;
   c shall ensure a reliable source of skilled and experienced labor;
   d shall further public policy objectives as to improved employment opportunities for minorities and women in the construction industry to the extent permitted by state and federal law;

e. shall permit the selection of the lowest qualified responsible bidder, without regard to union or non-union status at other construction sites;

f. shall be made binding on all contractors and subcontractors on the public works project through the inclusion of appropriate bid specifications in all relevant bid documents; and

g. shall include such other terms as the parties deem appropriate.

5. Any decision to use a project labor agreement in connection with a public works project by a State department, agency, authority, board or instrumentality shall be supported by a written, publicly disclosed finding by such department, agency, authority, board or instrumentality, setting forth the justification for use of the project labor agreement.

6. All State departments, agencies, authorities, boards and instrumentalities are hereby ordered to ensure that all public works projects are implemented in a manner consistent with the terms of this Order and are in full compliance with all statutes, regulations and Executive Orders.

7. Nothing in this Executive Order shall be construed to contravene any state or federal law or to jeopardize the State's entitlement to federal funding. If any provision of this Executive Order or its application to any person or circumstance is held invalid by any court of competent jurisdiction, this invalidity does not affect any other provision or application of this Executive Order that can be given effect without the invalid provision or application. To achieve this purpose, the provisions of this Executive Order are declared to be severable.

8. This Order supersedes Executive Order 2003-13.

9. This Order shall be in full force and effect upon its filing with the Secretary of State.

Pat Quinn

Pat Quinn
Governor

Issued by the Governor: March 31, 2010
Filed with the Secretary of State: March 31, 2010

Construction Guide
Fact Sheets
Links
Memos
Publications
Research
Reviews
Technical Advisories
Training & Workshops

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Construction Program Guide

IDOT Project Labor Agreement Determination

Contract Number
County

To:

From:

Date:

Re:

In accordance with Executive Order 2003-13 (Blagojevich), it is recommended that a project labor agreement (PLA) be utilized for the above-captioned Project. This recommendation is based on the considerations indicated below.

1. The Project is being awarded and administered by IDOT (i.e., not by another governmental agency).
2. The Project is being constructed using state or local funds only (i.e., no federal funds).
3. The overall size, scope, sequencing, logistics or other aspects of the Project make it particularly challenging to manage, and use of a PLA is expected to help assure that the construction work is performed properly and efficiently under the circumstances.
4. The duration of construction activity on the Project is expected to exceed one construction season (i.e., 110 or more working days), or the nature of the Project results in a heightened need for labor force continuity and stability over a substantial period of time.
5. There is a firm construction completion date established for the Project thereby increasing the adverse consequences of any work stoppage or other labor disruption.
6. The time required to complete the Project is expected to extend beyond the expiration date of one or more existing collective bargaining agreements covering trades likely to be involved in the Project, thereby increasing the likelihood of work stoppage(s) or other labor disruption(s) during construction of the Project.
7. In the absence of a PLA, there is an increased likelihood of jurisdictional disputes among unions or of conflict between unionized and non-unionized workers on the Project that could have a potentially material adverse effect on the time, cost, or quality of work performed on the Project.

More Information

- Contract Administration

Contact

Julie Trunk
Office of Program Administration
202-366-4639
E-mail Julie

Construction Feedback
E-mail Construction

8. This project presents specific safety concerns to the traveling public and a PLA, will ensure labor force continuity and stability, decreasing the length of the safety concern.
9. Use of a PLA is expected to result in improved access to skilled labor, improved efficiency, or improved safety performance on the Project.
10. Use of a PLA on the Project is not expected to have a material adverse effect on the competitive bidding process.
11. Use of a PLA on the Project is not expected to have a material adverse effect on the ability of the Department to achieve other Departmental goals (e.g., utilization of disadvantaged businesses, utilization of Illinois domiciled businesses, development of competitive vendor alternatives over time, etc.).
12. There are other material considerations favoring or disfavoring use of a PLA on this Project as follows:

Based upon the identified considerations, we recommend that you approve use of a PLA on this Project. Upon your approval, the Department shall undertake to negotiate in good faith a PLA with the relevant labor organization(s), and shall include in all necessary bid specifications and other documents information regarding the actual or form of PLA that is binding upon all contractors and their employees.

Agreed: _____
{Division Chief} (Date)

Agreed: _____
{Bureau of Design & Environment} (Date)

Agreed: _____
{Regional Engineer} (Date)

Approved: _____
Gary Hannig, Secretary (Date)

FHWA concurrence in the PLA for the above mentioned contract.

_____
Division Administrator FHWA (Date)

Word files can be viewed with the Word Viewer

Updated: 04/04/2011

Construction Guide

Fact Sheets

Links

Memos

Publications

Research

Reviews

Technical Advisories

Training & Workshops

Construction Program Guide

Project Labor Agreement

A project labor agreement (PLA) is a pre-hire collective bargaining agreement with one or more labor organizations that establishes the terms and conditions of employment for a specific construction project. For highway projects, PLAs are typically negotiated between a State department of transportation, or another relevant contracting agency, and an appropriate labor organization (such as an area or state building and construction trades councils and relevant local unions). As a condition of being awarded a contract, the contractor must sign the negotiated PLA with the relevant union organizations.

On February 6, 2009 President Obama signed an Executive Order 13502 titled "Use of Project Labor Agreement for Federal Construction Projects." This Executive Order encourages executive agencies to consider requiring the use of PLAs on large-scale direct Federal construction projects (defined as a project with a total cost of $25 million or more). Specifically, section 3 allows agencies to require the use of a PLA in Federal contracts where such use will: " . . . (i) advance the Federal Government's interest in achieving economy and efficiency in Federal procurement, producing labor-management stability, and ensuring compliance with laws and regulations governing safety and health, equal employment opportunity, labor and employment standards, and other matters, and (ii) be consistent with law." By its terms, section 3 applies only to Federal procurement, not contracts awarded under Federal financial assistance programs. With respect to projects receiving Federal financial assistance, section 5 provides, "This order does not require an agency to use a project labor agreement on any construction project, nor does it preclude the use of a project labor agreement in circumstances not covered by the order, including leasehold arrangements and projects receiving Federal financial assistance."

Executive Order 13502 revokes Executive Order 13202 of February 17, 2001, and Executive Order 13208 of April 6, 2001, and directs agencies, to the extent permitted by law to revoke any orders, rules or regulations implementing the two Executive Orders.

Authority/Legal Basis

1. *Laws*
   - None
2. *Regulations*
   - None

More Information

- Contract Administration

Contact

Julie Trunk
Office of Program Administration
202-366-4639
E-mail Julie

Construction Feedback
E-mail Construction

3. ***Orders***

   - Executive Order 13502 of February 6, 2009

4. ***Policy***

   - FHWA Interim Guidance - May 7, 2010 (Note: FHWA Division Offices should forward a copy of the State's justification and PLA to Michael Harkins (HCC-30) and Julie Trunk (HIPA-30) for review. A recommendation will then be forwarded to the Deputy Administrator for a final determination.)

Guidance

1. General Information
   - Illinois Department of Transportation Project Labor Agreement Master Plan (.pdf)
   - Illinois Department of Transportation PLA Project Determination Criteria
2. 2. Training
   - None

PDF files can be viewed with the Acrobat® Reader®

Updated: 03/15/2012

FAP Route 729(US 136)
Project ACF-0729(014)
Section 36(W,RS-1) & 34Z-2(W,RS)
Vermilion County
Contract No. 90939

Illinois Department of Transportation
PROJECT LABOR AGREEMENT

This Project Labor Agreement ("PLA") is entered into this _____ day of _____, by and between the Illinois Department of Transportation ("IDOT" or "Department") in its proprietary capacity, and each relevant Illinois AFL-CIO Building Trades Council made signatory hereto by the Illinois AFL-CIO Statewide Project Labor Agreement Committee on behalf of itself and each of its affiliated members (individually and collectively, the "Union"). This PLA shall apply to Construction Work (as defined herein) to be performed by IDOT's Prime Contractor and each of its relevant subcontractors of whatever tier ("Subcontractor" or "Subcontractors") on [redacted] (hereinafter, the "Project").

ARTICLE 1 - INTENT AND PURPOSES

1.1. This PLA is entered into in furtherance of Illinois Executive Order No. 2010-03 and P.A. 097-0199. It is mutually understood and agreed that the terms and conditions of this PLA are intended to promote the public interest in obtaining timely and economical completion of the Project by encouraging productive and efficient construction operations; by establishing a spirit of harmony and cooperation among the parties; and by providing for peaceful and prompt settlement of any and all labor grievances or jurisdictional disputes of any kind without strikes, lockouts, slowdowns, delays or other disruptions to the prosecution of the work.

1.2. As a condition of the award of the contract for performance of work on the Project, IDOT's Prime Contractor and each of its Subcontractors shall be required to sign a "Contractor Letter of Assent", in the form attached hereto as Exhibit A, prior to commencing Construction Work on the Project. Each Union affiliate and separate local representing workers engaged in Construction Work on the Project in accordance with this PLA are bound to this agreement by the Illinois AFL-CIO Statewide Project Labor Agreement Committee which is the central committee established with full authority to negotiate and sign PLAs with the State on behalf of all respective crafts. Upon their signing the Letter of Assent, the Prime Contractor, each Subcontractor, and the individual Unions shall thereafter be deemed a party to this PLA. No party signatory to this PLA shall, contract or subcontract, nor permit any other person, firm, company or entity to contract or subcontract for the performance of Construction Work for the Project to any person, firm, company or entity that does not agree in writing to become bound by the terms of this PLA prior to commencing such work.

1.3. It is understood that the Prime Contractor(s) and each Subcontractor will be considered and accepted by the Unions as separate employers for the purposes of collective bargaining, and it is further agreed that the employees working under this PLA shall constitute a bargaining unit separate and distinct from all others. The Parties hereto also agree that this PLA shall be applicable solely with respect to this Project, and shall have no bearing on the interpretation of any other collective bargaining agreement or as to the recognition of any bargaining unit other than for the specific purposes of this Project.

1.8. In the event that the applicable collective bargaining agreement between a Prime Contractor and the Union or between the Subcontractor and the Union expires prior to the completion of this Project, the expired applicable contract's terms will be maintained until a new applicable collective bargaining agreement is ratified. The wages and fringe benefits included in any new applicable collective bargaining agreement will apply on and after the effective date of the newly negotiated collective bargaining agreement, except to the extent wage and fringe benefit retroactivity is specifically agreed upon by the relevant bargaining parties.

ARTICLE II – APPLICABILITY, RECOGNITION, AND COMMITMENTS

2.1 The term Construction Work as used herein shall include all "construction, prosecution, completion, or repair" work performed by a "laborer or mechanic" at the "site of the work" for the purpose of "building" the specific structures and improvements that constitute the Project. Terms appearing within quotation marks in the preceding sentence shall have the meaning ascribed to them pursuant to 29 CFR Part 5.

2.2 By executing the Letters of Assent, Prime Contractor and each of its Subcontractors recognizes the Unions signatory to this PLA as the sole and exclusive bargaining representatives for their craft employees employed on the jobsite for this Project. Unions who are signatory to this PLA will have recognition on the Project for their craft.

2.3 The Prime Contractor and each of its Subcontractors retains and shall be permitted to exercise full and exclusive authority and responsibility for the management of its operations, except as expressly limited by the terms of this PLA or by the terms and conditions of the applicable collective bargaining agreement.

2.4 Except to the extent contrary to an express provision of the relevant collective bargaining agreement, equipment or materials used in the Project may be pre-assembled or pre-fabricated, and there shall be no refusal by the Union to handle, transport, install, or connect such equipment or materials. Equipment or materials delivered to the job-site will be unloaded and handled promptly without regard to potential jurisdictional disputes; any such disputes shall be handled in accordance with the provisions of this PLA.

2.5 Unions commit to furnishing qualified and skilled craft persons as required by the Prime Contractor and its Subcontractors in fulfillment of their obligations to complete the Project. In order to promote the long-term development of a skilled and knowledgeable work force, the parties are encouraged to utilize apprentices to the maximum extent permitted by the applicable collective bargaining agreement.

3.4 Not later than the earlier of (a) five business days following the pre-job conference, or (b) commencement of Construction Work, the Unions and Prime Contractor (on behalf of itself and all its subcontractors of whatever tier) shall confer and jointly designate a slate of three (3) permanent arbitrators (each a "Permanent Arbitrator") for the purpose of hearing disputes pursuant to Articles V and VII of this PLA. The slate of Permanent Arbitrators shall be selected from among the following individuals: Thomas F. Gibbons, Robert Perkovich, Byron Yaffee, and Glenn A. Zipp. In the event that the Unions and Prime Contractor are not able to agree on a full slate of three Permanent Arbitrators, the Department, after consultation with the Unions and Prime Contractor, shall designate such additional Permanent Arbitrators as may be necessary to establish the full slate. A single Permanent Arbitrator shall be selected from the slate of three on a rotating basis to adjudicate each arbitrable matter as it arises. In the event a Permanent Arbitrator is not available to adjudicate a particular matter in the order of rotation, the arbitration assignment shall pass to the next available Permanent Arbitrator.

ARTICLE IV - HOURS OF WORK AND GENERAL CONDITIONS

4.1 The standard work day for Construction Work on the Project shall be an established consecutive eight (8) hour period between the hours of 7:00 a.m. and 5:00 p.m. with one-half hour designated as unpaid period for lunch. The standard work week shall be five (5) consecutive days of work commencing on Monday. Starting time shall be established at the pre-job conference, and shall be applicable to all craft employees on the Project unless otherwise expressly agreed in writing. In the event Project site or other job conditions dictate a change in the established starting time and/or a staggered lunch period for portions of the Project or for specific crafts, the Prime Contractor, relevant Subcontractors and business managers of the specific crafts involved shall confer and mutually agree to such changes as appropriate.

If proposed work schedule changes cannot be mutually agreed upon between the parties, the hours fixed at the time of the pre-job meeting shall prevail.

4.2 Shift work may be established and directed by the Prime Contractor or relevant Subcontractor as reasonably necessary or appropriate to fulfill the terms of its contract with the Department. If used, shift hours, rates and conditions shall be as provided in the applicable collective bargaining agreement.

4.3 The parties agree that chronic and/or unexcused absenteeism is undesirable and must be controlled in accordance with procedures established by the applicable collective bargaining agreement. Any employee disciplined for absenteeism in accordance with such procedures shall be suspended from all work on the Project for not less than the maximum period permitted under the applicable collective bargaining agreement.

5.2.B. Step 2. In the event that the Steward and the contractors' representatives at the job-site cannot reach agreement within two (2) working days after a meeting is arranged and held, the matter shall be referred to the Union Business Manager and to executive representatives of the Prime Contractor and relevant Subcontractor.

5.2.C. Step 3. In the event the dispute is not resolved within five (5) working days after completion of Step 2, the relevant parties shall request a Permanent Arbitrator as determined in accordance with paragraph 3.4 of this PLA, who shall, within ten (10) working days, hear the grievance and make a written decision. Such decisions shall be final and binding on all parties. The parties shall each pay the expense of their own representative. The expense of the Permanent Arbitrator shall be divided equally between (1) the Prime Contractor and/or relevant Subcontractor, and (2) the involved Union.

5.3 Any failure of a party to comply fully with such final and binding decision of the Permanent Arbitrator may result in removal of the non-complying party from the site, in a holdback from the Prime Contractor or Subcontractor of any amounts awarded, or in such other relief as the Department may reasonably determine is necessary to promote final resolution of the dispute.

5.4 In the event any dispute or grievance should arise, the parties expressly agree that it shall be resolved without occurrence of any strike, work stoppage, slow-down or other prohibited activities as provided in Article VII of this PLA. Individuals or parties violating this section shall be subject to immediate discharge or other discipline.

ARTICLE VI - JURISDICTIONAL DISPUTES

6.1 As used in this Agreement, the term "jurisdictional dispute" shall be defined as any dispute, difference or disagreement involving the assignment of particular work to one class or craft of employees rather than to a different class or craft of employees, regardless of that Contractor's contractual relationship to any other employer, contractor, or organization on the site.

6.2 It is agreed by and between the parties to this Agreement that any and all jurisdictional disputes shall be resolved in the following manner; each of the steps hereinafter listed shall be initiated by the parties in sequence as set forth:

(a) Negotiation by and between the Local Business Representative of the disputing Union and Employer shall take place within two (2) business days. Business days are defined as Monday through Friday excluding contract holidays. Such negotiations shall be pursued until it is apparent that the dispute cannot be resolved at the local level.

(3) If the Arbitrator finds that a previous decision of record governs the case, the Arbitrator shall apply the decision of record in rendering his decision except under the following circumstances. After notice to the other parties to the dispute prior to the hearing that it intends to challenge the decision of record, if a trade challenging the decision of record is able to demonstrate that the recognized and established prevailing practice in the locality of the work has been contrary to the applicable decision of record, and that historically in that locality the work in dispute has not been performed by the other craft or crafts, the Arbitrator may rely on such prevailing practice rather than the decision of record.

If the craft relying on the decision of record demonstrates that it has performed the work in dispute in the locality of the job, then the Arbitrator shall apply the decision of record in rendering his decision. If the Arbitrator finds that a craft has improperly obtained the prevailing practice in the locality through raiding, the undercutting of wages or by the use of vertical agreements, the Arbitrator shall rely on the decision of record rather than the prevailing practice in the locality.

(4) If no decision of record is applicable, the Arbitrator shall then consider the established trade practice in the industry and prevailing practice in the locality; and

(5) Only if none of the above criteria is found to exist, the Arbitrator shall then consider that because efficiency, cost or continuity and good management are essential to the well being of the industry, the interest of the consumer or the past practice of the employer shall not be ignored.

The Arbitrator shall set forth the basis for his decision and shall explain his findings regarding the applicability of the above criteria. If lower-ranked criteria are relied upon, the Arbitrator shall explain why the higher-ranked criteria were not deemed applicable. The Arbitrator's decision shall only apply to the job in dispute.

(6) Agreements of record are applicable only to the party's signatory to such agreements. Decisions of record are applicable to all trades.

(7) The Arbitrator is not authorized to award back pay or any other damages for a mis-assignment of work. Nor may any party bring an independent action for back pay or any other damages, based upon a decision of an Arbitrator.

7.4 Upon notification of violations of this Article, the principal officer or officers of the local area Building and Construction Trades Council, and the Illinois AFL-CIO Statewide Project Labor Agreement Committee as appropriate, will immediately instruct, order and use their best efforts to cause the affiliated union or unions to cease any violations of this Article. A Trades Council and the Committee otherwise in compliance with the obligations under this paragraph shall not be liable for unauthorized acts of its affiliates.

7.5 In the event that activities in violation of this Article are not immediately halted through the efforts of the parties, any aggrieved party may invoke the special arbitration provisions set forth in paragraph 7.6 of this Article.

7.6 Upon written notice to the other involved parties by the most expeditious means available, any aggrieved party may institute the following special arbitration procedure when a breach of this Article is alleged:

7.6.A The party invoking this procedure shall notify the individual designated as the Permanent Arbitrator pursuant to Article III of the nature of the alleged violation; such notice shall be by the most expeditious means possible. The initiating party may also furnish such additional factual information as may be reasonably necessary for the Permanent Arbitrator to understand the relevant circumstances. Copies of any written materials provided to the arbitrator shall also be contemporaneously provided by the most expeditious means possible to the party alleged to be in violation and to all other involved parties.

7.6.B Upon receipt of said notice the Permanent Arbitrator shall set and hold a hearing within twenty-four (24) hours if it is contended the violation is ongoing, but not before twenty-four (24) hours after the written notice to all parties involved as required above.

7.6.C The Permanent Arbitrator shall notify the parties by facsimile or any other effective written means, of the place and time chosen by the Permanent Arbitrator for this hearing. Said hearing shall be completed in one session. A failure of any party or parties to attend said hearing shall not delay the hearing of evidence or issuance of an Award by the Permanent Arbitrator.

7.6.D The sole issue at the hearing shall be whether a violation of this Article has, in fact, occurred. An Award shall be issued in writing within three (3) hours after the close of the hearing, and may be issued without a written opinion. If any party desires a written opinion, one shall be issued within fifteen (15) days, but its issuance shall not delay compliance with, or enforcement of, the Award. The Permanent Arbitrator may order cessation of the violation of this Article, and such Award shall be served on all parties by hand or registered mail upon issuance.

8.5 The failure or refusal of a party to exercise its rights hereunder in one or more instances shall not be deemed a waiver of any such rights in respect of a separate instance of the same or similar nature.

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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 · (217) 782-3397
JB PRITZKER, GOVERNOR JOHN J. KIM, DIRECTOR

(217) 524-3300

CERTIFIED MAIL

7022 2410 0001 5388 1059

AUG 01 2023

Trust Department
Marine Bank Trust #53-0051
3050 West Wabash
Springfield, IL 62707

Re: 1670255005 -- Sangamon County
Cantrall/Marine Bank Trust #53-0051
9520 State Rour 29
Leaking UST Incident 20030135
Leaking UST Technical File

Dear Sir/Madam:

The Illinois Environmental Protection Agency (Illinois EPA) has reviewed the Corrective Action Plan (plan) submitted for the above-referenced incident. This plan, dated April 7, 2023, was received by the Illinois EPA on April 11, 2023. Citations in this letter are from the Environmental Protection Act (415 ILCS 5) (Act) and Title 35 of the Illinois Administrative Code (35 Ill. Adm. Code).

Pursuant to Sections 57.7(b)(2) and 57.7(c) of the Act and 35 Ill. Adm. Code 734.505(b) and 734.510(a), the plan is approved. The activities proposed in the plan are appropriate to demonstrate compliance with Title XVI of the Act. Please note that all activities associated with the remediation of this release proposed in the plan must be executed in accordance with all applicable regulatory and statutory requirements, including compliance with the proper permits. Please note that all activities associated with the remediation of this release proposed in the plan must be executed in accordance with all applicable regulatory and statutory requirements, including compliance with the proper permits.

In addition, the budget is modified pursuant to Sections 57.7(b)(3) and 57.7(c) of the Act and 35 Ill. Adm. Code 734.505(b) and 734.510(b). Based on the modifications listed in Section 2 of Attachment A, the amounts listed in Section 1 of Attachment A have been approved. Please note that the costs must be incurred in accordance with the approved plan. Be aware that the amount of payment from the Fund may be limited by Sections 57.7(c), 57.8(d), 57.8(e), and 57.8(g) of the Act, as well as 35 Ill. Adm. Code 734.630 and 734.655.

Further, pursuant to 35 Ill. Adm. Code 734.145, it is required that the Illinois EPA be notified of field activities prior to the date the field activities take place. This notice must include a description of the field activities to be conducted; the name of the person conducting the activities; and the date, time, and place the activities will be conducted and shall be made to EPA.FieldNotifications@illinois.gov. This notification of field activities must be provided at least two weeks prior to the scheduled field activities.

Pursuant to Sections 57.7(b)(4) and 35 Ill. Adm. Code 734.305 and 734.335(c), the Illinois EPA requires that an amended Corrective Plan which includes the results of this plan be submitted on or before February 9, 2024 to:

Illinois Environmental Protection Agency
Bureau of Land - #24
Leaking Underground Storage Tank Section
1021 North Grand Avenue East
Post Office Box 19276
Springfield, IL 62794-9276

Please submit all correspondence in duplicate and include the Re: block shown at the beginning of this letter.

An underground storage tank system owner or operator may appeal this decision to the Illinois Pollution Control Board. Appeal rights are attached.

If you have any questions or need further assistance, please contact the undersigned at (217) 785-1858 or at Scott.Rothering@illinois.gov.

Sincerely,

Scott Rothering
Project Manager
Special Projects and Financial Unit
Leaking Underground Storage Tank Section
Bureau of Land

Attachment: Attachment A
Appeal Rights

c: Carol Rowe, CWM Company Environmental Consulting Services (electronic copy)
BOL File

Attachment A

Re: 1670255005 -- Sangamon County
Cantrall/Marine Bank Trust #53-0051
9520 Illinois State Route 29
Leaking UST Incident 20030135
Leaking UST Technical File

SECTION 1

As a result of Illinois EPA's modification(s) in Section 2 of this Attachment A, the following amounts are approved:

$1,717.63	Drilling and Monitoring Well Costs
$3,706.61	Analytical Costs
$704.51	Remediation and Disposal Costs
$0.00	UST Removal and Abandonment Costs
$0.00	Paving, Demolition, and Well Abandonment Costs
$8,453.86	Consulting Personnel Costs
$171.82	Consultant's Materials Costs

Handling charges will be determined at the time a billing package is reviewed by the Illinois EPA. The amount of allowable handling charges will be determined in accordance with Section 57.1(a) of the Environmental Protection Act and 35 Illinois Administrative Code 734.635.

SECTION 2

1. $428.36 for costs for PNA analytical costs, which lack supporting documentation. Such costs are ineligible for payment from the Fund pursuant to 35 Ill. Adm. Code 734.630(cc). Since there is no supporting documentation of costs, the Illinois EPA cannot determine that costs will not be used for activities in excess of those necessary to meet the minimum requirements of Title XVI of the Act. Therefore, such costs are not approved pursuant to Section 57.7(c)(3) of the Act because they may be used for site investigation or corrective action activities in excess of those required to meet the minimum requirements of Title XVI of the Act.

   Additionally, the costs are not reasonable as submitted. Such costs are ineligible for payment from the Fund pursuant to Section 57.7(c)(3) of the Act and 35 Ill. Adm. Code 734.630(dd).

   PNA Analysis is not reimbursable for soil samples evaluating vertical extent of soil saturation.

   This results in a deduction of $428.36 from the Analytical Costs Form.

2. $4,508.80 has been deducted from the Consulting Personnel Costs Form.

   This includes the following deductions:

   $2,254.40 for 16 hours of the 32 requested hours at $140.90 per hour for amended corrective action plan development. An itemized account of the requested hours was requested via email on July 6, 2023. In a response from John Kveton of CWM Company, 16 of the 32 hours were requested for drafting the corrective action plan.

   $563.60 for 4 hours for Senior Project Manager at $140,90 per hour for TACO Tier 2 calculations/development of CUOs/GW modeling. These costs must be submitted in the next corrective action plan budget.

   $1,409.00 for 10 hours at $140.90 per hour for amended corrective action plan budget development. An itemized account of the requested hours was requested via email on July 6, 2023. In a response from John Kveton of CWM Company, the costs for the amended corrective action budget development were not itemized.

   $845.40 for 6 hours for Senior Project Manager at $140,90 per hour for review analytical results, bore logs, tabulation of analytical. These costs must be submitted in the next corrective action plan budget.

3. $24.00 has been deducted from the Consultant's Material Costs Form.

   This includes the flowing deductions:

   $24.00 for one day of use for a water level indicator. This is not needed for work proposed in the corrective action plan.

4. $402.00 has been added to the Analytical Costs Form to analyze one soil gas sample in the vicinity of MW-1.

5. $26.80 has been added to the Drilling Costs (drilling and monitoring well costs form) to drill for a second soil gas sample. This amount includes 5 feet of push-driven drilling at a rate of $25.36 per foot and is the amount for drilling which exceeds the minimum charge.

CW M Company
Environmental Consulting Services

701 W. South Grand Avenue
Springfield, IL 62704

Phone: (217) 522-8001
Fax: (217) 522-8009

February 2, 2024

Mr. Scott Rothering, Project Manager
LUST Section, Bureau of Land
Illinois Environmental Protection Agency
1021 North Grand Avenue East
Springfield, Illinois 62794-9276

RE: LPC #1670255005—Sangamon County
Cantrall/Marine Bank Trust #53-0051
9520 Illinois State Route 29
Incident Number: 2003-0135
LUST Technical Reports—Corrective Action Plan and Budget Amendment

Dear Mr. Rothering:

On behalf of Marine Bank Trust #53-0051, the owner of the former underground storage tanks at the above-referenced site, we are submitting this proposed Corrective Action Plan (CAP) and Budget Amendment.

If you have any questions or require additional information, please contact Mr. Matthew Saladino or me at (217) 522-8001.

Sincerely,

FOR CLR

Carol L. Rowe, P.G.
Senior Environmental Geologist

Enclosure

xc: Trust Officer, *Marine Bank Trust #53-0051*

CORRECTIVE ACTION PLAN & BUDGET AMENDMENT

MARINE BANK TRUST # 53-0051

CANTRALL, ILLINOIS
LPC # 1670255005— Sangamon County
Incident Number 2003-0135

Submitted to:
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
Leaking Underground Storage Tank Section, Bureau of Land
1021 North Grand Avenue East
Springfield, Illinois 62794-9276

Prepared by:
CW³M COMPANY, INC.

701 South Grand Avenue West
Springfield, Illinois
(217) 522-8001

400 West Jackson, Suite C
Marion, Illinois
(618) 997-2238

February 2024

TABLE OF CONTENTS

APPENDICES

TABLES

ACRONYMS AND ABBREVIATIONS

BETX	Benzene, Ethylbenzene, Toluene, Total Xylenes
CAP	Corrective Action Plan
CACR	Corrective Action Completion Report
CUO	Clean-up Objective
CW³M	CW³M Company, Inc.
C_{sat}	Soil Saturation
ELUC	Environmental Land Use Controls
HAA	Highway Authority Agreement
IEMA	Illinois Emergency Management Agency
IEPA	Illinois Environmental Protection Agency
Ill. Adm. Code	Illinois Administrative Code
ISGS	Illinois State Geological Survey
ISWS	Illinois State Water Survey
LUST	Leaking Underground Storage Tank
mg/kg	Milligrams/kilograms
mg/L	Milligrams/Liter
MTBE	Methyl Tert-Butyl Ether
OSFM	Illinois Office of the State Fire Marshal
PNA	Polynuclear Aromatic Hydrocarbon
PVC	Polyvinyl Chloride
ROW	Right-of-Way
SICR	Site Investigation Completion Report
SIP	Site Investigation Plan
SISR	Site Investigation Status Report
TACO	Tiered Approach to Corrective Action Objectives
USTs	Underground Storage Tanks
WCR	Well Completion Report

1. SITE HISTORY/EXECUTIVE SUMMARY

1.1 GENERAL

This proposed Corrective Action Plan (CAP) and Budget Amendment has been prepared in accordance with the requirements of the 35 Illinois Administrative Code (Ill. Adm. Code) 734. The Illinois Environmental Protection Agency (IEPA) Corrective Action Plan Form is included in this document as Appendix A.

Marine Bank Trust #53-0051, owner of the underground storage tanks (USTs) at 9520 Illinois State Route 29, Cantrall, Illinois, reported a release to the Illinois Emergency Management Agency (IEMA) and Incident Number 2003-0135 was assigned on February 4, 2003. The Marine Bank Trust Officer then requested that CW³M Company, Inc. (CW³M) proceed with the reporting and early action requirements of 415 ILCS 5/57-57.17.

The 20-Day Certification was submitted to the IEPA on February 5, 2003 (CW³M, 2003a). A 45-Day Report was submitted March 20, 2003 (CW³M, 2003b). An extension of the early action period through August 1, 2003 was approved by the IEPA on February 13, 2003 (IEPA, 2003a). A 45-Day Addendum Report was submitted to the IEPA on August 20, 2003 (CW³M, 2003c). The Site Investigation Plan (SIP) and Budget were prepared in accordance with the requirements of 415 ILCS 5/57-57.17 and submitted to the Agency on October 31, 2003 (CW³M, 2003d). The Agency approved the SIP with modifications on December 23, 2003 (IEPA, 2003b). On May 18, 2004, CW³M submitted a SIP Budget Amendment to the IEPA (CW³M, 2004a) and was approved by the Agency on June 7, 2004 (IEPA, 2004a). A Site Investigation Status Report (SISR) and budget was submitted to the IEPA on May 18, 2004 (CW³M, 2004b) and was approved by the Agency on June 7, 2004 (IEPA, 2004b).

A Site Investigation Completion Report (SICR) was submitted to the IEPA on April 8, 2005 (CW³M, 2005a) with additional information submitted on June 27, 2005 (CW³M, 2005b), which was denied by the Agency on August 29, 2005 (IEPA, 2005a). A revised SICR was submitted on September 14, 2005 (CW³M, 2005c) and was approved by the Agency on October 17, 2005 (IEPA, 2005b). A CAP and Budget was submitted on October 25, 2005 (CW³M, 2005d) and was denied by the Agency on February 21, 2006 (IEPA, 2006a). An Amended SIP Budget was submitted on November 2, 2005 (CW³M, 2005e) and was Approved by the Agency on December 2, 2005 (IEPA, 2005c). An amended SIP was submitted to the agency on February 28, 2006 (CW³M, 2006a) and was approved by the Agency on April 5, 2006 (IEPA, 2006b). A CAP and Budget was submitted on August 28, 2006 (CW³M, 2006b), which was rejected on October 23, 2006 (IEPA, 2006c). A response was submitted on November 17, 2006 (CW³M, 2006c) which was rejected on March 15, 2007 (IEPA, 2007). A CAP was submitted on November 14, 2008 (CW³M, 2008) and was approved by the Agency on March 10, 2009 (IEPA, 2009). A CAP and Budget Amendment was then submitted January 26, 2021 (CW³M, 2021) and was approved by the Agency on May 19, 2021 (IEPA, 2021). A CAP and Budget Amendment was submitted on April 11,

2023 (CW³M, 2023) and was approved with modifications by the Agency on August 1, 2023 (IEPA, 2023).

The investigation was performed under the direction of an Illinois Licensed Professional Geologist and completed in accordance with the Professional Geologist Licensing Act and its Rules for Administration.

1.2 SITE LOCATION

The Marine Bank Trust #53-0051 property is located at 9520 Illinois State Route 29, Cantrall, Sangamon County, Illinois. The site is located in the SW ¼ of the SW ¼ of the NW ¼ of Section 9, Township 17 North of the Centralia Baseline, Range 5 West of the Third Principal Meridian. Site location maps are provided in Appendix B.

1.3 UNDERGROUND STORAGE TANK INFORMATION

A release was reported to the IEMA and Incident Number 2003-0135 was assigned to the notification. The Marine Bank Trust Officer then requested that CW³M proceed with the early action and reporting requirements of 415 ILCS 5/57-57.17.

On March 31, 2003, CW³M personnel were on site to initiate Early Action activities. Illinois Office of the State Fire Marshall (OSFM) Tank Specialist William Hurrelbrink was on site to supervise the removal of the USTs. The tanks were ventilated and the tanks and piping removed. A narrative of the tank removals and other Early Action activities was provided in the 45-Day Report Addendum (CW³M, 2003c).

Table 1-1. Underground Storage Tank Summary

Tank Number	Tank Volume (gallons)	Tank Contents	Incident Number	Release Information	Current Status
1	500	Gasoline	03-0135	Tank & Lines	Removed 3/31/03
2	1,000	Gasoline	03-0135	Tank & Lines	Removed 3/31/03
3	500	Diesel	03-0135	Tank & Lines	Removed 3/31/03
4	500	Used Oil	03-0135	Tank & Lines	Removed 3/31/03
5	150	Used Oil	03-0135	None	Removed 3/31/05

1.4 EARLY ACTION SUMMARY

During and following completion of the tank removal activities, transportation and disposal of contaminated backfill materials were conducted. CW³M personnel were on site through May 16, 2003 to complete early action activities.

Approximately 251.49 tons (128.27 cubic yards) of contaminated backfill materials was removed from the UST excavation and disposed of at Five Oaks Landfill in Taylorville, Illinois. Upon completion of the backfill removal, samples were collected along the walls of the excavation. The locations of the excavation samples are depicted in the April 8, 2005 SICR (CW³M, 2005a).

1.5 ADDITIONAL DRILLING

CW³M Company personnel were on site March 10, 2006 to complete the soil borings requested by the IEPA in its February 21, 2006 CAP and Budget rejection letter (IEPA 2006a). The five soil borings were advanced to further define and minimize the soil contamination plume. A table summarizing the results are included in Appendix G. The boring logs are included in Appendix F.

1.6 SITE INVESTIGATION SUMMARY

Gasoline, diesel fuel, and heating oil were released at this site; therefore, soil samples were analyzed for the indicator contaminants benzene, ethylbenzene, toluene and total xylenes (BETX), methyl tert-butyl ether (MTBE) and polynuclear aromatic hydrocarbons (PNAs). Soil analytical results indicate that the Tiered Approach to Corrective Action Objectives (TACO) Tier I Residential Clean-Up Objectives (CUOs) were exceeded at the western property boundary for benzene, ethylbenzene, and naphthalene. It was determined the contamination did not exist on the adjacent property. As a result, the soil contamination plume was defined.

Groundwater analytical results indicate that groundwater contamination at the south, east, and west property boundaries have exceeded the Class I Groundwater CUOs. Groundwater analytical results depict the groundwater contamination plume not migrating onto the Cantrall Elementary School property to the west, the Village Park to the southwest, nor past the wells installed on the Lawson property to the south. As a result, the groundwater contamination plume was considered defined.

1.7 CORRECTIVE ACTION EXECUTIVE SUMMARY

Previously, soil contamination was shown to migrate west into the Right-of-Way (ROW) of IL Route 29, but did not migrate onto off-site properties. Due to the length of time since site investigation took place, additional sampling was completed on August 12, 2021 to see if natural attenuation occurred from the release. The results confirmed that contamination along the site's property boundaries was below CUOs, therefore removing the need for a Highway Authority Agreement (HAA). A map depicting the soil contamination plume is included in Appendix B as Drawing 0003B.

CW³M personnel returned to the site on September 7, 2021 to resample and survey the groundwater from several monitoring wells. The results indicate that groundwater contamination remains on- and off-site. The groundwater contamination plume is currently defined to remain onsite to the north. The groundwater contamination plume is also defined off-site to the south into the ROW of Claypool Street, west into the ROW of IL Route 29, and east on into a neighboring property. The plume is depicted as remaining within the ROW to the west and to the south, but does not extend onto the neighboring properties in those directions. A map depicting the groundwater contamination plume is included in Appendix B as Drawing 0004B. Well completion reports (WCRs) and soil boring logs are included in Appendix F for the Corrective Action activities. Tables summarizing the analytical results are included in Appendix G.

On September 5, 2023, CW³M personnel continued with Corrective Action activities. A total of seven soil borings were advanced as part of further soil contamination investigation. Three of the soil borings (SB-18, SB-19, and SB-20) were advanced to fully define the area requiring an engineered barrier encompassing SB-7. One boring (SB-21) was advanced to vertically define TACO Tier 1 Soil Saturation (C_{sat}) exceedances from SB-15. One soil boring (PTACO) was collected for site-specific geotechnical physical parameters per request of the IEPA. The two remaining soil borings (SVG-1 and SVG-2) had soil-gas vapor samples collected from each. Soil borings logs are included in Appendix F. Laboratory analytical results and tables summarizing the results are included in Appendix G. Drawing of the locations are included in Appendix B.

2. REMEDIATION OBJECTIVES

2.1 DETERMINATION OF CLEAN-UP OBJECTIVES

In accordance with 35 Ill. Adm. Code 734.410 and requested by the IEPA, remediation objectives were revised and determined in accordance with 35 Ill. Adm. Code § 742. The updated site-specific physical parameters were determined as the following:

Hydraulic Conductivity (K): $1.17 * 10^{-4}$ cm/sec
Soil bulk density (ρ_b): 1.640 g/cm^3
Soil particle density (ρ_s): 2.657 g/cm^3
Moisture content (w): 0.20
Organic carbon content (f_{oc}): 0.0108

In order to determine the hydraulic conductivity, a slug test was performed. The test was performed by lowering a "slug" constructed of polyvinyl chloride (PVC) into a monitoring well. When the slug is lowered into the well, the groundwater is displaced by the volume of the slug. As the water within the well equilibrates, water depth changes are recorded in relation to the time interval that has passed since the test was initiated.

The hydraulic conductivity calculations are based on the total well depth, screen length and radius, initial water depth, and the water depth change over time. The depth-to-water changes over time were plotted on a semi-logarithmic graph and the curve was evaluated. The slope of the straight-line portion of the curve, along with the other slug test data, is used to calculate the hydraulic conductivity.

The remaining four parameters were determined by laboratory analysis of a soil sample, which was collected on September 5, 2023. Samples were collected in accordance with 35 Ill. Adm. Code 742.

In addition, two monitoring wells/groundwater elevations had been used for the hydraulic gradient within previous TACO calculations. The Calculations have been revised to include multiple points for the calculations. The hydraulic gradient of 0.06188 was found by using the IEPA provided calculator found at https://www3.epa.gov/ceampubl/learn2model/part-two/onsite/gradient4plus-ns.html, accessed on January 18, 2023. This calculation for the hydraulic gradient is referenced in Appendix E of this report.

2.2 SOIL AND GROUNDWATER OBJECTIVES

Soil analytical results were compared to the TACO Residential Tier 1 and current TACO Industrial/Commercial Tier 2 CUOs with the soil to groundwater pathway removed in milligrams per kilogram (parts per million) (mg/kg). The calculations of the Tier 2 CUOs are included in Appendix E of this CAP.

Table 2-1. Soil Remediation Objectives

Parameter	TACO Residential Tier 1 CUOs (mg/kg)	TACO Industrial/Commercial Tier 2 CUOs (mg/kg)
Benzene	0.03	5.42
Ethylbenzene	13.0	58.0
Toluene	12.0	736.66
Total Xylenes	5.6	98.87
MTBE	0.32	418.35
Acenaphthene	570	-
Acenaphytylene	30	-
Anthracene	12,000	-
Benzo(a)anthracene	0.9	-
Benzo(a)pyrene	0.09	-
Benzo(b)fluoranthene	0.9	-
Benzo(g,h,i)perylene	160	-
Benzo(k)fluoranthene	9.0	-
Chrysene	88.0	-
Dibenz(a,h)anthracene	0.09	-
Fluoranthene	3,100	-
Fluorene	560	-
Indeno(1,2,3-cd)pyrene	0.9	-
Naphthalene	1.8	3.34
Phenanthrene	280	-
Pyrene	2,300	-

CW³M will consider the groundwater at this site to be Class I unless demonstrated otherwise pursuant to 35 Ill. Adm. Code § 620.210. According to the Illinois Pollution Control Board, three Class III Groundwater contributing areas exist; however, they are located in McHenry, Monroe and St. Clair Counties in northern and western Illinois. Groundwater investigation sample results would be compared to the TACO Tier 1 CUOs in milligrams per liter (mg/L).

Table 2-2. Groundwater Remediation Objectives

Parameter	TACO Tier 1 CUOs (mg/L)
Benzene	0.005
Ethylbenzene	0.7
Toluene	1.0
Total Xylenes	10.0
MTBE	0.07
Acenaphthene	0.42
Acenaphtylene	0.01
Anthracene	2.1
Benzo(a)anthracene	0.00013
Benzo(a)pyrene	0.0002
Benzo(b)fluoranthene	0.00018
Benzo(g,h,i)perylene	0.00076
Benzo(k)fluoranthene	0.00017
Chrysene	0.0015
Dibenz(a,h)anthracene	0.0003
Fluoranthene	0.28
Fluorene	0.28
Indeno(1,2,3-cd)pyrene	0.00043
Naphthalene	0.14
Phenanthrene	0.0064
Pyrene	0.210

3. CORRECTIVE ACTION PLAN

Based upon the analytical data from the soil and groundwater samples collected to date, it is apparent that soil contamination exceeding various CUOs for multiple indicator contaminants remains from the release. Additionally, groundwater contamination for multiple indicator contaminants remains from the release. Site investigation details were presented in the SICR (CW³M, 2005c) and CAP and Budget Amendment (CW³M, 2021).

The following CAP and Budget has been prepared by CW³M Company, Inc., as their recommendation for the most appropriate approach to the remediation of the contamination at the Marine Bank Trust #53-0051 site in Cantrall, Illinois.

At the conclusion of the most recent Corrective Action activities, SB-21 vertically defined TACO Tier 1 C_{sat} exceedances from SB-15. No additional soil investigation is required to vertically define TACO C_{sat} Tier 1 exceedances.

As requested by the Agency, an additional site-specific geotechnical soil sample (PTACO) was collected during the September 2, 2023 Corrective Action activities. These new site-specific geotechnical parameters revised the previous geotechnical data, therefore new TACO Tier 2 CUOs were required to be calculated.

Upon the calculation of the new TACO Tier 2 CUOs, it was determined that multiple soil samples remain which exceed various TACO Tier 2 CUOs. The table below dictates these exceedances:

Table 3-1. TACO Tier 2 Soil Exceedances

TACO Tier 2 CUO (value in mg/kg)	Exceeded Locations (Sample Depth)
Benzene Industrial-Commercial Inhalation (5.42)	SB-7 (6')
Total Xylenes Construction Worker Inhalation (98.87)	SB-15 (6')
Naphthalene Construction Worker Inhalation (3.34)	SB-7 (6'), SB-15 (6'), SB-19A (2.5'), SB-19B (7.5')
Benzene Construction Worker Inhalation (7.62)	SB-7 (6')

It was noted with previous TACO Tier 2 calculations that soil samples collected had exceeded TACO C_{sat} Tier 2 CUOs. With the new calculations, no such exceedances remain from the incident.

The contamination exceeding the TACO Industrial-Commercial Inhalation Tier 2 CUO is proposed to be addressed through the implementation of an engineered barrier. The area requiring an engineered barrier has been fully defined through Corrective Action activities and is depicted in Drawing 0008 in Appendix B. This area is currently overlain with

dilapidated concrete, especially surrounding the pump island. The concrete adjacent to the pump island is either nonexistent or heavily damaged and would not be suitable as an engineered barrier. The total area requiring an engineered barrier is 508 ft^2.

The contamination exceeding TACO Construction Worker Inhalation Tier 2 will be addressed with the use of Construction Worker Caution Areas. The Construction Worker Caution Areas are depicted on Drawing 0007 In Appendix B.

Following IEPA's Leaking Underground Storage Tank (LUST) flowchart for vapor intrusion assessment and at the Agency's request, two soil-gas vapor intrusion samples (SVG-1 and SVG-2) were collected during the September 5, 2023 sampling event. SVG-1 returned below applicable CUOs and does not require further remediation, however, SVG-2 depicts contamination exceeding indoor Industrial/Commercial inhalation CUOs and will need to be addressed. The contamination from SVG-2 is proposed to be addressed through the restriction that all future buildings will need to be constructed on a concrete base with no sumps. Currently, no above ground structures remain on site.

The remaining contamination required to be addressed is from soil-to-groundwater and groundwater contamination. All groundwater contamination remaining on site will be addressed with the use of a groundwater use restriction in the form a groundwater ordinance. It was determined by Ted Stead, Cantrall village president, that any of the properties east of Route 29 are not considered within the jurisdiction of the Village of Cantrall. Fancy Creek Township maintains jurisdiction of the properties surrounding the site. Therefore, the groundwater contamination migrating off-site to the east will be addressed with an Environmental Land Use Controls (ELUCs) and a groundwater ordinance. Based on the current modeling distances, it is expected that only one ELUC will be required for the adjacent farmland. Costs associated with securing the ELUC are included in Appendix D. A proposed groundwater ordinance will cover the area extending to the west and southeast of the site along West Barber Road/Claypool Street and IL 29.

At the current moment, the bank is leaving the site in the Marine Bank trust name even though the bank has been acquired. Their position is that if the site can be closed fairly soon, the trust does not need to be changed. We've spent a significant amount of time trying to sort this out.

In summary, this plan proposes:

- Replacement of concrete as an engineered barrier for contamination exceeding TACO Industrial/Commercial Inhalation Tier 2 of benzene.
    - The total area requiring an engineered barrier is 508 ft^2.
- A Construction Worker Caution area will be implemented on site to address all TACO Construction Worker Inhalation Tier 2 areas.
- The site will also implement restrictions for future buildings to be built on a concrete base with no sumps.

- An ELUC will be sought for the off-site property for the soil-to-groundwater and groundwater contamination modeling.
- A Groundwater Ordinance will be implemented to address the groundwater contamination extending to the west and southeast of the property.

3.1 CURRENT AND PROJECTED USES OF THE SITE

The site is surrounded by an elementary school, residential, light commercial and agricultural properties. No detailed future plans exist for the property following its remediation.

3.2 INSTITUTIONAL CONTROLS PROPOSED

Several institutional controls are being proposed. An engineered barrier will cover the area exceeding TACO Industrial/Commercial Inhalation Tier 2 contamination. A Construction Worker Caution Area as depicted in Drawing 0007 in Appendix B will be implemented. The engineered barrier and the construction worker caution area will address the Benzene exceedance at SB-7. A restriction on the property will require all buildings to be constructed on a concrete base with no sumps. A groundwater use restriction in the form of a groundwater ordinance will be implemented on site to address all soil-to-groundwater and groundwater contamination. An ELUC for an off-site property will address any remaining modeling of groundwater contamination.

3.3 WATER SUPPLY WELL SURVEY

A survey of water supply wells for the purpose of identifying and locating all community water supply wells within 2,500 feet of the UST systems and all potable water supply wells within 200 feet of the UST systems was conducted. The Illinois State Geological Survey (ISGS), Illinois State Water Survey (ISWS) and the IEPA Division of Public Water Supplies data was accessed online on January 23, 2024 to update the original well survey based on the full extents of the plume.

The review indicated that twelve potable wells are located within 2,500 feet of the site. However, they are not located within the setback zone. Also, the review revealed that there are no community water supply wells located within 2,500 feet of the site. The IEPA was accessed online on July 20, 2006, to determine if there is a local ordinance or policy regulating the usage of potable water supply wells for the Village of Cantrall. There is no ordinance in effect. All wells found within 2,500 feet of the contaminant plume are listed in Table 3-2 below.

Table 3-2. Water Supply Well Information

Well ID	Type	Distance From Site (*feet*)	Setback Zone (*feet*)
*00210	ISGS	362	200
00565	ISGS	1,024	200
24621	ISGS	1,135	200
22982	ISGS	2,420	200
24639	ISGS	2,016	200
25029	ISGS	2,016	200
22498	ISGS	1,056	200
22472	ISGS	2,358	200
22983	ISGS	427	200
22430	ISGS	2,358	200
22984	ISGS	1,697	200
24431	ISGS	378	200

*The well ISGS has identified as 00210 belongs to the Athens Community Unit School District, Cantrall Elementary School. Cantrall Elementary School was contacted on June 10, 2003, and the school stated that they no longer use this well and currently obtain the village's water.

3.4 CLOSURE

At the conclusion of the proposed activities in this CAP and Budget Amendment, a Corrective Action Completion Report (CACR) will be submitted to the IEPA requesting a No Further Remediation letter. The closure report will be accompanied by a certification from an Illinois Registered Professional Engineer.

4. REFERENCES

CW³M, 2003a. CW³M Company, Inc., *20-Day Certification,* Marine Bank Trust #53-0051, Cantrall, Illinois, February 5, 2003.

CW³M, 2003b. CW³M Company, Inc., *45-Day Report,* Marine Bank Trust #53-0051, Cantrall, Illinois, March 20, 2003.

CW³M, 2003c. CW³M Company, Inc., *45-Day Report Addendum,* Marine Bank Trust #53-0051, Cantrall, Illinois, August 20, 2003.

CW³M, 2003d. CW³M Company, Inc., *Site Investigation Plan and Budget,* Marine Bank Trust #53-0051, Cantrall, Illinois, October 31, 2003.

CW³M, 2004a. CW³M Company, Inc., *Site Investigation Plan and Budget Amendment,* Marine Bank Trust #53-0051, Cantrall, Illinois, May 18, 2004.

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CW³M, 2005a. CW³M Company, Inc., *Site Investigation Completion Report,* Marine Bank Trust #53-0051, Cantrall, Illinois, April 8, 2005.

CW³M, 2005b. CW³M Company, Inc., *Site Investigation Completion Report,* Marine Bank Trust #53-0051, Cantrall, Illinois, June 27, 2005.

CW³M, 2005c. CW³M Company, Inc., *Site Investigation Completion Report,* Marine Bank Trust #53-0051, Cantrall, Illinois, September 14, 2005.

CW³M, 2005d. CW³M Company, Inc., *Corrective Action Plan and Budget,* Marine Bank Trust #53-0051, Cantrall, Illinois, October 25, 2005.

CW³M, 2005e. CW³M Company, Inc., *Amended Site Investigation Plan Budget,* Marine Bank Trust #53-0051, Cantrall, Illinois, November 2, 2005.

CW³M, 2006a. CW³M Company, Inc., *Site Investigation Plan and Budget Amendment,* Marine Bank Trust #53-0051, Cantrall, Illinois, February 28, 2006.

CW³M, 2006b. CW³M Company, Inc., *Corrective Action Plan and Budget,* Marine Bank Trust #53-0051, Cantrall, Illinois, August 28, 2006.

CW³M, 2006c. CW³M Company, Inc., *Corrective Action Plan Response,* Marine Bank Trust #53-0051, Cantrall, Illinois, November 17, 2006.

CW³M, 2008. CW³M Company, Inc., *Corrective Action Plan,* Marine Bank Trust #53-0051, Cantrall, Illinois, November 14, 2008.

CW³M, 2021. CW³M Company, Inc., *Corrective Action Plan and Budget Amendment,* Marine Bank Trust #53-0051, Cantrall, Illinois, January 26, 2021.

CW³M, 2023. CW³M Company, Inc., *Corrective Action Plan and Budget Amendment,* Marine Bank Trust #53-0051, Cantrall, Illinois, April 11, 2023.

EPA.GOV, 2022. EPA on-Line Tools for SITE Assessment Calculation. EPA, Environmental Protection Agency, January 18, 2023, https://www3.epa.gov/ceampubl/learn2model/part-two/onsite/gradient4plus-ns.html.

IEPA, 2003a. Illinois Environmental Protection Agency, *20-Day Certification Correspondence,* Marine Bank Trust #53-0051, Cantrall, Illinois, February 13, 2003.

IEPA, 2003b. Illinois Environmental Protection Agency, *Site Investigation Plan and Budget Correspondence,* Marine Bank Trust #53-0051, Cantrall, Illinois, December 23, 2003.

IEPA, 2004a. Illinois Environmental Protection Agency, *Site Investigation Plan and Budget Correspondence,* Marine Bank Trust #53, Cantrall, Illinois, June 7, 2004.

IEPA, 2004b. Illinois Environmental Protection Agency, *Site Investigation Status Report and Budget Correspondence,* Marine Bank Trust #53-0051, Cantrall, Illinois, June 7, 2004.

IEPA, 2005a. Illinois Environmental Protection Agency, *Site Investigation Completion Report and Budget Correspondence,* Marine Bank Trust #53-0051, Cantrall, Illinois, August 29, 2005.

IEPA, 2005b. Illinois Environmental Protection Agency, *Site Investigation Completion Report and Budget Correspondence,* Marine Bank Trust #53-0051, Cantrall, Illinois, October 17, 2005.

IEPA, 2005c. Illinois Environmental Protection Agency, *Amended Site Investigation Plan Budget Correspondence,* Marine Bank Trust #53-0051, Cantrall, Illinois, December 2, 2005.

IEPA, 2006a. Illinois Environmental Protection Agency, *Corrective Action Plan and Budget Correspondence,* Marine Bank Trust #53-0051, Cantrall, Illinois, February 21, 2006.

IEPA, 2006b. Illinois Environmental Protection Agency, *Site Investigation Plan and Budget Correspondence,* Marine Bank Trust #53-0051, Cantrall, Illinois, April 5, 2006.

IEPA, 2006c. Illinois Environmental Protection Agency, *Corrective Action Plan and Budget Correspondence,* Marine Bank Trust #53-0051, Cantrall, Illinois, October 23, 2006.

IEPA, 2007. Illinois Environmental Protection Agency, *Corrective Action Plan and Budget Correspondence,* Marine Bank Trust #53-0051, Cantrall, Illinois, March 15, 2007.

IEPA, 2009. Illinois Environmental Protection Agency, *Corrective Action Plan Correspondence,* Marine Bank Trust #53-0051, Cantrall, Illinois, March 10, 2009.

IEPA, 2021. Illinois Environmental Protection Agency, *Corrective Action Plan and Budget Amendment Correspondence,* Marine Bank Trust #53-0051, Cantrall, Illinois, May 19, 2021.

IEPA, 2023. Illinois Environmental Protection Agency, *Corrective Action Plan and Budget Amendment Correspondence,* Marine Bank Trust #53-0051, Cantrall, Illinois, August 1, 2023.

APPENDIX A

CORRECTIVE ACTION PLAN FORM

CORRECTIVE ACTION PLAN AND BUDGET AMENDMENT

MARINE BANK TRUST # 53-0051
CANTRALL, ILLINOIS

Illinois Environmental Protection Agency

1021 North Grand Avenue East • P.O. Box 19276 • Springfield • Illinois • 62794-9276 • (217) 782-3397

Leaking Underground Storage Tank Program
Corrective Action Plan

A. Site Identification

IEMA Incident # (6- or 8-digit): 20030135 IEPA LPC# (10-digit): 1670255005

Site Name: Marine Bank Trust #53-0051

Site Address (Not a P.O. Box): 9520 Illinois State Route 29

City: Cantrall County: Sangamon ZIP Code: 62625

B. Site Information

1. Will the owner or operator seek reimbursement from the Underground Storage Tank Fund? ☑ Yes ○ No
2. If yes, is the budget attached? ☑ Yes ○ No
3. Is this an amended plan? ☑ Yes ○ No
4. Identify the material(s) released: Gasoline, Diesel, and Used Oil
5. This Corrective Action Plan is submitted pursuant to:
   - ○ a. 35 Ill. Adm. Code 731.166
   - ○ b. 35 Ill. Adm. Code 732.404
   - ☑ c. 35 Ill. Adm. Code 734.335

C. Proposed Methods of Remediation

1. Soil Engineered Barrier, Construction Worker Caution Area
2. Groundwater Groundwater Ordinance, ELUC

D. Soil and Groundwater Investigation Results

(for incidents subject to 35 Ill. Adm. Code 731 only or 732 that were classified using Method One or Two, if not previously provided)

Provide the following:

1. Description of investigation activities performed to define the extents of soil and/or groundwater contamination;
2. Analytical results, chain-of-custody forms, and laboratory certifications;
3. Tables comparing analytical results to applicable remediation objectives;

4. Boring logs;
5. Monitoring well logs; and
6. Site maps meeting the requirements of 35 Ill. Adm. Code 732.110(a) or 734.440 and showing:
    a. Soil sample locations;
    b. Monitoring well locations; and
    c. Plumes of soil and groundwater contamination.

E. Technical Information - Corrective Action Plan

Provide the following:

1. Executive summary identifying the objectives of the corrective action plan and the technical approach to be utilized to meet such objectives;
    a. The major components (e.g., treatment, containment, removal) of the corrective action plan;
    b. The scope of the problems to be addressed by the proposed corrective action; and
    c. A schedule for implementation and completion of the plan;
2. Identification of the remediation objectives proposed for the site;
3. A description of the remedial technologies selected:
    a. The feasibility of implementing the remedial technologies;
    b. Whether the remedial technologies will perform satisfactorily and reliably until the remediation objectives are achieved; and
    c. A schedule of when the technologies are expected to achieve the applicable remediation objectives;
4. A confirmation sampling plan that describes how the effectiveness of the corrective action activities will be monitored during their implementation and after their completion;
5. A description of the current and projected future uses of the site;
6. A description of engineered barriers or institutional controls that will be relied upon to achieve remediation objectives:
    a. an assessment of their long-term reliability;
    b. operating and maintenance plans;
    c. maps showing area covered by barriers and institutional controls;
    d. copies of the complete application(s) for planned Highway Authority Agreement(s); and
    e. draft groundwater ordinance(s) and Environmental Land Use Controls.
7. The water supply well survey:
    a. Map(s) showing locations of community water supply wells and other potable wells and the setback zone for each well;
    b. Map(s) showing regulated recharge areas and wellhead protection areas;
    c. Map(s) showing the current extent of groundwater contamination exceeding the most stringent Tier 1 remediation objectives;
    d. Map(s) showing the modeled extent of groundwater contamination exceeding the most stringent Tier 1 remediation objectives;
    e. Tables listing the setback zone for each community water supply well and other potable water supply wells;
    f. A narrative identifying each entity contacted to identify potable water supply wells, the name and title of each person contacted, and any field observations associated with any wells identified; and
    g. A certification from a Licensed Professional Engineer or Licensed Professional Geologist that the survey was conducted in accordance with the requirements and that documentation submitted includes information obtained as a result of the survey (certification of this plan satisfies this requirement);

8. Appendices:
    a. References and data sources report that are organized; and
    b. Field logs, well logs, and reports of laboratory analyses;
9. Site map(s) meeting the requirements of 35 Ill. Adm. Code 732.110(a) or 734.440;
10. Engineering design specifications, diagrams, schematics, calculations, manufacturer's specifications, etc.;
11. A description of bench/pilot studies;
12. Cost comparison between proposed method of remediation and other methods of remediation;
13. For the proposed Tier 2 or 3 remediation objectives, provide the following:
    a. The equations used;
    b. A discussion of how input variables were determined;
    c. Map(s) depicting distances used in equations; and
    d. Calculations; and
14. Provide documentation to demonstrate the following for alternative technologies:
    a. The proposed alternative technology has a substantial likelihood of successfully achieving compliance with all applicable regulations and remediation objectives;
    b. The proposed alternative technology will not adversely affect human health and safety or the environment;
    c. The owner or operator will obtain all Illinois EPA permits necessary to legally authorize use of the alternative technology;
    d. The owner or operator will implement a program to monitor whether the requirements of subsection (14)(a) have been met;
    e. Within one year from the date of Illinois EPA approval, the owner or operator will provide to the Illinois EPA monitoring program results establishing whether the proposed alternative technology will successfully achieve compliance with the requirements of subsection (14)(a); and
    f. Demonstration that the cost of alternative technology will not exceed the cost of conventional technology and is not substantially higher than at least two other alternative technologies, if available and technically feasible.

F. Exposure Pathway Exclusion

Provide the following:

1. A description of the tests to be performed in determining whether the following requirements will be met:
    a. Attenuation capacity of the soil will not be exceeded for any of the organic contaminants;
    b. Soil saturation limit will not be exceeded for any of the organic contaminants;
    c. Contaminated soils do not exhibit any of the reactivity characteristics of hazardous waste per 35 Ill. Adm. Code 721.123;
    d. Contaminated soils do not exhibit a pH $\leq$ 2.0 or $\geq$ 12.5; and
    e. Contaminated soils which contain arsenic, barium, cadmium, chromium, lead, mercury, or selenium (or their associated salts) do not exhibit any of the toxicity characteristics of hazardous waste per 35 Ill. Adm. Code 721.124.
2. A discussion of how any exposure pathways are to be excluded.

G. Signatures

All plans, budgets, and reports must be signed by the owner or operator and list the owner's or operator's full name, address, and telephone number.

UST Owner or Operator

Name: Marine Bank Trust #53-0051
Contact: Jeffery M. Ulrich
Address: 201 Clock Tower Dr.
City: East Peoria
State: Illinois
Zip Code: 61611
Phone: 309 681 3865
Email: Jeffery.Ulrich@mcbtrust.com
Signature: Jeffery M. Ulrich TRUSTEE
Date: 1-8-2024

Consultant

Company: CWM Company, Inc.
Contact: ~~Carol Rowe~~ MATTHEW SALADINO
Address: 701 South Grand Avenue West
City: Springfield
State: Illinois
Zip Code: 62704
Phone: 217-522-8001
Email: cwm@cwmcompany.com
Signature:
Date: 1/12/24

I certify under penalty of law that all activities that are the subject of this plan were conducted under my supervision or were conducted under the supervision of another Licensed Professional Engineer or Licensed Professional Geologist and reviewed by me; that this plan and all attachments were prepared under my supervision; that, to the best of my knowledge and belief, the work described in this plan has been completed in accordance with the Environmental Protection Act [415 ILCS 5], 35 Ill. Adm. Code 731, 732 or 734, and generally accepted standards and practices of my profession; and that the information presented is accurate and complete. I am aware there are significant penalties for submitting false statements or representations to the Illinois EPA, including but not limited to fines, imprisonment, or both as provided in Sections 44 and 57.17 of the Environmental Protection Act [415 ILCS 5/44 and 57.17].

Licensed Professional Engineer or Geologist

Name: Vince E. Smith
Company: CWM Company, Inc.
Address: 701 South Grand Ave. West
City: Springfield
State: Illinois
Zip Code: 62704
Phone: 217-522-8001
Ill. Registration No.: 062-046118
License Expiration Date: 11/30/25
Signature:
Date: 1/12/24

L.P.E. or L.P.G. Seal

APPENDIX B

SITE MAPS AND ILLUSTRATIONS

CORRECTIVE ACTION PLAN AND BUDGET AMENDMENT

MARINE BANK TRUST # 53-0051
CANTRALL, ILLINOIS

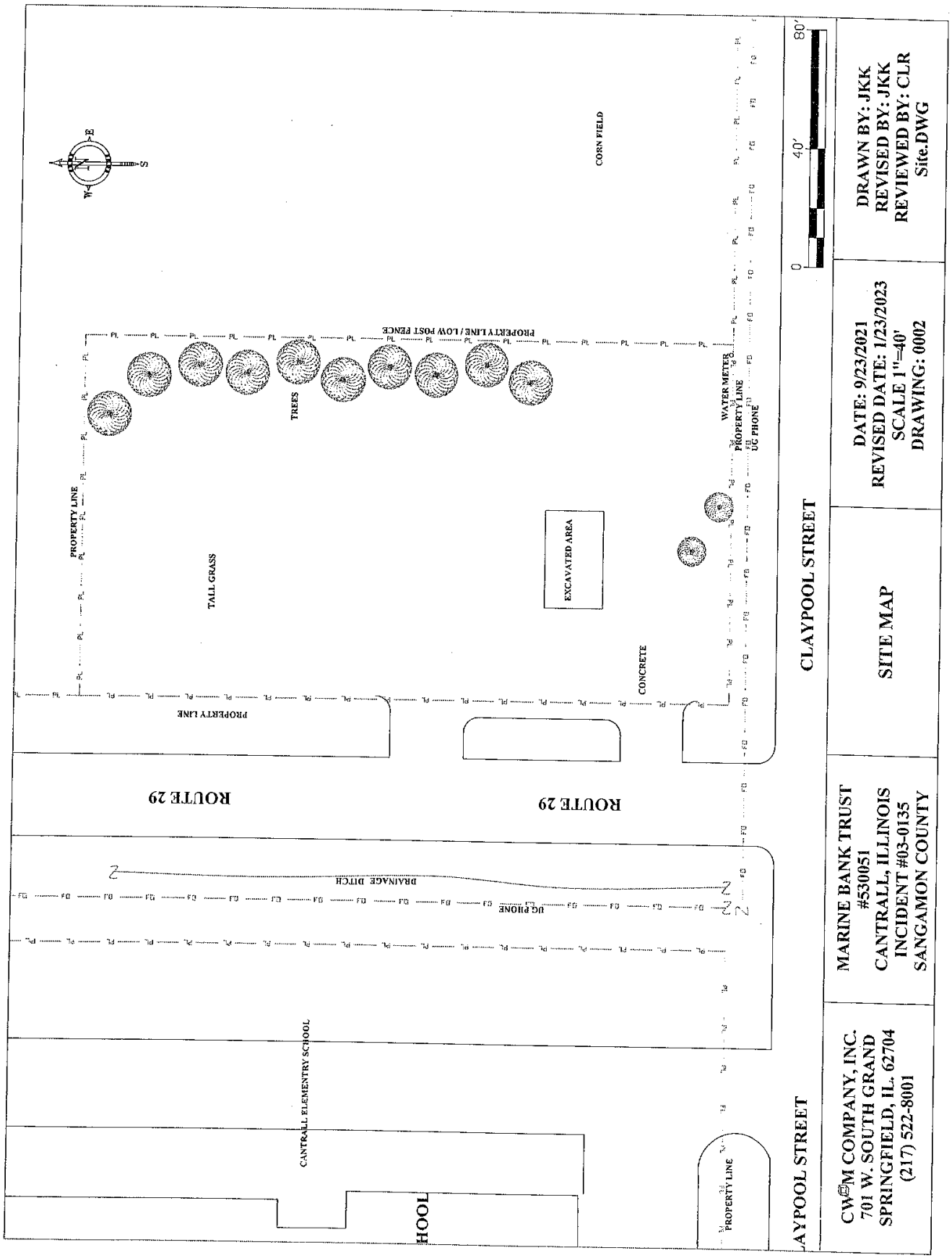
CW³M Company, Inc.
Corrective Action Plan & Budget Amendment
Marine Bank Trust # 53-0051
LPC # 1670255005/ Incident Number 2003-0135

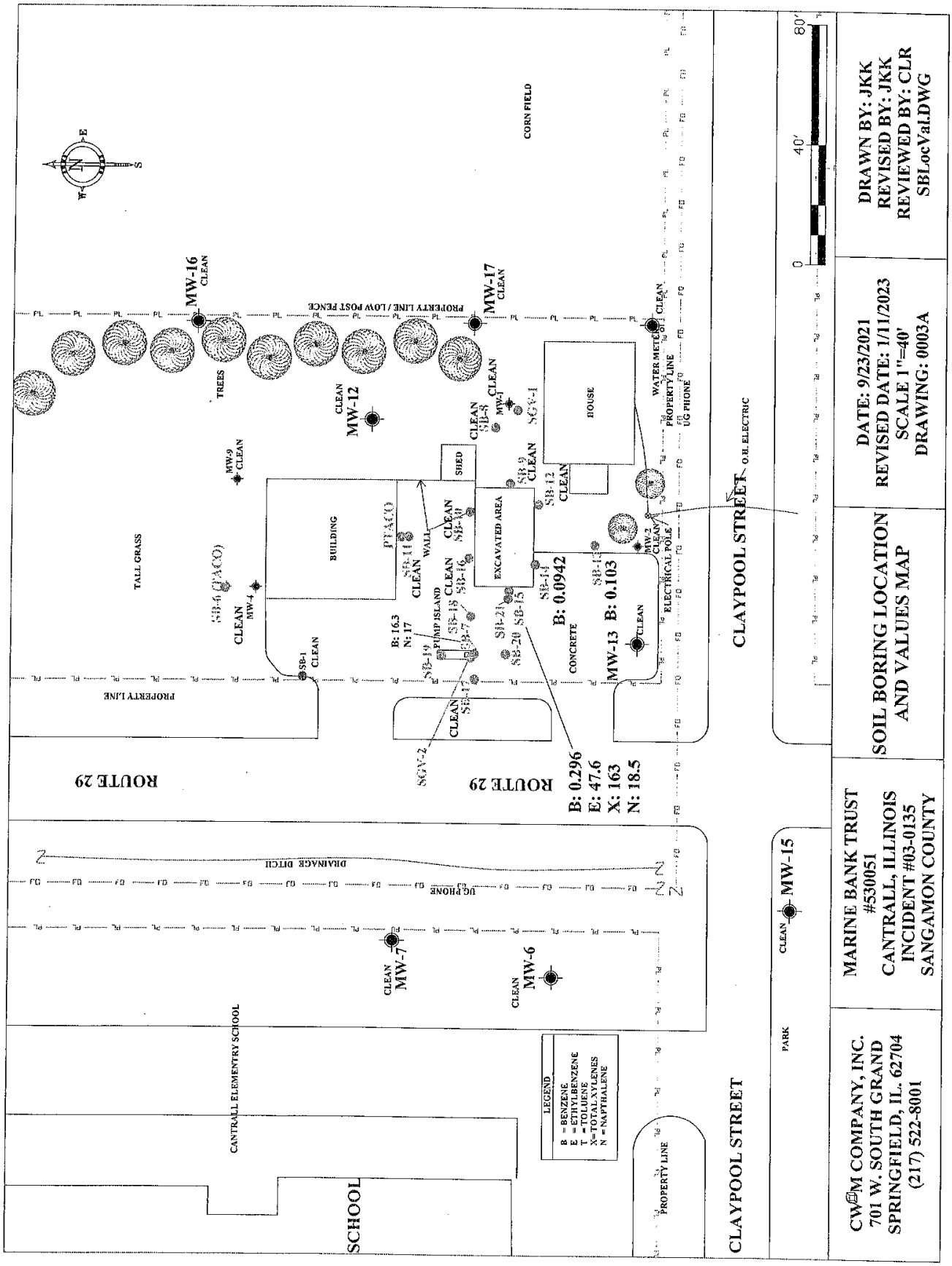
INDEX OF DRAWINGS

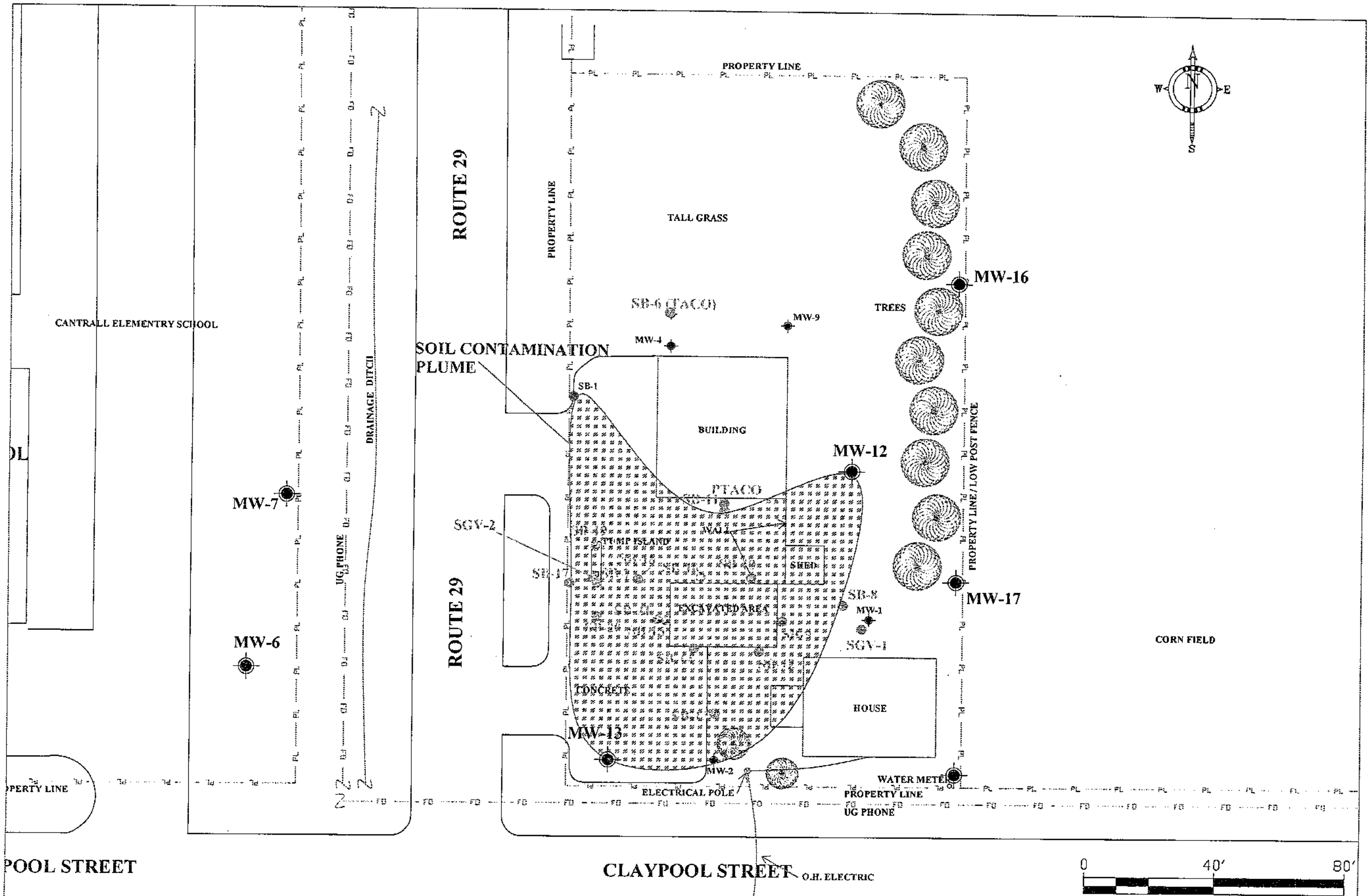
Drawing Number	Description	File Name
0001	Site Location Map	Site1.dwg
0001A	Topographic Map	topo.dwg
0002	Site Map	Site.dwg
0003A	Soil Boring Location and Values Map	SBLocVal.dwg
0003B	Soil Contamination Plume Map	SPlume.dwg
0004A	Monitoring Well Locations and GW Values Map	MWLoc-GWVal.dwg
0004B	Groundwater Contamination Plume Map	GWPlume.dwg
0005a	Groundwater Flow Map (February 27, 2004)	GWFlow02-04.dwg
0005b	Groundwater Flow Map (August 11, 2004)	GWFlow08-04.dwg
0005c	Groundwater Flow Map (September 1, 2004)	GWFlow09-04.dwg
0005d	Groundwater Flow Map (September 7, 2021)	GWFlow09-21.dwg
0006A	R-26 Modeling Map	R-26.dwg
0006B	R-26 Modeling Map (close)	R-26close.dwg
0007	Construction Worker Caution Area Map	CWCat.dwg
0008	Proposed Engineered Barrier Location Map	EngBar.dwg
0009	Proposed Groundwater Ordinance Map	GWOrd.dwg

CW[M] COMPANY, INC. 701 W. SOUTH GRAND SPRINGFIELD, IL. 62704 (217) 522-8001	MARINE BANK TRUST #530051 CANTRALL, ILLINOIS INCIDENT #03-0135 SANGAMON COUNTY	SITE LOCATION MAP	DATE: 9/23/2021 REVISED DATE: 1/23/2023 SCALE 1"=40' DRAWING: 0001	DRAWN BY: JKK REVISED BY: JKK REVIEWED BY: CLR Site1.DWG

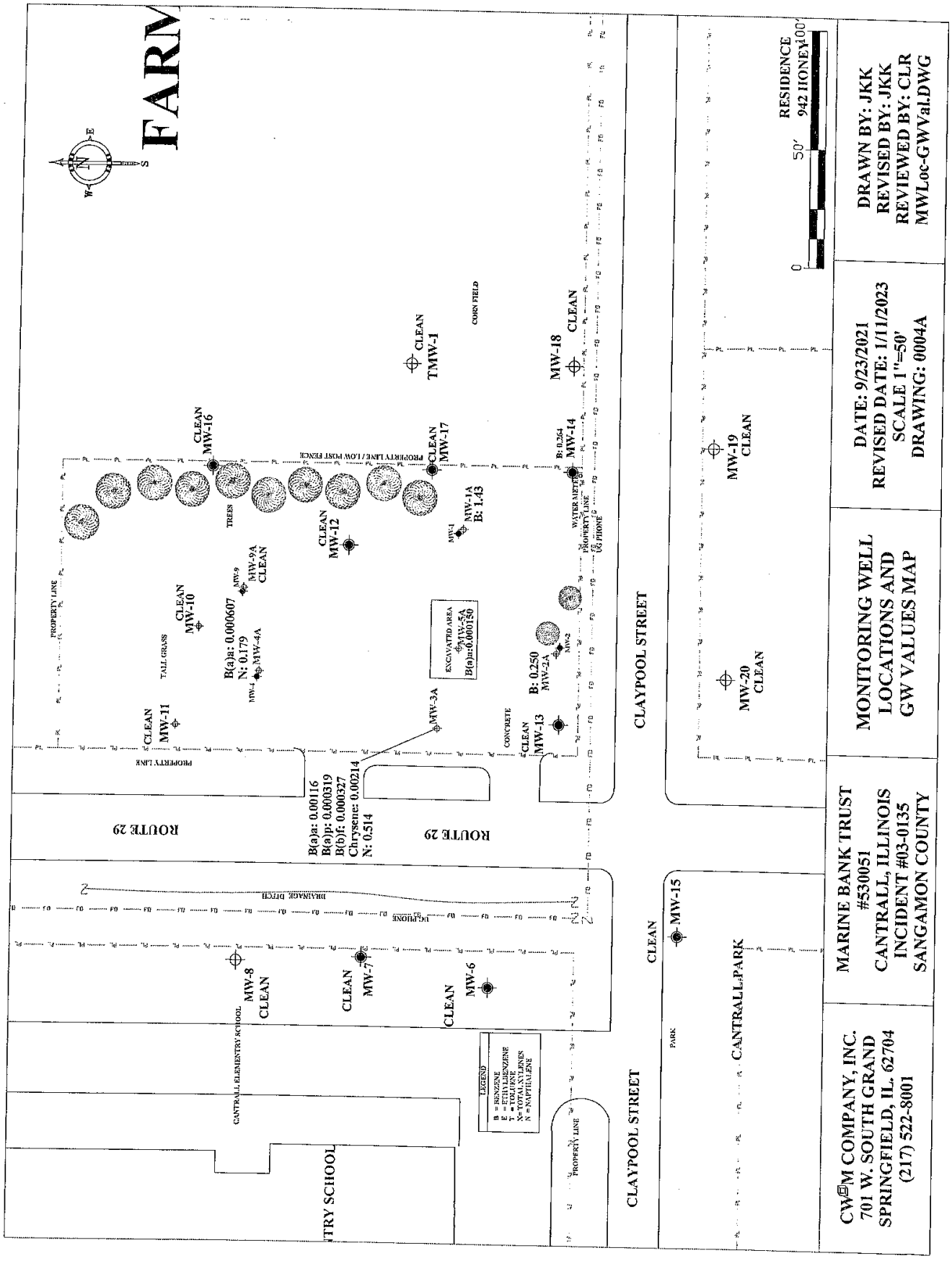
CW[illegible]M COMPANY, INC. 701 W. SOUTH GRAND SPRINGFIELD, IL. 62704 (217) 522-8001	MARINE BANK TRUST #530051 CANTRALL, ILLINOIS INCIDENT #03-0135 SANGAMON COUNTY	TOPOGRAPHIC MAP	DATE: 9/23/2021 REVISED DATE: 1/23/2023 SCALE 1"=40' DRAWING: 0001A	DRAWN BY: JKK REVISED BY: JKK REVIEWED BY: CLR *topo.DWG*

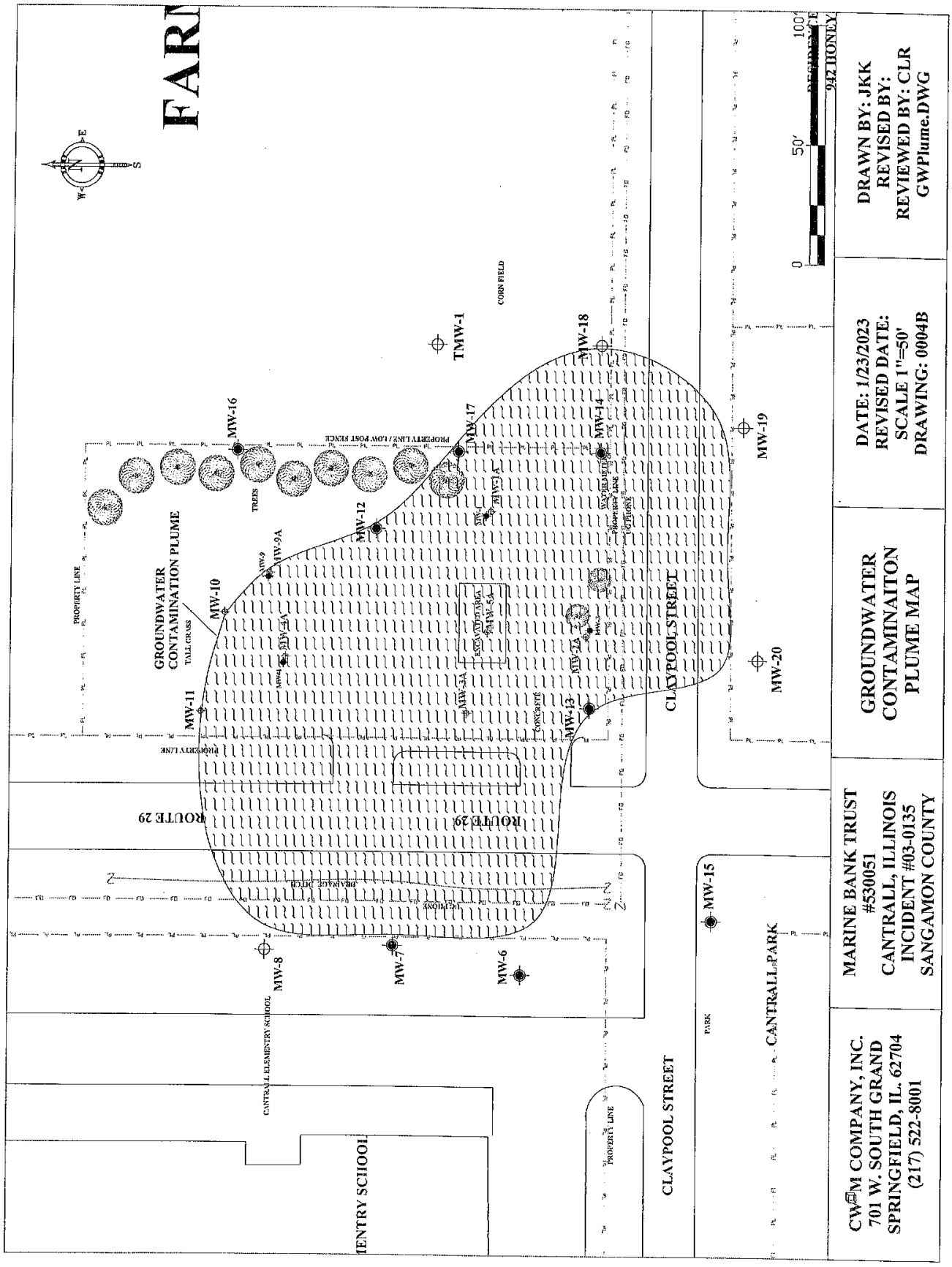

CORN FIELD
PROPERTY LINE / LOW POST FENCE
TREES
WATER METER
PROPERTY LINE
UG PHONE
PROPERTY LINE
TALL GRASS
EXCAVATED AREA
CONCRETE
PROPERTY LINE
ROUTE 29
ROUTE 29
DRAINAGE DITCH
UG PHONE
CANTRALL ELEMENTRY SCHOOL
PROPERTY LINE
CLAYPOOL STREET
CLAYPOOL STREET
0
40'
80'
DRAWN BY: JKK
REVISED BY: JKK
REVIEWED BY: CLR
Site.DWG
DATE: 9/23/2021
REVISED DATE: 1/23/2023
SCALE 1"=40'
DRAWING: 0002
SITE MAP
MARINE BANK TRUST
#530051
CANTRALL, ILLINOIS
INCIDENT #03-0135
SANGAMON COUNTY
CWM COMPANY, INC.
701 W. SOUTH GRAND
SPRINGFIELD, IL. 62704
(217) 522-8001

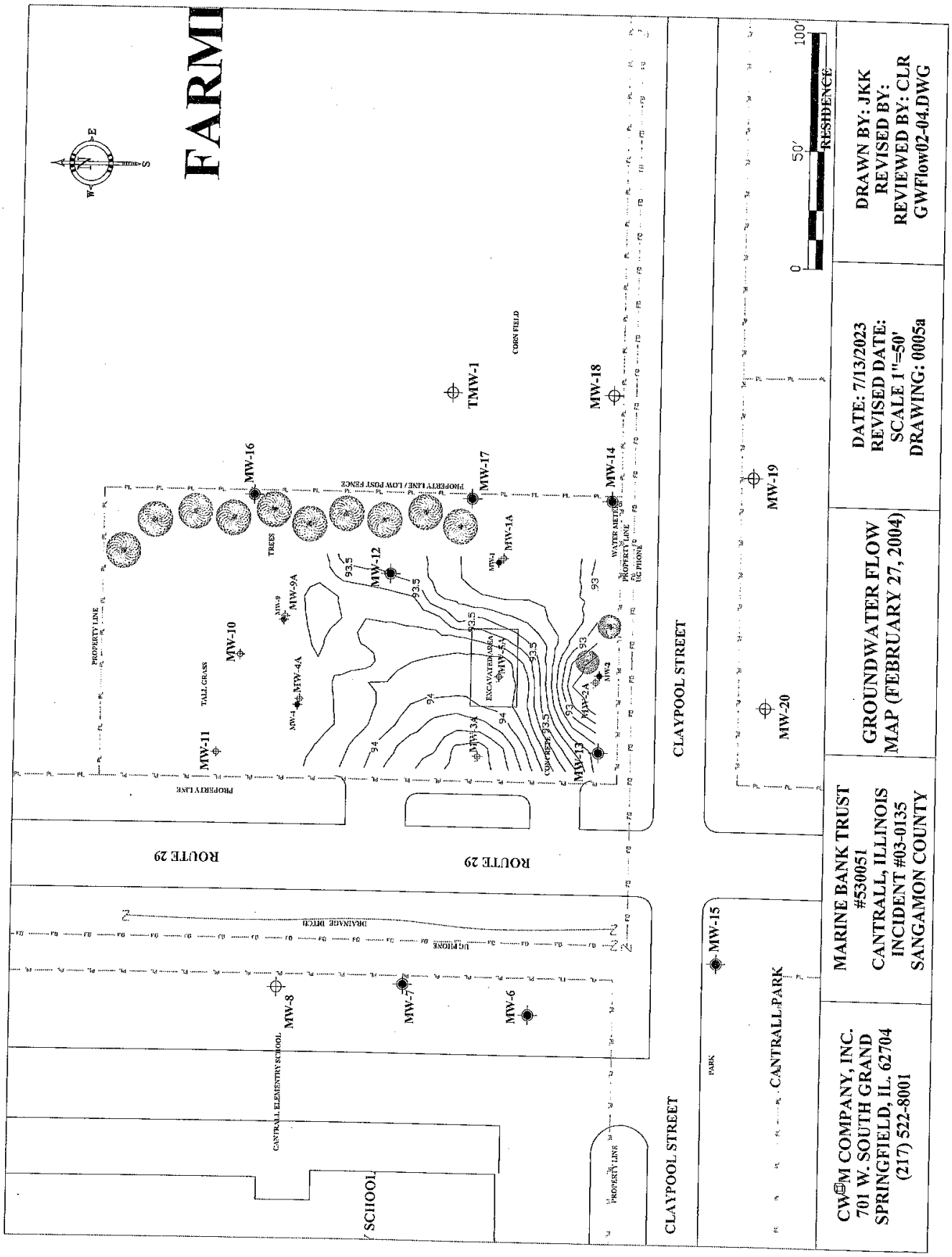

MW-16
CLEAN
MW-17
CLEAN
PROPERTY LINE / LOW POST FENCE
TREES
CORN FIELD
MW-12
CLEAN
MW-1
CLEAN
SG V-1
SB-8
CLEAN
HOUSE
WATER METER
PROPERTY LINE
UG PHONE
MW-9
CLEAN
SHED
SB-9
CLEAN
SB-12
CLEAN
TALL GRASS
BUILDING
PATIO
SB-11
CLEAN
WALL
SB-10
CLEAN
EXCAVATED AREA
MW-2
CLEAN
ELECTRICAL POLE
SB-4 (PACO)
CLEAN
MW-4
PUMP ISLAND
SB-18
CLEAN
SB-16
SB-17
SB-21
SB-20
SB-15
SB-14
B: 0.0942
CONCRETE
MW-13
B: 0.103
CLEAN
B: 16.3
N: 17
SB-19
SB-1
CLEAN
PROPERTY LINE
SB-7
SB-6
CLEAN
SG V-2
ROUTE 29
ROUTE 29
B: 0.296
E: 47.6
X: 163
N: 18.5
CLAYPOOL STREET
O.H. ELECTRIC
0
40'
80'
DRAINAGE DITCH
UG PHONE
CLEAN
MW-7
CLEAN
MW-6
CLEAN
MW-15
PARK
CANTRALL ELEMENTRY SCHOOL
SCHOOL
PROPERTY LINE
CLAYPOOL STREET
LEGEND
B = BENZENE
E = ETHYLBENZENE
T = TOLUENE
X= TOTAL XYLENES
N = NAPTHALENE
CW M COMPANY, INC.
701 W. SOUTH GRAND
SPRINGFIELD, IL. 62704
(217) 522-8001
MARINE BANK TRUST
#530051
CANTRALL, ILLINOIS
INCIDENT #03-0135
SANGAMON COUNTY
SOIL BORING LOCATION
AND VALUES MAP
DATE: 9/23/2021
REVISED DATE: 1/11/2023
SCALE 1"=40'
DRAWING: 0003A
DRAWN BY: JKK
REVISED BY: JKK
REVIEWED BY: CLR
SBLocVal.DWG

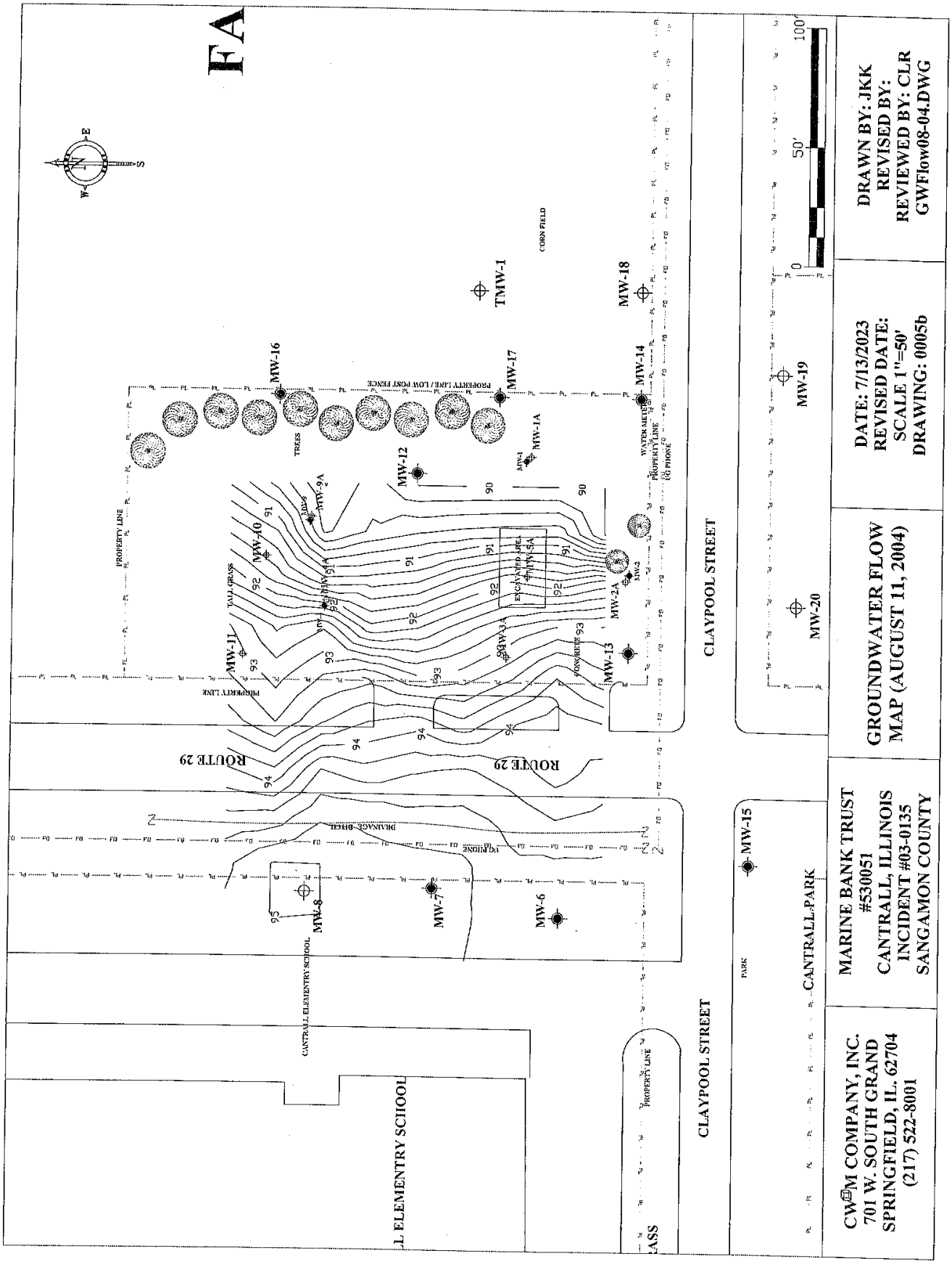

PROPERTY LINE
TALL GRASS
ROUTE 29
PROPERTY LINE
DRAINAGE DITCH
UG PHONE
CANTRALL ELEMENTRY SCHOOL
SOIL CONTAMINATION PLUME
SB-6 (TACO)
MW-9
MW-4
SB-1
BUILDING
MW-12
PTACO
TREES
MW-16
MW-17
PROPERTY LINE / LOW POST FENCE
MW-7
MW-6
SGV-2
PUMP ISLAND
SHED
EXCAVATED AREA
SB-8
MW-1
SGV-1
CONCRETE
HOUSE
CORN FIELD
MW-13
MW-2
ELECTRICAL POLE
WATER METER
PROPERTY LINE
UG PHONE
POOL STREET
CLAYPOOL STREET
O.H. ELECTRIC
0
40'
80'

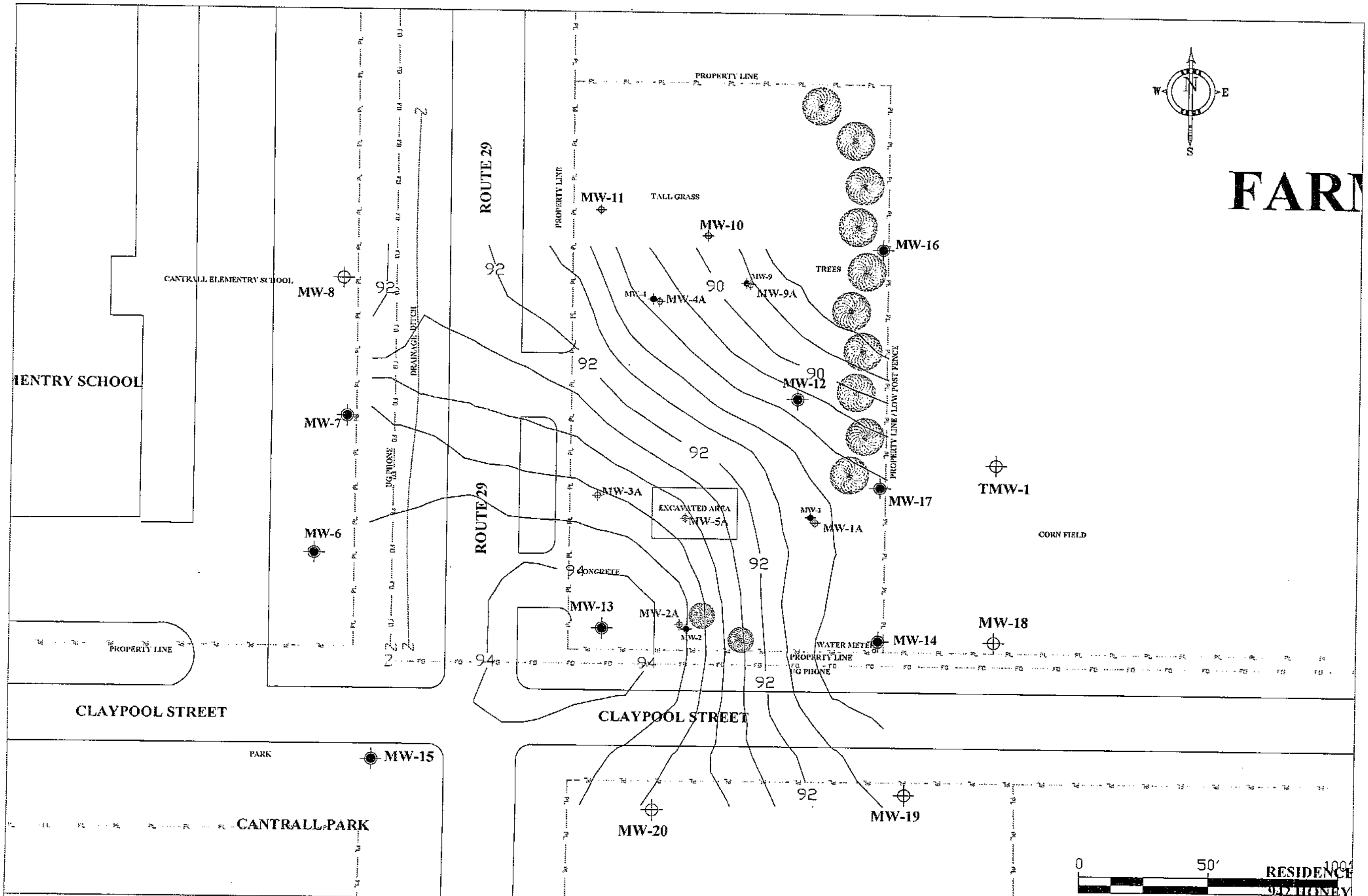
CW3M COMPANY, INC. 701 W. SOUTH GRAND SPRINGFIELD, IL. 62704 (217) 522-8001	MARINE BANK TRUST #530051 CANTRALL, ILLINOIS INCIDENT #03-0135 SANGAMON COUNTY	SOIL CONTAMINATION PLUME MAP	DATE: 1/23/2023 REVISED DATE: SCALE 1"=40' DRAWING: 0003B	DRAWN BY: JKK REVISED BY: REVIEWED BY: CLR SPlume.DWG


FARM
CLEAN MW-16
CLEAN MW-17
CLEAN TMW-1
MW-18 CLEAN
CLEAN MW-12
MW-14
B: 0.254
MW-1A B: 1.43
CLEAN MW-10
MW-9 MW-9A CLEAN
B(a)a: 0.000607 N: 0.179
MW-4 MW-4A
MW-5A B(a)a:0.000150
B: 0.250 MW-2A
MW-2
CLEAN MW-11
MW-3A
CLEAN MW-13
B(a)a: 0.00116
B(a)p: 0.000319
B(b)f: 0.000327
Chrysene: 0.00214
N: 0.514
MW-19 CLEAN
MW-20 CLEAN
CLEAN MW-15
CLEAN MW-8
CLEAN MW-7
CLEAN MW-6
ROUTE 29
CLAYPOOL STREET
CANTRALL ELEMENTARY SCHOOL
CANTRALL PARK
PROPERTY LINE
TALL GRASS
TREES
CORN FIELD
CONCRETE
EXCAVATED AREA
DRAINAGE DITCH
UG PHONE
WATER METER
RESIDENCE 942 HONEY
0 50' 100'
LEGEND
B = BENZENE
E = ETHYLBENZENE
T = TOLUENE
X= TOTAL XYLENES
N = NAPHTHALENE
CW2M COMPANY, INC.
701 W. SOUTH GRAND
SPRINGFIELD, IL 62704
(217) 522-8001
MARINE BANK TRUST
#530051
CANTRALL, ILLINOIS
INCIDENT #03-0135
SANGAMON COUNTY
MONTORING WELL
LOCATIONS AND
GW VALUES MAP
DATE: 9/23/2021
REVISED DATE: 1/11/2023
SCALE 1"=50'
DRAWING: 0004A
DRAWN BY: JKK
REVISED BY: JKK
REVIEWED BY: CLR
MWLoc-GWVal.DWG

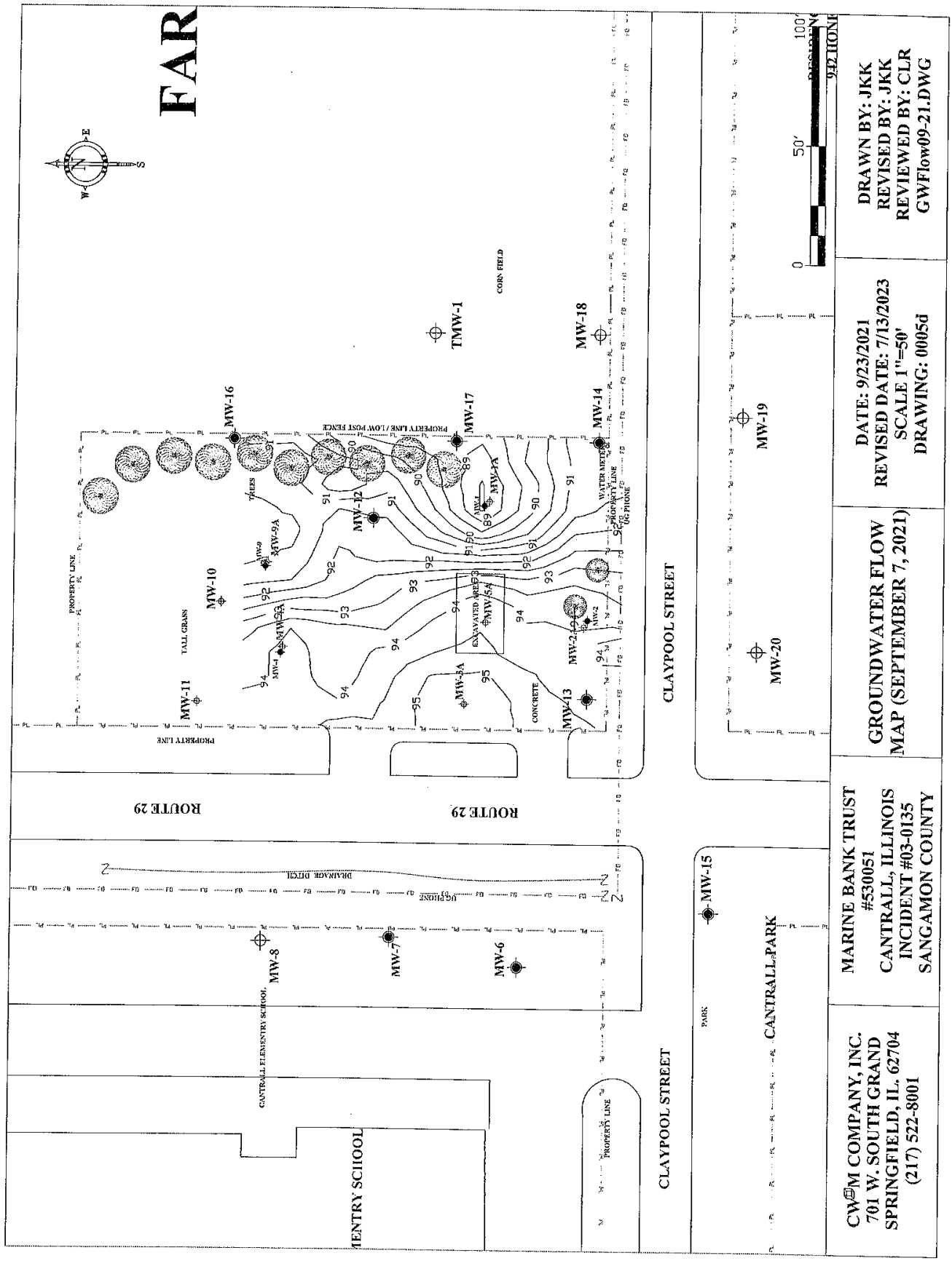

GROUNDWATER CONTAMINATION PLUME
MW-1
MW-2
MW-3
MW-3A
MW-4
MW-5
MW-6
MW-7
MW-8
MW-9
MW-9A
MW-10
MW-11
MW-12
MW-13
MW-14
MW-15
MW-16
MW-17
MW-18
MW-19
MW-20
TMW-1
ROUTE 29
CLAYPOOL STREET
CANTRALL ELEMENTARY SCHOOL
CANTRALL PARK
PROPERTY LINE
TREES
CORN FIELD
CONCRETE
DRAINAGE DITCH
0
50'
100'
CWM COMPANY, INC.
701 W. SOUTH GRAND
SPRINGFIELD, IL. 62704
(217) 522-8001
MARINE BANK TRUST
#530051
CANTRALL, ILLINOIS
INCIDENT #03-0135
SANGAMON COUNTY
GROUNDWATER
CONTAMINAITON
PLUME MAP
DATE: 1/23/2023
REVISED DATE:
SCALE 1"=50'
DRAWING: 0004B
DRAWN BY: JKK
REVISED BY:
REVIEWED BY: CLR
GWPlume.DWG

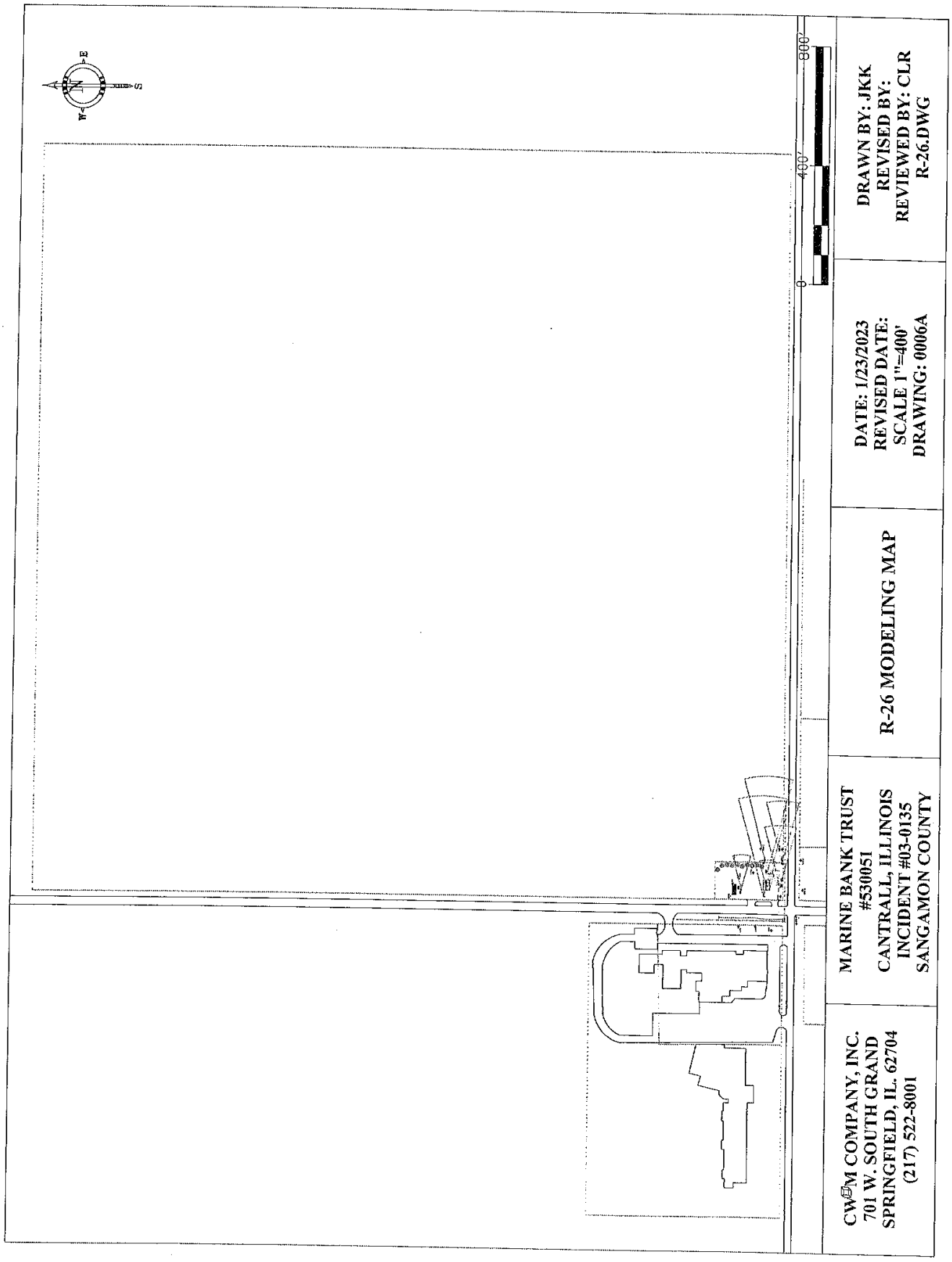

FARMI
MW-16
MW-17
MW-14
MW-18
TMW-1
MW-12
MW-10
MW-11
MW-13
MW-15
MW-19
MW-20
MW-8
MW-7
MW-6
MW-9A
MW-4A
MW-1A
MW-2A
MW-3A
MW-5A
PROPERTY LINE
TREES
TALL GRASS
CORN FIELD
CLAYPOOL STREET
ROUTE 29
CANTRALL ELEMENTARY SCHOOL
PARK
CANTRALL PARK
RESIDENCE
0
50'
100'
CWM COMPANY, INC.
701 W. SOUTH GRAND
SPRINGFIELD, IL. 62704
(217) 522-8001
MARINE BANK TRUST
#530051
CANTRALL, ILLINOIS
INCIDENT #03-0135
SANGAMON COUNTY
GROUNDWATER FLOW
MAP (FEBRUARY 27, 2004)
DATE: 7/13/2023
REVISED DATE:
SCALE 1"=50'
DRAWING: 0005a
DRAWN BY: JKK
REVISED BY:
REVIEWED BY: CLR
GWFlow02-04.DWG

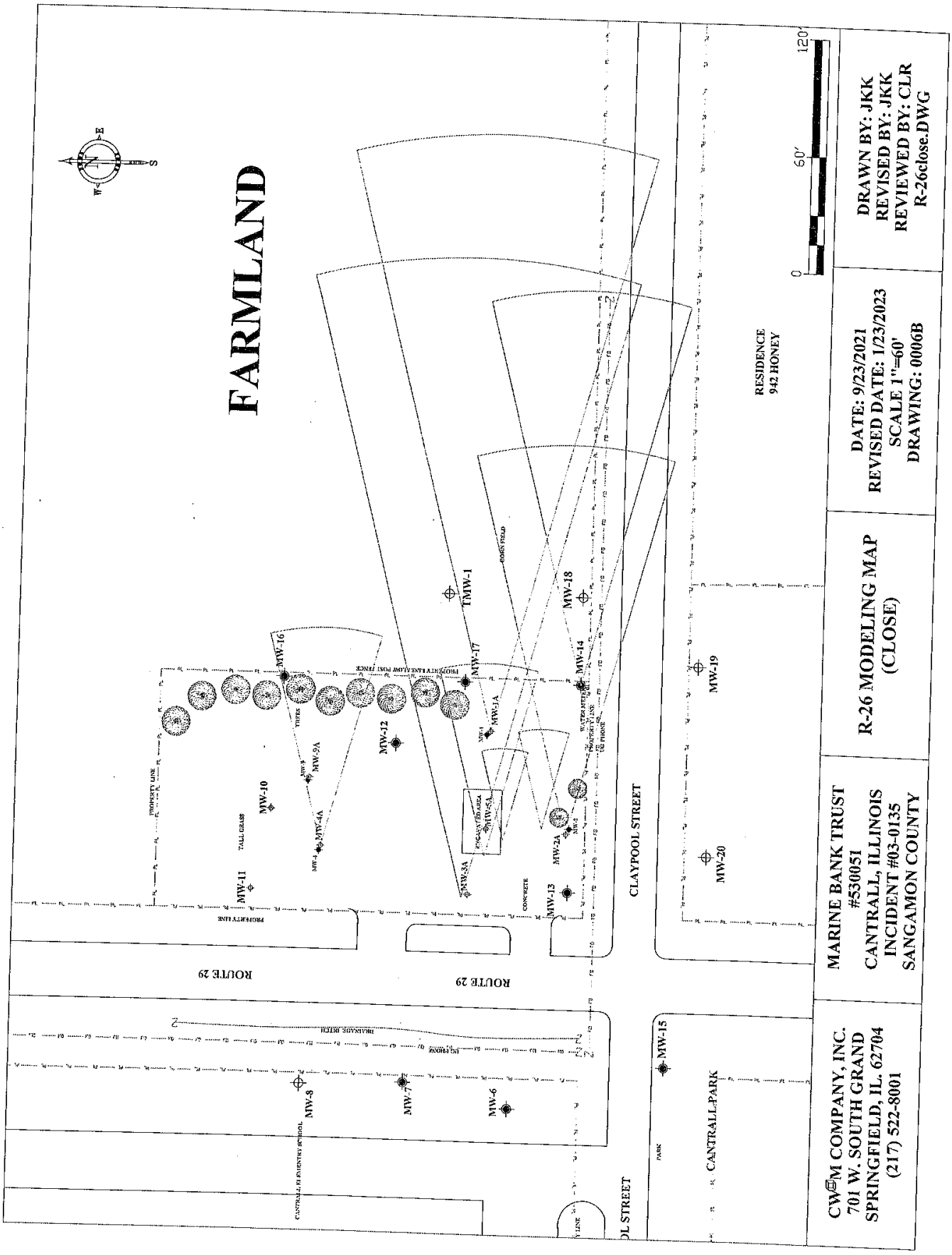

MW-16
MW-17
MW-18
TMW-1
MW-14
MW-12
MW-10
MW-11
MW-13
MW-2A
MW-9A
MW-1A
MW-8
MW-7
MW-6
MW-15
MW-19
MW-20
PROPERTY LINE
TREES
CORN FIELD
TALL GRASS
CONCRETE
ROUTE 29
CLAYPOOL STREET
CANTRALL ELEMENTRY SCHOOL
CANTRALL PARK
PARK
DRAINAGE DITCH
0
50'
100'
CWM COMPANY, INC.
701 W. SOUTH GRAND
SPRINGFIELD, IL. 62704
(217) 522-8001
MARINE BANK TRUST
#530051
CANTRALL, ILLINOIS
INCIDENT #03-0135
SANGAMON COUNTY
GROUNDWATER FLOW
MAP (AUGUST 11, 2004)
DATE: 7/13/2023
REVISED DATE:
SCALE 1"=50'
DRAWING: 0005b
DRAWN BY: JKK
REVISED BY:
REVIEWED BY: CLR
GWFlow08-04.DWG



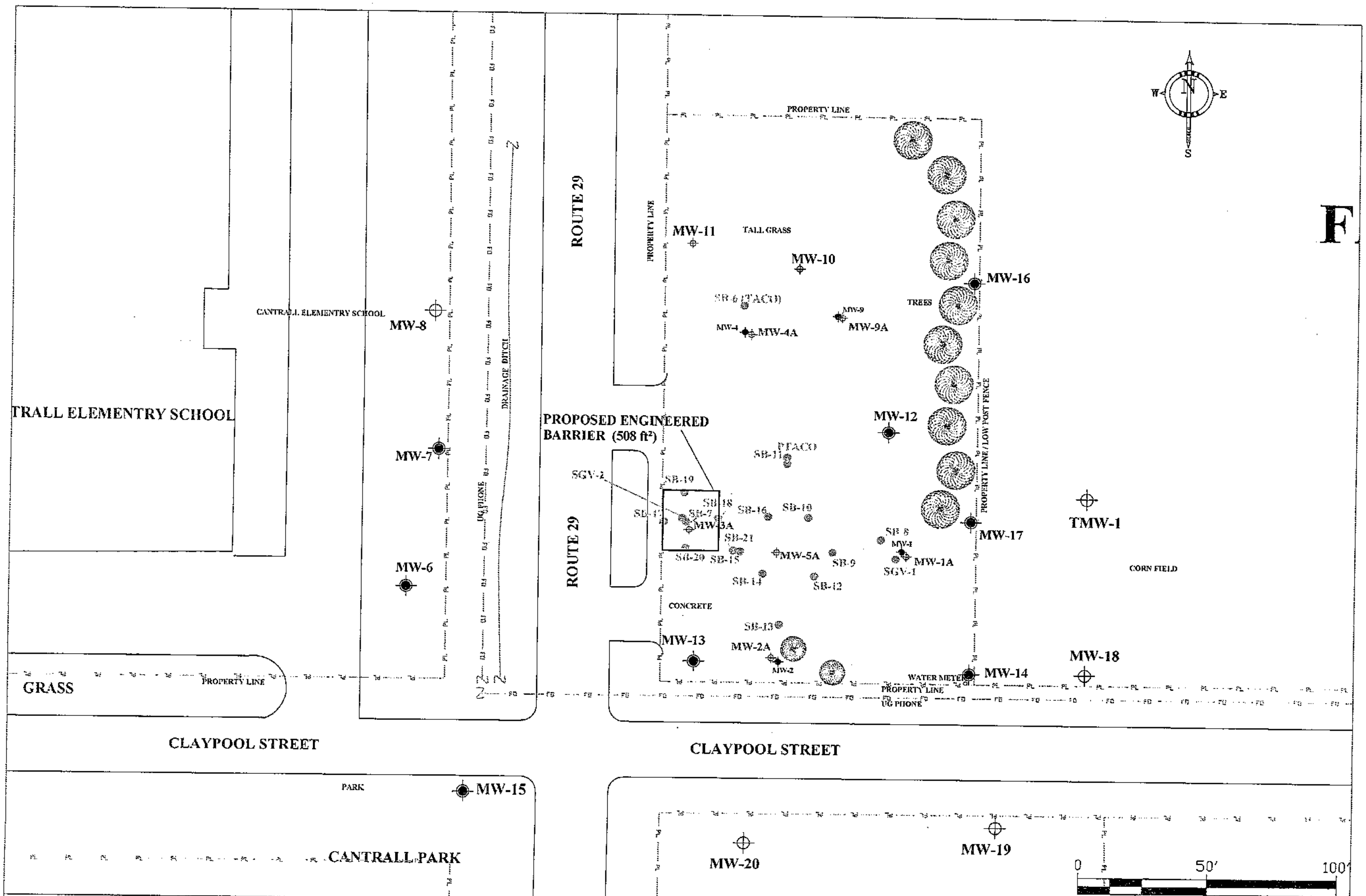
CW³M COMPANY, INC. 701 W. SOUTH GRAND SPRINGFIELD, IL. 62704 (217) 522-8001	MARINE BANK TRUST #530051 CANTRALL, ILLINOIS INCIDENT #03-0135 SANGAMON COUNTY	GROUNDWATER FLOW MAP (SEPTEMBER 1, 2004)	DATE: 7/13/2023 REVISED DATE: SCALE 1"=50' DRAWING: 0005c	DRAWN BY: JKK REVISED BY: REVIEWED BY: CLR GWFlow09-04.DWG


FAR
ROUTE 29
ROUTE 29
CLAYPOOL STREET
CLAYPOOL STREET
CANTRALL ELEMENTARY SCHOOL
CANTRALL PARK
PARK
CORN FIELD
TALL GRASS
CONCRETE
EXCAVATED AREA
PROPERTY LINE
PROPERTY LINE / LOW POST FENCE
TREES
DRAINAGE DITCH
UG PHONE
MW-1
MW-2
MW-3
MW-3A
MW-4
MW-5A
MW-6
MW-7
MW-8
MW-9
MW-9A
MW-10
MW-11
MW-12
MW-13
MW-14
MW-15
MW-16
MW-17
MW-17A
MW-18
MW-19
MW-20
TMW-1
0
50'
100'
CW M COMPANY, INC.
701 W. SOUTH GRAND
SPRINGFIELD, IL. 62704
(217) 522-8001
MARINE BANK TRUST
#530051
CANTRALL, ILLINOIS
INCIDENT #03-0135
SANGAMON COUNTY
GROUNDWATER FLOW
MAP (SEPTEMBER 7, 2021)
DATE: 9/23/2021
REVISED DATE: 7/13/2023
SCALE 1"=50'
DRAWING: 0005d
DRAWN BY: JKK
REVISED BY: JKK
REVIEWED BY: CLR
GWFlow09-21.DWG


N
E
S
W
0
400'
800'
CW M COMPANY, INC.
701 W. SOUTH GRAND
SPRINGFIELD, IL. 62704
(217) 522-8001
MARINE BANK TRUST
#530051
CANTRALL, ILLINOIS
INCIDENT #03-0135
SANGAMON COUNTY
R-26 MODELING MAP
DATE: 1/23/2023
REVISED DATE:
SCALE 1"=400'
DRAWING: 0006A
DRAWN BY: JKK
REVISED BY:
REVIEWED BY: CLR
R-26.DWG

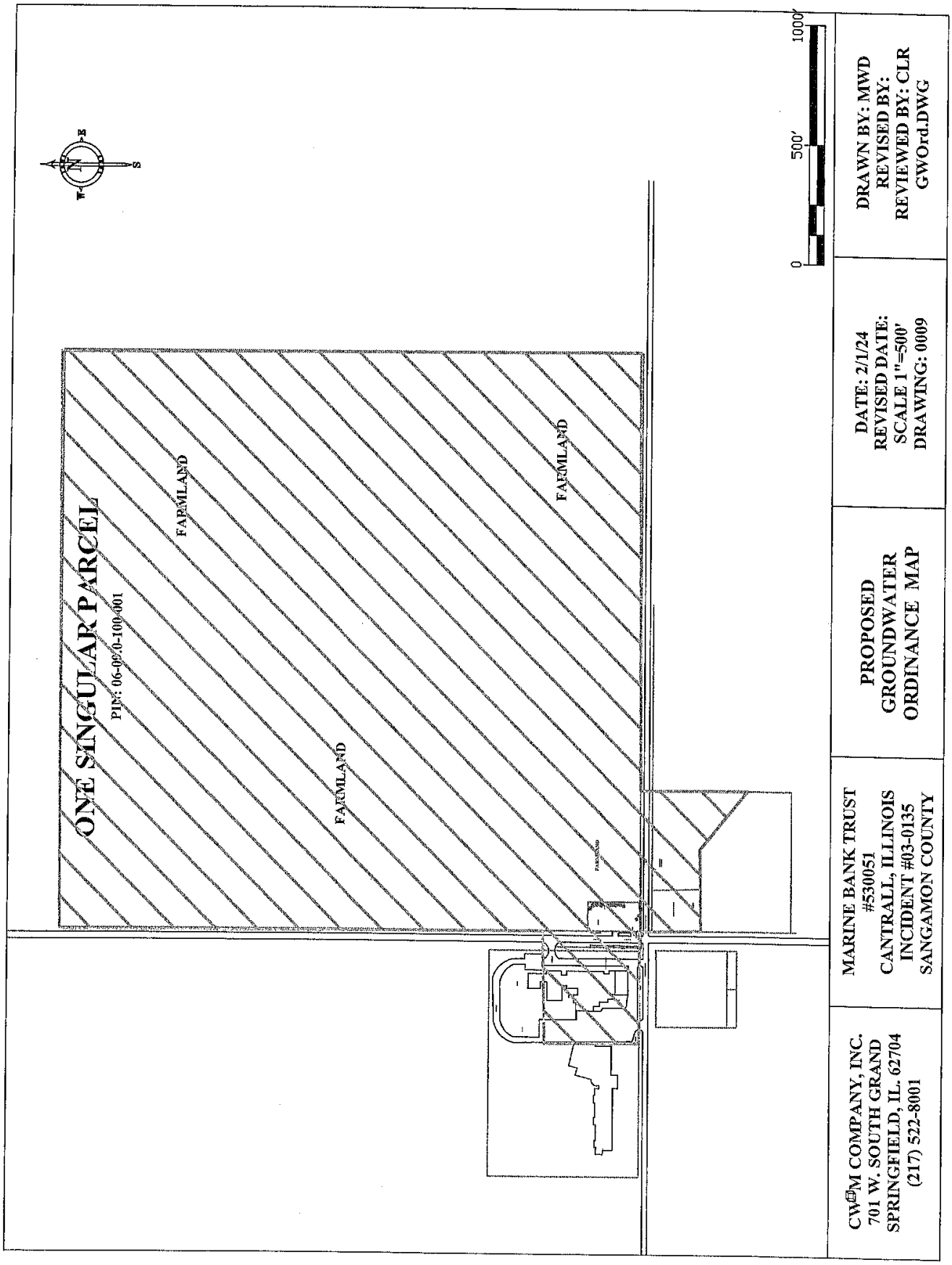

FARMLAND
RESIDENCE
942 HONEY
CLAYPOOL STREET
ROUTE 29
ROUTE 29
CANTRALL PARK
CANTRALL ELEMENTARY SCHOOL
PROPERTY LINE
TALL GRASS
CONCRETE
MW-1
MW-2
MW-2A
MW-3
MW-3A
MW-4
MW-4A
MW-5
MW-5A
MW-6
MW-7
MW-8
MW-9
MW-9A
MW-10
MW-11
MW-12
MW-13
MW-14
MW-15
MW-16
MW-17
MW-18
MW-19
MW-20
0
60'
120'
CW&M COMPANY, INC.
701 W. SOUTH GRAND
SPRINGFIELD, IL. 62704
(217) 522-8001
MARINE BANK TRUST
#530051
CANTRALL, ILLINOIS
INCIDENT #03-0135
SANGAMON COUNTY
R-26 MODELING MAP
(CLOSE)
DATE: 9/23/2021
REVISED DATE: 1/23/2023
SCALE 1"=60'
DRAWING: 0006B
DRAWN BY: JKK
REVISED BY: JKK
REVIEWED BY: CLR
R-26close.DWG

CWM COMPANY, INC. 701 W. SOUTH GRAND SPRINGFIELD, IL. 62704 (217) 522-8001	MARINE BANK TRUST #530051 CANTRALL, ILLINOIS INCIDENT #03-0135 SANGAMON COUNTY	CONSTRUCTION WORKER CAUTION AREA MAP	DATE: 9/23/2021 REVISED DATE: 11/20/2023 SCALE 1"=50' DRAWING: 0007	DRAWN BY: JKK REVISED BY: JKK REVIEWED BY: CLR CWarea.DWG



CW³M COMPANY, INC. 701 W. SOUTH GRAND SPRINGFIELD, IL. 62704 (217) 522-8001	MARINE BANK TRUST #530051 CANTRALL, ILLINOIS INCIDENT #03-0135 SANGAMON COUNTY	PROPOSED ENGINEERED BARRIER LOCATION MAP	DATE: 9/23/21 REVISED DATE: 1/23/2023 SCALE 1"=50' DRAWING: 0008	DRAWN BY: JKK REVISED BY: JKK REVIEWED BY: CLR EngBar.DWG

000248


ONE SINGULAR PARCEL
PIN: 06-09-0-100-001
FARMLAND
FARMLAND
FARMLAND
0
500'
1000'
CWEM COMPANY, INC.
701 W. SOUTH GRAND
SPRINGFIELD, IL. 62704
(217) 522-8001
MARINE BANK TRUST
#530051
CANTRALL, ILLINOIS
INCIDENT #03-0135
SANGAMON COUNTY
PROPOSED
GROUNDWATER
ORDINANCE MAP
DATE: 2/1/24
REVISED DATE:
SCALE 1"=500'
DRAWING: 0009
DRAWN BY: MWD
REVISED BY:
REVIEWED BY: CLR
GWOrd.DWG

APPENDIX C

OSFM ELIGIBILITY DETERMINATION

CORRECTIVE ACTION PLAN AND BUDGET AMENDMENT

MARINE BANK TRUST # 53-0051
CANTRALL, ILLINOIS

Office of the Illinois
State Fire Marshal

General Office
217-785-0969
FAX
217-782-1062
Divisions
ARSON INVESTIGATION
217-782-9116
BOILER and PRESSURE VESSEL SAFETY
217-782-2696
FIRE PREVENTION
217-785-4714
MANAGEMENT SERVICES
217-782-9869
INFIRS
217-785-5826
HUMAN RESOURCES
217-785-1026
PERSONNEL STANDARDS and EDUCATION
217-782-4542
PETROLEUM and CHEMICAL SAFETY
217-785-5878
PUBLIC INFORMATION
217-785-1021
WEB SITE
www.state.il.us/osfm

CERTIFIED MAIL - RECEIPT REQUESTED #7001 2510 0002 3296 7267

RECEIVED
JUN 18 2003
BY:

REVISED

June 16, 2003

Marine Bank Springfield Trust #53-0051
c/o CW3M Company
P.O. Box 571
Carlinville, IL 62626

In Re: Facility No. 5-040470
IEMA Incident No. 03-0135
Ray & Lillian Ford Property
9520 State Route 29
Cantrall, Sangamon Co., IL

Dear Applicant:

The Reimbursement Eligibility and Deductible Application received on May 13, 2003 for the above referenced occurrence has been reviewed. The following determinations have been made based upon this review.

It has been determined that you are eligible to seek payment of costs in excess of $15,000. The costs must be in response to the occurrence referenced above and associated with the following tanks:

Eligible Tanks

Tank 1 500 gallon Gasoline
Tank 2 500 gallon Used Oil
Tank 3 500 gallon Diesel
Tank 4 1,000 gallon Gasoline

You must contact the Illinois Environmental Protection Agency to receive a packet of Agency billing forms for submitting your request for payment.

An owner or operator is eligible to access the Underground Storage Tank Fund if the eligibility requirements are satisfied:

1. Neither the owner nor the operator is the United States Government,

2. The tank does not contain fuel which is exempt from the Motor Fuel Tax Law,

3. The costs were incurred as a result of a confirmed release of any of the following substances:

"Fuel", as defined in Section 1.19 of the Motor Fuel Tax Law

Aviation fuel

Heating oil

Kerosene

Used oil, which has been refined from crude oil used in a motor vehicle, as defined in Section 1.3 of the Motor Fuel Tax Law.

JUN 18 2003

4. The owner or operator registered the tank and paid all fees in accordance with the statutory and regulatory requirements of the Gasoline Storage Act.

5. The owner or operator notified the Illinois Emergency Management Agency of a confirmed release, the costs were incurred after the notification and the costs were a result of a release of a substance listed in this Section. Costs of corrective action or indemnification incurred before providing that notification shall not be eligible for payment.

6. The costs have not already been paid to the owner or operator under a private insurance policy, other written agreement, or court order.

7. The costs were associated with "corrective action".

This constitutes the final decision as it relates to your eligibility and deductibility. We reserve the right to change the deductible determination should additional information that would change the determination become available. An underground storage tank owner or operator may appeal the decision to the Illinois Pollution Control Board (Board), pursuant to Section 57.9 (c) (2). An owner or operator who seeks to appeal the decision shall file a petition for a hearing before the Board within 35 days of the date of mailing of the final decision, (35 Illinois Administrative Code 105.102(a) (2)).

For information regarding the filing of an appeal, please contact:

Dorothy Gunn, Clerk
Illinois Pollution Control Board
State of Illinois Center
100 West Randolph, Suite 11-500
Chicago, Illinois 60601
(312) 814-3620

The following tanks are also listed for this site:

Tank 5 150 gallon Used Oil

Your application indicates that there has not been a release from these tanks under this incident number. You may be eligible to seek payment of corrective action costs associated with these tanks if it is determined that there has been a release from one or more of these tanks. Once it is determined that there has been a release from one or more of these tanks you may submit a separate application for an eligibility determination to seek corrective action costs associated with this/these tanks.

If you have any questions, please contact our Office at (217) 785-1020 or (217) 785-5878.

Sincerely,

Deanne Lock
Administrative Assistant
Division of Petroleum and Chemical Safety

cc: IEPA
Facility File

APPENDIX D

CORRECTIVE ACTION PLAN BUDGET AND CERTIFICATION

CORRECTIVE ACTION PLAN AND BUDGET AMENDMENT

MARINE BANK TRUST # 53-0051
CANTRALL, ILLINOIS

Illinois Environmental Protection Agency

1021 North Grand Avenue East • P.O. Box 19276 • Springfield • Illinois • 62794-9276 • (217) 782-3397

General Information for the Budget and Billing Forms

LPC #: 1670255005 **County:** Sangamon

City: Cantrall **Site Name:** Marine Bank Trust #05-0051

Site Address: 9520 State Rt 29

Date this form was prepared: Feb 2, 2024

List all IEMA Incident numbers associated with this package:

2003-0135

List all other incidents associated with this site that are not associated with this package:

This form is being submitted as a (check one, if applicable):

- ○ Billing Package
- ⊘ Budget Amendment (Budget amendments must include only the costs over the previous budget.)
- ○ Budget Proposal

Please provide the name(s) and date(s) of report(s) documenting the costs requested:

Name(s): CAP Budget Amendment

Date(s): Feb 2, 2024

This package is being submitted for the site activities indicated below:

35 Ill. Adm. Code 734:

- ☐ Early Action
- ☐ Free Product Removal after Early Action
- ☐ Site Investigation . . . . . Stage 1: ☐ Stage 2: ☐ Stage 3: ☐
- ☑ Corrective Action

35 Ill. Adm. Code 732:

- ☐ Early Action
- ☐ Free Product Removal after Early Action
- ☐ Site Classification
- ☐ Low Priority Corrective Action
- ☐ High Priority Corrective Action

35 Ill. Adm. Code 731:

- ☐ Site Investigation
- ☐ Corrective Action

General Information for the Budget and Billing Forms

The following address will be used as the mailing address for checks and any final determination letters regarding payment from the Fund for this package.

Pay to the order of: Marine Bank Trust #53-0051

Send in care of: CWM Company, Inc.

Address: 701 South Grand Avenue West

City: Springfield State: IL Zip: 62704

The payee is the: Owner ☑ Operator ☐ (Check one or both.)

Jeffry M. Ulrich TRUSTEE
Signature of the owner or operator of the UST(s) (required) Date

Jeffery M. Ulrich
Printed name of the owner or operator of the UST(s) (required)

W-9 must be submitted.
Click here to print off a W-9 Form.

Email: Jeffery.Ulrich@mcbtrust.com

Number of petroleum USTs in Illinois presently owned or operated by the owner or operator; any subsidiary, parent or joint stock company of the owner or operator; and any company owned by any parent, subsidiary or joint stock company of the owner or operator:

Fewer than 101: ✓ 101 or more: ○

Please list all tanks that have ever been located at the site and tanks that are presently located at the site.

Product Stored in UST	Size (gallons)	Did UST have a release?	Incident No.	Type of Release Tank Leak / Overfill / Piping Leak
Gasoline	500	Yes ✓ No ○	2003-0135	Overfill
Gasoline	1,000	Yes ✓ No ○	2003-0135	Overfill
Diesel	500	Yes ✓ No ○	2003-0135	Overfill
Used Oil	500	Yes ✓ No ○	2003-0135	Overfill
Used Oil	150	Yes ○ No ✓	None	
		Yes ○ No ○		

Owner/Operator and Licensed Professional Engineer/Geologist Budget Certification Form

I hereby certify that I intend to seek payment from the UST Fund for costs incurred while performing corrective action activities for Leaking UST Incident 2003-0135. I further certify that the costs set forth in this budget are for necessary activities and are reasonable and accurate to the best of my knowledge and belief. I also certify that the costs included in this budget are not for corrective action in excess of the minimum requirements of 415 ILCS 5/57, no costs are included in this budget that are not described in the corrective action plan, and no costs exceed Subpart H: Maximum Payment Amounts, Appendix D Sample Handling and Analysis amounts, and Appendix E Personnel Titles and Rates of 35 Ill. Adm. Code 732 or 734. I further certify that costs ineligible for payment from the Fund pursuant to 35 Ill. Adm. Code 732.606 or 734.630 are not included in the budget proposal or amendment. Such ineligible costs include but are not limited to:

Costs associated with ineligible tanks.
Costs associated with site restoration (e.g., pump islands, canopies).
Costs associated with utility replacement (e.g., sewers, electrical, telephone, etc.).
Costs incurred prior to IEMA notification.
Costs associated with planned tank pulls.
Legal fees or costs.
Costs incurred prior to July 28, 1989.
Costs associated with installation of new USTs or the repair of existing USTs.

Owner/Operator: MARINE BANK TRUST #53-0051

Authorized Representative: Jeffy Mitchell / JEFFERY MITCHELL Title: Trust & Wealth Management Executive

Signature: Jeffy Mitchell, TRUSTEE Date: 1-8-2024

Subscribed and sworn to before me the 8 day of January, 2024.

[signature] (Notary Public) Seal: "OFFICIAL SEAL" WENDY K SMITH Notary Public, State of Illinois My Commission Expires 05/14/2027

In addition, I certify under penalty of law that all activities that are the subject of this plan, budget, or report were conducted under my supervision or were conducted under the supervision of another Licensed Professional Engineer or Licensed Professional Geologist and reviewed by me; that this plan, budget, or report and all attachments were prepared under my supervision; that, to the best of my knowledge and belief, the work described in the plan, budget, or report has been completed in accordance with the Environmental Protection Act [415 ILCS 5], 35 Ill. Adm. Code 732 or 734, and generally accepted standards and practices of my profession; and that the information presented is accurate and complete. I am aware there are significant penalties for submitting false statements or representations to the Illinois EPA, including but not limited to fines, imprisonment, or both as provided in Sections 44 and 57.17 of the Environmental Protection Act [415 ILCS 5/44 and 57.17].

L.P.E./L.P.G.: Vince E Smith L.P.E./L.P.G. Seal: VINCE E. SMITH 46118

L.P.E./L.P.G. Signature: [signature] Date: 1/12/24

Subscribed and sworn to before me the 12th day of January, 2024.

Rose M. Haas (Notary Public) Seal: OFFICIAL SEAL ROSE MARIE HAAS Notary Public, State of Illinois Commission No. 980043 My Commission Expires ... 2027

The Illinois EPA is authorized to require this information under 415 ILCS 5/1. Disclosure of this information is required. Failure to do so may result in the delay or denial of any budget or payment requested hereunder.

Budget Summary

Choose the applicable regulation: (•) 734 ( ) 732

734	Free Product	Stage 1 Site Investigation	Stage 2 Site Investigation	Stage 3 Site Investigation	Corrective Action
					Proposed
Drilling and Monitoring Well Costs Form	$	$	$	$	$
Analytical Costs Form	$	$	$	$	$
Remediation and Disposal Costs Form	$	$	$	$	$
UST Removal and Abandonment Costs Form	$	$	$	$	$
Paving, Demolition, and Well Abandonment Costs Form	$	$	$	$	$ 5,545.83
Consulting Personnel Costs Form	$	$	$	$	$ 17,065.61
Consultant's Materials Costs Form	$	$	$	$	$ 113.82
Handling Charges Form	Handling charges will be determined at the time a billing package is submitted to the Illinois EPA. The amount of allowable handling charges will be determined in accordance with the Handling Charges Form.				
Total	$	$	$	$	$ 22,725.26

Paving, Demolition, and Well Abandonment Costs Form

A. Concrete and Asphalt Placement/Replacement

Number of Square Feet	Asphalt or Concrete	Thickness (Inches)	Cost ($) per Square Foot	Replacement or Placement for an Engineered Barrier	Total Cost
508.00	Concrete	8.00	7.86	Placement	$3,992.88

Total Concrete and Asphalt Placement/Replacement Costs:	$3,992.88

B. Building Destruction or Dismantling and Canopy Removal

Item to Be Destroyed, Dismantled, or Removed	Unit Cost ($)	Total Cost ($)

Total Building Destruction or Dismantling and Canopy Removal Costs:	

Paving, Demolition, and Well Abandonment Costs Form

C. Well Abandonment

Monitoring Well ID #	Type of Well (HSA / PUSH / Recovery)	Depth of Well (feet)	Cost ($) per Foot	Total Cost
MW-1	HSA	15.00	14.79	$221.85
MW-2	HSA	15.00	14.79	$221.85
MW-3	HSA	15.00	14.79	$221.85
MW-4	HSA	15.00	14.79	$221.85
MW-5	HSA	15.00	14.79	$221.85
MW-9	HSA	15.00	14.79	$221.85
MW-14	HSA	15.00	14.79	$221.85

Total Monitoring Well Abandonment Costs:	**$1,552.95**

Total Paving, Demolition, and Well Abandonment Costs:	**$5,545.83**

Consulting Personnel Costs Form

Employee Name	Personnel Title	Hours	Rate* ($)	Total Cost
Remediation Category	Task			
	Senior Project Manager	26.00	147.95	$3,846.70
CCAP	Amended Corrective Action Plan Development			
	Senior Draftperson/CAD	6.00	88.76	$532.56
CCAP	Drafting/Editing Maps for Plan Amendment			
	Senior Prof. Engineer	2.00	192.33	$384.66
CCAP	Amended Corrective Action Plan Review & Certification			
	Senior Admin. Assistant	2.00	66.58	$133.16
CCAP	Amended Corrective Action Plan Compilation, Assembly, and Distribution			
	Senior Project Manager	6.00	147.95	$887.70
TACO 2 or 3	TACO Tier 2 Calculations / Development of CUOs / GW Modeling			
	Senior Prof. Engineer	2.00	192.33	$384.66
CCAP-Budget	Amended Corrective Action Budget Review & Certification			
	Senior Project Manager	7.00	147.95	$1,035.65
CCAP-Budget	Amended Corrective Action Budget Development			
	Senior Project Manager	6.00	147.95	$887.70
CCAP	Review of analytical results/bore log and and analytical tabulation			

Employee Name	Personnel Title	Hours	Rate* ($)	Total Cost
Remediation Category	**Task**			
	Senior Project Manager	8.00	147.95	$1,183.60
CCA-Field	Scheduling, Contractor search/Arrangements/Coordination for Corrective Action Activities			
	Senior Project Manager	10.00	147.95	$1,479.50
ELUC	ELUC Review and Preparation/Property owner Corr./Notifications/meeting			
	Senior Admin. Assistant	3.00	66.58	$199.74
ELUC	ELUC correspondence/Property owner & notifications			
	Senior Project Manager	12.00	147.95	$1,775.40
ELUC	Preparation and Distribution of groundwater ordinance			
	Senior Project Manager	6.00	147.95	$887.70
ELUC	Groundwater Ordinance Notifications			
	Senior Admin. Assistant	2.00	66.58	$133.16
ELUC	Groundwater Ordiance Notificatons			
	Senior Prof. Engineer	4.00	192.33	$769.32
CA-Pay	Corrective Action Reimbursement Review & Certification (2)			
	Senior Acct. Technician	28.00	81.36	$2,278.08
CA-Pay	Corrective Action Reimbursement Preparation (2)			
	Senior Admin. Assistant	4.00	66.58	$266.32
CA-Pay	Corrective Action Reimbursement Compilation / Assembly / Distribution (2)			

*Refer to the applicable Maximum Payment Amounts document.

Total of Consulting Personnel Costs	**$17,065.61**

Consultant's Materials Costs Form

Materials, Equipment, or Field Purchase	Time or Amount Used	Rate ($)	Unit	Total Cost
Remediation Category	**Description/Justification**			
Postage	2.00	14.20	/each	$28.40
CCAP	Corrective Action Plan and Budget Amendment Distribution / Forms / Client Review			
Mileage	38.00	.59	/mile	$22.42
CCA-Field	1 Round Trip. (Set up/Layout/final inspection/Documentation)			
Postage	2.00	10.50	/each	$21.00
CA-Pay	Distribution of Corrective Action Reimbursement Packages / Drafts / Forms			
Postage	2.00	9.00	/each	$18.00
ELUC	Distribution of ELUC forms/agreement/owner correspondence			
Postage	4.00	6.00	/each	$24.00
ELUC	Groundwater Ordinance Notifications			

Total of Consultant Materials Costs	$113.82

APPENDIX E

TACO VARIABLES AND EQUATIONS & HYDRAULIC CONDUCTIVITY CALCULATIONS

CORRECTIVE ACTION PLAN AND BUDGET AMENDMENT

MARINE BANK TRUST # 53-0051
CANTRALL, ILLINOIS

Version: 3/26/2018

R-25 Input/Summary Sheet

IEMA Incident # (6 or 8 digit)	20030135
IEPA LPC # (10 digit)	1670255008
Site Name:	Marine Bank Trust 53-0051
Site Address:	9520 State Route 29
City:	Cantrall
County:	Sangamon
Zip Code:	62625
SSL Equations Used:	S5,6,7,8,9,10,17,18,19,20,21,22,24
RBCA Equations Used:	R-1, R-2, R3
Contact Information for Individual who Performed Calculat	GWM
Land Use:	Residential & Construction Worker
Objective from S17 used in R26:	No
Groundwater:	Class 1
Standard or Mass Limit Equations:	Standard Equations — If Mass Limit, then Specifiy Acres:
Square Feet of Plume for Mass Limit Eq.:	0.00 < use this # above
Date Data is Entered:	October 5, 2023

Entry	Description	Reference	
	Holcomb Bulk Density (pcf), or — Shelby Tube Location:		
1.84	Dry Soil Bulk Density (g/cm³ or kg/L): 1.5, or Gravel =2.0, Sand = 1.8, Silt = 1.5, Clay = 1.7, or site specific		
2.657	ρs - Soil Particle Density		
0.383	Total Soil Porosity	0.383	0.383
0.246	Water Filled Porosity	0.246	0.246
0.137	Air Filled Porosity	0.137	0.137
0.430	θ_T - Total Soil Porosity (RBCA)	0.43 or, Gravel = 0.25; Sand = 0.32; Silt = 0.40; Clay = 0.38	
20.000	w - Average Soil Moisture Content		
Silt Loam	USDA Soil Classification (Pick from List)	0.1, or, Subsurface Soil (top 1m) = 0.1; Subsurface Soil (below 1 m) =0.2; or Site Specific	

Entry	Description		
0.01080	Fractional Organic Carbon (foc) in g/g	Organic Matter (%):	
		Organic Matter (mg/kg):	
		Total Organic Carbon (g/g):	0.0108
1.17E-04	Average Hydraulic Conductivity (cm/sec) — Well Name:		
1.17E-04	Falling Hydraulic Conductivity (cm/sec) — MW-4		
	Rising Hydraulic Conductivity (cm/sec)		
0.06188	Hydraulic Gradient (0.02 for sites with no groundwater)		

Hydraulic Gradient Calculations

MW-1	93.70
MW-2	92.66
Distance:	127

10	d_a - Aquifer Thickness (ft)	Meters	3.048 m
10	d_s - Depth of Source (ft) (Vertical Thickness of Contamination)		3.048 m
	X - Distance along the centerline of the groundwater plume extending to setback zone or surface water from the source in the direction of groundwater flow (ft) (RBCA)		0 cm
282	L - Source Length Parallel to Groundwater Flow (ft)		79.8678 m
216	Sw: Source Width -horizontal plane (ft) (RBCA)		6583.68 cm

C_{po} - Concentration of Contaminant in groundwater at distance X from the source (mg/L)

	Benzene	MTBE
	Toluene	
	Ethylbenzene	
	Total Xylenes	

Surface Water

Chemicals of Concern

Benzene	Naphthalene	
Toluene		Chrysene
Ethylbenzene		Benzo(k)fluoranthene
Total Xylenes		Indeno(1,2,3-cd)pyrene
MTBE		

☐ Mass Limit Equations

SSL Equations Needed

☑ Inhalation Equations

☑ Groundwater Ingestion Equations

☑ Csat Equations

☐ Fugitive Dust Equations

☑ Ingestion Equations

Text discussion for "I", L, d_a, d_s, S_w, S_d	
Hydraulic Gradient	The **Hydraulic Gradient (*I*)** was determined from an onsite survey of each of the groundwater monitoring wells. The riser elevations were determined and the depth to groundwater was noted in each well. This data was used to generate a potentiometric flow map with contour lines which show potentiometric head. A corresponding flow line, perpendicular to the contour lines, was determined between two known points of groundwater elevation. The hydraulic gradient was determined by the difference in elevation divided by the length of flow between the points.
Source Length	The **Source Length Parallel to Groundwater Flow (L)** was determined from the site map and analytical results. A value of 45.1104 m was used to encompass the length of contamination parallel to groundwater flow. This value is the distance between soil borings BH-1 and BH-2.
Aquifer Thickness	The **Aquifer Thickness (d_a)** is a site specific value determined by the length of the monitoring well screen. The Aquifer Thickness value used in the modeling equations was 3.048 meters.
Depth of Source	The **Depth of Source (d_s)** was determined from the analytical results and soil boring logs. A value of 3.048 m was used to encompass the vertical thickness of contamination based upon a clean soil sample at BH-1A, "hot" samples at BH-2B and BH-2C, and a clean soil sample at BH-2D. Thus the vertical thickness of soil contamination has been determined to be 3.048 m.
Source Width	**The source width perpendicular to groundwater flow direction in the Horizontal Plane (S_w)** was determined from the site map and analytical results. A value of 3566.16 cm was used to encompass the width of contamination in the horizontal plane. This value is the distance between clean wells MW-4 and and MW-6.
Source Depth	**The source width perpendicular to groundwater flow direction in the Vertical Plane (S_d)** was determined from the soil boring logs and analytical results. A value of 304.8 cm was used to encompass the width of contamination in the vertical plane based on the depths of contamination present and the PID readings from the bore logs.
Distance (X)	

BENZENE								
Soil Exceedances					Groundwater Exceedances			
Location	Soil Concentration (mg/kg)	X (ft)	Gw_{obj} (mg/L) R26 Csource	C(x) (mg/L)	Location	Groundwater Concentration (mg/L)	X (ft)	C(x) (mg/L)
SB-7	16.3	292	1.149	0.0050	MW-1	1.490	307	0.0050
SB-13	0.103	20	0.007	0.0050	MW-2	0.250	200	0.0050
SB-14	0.0942	15	0.007	0.0050	MW-14	0.284	203	0.0050
SB-15	0.296	74	0.021	0.0050				
SB-20A	0.0941	15	0.007	0.0050				
SB-20B	0.0994	18	0.007	0.0050				
SB-21C	0.0675	1	0.005	0.0047				
SB-21D	0.0702	1	0.005	0.0049				

Toluene								
Soil Exceedances					Groundwater Exceedances			
Location	Soil Concentration (mg/kg)	X (ft)	GW_{obj} (mg/L) R26 Csource	C(x) (mg/L)	Location	Groundwater Concentration (mg/L)	X (ft)	C(x) (mg/L)

Ethylbenzene								
Soil Exceedances					Groundwater Exceedances			
Location	Soil Concentration (mg/kg)	X (ft)	GW_{obj} (mg/L) R26 Csource	C(x) (mg/L)	Location	Groundwater Concentration (mg/L)	X (ft)	C(x) (mg/L)
SB-15	47.6	1	0.65509410	0.6154				

Total Xylenes

Soil Exceedances					Groundwater Exceedances			
Location	Soil Concentration (mg/kg)	X (ft)	GW_{obj} (mg/L) R26 Csource	C(x) (mg/L)	Location	Groundwater Concentration (mg/L)	X (ft)	C(x) (mg/L)
SB-15	163	1	1.822842759	1.7520				

MTBE

Soil Exceedances					Groundwater Exceedances			
Location	Soil Concentration (mg/kg)	X (ft)	GW_{obj} (mg/L) R26 Csource	C(x) (mg/L)	Location	Groundwater Concentration (mg/L)	X (ft)	C(x) (mg/L)

Naphthalene

Soil Exceedances					Groundwater Exceedances			
Location	Soil Concentration (mg/kg)	X (ft)	GW_{obj} (mg/L) R26 Csource	C(x) (mg/L)	Location	Groundwater Concentration (mg/L)	X (ft)	C(x) (mg/L)
SB-7	17	2	0.153107524	0.1369	MW-2A	0.178	5	0.1352
SB-15	18.5	4	0.167	0.1335	MW-3A	0.514	26	0.1399
SB-19A	89.3	37	0.804	0.1351	MW-4A	0.179	5	0.1359
SB-19B	116	43	1.045	0.1354				

Benzo[a]pyrene

Soil Exceedances					Groundwater Exceedances			
Location	Soil Concentration (mg/kg)	X (ft)	GW_{obj} (mg/L) R26 Csource	C(x) (mg/L)	Location	Groundwater Concentration (mg/L)	X (ft)	C(x) (mg/L)
					MW-3A	0.000319	36	0.000199

Benz[a]anthracene								
Soil Exceedances					Groundwater Exceedances			
Location	Soil Concentration (mg/kg)	X (ft)	Gw_{obj} (mg/L) R26 Csource	C(x) (mg/L)	Location	Groundwater Concentration (mg/L)	X (ft)	C(x) (mg/L)
					MW-3A	0.00116	156	0.0001286
					MW-4A	0.000607	112	0.0001294
					MW-5A	0.00015	14	0.0001294

Acenaphthene								
Soil Exceedances					Groundwater Exceedances			
Location	Soil Concentration (mg/kg)	X (ft)	Gw_{obj} (mg/L) R26 Csource	C(x) (mg/L)	Location	Groundwater Concentration (mg/L)	X (ft)	C(x) (mg/L)

Marine Bank Trust 53-0051				
GROUNDWATER CLEAN-UP OBJECTIVES				
(mg/L)				
	Most Stringent	Class I	Class II	ADLs
Parameter	CUO	GW	GW	(U)
Benzene	0.005	0.005	0.025	<0.002
Ethylbenzene	0.7	0.7	1	<0.002
MTBE	0.07	0.07	0.07	<0.005
Toluene	1.0	1.0	2.5	<0.002
Total Xylenes	10.0	10.0	10.0	<0.005
Acenaphthene	0.42	0.42	2.1	<0.018
Acenaphthylene^	0.21	0.21	1.05	<0.010
Anthracene	2.1	2.1	10.5	<0.0066
Benzo(a)anthracene	0.00013	0.00013	0.00065	<0.00013
Benzo(a)pyrene	0.0002	0.0002	0.002	<0.0002
Benzo(b)fluoranthene	0.00018	0.00018	0.0009	<0.00018
Benzo(g,h,i)perylene^	0.21	0.21	1.05	<0.00076
Benzo(k)fluoranthene	0.00017	0.00017	0.00085	<0.00017
Chrysene	0.0015	0.0015	0.0075	<0.0015
Dibenz(a,h)anthracene	0.0003	0.0003	0.0015	<0.0003
Fluoranthene	0.28	0.28	1.4	<0.0021
Fluorene	0.28	0.28	1.4	<0.0021
Indeno(1,2,3-cd)pyrene	0.00043	0.00043	0.00215	<0.00043
Naphthalene	0.14	0.14	0.22	<0.010
Phenanthrene^	0.21	0.21	1.05	<0.0064
Pyrene	0.21	0.21	1.05	<0.0027
^Temporary Objectives from additional tables -- 10/1/04				
Updated 12/20/04				

Summary of Tier 2 Calculations
Marine Bank Trust 53-0051
20030135
10/05/23

Table 3

Tier 1 Objectives

		Benzene		Toluene		Ethylbenzene		Total Xylenes		Naphthalene		MTBE	
Residential	Ingestion	12	mg/kg	16,000	mg/kg	7,800	mg/kg	16,000	mg/kg	1,600	mg/kg	780	mg/kg
	Inhalation	0.8	mg/kg	650	mg/kg	400	mg/kg	320	mg/kg	170	mg/kg	8,800	mg/kg
	Migration Class 1	0.03	mg/kg	12	mg/kg	13	mg/kg	150	mg/kg	12	mg/kg	0.32	mg/kg
	Migration Class 2	0.17	mg/kg	29	mg/kg	19	mg/kg	150	mg/kg	18	mg/kg	0.32	mg/kg
Industrial/Commercial	Ingestion	100	mg/kg	410,000	mg/kg	200,000	mg/kg	410,000	mg/kg	41,000	mg/kg	20,000	mg/kg
	Inhalation	1.60	mg/kg	650	mg/kg	400	mg/kg	320	mg/kg	270	mg/kg	8,800	mg/kg
Construction Worker	Ingestion	2,300	mg/kg	410,000	mg/kg	20,000	mg/kg	41,000	mg/kg	4,100	mg/kg	2,000	mg/kg
	Inhalation	2.20	mg/kg	42	mg/kg	58	mg/kg	5.6	mg/kg	1.80	mg/kg	140	mg/kg
Soil Saturation		580	mg/kg	290	mg/kg	150	mg/kg	110	mg/kg	172.10	mg/kg	8,400	mg/kg

Tier 2 SSL Objectives

		Benzene	Equation	Toluene	Equation	Ethylbenzene	Equation	Total Xylenes	Equation	Naphthalene	Equation	MTBE	
Residential	Ingestion	11.64	S-2	6,257.14	S-1	7,821	S-1	15,643	S-1	1,564	S-1	782.1	S-1
	Inhalation	2.84	S-6	71,523.39	S-4	18.29	S-6	2,399.83	S-4	324.57	S-4	48,741.75	S-4
	Migration Mass-Limit Class 1	0.25	S-28	50.41	S-28	35.29	S-28	504.13	S-28	7.06	S-28	3.53	S-28
	Migration Class 1	0.071	S-17	37.58	S-17	50.86	S-17	894.21	S-17	15.54	S-17	0.36	S-17
Industrial-Commercial	Ingestion	104.06	S-2	1,635,200	S-1	204,400	S-1	408,800	S-1	40,880	S-1	20,440	S-1
	Inhalation	5.42	S-6	113,871.29	S-4	34.94	S-6	3,820.73	S-4	516.74	S-4	77,600.99	S-4
	Migration Mass-Limit Class 1	0.25	S-28	50.41	S-28	35.29	S-28	504.13	S-28	7.06	S-28	3.53	S-28
	Migration Class 1	0.071	S-17	37.58	S-17	50.86	S-17	894.21	S-17	15.54	S-17	0.36	S-17
Construction Worker	Ingestion	2,258.21	S-3	163,236	S-1	10,202.26	S-1	81,618	S-1	122,427	S-1	61,214	S-1
	Inhalation	7.62	S-7	736.66	S-5	49.14	S-7	98.87	S-5	3.34	S-5	418.35	S-5
Soil Saturation		1,276.58	S-29	995.89	S-29	617.62	S-29	491.81	S-29	172.10	S-29	13,260.67	S-29

all values are in mg/kg

Site Specific Value cannot exceed Soil Saturation Limit, otherwise Tier 2 Inhalation or Tier 2 Migration objectives are the Soil Saturation objective
Calculated value is less than Tier 1 Objective

Groundwater Contaminate Concentration Exceedances at Surface Water or Set Back Zone (mg/L)

	Benzene	Equation	Toluene	Equation	Ethylbenzene	Equation	Total Xylenes	Equation	Naphthalene	Equation	MTBE	
Result	#DIV/0!	R-26	#DIV/0!	R-26	#DIV/0!	R-26	#DIV/0!	R-26			#DIV/0!	R-26
Surface Water Objective	0.86		0.6		0.014		0.36					

Marine Bank Trust 63-0561 20030135

Math for R-26 Calculations
BENZENE MATH FOR VERTICAL SOIL MODELING AND R-26 MODELING OF VERTICAL MIXED SOIL (Attachment A)

Sample Location	C_w = (soil contamination at modeling point) / (Equation S-17)				C_w	$GW_{no} = C_w / DF$				Conversion: 1 foot = 30.48 cm	
					C_w	C_w	/ DF	=	GW_{no} (mg/L)	X (ft)	X (cm)
SB-7	15.3	/	0.709	=	22.983	22.983	/ 20.000	=	1.14915	22[illegible]	6900.16
SB-13	0.103	/	0.709	=	0.145	0.145	/ 20.000	=	0.00726	20	609.6
SB-14	0.0943	/	0.709	=	0.133	0.133	/ 20.000	=	0.00664	15	457.2
SB-15	0.296	/	0.709	=	0.417	0.417	/ 20.000	=	0.02087	74	2255.52
SB-20A	0.0941	/	0.709	=	0.133	0.133	/ 20.000	=	0.00665	15	457.2
SB-20B	0.0994	/	0.709	=	0.140	0.140	/ 20.000	=	0.00701	18	548.64
SB-21C	0.0075	/	0.709	=	0.095	0.093	/ 20.000	=	0.00479	1	30.48
SB-21D	0.0072	/	0.709	=	0.099	0.099	/ 20.000	=	0.00496	1	30.48

Sample Location	R-15: a_x = 0.10 * X					S-17: $a_y = a_x / 3$					R-18: $a_z = a_x / 20$				
	0.1	x	X (cm)	=	a_x (cm)	a_x (cm)	/	3	=	a_y (cm)	a_x (cm)	/	20	=	a_z (cm)
SB-7	0.1	x	6900.16	=	690.016	690.016	/	3	=	230.005	690.016	/	20	=	34.5008
SB-13	0.1	x	609.6	=	60.96	60.96	/	3	=	20.32	60.96	/	20	=	3.048
SB-14	0.1	x	457.2	=	45.72	45.72	/	3	=	15.24	45.72	/	20	=	2.286
SB-15	0.1	x	2255.52	=	225.552	225.552	/	3	=	75.184	225.552	/	20	=	11.2776
SB-20A	0.1	x	457.2	=	45.72	45.72	/	3	=	15.24	45.72	/	20	=	2.286
SB-20B	0.1	x	548.64	=	54.864	54.864	/	3	=	18.288	54.864	/	20	=	2.7432
SB-21C	0.1	x	30.48	=	3.048	3.048	/	3	=	1.016	3.048	/	20	=	0.1524
SB-21D	0.1	x	30.48	=	3.048	3.048	/	3	=	1.016	3.048	/	20	=	0.1524

Sample Location	"Term 1" = (X / (2 * a_x))							"Term 2" = (1 - SQRT(1 + (4 * λ * a_x) / U))												
	X	/	2	x	a_x	=	"Term 1"	1	-	SQRT	1	+(	4	x	λ	x	a_x	)/	U	= "Term 2"
SB-7	6900.16	/	2	x	690.016	=	5	1	-	SQRT	1	+(	4	x	0.0009	x	690.016	)/	1.45473	-0.7856
SB-13	609.6	/	2	x	60.96	=	5	1	-	SQRT	1	+(	4	x	0.0009	x	60.96	)/	1.45473	-0.0728
SB-14	457.2	/	2	x	45.72	=	5	1	-	SQRT	1	+(	4	x	0.0009	x	45.72	)/	1.45473	-0.0551
SB-15	2255.52	/	2	x	225.552	=	5	1	-	SQRT	1	+(	4	x	0.0009	x	225.552	)/	1.45473	-0.2483
SB-20A	457.2	/	2	x	45.72	=	5	1	-	SQRT	1	+(	4	x	0.0009	x	45.72	)/	1.45473	-0.0551
SB-20B	548.64	/	2	x	54.864	=	5	1	-	SQRT	1	+(	4	x	0.0009	x	54.864	)/	1.45473	-0.0651
SB-21C	30.48	/	2	x	3.048	=	5	1	-	SQRT	1	+(	4	x	0.0009	x	3.048	)/	1.45473	-0.0037
SB-21D	30.48	/	2	x	3.048	=	5	1	-	SQRT	1	+(	4	x	0.0009	x	3.048	)/	1.45473	-0.0038

Sample Location	$\beta_x = S_w / (4 * SQRT(a_y * X))$											$\beta_z = S_d / (2 * SQRT(a_z * X))$									
	S_w	//	4	x	SQRT	(	a_y	x	X	)) =	β_x	S_d	//	2	x	SQRT	(	a_z	x	X	)) = β_z
SB-7	6933.66	//	4	x	SQRT	(	230.005	x	6900.16	)) =	1.81291	304.8	//	2	x	SQRT	(	34.5008	x	6900.16	2.24216
SB-13	6983.66	//	4	x	SQRT	(	20.32	x	609.6	)) =	14.75661	304.8	//	2	x	SQRT	(	3.048	x	609.6	3.85355
SB-14	6942.66	//	4	x	SQRT	(	15.24	x	457.2	)) =	19.71308	304.8	//	2	x	SQRT	(	2.286	x	457.2	4.71405
SB-15	6963.66	//	4	x	SQRT	(	75.184	x	2255.52	)) =	3.95685	304.8	//	2	x	SQRT	(	11.2776	x	2255.52	0.95569
SB-20A	6960.66	//	4	x	SQRT	(	15.24	x	457.2	)) =	19.71301	304.8	//	2	x	SQRT	(	2.286	x	457.2	4.71405
SB-20B	6960.66	//	4	x	SQRT	(	18.288	x	548.64	)) =	16.63368	304.8	//	2	x	SQRT	(	2.7432	x	548.64	3.92857
SB-21C	6980.66	//	4	x	SQRT	(	1.016	x	30.48	)) =	295.27079	304.8	//	2	x	SQRT	(	0.1524	x	30.48	78.21069
SB-21D	6960.66	//	4	x	SQRT	(	1.016	x	30.48	)) =	295.27078	304.8	//	2	x	SQRT	(	0.1524	x	30.48	78.21069

Sample Location	ERF(β_x)	ERF(β_z)	$C_{(x)} = C_{source} \times e^{(Term 1 \times Term 2)} \times erf(\beta_x) \times erf(\beta_z)$									
	Section 742 APPENDIX C, Table G		C_{source}	x e	"Term 1"	x	"Term 2"	x ERF(β_x)	x	ERF(β_z)	=	mg/L
SB-7	0.947592	0.238000	1.14915	x e	5	x	[illegible]	x 0.947592	x	0.238000	=	0.60564
SB-13	1.000000	0.999999	0.00726	x e	5	x	[illegible]	x 1.000000	x	0.999999	=	0.00606
SB-14	1.000000	1.000000	0.00664	x e	5	x	[illegible]	x 1.000000	x	1.000000	=	0.00504
SB-15	1.000000	0.823417	0.02087	x e	5	x	[illegible]	x 1.000000	x	0.823417	=	0.00437
SB-20A	1.000000	1.000000	0.00665	x e	5	x	[illegible]	x 1.000000	x	1.000000	=	0.00524
SB-20B	1.000000	1.000000	0.00701	x e	5	x	[illegible]	x 1.000000	x	1.000000	=	0.00566
SB-21C	1.000000	1.000000	0.00456	x e	5	x	[illegible]	x 1.000000	x	1.000000	=	0.00467
SB-21D	1.000000	1.000000	0.00496	x e	5	x	[illegible]	x 1.000000	x	1.000000	=	0.00486

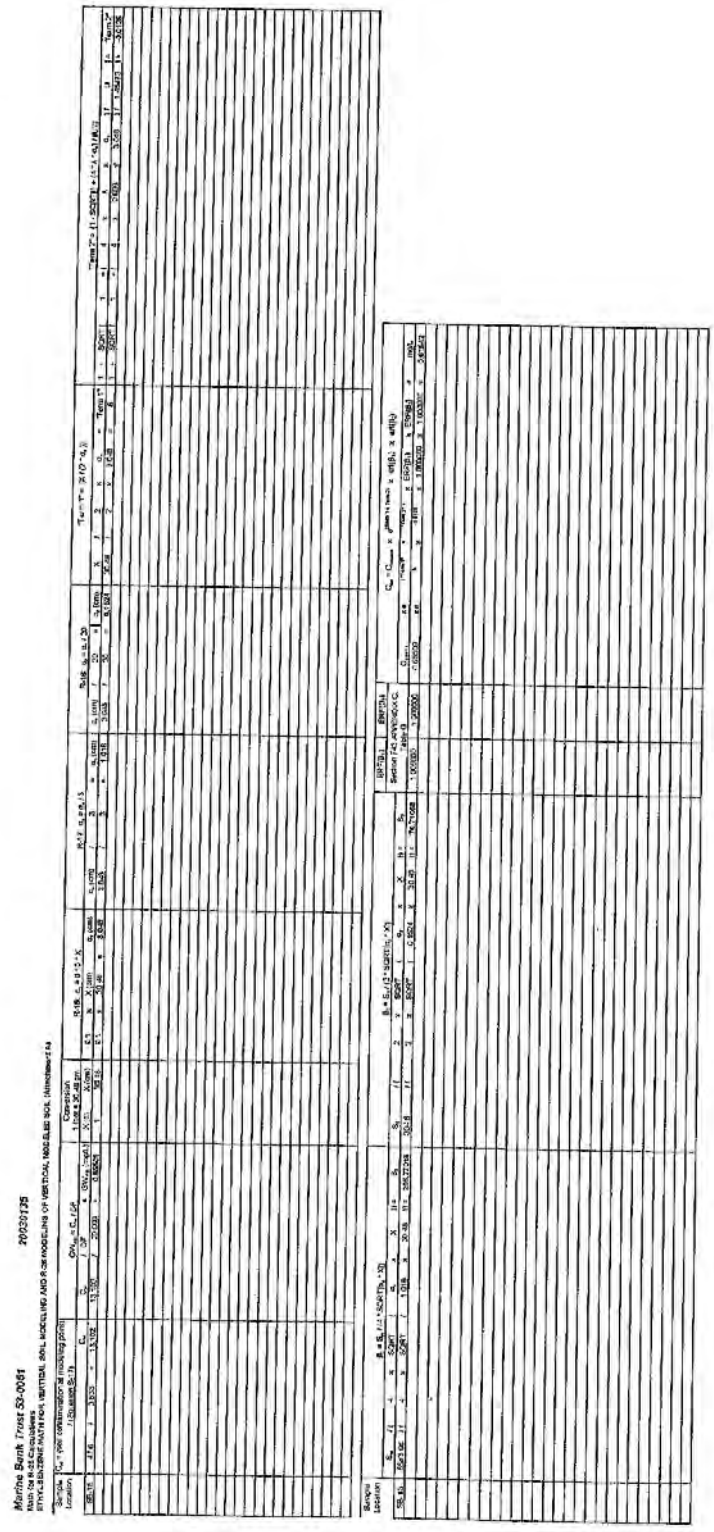
Marine Bank Trust 53-0051 *20030135*

R-26 Calculations

TOLUENE MATH FOR R-26 MODELING OF GROUNDWATER (Attachment A)

Sample Location	GW Value	Conversion, 1 foot = 30.48 cm		R-16 $\sigma_x = 0.10 * X$				R-17, $\sigma_y = \sigma_x / 3$					R-18 $\sigma_z = \sigma_x / 20$					"Term 1" = [X / (2 * α_x)]							"Term 2" = (1 - SQRT[1 + (4 * λ * α_x) / (U)])												
		X (ft)	X (cm)	0.1	x	X (cm)	σ_x (cm)	σ_x (cm)	/	3	=	σ_y (cm)	σ_x (cm)	/	20	=	σ_z (cm)	X	/	2	x	α_x	=	"Term 1"	1	-	SQRT[	1	+(	4	x	λ	x	α_x	)/	U	]= "Term 2"

Sample Location	$\beta_1 = S_w / (4 * SQRT[\sigma_y * X])$									$\beta_2 = S_d / (2 * SQRT[\sigma_z * X])$										ERF(β_1)	ERF(β_2)	$C_{(x)} = C_{source} \times e^{(Term 1 \times Term 2)} \times erf(\beta_1) \times erf(\beta_2)$							
	S_w	/(	4	x SQRT	(	σ_y	x	X	))=	β_1	S_d	/(	2	x SQRT	(	σ_z	x	X	))= β_2	Section 742 APPENDIX C, Table G		C_{source}	x e	("Term 1"	"Term 2")	x	ERF(β_1)	x	ERF(β_2) = mg/L



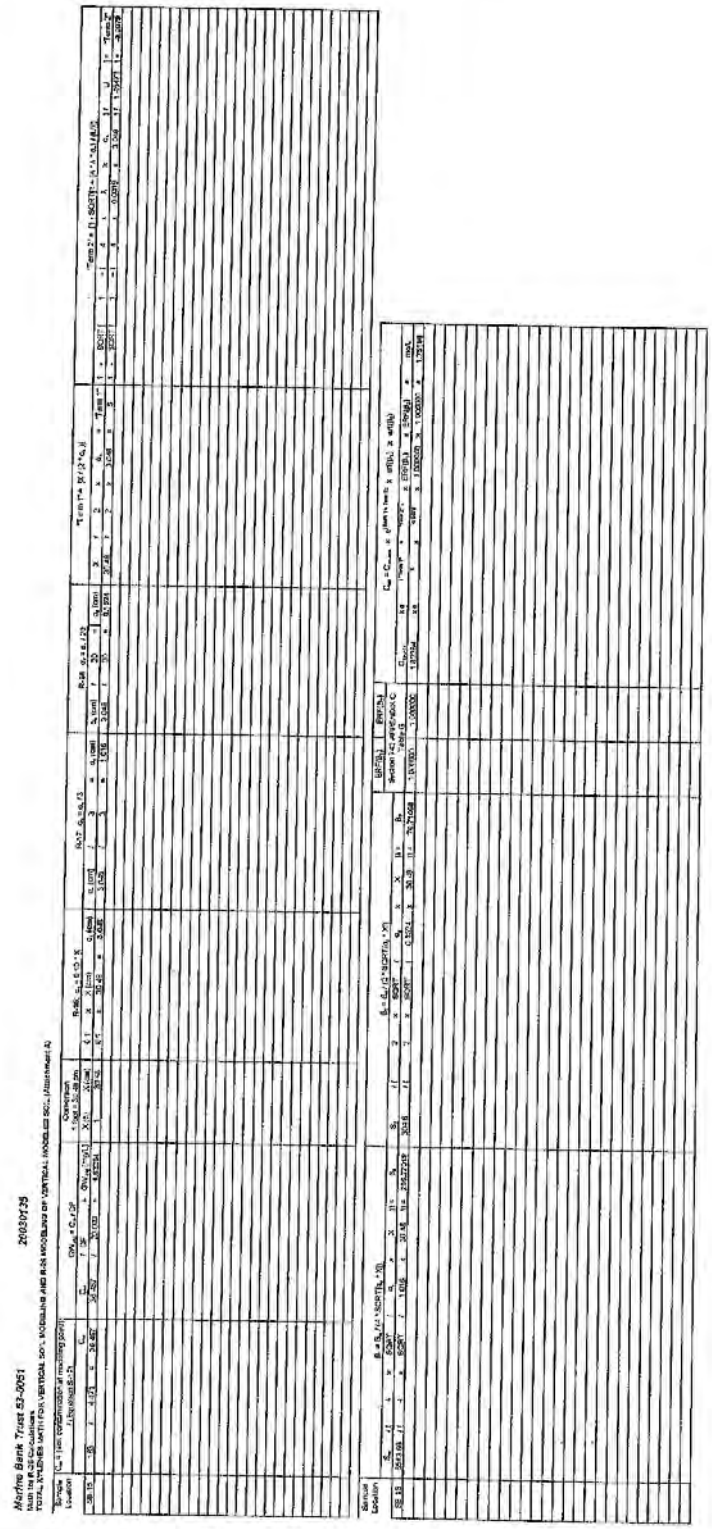
Marine Bank Trust 53-0051 *20030135*

R-26 Calculations

ETHYLBENZENE MATH FOR R-26 MODELING OF GROUNDWATER (Attachment A)

Sample Location	GW Value	Conversion 1 foot = 30.48 cm		R-16 $\alpha_x = 0.10 * X$				R-17: $\alpha_y = \alpha_x / 3$					R-18: $\alpha_z = \alpha_x / 20$					"Term 1" = $[X / (2 * \alpha_x)]$							"Term 2" = $\{1 - SQRT[1 + (4 * \lambda * \alpha_x) / (U)]\}$												
		X (ft)	X (cm)	0.1	x	X (cm)	α_x (cm)	α_x (cm)	/	3	=	α_y (cm)	α_x (cm)	/	20	=	α_z (cm)	X	/	2	x	α_x	=	"Term 1"	1	-	SQRT [	1	+ (	4	x	λ	x	α_x	) /	U	] =	"Term 2"

Sample Location	$\beta_1 = S_w / (4 * SQRT(\alpha_y * X))$										$\beta_2 = S_d / (2 * SQRT(\alpha_z * X))$										ERF(β_1)	ERF(β_2)	$C_{(x)} = C_{source} \times e^{(Term 1 \times Term 2)} \times erf(\beta_1) \times erf(\beta_2)$									
																					Section 742 APPENDIX C, Table G										
	S_w	/ (	4	x	SQRT	(	α_y	x	X	)) =	β_1	S_d	/ (	2	x SQRT	(	α_z	x	X	)) =	β_2			C_{source}	x e	("Term 1"	"Term 2")	x	ERF(β_1)	x	ERF(β_2)	=	mg/L



Marine Bank Trust 53-0051 *20030135*

R-26 Calculations

Total Xylenes MATH FOR R-26 MODELING OF GROUNDWATER (Attachment A)

Sample Location	GW Value	Conversion 1 foot = 30.48 cm		R-16: $\alpha_x = 0.10 * X$				R-17: $\alpha_y = \alpha_x / 3$					R-18: $\alpha_z = \alpha_x / 20$					"Term 1" = $[X / (2 * \alpha_x)]$							"Term 2" = $[1 - SQRT(1 + (4 * \lambda * \alpha_x) / (U))]$												
		X (ft)	X (cm)	0.1	x	X (cm)	α_x (cm)	α_x (cm)	/	3	=	α_y (cm)	α_x (cm)	/	20	=	α_z (cm)	X	/	2	x	α_x	=	"Term 1"	1	-	SQRT [	1	+ (	4	x	λ	x	α_x	) /	U	] = "Term 2"

Sample Location	$\beta_1 = S_w / (4 * SQRT[\alpha_y * X])$										$\beta_2 = S_d / (2 * SQRT[\alpha_z * X])$										ERF(β_1)	ERF(β_2)	$C_{(x)} = C_{source} \times e^{(Term 1 + Term 2)} \times erf(\beta_1) \times erf(\beta_2)$							
																					Section 742.APPENDIX C: Table G									
	S_w	/ (	4	x	SQRT	(	α_y	x	X	)) =	β_1	S_d	/ (	2	x SQRT	(	α_z	x	X	)) =	β_2			C_{source}	x e	("Term 1"	"Term 2")	x	ERF(β_1)	x	ERF(β_2)	=	mg/L

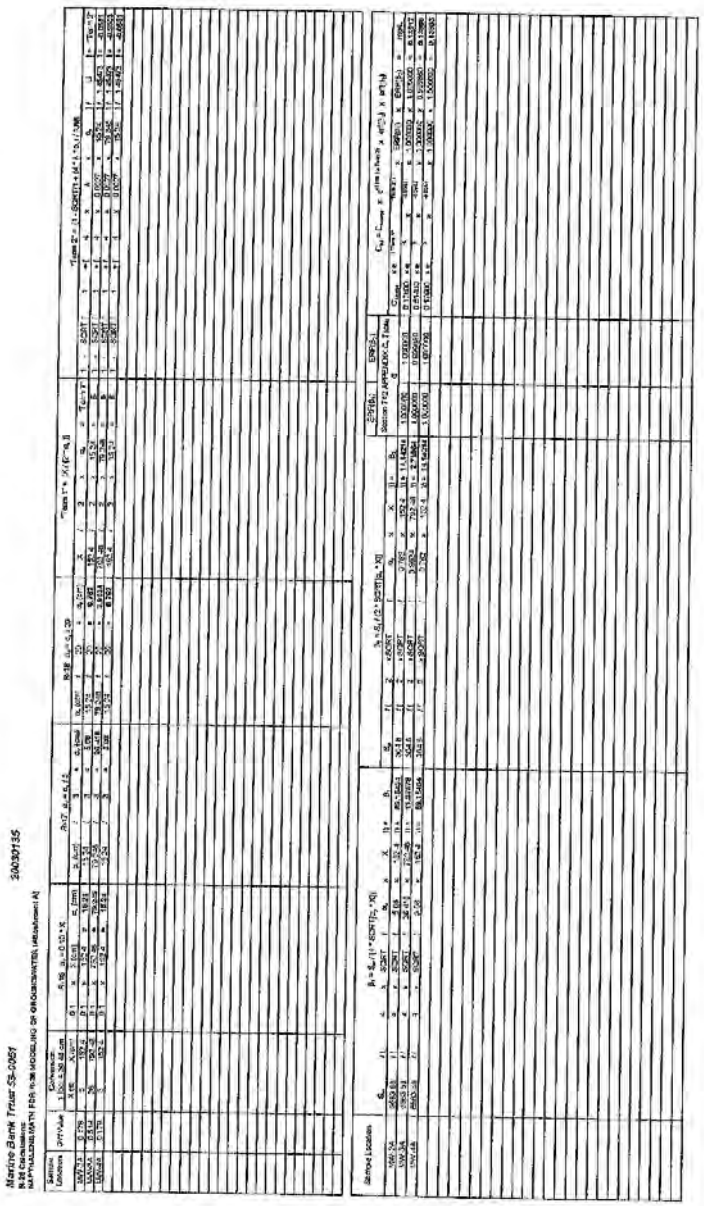
Marine Bank Trust 53-0051 *20030135*

Math for R-26 Calculations

MTBE MATH FOR VERTICAL SOIL MODELING AND R-26 MODELING OF VERTICAL MODELED SOIL (Attachment A)

Sample Location	C_w = (soil contamination at modeling point) / (Equation S-17)	$GW_{obj} = C_w / DF$	Conversion: 1 foot = 30.48 cm	R-16 $\alpha_x = 0.10 * X$	R-17. $\alpha_y = \alpha_x / 3$	R-18 $\alpha_z = \alpha_x / 20$	"Term 1" = [X / (2 * α_x)]	"Term 2" = (1 - SQRT(1 + (4 * λ * α_x) / (U)))
	C_w	C_w / DF = GW_{obj} (mg/L)	X (ft) X (cm)	0.1 x X (cm) α_x (cm)	α_x (cm) / 3 = α_y (cm)	α_x (cm) / 20 = α_z (cm)	X / 2 x α_x = "Term 1"	1 - SQRT (1 + (4 x λ x α_x) / U) = "Term 2"

Sample Location	$\beta_1 = S_w / (4 * SQRT(\alpha_y * X))$	$\beta_2 = S_d / (2 * SQRT(\alpha_z * X))$	ERF(β_1)	ERF(β_2)	$C_{(x)} = C_{source} \times e^{(Term 1 + Term 2)} \times erf(\beta_1) \times erf(\beta_2)$
	S_w / (4 x SQRT (α_y x X)) = β_1	S_d / (2 x SQRT (α_z x X)) = β_2	Section 742.APPENDIX C: Table G		C_{source} x e ("Term 1" + "Term 2") x ERF(β_1) x ERF(β_2) = mg/L



Marine Bank Trust 53-0051 ***20030135***

Math for R-26 Calculations

BENZO(a)PYRENE MATH FOR VERTICAL SOIL MODELING AND R-26 MODELING OF VERTICAL MODELED SOIL (Attachment A)

Sample Location	C_w = (soil contamination at modeling point) / (Equation S-17)	$GW_{obj} = C_w / DF$			Conversion 1 foot = 30.48 cm		R-16: $\alpha_x = 0.10 * X$				R-17: $\alpha_y = \alpha_x / 3$					R-18: $\alpha_z = \alpha_x / 20$					"Term 1" = [X / (2 * α_x)]							"Term 2" = (1 - SQRT[1 + (4 * λ * α_x) / (U)])											
	C_w	C_w	/ DF	= GW_{obj} (mg/L)	X (ft)	X (cm)	0.1	x	X (cm)	α_x (cm)	α_x (cm)	/	3	=	α_y (cm)	α_x (cm)	/	20	=	α_z (cm)	X	/	2	x	α_x	=	"Term 1"	1	-	SQRT[	1	+(	4	x	λ	x	α_x	)/	U	]= "Term 2"

Sample Location	$\beta_1 = S_w / (4 * SQRT(\alpha_y * X))$										$\beta_2 = S_d / (2 * SQRT(\alpha_z * X))$										ERF(β_1)	ERF(β_2)	$C_{(x)} = C_{source} \times e^{(Term 1 \times Term 2)} \times erf(\beta_1) \times erf(\beta_2)$								
	S_w	/(	4	x	SQRT	(	α_y	x	X	))=	β_1	S_d	/(	2	x	SQRT	(	α_z	x	X	))= β_2	Section 742 APPENDIX C: Table G		C_{source}	x e	("Term 1"	x	"Term 2")	x ERF(β_1)	x ERF(β_2)	= mg/L

Marine Bank Trust 53-0051 20030135

Math for R-28 Calculations

Dimensionless Mathematical MATH FOR VERTICAL SOIL MODELING AND R-28 MODELING OF VERTICAL MODELED SOIL (Attachment A)

Marine Bank Trust 93-0051
20030135

Illinois Enviromental Protection Agency
Leaking Underground Storage Tank Program
SSL Input Parameters for Use with Tier 2 Calculations

A. Site Identification

IEMA Incident # (6- or 8-digit): 20030135 IEPA LPC # (10-digit): 1670255005

Site Name: Marine Bank Trust 53-0051

Site Address (not a P.O. Box): 9520 State Route 29

City: Cantrall County: Sangamon Zip Code: 62625

Leaking UST Technical File

B. Tier 2 Calculation Information

Equation(s) Used (ex: S12,S17,S28): S5,6,7,8,9,10,17,18,19,20,21,22,24

Contact Information for Individual Who Performed Calculations:

CWM

Land Use: Residential Soil Type: Silt Loam

Groundwater: [X] Class I [ ] Class II

Mass Limit: [ ] Yes [X] No If Yes, then Specify Acreage:

- Mass Limit Acreage other than defaults must always be rounded up.
- Failure to use site-specific parameters where allowed could affect payment from the UST Fund
- Maps depicting source width, plume dimensions, distance, etc. must also be submitted.
- Inputs must be submitted in the designated unit.

AT (ingestion)	=	Residential = 6	yr
		Con. Worker = 0.115	yr
AT (inhalation)	=	Residential = 30	yr
		Con. Worker = 0.115	yr
AT_c	=	70	yr
BW	=	Res. (NonCarcinogen) = 15	kg
		Res. (Carcinogen) = 70	kg
		Con. Worker = 70	kg
C_{sat}	=	Benzene = 1276.584	mg/kg
		Toluene = 995.89	mg/kg
		Ethylbenzene = 817.621	mg/kg
		Total Xylenes = 491.814	mg/kg
		MTBE = 13260.674	mg/kg
		Naphthalene = 172.101	mg/kg
			mg/kg
			mg/kg
			mg/kg
			mg/kg

d_a	=	3.048	m
d_b	=	3.048	m
DA	=	Benzene = 0.000158858894258487	cm^2/s
		Toluene = 6.97753867647195E-05	cm^2/s
		Ethylbenzene = 3.71833957760776E-05	cm^2/s
		Xylenes = 2.47911027815617E-05	cm^2/s
		MTBE = 5.40877064477589E-05	cm^2/s
		Naphthalene = 1.21979406983555E-05	cm^2/s
			cm^2/s
			cm^2/s
			cm^2/s
			cm^2/s

Incident # 20030135

C_w	=	Benzene = 0.1	mg/L
		Toluene = 20	mg/L
		Ethylbenzene = 50.862	mg/L
		Total Xylenes = 894.207	mg/L
		MTBE = 0.364	mg/L
		Naphthalene = 15.544	mg/L
			mg/L
			mg/L
			mg/L
			mg/L
			mg/L
d	=	11.401	m
ED (inhalation of carcinogens)	=	Residential = 30	yr
		Con. Worker = 1	yr
ED (ingestion of noncarcinogens)	=	Residential = 6	yr
		Con. Worker = 1	yr
ED (inhalation of noncarcinogens)	=	Residential = 30	yr
		Con. Worker = 1	yr
ED (ingestion of groundwater)	=	Residential = 30	yr
		Con. Worker = 1	yr
ED_{M-L}	=	70	yr
EF	=	Residential = 350	d/yr
		Con. Worker = 30	d/yr
F(x)	=	0.194	unitless
f_{oc}	=	0.0108	g/g
GW_{obj}	=	Benzene = 0.005	mg/L
		Toluene = 1	mg/L
		Ethylbenzene = 0.7	mg/L
		Total Xylenes = 10	mg/L
		MTBE = 0.07	mg/L
		Naphthalene = 0.14	mg/L
			mg/L
			mg/L
			mg/L
			mg/L
H'	=	Benzene = 0.23	unitless
		Toluene = 0.271	unitless
		Ethylbenzene = 0.324	unitless
		Total Xylenes = 0.271	unitless
		MTBE = 0.0241	unitless
		Naphthalene = 0.0198	unitless
			unitless
			unitless
			unitless
			unitless
i	=	0.06188	m/m
I	=	0.3	m/yr
I_{M-L}	=	0.18	m/yr
$IF_{soil-adj}$	=	114	(mg-yr)/(kg-d)
IR_{soil}	=	Residential = 200	mg/d
		Con. Worker = 480	mg/d

D_i	=	Benzene = 0.088	cm^2/s
		Toluene = 0.087	cm^2/s
		Ethylbenzene = 0.075	cm^2/s
		Total Xylenes = 0.0735	cm^2/s
		MTBE = 0.102	cm^2/s
		Naphthalene = 0.0000075	cm^2/s
			cm^2/s
			cm^2/s
			cm^2/s
			cm^2/s
D_w	=	Benzene = 0.0000102	cm^2/s
		Toluene = 0.0000086	cm^2/s
		Ethylbenzene = 0.0000078	cm^2/s
		Total Xylenes = 0.00000923	cm^2/s
		MTBE = 0.000011	cm^2/s
		Naphthalene = 0.0000075	cm^2/s
			cm^2/s
			cm^2/s
			cm^2/s
			cm^2/s
DF	=	2.08662718	unitless
ED (ingestion of carcinogens	=		yr
		Con. Worker = 1	yr
K_{oc}	=	Benzene = 50	cm^3/g or L/kg
		Toluene = 158	cm^3/g or L/kg
		Ethylbenzene = 320	cm^3/g or L/kg
		Total Xylenes = 398	cm^3/g or L/kg
		MTBE = 10	cm^3/g or L/kg
		Naphthalene = 500	cm^3/g or L/kg
			cm^3/g or L/kg
			cm^3/g or L/kg
			cm^3/g or L/kg
			cm^3/g or L/kg
K_s	=	120	m/yr
L	=	79.8576	m
PEF	=		m^3/kg
PEF'	=		m^3/kg
Q/C (VF equations)	=	Residential = 68.81	$(g/m^2\text{-}s)/(kg/m^3)$
		Con. Worker = 85.81	$(g/m^2\text{-}s)/(kg/m^3)$
Q/C (PEF equations)	=		$(g/m^2\text{-}s)/(kg/m^3)$

RfC (mg/m^3)		Chronic	Subchronic
Benzene	=	0.03	0.08
Toluene	=	5	5
Ethylbenzene	=	1	9
Total Xylenes	=	0.1	0.4
MTBE	=	3	2.5
Naphthalene	=	0.003	0.003
	=		NA
	=		NA
	=		NA
	=		NA

Incident # 20030135

IR_w	=	Residential = 2	L/d
K	=	36.89712	m/yr
K_d(non-ionizing organics)	=	Benzene = 0.54	cm^3/g or L/kg
		Toluene = 1.7064	cm^3/g or L/kg
		Ethylbenzene = 3.456	cm^3/g or L/kg
		Total Xylenes = 4.2984	cm^3/g or L/kg
		MTBE = 0.108	cm^3/g or L/kg
		Naphthalene = 5.4	cm^3/g or L/kg
			cm^3/g or L/kg
			cm^3/g or L/kg
			cm^3/g or L/kg
			cm^3/g or L/kg
K_d (ionizing organics)	=		cm^3/g or L/kg
K_d (inorganics)	=		cm^3/g or L/kg
VF'	=	Benzene = 697.874	m^3/kg
		Toluene = 1053.001	m^3/kg
		Ethylbenzene = 1442.466	m^3/kg
		Total Xylenes = 1766.572	m^3/kg
		MTBE = 1196.999	m^3/kg
		Naphthalene = 7964.103	m^3/kg
			m^3/kg
			m^3/kg
			m^3/kg
			m^3/kg
VM_{M-L}	=	#VALUE!	m^3/kg
		#VALUE!	m^3/kg
		#VALUE!	m^3/kg
		#VALUE!	m^3/kg
		#VALUE!	m^3/kg
		#VALUE!	m^3/kg
			m^3/kg
			m^3/kg
			m^3/kg
			m^3/kg
VF'_{M-L}	=	#VALUE!	m^3/kg
		#VALUE!	m^3/kg
		#VALUE!	m^3/kg
		#VALUE!	m^3/kg
		#VALUE!	m^3/kg
		#VALUE!	m^3/kg
			m^3/kg
			m^3/kg
			m^3/kg
			m^3/kg
			m^3/kg
η	=	0.383	L_{pore}/L_{soil}
θ_a	=	0.137	L_{air}/L_{soil}

RfD_o mg/(kg-d)		Chronic	Subchronic
Benzene	=	0.004	0.012
Toluene	=	0.08	0.8
Ethylbenzene	=	0.1	0.05
Total Xylenes	=	0.2	0.4
MTBE	=	0.01	0.3
Naphthalene	=	0.02	0.6
	=		0.2
	=		NA
	=		NA
	=		NA

S	=	Benzene = 1800	mg/L
		Toluene = 530	mg/L
		Ethylbenzene = 170	mg/L
		Total Xylenes = 110	mg/L
		MTBE = 51000	mg/L
		Naphthalene = 31	mg/L
			mg/L
			mg/L
			mg/L
			mg/L
SF_o	=	Benzene = 0.055	$(mg/kg-d)^{-1}$
		Toluene = NA	$(mg/kg-d)^{-1}$
		Ethylbenzene = 0.011	$(mg/kg-d)^{-1}$
		Total Xylenes = NA	$(mg/kg-d)^{-1}$
		MTBE = NA	$(mg/kg-d)^{-1}$
		Naphthalene = NA	$(mg/kg-d)^{-1}$
			$(mg/kg-d)^{-1}$
			$(mg/kg-d)^{-1}$
			$(mg/kg-d)^{-1}$
			$(mg/kg-d)^{-1}$
T	=	Residential = 9.5E08	s
		Con. Worker = 3.6×10^8	s
T_{M-L}	=	30	yr
THQ	=	1	unitless
TR	=	1.00E-06	unitless
U_m	=	4.69	m/s
URF	=	Benzene = 7.8×10^{-6}	$(\mu g/m^3)^{-1}$
U_t	=	11.32	m/s
V	=	0.5	unitless
VF	=	Benzene = 9090.783	m^3/kg
		Toluene = 13716.814	m^3/kg
		Ethylbenzene = 18790.131	m^3/kg
		Total Xylenes = 23012.066	m^3/kg
		MTBE = 15579.585	m^3/kg
		Naphthalene = 103743.544	m^3/kg
			m^3/kg
			m^3/kg
			m^3/kg
			m^3/kg

Incident # 20030135

θ_w	=	0.246	L_{water}/L_{soil}
ρ_b	=	1.64	kg/l or g/cm^3
ρ_s	=	2.657	g/cm^3
ρ_w	=	1	g/cm^3
1/(2b+3)	=	0.074	unitless

Illinois Environmental Protection Agency
Leaking Underground Storage Tank Program
RBCA Input Parameters for Use with Tier 2 Calculations

A. Site Identification

IEMA Incident # (6- or 8-digit): 20030136 IEPA LPC # (10-digit): 1670255005

Site Name: Marine Bank Trust 53-0051

Site Address (not a P.O. Box): 9520 State Route 29

City: Cantrall County: Sangamon Zip Code: 62625

Leaking UST Technical File

B. Tier 2 Calculation Information

Equation(s) Used (ex: R12,R14,R29): R16, R17, R18,R19, R21, R22, R23, R24,R26

Contact Information for Individual Who Performed Calculations:

CWM

Land Use: Residential Soil Type: Silt Loam

Groundwater: [X] Class I [ ] Class II

Mass Limit: [ ] Yes [X] No If Yes, then Specify Acreage:

Objective from S17 used in R25? [ ] Yes [X] No

If Yes, then Specify C_{source} from S17 See Attached mg/L

- Mass Limit Acreage other than defaults must always be rounded up.
- Failure to use site-specific parameters where allowed could affect payment from the UST Fund
- Maps depicting source width, plume dimensions, distance, etc. must also be submitted.
- Inputs must be submitted in the designated unit.

AT_c	=	70	yr
AT_n	=	Residential = 30 Con. Worker = 0.115	yr yr
BW	=	70	yr
C_{source}	=	See Attached	mg/L
$C_{(x)}$	=	See Attached	mg/L
d	=	100	cm

D^{air}	=	See Attached	cm^2/s
D^{water}	=	See Attached	cm^2/s
D_s^{sill}	=	See Attached	cm^2/s
ED	=	Residential = 30 Con. Worker = 1	yr yr
EF	=	Residential = 350 Con. Worker = 30	d/yr d/yr

orf	=	See Attached	unitless
f_{oc}	=	0.0108	g/g
GW_{ccamp}	=	See Attached	mg/L
GW_{source}	=	See Attached	mg/L
H'	=	See Attached	cm^3_{air}/cm^3_{w}
I	=	0.06196	cm/cm
I	=	30	cm/yr
IR_{air}	=	20	m^3/d
IR_{soil}	=	Residential = 100 Con. Worker = 480	mg/d mg/d
IR_w	=	Residential = 2	L/d
K	=	10.109 3689.712	cm/d cm/yr
K_{oc}	=	See Attached	cm^3/g or L/kg
K_d (non-ionizing organics)	=	See Attached	cm^3_{water}/g_{soil}
K_d (ionizing organics)	=	Not Applicable	cm^3_{water}/g_{soil}
K_d (inorganics)	=	Not Applicable	cm^3_{water}/g_{soil}
L_s	=	100	cm
LF_{sw}	=	See Attached	$(mg/L_{water})/(mg/kg_{soil})$
M	=	0.5	mg/cm^2
Pe	=	$6.9 \cdot 10^{-14}$	g/cm^3-s
RAF_d	=	0.5	unitless
a_x	=	See Attached	cm
a_y	=	See Attached	cm
a_z	=	See Attached	cm
λ	=	See Attached	d^{-1}
π	=	3.1416	
t	=	$9.46 \cdot 10^8$	s

RAF_d (PNAs)	=	0.05	unitless
RAF_d (inorganics)	=	0	unitless
RAF_o	=	1	unitless
$RBSL_{air}$ (carcinogenic)	=	See Attached	$\mu g/m^3$
$RBSL_{air}$ (noncarcinogenic)	=	See Attached	$\mu g/m^3$
RfO_i	=	See Attached	mg/kg-d
SA	=	3,160	cm^2/d
S_d	=	200.0	cm
S_w	=	6,583.7	cm
SF_i	=	See Attached	$(mg/kg-d)^{-1}$
SF_o	=	See Attached	$(mg/kg-d)^{-1}$
THQ	=	1	unitless
TR	=	1.00E-06	unitless
U	=	1.4547	cm/d
U_{air}	=	225	cm/s
U_{gw}	=	3689.773	cm/y
VF_p	=	3.97133E-12	kg/m^3
VF_{semi}	=	See Attached	$(mg/m^3_{air})/(mg/kg_{soil}$ or $kg/kg_{soil})$
VF_{ss}	=	See Attached	kg/m3
W	=		cm
w	=	20	$\theta_{water}/\theta_{soil}$
δ_{air}	=	200	cm
δ_{gw}	=	200	cm
θ_{as}	=	32.37	cm^3_{air}/cm^3_{soil}
θ_{ws}	=	32.8	cm^3_{water}/cm^3_{soil}
θ_T	=	0.43	cm^3/cm^3_{soil}
ρ_b	=	1.64	g/cm^3
ρ_w	=	1	g/cm^3

	H'	λ	Koc
Benzene	0.23	0.0009	50
Toluene	0.271	0.011	158
Ethylbenzene	0.324	0.003	320
Total Xylenes	0.271	0.0019	398
MTBE	0.0241	0	10
Naphthalene	0.0198	0.0027	500

Benzene R26 Modeled Groundwater from Vertical Modeled Soils

Location	C_{source} from S17 (mg/L)	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $\delta_w/(4\cdot\sqrt{[\alpha_y\cdot X]})$	erf: $\delta_w/(2\cdot\sqrt{[\alpha_z\cdot X]})$
SB-7	1.149	0.005	8900.16	890.016	296.672	44.5008	0.84799159	0.26799059
SB-13	0.007	0.005	609.6	60.96	20.32	3.048	1	0.99999543
SB-14	0.007	0.005	457.2	45.72	15.24	2.286	1	1
SB-15	0.021	0.005	2255.52	225.552	75.184	11.2776	0.99999998	0.82341709
SB-20A	0.007	0.005	457.2	45.72	15.24	2.286	1	1
SB-20B	0.007	0.005	548.64	54.864	18.288	2.7432	1	0.99999997
SB-21C	0.005	0.005	30.48	3.048	1.016	0.1524	1	1
SB-21D	0.005	0.005	30.48	3.048	1.016	0.1524	1	1

Benzene R26 Modeled Groundwater

Location	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $\delta_w/(4\cdot\sqrt{[\alpha_y\cdot X]})$	erf: $\delta_w/(2\cdot\sqrt{[\alpha_z\cdot X]})$
MW-1	1.430	9357.36	935.736	311.912	46.7868	0.82695441	0.2553755
MW-2	0.250	6096	609.6	203.2	30.48	0.96350676	0.38252492
MW-14	0.264	6187.44	618.744	206.248	30.9372	0.96064966	0.37771241

Toluene R26 Modeled Groundwater from Vertical Modeled Soils

Location	C_{source} from S17 (mg/L)	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $S_w/(4 \cdot \sqrt{[\alpha_y \cdot X]})$	erf: $S_w/(2 \cdot \sqrt{[\alpha_z \cdot X]})$

Toluene R26 Modeled Groundwater

Location	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $S_w/(4 \cdot \sqrt{[\alpha_y \cdot X]})$	erf: $S_w/(2 \cdot \sqrt{[\alpha_z \cdot X]})$

Ethylbenzene R26 Modeled Groundwater from Vertical Modeled Soils								
Location	C_{source} from S17 (mg/L)	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $S_w / (4 \cdot \sqrt{(\alpha_y \cdot X)})$	erf: $S_w / (2 \cdot \sqrt{(\alpha_z \cdot X)})$
SB-15	0.6551	0.6154	30.48	3.048	1.016	0.1524	1	1

Ethylbenzene R26 Modeled Groundwater							
Location	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	$\sqrt{(\alpha_y \cdot X)}$	$\sqrt{(\alpha_z \cdot X)}$

Total Xylenes R26 Modeled Groundwater from Vertical Modeled Soils								
Location	C_{source} from S17 (mg/L)	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $s_w / (4 \cdot \sqrt{[\alpha_y \cdot X]})$	erf: $s_w / (2 \cdot \sqrt{[\alpha_z \cdot X]})$
SB-15	1.8228	1.7520	30.48	3.048	1.016	0.1524	1	1

Total Xylenes R26 Modeled Groundwater							
Location	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $s_w / (4 \cdot \sqrt{[\alpha_y \cdot X]})$	erf: $s_w / (2 \cdot \sqrt{[\alpha_z \cdot X]})$

MTBE R26 Modeled Groundwater from Vertical Modeled Soils								
Location	C_{source} from S17 (mg/L)	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $S_w / (4 \cdot \sqrt{[\alpha_y \cdot X]})$	erf: $S_w / (2 \cdot \sqrt{[\alpha_z \cdot X]})$

MTBE R26 Modeled Groundwater							
Location	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $S_w / (4 \cdot \sqrt{[\alpha_y \cdot X]})$	erf: $S_w / (2 \cdot \sqrt{[\alpha_z \cdot X]})$

Naphthalene R26 Modeled Groundwater from Vertical Modeled Soils

Location	C_{source} from S17 (mg/L)	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $S_w/(4\cdot\sqrt{[\alpha_y\cdot X]})$	erf: $S_w/(2\cdot\sqrt{[\alpha_z\cdot X]})$
SB-7	0.1531	0.1369	60.96	6.096	2.032	0.3048	1	1
SB-15	0.1666	0.1335	121.92	12.192	4.064	0.6096	1	1
SB-19A	0.8043	0.1351	1127.76	112.776	37.592	5.6388	1	0.99312218
SB-19B	1.0447	0.1354	1310.64	131.064	43.688	6.5532	1	0.97995911

Naphthalene R26 Modeled Groundwater

Location	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $S_w/(4\cdot\sqrt{[\alpha_y\cdot X]})$	erf: $S_w/(2\cdot\sqrt{[\alpha_z\cdot X]})$
MW-2A	0.178	152.4	15.24	5.08	0.762	1	1
MW-3A	0.514	792.48	79.248	26.416	3.9624	1	0.99988001
MW-4A	0.179	152.4	15.24	5.08	0.762	1	1

Location	C_{source} from S17 (mg/L)	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $S_w / (4 \cdot \sqrt{[\alpha_y \cdot X]})$	erf: $S_w / (2 \cdot \sqrt{[\alpha_z \cdot X]})$

Location	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $S_w / (4 \cdot \sqrt{[\alpha_y \cdot X]})$	erf: $S_w / (2 \cdot \sqrt{[\alpha_z \cdot X]})$

Location	C_{source} from S17 (mg/L)	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $s_w / (4 \cdot \sqrt{(\alpha_z \cdot x)})$	erf: $s_w / (2 \cdot \sqrt{(\alpha_z \cdot x)})$

Location	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $s_w / (4 \cdot \sqrt{(\alpha_z \cdot x)})$	erf: $s_w / (2 \cdot \sqrt{(\alpha_z \cdot x)})$
MW-3A	0.001	4754.88	475.488	158.496	23.7744	0.99266624	0.47849398
MW-4A	0.001	3413.76	341.376	113.792	17.0688	0.99961203	0.62806632
MW-5A	0.000	426.72	42.672	14.224	2.1336	1	1

Location	C_{source} from S17 (mg/L)	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $s_w / (4 \cdot \sqrt{[\alpha_y \cdot x]})$	erf: $s_w / (2 \cdot \sqrt{[\alpha_z \cdot x]})$

Location	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $s_w / (4 \cdot \sqrt{[\alpha_y \cdot x]})$	erf: $s_w / (2 \cdot \sqrt{[\alpha_z \cdot x]})$
MW-3A	0.000	1097.28	109.728	36.576	5.4864	1	0.9945268

Location	C_{source} from S17 (mg/L)	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $S_w / (4 \cdot \sqrt{[\alpha_y \cdot X]})$	erf: $S_w / (2 \cdot \sqrt{[\alpha_z \cdot X]})$

Location	C(x) (mg/L)	X (cm)	α_x (cm)	α_y (cm)	α_z (cm)	erf: $S_w / (4 \cdot \sqrt{[\alpha_y \cdot X]})$	erf: $S_w / (2 \cdot \sqrt{[\alpha_z \cdot X]})$

Tier 2 Residential Calculations for Benzene

Marine Bank Trust 53-0051
20030135

SSL	SSL & RBCA
RBCA	IRIS/HEAST

Date Compiled: 10/05/23

Input Values

Holcomb's Bulk Density --> 0 | Converted Value to be used in calculation sheet --> | – | USDA Soil Classification: Silt Loam

Organic Matter (%) --> 0 | FOC % (0.58 conversion) --> 0.000 | Organic Matter (mg/kg) 0 | FOC mg/kg (0.58 conversion) 0.000 | foc conversion to g/g: 0.000

1.640	ρ_b - Dry Soil Bulk Density			1.5 or; Gravel = 2.0; Sand = 1.8; Silt = 1.6; Clay = 1.7; or Site Specific
2.657	ps - Soil Particle Density			2.65 or; Site Specific
0.137	Θ_a - Air Filled Soil Porosity	*0.137*	Value from S-21	Top 1 meter = 0.28; below 1 meter = 0.13; Gravel = 0.05; Sand = 0.14; Silt =0.24; Clay = 0.19; or Calculated Value (S21)
0.246	Θw - Water Filled Soil Porosity	*0.246*	Value from S-20	Top 1 meter = 0.15; below 1 meter = 0.30; Gravel = 0.20; Sand = 0.16; Silt =0.16; Clay = 0.17; or Calculated Value (S20)
0.383	η - SSL: Total Soil Porosity	*0.383*	Value from S-24	0.43 or; Gravel - 0.25; Sand = 0.32; Silt = 0.40; Clay = 0.36; or Calculated Value (S24 or R23)
0.0619	i - Hydraulic Gradient			Site Specific
0.011	foc - Total Organic Carbon (g/g)			Surface Soil = 0.006; Subsurface Soil = 0.002; or Site Specific
20.000	DF - Dilution Factor	*2.087*	Value from S-22	If calculated value for DF is less than 20, then 20 default is used, else calculated value is used
11.402	d - Mixing Zone (m)	*11.402*	Value from S-25	2; or calculated value
3.048	d_s - Depth of source (m)		feet = 10	Depth of Source (Vertical thickness of contamination)
36.90	K - Hydraulic Conductivity (m/yr)	cm/sec =	1.17E-04	Site Specific: 10.11 cm/d; 3689.71 cm/yr; Use cm/d for R15, R19, & R26, cm/yr for R24
79.858	L - Source Length Parallel to Groundwater Flow (m)		feet = 262	Site Specific (m)
3.048	d_a - Aquifer Thickness (m)		feet = 10	Site Specific (m)
0.3	I - Infiltration Rate (m/yr)			0.3 for Illinois
120	K_s - Saturated Hydraulic Conductivity			See Table K for Input Values
0.005	GW_{obj} - Groundwater Remediation Objective Class 1			0.025 GW_{obj} - Groundwater Remediation Objective Class 2
0.074	1/(2b+3) - Exponent for S20			See Table K for Input Values
70	BW - Body Weight			Residential = 70 (carcinogenic); 15 (non-carcinogenic); Industrial/Commercial = 70; Construction Worker = 70; RBCA =70
114	$IF_{soil-adj}$ -Age Adjusted Soil Ingestion Factor for Carcinogens			114
200	IR_{soil} -Soil Ingestion Rate			Residential = 200; Industrial/Commercial = 50; Construction Worker = 480
0.055	SF_o -Oral Slope Factor			Benzene = 0.055
2	IR_w -Daily Water Ingestion Rate			Residential = 2; Industrial/Commercial = 1
1800	S - Solubility in Water			Benzene = 1750
1.0E-06	TR - Target Cancer Risk			Residential = 10^{-6}; Industrial/Commercial = 10^{-6}; Construction Worker = 10^{-6} at point of human exposure
70	AT_c -Average Time for Carcinogens			70
7.80E-06	URF - Inhalation Unit Risk Factor			Benzene = 7.8×10^{-6}
350	EF - Exposure Frequency			Residential = 350; Industrial/Commercial = 250; Construction Worker = 30
30	ED - Exposure Duration for Inhalation to Carcinogens			Residential = 30; Industrial/Commercial = 25; Construction Worker = 1
68.81	Q/C - Inverse of the mean concentration at the center of a square source			Residential = 68.81; Industrial/Commercial = 85.81; Construction Worker = 85.81; or Table H
9.50E+08	T - Exposure Interval			Residential = 9.5×10^8; Industrial/Commercial = 7.9×10^8; Construction Worker = 3.6×10^8
30	T_{M-L} - Exposure Interval for Mall Limit Volatilization Factor Equation S26			30
70	ED_{M-L} - Exposure Duration for Migration to Groundwater Mass-Limit Equation S28			70
0.18	I_{M-L} - Infiltration Rate for Migration to Groundwater Mass-Limit Equation S28			0.18
0.088	D_a & D^{air} - Diffusivity in Air			Benzene = 0.088
0.230	H' - Henry's Law Constant			Benzene = 0.228
1.02E-05	D_w & D^{water} - Diffusivity in Water			Benzene = 9.8×10^{-6}
50.00	K_{oc} - Organic Carbon Partition Coefficient			Benzene = 58.9

Residential Ingestion Tier II Benzene Objective

$$S\text{-}2 = \frac{TR \cdot AT_c \cdot 365}{Sf_o \cdot 10^{-6} \cdot EF \cdot IF_{soil\text{-}adj}} = \frac{1.0E\text{-}06 \cdot 70 \cdot 365}{0.055 \cdot 1.00E\text{-}06 \cdot 350 \cdot 114} = \frac{2.6E\text{-}02}{2.19E\text{-}03} = 11.643 \text{ mg/kg}$$

Construction Worker Ingestion Tier II Benzene Objective

$$S\text{-}3 = \frac{TR \times BW \times AT_c \times 365}{Sf_o \times 10^{-6} \times EF \times IRsoil} = \frac{1.0E\text{-}06 \cdot 70 \cdot 70 \cdot 365}{0.055 \cdot 1.00E\text{-}06 \cdot 30 \cdot 480} = \frac{1.8E+00}{7.92E\text{-}04} = 2258.21 \text{ mg/kg}$$

Tier 2 Residential Calculations for Benzene

Marine Bank Trust 53-0051
20030135

Residential Inhalation Tier II Benzene Objective

$$S\text{-}6 = \frac{TR \times ATc \times 365}{URF \times 1000 \times EF \times ED \times 1/VF} = \frac{1.0E\text{-}06 \cdot 70 \cdot 365}{7.80E\text{-}06 \cdot 1000 \cdot 350 \cdot 30 \cdot (1/\ 9{,}090.78\ )} = \frac{0.02555}{9.01E\text{-}03} = \mathbf{2.836}\ \text{mg/kg}$$

Construction Worker Inhalation Tier II Benzene Objective

$$S\text{-}7 = \frac{TR \times ATc \times 365}{URF \times 1000 \times EF \times ED \times 1/VF'} = \frac{1.0E\text{-}06 \cdot 70 \cdot 365}{7.80E\text{-}06 \cdot 1000 \cdot 30 \cdot 1 \cdot (1/\ 69.79\ )} = \frac{0.02555}{3.35E\text{-}03} = \mathbf{7.620}\ \text{mg/kg}$$

RESIDENTIAL OR COMMERCIAL

$$S\text{-}8 = VF = \frac{Q}{C} \times \frac{(3.14 \times D_A \times T)^{1/2} \times 10^{-4}}{(2 \times \rho_b \times D_A)} = 68.81 \times \frac{\left(\frac{3.14}{2} \times \frac{1.59E\text{-}04}{1.64} \times \frac{9.50E+08}{1.59E\text{-}04}\right)^{1/2} \times 0.0001}{} = \frac{4.7368}{0.0005} = 9090.783$$

Construction Worker

$$S\text{-}8 = VF = \frac{Q}{C} \times \frac{(3.14 \times D_A \times T)^{1/2} \times 10^{-4}}{(2 \times \rho_b \times D_A)} = 85.81 \times \frac{\left(\frac{3.14}{2} \times \frac{1.59E\text{-}04}{1.64} \times \frac{3.60E+06}{1.59E\text{-}04}\right)^{1/2} \times 0.0001}{} = \frac{0.3636}{0.0005} = 697.8741$$

Equation for Derivation of Volatilization Factor - Construction Worker

$$S\text{-}9 = VF' = \frac{VF}{10} = \frac{697.8741}{10} = 69.7874$$

Equation for Derivation of Apparent Diffusivity

$$S\text{-}10 = D_A = \frac{(\theta_a^{3.33} \times D_i \times H') + (\theta_w^{3.33} \times D_w)}{\eta^2} \times \frac{1}{(\rho_b \times K_d) + \theta_w + (\theta_a \times H')}$$

$$= \frac{\left(\frac{1.33E\text{-}03}{0.1467} \times 0.088 \times 0.230\right) + \left(0.0094 \times 1.02E\text{-}05\right)}{\left(1.64 \times 0.54\right) + 0.25 + \left(0.137 \times 0.230\right)} \times \frac{1}{} = 1.59E\text{-}04$$

Soil Component of the Migration to Groundwater Cleanup Objective (Class 1)

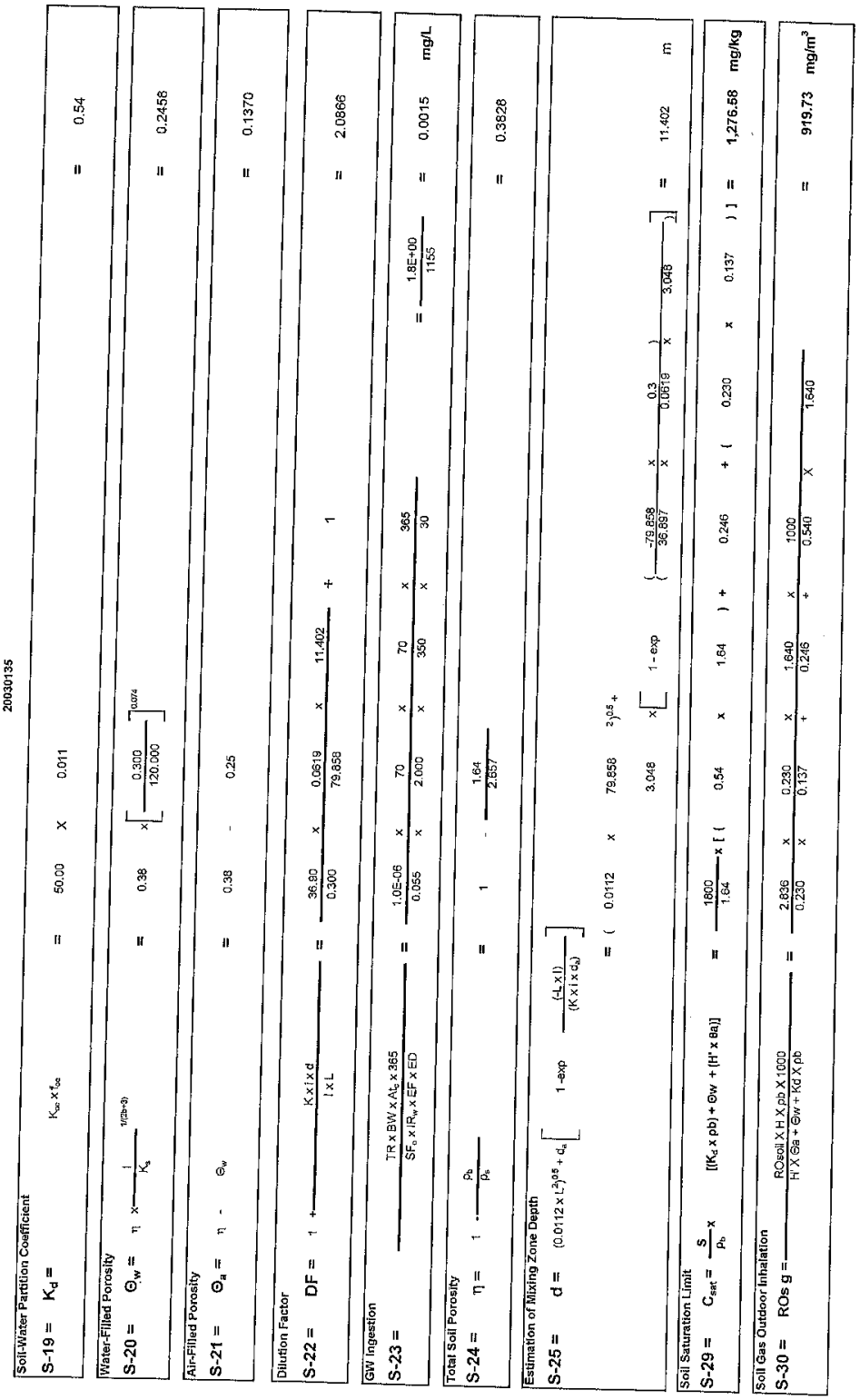
$$S\text{-}17 = C_w \times \left[K_d + \frac{(\theta_w + \theta_a \times H')}{pb}\right] = 0.1 \times \left[0.54 + \frac{0.246 + 0.137 \times 0.230}{1.64}\right] = \mathbf{0.071}\ \text{mg/kg}$$

Target Soil Leachate Concentration (Class 1)

$$S\text{-}18 = C_w = DF \times GW_{obj} = 20.00 \times 0.005 = 0.1$$

Tier 2 Residential Calculations for Benzene

Marine Bank Trust 53-0051
20030135



Tier 2 Residential Calculations for Ethylbenzene

Marine Bank Trust 53-0051
20030135

SSL / RBCA | SSL & RBCA / IRIS/HEAST

Date Compiled: 10/05/23

Input Values

Holcomb's Bulk Density -->	0	Converted Value to be used in calculation sheet -->		–	USDA Soil Classification:	Silt Loam			
Organic Matter (%) -->	0	FOC % (0.58 conversion) -->	0.000	Organic Matter (mg/kg)	0	FOC mg/kg (0.58 conversion)	0.000	foc conversion to g/g:	0.000

1.640	ρ_b - Dry Soil Bulk Density			1.5 or; Gravel = 2.0; Sand = 1.8; Silt = 1.6; Clay = 1.7; or Site Specific
2.657	ρ_s - Soil Particle Density			2.65 or; Site Specific
0.137	Θ_a - Air Filled Soil Porosity	*0.137*	Value from S-21	Top 1 meter = 0.28; below 1 meter = 0.13; Gravel = 0.05; Sand = 0.14; Silt =0.24; Clay = 0.19; or Calculated Value (S21)
0.246	Θ_w - Water Filled Soil Porosity	*0.246*	Value from S-20	Top 1 meter = 0.15; below 1 meter = 0.30; Gravel = 0.20; Sand = 0.18; Silt =0.16; Clay = 0.17; or Calculated Value (S20)
0.383	n - SSL: Total Soil Porosity	*0.383*	Value from S-24	0.43 or; Gravel - 0.25; Sand = 0.32; Silt = 0.40; Clay = 0.36; or Calculated Value (S24)
0.06186	I - Hydraulic Gradient			Site Specific
0.011	foc - Total Organic Carbon (g/g)			Surface Soil = 0.006; Subsurface Soil = 0.002; or Site Specific
20.000	DF - Dilution Factor	*2.087*	Value from S-22	If calculated value for DF is less than 20, then 20 default is used, else calculated value is used
11.402	d - Mixing Zone (m)	11.402	Value from S-26	2; or calculated value
3.048	d_a - Depth of source (m)	feet = 10		Depth of Source (Vertical thickness of contamination)
36.90	K - Hydraulic Conductivity (m/yr)	cm/sec =	1.17E-04	Site Specific 1.01E+01 cm/d 3.69E+03 cm/yr Use cm/d for R15, R19, & R26; cm/yr for R24
79.856	L - Source Length Parallel to Groundwater Flow (m)	feet = 262		Site Specific (m)
3.048	d_a - Aquifer Thickness (m)	feet = 10		Site Specific (m)
0.3	I - Infiltration Rate (m/yr)			0.3 for Illinois
120	K_s - Saturated Hydraulic Conductivity			See Table K for Input Values
0.700	GW_{obj} - Groundwater Remediation Objective Class 1			1 GW_{obj} - Groundwater Remediation Objective Class 2
0.074	1/(2b+3) - Exponent for S20			See Table K for Input Values
15	BW - Body Weight			Residential = 70 (carcinogenic); 15 (non-carcinogenic); Industrial/Commercial = 70; Construction Worker = 70; RBCA = 70
114	$IF_{soil-adj}$ -Age Adjusted Soil Ingestion Factor for Carcinogens			114
200	IR_{soil} -Soil Ingestion Rate			Residential = 200; Industrial/Commercial = 50; Construction Worker = 480
2	IR_w -Daily Water Ingestion Rate			Residential = 2; Industrial/Commercial = 1
170	S - Solubility in Water			Ethylbenzene = 169
1.0E-06	TR - Target Cancer Risk			Residential = 10^{-6}; Industrial/Commercial = 10^{-5}; Construction Worker = 10^{-5} at point of human exposure
350	EF - Exposure Frequency			Residential = 350; Industrial/Commercial = 250; Construction Worker = 30
30	ED - Exposure Duration for Inhalation for Non-Carcinogens			Residential = 30; Industrial/Commercial = 25; Construction Worker = 1
68.81	Q/C - Inverse of the mean concentration at the center of a square source			Residential = 68.81; Industrial/Commercial = 68.81; Construction Worker = 68.81; or Table H
9.50E+08	T - Exposure Interval			Residential = 9.5×10^8; Industrial/Commercial = 7.9×10^8; Construction Worker = 3.8×10^8
30	T_{M-L} - Exposure Interval for Mall Limit Volatilization Factor Equation S26			30
70	ED_{M-L} - Exposure Duration for Migration to Groundwater Mass-Limit Equation S26			70
0.18	I_{M-L} - Infiltration Rate for Migration to Groundwater Mass-Limit Equation S28			0.18
0.075	D_i - Diffusivity in Air			Ethylbenzene = 0.075.
0.324	H' - Henry's Law Constant			Ethylbenzene = 0.323
7.80E-06	D_w - Diffusivity in Water			Ethylbenzene = 7.8×10^{-6}
6	AT - Average Time for Non-Carcinogens In Ingestion Equation			Residential = 6; Industrial/Commercial = 25; Construction Worker = 0.115
30	AT - Average Time for Non-Carcinogens In Inhalation Equation			Residential = 30; Industrial/Commercial = 25; Construction Worker = 0.115
1	THQ - Target Hazard Quotient			1
	RfC - Inhalation Reference Concentration			Chronic = 1; Subchronic = 1
0.1	RfD_o - Oral Reference Dose			Chronic = 0.1; Subchronic = 0.05
320.00	K_{oc} - Organic Carbon Partition Coefficient			Ethylbenzene = 363

Residential Ingestion Remediation Objectives for Non-Carcinogenic Contaminants

$$S\text{-}1 = \frac{THQ \times BW \times AT \times 365}{10^{-6} \times (1/RfD_o) \times EF \times ED \times IR_{soil}} = \frac{1 \times 15 \times 6 \times 365}{0.000001 \times 1/0.1 \times 350 \times 6 \times 200} = \frac{32850}{4.2} = 7821 \text{ mg/kg}$$

Construction Worker Ingestion Remediation Objectives for Non-Carcinogenic Contaminants

$$S\text{-}1 = \frac{THQ \times BW \times AT \times 365}{10^{-6} \times (1/RfD_o) \times EF \times ED \times IR_{soil}} = \frac{1 \times 70 \times 0.115 \times 365}{0.000001 \times 1/0.05 \times 30 \times 1 \times 480} = \frac{2938.25}{0.288} = 10202 \text{ mg/kg}$$

Residential Inhalation Tier II Ethylbenzene Objective

$$S\text{-}4 = \frac{THQ \times AT \times 365}{EF \times ED \times (1/RfC \times 1/VF)} = \frac{1 \times 30 \times 365}{350 \times 30 \times 1/1 \times 1/18790.1313} = \frac{10950}{0.558804} = 19595.423 \text{ mg/kg}$$

Tier 2 Inhalation Objective cannot exceed Soil Saturation Limit

Residential Inhalation Objective (Carcinogen)

Tier 2 Inhalation Objective does not exceed Tier 1 Objective

$$S\text{-}6 = \frac{TR \times ATc \times 365}{URF \times 1000 \times EF \times ED \times (1/VF)} = \frac{0.000001 \times 70 \times 365}{2.5E\text{-}06 \times 1000 \times 350 \times 30.0000 \times 1/18790.1314} = \frac{0.02555}{0.001397} = 18.289 \text{ mg/kg}$$

Construction Worker Inhalation Objective (Carcinogen)

Tier 2 Inhalation Objective does not exceed Tier 1 Objective

$$S\text{-}7 = \frac{TR \times ATc \times 365}{URF \times 1000 \times EF \times ED \times (1/VF)} = \frac{0.000001 \times 70 \times 365}{2.5E\text{-}06 \times 1000 \times 30 \times 1.0000 \times 1/144.2466} = \frac{0.02555}{0.0005199} = 49.140 \text{ mg/kg}$$

Tier 2 Residential Calculations for Ethylbenzene

Marine Bank Trust 53-0051
20030136

Construction Worker Inhalation Objective

$$S\text{-}5 = \frac{THQ \times AT \times 365}{EF \times ED \times (1/RfC \times 1/VF)} = \frac{1}{30} \times \frac{0.115}{1} \times \frac{365}{9} \times 1 / 144.2466076 = \frac{41.975}{0.0231086} = 1816.425 \text{ mg/kg}$$

Tier 2 Inhalation Objective cannot exceed Soil Saturation Limit

t (Ethylbenzene)

Tier 2 Residential Calculations for Ethylbenzene

Marine Bank Trust S3-0051
20030135

RESIDENTIAL OR COMMERCIAL

$$S\text{-}8 = VF = \frac{Q}{C} \times \frac{(3.14 \times D_A \times T)^{1/2} \times 10^{-4}}{(2 \times \rho_b \times D_A)} = 88.81 \times \frac{\left(\frac{3.14}{2} \times \frac{3.72E\text{-}05}{1.64} \times \frac{9.50E+08}{3.72E\text{-}05}\right)^{1/2} \times 0.0001}{1.22E\text{-}04} = \frac{2.2917}{1.22E\text{-}04} = 18790.1314$$

Construction Worker

$$S\text{-}8 = VF = \frac{Q}{C} \times \frac{(3.14 \times D_A \times T)^{1/2} \times 10^{-4}}{(2 \times \rho_b \times D_A)} = 85.81 \times \frac{\left(\frac{3.14}{2} \times \frac{3.72E\text{-}05}{1.64} \times \frac{3.60E+06}{3.72E\text{-}05}\right)^{1/2} \times 0.0001}{1.22E\text{-}04} = \frac{0.1759}{1.22E\text{-}04} = 1442.4661$$

Equation for Derivation of Volatilization Factor - Construction Worker

$$S\text{-}9 = VF' = \frac{VF}{10} = \frac{1442.4661}{10} = 144.2466$$

Equation for Derivation of Apparent Diffusivity

$$S\text{-}10 = D_A = \frac{(\theta_a^{3.33} \times D_i \times H') + (\theta_w^{3.33} \times D_w)}{\eta^2} \times \frac{1}{(\rho_b \times K_d) + \theta_w + (\theta_a \times H')}$$

$$= \frac{\left(1.33E\text{-}03 \times 0.075 \times 0.324\right) + \left(0.0094 \times 7.80E\text{-}06\right)}{0.1467} \times \frac{1}{\left(1.64 \times 3.456\right) + 0.25 + \left(0.137 \times 0.324\right)} = 3.72E\text{-}05$$

Soil Component of the Migration to Groundwater Cleanup Objective (Class 1)

$$S\text{-}17 = C_w \times \left[K_d + \frac{(\theta_w + \theta_a \times H')}{\rho b}\right] = 14 \times \left[3.456 + \left(\frac{0.246 + 0.137 \times 0.324}{1.64}\right)\right] = 50.863 \text{ mg/kg}$$

Target Soil Leachate Concentration (Class 1)

$$S\text{-}18 = C_w = DF \times GW_{obj} = 20.00 \times 0.700 = 14$$

Soil-Water Partition Coefficient

$$S\text{-}19 = K_d = K_{oc} \times f_{oc} = 320.00 \times 0.011 = 3.456$$

Water-Filled Porosity

$$S\text{-}20 = \Theta_w = \eta \times \frac{I}{K_s}^{1/(2b+3)} = 0.38 \times \left[\frac{0.300}{120.000}\right]^{0.074} = 0.2458$$

Air-Filled Porosity

$$S\text{-}21 = \Theta_a = \eta - \Theta_w = 0.38 - 0.25 = 0.1370$$

Tier 2 Residential Calculations for Ethylbenzene

Marine Bank Trust 53-0051
20030135

Dilution Factor

$$S\text{-}22 = DF = 1 + \frac{K \times i \times d}{I \times L} = \frac{36.90}{0.300} \times \frac{0.0619}{79.858} \times \frac{11.402}{} + 1 = 2.0866$$

GW Ingestion

$$S\text{-}23 = \frac{TR \times BW_a \times At_c \times 365}{SF_o \times IR_w \times EF \times ED} = \frac{1.0E\text{-}06}{0.000} \times \frac{15}{2.000} \times \frac{0}{350} \times \frac{365}{30} = \frac{0.0E+00}{0} = \#DIV/0!\ mg/L$$

Total Soil Porosity

$$S\text{-}24 = \eta = 1 - \frac{\rho_b}{\rho_s} = 1 - \frac{1.64}{2.857} = 0.3828$$

Estimation of Mixing Zone Depth

$$S\text{-}25 = d = (0.0112 \times L^2)^{0.5} + d_a\left[1 - \exp\frac{(-L \times I)}{(K \times i \times d_a)}\right]$$

$$= (0.0112 \times 79.858^2)^{0.5} + 3.048 \times \left[1 - \exp\left\{\frac{-79.858}{36.897} \times \frac{0.3}{0.0619} \times \frac{}{3.048}\right\}\right] = 11.402\ m$$

Soil Saturation Limit

$$S\text{-}29 = C_{sat} = \frac{S}{\rho_b} \times [(K_d \times \rho b) + \Theta w + (H' \times \theta a)] = \frac{170}{1.64} \times [(3.456 \times 1.64) + 0.246 + (0.324 \times 0.137)] = 617.62\ mg/kg$$

Soil Gas Outdoor Inhalation

$$S\text{-}30 = ROs\ g = \frac{ROsoil \times H \times \rho b \times 1000}{H' \times \Theta a + \Theta w + Kd \times \rho b} = \frac{617.621}{0.324} \times \frac{0.324}{0.137} \times \frac{1.640}{0.246} \times \frac{1000}{3.456} \times \frac{}{1.640} = 55,080\ mg/m^3$$

ε (Ethylbenzene)

Tier 2 Residential Calculations for Total Xylenes

Marine Bank Trust 63-0051
20030135

SSL	SSL & RBCA
RBCA	IRIS/HEAST

Date Compiled: 10/05/23

Input Values

Holcomb's Bulk Density -->	0	Converted Value to be used in calculation sheet -->		–	USDA Soil Classification:	Silt Loam	
Organic Matter (%) -->	0	FOC % (0.58 conversion) -->	0.000	- Organic Matter (mg/kg)	0	FOC mg/kg (0.58 conversion)	0.000
						foc conversion to g/g:	0.000

Value	Parameter			Notes
1.540	ρ_b - Dry Soil Bulk Density			1.5 or; Gravel = 2.0; Sand = 1.8; Silt = 1.9; Clay = 1.7; or Site Specific
2.657	ρs - Soil Particle Density			2.65 or; Site Specific
0.137	Θ_a - Air Filled Soil Porosity	0.137	Value from S-21	Top 1 meter = 0.28; below 1 meter = 0.13; Gravel = 0.05; Sand = 0.14; Silt = 0.24; Clay = 0.19; or Calculated Value (S21)
0.246	Θw - Water Filled Soil Porosity	0.246	Value from S-20	Top 1 meter = 0.15; below 1 meter = 0.30; Gravel = 0.20; Sand = 0.18; Silt = 0.16; Clay = 0.17; or Calculated Value (S20)
0.383	η - SSL: Total Soil Porosity	0.383	Value from S-24	0.43 or; Gravel - 0.25; Sand = 0.32; Silt = 0.40; Clay = 0.36; or Calculated Value (S24)
0.06155	i - Hydraulic Gradient			Site Specific
0.011	foc - Total Organic Carbon (g/g)			Surface Soil = 0.006; Subsurface Soil = 0.002; or Site Specific
20.000	DF - Dilution Factor	2.087	Value from S-22	If calculated value for DF is less than 20, then 20 default is used, else calculated value is used
11.402	d - Mixing Zone (m)	11.402	Value from S-25	2; or calculated value
3.048	d_s - Depth of source (m)		feet = 10	Depth of Source (Vertical thickness of contamination)
38.90	K - Hydraulic Conductivity (m/yr)	cm/sec =	1.17E-04	Site Specific — 1.01E+01 cm/d — 3.69E+03 cm/yr — Use cm/d for R15, R19, & R26; cm/yr for R24
79.858	L - Source Length Parallel to Groundwater Flow (m)		feet = 262	Site Specific (m)
3.048	d_a - Aquifer Thickness (m)		feet = 10	Site Specific (m)
0.3	I - Infiltration Rate (m/yr)			0.3 for Illinois
120	K_s - Saturated Hydraulic Conductivity			See Table K for Input Values
10.000	GW_{obj} - Groundwater Remediation Objective Class 1			10 — GW_{obj} - Groundwater Remediation Objective Class 2
0.074	1/(2b+3) - Exponent for S26			See Table K for Input Values
15	BW - Body Weight			Residential = 70 (carcinogenic); 15 (non-carcinogenic); Industrial/Commercial = 70; Construction Worker = 70; RBCA = 70
114	$IF_{soil-adj}$ - Age Adjusted Soil Ingestion Factor for Carcinogens			114
200	IR_{soil} - Soil Ingestion Rate			Residential = 200; Industrial/Commercial = 50; Construction Worker = 480
2	IR_w - Daily Water Ingestion Rate			Residential = 2; Industrial/Commercial = 1
110	S - Solubility in Water			Total Xylenes = 186
1.0E-06	TR - Target Cancer Risk			Residential = 10^{-6}; Industrial/Commercial = 10^{-6}; Construction Worker = 10^{-6} at point of human exposure
350	EF - Exposure Frequency			Residential = 350; Industrial/Commercial = 250; Construction Worker = 30
30	ED - Exposure Duration for Inhalation for Non-Carcinogens			Residential = 30; Industrial/Commercial = 25; Construction Worker = 1
68.81	Q/C - inverse of the mean concentration at the center of a square source			Residential = 68.81; Industrial/Commercial = 85.81; Construction Worker = 85.81; or Table H
9.50E+08	T - Exposure Interval			Residential = 9.5×10^8; Industrial/Commercial = 7.9×10^8; Construction Worker = 3.6×10^6
30	T_{M-L} - Exposure Interval for Mass Limit Volatilization Factor Equation S26			30
70	ED_{M-L} - Exposure Duration for Migration to Groundwater Mass-Limit Equation S28			70
0.18	I_{M-L} - Infiltration Rate for Migration to Groundwater Mass-Limit Equation S28			0.18
0.074	D_i - Diffusivity in Air			Total Xylenes = 0.072
0.271	H' - Henry's Law Constant			Total Xylenes = 0.25
9.23E-06	D_w - Diffusivity in Water			Total Xylenes = 9.34×10^{-6}
6	AT - Average Time for Non-Carcinogens in Ingestion Equation			Residential = 6; Industrial/Commercial = 25; Construction Worker = 0.115
30	AT - Average Time for Non-Carcinogens in Inhalation Equation			Residential = 30; Industrial/Commercial = 25; Construction Worker = 0.115
1	THQ - Target Hazard Quotient			1
0.1	RfC - Inhalation Reference Concentration			Chronic = 0.1; Subchronic = 0.4
0.2	RfD_o - Oral Reference Dose			Chronic = 0.2; Subchronic = 0.4
398.00	K_{oc} - Organic Carbon Partition Coefficient			Total Xylenes = 260

Residential Ingestion Remediation Objectives for Non-Carcinogenic Contaminants

$$S\text{-}1 = \frac{THQ \times BW \times AT \times 365}{10^{-6} \times (1/RfD_o) \times EF \times ED \times IR_{soil}} = \frac{1 \times 15 \times 6 \times 365}{0.000001 \times 1/0.2 \times 350 \times 6 \times 200} = \frac{32850}{2.1} = 15643 \text{ mg/kg}$$

Construction Worker Ingestion Remediation Objectives for Non-Carcinogenic Contaminants

$$S\text{-}1 = \frac{THQ \times BW \times AT \times 365}{10^{-6} \times (1/RfD_o) \times EF \times ED \times IR_{soil}} = \frac{1 \times 70 \times 0.115 \times 365}{0.000001 \times 1/0.4 \times 30 \times 1 \times 480} = \frac{2938.25}{0.036} = 81618 \text{ mg/kg}$$

Inhalation Non-Carcinogenic Residential, Ind/Commercial

$$S\text{-}4 = \frac{THQ \times AT \times 365}{EF \times ED \times (1/RfC \times 1/VF)} = \frac{1 \times 30 \times 365}{350 \times 30 \times 1/0.1 \times 1/23012.067} = \frac{10950}{4.5628235} = 2399.830 \text{ mg/kg}$$

Tier 2 Inhalation Objective cannot exceed Soil Saturation Limit

Inhalation Non-Carcinogenic Construction Worker

$$S\text{-}5 = \frac{THQ \times AT \times 365}{EF \times ED \times (1/RfC \times 1/VF)} = \frac{1 \times 0.115 \times 365}{30 \times 1 \times 1/0.4 \times 1/176.6572321} = \frac{41.975}{0.424551} = 98.869 \text{ mg/kg}$$

Tier 2 Residential Calculations for Total Xylenes

Marine Bank Trust 53-0051
20030135

RESIDENTIAL OR COMMERCIAL

S-8 = $VF = \frac{Q}{C} \times \frac{(3.14 \times D_A \times T)^{1/2} \times 10^{-4}}{(2 \times \rho_b \times D_A)}$ = 68.81 × $\frac{\left(\frac{3.14}{2} \times 2.48E\text{-}05 \times 9.50E+08\right)^{1/2} \times 0.0001}{\left(2 \times 1.64 \times 2.48E\text{-}05\right)}$ = $\frac{1.8712}{8.13E\text{-}05}$ = 23012.0670

Construction Worker

S-8 = $VF = \frac{Q}{C} \times \frac{(3.14 \times D_A \times T)^{1/2} \times 10^{-4}}{(2 \times \rho_b \times D_A)}$ = 85.81 × $\frac{\left(\frac{3.14}{2} \times 2.48E\text{-}05 \times 3.60E+06\right)^{1/2} \times 0.0001}{\left(2 \times 1.64 \times 2.48E\text{-}05\right)}$ = $\frac{0.1436}{8.13E\text{-}05}$ = 1766.5723

Equation for Derivation of Volatilization Factor - Construction Worker

S-9 = $VF' = \frac{VF}{10}$ = $\frac{1766.5723}{10}$ = 176.6572

Equation for Derivation of Apparent Diffusivity

S-10 = $D_A = \frac{(\theta_a^{3.33} \times D_i \times H') + (\theta_w^{3.33} \times D_w)}{\eta^2} \times \frac{1}{(\rho_b \times K_d) + \theta_w + (\theta_a \times H')}$

$= \frac{\left(1.33E\text{-}03 \times 0.074 \times 0.271\right) + \left(0.0094 \times 9.23E\text{-}06\right)}{0.1467} \times \frac{1}{\left(1.64 \times 4.2984\right) + 0.25 + \left(0.137 \times 0.271\right)}$ = 2.48E-05

Soil Component of the Migration to Groundwater Cleanup Objective (Class 1)

S-17 = $C_w \times \left[K_d + \frac{(\theta_w + \theta_a \times H')}{\rho b}\right]$ = 200 × $\left[4.2984 + \frac{0.246 + 0.137 \times 0.271}{1.64}\right]$ = **894.208** mg/kg

Tier 2 Soil Component of GW Ingestion Objective cannot exceed Soil Saturation Limit

Target Soil Leachate Concentration (Class 1)

S-18 = C_w = $DF \times GW_{obj}$ = 20.00 × 10.000 = 200

Soil-Water Partition Coefficient

S-19 = K_d = $K_{oc} \times f_{oc}$ = 398.00 × 0.011 = 4.2984

Water-Filled Porosity

S-20 = $\Theta_w = \eta \times \left(\frac{1}{K_a}\right)^{1/(2b+3)}$ = 0.38 × $\left[\frac{0.300}{120.000}\right]^{0.074}$ = 0.2458

Air-Filled Porosity

S-21 = Θ_a = $\eta - \Theta_w$ = 0.38 - 0.25 = 0.1370

Tier 2 Residential Calculations for Total Xylenes

Marine Bank Trust 53-0051
20030135

Dilution Factor

$$S\text{-}22 = DF = 1 + \frac{K \times i \times d}{I \times L} = \frac{36.90}{0.300} \times \frac{0.0819}{79.858} \times 11.402 + 1 = 2.0866$$

GW Ingestion

$$S\text{-}23 = \frac{TR \times BW \times At_c \times 365}{SF_o \times IR_w \times EF \times ED} = \frac{1.0E\text{-}06}{0.000} \times \frac{15}{2.000} \times \frac{0}{350} \times \frac{365}{30} = \frac{0.0E+00}{0} = \text{\#DIV/0!} \ mg/L$$

Total Soil Porosity

$$S\text{-}24 = \eta = 1 - \frac{\rho_b}{\rho_s} = 1 - \frac{1.64}{2.657} = 0.3828$$

Estimation of Mixing Zone Depth

$$S\text{-}25 = d = (0.0112 \times L^2)^{0.5} + d_a \left[1 - \exp \frac{(-L \times I)}{(K \times i \times d_a)} \right]$$

$$= (0.0112 \times 79.858 \ ^2)^{0.5} + 3.048 \times \left[1 - \exp \left(\frac{-79.858}{36.897} \times \frac{0.3}{0.0819} \times 3.048 \right) \right] = 11.402 \ m$$

Soil Saturation Limit

$$S\text{-}29 = C_{sat} = \frac{S}{\rho_b} \times [(K_d \times \rho b) + \Theta w + (H' \times \theta a)] = \frac{110}{1.64} \times [(4.2984 \times 1.64) + 0.246 + (0.271 \times 0.137)] = 491.81 \ mg/kg$$

Soil Gas Outdoor Inhalation

$$S\text{-}30 = ROs\ g = \frac{ROsoil \ X \ H \ X \ \rho b \ X \ 1000}{H' \ X \ \Theta a + \Theta w + Kd \ X \ \rho b} = \frac{98.889}{0.271} \times \frac{0.271}{0.137} \times \frac{1.640}{0.246} \times \frac{1000}{4.298} \ X \ \frac{}{1.640} = 5,993 \ mg/m^3$$

Tier 2 Residential Calculations for Naphthalene

Marine Bank Trust 53-0051
20030135

SSL	SSL & RBCA
RBCA	IRIS/HEAST

Date Compiled: 10/05/23

Input Values

Holcomb's Bulk Density -->	0	Converted Value to be used in calculation sheet -->			—	USDA Soil Classification:	Silt Loam		
Organic Matter (%) -->	0	FOC % (0.58 conversion) -->	0.000	Organic Matter (mg/kg)	0	FOC mg/kg (0.58 conversion)	0.000	foc conversion to g/g:	0.000

1.640	ρ_b - Dry Soil Bulk Density			1.5 or; Gravel = 2.0; Sand = 1.8; Silt = 1.6; Clay = 1.7; or Site Specific
2.657	ps - Soil Particle Density			2.65 or; Site Specific
0.137	Θ_a - Air Filled Soil Porosity	*0.137*	Value from S-21	Top 1 meter = 0.28; below 1 meter = 0.13; Gravel = 0.05; Sand = 0.14; Silt =0.24; Clay = 0.19; or Calculated Value (S21)
0.246	Θw - Water Filled Soil Porosity	*0.246*	Value from S-20	Top 1 meter = 0.15; below 1 meter = 0.30; Gravel = 0.20; Sand = 0.18; Silt =0.16; Clay = 0.17; or Calculated Value (S20)
0.383	n - SSL: Total Soil Porosity	*0.383*	Value from S-24	0.43 or; Gravel - 0.25; Sand = 0.32; Silt = 0.40; Clay = 0.36; or Calculated Value (S24)
0.06188	i - Hydraulic Gradient			Site Specific
0.011	foc - Total Organic Carbon (g/g)			Surface Soil = 0.006; Subsurface Soil = 0.002; or Site Specific
20.000	DF - Dilution Factor	*2.087*	Value from S-22	If calculated value for DF is less than 20, then 20 default is used, else calculated value is used
11.402	d - Mixing Zone (m)	11.402	Value from S-25	2; or calculated value
3.048	d_a - Depth of source (m)	feet = 10		Depth of Source (Vertical thickness of contamination)
36.90	K - Hydraulic Conductivity (m/yr)	cm/sec =	1.17E-04	Site Specific
79.858	L - Source Length Parallel to Groundwater Flow (m)	feet = 262		Site Specific (m)
3.048	d_s - Aquifer Thickness (m)	feet = 10		Site Specific (m)
0.3	I - Infiltration Rate (m/yr)			0.3 for Illinois
120	K_s - Saturated Hydraulic Conductivity			See Table K for Input Values
0.140	GW_{objl} - Groundwater Remediation Objective Class 1			0.22 GW_{obj} - Groundwater Remediation Objective Class 2
0.074	1/(2b+3) - Exponent for S20			See Table K for Input Values
15	BW - Body Weight			Residential = 70 (carcinogenic); 15 (non-carcinogenic); Industrial/Commercial = 70; Construction Worker = 70; RBCA = 70
114	$IF_{soil-adj}$ -Age Adjusted Soil Ingestion Factor for Carcinogens			114
200	IR_{soil} -Soil Ingestion Rate			Residential = 200; Industrial/Commercial = 50; Construction Worker = 480
2	IR_w -Daily Water Ingestion Rate			Residential = 2; Industrial/Commercial = 1
31	S - Solubility in Water			Napthalene = 31
1.0E-06	TR - Target Cancer Risk			Residential = 10^{-6}; Industrial/Commercial = 10^{-5}; Construction Worker = 10^{-5} at point of human exposure
350	EF - Exposure Frequency			Residential = 350; Industrial/Commercial = 250; Construction Worker = 30
30	ED - Exposure Duration for Inhalation for Non-Carcinogens			Residential = 30; Industrial/Commercial = 25; Construction Worker = 1
68.81	Q/C - Inverse of the mean concentration at the center of a square source			Residential = 68.81; Industrial/Commercial = 85.81; Construction Worker = 85.81; or Table H
9.50E+08	T - Exposure Interval			Residential = 9.5 x 10^8; Industrial/Commercial = 7.9 x 10^8; Construction Worker = 3.6 x 10^8
30	T_{M-L} - Exposure Interval for Mass Limit Volatilization Factor Equation S26			30
70	ED_{M-L} - Exposure Duration for Migration to Groundwater Mass-Limit Equation S28			70
0.18	I_{M-L} - Infiltration Rate for Migration to Groundwater Mass-Limit Equation S28			0.18
0.059	D_i - Diffusivity in Air			Naphthalene = 0.059
0.0198	H' - Henry's Law Constant			Naphthalene = 0.0198
7.50E-06	D_w - Diffusivity in Water			Naphthalene = 7.5 x 10^{-6}
6	AT - Average Time for Non-Carcinogens In Ingestion Equation			Residential = 6; Industrial/Commercial = 25; Construction Worker = 0.115
30	AT - Average Time for Non-Carcinogens In Inhalation Equation			Residential = 30; Industrial/Commercial = 25; Construction Worker = 0.115
1	THQ - Target Hazard Quotient			1
0.003	RfC - Inhalation Reference Concentration			Chronic = 0.003; Subchronic = 0.003
0.020	RfD_o - Oral Reference Dose			Chronic = 0.02; Subchronic = 0.6
500.00	K_{oc} - Organic Carbon Partition Coefficient			Naphthalene = 2,000

Residential Ingestion Remediation Objectives for Non-Carcinogenic Contaminants

$$S\text{-}1 = \frac{THQ \times BW \times AT \times 365}{10^{-6} \times (1/RfD_o) \times EF \times ED \times IR_{soil}} = \frac{1}{0.000001} \times \frac{15}{1/0.02} \times \frac{6}{350} \times \frac{365}{6} \times \frac{}{200} = \frac{32850}{21} = 1564 \text{ mg/kg}$$

Tier 2 Residential Calculations for Naphthalene

Marine Bank Trust 53-0051
20030135

Construction Worker Ingestion Remediation Objectives for Non-Carcinogenic Contaminants

$$S\text{-}1 = \frac{THQ \times BW \times AT \times 365}{10^{-6} \times (1/RfD_o) \times EF \times ED \times IR_{soil}} = \frac{1 \times 70 \times 0.115 \times 365}{0.000001 \times 1/0.6 \times 30 \times 1 \times 480} = \frac{2938.25}{0.024} = 122427 \text{ mg/kg}$$

Residential Tier II Inhalation

$$S\text{-}4 = \frac{THQ \times AT \times 365}{EF \times ED \times (1/RfC \times 1/VF)} = \frac{1 \times 30 \times 365}{350 \times 30 \times 1/0.003 \times 1/103743.5445} = \frac{10950}{33.73704} = 324.569 \text{ mg/kg}$$

Inhalation Non-Carcinogenic Construction Worker

$$S\text{-}5 = \frac{THQ \times AT \times 365}{EF \times ED \times (1/RfC \times 1/VF')} = \frac{1 \times 0.115 \times 365}{30 \times 1 \times 1/0.003 \times 1/796.4103105} = \frac{41.975}{12.55634} = 3.343 \text{ mg/kg}$$

RESIDENTIAL OR COMMERCIAL

$$S\text{-}8 = VF = \frac{Q}{C} \times \frac{(3.14 \times D_A \times T)^{1/2} \times 10^{-4}}{(2 \times \rho_b \times D_A)} = 68.81 \times \frac{\left(\frac{3.14 \times 1.22E\text{-}06 \times 9.50E+08}{2 \times 1.64 \times 1.22E\text{-}06}\right)^{1/2} \times 0.0001}{4.00E\text{-}06} = 103743.5445$$

Construction Worker

$$S\text{-}8 = VF = \frac{Q}{C} \times \frac{(3.14 \times D_A \times T)^{1/2} \times 10^{-4}}{(2 \times \rho_b \times D_A)} = 85.81 \times \frac{\left(\frac{3.14 \times 1.22E\text{-}06 \times 3.60E+06}{2 \times 1.64 \times 1.22E\text{-}06}\right)^{1/2} \times 0.0001}{4.00E\text{-}06} = 7964.1031$$

Equation for Derivation of Volatilization Factor - Construction Worker

$$S\text{-}9 = VF' = \frac{VF}{10} = \frac{7964.1031}{10} = 796.4103$$

Equation for Derivation of Apparent Diffusivity

$$S\text{-}10 = D_A = \frac{(\theta_a^{3.33} \times D_i \times H') + (\theta_w^{3.33} \times D_w)}{\eta^2} \times \frac{1}{(\rho_b \times K_d) + \theta_w + (\theta_a \times H')}$$

$$= \frac{(1.33E\text{-}03 \times 0.059 \times 0.020) + (0.0094 \times 7.50E\text{-}06)}{0.1467} \times \frac{1}{(1.64 \times 5.4) + 0.25 + (0.137 \times 0.020)} = 1.22E\text{-}06$$

Soil Component of the Migration to Groundwater Cleanup Objective (Class 1)

$$S\text{-}17 = C_w \times \left[K_d + \frac{(\theta_w + \theta_a \times H')}{\rho b}\right] = 2.8 \times \left[5.4 + \frac{(0.246 + 0.137 \times 0.020)}{1.64}\right] = 15.545 \text{ mg/kg}$$

Tier 2 Residential Calculations for Naphthalene

Marine Bank Trust 53-0051
20030135

Target Soil Leachate Concentration (Class 1)

S-18 = C_w = $DF \times GW_{obj}$ = 20.00 x 0.140 = 2.8

Soil-Water Partition Coefficient

S-19 = K_d = $K_{oc} \times f_{oc}$ = 500.00 x 0.011 = 5.4

Water-Filled Porosity

S-20 = Θ_w = $\eta \times \left(\frac{1}{K_s}\right)^{1/(2b+3)}$ = 0.38 x $\left[\frac{0.300}{120.000}\right]^{0.074}$ = 0.2458

Air-Filled Porosity

S-21 = Θ_a = $\eta - \Theta_w$ = 0.38 - 0.25 = 0.1370

Dilution Factor

S-22 = DF = $1 + \frac{K \times i \times d}{I \times L}$ = $\frac{36.90}{0.300} \times \frac{0.0619}{79.858} \times 11.402 + 1$ = 2.0866

GW Ingestion

S-23 = $\frac{TR \times BW \times At_a \times 365}{SF_o \times IR_w \times EF \times ED}$ = $\frac{1.0E\text{-}06}{0.000} \times \frac{15}{2.000} \times \frac{0}{350} \times \frac{365}{30}$ = $\frac{0.0E+00}{0}$ = #DIV/0! mg/L

Total Soil Porosity

S-24 = $\eta = 1 - \frac{\rho_b}{\rho_s}$ = 1 - $\frac{1.64}{2.657}$ = 0.3828

Estimation of Mixing Zone Depth

S-25 = d = $(0.0112 \times L^2)^{0.5} + d_a \left[1 - \exp \frac{(-L \times I)}{(K \times i \times d_a)}\right]$

= (0.0112 x 79.858 ^{2})$^{0.5}$ + 3.048 x [1 - exp ((-79.858 x 0.3) / (36.897 x 0.0619 x 3.048))] = 11.402 m

Soil Saturation Limit

S-29 = $C_{sat} = \frac{S}{\rho_b} \times [(K_d \times \rho b) + \Theta w + (H' \times \theta a)]$ = $\frac{31}{1.64}$ x [(5.4 x 1.64) + 0.246 + (0.020 x 0.137)] = **172.10 mg/kg**

Tier 2 Residential Calculations for Naphthalene

Marine Bank Trust 53-0051
20030135

Soil Gas Outdoor Inhalation

$$S\text{-}30 = ROs\ g = \frac{ROsoil \times H \times \rho b \times 1000}{H' \times \Theta a + \Theta w + Kd \times \rho b} = \frac{3.343}{0.020} \times \frac{0.020}{0.137} \times \frac{1.640}{0.246} \times \frac{1000}{5.400} \times \frac{}{1.640} = 12\ mg/m^3$$

Tier 2 Residential Calculations for Benzo[a]pyrene

Marine Bank Trust 53-0051
20030135

SSL	SSL & RBCA
RBCA	IRIS/HEAST

Date Compiled: 10/05/23

Input Values

Holcomb's Bulk Density -->	0	Converted Value to be used in calculation sheet -->	--	USDA Soil Classification: Silt Loam
Organic Matter (%) -->	0	FOC % (0.58 conversion) --> 0.000	Organic Matter (mg/kg) 0	FOC mg/kg (0.58 conversion) 0.000 foc conversion to g/g: 0.000

1.64	ρ_b - Dry Soil Bulk Density				1.5 or; Gravel = 2.0; Sand = 1.8; Silt = 1.6; Clay = 1.7; or Site Specific
2.657	ρs - Soil Particle Density				2.65 or; Site Specific
0.137	Θ_a - Air Filled Soil Porosity	*0.137*	Value from S-21		Top 1 meter = 0.28; below 1 meter = 0.13; Gravel = 0.05; Sand = 0.14; Silt =0.24; Clay = 0.19; or Calculated Value (S21)
0.246	Θw - Water Filled Soil Porosity	*0.246*	Value from S-20		Top 1 meter = 0.15; below 1 meter = 0.30; Gravel = 0.20; Sand = 0.18; Silt =0.16; Clay = 0.17; or Calculated Value (S20)
0.383	η - SSL: Total Soil Porosity	*0.383*	Value from S-24		0.43 or; Gravel - 0.25; Sand = 0.32; Silt = 0.40; Clay = 0.36; or Calculated Value (S24)
0.06188	i - Hydraulic Gradient				Site Specific
0.011	foc - Total Organic Carbon (g/g)				Surface Soil = 0.006; Subsurface Soil = 0.002; or Site Specific
20.000	DF - Dilution Factor	*2.087*	Value from S-22		If calculated value for DF is less than 20, then 20 default is used, else calculated value is used
11.402	d - Mixing Zone (m)	**11.402**	Value from S-25		2; or calculated value
36.90	K - Hydraulic Conductivity (m/yr)	cm/sec =	1.17E-04		Site Specific 1.01E+01 cm/d 3.69E+03 cm/yr Use cm/d for R15, R19, & R26, cm/yr for R24
79.858	L - Source Length Parallel to Groundwater Flow (m)		feet = 262		Site Specific (m)
3.048	d_a - Aquifer Thickness (m)		feet = 10		Site Specific (m)
0.3	I - Infiltration Rate (m/yr)				0.3 for Illinois
120	K_s - Saturated Hydraulic Conductivity				See Table K for input Values
0.005	GW_{obj} - Groundwater Remediation Objective Class 1				0.025 GW_{obj} - Groundwater Remediation Objective Class 2
0.074	1/(2b+3) - Exponent for S20				See Table K for input Values
70	BW - Body Weight				Residential = 70 (carcinogenic); 15 (non-carcinogenic); Industrial/Commercial = 70; Construction Worker = 70; RBCA = 70
114	$IF_{soil-adj}$ -Age Adjusted Soil Ingestion Factor for Carcinogens				114
200	IR_{soil} -Soil Ingestion Rate				Residential = 200; Industrial/Commercial = 50; Construction Worker = 480
1	SF_o -Oral Slop Factor				
2	IR_w -Daily Water Ingestion Rate				Residential = 2; Industrial/Commercial = 1
0.00162	S - Solubility in Water				Benzo[a]pyrene = 0.00162
1.0E-06	TR - Target Cancer Risk				Residential = 10^{-6}; Industrial/Commercial = 10^{-6}; Construction Worker = 10^{-6} at point of human exposure
70	AT_c -Average Time for Carcinogens				70
6.00E-04	URF - Inhalation Unit Risk Factor				
350	EF - Exposure Frequency				Residential = 350; Industrial/Commercial = 250; Construction Worker = 30
30	ED - Exposure Duration for Inhalation fo Carcinogens				Residential = 30; Industrial/Commercial = 25; Construction Worker = 1
68.81	Q/C - Inverse of the mean concentration at the center of a square source				Residential = 68.81; Industrial/Commercial = 85.81; Construction Worker = 85.81
9.50E+08	T - Exposure Interval				Residential = 9.5×10^8; Industrial/Commercial = 7.9×10^8; Construction Worker = 3.6×10^6
0.043	D_i - Diffusivity in Air				Benzo[a]pyrene = 0.043
4.63E-05	H' - Henry's Law Constant				Benzo[a]pyrene = 4.63×10^{-5}
9.00E-06	D_w - Diffusivity in Water				Benzo[a]pyrene = 9.00×10^{-6}
1020000	K_{oc} - Organic Carbon Partition Coefficient				Benzo[a]pyrene = 1,020,000

Residential Ingestion Tier II Objective

$$S\text{-}2 = \frac{TR \times AT_c \times 365}{SF_o \times 10^{-6} \times EF \times IF_{soil\text{-}adj}} = \frac{1.0E\text{-}06}{1.000} \times \frac{70}{1.00E\text{-}06} \times \frac{365}{350} \times 114 = \frac{2.6E\text{-}02}{3.99E\text{-}02} = \mathbf{0.640}\ \text{mg/kg}$$

Construction Worker Ingestion Tier II Objective

$$S\text{-}3 = \frac{TR \times BW \times AT_c \times 365}{SF_o \times 10^{-6} \times EF \times IRsoil} = \frac{1.0E\text{-}06}{1.000} \times \frac{70}{1.00E\text{-}06} \times \frac{70}{30} \times \frac{365}{480} = \frac{1.8E+00}{1.44E\text{-}02} = \mathbf{124.20}\ \text{mg/kg}$$

Tier 2 Residential Calculations for Benzo[a]pyrene

Marine Bank Trust 53-0051
20030135

Residential Inhalation Tier II Objective

$$S\text{-}6 = \frac{TR \times ATc \times 365}{URF \times 1000 \times EF \times ED \times 1/VF} = \frac{1.0E\text{-}06 \times 70 \times 365}{6.00E\text{-}04 \times 1000 \times 350 \times 30 \times (1/\ 2.00E+07)} = \frac{0.02555}{3.15E\text{-}04} = 8.11E+01 \text{ mg/kg}$$

Construction Worker Inhalation Tier II Objective

$$S\text{-}7 = \frac{TR \times ATc \times 365}{URF \times 1000 \times EF \times ED \times 1/VF'} = \frac{1.0E\text{-}06 \times 70 \times 365}{6.00E\text{-}04 \times 1000 \times 30 \times 1 \times (1/\ 1.54E+05)} = \frac{0.02555}{1.17E\text{-}04} = 2.18E+02 \text{ mg/kg}$$

RESIDENTIAL OR COMMERCIAL

$$S\text{-}8 = VF = \frac{Q}{C} \times \frac{(3.14 \times D_A \times T)^{1/2} \times 10^{-4}}{(2 \times \rho_b \times D_A)} = 68.81 \times \frac{(3.14 \times 3.28E\text{-}11 \times 9.50E+08)^{1/2} \times 0.0001}{(2 \times 1.64 \times 3.28E\text{-}11)} = \frac{0.0022}{1.08E\text{-}10} = 19997592.5668$$

Construction Worker

$$S\text{-}8 = VF = \frac{Q}{C} \times \frac{(3.14 \times D_A \times T)^{1/2} \times 10^{-4}}{(2 \times \rho_b \times D_A)} = 85.81 \times \frac{(3.14 \times 3.28E\text{-}11 \times 3.60E+06)^{1/2} \times 0.0001}{(2 \times 1.64 \times 3.28E\text{-}11)} = \frac{0.0002}{1.08E\text{-}10} = 1.54E+06$$

Equation for Derivation of Volatilization Factor - Construction Worker

$$S\text{-}9 = VF' = \frac{VF}{10} = \frac{1535159.5113}{10} = 153515.9511$$

Equation for Derivation of Apparent Diffusivity

$$S\text{-}10 = D_A = \frac{(\theta_a^{3.33} \times D_i \times H') + (\theta_w^{3.33} \times D_w)}{\eta^2} \times \frac{1}{(\rho_b \times K_d) + \theta_w + (\theta_a \times H')}$$

$$= \frac{(1.33E\text{-}03 \times 0.043 \times 4.63E\text{-}05) + (0.0094 \times 9.00E\text{-}06)}{0.1467} \times \frac{1}{(1.64 \times 11016) + 0.25 + (0.137 \times 4.630E\text{-}05)} = 3.28E\text{-}11$$

Tier 2 Residential Calculations for Benzo[a]pyrene

Marine Bank Trust 53-0051
20030135

Soil Component of the Migration to Groundwater Cleanup Objective (Class 1)

S-17 = $C_w \times \left[K_d + \frac{(\theta_w + \theta_a \times H')}{\rho b} \right]$ = 0.1 × [11016 + (0.246 + 0.137 × 4.63E-05) / 1.64] = **1101.615** mg/kg

Target Soil Leachate Concentration (Class 1)

S-18 = $C_w =$ $DF \times GW_{obj}$ = 20.00 × 0.005 = 0.1

Soil-Water Partition Coefficient

S-19 = $K_d =$ $K_{oc} \times f_{oc}$ = 1.02E+06 × 0.011 = 11016

Water-Filled Porosity

S-20 = $\theta_w = \eta \times \left(\frac{I}{K_s} \right)^{1/(2b+3)}$ = 0.38 × [0.300 / 120.000]^0.074 = 0.2458

Air-Filled Porosity

S-21 = $\theta_a = \eta - \theta_w$ = 0.38 - 0.25 = 0.1370

Dilution Factor

S-22 = $DF = 1 + \frac{K \times i \times d}{I \times L}$ = 36.90 / 0.300 × 0.0619 × 11.402 / 79.858 + 1 = 2.0866

GW Ingestion

S-23 = $\frac{TR \times BW \times At_s \times 365}{SF_o \times IR_w \times EF \times ED}$ = 1.0E-06 / 1.000 × 70 / 2.000 × 70 / 350 × 365 / 30 = 1.8E+00 / 21000 = 0.0001 mg/L

Total Soil Porosity

S-24 = $\eta = 1 - \frac{\rho_b}{\rho_s}$ = 1 - 1.64 / 2.657 = 0.3828

Tier 2 Residential Calculations for Benzo[a]pyrene

Marine Bank Trust 53-0051

20030135

Estimation of Mixing Zone Depth

S-25 = $d = (0.0112 \times L^2)^{0.5} + d_a \left[1 - \exp \frac{(-L \times I)}{(K \times i \times d_a)} \right]$

$= (0.0112 \times 79.858 \,^{2})^{0.5} + 3.048 \times \left[1 - \exp \left\{ \frac{-79.858 \times 0.3}{36.897 \times 0.0619 \times 3.048} \right\} \right] = 11.402$ m

Soil Saturation Limit

S-29 = $C_{sat} = \frac{S}{\rho_b} \times [(K_d \times \rho b) + \Theta w + (H' \times \theta a)] = \frac{1.62E\text{-}03}{1.64} \times [(11016 \times 1.64) + 0.246 + (4.63E\text{-}05 \times 0.137)] =$ **17.85** **mg/kg**

Soil Gas Outdoor Inhalation

S-30 = $ROs\ g = \frac{ROsoil \times H \times \rho b \times 1000}{H' \times \Theta a + \Theta w + Kd \times \rho b} = \frac{17.846 \times 4.630E\text{-}05 \times 1.640 \times 1000}{4.630E\text{-}05 \times 0.137 + 0.246 + 11016.000 \times 1.640} =$ **0.000075** **mg/m^3**

Tier 2 Residential Calculations for Benz[a]anthracene

Marine Bank Trust 53-0051
20030135

SSL / RBCA — SSL & RBCA / IRIS/HEAST

Date Compiled: 10/05/23

Input Values

Holcomb's Bulk Density -->	0	Converted Value to be used in calculation sheet -->				USDA Soil Classification:	Silt Loam		
Organic Matter (%) -->	0	FOC % (0.58 conversion) -->	0.000	Organic Matter (mg/kg)	0	FOC mg/kg (0.58 conversion)	0.000	foc conversion to g/g:	0.000
1.64	ρ_b - Dry Soil Bulk Density			1.5 or; Gravel = 2.0; Sand = 1.8; Silt = 1.6; Clay = 1.7; or Site Specific					
2.557	ρ_s - Soil Particle Density			2.65 or; Site Specific					
0.137	Θ_a - Air Filled Soil Porosity	0.137	Value from S-21	Top 1 meter = 0.28; below 1 meter = 0.13; Gravel = 0.05; Sand = 0.14; Silt = 0.24; Clay = 0.19; or Calculated Value (S21)					
0.246	Θ_w - Water Filled Soil Porosity	0.246	Value from S-20	Top 1 meter = 0.15; below 1 meter = 0.30; Gravel = 0.20; Sand = 0.18; Silt = 0.16; Clay = 0.17; or Calculated Value (S20)					
0.383	n - SSL: Total Soil Porosity	0.383	Value from S-24	0.43 or; Gravel - 0.25; Sand = 0.32; Silt = 0.40; Clay = 0.36; or Calculated Value (S24)					
0.06188	i - Hydraulic Gradient			Site Specific					
0.011	foc - Total Organic Carbon (g/g)			Surface Soil = 0.006; Subsurface Soil = 0.002; or Site Specific					
20.000	DF - Dilution Factor	2.087	Value from S-22	If calculated value for DF is less than 20, then 20 default is used, else calculated value is used					
11.402	d - Mixing Zone (m)	11.402	Value from S-25	2; or calculated value					
36.90	K - Hydraulic Conductivity (m/yr)	cm/sec =	1.17E-04	Site Specific	1.01E+01	cm/d	3.69E+03 = cm/yr	Use cm/d for R15, R19, & R26, cm/yr for R24	
79.858	L - Source Length Parallel to Groundwater Flow (m)		feet = 262	Site Specific (m)					
3.048	d_a - Aquifer Thickness (m)		feet = 10	Site Specific (m)					
0.3	I - Infiltration Rate (m/yr)			0.3 for Illinois					
120	K_s - Saturated Hydraulic Conductivity			See Table K for Input Values					
0.005	GW_{obj} - Groundwater Remediation Objective Class 1			0.025 GW_{obj} - Groundwater Remediation Objective Class 2					
0.074	1/(2b+3) - Exponent for S20			See Table K for Input Values					
70	BW - Body Weight			Residential = 70 (carcinogenic); 15 (non-carcinogenic); Industrial/Commercial = 70; Construction Worker = 70; RBCA = 70					
114	$IF_{soil-adj}$ -Age Adjusted Soil Ingestion Factor for Carcinogens			114					
200	IR_{soil} -Soil Ingestion Rate			Residential = 200; Industrial/Commercial = 50; Construction Worker = 480					
0.1[illegible]	SF_o -Oral Slop Factor								
2	IR_w -Daily Water Ingestion Rate			Residential = 2; Industrial/Commercial = 1					
0.0094	S - Solubility in Water			Benz[a]anthracene = 0.0094					
1.0E-06	TR - Target Cancer Risk			Residential = 10^{-6}; Industrial/Commercial = 10^{-6}; Construction Worker = 10^{-6} at point of human exposure					
70	AT_c -Average Time for Carcinogens			70					
6.00E-05	URF - Inhalation Unit Risk Factor								
350	EF - Exposure Frequency			Residential = 350; Industrial/Commercial = 250; Construction Worker = 30					
30	ED - Exposure Duration for Inhalation fo Carcinogens			Residential = 30; Industrial/Commercial = 25; Construction Worker = 1					
68.81	Q/C - Inverse of the mean concentration at the center of a square source			Residential = 68.81; Industrial/Commercial = 85.81; Construction Worker = 85.81					
9.50E+08	T - Exposure Interval			Residential = 9.5×10^8; Industrial/Commercial = 7.9×10^8; Construction Worker = 3.6×10^8					
0.051	D_i - Diffusivity in Air			Benz[a]anthracene = 0.051					
1.37E-04	H' - Henry's Law Constant			Benz[a]anthracene = 1.37×10^{-4}					
9.00E-06	D_w - Diffusivity in Water			Benz[a]anthracene = 9.00×10^{-6}					
398000	K_{oc} - Organic Carbon Partition Coefficient			Benz[a]anthracene = 398,000					

Residential Ingestion Tier II Objective

$$S\text{-}2 = \frac{TR \times AT_c \times 365}{Sf_o \times 10^{-6} \times EF \times IF_{soil\text{-}adj}} = \frac{1.0E\text{-}06 \times 70 \times 365}{0.100 \times 1.00E\text{-}05 \times 350 \times 114} = \frac{2.6E\text{-}02}{3.99E\text{-}03} = 6.404 \text{ mg/kg}$$

Construction Worker Ingestion Tier II Objective

$$S\text{-}3 = \frac{TR \times BW \times AT_c \times 365}{Sf_o \times 10^{-6} \times EF \times IRsoil} = \frac{1.0E\text{-}06 \times 70 \times 70 \times 365}{0.100 \times 1.00E\text{-}06 \times 30 \times 480} = \frac{1.8E+00}{1.44E\text{-}03} = 1242.01 \text{ mg/kg}$$

Residential Inhalation Tier II Objective

$$S\text{-}6 = \frac{TR \times ATc \times 365}{URF \times 1000 \times EF \times ED \times 1/VF} = \frac{1.0E\text{-}06 \times 70 \times 365}{6.00E\text{-}05 \times 1000 \times 350 \times 30 \times (1/\ 1.20E+07\ )} = \frac{0.02555}{5.23E\text{-}05} = 4.88E+02 \text{ mg/kg}$$

Construction Worker Inhalation Tier II Objective

$$S\text{-}7 = \frac{TR \times ATc \times 365}{URF \times 1000 \times EF \times ED \times 1/VF} = \frac{1.0E\text{-}06 \times 70 \times 365}{6.00E\text{-}05 \times 1000 \times 30 \times 1 \times (1/\ 9.24E+04\ )} = \frac{0.02555}{1.95E\text{-}05} = 1.31E+03 \text{ mg/kg}$$

Tier 2 Residential Calculations for Benz[a]anthracene

Marine Bank Trust 53-0051
20030135

RESIDENTIAL OR COMMERCIAL

S-8 = $VF = \frac{Q}{C} \times \frac{(3.14 \times D_A \times T)^{1/2} \times 10^{-4}}{(2 \times \rho_b \times D_A)}$ = 68.81 $\times \frac{(3.14 \times 9.06E\text{-}11 \times 9.50E+08)^{1/2} \times 0.0001}{(2 \times 1.64 \times 9.06E\text{-}11)}$ = $\frac{0.0036}{2.97E\text{-}10}$ = 12039016.2519

Construction Worker

S-8 = $VF = \frac{Q}{C} \times \frac{(3.14 \times D_A \times T)^{1/2} \times 10^{-4}}{(2 \times \rho_b \times D_A)}$ = 85.81 $\times \frac{(3.14 \times 9.06E\text{-}11 \times 3.80E+06)^{1/2} \times 0.0001}{(2 \times 1.64 \times 9.06E\text{-}11)}$ = $\frac{0.0003}{2.97E\text{-}10}$ = 9.24E+05

Equation for Derivation of Volatilization Factor - Construction Worker

S-9 = $VF' = \frac{VF}{10}$ = $\frac{924201.7629}{10}$ = 92420.1763

Equation for Derivation of Apparent Diffusivity

S-10 = $D_A = \frac{(\theta_a^{3.33} \times D_i \times H') + (\theta_w^{3.33} \times D_w)}{\eta^2} \times \frac{1}{(\rho_b \times K_d) + \theta_w + (\theta_a \times H')}$

$= \frac{(1.33E\text{-}03 \times 0.051 \times 1.37E\text{-}04) + (0.0094 \times 9.00E\text{-}06)}{0.1497} \times \frac{1}{(1.64 \times 4298.4) + 0.25 + (0.137 \times 1.37E\text{-}04)}$ = 9.06E-11

Soil Component of the Migration to Groundwater Cleanup Objective (Class 1)

S-17 = $C_w \times \left[K_d + \frac{(\theta_w + \theta_a \times H')}{\rho b} \right]$ = 0.1 $\times \left[4298.4 + \frac{0.246 + 0.137 \times 1.37E\text{-}04}{1.64} \right]$ = **429.855** **mg/kg**

Target Soil Leachate Concentration (Class 1)

S-18 = $C_w =$ $DF \times GW_{obj}$ = 20.00 X 0.005 = 0.1

Soil-Water Partition Coefficient

S-19 = $K_d =$ $K_{oc} \times f_{oc}$ = 3.98E+05 X 0.011 = 4298.4

Tier 2 Residential Calculations for Benz[a]anthracene

Marine Bank Trust 53-0051
20030135

Water-Filled Porosity

S-20 = $\Theta_w = \eta \times \frac{1}{K_s}^{1/(2n+3)}$ = 0.38 x $\left[\frac{0.300}{120.000}\right]^{0.074}$ = 0.2458

Air-Filled Porosity

S-21 = $\Theta_a = \eta - \Theta_w$ = 0.38 - 0.25 = 0.1370

Dilution Factor

S-22 = $DF = 1 + \frac{K \times i \times d}{I \times L}$ = $\frac{36.90}{0.300} \times \frac{0.0619}{79.858} \times 11.402 + 1$ = 2.0866

GW Ingestion

S-23 = $\frac{TR \times BW \times At_c \times 365}{SF_o \times IR_w \times EF \times ED}$ = $\frac{1.0E-06}{0.100} \times \frac{70}{2.000} \times \frac{70}{350} \times \frac{365}{30}$ = $\frac{1.8E+00}{2100}$ = 0.0009 mg/L

Total Soil Porosity

S-24 = $\eta = 1 - \frac{\rho_b}{\rho_s}$ = 1 - $\frac{1.64}{2.657}$ = 0.3828

Estimation of Mixing Zone Depth

S-25 = $d = (0.0112 \times L^2)^{0.5} + d_a\left[1 - \exp\frac{(-L_s \times I)}{(K \times I \times d_a)}\right]$

= (0.0112 x 79.858 ^{2})$^{0.5}$ +

3.048 x $\left[1 - \exp\left\{\frac{-79.858}{36.897} \times \frac{0.3}{0.0619} \times \frac{}{3.048}\right\}\right]$ = 11.402 m

Soil Saturation Limit

S-29 = $C_{sat} = \frac{S}{\rho_b} \times [(K_d \times \rho b) + \Theta w + (H' \times \theta a)]$ = $\frac{9.40E-03}{1.64}$ x [(4298.4 x 1.64) + 0.246 + (1.37E-04 x 0.137)] = 40.41 mg/kg

Soil Gas Outdoor Inhalation

S-30 = $ROs\ g = \frac{ROsoil \times H \times \rho b \times 1000}{H' \times \Theta a + \Theta w + Kd \times \rho b}$ = $\frac{40.406}{1.370E-04} \times \frac{1.370E-04}{0.137} \times \frac{1.640}{0.246} \times \frac{1000}{4298.400} \times \frac{}{1.640}$ = 0.001288 mg/m^3

ɾ (BaA)

Marine Bank Trust 53-0051
20030135

Appendix C - Table K
Parameter Estimates for Calculating Water - Filled Soil Porosity (Ow)

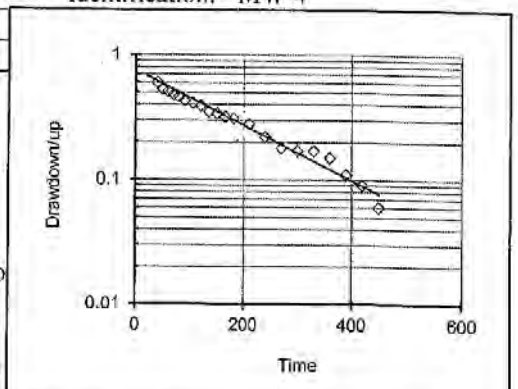
Soil Texture	Saturated Hydraulic Conductivity (Ks) (m/yr)	1/ (2b+3)
Sand	1830	0.09
Loamy Sand	540	0.085
Sandy Loam	230	0.08
Silt Loam	120	0.074
Loam	60	0.073
Sandy Clay Loam	40	0.058
Silt Clay Loam	13	0.054
Clay Loam	20	0.05
Sandy Clay	10	0.042
Silt Clay	8	0.042
Clay	5	0.039

Version 3/26/2018

Bouwer & Rice Method for Calculating Hydraulic Conductivity

Project Name: Marine Trust - Cantrall
Project No.: 03-0135
Client Name: Marine Bank Trust #530051
Identification: MW-4
Analysis By: VES/BAR
Run Date: 8/11/2004

Riser Pipe Diameter:	0.1667	feet
Intake Diameter:	0.604	feet
Intake Length:	10	feet
Saturated Column Length:	6.72	feet
Water Table Depth:	8.28	feet
Aquifer Thickness:	10	feet
Line Fit Starting No.:	1	Min 1 to
Line Fit Ending No.:	22	Max 22
Specify Output Units:	7	1 to 9
Hyd. Cond., K(h):	1.17E-04	cm./sec.
Error of Fit:	0.474	



Meas. #	Time seconds	Field Meas. feet	Drawdown/up feet		Line Fit To LN(Yt)	Regression On LN(Yt)
1)	20.00	7.15	1.13		0.122	-0.384
2)	40.00	7.68	0.60		-0.511	-0.485
3)	50.00	7.75	0.53		-0.635	-0.536
4)	60.00	7.77	0.51		-0.673	-0.586
5)	70.00	7.80	0.48		-0.734	-0.637
6)	80.00	7.82	0.46		-0.777	-0.688
7)	90.00	7.85	0.43		-0.844	-0.739
8)	105.00	7.87	0.41		-0.892	-0.815
9)	120.00	7.89	0.39		-0.942	-0.891
10)	135.00	7.93	0.35		-1.050	-0.967
11)	150.00	7.94	0.34		-1.079	-1.043
12)	165.00	7.96	0.32		-1.139	-1.119
13)	180.00	7.97	0.31		-1.171	-1.195
14)	210.00	8.00	0.28		-1.273	-1.348
15)	240.00	8.06	0.22		-1.514	-1.500
16)	270.00	8.10	0.18		-1.715	-1.652
17)	300.00	8.11	0.17		-1.772	-1.804
18)	330.00	8.11	0.17		-1.772	-1.957
19)	360.00	8.13	0.15		-1.897	-2.109
20)	390.00	8.17	0.11		-2.207	-2.261
21)	420.00	8.19	0.09		-2.408	-2.413
22)	450.00	8.22	0.06		-2.813	-2.566

APPENDIX F

BORE LOGS AND WELL COMPLETION REPORTS

CORRECTIVE ACTION PLAN AND BUDGET AMENDMENT

MARINE BANK TRUST # 53-0051
CANTRALL, ILLINOIS

Illinois Environmental Protection Agency

CW M COMPANY, INC.
DRILLING BOREHOLE LOG

Page 1 of 1

LUST INCIDENT #: 03-0135	**BOREHOLE NUMBER:** SB-18
SITE NAME: Marine Bank Trust #530051	**BORING LOCATION:** 50'N & 28'W of SW Tree
SITE ADDRESS: 9520 State Route 29 Cantrall, Illinois	**RIG TYPE:** Truck Mounted Drill Rig
DATE/TIME STARTED: 9/5/2023 15:30	**DRILLING/SAMPLE METHOD:** Push
DATE/TIME FINISHED: 9/5/2023 15:40	**BACKFILL:** Grout/Cuttings

DEPTH (FEET)	SOIL AND ROCK DESCRIPTION	USCS CLASS	Sample Recovery	PID (ppm)	Sample Type	SAMPLE NUMBER	REMARKS: (Odor, Color, Moisture, Penetrometer, etc.)
0							
1	Black/Brown Silty Clay	CL		50.0			
2							
3			90%	115.0	Grab	SB-18A	BETX, MTBE, PNA's
4							
5				46.0			
6				119.0			
7							
8			90%	136.0	Grab	SB-18B	BETX, MTBE, PNA's
9							
10				120.0			
11	EOB-10'						
12							
13							
14							
15 #							

Stratification lines are approximate, in-situ transition between soil types may be gradual.

NOTES: Sampled at highest PID reading per 5' interval.

Manway / Surface Elevation:

▼	**Groundwater Depth While Drilling:** N/A	**Auger Depth:** 10'	**Driller:**	AEDC
▽	**Groundwater Depth After Drilling:**	**Rotary Depth:**	**Geologist:**	GTR

Illinois Environmental Protection Agency

CW[M] COMPANY, INC.
DRILLING BOREHOLE LOG

Page 1 of 1

LUST INCIDENT #: 03-0135	BOREHOLE NUMBER: SB-19
SITE NAME: Marine Bank Trust #530051	BORING LOCATION: 61'N & 43'W of SW Tree
SITE ADDRESS: 9520 State Route 29 Centralia, Illinois	RIG TYPE: Truck Mounted Drill Rig
DATE/TIME STARTED: 9/5/2023 15:40	DRILLING/SAMPLE METHOD: Push
DATE/TIME FINISHED: 9/5/2023 15:50	BACKFILL: Grout/Cuttings

DEPTH (FEET)	SOIL AND ROCK DESCRIPTION	USCS CLASS	Sample Recovery	PID (ppm)	Sample Type	SAMPLE NUMBER	REMARKS: (Odor, Color, Moisture, Penetrometer, etc.)
0							
1	Black/Brown Silty Clay	CL		16.0			
2							
3			90%	124.0	Grab	SB-19A	BETX, MTBE, PNA's
4							
5				116.0			
6				118.0			
7							
8			90%	144.0	Grab	SB-19B	BETX, MTBE, PNA's
9							
10				126.0			
11	EOB-10'						
12							
13							
14							
15 ft							

Stratification lines are approximate, in-situ transition between soil types may be gradual.

NOTES: Sampled at highest PID reading per 5' interval.

Manway / Surface Elevation:

▼ Groundwater Depth While Drilling:	N/A	Auger Depth:	10'	Driller:	AEDC
▽ Groundwater Depth After Drilling:		Rotary Depth:		Geologist:	GTR

Illinois Environmental Protection Agency

CW[illegible]M COMPANY, INC.
DRILLING BOREHOLE LOG

Page 1 of 1

LUST INCIDENT #: 03-0135
SITE NAME: Marine Bank Trust #530051
SITE ADDRESS: 9520 State Route 29
Cantrall, Illinois
DATE/TIME STARTED: 9/5/2023 15:55
DATE/TIME FINISHED: 9/5/2023 16:05

BOREHOLE NUMBER: SB-20
BORING LOCATION: 37'N & 41'W of SW Tree
RIG TYPE: Truck Mounted Drill Rig
DRILLING/SAMPLE METHOD: Push
BACKFILL: Grout/Cuttings

DEPTH (FEET)	SOIL AND ROCK DESCRIPTION	USCS CLASS	Sample Recovery	PID (ppm)	Sample Type	SAMPLE NUMBER	REMARKS: (Odor, Color, Moisture, Penetrometer, etc.)
0							
1	Black/Brown Silty Clay	CL		10.0			
2							
3			90%	96.0	Grab	SB-20A	BETX, MTBE, PNA's
4							
5				82.0			
6				86.0			
7							
8			90%	110.0	Grab	SB-20B	BETX, MTBE, PNA's
9							
10				98.0			
11	EOB-10'						
12							
13							
14							
15 #							

Stratification lines are approximate, in-situ transition between soil types may be gradual.

NOTES: Sampled at highest PID reading per 5' interval.

Manway / Surface Elevation:

Groundwater Depth While Drilling: N/A
Groundwater Depth After Drilling:

Auger Depth: 10'
Rotary Depth:

Driller: AEDC
Geologist: GTR

Illinois Environmental Protection Agency

CW[M] COMPANY, INC.
DRILLING BOREHOLE LOG

Page 1 of 1

LUST INCIDENT #: 03-0135	**BOREHOLE NUMBER:** SB-21
SITE NAME: Marine Bank Trust #530051	**BORING LOCATION:** 37'N & 41'W of SW Tree
SITE ADDRESS: 9520 State Route 29 Centralia, Illinois	**RIG TYPE:** Truck Mounted Drill Rig
DATE/TIME STARTED: 9/5/2023 16:50	**DRILLING/SAMPLE METHOD:** Push
DATE/TIME FINISHED: 9/5/2023 17:00	**BACKFILL:** Grout/Cuttings

DEPTH (FEET)	SOIL AND ROCK DESCRIPTION	USCS CLASS	Sample Recovery	PID (ppm)	Sample Type	SAMPLE NUMBER	REMARKS: (Odor, Color, Moisture, Penetrometer, etc.)
0							
1							
2							
3							
4							
5	No Sample						
6							
7							
8							
9							
10							
11	Green Silty Clay	CL		110.0			Moisture
12							
13			100%	143.0	Grab	SB-21C	BETX, MTBE
14							
15 #				134.0			

Stratification lines are approximate, in-situ transition between soil types may be gradual.

NOTES: Sampled at highest PID reading per 5' interval.

Manway / Surface Elevation:

▼ **Groundwater Depth While Drilling:**	10'	**Auger Depth:**	20'	**Driller:**	AEDC
▽ **Groundwater Depth After Drilling:**		**Rotary Depth:**		**Geologist:**	GTR

Illinois Environmental Protection Agency

CW[M] M COMPANY, INC.
DRILLING BOREHOLE LOG

Page 2 of 2

LUST INCIDENT #: 03-0135	BOREHOLE NUMBER: SB-21
SITE NAME: Marine Bank Trust #530051	BORING LOCATION: 37'N & 41'W of SW Tree
SITE ADDRESS: 9520 State Route 29 Centralia, Illinois	RIG TYPE: Truck Mounted Drill Rig
DATE/TIME STARTED: 9/5/2023 16:50	DRILLING/SAMPLE METHOD: Push
DATE/TIME FINISHED: 9/5/2023 17:00	BACKFILL: Grout/Cuttings

DEPTH (FEET)	SOIL AND ROCK DESCRIPTION	USCS CLASS	Sample Recovery	PID (ppm)	Sample Type	SAMPLE NUMBER	REMARKS: (Odor, Color, Moisture, Penetrometer, etc.)
15	Green Silty Clay	CL					
16				172			
17							
18			100%	184	Grab	SB-21D	
19							
20				164			
	EOB-20'						
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							

Stratification lines are approximate, in-situ transition between soil types may be gradual.

NOTES:

Manway / Surface Elevation:

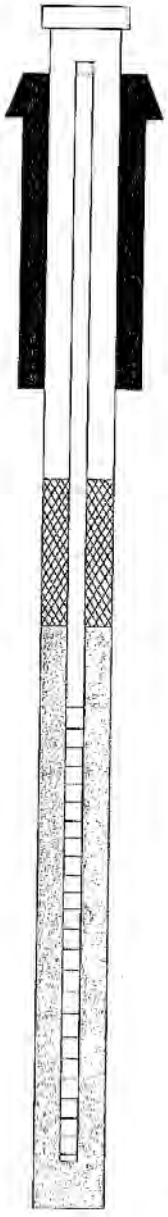
▼ Groundwater Depth While Drilling:	10'	Auger Depth:	20'	Driller:	AEDC
▽ Groundwater Depth After Drilling:		Rotary Depth:		Geologist:	GTR

Illinois Environmental Protection Agency — **LUST Well Completion Report**

Incident No.	03-0135	**Well No.**	MW-1A
Site Name	Marine Bank Trust #530051	**Date Drilled**	8/12/2021
Drilling Contractor	AEDC	**Date Completed**	8/12/2021
Driller	AEDC	**Geologist**	MJS/KTR
Drilling Method	Hollow Stem Auger	**Drilling Fluids**	N/A

Annular Space Details

Type of Surface Seal	Concrete
Type of Annular Sealant	Bentonite
Type of Bentonite	High-Yield
Type of Sand Pack	Coarse 20-20



99.54 ft. Top of Protective Casing
99.29 ft. Top of riser pipe
99.54 ft. Ground surface
99.04 ft. Top of Annular Sealant
N/A Casing Stickup

99.04 ft. Top of Seal
3.00 ft. Total Seal interval
96.04 ft. Top of Sand
95.04 ft. Top of Screen
10.0 ft. Total Screen Interval
85.04 ft. Bottom of Screen
84.54 ft. Bottom of Borehole

Well Construction Materials

	Stainless Steel Type	PVC Specify Type	Other Specify Type
Riser Coupling Joint			
Riser Pipe Above w.t.		Sched.-40	
Riser Pipe Below w.t.			
Screen		Sched.-40	
Coupling Joint Screen to Riser		Sched.-40	
Protective Casing			Steel

Measurements

Riser Pipe Length	4.25 ft.
Screen Length	10.0 ft.
Screen Slot Size	10-slot
Protective Casing Length	N/A
Depth to Water	~8' ft. while drilling
Depth to Water	88.44 ft. static
Free Product Thickness	N/A
Gallons removed (develop)	Approximately 1 gallon
Gallons removed (purge)	Approximately 1 gallon
Other	

Completed by: JKK

Illinois Environmental Protection Agency — **LUST Well Completion Report**

Incident No.	03-0135	**Well No.**	MW-2A
Site Name	Marine Bank Trust #530051	**Date Drilled**	8/12/2021
Drilling Contractor	AEDC	**Date Completed**	8/12/2021
Driller	AEDC	**Geologist**	MJS/KTR
Drilling Method	Hollow Stem Auger	**Drilling Fluids**	N/A

Annular Space Details

Type of Surface Seal	Concrete
Type of Annular Sealant	Bentonite
Type of Bentonite	High-Yield
Type of Sand Pack	Coarse 20-20

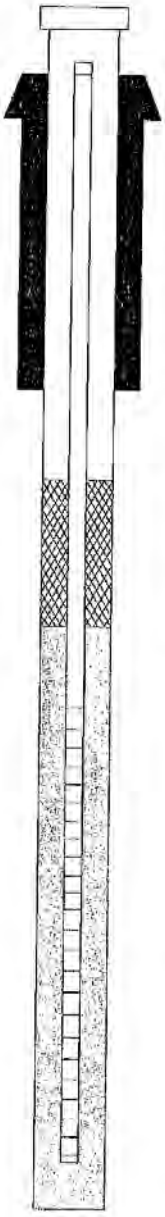
Well Construction Materials

	Stainless Steel Type	PVC Specify Type	Other Specify Type
Riser Coupling Joint			
Riser Pipe Above w.t.		Sched.-40	
Riser Pipe Below w.t.			
Screen		Sched.-40	
Coupling Joint Screen to Riser		Sched.-40	
Protective Casing			Steel

Measurements

Riser Pipe Length	4.25 ft.
Screen Length	10.0 ft.
Screen Slot Size	10-slot
Protective Casing Length	N/A
Depth to Water	~8' ft. while drilling
Depth to Water	94.00 ft. static
Free Product Thickness	N/A
Gallons removed (develop)	Approximately 1 gallon
Gallons removed (purge)	Approximately 1 gallon
Other	

Completed by: JKK



99.16 ft. Top of Protective Casing
98.91 ft. Top of riser pipe
99.16 ft. Ground surface
98.66 ft. Top of Annular Sealant
N/A Casing Stickup

98.66 ft. Top of Seal
3.00 ft. Total Seal interval
95.66 ft. Top of Sand
94.66 ft. Top of Screen

10.0 ft. Total Screen Interval

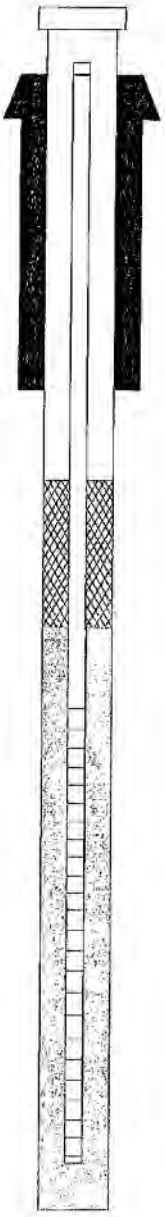
84.66 ft. Bottom of Screen
84.16 ft. Bottom of Borehole

Illinois Environmental Protection Agency — **LUST Well Completion Report**

Incident No.	03-0135	**Well No.**	MW-3A
Site Name	Marine Bank Trust #530051	**Date Drilled**	8/12/2021
Drilling Contractor	AEDC	**Date Completed**	8/12/2021
Driller	AEDC	**Geologist**	MJS/KTR
Drilling Method	Hollow Stem Auger	**Drilling Fluids**	N/A

Annular Space Details

Type of Surface Seal	Concrete
Type of Annular Sealant	Bentonite
Type of Bentonite	High-Yield
Type of Sand Pack	Coarse 20-20



100.00 ft. Top of Protective Casing
99.75 ft. Top of riser pipe
100.00 ft. Ground surface
99.50 ft. Top of Annular Sealant
N/A Casing Stickup

99.50 ft. Top of Seal
3.00 ft. Total Seal interval
96.50 ft. Top of Sand
95.50 ft. Top of Screen

10.0 ft. Total Screen Interval

85.50 ft. Bottom of Screen
85.00 ft. Bottom of Borehole

Well Construction Materials

	Stainless Steel Type	PVC Specify Type	Other Specify Type
Riser Coupling Joint			
Riser Pipe Above w.t.		Sched.-40	
Riser Pipe Below w.t.			
Screen		Sched.-40	
Coupling Joint Screen to Riser		Sched.-40	
Protective Casing			Steel

Measurements

Riser Pipe Length	4.25 ft.
Screen Length	10.0 ft.
Screen Slot Size	10-slot
Protective Casing Length	N/A
Depth to Water	~8' ft. while drilling
Depth to Water	95.36 ft. static
Free Product Thickness	N/A
Gallons removed (develop)	Approximately 1 gallon
Gallons removed (purge)	Approximately 1 gallon
Other	

Completed by: JKK

Illinois Environmental Protection Agency — **LUST Well Completion Report**

Incident No.	03-0135	**Well No.**	MW-4A
Site Name	Marine Bank Trust #530051	**Date Drilled**	8/12/2021
Drilling Contractor	AEDC	**Date Completed**	8/12/2021
Driller	AEDC	**Geologist**	MJS/KTR
Drilling Method	Hollow Stem Auger	**Drilling Fluids**	N/A

Annular Space Details

Type of Surface Seal	Concrete
Type of Annular Sealant	Bentonite
Type of Bentonite	High-Yield
Type of Sand Pack	Coarse 20-20

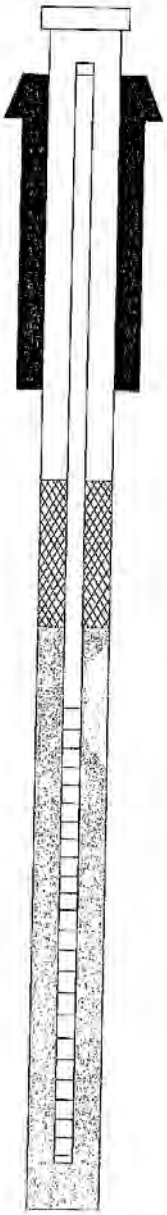
Well Construction Materials

	Stainless Steel Type	PVC Specify Type	Other Specify Type
Riser Coupling Joint			
Riser Pipe Above w.t.		Sched.-40	
Riser Pipe Below w.t.			
Screen		Sched.-40	
Coupling Joint Screen to Riser		Sched.-40	
Protective Casing			Steel

Measurements

Riser Pipe Length	4.25 ft.
Screen Length	10.0 ft.
Screen Slot Size	10-slot
Protective Casing Length	N/A
Depth to Water	~8' ft. while drilling
Depth to Water	94.24 ft. static
Free Product Thickness	N/A
Gallons removed (develop)	Approximately 1 gallon
Gallons removed (purge)	Approximately 1 gallon
Other	

Completed by: JKK



100.62 ft. Top of Protective Casing
100.37 ft. Top of riser pipe
100.62 ft. Ground surface
100.12 ft. Top of Annular Sealant
N/A Casing Stickup

100.12 ft. Top of Seal
3.00 ft. Total Seal interval
97.12 ft. Top of Sand
96.12 ft. Top of Screen

10.0 ft. Total Screen Interval

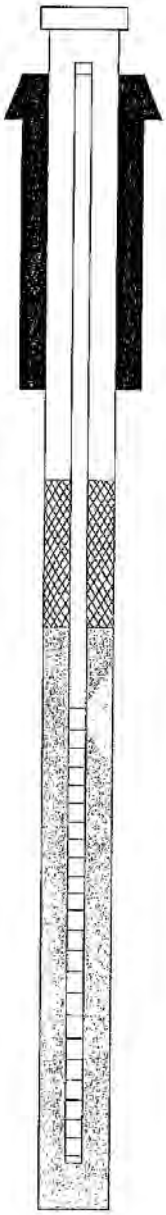
86.12 ft. Bottom of Screen
85.62 ft. Bottom of Borehole

Illinois Environmental Protection Agency — **LUST Well Completion Report**

Incident No.	03-0135	**Well No.**	MW-5A
Site Name	Marine Bank Trust #530051	**Date Drilled**	8/12/2021
Drilling Contractor	AEDC	**Date Completed**	8/12/2021
Driller	AEDC	**Geologist**	MJS/KTR
Drilling Method	Hollow Stem Auger	**Drilling Fluids**	N/A

Annular Space Details

Type of Surface Seal	Concrete
Type of Annular Sealant	Bentonite
Type of Bentonite	High-Yield
Type of Sand Pack	Coarse 20-20



99.75 ft. Top of Protective Casing
99.50 ft. Top of riser pipe
99.75 ft. Ground surface
99.25 ft. Top of Annular Sealant
N/A Casing Stickup

99.25 ft. Top of Seal
3.00 ft. Total Seal interval
96.25 ft. Top of Sand
95.25 ft. Top of Screen

10.0 ft. Total Screen Interval

85.25 ft. Bottom of Screen
84.75 ft. Bottom of Borehole

Well Construction Materials

	Stainless Steel Type	PVC Specify Type	Other Specify Type
Riser Coupling Joint			
Riser Pipe Above w.t.		Sched.-40	
Riser Pipe Below w.t.			
Screen		Sched.-40	
Coupling Joint Screen to Riser		Sched.-40	
Protective Casing			Steel

Measurements

Riser Pipe Length	4.25 ft.
Screen Length	10.0 ft.
Screen Slot Size	10-slot
Protective Casing Length	N/A
Depth to Water	~8' ft. while drilling
Depth to Water	94.48 ft. static
Free Product Thickness	N/A
Gallons removed (develop)	Approximately 1 gallon
Gallons removed (purge)	Approximately 1 gallon
Other	

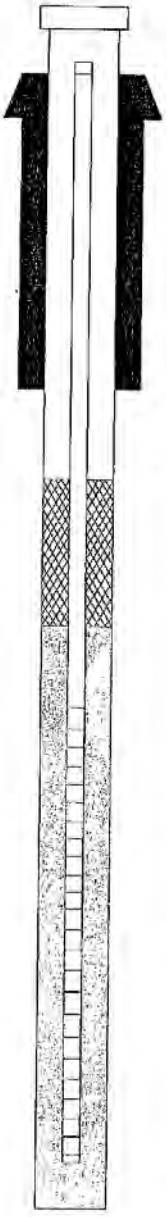
Completed by: JKK

Illinois Environmental Protection Agency — **LUST Well Completion Report**

Incident No.	03-0135	**Well No.**	MW-9A
Site Name	Marine Bank Trust #530051	**Date Drilled**	8/12/2021
Drilling Contractor	AEDC	**Date Completed**	8/12/2021
Driller	AEDC	**Geologist**	MJS/KTR
Drilling Method	Hollow Stem Auger	**Drilling Fluids**	N/A

Annular Space Details

Type of Surface Seal	Concrete
Type of Annular Sealant	Bentonite
Type of Bentonite	High-Yield
Type of Sand Pack	Coarse 20-20



100.80 ft. Top of Protective Casing
100.55 ft. Top of riser pipe
100.80 ft. Ground surface
100.30 ft. Top of Annular Sealant
N/A Casing Stickup

100.30 ft. Top of Seal
3.00 ft. Total Seal interval
97.30 ft. Top of Sand
96.30 ft. Top of Screen
10.0 ft. Total Screen Interval
86.30 ft. Bottom of Screen
85.80 ft. Bottom of Borehole

Well Construction Materials

	Stainless Steel Type	PVC Specify Type	Other Specify Type
Riser Coupling Joint			
Riser Pipe Above w.t.		Sched.-40	
Riser Pipe Below w.t.			
Screen		Sched.-40	
Coupling Joint Screen to Riser		Sched.-40	
Protective Casing			Steel

Measurements

Riser Pipe Length	4.25 ft.
Screen Length	10.0 ft.
Screen Slot Size	10-slot
Protective Casing Length	N/A
Depth to Water	~8' ft. while drilling
Depth to Water	90.84 ft. static
Free Product Thickness	N/A
Gallons removed (develop)	Approximately 1 gallon
Gallons removed (purge)	Approximately 1 gallon
Other	

Completed by: JKK

Illinois Environmental Protection Agency — **LUST Well Completion Report**

Incident No.	03-0135	**Well No.**	MW-14
Site Name	Marine Bank Trust #530051	**Date Drilled**	8/12/2021
Drilling Contractor	AEDC	**Date Completed**	8/12/2021
Driller	AEDC	**Geologist**	MJS/KTR
Drilling Method	Hollow Stem Auger	**Drilling Fluids**	N/A

Annular Space Details

Type of Surface Seal	Concrete
Type of Annular Sealant	Bentonite
Type of Bentonite	High-Yield
Type of Sand Pack	Coarse 20-20

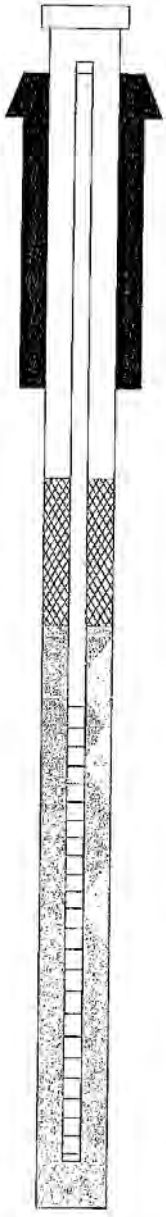
Well Construction Materials

	Stainless Steel Type	PVC Specify Type	Other Specify Type
Riser Coupling Joint			
Riser Pipe Above w.t.		Sched.-40	
Riser Pipe Below w.t.			
Screen		Sched.-40	
Coupling Joint Screen to Riser		Sched.-40	
Protective Casing			Steel

Measurements

Riser Pipe Length	4.25 ft.
Screen Length	10.0 ft.
Screen Slot Size	10-slot
Protective Casing Length	N/A
Depth to Water	~8' ft. while drilling
Depth to Water	91.41 ft. static
Free Product Thickness	N/A
Gallons removed (develop)	Approximately 1 gallon
Gallons removed (purge)	Approximately 1 gallon
Other	

Completed by: JKK



98.47 ft. Top of Protective Casing
98.22 ft. Top of riser pipe
98.47 ft. Ground surface
97.97 ft. Top of Annular Sealant
N/A Casing Stickup

97.97 ft. Top of Seal
3.00 ft. Total Seal interval
94.97 ft. Top of Sand
93.97 ft. Top of Screen

10.0 ft. Total Screen Interval

83.97 ft. Bottom of Screen
83.47 ft. Bottom of Borehole

APPENDIX G

ANALYTICAL RESULTS

CORRECTIVE ACTION PLAN AND BUDGET AMENDMENT

MARINE BANK TRUST # 53-0051
CANTRALL, ILLINOIS

Marine Bank- Cantrall
Site Assessment Data

EA Lust App. B

	Location		N-1
	Date		5/15/2003
Parameter	Tier I CUO	PH Specific CUO	
Arsenic	5.2	30	13.2
Barium	122.0	1800.0	76.1
Cadmium	0.5	59.0	0.826
Chromium	13.0	32.0	13.1
Lead	20.9	20.9*	13.9
Mercury	0.05	6.4	<0.111
Selenium	0.37	3.3	<0.555
PH Specific values from 742 Appendix A, Table G			
* - Value from 742 Appendix B, Table C			
BOLD & SHADING -- Exceeds the TACO Tier 1 Most Stringent Soil Clean-up Objective			
Results are in mg/Kg			

Marine Bank- Cantrall
Site Assessment Data

EA Soil

	Location	E	S-1	S-2	W	N-1	N-2
	Depth	6'	6'	6'	6'	6'	6'
	Date	5/15/2003	5/15/2003	5/15/2003	5/15/2003	5/15/2003	5/15/2003
Parameter	Tier I CUO	*	*	*	*	*	*
Benzene	**0.03**	**0.035**	**0.711**	**0.17**	**3.4**	**0.983**	**0.971**
Ethylbenzene	**13.0**	0.139	11.1	**14.**	**47.8**	**112.**	**75.4**
Toluene	**12.0**	0.009	0.023	0.02	**89.7**	**30.3**	**43.6**
Total Xylenes	**5.6**	0.23	**25.4**	**32.6**	**186.**	**418.**	**291.**
MTBE	**0.32**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthene	**570.0**	<1.200	<1.200	<1.200	<1.200	<1.200	<1.200
Acenaphtylene	**15.0**	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660
Anthracene	**12,000.0**	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660
Benzo(a)anthracene	**0.9**	<0.0087	<0.0087	<0.0087	<0.0087	<0.0087	<0.0087
Benzo(a)pyrene	**0.09**	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Benzo(b)fluoranthene	**0.9**	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(g,h,i)perylene	**2,300.0**	<0.051	<0.051	<0.051	<0.051	<0.051	<0.051
Benzo(k)fluoranthene	**9.0**	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Chrysene	**88.0**	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Dibenz(a,h)anthracene	**0.09**	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Fluoranthene	**4,300.0**	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660
Fluorene	**560.0**	<0.140	<0.140	<0.140	<0.140	<0.140	<0.140
Indeno(1,2,3-cd)pyrene	**0.9**	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029
Naphthalene	**1.8**	<0.660	1.57	0.666	<0.660	<0.660	**6.59**
Phenanthrene	**140.0**	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660
Pyrene	**2,300.0**	<0.180	<0.180	<0.180	<0.180	<0.180	<0.180

Numbers not bold indicate actual quantities, but are below the TACO Tier 1 Most Stringent Soil Clean-up Objective.
BOLD & SHADING – Exceeds the TACO Tier 1 Most Stringent Soil Clean-up Objective.
Results are in mg/Kg
*Resampled

Marine Bank-Cantrall
Site Assessment Data

Soil 1-15-04

	Location	MW-1	MW-2	MW-3	MW-4		
	Date	1/15/2004	1/15/2004	1/15/2004	1/15/2004		
	Depth	9'	9'	6'	9'		
Parameter	Tier I CUO			*			
Benzene	**0.03**	0.005	0.016	**11.2**	0.00492		
Ethylbenzene	**13.0**	0.013	0.037	3.19	0.00391		
Toluene	**12.0**	0.012	0.009	0.419	0.0103		
Total Xylenes	**5.6**	0.043	0.02	**9.49**	0.0093		
MTBE	**0.32**	<0.005	<0.005	<0.005	<0.005		
Acenaphthene	**570.0**	<1.200	<1.200	<1.200	<1.060		
Acenaphtylene	**15.0**	<0.660	<0.660	<0.660	<0.582		
Anthracene	**12,000.0**	<0.660	<0.660	<0.660	<0.582		
Benzo(a)anthracene	**0.9**	0.063	<0.0087	<0.0087	<0.00767		
Benzo(a)pyrene	**0.09**	<0.015	<0.015	<0.015	<0.0132		
Benzo(b)fluoranthene	**0.9**	<0.011	<0.011	<0.011	<0.00970		
Benzo(g,h,i)perylene	**2,300.0**	<0.051	<0.051	<0.051	<0.0450		
Benzo(k)fluoranthene	**9.0**	<0.011	<0.011	<0.011	<0.00970		
Chrysene	**88.0**	<0.100	<0.100	<0.100	<0.0882		
Dibenz(a,h)anthracene	**0.09**	<0.020	<0.020	<0.020	<0.0176		
Fluoranthene	**4,300.0**	<0.660	<0.660	<0.660	<0.582		
Fluorene	**560.0**	<0.140	<0.140	1.25	<0.123		
Indeno(1,2,3-cd)pyrene	**0.9**	<0.029	<0.029	<0.029	<0.0256		
Naphthalene	**1.8**	<0.660	<0.660	**3.08**	<0.582		
Phenanthrene	**140.0**	<0.660	<0.660	2.03	<0.582		
Pyrene	**2,300.0**	<0.180	<0.180	0.452	<0.159		

Numbers not bold indicate actual quantities, but are below the TACO Tier 1 Most Stringent Soil Clean-up Objective.
BOLD & SHADING – Exceeds the TACO Tier 1 Most Stringent Soil Clean-up Objective.
Results are in mg/Kg
*Resampled

Marine Bank-Cantrall
Site Assessment Data

Soil August 2004

	Location	MW-6	MW-7	MW-9	SB-1	MW-12	MW-13	MW-14	MW-15	MW-16	MW-17
	Depth	6'	6'	9'	9'	6'	6'	6'	6'	9'	6'
Date		8/5/2004	8/5/2004	8/5/2004	8/5/2004	8/6/2004	8/30/2004	8/30/2004	8/30/2004	8/30/2004	8/30/2004
Parameter	Tier I CUO										
Benzene	0.03	0.002	0.0092	0.00426	0.002	<0.002	0.004	<0.002	0.003	0.006	0.003
Ethylbenzene	13.0	0.011	0.0057	0.00307	0.002	0.003	0.003	<0.002	0.003	0.013	0.003
Toluene	12.0	0.00218	0.0307	0.00814	0.004	<0.002	0.007	0.004	0.006	0.033	0.006
Total Xylenes	5.6	<0.00338	0.0221	0.00670	<0.005	0.01	0.007	<0.005	0.006	0.059	0.006
MTBE	0.32	<0.00338	<0.00351	<0.00384	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthene	570.0	<1.200	<1.200	<1.200	<1.200	<1.200	<1.200	<1.200	<1.200	<1.200	<1.200
Acenaphtylene	15.0	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660
Anthracene	12,000.0	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660
Benzo(a)anthracene	0.9	<0.0087	<0.0087	<0.0087	<0.0087	<0.0087	<0.0087	<0.0087	<0.0087	<0.0087	<0.0087
Benzo(a)pyrene	0.09	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Benzo(b)fluoranthene	0.9	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Benzo(g,h,i)perylene	2,300.0	<0.051	<0.051	<0.051	<0.051	<0.051	<0.051	<0.051	<0.051	<0.051	<0.051
Benzo(k)fluoranthene	9.0	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
Chrysene	88.0	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Dibenz(a,h)anthracene	0.09	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Fluoranthene	4,300.0	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660
Fluorene	560.0	<0.140	<0.140	<0.140	<0.140	<0.140	<0.140	<0.140	<0.140	<0.140	<0.140
Indeno(1,2,3-cd)pyrene	0.9	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029	<0.029
Naphthalene	1.8	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660
Phenanthrene	140.0	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660	<0.660
Pyrene	2,300.0	<0.180	<0.180	<0.180	<0.180	<0.180	<0.180	<0.180	<0.180	<0.180	<0.180

Numbers not bold indicate actual quantities, but are below the TACO Tier 1 Most Stringent Soil Clean-up Objective.
BOLD & SHADING – Exceeds the TACO Tier 1 Most Stringent Soil Clean-up Objective.
Results are in mg/Kg

Marine Bank-Cantrall
Site Assessment Data

Groundwater

	Location	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-12	MW-13
	Date	2/27/04	2/27/04	2/27/04	2/27/04	2/27/04	8/11/04	8/11/04	8/11/04	8/11/04	8/11/04	8/11/04	9/30/04	9/1/04
Parameter	Class I CUO	*	*	*	*	*				*				
Benzene	**0.005**	**0.067**	**0.069**	**3.51**	**0.008**	**1.66**	<0.002	<0.002	<0.002	**0.014**	<0.002	<0.002	<0.002	0.002
Ethylbenzene	**0.7**	0.139	0.008	**2.82**	**1.86**	**8.92**	<0.002	<0.002	<0.002	0.147	<0.002	<0.002	<0.002	<0.002
Toluene	**1.0**	0.014	<0.002	0.052	0.015	**1.2**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Xylenes	**10.0**	0.539	0.01	4.19	3.01	**25.**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MTBE	**0.07**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthene	**0.42**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Acenaphtylene	**0.210**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Anthracene	**2.1**	<0.0066	<0.0066	<0.0066	<0.0066	<0.0066	<0.0066	<0.0066	<0.0066	<0.0066	<0.0066	<0.0066	<0.0066	<0.0066
Benzo(a)anthracene	**0.00013**	<0.00013	<0.00013	**0.0014**	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013
Benzo(a)pyrene	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Benzo(b)fluoranthene	**0.00018**	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018
Benzo(g,h,i)perylene	**0.21**	<0.00076	<0.00076	<0.00076	<0.00076	<0.00076	<0.00076	<0.00076	<0.00076	<0.00076	<0.00076	<0.00076	<0.00076	<0.00076
Benzo(k)fluoranthene	**0.00017**	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017
Chrysene	**0.0015**	<0.0015	<0.0015	0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015
Dibenz(a,h)anthracene	**0.0003**	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Fluoranthene	**0.28**	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	0.0003
Fluorene	**0.28**	<0.0021	<0.0021	0.0473	0.013	0.019	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021
Indeno(1,2,3-cd)pyrene	**0.00043**	<0.00043	<0.00043	<0.00043	<0.00043	<0.00043	<0.00043	<0.00043	<0.00043	<0.00043	<0.00043	<0.00043	<0.00043	<0.00043
Naphthalene	**0.14**	0.026	<0.010	**0.451**	0.14	**0.782**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Phenanthrene	**0.21**	<0.0064	<0.0064	0.0567	0.019	0.022	<0.0064	<0.0064	<0.0064	<0.0064	<0.0064	<0.0064	<0.0064	<0.0064
Pyrene	**0.21**	<0.0027	<0.0027	0.0157	0.005	0.005	<0.0027	<0.0027	<0.0027	<0.0027	<0.0027	<0.0027	<0.0027	<0.0027

Numbers not bold indicate actual quantities, but are below the TACO Tier 1 Most Stringent Soil Clean-up Objective.

BOLD & SHADING -- Exceeds the TACO Tier 1 Most Stringent Soil Clean-up Objective.

Results are in mg/L

*Resampled

Marine Bank-Cantrail
Site Assessment Data

Groundwater

	Location	MW-14	MW-15	MW-16	MW-17	MW-18	TMW-1	MW-19	MW-20
	Date	9/1/04	9/1/04	9/1/04	9/30/04	1/24/05	1/24/05	8/9/05	8/9/05
Parameter	Class I CUO	*							
Benzene	**0.005**	**0.822**	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002
Ethylbenzene	**0.7**	**1.08**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Toluene	**1.0**	0.023	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Xylenes	**10.0**	2.47	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MTBE	**0.07**	0.016	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthene	**0.42**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.0164	<0.0164
Acenaphtylene	**0.210**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.00909	<0.00909
Anthracene	**2.1**	<0.0066	<0.0066	<0.0066	<0.0066	<0.0066	<0.0066	<0.000600	<0.000600
Benzo(a)anthracene	**0.00013**	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.000118	<0.000118
Benzo(a)pyrene	**0.0002**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.000182	<0.000182
Benzo(b)fluoranthene	**0.00018**	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.000164	<0.000164
Benzo(g,h,i)perylene	**0.21**	<0.00076	0.003	<0.00076	<0.00076	<0.00076	<0.00076	<0.000691	<0.000691
Benzo(k)fluoranthene	**0.00017**	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.000155	<0.000155
Chrysene	**0.0015**	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.00136	<0.00136
Dibenz(a,h)anthracene	**0.0003**	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.000273	<0.000273
Fluoranthene	**0.28**	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.00191	<0.00191
Fluorene	**0.28**	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.0021	<0.00191	<0.00191
Indeno(1,2,3-cd)pyrene	**0.00043**	<0.00043	<0.00043	<0.00043	<0.00043	<0.00043	<0.00043	<0.000391	<0.000391
Naphthalene	**0.14**	**0.16**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.00909	<0.00909
Phenanthrene	**0.21**	<0.0064	<0.0064	<0.0064	<0.0064	<0.0064	<0.0064	<0.00582	<0.00582
Pyrene	**0.21**	<0.0027	<0.0027	<0.0027	<0.0027	<0.0027	<0.0027	<0.00245	<0.00245
Numbers not bold indicate actual quantities, bu									
BOLD & SHADING -- Exceeds the TACO Ti									
Results are in mg/L									
*Resampled									

Marine Bank- Cantrall
Site Assessment Data

Soil 3-10-06

	Location	SB-2	SB-3	SB-4	SB-5		
	Depth	9'	6'	9'	9'		
Date		3/10/2006	3/10/2006	3/10/2006	3/10/2006		
Parameter	Tier I CUO	*	*	*	*		
Benzene	**0.03**	**0.871**	**9.55**	**0.082**	**0.612**		
Ethylbenzene	**13.0**	0.055	**119.**	0.358	0.106		
Toluene	**12.0**	0.013	0.58	0.019	0.03		
Total Xylenes	**150.0**	0.026	105.	0.289	0.178		
MTBE	**0.32**	<0.005	<0.005	<0.005	<0.005		
Acenaphthene	**570.0**	<1.200	<1.200	<1.200	<1.200		
Acenaphtylene	**15.0**	<0.660	<0.660	<0.660	<0.660		
Anthracene	**12,000.0**	<0.660	<0.660	<0.660	<0.660		
Benzo(a)anthracene	**0.9**	<0.0087	<0.0087	<0.0087	<0.0087		
Benzo(a)pyrene	**0.09**	<0.015	<0.015	<0.015	<0.015		
Benzo(b)fluoranthene	**0.9**	<0.011	<0.011	<0.011	<0.011		
Benzo(g,h,i)perylene	**2,300.0**	<0.051	<0.051	<0.051	<0.051		
Benzo(k)fluoranthene	**9.0**	<0.011	<0.011	<0.011	<0.011		
Chrysene	**88.0**	<0.100	<0.100	<0.100	<0.100		
Dibenz(a,h)anthracene	**0.09**	<0.020	<0.020	<0.020	<0.020		
Fluoranthene	**4,300.0**	<0.660	<0.660	<0.660	<0.660		
Fluorene	**560.0**	<0.140	0.483	<0.140	<0.140		
Indeno(1,2,3-cd)pyrene	**0.9**	<0.029	<0.029	0.046	<0.029		
Naphthalene	**1.8**	<0.660	**1.91**	<0.660	<0.660		
Phenanthrene	**140.0**	<0.660	1.09	<0.660	<0.660		
Pyrene	**2,300.0**	<0.180	0.164	<0.180	<0.180		
Numbers not bold indicate actual quantities, but are below the TACO Tier 1 Most Stringent Soil Clean-up Objective.							
BOLD & SHADING -- Exceeds the TACO Tier 1 Most Stringent Soil Clean-up Objective.							
Results are in mg/Kg							
*Resampled							

Marine Bank- Cantrail
Site Assessment Data

Soil 8-12-2021
Analytical Results

	Location	SB-7	SB-8	SB-9	SB-10	SB-11	SB-12	SB-13	SB-14	SB-15	SB-16	SB-17
	Date	8/12/2021	8/12/2021	8/12/2021	8/12/2021	8/12/2021	8/12/2021	8/12/2021	8/12/2021	8/12/2021	8/12/2021	8/12/2021
	Resampled @:	MW-3	SB-5	E	N2	SB-4	S1	SB-2	S2	W	N1	SB-3
	Depth	6'	9'	6'	6'	6'	6'	9'	6'	6'	6'	6'
Parameter	Tier I CUO											
Benzene	0.03	16.3	<0.0452	<0.0121	<0.0133	<0.0162	<0.0134	0.103	0.0942	0.296	<0.0138	<0.0131
Ethylbenzene	13.0	7.41	<0.0514	<0.0484	<0.0532	<0.0649	<0.0534	0.226	<0.0572	47.6	<0.0551	<0.0523
Toluene	12.0	0.613	<0.0514	<0.0514	<0.0532	<0.0649	<0.0534	<0.0493	<0.0572	0.277	<0.0551	<0.0523
Total Xylenes	150.0	7.24	<0.103	<0.0967	<0.106	<0.130	<0.107	<0.109	<0.114	163.	<0.110	<0.105
MTBE	0.32	<0.0463	<0.0514	<0.0514	<0.0532	<0.0649	<0.0534	<0.0493	<0.0572	<0.0519	<0.0551	<0.0523
Acenaphthene	570.0	1.34	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	<0.0493	<0.0519	0.0674	<0.0503	<0.0529
Acenaphtylene	15.0	0.548	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	<0.0493	<0.0519	<0.0516	<0.0503	<0.0529
Anthracene	12,000.0	1.23	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	<0.0493	<0.0519	<0.0516	<0.0503	<0.0529
Benzo(a)anthracene	0.9	<0.0493	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	<0.0493	<0.0519	<0.0516	<0.0503	<0.0529
Benzo(a)pyrene	0.09	<0.0493	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	<0.0493	<0.0519	<0.0516	<0.0503	<0.0529
Benzo(b)fluoranthene	0.9	<0.0493	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	<0.0493	<0.0519	<0.0516	<0.0503	<0.0529
Benzo(g,h,i)perylene	2,300.0	<0.0493	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	<0.0493	<0.0519	<0.0516	<0.0503	<0.0529
Benzo(k)fluoranthene	9.0	<0.0493	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	<0.0493	<0.0519	<0.0516	<0.0503	<0.0529
Chrysene	88.0	0.153	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	<0.0493	<0.0519	<0.0516	<0.0503	<0.0529
Dibenz(a,h)anthracene	0.09	<0.0493	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	<0.0493	<0.0519	<0.0516	<0.0503	<0.0529
Fluoranthene	4,300.0	0.298	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	<0.0493	<0.0519	<0.0516	<0.0503	<0.0529
Fluorene	560.0	3.13	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	<0.0493	<0.0519	<0.0516	<0.0503	<0.0529
Indeno(1,2,3-cd)pyrene	0.9	<0.0493	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	<0.0493	<0.0519	<0.0516	<0.0503	<0.0529
Naphthalene	1.8	17.	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	0.0990	0.0937	18.5	<0.0503	0.0584
Phenanthrene	140.0	10.6	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	<0.0493	<0.0519	0.195	<0.0503	<0.0529
Pyrene	2,300.0	1.5	<0.0490	<0.0489	<0.0503	<0.0497	<0.0507	<0.0493	<0.0519	<0.0516	<0.0503	<0.0529

Numbers not bold indicate actual quantities, but are below the TACO Tier 1 Most Stringent Soil Clean-up Objective.
BOLD & SHADING – Exceeds the TACO Tier 1 Most Stringent Soil Clean-up Objective.
Results are in mg/Kg

Marine Bank-Cantrall
Site Assessment Data

Groundwater 2021
Analytical Results

	Location	MW-1A	MW-2A	MW-3A	MW-4A	MW-5A	MW-9A	MW-14A
	Date	9/7/2021	9/7/2021	9/7/2021	9/7/2021	9/7/2021	9/7/2021	9/7/2021
Parameter	Class I CUO							
Benzene	**0.005**	**1.43**	**0.250**	<0.00100	<0.00100	<0.00100	0.00291	**0.264**
Ethylbenzene	**0.7**	0.2	0.0400	<0.00100	0.471	0.0122	0.0913	0.00912
Toluene	**1.0**	0.0176	0.00608	<0.00100	<0.00100	<0.00100	0.00604	0.00374
Total Xylenes	**10.0**	0.331	0.0148	<0.00200	0.0582	0.0569	0.0837	0.00592
MTBE	**0.07**	0.0136	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	0.0167
Acenaphthene	**0.42**	0.000216	0.00258	0.0194	0.00451	0.00104	0.000994	<0.000100
Acenaphtylene	**0.210**	<0.000100	0.000328	0.00720	0.00208	0.000589	0.000368	<0.000100
Anthracene	**2.1**	<0.000100	0.00294	0.0141	0.00337	0.000718	<0.000152	<0.000100
Benzo(a)anthracene	**0.00013**	<0.000100	<0.000100	**0.00116**	**0.000607**	**0.000150**	<0.000152	<0.000100
Benzo(a)pyrene	**0.0002**	<0.000100	<0.000100	**0.000319**	0.000132	<0.000100	<0.000152	<0.000100
Benzo(b)fluoranthene	**0.00018**	<0.000100	<0.000100	**0.000327**	0.000104	<0.000100	<0.000152	<0.000100
Benzo(g,h,i)perylene	**0.21**	<0.000100	<0.000100	0.000268	0.000127	<0.000100	<0.000152	<0.000100
Benzo(k)fluoranthene	**0.00017**	<0.000100	<0.000100	0.000140	<0.000100	<0.000100	<0.000152	<0.000100
Chrysene	**0.0015**	<0.000100	<0.000100	**0.00214**	0.000879	0.000156	<0.000152	<0.000100
Dibenz(a,h)anthracene	**0.0003**	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000152	<0.000100
Fluoranthene	**0.28**	<0.000100	0.000206	0.00464	0.00158	0.000337	<0.000152	<0.000100
Fluorene	**0.28**	0.000194	0.00258	0.0447	0.00915	0.00202	0.00159	<0.000100
Indeno(1,2,3-cd)pyrene	**0.00043**	<0.000100	<0.000100	0.000141	<0.000100	<0.000100	<0.000152	<0.000100
Naphthalene	**0.14**	0.00621	**0.178**	**0.514**	**0.179**	0.0382	0.0935	0.00167
Phenanthrene	**0.21**	<0.000100	0.00170	0.131	0.0314	0.00385	0.00156	<0.000100
Pyrene	**0.21**	<0.000100	0.000202	0.0178	0.00519	0.000825	0.000168	<0.000100

Numbers not bold indicate actual quantities, but are below the TACO Tier 1 Most Stringent Soil Clean-up Objective.
BOLD & SHADING -- Exceeds the TACO Tier 1 Most Stringent Soil Clean-up Objective.
Results are in mg/L

Marine Bank- Cantrall
Site Assessment Data

Soil 9-5-2023
Analytical Results

	Location	SB-18A	SB-18B	SB-19A	SB-19B	SB-20A	SB-20B	SB-21C	SB-21D
	Date	9/5/2023	9/5/2023	9/5/2023	9/5/2023	9/5/2023	9/5/2023	9/5/2023	9/5/2023
	Depth	2.5'	7.5'	2.5'	7.5'	2.5'	7.5'	12.5	17.5
Parameter	Tier I CUO								
Benzene	**0.03**	<0.0103	<0.0142	<0.0135	<0.0133	**0.0941**	**0.0994**	**0.0675**	**0.0702**
Ethylbenzene	**13.0**	<0.0412	<0.0568	<0.0539	<0.0533	0.0568	0.0632	<0.120	<0.120
Toluene	**12.0**	<0.0412	<0.0568	<0.0539	<0.0533	<0.0533	<0.0520	<0.120	<0.120
Total Xylenes	**150.0**	<0.0824	<0.114	<0.108	<0.107	0.186	<0.104	<0.120	<0.120
MTBE	**0.32**	<0.0412	<0.0568	<0.0539	<0.0533	<0.0533	<0.0520	<0.120	<0.120
Acenaphthene	**570.0**	<0.00699	<0.00746	0.898	1.33	0.0157	<0.00687		
Acenaphtylene	**15.0**	<0.0112	<0.120	0.0297	0.0269	<0.0110	<0.0110		
Anthracene	**12,000.0**	<0.0100	<0.0107	0.249	0.241	0.0107	<0.00985		
Benzo(a)anthracene	**0.9**	<0.00967	<0.0103	0.114	0.136	0.0219	<0.00950		
Benzo(a)pyrene	**0.09**	<0.0704	<0.00751	0.0662	0.0781	0.0303	<0.00691		
Benzo(b)fluoranthene	**0.9**	<0.00877	<0.00936	0.0255	0.0286	0.0105	<0.00862		
Benzo(g,h,i)perylene	**2,300.0**	<0.00604	<0.00644	0.0492	0.058	0.0457	0.00815		
Benzo(k)fluoranthene	**9.0**	<0.00924	<0.00987	0.0128	0.0144	<0.00901	<0.00908		
Chrysene	**88.0**	<0.00958	<0.0102	0.0698	0.0794	0.0172	<0.00942		
Dibenz(a,h)anthracene	**0.09**	<0.00639	<0.00682	<0.00625	<0.00665	<0.00623	<0.00628		
Fluoranthene	**4,300.0**	<0.0161	<0.0172	0.148	0.146	<0.0157	<0.0158		
Fluorene	**560.0**	<0.0117	<0.0125	0.448	0.462	0.0248	<0.0115		
Indeno(1,2,3-cd)pyrene	**0.9**	<0.00826	<0.00881	0.0164	0.0174	0.0122	<0.00811		
Naphthalene	**1.8**	0.163	0.168	**89.3**	**116.**	0.733	1.50		
Phenanthrene	**140.0**	<0.0191	<0.0204	0.822	0.939	0.0555	<0.0188		
Pyrene	**2,300.0**	<0.0244	<0.0260	0.259	0.284	0.205	<0.0240		

Numbers not bold indicate actual quantities, but are below the TACO Tier I Most Stringent Soil Clean-up Objective.
BOLD & SHADING – Exceeds the TACO Tier I Most Stringent Soil Clean-up Objective.
Results are in mg/Kg

Marine Bank- Cantrall
Site Assessment Data

TACO
Analytical Results

Marine Bank Trust	
9/5/2023	
Sample ID: PTACO	
Parameter	Result
FOC	1.08%
Gravel	0%
Sand	14.50%
Silt	74.1%
Clay	11.4%
Soil Bulk Density	1.640 gm/cm^3
Soil Specifc Gravity	2.657
Percent Moisture	20.00%

SUBURBAN LABORATORIES, Inc.

1950 S. Batavia Ave., Suite 150 Geneva, Illinois 60134
Tel. (708) 544-3260 • Toll Free (800) 783-LABS
Fax (708) 544-8587
www.suburbanlabs.com

September 15, 2023

Carol Rowe
GWM Company, Inc
701 West South Grand
Springfield, IL 62704

Workorder: 2309516

TEL: (217) 522-8001
FAX: (217) 522-8009
RE: Marine Bank Trust

Dear Carol Rowe:

Suburban Laboratories, Inc. received 9 sample(s) on 9/8/2023 for the analyses presented in the following report.

All data for the associated quality control (QC) met EPA, method, or internal laboratory specifications except where noted in the case narrative. If you are comparing these results to external QC specifications or compliance limits and have any questions, please contact us.

This final report of laboratory analysis consists of this cover letter, case narrative, analytical report, dates report, and any accompanying documentation including, but not limited to, chain of custody records, raw data, and letters of explanation or reliance. This report may not be reproduced, except in full, without the prior written approval of Suburban Laboratories, Inc.

If you have any questions regarding these test results, please call me at (708) 544-3260.

Sincerely,

Dan Galeher
Project Manager
708-544-3260 ext 216
dan@SuburbanLabs.com

Suburban Laboratories, Inc.
1950 S. Batavia Ave., Suite 150, Geneva, IL 60134 (708) 544-3260

Case Narrative

Client: CWM Company, Inc
Project: Marine Bank Trust
WorkOrder: 2309516
Temperature of samples upon receipt at SLI: 4.3 C

Date: September 15, 2023
PO #:
QC Level:
Chain of Custody #:

General Comments:
- All results reported in wet weight unless otherwise indicated. (dry = Dry Weight)
- Sample results relate only to the analytes of interest tested and to sample as received by the laboratory.
- Environmental compliance sample results meet the requirements of 35 IAC Part 186 unless otherwise indicated.
- Waste water analysis follows the rules set forth in 40 CFR part 136 except where otherwise noted.
- Accreditation by the State of Illinois is not an endorsement or a guarantee of the validity of data generated.
- For more information about the laboratories' scope of accreditation, please contact us at (708) 544-3260 or the Agency at (217) 782-6455.
- All radiological results are reported to the 95% confidence level.

Abbreviations:
- Reporting Limit: The concentration at which an analyte can be routinely detected on a day to day basis, and which also meets regulatory and client needs.
- Quantitation Limit: The lowest concentration at which results can be accurately quantitated.
- J: The analyte was positively identified above our Method Detection Limit and is considered detectable and usable; however, the associated numerical value is the approximate concentration of the analyte in the sample.
- ATC: Automatic Temperature Correction. - TNTC: Too Numerous To Count
- TIC: Tentatively Identified Compound (GCMS library search identification, concentration estimated to nearest internal standard).
- SS: (Surrogate Standard): Quality control compound added to the sample by the lab.
-LA: Lab Accident - No valid data to report.
-VO: Insufficient Volume provided
-BR: Received broken
-IP: Invalid Sampling

Method References:
For a complete list of method references please contact us.
- E: USEPA Reference methods
- SW: USEPA, Test Methods for Evaluating Solid Waste (SW-846)
- M: Standard Methods for the Examination of Water and Wastewater
- USP: Latest version of United States Pharmacopeia

Workorder Specific Comments:

Suburban Laboratories, Inc.
1950 S. Batavia Ave., Suite 150, Geneva, IL 60134 (708) 544-3260

Laboratory Results

Client ID: CWM Company, Inc
Project Name: Marine Bank Trust

Report Date: September 15, 2023
Workorder: 2309516

Client Sample ID: SB18A
Lab ID: 2309516-001

Date Received: 09/08/2023 9:52 AM

Matrix: SOIL
Collection Date: 09/05/2023 3:40 PM

Parameter	Result	Report Limit	Qual	Units	Dilution Factor	Date Analyzed	Batch ID
VOLATILE ORGANIC COMPOUNDS		Method: EPA-8260B-Rev 2; Dec-96				Analyst: RWM	
Benzene	ND	0.0103		mg/Kg-dry	32.6	09/08/2023 8:06 PM	R167131
Ethylbenzene	ND	0.0412		mg/Kg-dry	32.6	09/08/2023 8:06 PM	R167131
m,p-Xylene	ND	0.0824		mg/Kg-dry	32.6	09/08/2023 8:06 PM	R167131
Methyl tert-butyl ether	ND	0.0412		mg/Kg-dry	32.6	09/08/2023 8:06 PM	R167131
o-Xylene	ND	0.0412		mg/Kg-dry	32.6	09/08/2023 8:06 PM	R167131
Total Xylenes	ND	0.0824		mg/Kg-dry	32.6	09/08/2023 8:06 PM	R167131
Toluene	ND	0.0412		mg/Kg-dry	32.6	09/08/2023 8:06 PM	R167131
Internal Quality Control Compounds							
SS: 4-Bromofluorobenzene	112	79-122		%Rec	32.6	09/08/2023 8:06 PM	R167131
SS: Dibromofluoromethane	83.6	63-129		%Rec	32.6	09/08/2023 8:06 PM	R167131
SS: Toluene-d8	99.7	79-119		%Rec	32.6	09/08/2023 8:06 PM	R167131
SEMIVOLATILE ORGANICS, BY GCMS SIM		Method: EPA-8270C-Rev 3; Dec-96				Analyst: BM	
Acenaphthene	ND	0.00699		mg/Kg-dry	1	09/12/2023 9:28 AM	92222
Acenaphthylene	ND	0.0112		mg/Kg-dry	1	09/12/2023 9:28 AM	92222
Anthracene	ND	0.0100		mg/Kg-dry	1	09/12/2023 9:28 AM	92222
Benzo(a)anthracene	ND	0.00967		mg/Kg-dry	1	09/12/2023 9:28 AM	92222
Benzo(a)pyrene	ND	0.00704		mg/Kg-dry	1	09/12/2023 9:28 AM	92222
Benzo(b)fluoranthene	ND	0.00877		mg/Kg-dry	1	09/12/2023 9:28 AM	92222
Benzo(g,h,i)perylene	ND	0.00804		mg/Kg-dry	1	09/12/2023 9:28 AM	92222
Benzo(k)fluoranthene	ND	0.00924		mg/Kg-dry	1	09/12/2023 9:28 AM	92222
Chrysene	ND	0.00958		mg/Kg-dry	1	09/12/2023 9:28 AM	92222
Dibenzo(a,h)anthracene	ND	0.00639		mg/Kg-dry	1	09/12/2023 9:28 AM	92222
Fluoranthene	ND	0.0161		mg/Kg-dry	1	09/12/2023 9:28 AM	92222
Fluorene	ND	0.0117		mg/Kg-dry	1	09/12/2023 9:28 AM	92222
Indeno(1,2,3-cd)pyrene	ND	0.00826		mg/Kg-dry	1	09/12/2023 9:28 AM	92222
Naphthalene	0.163	0.0216		mg/Kg-dry	1	09/12/2023 9:28 AM	92222
Phenanthrene	ND	0.0191		mg/Kg-dry	1	09/12/2023 9:28 AM	92222
Pyrene	ND	0.0244		mg/Kg-dry	1	09/12/2023 9:28 AM	92222
Internal Quality Control Compounds							
SS: 2-Fluorobiphenyl	81.2	56-123		%Rec	1	09/12/2023 9:28 AM	92222
SS: 4-Terphenyl-d14	101	44-136		%Rec	1	09/12/2023 9:28 AM	92222
SS: Nitrobenzene-d5	82.4	62-129		%Rec	1	09/12/2023 9:28 AM	92222
PERCENT MOISTURE		Method: ASTM-D2216-Rev 2005				Analyst: KC	
Percent Moisture	21	1.0	c	wt%	1	09/11/2023 9:41 AM	R167127

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Laboratory Results

Client ID: CWM Company, Inc
Project Name: Marine Bank Trust

Report Date: September 15, 2023
Workorder: 2309516

Client Sample ID: SB18B
Lab ID: 2309516-002 Date Received: 09/08/2023 9:52 AM

Matrix: SOIL
Collection Date: 09/05/2023 3:40 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
VOLATILE ORGANIC COMPOUNDS		Method: EPA-8260B-Rev 2, Dec-96				Analyst: RWM	
Benzene	ND	0.0142		mg/Kg-dry	43.34	09/08/2023 8:31 PM	R167131
Ethylbenzene	ND	0.0568		mg/Kg-dry	43.34	09/08/2023 8:31 PM	R167131
m,p-Xylene	ND	0.114		mg/Kg-dry	43.34	09/08/2023 8:31 PM	R167131
Methyl tert-butyl ether	ND	0.0568		mg/Kg-dry	43.34	09/08/2023 8:31 PM	R167131
o-Xylene	ND	0.0568		mg/Kg-dry	43.34	09/08/2023 8:31 PM	R167131
Total Xylenes	ND	0.114		mg/Kg-dry	43.34	09/08/2023 8:31 PM	R167131
Toluene	ND	0.0568		mg/Kg-dry	43.34	09/08/2023 8:31 PM	R167131
Internal Quality Control Compounds							
SS: 4-Bromofluorobenzene	111	79-122		%Rec	43.34	09/08/2023 8:31 PM	R167131
SS: Dibromofluoromethane	82.3	63-129		%Rec	43.34	09/08/2023 8:31 PM	R167131
SS: Toluene-d8	99.4	79-119		%Rec	43.34	09/08/2023 8:31 PM	R167131
SEMIVOLATILE ORGANICS, BY GCMS SIM		Method: EPA-8270C-Rev 3, Dec-96				Analyst: BM	
Acenaphthene	ND	0.00746		mg/Kg-dry	1	09/12/2023 10:01 AM	92222
Acenaphthylene	ND	0.0120		mg/Kg-dry	1	09/12/2023 10:01 AM	92222
Anthracene	ND	0.0107		mg/Kg-dry	1	09/12/2023 10:01 AM	92222
Benzo(a)anthracene	ND	0.0103		mg/Kg-dry	1	09/12/2023 10:01 AM	92222
Benzo(a)pyrene	ND	0.00751		mg/Kg-dry	1	09/12/2023 10:01 AM	92222
Benzo(b)fluoranthene	ND	0.00936		mg/Kg-dry	1	09/12/2023 10:01 AM	92222
Benzo(g,h,i)perylene	ND	0.00644		mg/Kg-dry	1	09/12/2023 10:01 AM	92222
Benzo(k)fluoranthene	ND	0.00987		mg/Kg-dry	1	09/12/2023 10:01 AM	92222
Chrysene	ND	0.0102		mg/Kg-dry	1	09/12/2023 10:01 AM	92222
Dibenzo(a,h)anthracene	ND	0.00682		mg/Kg-dry	1	09/12/2023 10:01 AM	92222
Fluoranthene	ND	0.0172		mg/Kg-dry	1	09/12/2023 10:01 AM	92222
Fluorene	ND	0.0125		mg/Kg-dry	1	09/12/2023 10:01 AM	92222
Indeno(1,2,3-cd)pyrene	ND	0.00681		mg/Kg-dry	1	09/12/2023 10:01 AM	92222
Naphthalene	0.165	0.0230		mg/Kg-dry	1	09/12/2023 10:01 AM	92222
Phenanthrene	ND	0.0204		mg/Kg-dry	1	09/12/2023 10:01 AM	92222
Pyrene	ND	0.0260		mg/Kg-dry	1	09/12/2023 10:01 AM	92222
Internal Quality Control Compounds							
SS: 2-Fluorobiphenyl	83.6	56-123		%Rec	1	09/12/2023 10:01 AM	92222
SS: 4-Terphenyl-d14	107	44-136		%Rec	1	09/12/2023 10:01 AM	92222
SS: Nitrobenzene-d5	84.8	62-129		%Rec	1	09/12/2023 10:01 AM	92222
PERCENT MOISTURE		Method: ASTM-D2216-Rev 2005				Analyst: KC	
Percent Moisture	24	1.0	c	wt%	1	09/11/2023 9:41 AM	R167127

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Laboratory Results

Client ID: CWM Company, Inc
Project Name: Marine Bank Trust

Report Date: September 15, 2023
Workorder: 2309516

Client Sample ID: SB19A
Lab ID: 2309516-003 Date Received: 09/08/2023 9:52 AM

Matrix: SOIL
Collection Date: 09/05/2023 3:50 PM

Parameter	Result	Report Limit	Qual	Units	Dilution Factor	Date Analyzed	Batch ID
VOLATILE ORGANIC COMPOUNDS		Method: EPA-8260B-Rev 2, Dec-96				Analyst: RWM	
Benzene	ND	0.0135		mg/Kg-dry	42.51	09/08/2023 10:38 PM	R167131
Ethylbenzene	ND	0.0539		mg/Kg-dry	42.51	09/08/2023 10:38 PM	R167131
m,p-Xylene	ND	0.108		mg/Kg-dry	42.51	09/08/2023 10:38 PM	R167131
Methyl tert butyl ether	ND	0.0539		mg/Kg-dry	42.51	09/08/2023 10:38 PM	R167131
o-Xylene	ND	0.0539		mg/Kg-dry	42.51	09/08/2023 10:38 PM	R167131
Total Xylenes	ND	0.108		mg/Kg-dry	42.51	09/08/2023 10:38 PM	R167131
Toluene	ND	0.0539		mg/Kg-dry	42.51	09/08/2023 10:38 PM	R167131
Internal Quality Control Compounds							
SS: 4-Bromofluorobenzene	106	79-122		%Rec	42.51	09/08/2023 10:38 PM	R167131
SS: Dibromofluoromethane	81.7	63-129		%Rec	42.51	09/08/2023 10:38 PM	R167131
SS: Toluene-d8	92.3	79-119		%Rec	42.51	09/08/2023 10:38 PM	R167131
SEMIVOLATILE ORGANICS, BY GCMS SIM		Method: EPA 8270C-Rev 3, Dec-96				Analyst: BM	
Acenaphthene	0.898	0.00684		mg/Kg-dry	1	09/12/2023 11:39 AM	92222
Acenaphthylene	0.0297	0.0110		mg/Kg-dry	1	09/12/2023 11:39 AM	92222
Anthracene	0.249	0.00981		mg/Kg-dry	1	09/12/2023 11:39 AM	92222
Benzo(a)anthracene	0.114	0.00946		mg/Kg-dry	1	09/12/2023 11:39 AM	92222
Benzo(a)pyrene	0.0662	0.00688		mg/Kg-dry	1	09/12/2023 11:39 AM	92222
Benzo(b)fluoranthene	0.0255	0.00858		mg/Kg-dry	1	09/12/2023 11:39 AM	92222
Benzo(g,h,i)perylene	0.0492	0.00591		mg/Kg-dry	1	09/12/2023 11:39 AM	92222
Benzo(k)fluoranthene	0.0128	0.00904		mg/Kg-dry	1	09/12/2023 11:39 AM	92222
Chrysene	0.0898	0.00938		mg/Kg-dry	1	09/12/2023 11:39 AM	92222
Dibenzo(a,h)anthracene	ND	0.00625		mg/Kg-dry	1	09/12/2023 11:39 AM	92222
Fluoranthene	0.148	0.0157		mg/Kg-dry	1	09/12/2023 11:39 AM	92222
Fluorene	0.448	0.0115		mg/Kg-dry	1	09/12/2023 11:39 AM	92222
Indeno(1,2,3-cd)pyrene	0.0164	0.00808		mg/Kg-dry	1	09/12/2023 11:39 AM	92222
Naphthalene	89.3	2.11		mg/Kg-dry	100	09/13/2023 12:12 AM	92222
Phenanthrene	0.822	0.0187		mg/Kg-dry	1	09/12/2023 11:39 AM	92222
Pyrene	0.259	0.0239		mg/Kg-dry	1	09/12/2023 11:39 AM	92222
Internal Quality Control Compounds							
SS: 2-Fluorobiphenyl	77.9	56-123		%Rec	1	09/12/2023 11:39 AM	92222
SS: 4-Terphenyl-d14	105	44-136		%Rec	1	09/12/2023 11:39 AM	92222
SS: Nitrobenzene-d5	85.8	62-129		%Rec	1	09/12/2023 11:39 AM	92222
PERCENT MOISTURE		Method: ASTM-D2216-Rev 2005				Analyst: KC	
Percent Moisture	21	1.0	c	wt%	1	09/11/2023 9:41 AM	R167127

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Laboratory Results

Client ID: CWM Company, Inc
Project Name: Marine Bank Trust

Report Date: September 15, 2023
Workorder: 2309516

Client Sample ID: SB19B
Lab ID: 2309516-004 Date Received: 09/08/2023 9:52 AM

Matrix: SOIL
Collection Date: 09/05/2023 3:50 PM

Parameter	Result	Report Limit	Qual	Units	Dilution Factor	Date Analyzed	Batch ID
VOLATILE ORGANIC COMPOUNDS		Method: EPA-8260B Rev 2, Dec-96				Analyst: RWM	
Benzene	ND	0.0133		mg/Kg-dry	41.9	09/08/2023 11:03 PM	R167131
Ethylbenzene	ND	0.0533		mg/Kg-dry	41.9	09/08/2023 11:03 PM	R167131
m,p-Xylene	ND	0.107		mg/Kg-dry	41.9	09/08/2023 11:03 PM	R167131
Methyl tert-butyl ether	ND	0.0533		mg/Kg-dry	41.9	09/08/2023 11:03 PM	R167131
o-Xylene	ND	0.0533		mg/Kg-dry	41.9	09/08/2023 11:03 PM	R167131
Total Xylenes	ND	0.107		mg/Kg-dry	41.9	09/08/2023 11:03 PM	R167131
Toluene	ND	0.0533		mg/Kg-dry	41.9	09/08/2023 11:03 PM	R167131
Internal Quality Control Compounds							
SS: 4-Bromofluorobenzene	97.4	79-122		%Rec	41.9	09/08/2023 11:03 PM	R167131
SS: Dibromofluoromethane	81.5	83-129		%Rec	41.9	09/08/2023 11:03 PM	R167131
SS: Toluene-d8	93.9	79-119		%Rec	41.9	09/08/2023 11:03 PM	R167131
SEMIVOLATILE ORGANICS, BY GCMS SIM		Method: EPA-8270C-Rev 3, Dec-96				Analyst: BM	
Acenaphthene	1.33	0.00727		mg/Kg-dry	1	09/12/2023 12:12 PM	92222
Acenaphthylene	0.0269	0.0117		mg/Kg-dry	1	09/12/2023 12:12 PM	92222
Anthracene	0.241	0.0104		mg/Kg-dry	1	09/12/2023 12:12 PM	92222
Benzo(a)anthracene	0.136	0.0101		mg/Kg-dry	1	09/12/2023 12:12 PM	92222
Benzo(a)pyrene	0.0781	0.00732		mg/Kg-dry	1	09/12/2023 12:12 PM	92222
Benzo(b)fluoranthene	0.0286	0.00912		mg/Kg-dry	1	09/12/2023 12:12 PM	92222
Benzo(g,h,i)perylene	0.0580	0.00628		mg/Kg-dry	1	09/12/2023 12:12 PM	92222
Benzo(k)fluoranthene	0.0144	0.00962		mg/Kg-dry	1	09/12/2023 12:12 PM	92222
Chrysene	0.0794	0.00997		mg/Kg-dry	1	09/12/2023 12:12 PM	92222
Dibenzo(a,h)anthracene	ND	0.00665		mg/Kg-dry	1	09/12/2023 12:12 PM	92222
Fluoranthene	0.148	0.0167		mg/Kg-dry	1	09/12/2023 12:12 PM	92222
Fluorene	0.462	0.0122		mg/Kg-dry	1	09/12/2023 12:12 PM	92222
Indeno(1,2,3-cd)pyrene	0.0174	0.00859		mg/Kg-dry	1	09/12/2023 12:12 PM	92222
Naphthalene	116	2.25		mg/Kg-dry	100	09/13/2023 12:44 AM	92222
Phenanthrene	0.939	0.0199		mg/Kg-dry	1	09/12/2023 12:12 PM	92222
Pyrene	0.264	0.0264		mg/Kg-dry	1	09/12/2023 12:12 PM	92222
Internal Quality Control Compounds							
SS: 2-Fluorobiphenyl	77.0	56-123		%Rec	1	09/12/2023 12:12 PM	92222
SS: 4-Terphenyl-d14	107	44-136		%Rec	1	09/12/2023 12:12 PM	92222
SS: Nitrobenzene-d5	62.9	62-129		%Rec	1	09/12/2023 12:12 PM	92222
PERCENT MOISTURE		Method: ASTM D2216-Rev 2005				Analyst: KC	
Percent Moisture	21	1.0	c	wt%	1	09/11/2023 9:41 AM	R167127

Suburban Laboratories, Inc.
1750 S. Batavia Ave., Suite 150, Geneva, IL 60134 (708) 544-3260

Laboratory Results

Client ID: CWM Company, Inc
Project Name: Marine Bank Trust

Report Date: September 15, 2023
Workorder: 2309516

Client Sample ID: SB20A
Lab ID: 2309516-005 Date Received: 09/08/2023 9:52 AM

Matrix: SOIL
Collection Date: 09/05/2023 4:05 PM

Parameter	Result	Report Limit	Qual	Units	Dilution Factor	Date Analyzed	Batch ID
VOLATILE ORGANIC COMPOUNDS		Method: EPA-8260B-Rev 2, Dec-96				Analyst: RWM	
Benzene	0.0941	0.0133		mg/Kg-dry	42	09/08/2023 8:57 PM	R167131
Ethylbenzene	0.0568	0.0533		mg/Kg-dry	42	09/08/2023 8:57 PM	R167131
m,p-Xylene	0.186	0.107		mg/Kg-dry	42	09/08/2023 8:57 PM	R167131
Methyl tert-butyl ether	ND	0.0533		mg/Kg-dry	42	09/08/2023 8:57 PM	R167131
o-Xylene	ND	0.0533		mg/Kg-dry	42	09/08/2023 8:57 PM	R167131
Total Xylenes	0.186	0.107		mg/Kg-dry	42	09/08/2023 8:57 PM	R167131
Toluene	ND	0.0533		mg/Kg-dry	42	09/08/2023 8:57 PM	R167131
Internal Quality Control Compounds							
SS: 4-Bromofluorobenzene	111	79-122		%Rec	42	09/08/2023 8:57 PM	R167131
SS: Dibromofluoromethane	83.1	63-129		%Rec	42	09/08/2023 8:57 PM	R167131
SS: Toluene-d8	101	79-119		%Rec	42	09/08/2023 8:57 PM	R167131
SEMIVOLATILE ORGANICS, BY GCMS SIM		Method: EPA-8270C-Rev 3, Dec-96				Analyst: BM	
Acenaphthene	0.0157	0.00681		mg/Kg-dry	1	09/12/2023 12:46 PM	92222
Acenaphthylene	ND	0.0110		mg/Kg-dry	1	09/12/2023 12:46 PM	92222
Anthracene	0.0107	0.00977		mg/Kg-dry	1	09/12/2023 12:46 PM	92222
Benzo(a)anthracene	0.0219	0.00943		mg/Kg-dry	1	09/12/2023 12:46 PM	92222
Benzo(a)pyrene	0.0303	0.00686		mg/Kg-dry	1	09/12/2023 12:46 PM	92222
Benzo(b)fluoranthene	0.0105	0.00855		mg/Kg-dry	1	09/12/2023 12:46 PM	92222
Benzo(g,h,i)perylene	0.0457	0.00589		mg/Kg-dry	1	09/12/2023 12:46 PM	92222
Benzo(k)fluoranthene	ND	0.00901		mg/Kg-dry	1	09/12/2023 12:46 PM	92222
Chrysene	0.0172	0.00936		mg/Kg-dry	1	09/12/2023 12:46 PM	92222
Dibenzo(a,h)anthracene	ND	0.00623		mg/Kg-dry	1	09/12/2023 12:46 PM	92222
Fluoranthene	ND	0.0157		mg/Kg-dry	1	09/12/2023 12:46 PM	92222
Fluorene	0.0248	0.0114		mg/Kg-dry	1	09/12/2023 12:46 PM	92222
Indeno(1,2,3-cd)pyrene	0.0122	0.00805		mg/Kg-dry	1	09/12/2023 12:46 PM	92222
Naphthalene	0.733	0.0210		mg/Kg-dry	1	09/12/2023 12:46 PM	92222
Phenanthrene	0.0555	0.0187		mg/Kg-dry	1	09/12/2023 12:46 PM	92222
Pyrene	0.205	0.0238		mg/Kg-dry	1	09/12/2023 12:46 PM	92222
Internal Quality Control Compounds							
SS: 2-Fluorobiphenyl	81.2	56-123		%Rec	1	09/12/2023 12:46 PM	92222
SS: 4-Terphenyl-d14	103	44-136		%Rec	1	09/12/2023 12:46 PM	92222
SS: Nitrobenzene-d5	87.6	62-129		%Rec	1	09/12/2023 12:46 PM	92222
PERCENT MOISTURE		Method: ASTM-D2216-Rev 2005				Analyst: KC	
Percent Moisture	21	1.0	c	wt%	1	09/11/2023 9:41 AM	R167127

Suburban Laboratories, Inc.
1950 S. Batavia Ave., Suite 150, Geneva, IL 60134 (708)514-3760

Laboratory Results

Client ID: CWM Company, Inc
Project Name: Marine Bank Trust

Report Date: September 15, 2023
Workorder: 2309516

Client Sample ID: SB20B
Lab ID: 2309516-006

Date Received: 09/08/2023 9:52 AM

Matrix: SOIL
Collection Date: 09/05/2023 4:05 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
VOLATILE ORGANIC COMPOUNDS		Method: EPA-8260B-Rev 2, Dec-96				Analyst: RWM	
Benzene	0.0994	0.0130		mg/Kg-dry	42.74	09/08/2023 9:22 PM	R167131
Ethylbenzene	0.0632	0.0520		mg/Kg-dry	42.74	09/08/2023 9:22 PM	R167131
m,p-Xylene	ND	0.104		mg/Kg-dry	42.74	09/08/2023 9:22 PM	R167131
Methyl tert-butyl ether	ND	0.0520		mg/Kg-dry	42.74	09/08/2023 9:22 PM	R167131
o-Xylene	ND	0.0520		mg/Kg-dry	42.74	09/08/2023 9:22 PM	R167131
Total Xylenes	ND	0.104		mg/Kg-dry	42.74	09/08/2023 9:22 PM	R167131
Toluene	ND	0.0520		mg/Kg-dry	42.74	09/08/2023 9:22 PM	R167131
Internal Quality Control Compounds							
SS: 4-Bromofluorobenzene	112	79-122		%Rec	42.74	09/08/2023 9:22 PM	R167131
SS: Dibromofluoromethane	81.4	63-129		%Rec	42.74	09/08/2023 9:22 PM	R167131
SS: Toluene-d8	99.8	79-119		%Rec	42.74	09/08/2023 9:22 PM	R167131
SEMIVOLATILE ORGANICS, BY GCMS SIM		Method: EPA-8270C-Rev 3, Dec-96				Analyst: BM	
Acenaphthene	ND	0.00687		mg/Kg-dry	1	09/12/2023 1:19 PM	92222
Acenaphthylene	ND	0.0110		mg/Kg-dry	1	09/12/2023 1:19 PM	92222
Anthracene	ND	0.00985		mg/Kg-dry	1	09/12/2023 1:19 PM	92222
Benzo(a)anthracene	ND	0.00950		mg/Kg-dry	1	09/12/2023 1:19 PM	92222
Benzo(a)pyrene	ND	0.00691		mg/Kg-dry	1	09/12/2023 1:19 PM	92222
Benzo(b)fluoranthene	ND	0.00862		mg/Kg-dry	1	09/12/2023 1:19 PM	92222
Benzo(g,h,i)perylene	0.00815	0.00593		mg/Kg-dry	1	09/12/2023 1:19 PM	92222
Benzo(k)fluoranthene	ND	0.00908		mg/Kg-dry	1	09/12/2023 1:19 PM	92222
Chrysene	ND	0.00942		mg/Kg-dry	1	09/12/2023 1:19 PM	92222
Dibenzo(a,h)anthracene	ND	0.00628		mg/Kg-dry	1	09/12/2023 1:19 PM	92222
Fluoranthene	ND	0.0158		mg/Kg-dry	1	09/12/2023 1:19 PM	92222
Fluorene	ND	0.0115		mg/Kg-dry	1	09/12/2023 1:19 PM	92222
Indeno(1,2,3-cd)pyrene	ND	0.00811		mg/Kg-dry	1	09/12/2023 1:19 PM	92222
Naphthalene	1.50	0.0212		mg/Kg-dry	1	09/12/2023 1:19 PM	92222
Phenanthrene	ND	0.0188		mg/Kg-dry	1	09/12/2023 1:19 PM	92222
Pyrene	ND	0.0240		mg/Kg-dry	1	09/12/2023 1:19 PM	92222
Internal Quality Control Compounds							
SS: 2-Fluorobiphenyl	84.7	56-123		%Rec	1	09/12/2023 1:19 PM	92222
SS: 4-Terphenyl-d14	109	44-136		%Rec	1	09/12/2023 1:19 PM	92222
SS: Nitrobenzene-d5	87.9	62-129		%Rec	1	09/12/2023 1:19 PM	92222
PERCENT MOISTURE		Method: ASTM-D2216-Rev 2005				Analyst: KC	
Percent Moisture	18	1.0	c	wt%	1	09/11/2023 9:41 AM	R167127

Suburban Laboratories, Inc.
1950 S. Batavia Ave., Suite 150, Geneva, IL 60134 (708) 544-3260

Laboratory Results

Client ID: CWM Company, Inc
Project Name: Marine Bank Trust

Report Date: September 15, 2023
Workorder: 2309516

Client Sample ID: SB21C
Lab ID: 2309516-007 Date Received: 09/08/2023 9:52 AM

Matrix: SOIL
Collection Date: 09/05/2023 12:00 AM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
VOLATILE ORGANIC COMPOUNDS		Method: EPA-8260B-Rev 2, Dec-96				Analyst: RWM	
Benzene	0.0675	0.0127		mg/Kg-dry	40.24	09/08/2023 9:47 PM	R167131
Ethylbenzene	ND	0.0507		mg/Kg-dry	40.24	09/08/2023 9:47 PM	R167131
m,p-Xylene	ND	0.101		mg/Kg-dry	40.24	09/08/2023 9:47 PM	R167131
Methyl tert-butyl ether	ND	0.0507		mg/Kg-dry	40.24	09/08/2023 9:47 PM	R167131
o-Xylene	ND	0.0507		mg/Kg-dry	40.24	09/08/2023 9:47 PM	R167131
Total Xylenes	ND	0.101		mg/Kg-dry	40.24	09/08/2023 9:47 PM	R167131
Toluene	ND	0.0507		mg/Kg-dry	40.24	09/08/2023 9:47 PM	R167131
Internal Quality Control Compounds							
SS: 4-Bromofluorobenzene	112	79-122		%Rec	40.24	09/08/2023 9:47 PM	R167131
SS: Dibromofluoromethane	81.1	63-129		%Rec	40.24	09/08/2023 9:47 PM	R167131
SS: Toluene-d8	99.7	79-119		%Rec	40.24	09/08/2023 9:47 PM	R167131
PERCENT MOISTURE		Method: ASTM-D2216-Rev 2005				Analyst: KC	
Percent Moisture	21	1.0	c	wt%	1	09/11/2023 9:41 AM	R167127

Client Sample ID: SB21D
Lab ID: 2309516-008 Date Received: 09/08/2023 9:52 AM

Matrix: SOIL
Collection Date: 09/05/2023 12:00 AM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
VOLATILE ORGANIC COMPOUNDS		Method: EPA-8260B-Rev 2, Dec-96				Analyst: RWM	
Benzene	0.0702	0.0124		mg/Kg-dry	39.89	09/08/2023 10:12 PM	R167131
Ethylbenzene	ND	0.0494		mg/Kg-dry	39.89	09/08/2023 10:12 PM	R167131
m,p-Xylene	ND	0.0989		mg/Kg-dry	39.89	09/08/2023 10:12 PM	R167131
Methyl tert-butyl ether	ND	0.0494		mg/Kg-dry	39.89	09/08/2023 10:12 PM	R167131
o-Xylene	ND	0.0494		mg/Kg-dry	39.89	09/08/2023 10:12 PM	R167131
Total Xylenes	ND	0.0989		mg/Kg-dry	39.89	09/08/2023 10:12 PM	R167131
Toluene	ND	0.0494		mg/Kg-dry	39.89	09/08/2023 10:12 PM	R167131
Internal Quality Control Compounds							
SS: 4-Bromofluorobenzene	111	79-122		%Rec	39.89	09/08/2023 10:12 PM	R167131
SS: Dibromofluoromethane	82.0	63-129		%Rec	39.89	09/08/2023 10:12 PM	R167131
SS: Toluene-d8	101	79-119		%Rec	39.89	09/08/2023 10:12 PM	R167131
PERCENT MOISTURE		Method: ASTM-D2216-Rev 2005				Analyst: KC	
Percent Moisture	19	1.0	c	wt%	1	09/11/2023 9:41 AM	R167127

Suburban Laboratories, Inc.
1950 S. Batavia Ave., Suite 150, Geneva, IL 60134 (708) 544-3260

Laboratory Results

Client ID: CWM Company, Inc
Project Name: Marine Bank Trust

Report Date: September 15, 2023
Workorder: 2309516

Client Sample ID: PTACO
Lab ID: 2309516-009 Date Received: 09/08/2023 9:52 AM

Matrix: SOIL
Collection Date: 09/05/2023 3:20 PM

Parameter	Result	Report Limit	Qual.	Units	Dilution Factor	Date Analyzed	Batch ID
DRY BULK DENSITY		Method: ASTM-D2937-Rev 2004				Analyst: KC	
Soil Bulk Density (Pb)	1.640	0	c	g/cm³	1	09/12/2023 8:21 AM	R167169
ORGANIC MATTER & ORGANIC CARBON CONTENT		Method: ASTM-D2974-Rev 2000				Analyst: KC	
FOM-Organic Matter (@ 440 C	0.0186	0.00100	c	g/g	1	09/12/2023 8:21 AM	R167167
FOC-Organic Carbon (0.58 Fa	0.0108	0.00100	c	g/g	1	09/12/2023 8:21 AM	R167167
PARTICLE-SIZE ANALYSIS OF SOILS		Method: ASTM-D422-Rev 1963				Analyst: KC	
% Soil in Suspension	COMPLETED	0	c		1	09/11/2023 5:41 PM	R167166
Diameter of Soil Particles	COMPLETED	0	c		1	09/11/2023 5:41 PM	R167166
Hydrometer	COMPLETED	0	c		1	09/11/2023 5:41 PM	R167166
Particle Density	COMPLETED	0	c		1	09/11/2023 5:41 PM	R167166
Sieve Analysis	COMPLETED	0	c		1	09/11/2023 5:41 PM	R167166
SOIL PARTICLE DENSITY		Method: ASTM-D854-Rev 2000				Analyst: KC	
Soil Particle Density (Ps)	2.657	0	c	g/cm³	1	09/12/2023 8:21 AM	R167168
PERCENT MOISTURE		Method: ASTM-D2216-Rev 2005				Analyst: KC	
Percent Moisture	20	1.0	c	wt%	1	09/12/2023 8:21 AM	R167167

Suburban Laboratories, Inc.
1950 S. Batavia Ave., Suite 150, Geneva, IL 60134 / (630) 241-3299

PREP DATES REPORT

Client: CWM Company, Inc
Project: Marine Bank Trust

Report Date: September 15, 2023
Lab Order: 2309516

Sample ID	Collection Date	Batch ID	Prep Test Name	TCLP Date	Prep Date
2309516-001A	9/5/2023 3:40:00 PM	92353	CLOSED SYSTEM P&T VOC Prep		9/15/2023
2309516-001B		92222	SOLID PREP MICROWAVE: BNA		9/11/2023
2309516-002A		92353	CLOSED SYSTEM P&T VOC Prep		9/15/2023
2309516-002B		92222	SOLID PREP MICROWAVE: BNA		9/11/2023
2309516-003A	9/5/2023 3:50:00 PM	92353	CLOSED SYSTEM P&T VOC Prep		9/15/2023
2309516-003B		92222	SOLID PREP MICROWAVE: BNA		9/11/2023
2309516-004A		92353	CLOSED SYSTEM P&T VOC Prep		9/15/2023
2309516-004B		92222	SOLID PREP MICROWAVE: BNA		9/11/2023
2309516-005A	9/5/2023 4:05:00 PM	92353	CLOSED SYSTEM P&T VOC Prep		9/15/2023
2309516-005B		92222	SOLID PREP MICROWAVE: BNA		9/11/2023
2309516-006A		92353	CLOSED SYSTEM P&T VOC Prep		9/15/2023
2309516-006B		92222	SOLID PREP MICROWAVE: BNA		9/11/2023
2309516-007A	9/5/2023	92353	CLOSED SYSTEM P&T VOC Prep		9/15/2023
2309516-008A		92353	CLOSED SYSTEM P&T VOC Prep		9/15/2023

Suburban Laboratories, Inc.
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Qualifier Definitions

WO#: 2309516
Date: 9/15/2023

Qualifiers:

*/x	Value exceeds Maximum Contaminant Level
B	Analyte detected in the associated Method Blank
C	Value is below Minimum Concentration Limit
c	Analyte not in TNI/NELAC scope of accreditation
E	Estimated, detected above quantitation range
G	Refer to case narrative page for specific comments
H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limit (QL)
N	Tentatively identified compounds
ND	Not Detected at the Reporting Limit
P	Present
Q	Accreditation is not available from Wisconsin
R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits
T	Analyte detected in sample trip blank
V	EPA requires field analysis/filtration. Lab analysis would be considered past hold time.
WI	This sample was ran at the Wisconsin Laboratory, WI DNR Certified #246179890

SUBURBAN LABORATORIES, Inc.

1950 S. Batavia Ave. Ste. 150 Geneva, IL 60134 Tel. 708.544.3260 login@suburbanlabs.com www.suburbanlabs.com

CHAIN OF CUSTODY RECORD

Company Name: CW3M Company
Company Address: 701 S. Grand Ave West
City: Springfield State: IL Zip: 62704
Office: 217-522-8001 Mobile: Fax:
Email Address: cwm@cwmcompany.com
Project ID / Location: Marine Bank Trust - Control
Project Manager (Report to): Carol
Sample Collector(s): GTR / JKK

TURNAROUND TIME REQUESTED
[X] Normal [ ] RUSH*
* Must be pre-approved and surcharges apply. Checking this box indicates your approval of surcharges.
Date and Time Report Needed:

Specify Regulatory Program: [ ] None/Info Only
[X] LUST [ ] SRP [ ] SDWA
[ ] 503 Sludge [ ] NPDES [ ] MWRDGC
[ ] Disposal [ ] CCDD [ ] OTHER - Specify Below

ANALYSIS & METHOD REQUESTED
Enter an "X" in box below for request

Page 1 of 1
PO #
Report Type [X] Normal [ ] Special*
* Additional charges apply for QC reports and raw data. Specify in comments section.
Shipping Method

LAB USE ONLY
Work Order # 230516
Temperature of Received Samples 4.3 °C
Received within 24 hours of collection? [ ] No [ ] Yes

	SAMPLE IDENTIFICATION (Use 1 line per container type)	COLLECTION DATE	COLLECTION TIME	MATRIX	GRAB/ COMP.	CONTAINERS Qty	CONTAINERS SIZE & TYPE	PRESERVATIVE	BETX MTBE	PNAs	FOC	Bulk Density	Moisture Content	Sieve Analysis	Particle Density	Lab Comment	LAB #
1	SB18A	9/5/23	1540	S	G	2	40ml/4oz	MeOH/—	X	X							
2	SB18B	"	1540	"	"	"	"	"	X	X							
3	SB19A	"	1550	"	"	"	"	"	X	X							
4	SB19B	"	1550	"	"	"	"	"	X	X							
5	SB20A	"	1605	"	"	"	"	"	X	X							
6	SB20B	"	1605	"	"	"	"	"	X	X							
7	SB21C					↓	↓	↓	X								
8	SB21D					↓	↓	↓	X								
9	PTACO		1520			3/3	40ML	MeOH/STK									
10		↓	↓	↓	↓	3	4oz	—									
11			↓			1	Tube	—									
12																	

MATRIX: Drinking Water (DW), Soil (S), Waste Water (WW), Surface Water(SW), Ground Water (GW), Solid Waste (WA), Sludge (U), Wipe (P) CONTAINER: 2oz, 4oz, 8oz, 40ml Vial, 500ml, Liter (L), Tube, Glass (G), Plastic (P) PRESERVATIVE: H_2SO_4, HCl, HNO_3, Methanol (MeOH) NaOH, Sodium Bisulfate (NaB), NaThio

COMMENTS & SPECIAL INSTRUCTIONS:

1. Relinquished By	Date	2. Relinquished By	Date	3. Relinquished By	Date	4. Relinquished By	Date
	9/14/23		9/15/23				
Received By	Time	Received By	Time	Received By	Time	Received By	Time
[ ] Ice	8:00	[X] Ice	9:13	[ ] Ice		[ ] Ice	

THIS FORM MUST BE FILLED OUT COMPLETELY BY THE SAMPLE COLLECTOR OR SUBMITTER AND ORIGINAL FORM MUST ACCOMPANY SAMPLES AT ALL TIMES. Rev 2/17

000368

SUBURBAN LABORATORIES, Inc.

1950 S. Batavia Ave. Ste. 150 Geneva, IL 60134 Tel. 708.544.3260 login@suburbanlabs.com www.suburbanlabs.com

CHAIN OF CUSTODY RECORD

Company Name: CW3M Company

Company Address: 701 S. Grand Ave West

City: Springfield State: IL Zip: 62704

Office: 217-522-8001 Mobile: Fax:

Email Address: cwm@cwmcompany.com

Project ID / Location: Marine Bank Trust - Canton II

Project Manager (Report to): Carl

Sample Collector(s): GTR / JKK

TURNAROUND TIME REQUESTED

☒ Normal ☐ RUSH*

* Must be pre-approved and surcharges apply. Checking this box indicates your approval of surcharges.

Date and Time Report Needed:

Specify Regulatory Program: ☐ None/Info Only

☒ LUST ☐ SRP ☐ SDWA

☐ 503 Sludge ☐ NPDES ☐ MWRDGC

☐ Disposal ☐ CCDD ☐ OTHER - Specify Below

ANALYSIS & METHOD REQUESTED Enter an "X" in box below for request

BETX MTBE | PNA's | FOC | Bulk Density | Moisture Content | Sieve Analysis | Particle Density | T.O.C.

	SAMPLE IDENTIFICATION (Use 1 line per container type)	COLLECTION DATE	COLLECTION TIME	MATRIX	GRAB/ COMP.	CONTAINERS Qty	CONTAINERS SIZE & TYPE	PRESERVATIVE	BETX MTBE	PNA's	FOC	Bulk Density	Moisture Content	Sieve Analysis	Particle Density	T.O.C.
1	SB18A	9/5/23	1540	S	G	2	40ml/4oz	MeOH/—	X	X						
2	SB18B		1540						X	X						
3	SB19A		1550						X	X						
4	SB19B		1550						X	X						
5	SB20A		1605						X	X						
6	SB20B		1605						X	X						
7	SB21C					↓	↓	↓	X							
8	SB21D					↓	↓		X							
9	PTACO		1520			3/3	40ML	MeOH/STR								
10		↓	↓	↓	↓	3	4oz	—								
11			↓			1	T-bc	—								
12																

Page 1 of 1

PO #

Report Type ☐ Normal ☐ Special*

* Additional charges apply for QC reports and raw data. Specify in comments section

Shipping Method

LAB USE ONLY

Work Order # 23C516

Temperature of Received Samples 4.3 °C

Received within 24 hours of collection? ☐ No ☐ Yes

Lab Comment	LAB #

MATRIX: Drinking Water (DW), Soil (S), Waste Water (WW), Surface Water(SW), Ground Water (GW), Solid Waste (WA), Sludge (U), Wipe (P) CONTAINER: 2oz, 4oz, 8oz, 40ml Vial, 500ml, Liter (L), Tube, Glass (G), Plastic (P) PRESERVATIVE: H_2SO_4, HCl, HNO_3, Methanol (MeOH) NaOH, Sodium Bisulfate (NaB), NaThio

COMMENTS & SPECIAL INSTRUCTIONS:

1. Relinquished By	Date	2. Relinquished By	Date	3. Relinquished By	Date	4. Relinquished By	Date
	9/6/23		9/6/23				
Received By ☐ Ice	Time 8.00	Received By ☐ Ice	Time 11:13	Received By ☐ Ice	Time	Received By ☐ Ice	Time

THIS FORM MUST BE FILLED OUT COMPLETELY BY THE SAMPLE COLLECTOR OR SUBMITTER AND ORIGINAL FORM MUST ACCOMPANY SAMPLES AT ALL TIMES.

Rev 2/17

000369

SUBURBAN LABORATORIES, Inc.
1950 S Batavia Ave Ste. 150 Geneva, Illinois 60134
Tel. (708) 544-3260 · Toll Free (800) 783-LABS · Fax (708) 544-8587
www.suburbanlabs.com

SLI Work Order: 2309516
SLI Sample ID: 2309516-009A

Analysis Date: 9/13/2023

Standard Test Method for Particle-Size Analysis of Soil

		Percent Retained
Sieve (U.S.)	Sieve Opening (mm)	2309516-009A
1-1/2"	38.1	0.00%
1"	25.4	0.00%
0.75"	19.1	0.0%
No. 4	4.75	0.0%
No. 10	2.00	0.1%
No. 20	0.85	0.2%
No. 40	0.420	1.0%
No. 60	0.250	1.7%
No. 140	0.106	6.0%
No. 200	0.075	5.5%

		Percent Present
Particle(s)	Particle Size (mm)	2309516-009A
Gravel	>4.75	0.0%
Sand, Course	4.74-2.0	0.1%
Sand, Medium	1.99-0.420	1.2%
Sand, Fine	0.419-0.075	13.2%
Silt	0.074-0.005	74.1%
Clay	<0.005-0.001	3.5%
Colloids	<0.001	7.9%

Analyst: Kara Coffel — Digitally signed by Kara Coffel Date: 2023.09.14 10:33:08 -05'00' — Date: 9/14/2023

Reviewed: _____ Date: _____

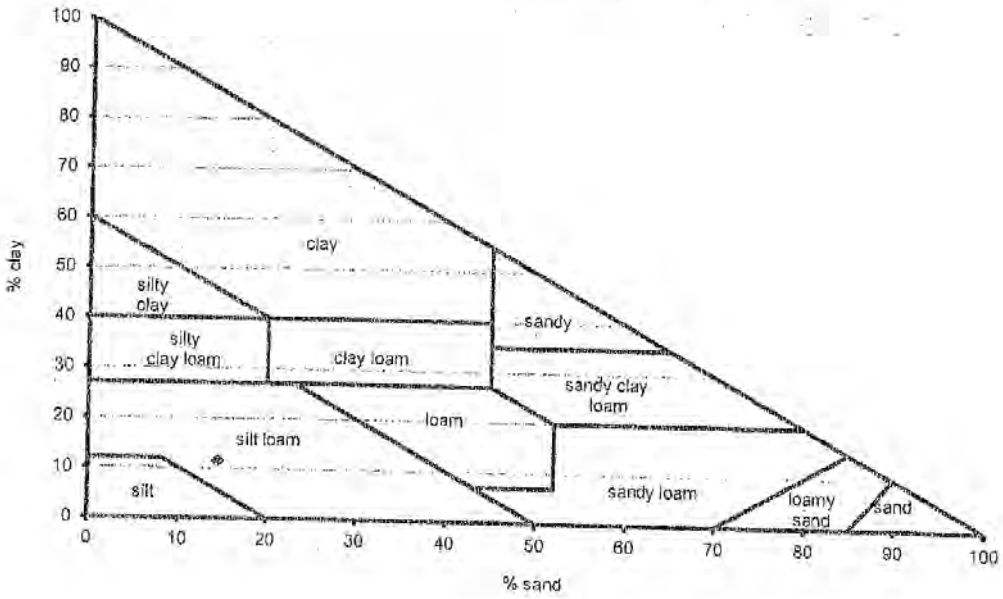
SUBURBAN LABORATORIES, Inc.
1950 S Batavia Ave Ste. 150 Geneva, Illinois 60134
Tel. (708) 544-3260 · Toll Free (800) 783-LABS · Fax (708) 544-8587
www.suburbanlabs.com

SLI Work Order: 2309516
SLI Sample ID: 2309516-009A

Analysis Date: 9/13/2023

% SAND	% CLAY	%SILT
14.5	11.4	74.10

Soil Classification: Silt Loam



Textural triangle by A. Gerakis and B. Baer, 26 July 2000.

Illinois Environmental Protection Agency

Bureau of Land • 1021 N. Grand Avenue E. • P.O. Box 19276 • Springfield • Illinois • 62794-9276

The Agency is authorized to require this information under Section 4 and Title XVI of the Environmental Protection Act (415 ILCS 5/4, 5/57 – 57.17). Failure to disclose this information may result in a civil penalty of not to exceed $50,000.00 for the violation and an additional civil penalty of not to exceed $10,000.00 for each day during which the violation continues (415 ILCS 5/42). Any person who knowingly makes a false material statement or representation, orally or in writing, in any label, manifest, record, report, permit, or license, or other document filed, maintained or used for the purpose of compliance with Title XVI commits a Class 4 felony. Any second or subsequent offense after conviction hereunder is a Class 3 felony (415 ILCS 5/44 and 57.17). This form has been approved by the Forms Management Center.

Leaking Underground Storage Tank Program
Laboratory Certification for Physical Soil Analysis

A. Site Identification

IEMA Incident # (6- or 8-digit): 20030135 IEPA LPC# (10-digit): 1670255005

Site Name: Marine Bank Trust # 53-0051

Site Address (Not a P.O. Box): 9520 State Rt. 29

City: Cantrall County: Sangamon ZIP Code: 62625

Leaking UST Technical File

B. Sample Collector

I certify that:

1. Samples were collected using ASTM procedures. GTR (Initial)
2. Chain-of-custody procedures were followed in the field. GTR (Initial)
3. Sample integrity was maintained by proper preservation. GTR (Initial)
4. All samples were properly labeled. GTR (Initial)

C. Laboratory Representative

I certify that:

1. Proper chain-of-custody procedures were followed as documented on the chain-of-custody forms (Initial)
2. Sample integrity was maintained by proper preservation. (Initial)
3. All samples were properly labeled. (Initial)
4. Quality assurance/quality control procedures were established and carried out. (Initial)
5. The test methods specified in the ASTM Standard D 422-63 or or D 1140-54 were used for particle size analysis. (Initial)

6. The test methods specified in ASTM Standards D 2216-90 or D 4643-87 were used for soil moisture content. _____ (Initial)

7. The test methods specified in ASTM Standards D 2487-90 or D 2488-90 were used for soil classification. _____ (Initial)

8. The test methods specified in ASTM Standards D 5084-90 or D 4525-90 were used for hydraulic conductivity. _____ (Initial)

D. Signatures

I hereby affirm that all information contained in this form is true and accurate to the best of my knowledge and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sample Collector

Name G. Tad Rowe
Title Senior Project Manager
Company CWM Company, Inc.
Address 701 S. Grand Ave. W.
City Springfield
State IL
Zip Code 62704
Phone 217-522-8001
Signature
Date 9-5-2023

Laboratory Representative

Name
Title
Company Suburban Laboratories, Inc.
Address 1950 S. Batavia Ave.
City Geneva
State IL
Zip Code 60134
Phone 708-544-3260
Signature
Date

Illinois Environmental Protection Agency

Bureau of Land • 1021 N. Grand Avenue E. • P.O. Box 19276 • Springfield • Illinois • 62794-9276

The Agency is authorized to require this information under Section 4 and Title XVI of the Environmental Protection Act (415 ILCS 5/4, 5/57 – 57.17). Failure to disclose this information may result in a civil penalty of not to exceed $50,000.00 for the violation and an additional civil penalty of not to exceed $10,000.00 for each day during which the violation continues (415 ILCS 5/42). Any person who knowingly makes a false material statement or representation, orally or in writing, in any label, manifest, record, report, permit, or license, or other document filed, maintained or used for the purpose of compliance with Title XVI commits a Class 4 felony. Any second or subsequent offense after conviction hereunder is a Class 3 felony (415 ILCS 5/44 and 57.17). This form has been approved by the Forms Management Center.

Leaking Underground Storage Tank Program
Laboratory Certification for Chemical Analysis

A. Site Identification

IEMA Incident # (6- or 8-digit): 20030135 IEPA LPC# (10-digit): 1670255005

Site Name: Marine Bank Trust # 53-0051

Site Address (Not a P.O. Box): 9520 State Rt. 29

City: Cantrall, County: Sangamon ZIP Code: 62625

Leaking UST Technical File

B. Sample Collector

I certify that:

1. Appropriate sampling equipment/methods were utilized to obtain representative samples. GTR (Initial)
2. Chain-of-custody procedures were followed in the field. GTR (Initial)
3. Sample integrity was maintained by proper preservation. GTR (Initial)
4. All samples were properly labeled. GTR (Initial)

C. Laboratory Representative

I certify that:

1. Proper chain-of-custody procedures were followed as documented on the chain-of-custody forms (Initial)
2. Sample integrity was maintained by proper preservation. (Initial)
3. All samples were properly labeled. (Initial)
4. Quality assurance/quality control procedures were established and carried out. (Initial)
5. Sample holding times were not exceeded. (Initial)

6. SW-846 Analytical Laboratory Procedure (USEPA) methods were used for the analyses.

7. An accredited lab performed quantitative analysis using test methods identified in 35 IAC 186.180 (for samples collected on or after January 1, 2003).

(Initial)

(Initial)

D. Signatures

I hereby affirm that all information contained in this form is true and accurate to the best of my knowledge and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sample Collector

Name GTodrovic
Title Senior Project Manager
Company CWM Company, Inc.
Address 701 South Grand Ave. West
City Springfield
State IL
Zip Code 62704
Phone 217-522-8001
Signature
Date 9-5-23

Laboratory Representative

Name DAN GALEHER
Title SENIOR P.M
Company Suburban Laboratories, Inc.
Address 1950 S. Batavia Ave., Suite 150
City Geneva
State IL
Zip Code 60134
Phone 708-544-3260
Signature
Date 9-22-23

Teklab Inc.
Environmental Laboratory
http://www.teklabinc.com/

September 21, 2023

Carol Rowe
CW3M Co. Inc.
701 W. South Grand Ave.
Springfield, IL 62704
TEL: (217) 522-8001
FAX: (217) 522-8009

NELAP ACCREDITED TNI LABORATORY

Illinois	100226
Kansas	E-10374
Louisiana	05002
Louisiana	05003
Oklahoma	9978

RE: Marine Bank Trust

WorkOrder: 23090750

Dear Carol Rowe:

TEKLAB, INC received 2 samples on 9/12/2023 2:10:00 PM for the analysis presented in the following report.

Samples are analyzed on an as received basis unless otherwise requested and documented. The sample results contained in this report relate only to the requested analytes of interest as directed on the chain of custody. NELAP accredited fields of testing are indicated by the letters NELAP under the Certification column. Unless otherwise documented within this report, Teklab Inc. analyzes samples utilizing the most current methods in compliance with 40CFR. All tests are performed in the Collinsville, IL laboratory unless otherwise noted in the Case Narrative.

All quality control criteria applicable to the test methods employed for this project have been satisfactorily met and are in accordance with NELAP except where noted. The following report shall not be reproduced, except in full, without the written approval of Teklab, Inc.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Marvin L. Darling II

Marvin L. Darling
Project Manager
(618)344-1004 ex 41
mdarling@teklabinc.com

Teklab, Inc.
Environmental Laboratory

Report Contents

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Client: CW3M Co. Inc.
Work Order: 23090750

Client Project: Marine Bank Trust
Report Date: 21-Sep-23

This reporting package includes the following:

Teklab, Inc.
Environmental Laboratory

Definitions

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Client: CW3M Co. Inc.

Work Order: 23090750

Client Project: Marine Bank Trust

Report Date: 21-Sep-23

Abbr	Definition
*	Analytes on report marked with an asterisk are not NELAP accredited
CCV	Continuing calibration verification is a check of a standard to determine the state of calibration of an instrument between recalibration.
CRQL	A Client Requested Quantitation Limit is a reporting limit that varies according to customer request. The CRQL may not be less than the MDL.
DF	Dilution factor is the dilution performed during analysis only and does not take into account any dilutions made during sample preparation. The reported result is final and includes all dilution factors.
DNI	Did not ignite
DUP	Laboratory duplicate is a replicate aliquot prepared under the same laboratory conditions and independently analyzed to obtain a measure of precision.
ICV	Initial calibration verification is a check of a standard to determine the state of calibration of an instrument before sample analysis is initiated.
IDPH	IL Dept. of Public Health
LCS	Laboratory control sample is a sample matrix, free from the analytes of interest,spiked with verified known amounts of analytes and analyzed exactly like a sample to establish intra-laboratory or analyst specific precision and bias or to assess the performance of all or a portion of the measurement system.
LCSD	Laboratory control sample duplicate is a replicate laboratory control sample that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
MBLK	Method blank is a sample of a matrix similar to the batch of associated sample (when available) that is free from the analytes of interest and is processed simultaneously with and under the same conditions as samples through all steps of the analytical procedures, and in which no target analytes or interferences should present at concentrations that impact the analytical results for sample analyses.
MDL	"The method detection limit is defined as the minimum measured concentration of a substance that can be reported with 99% confidence that the measured concentration is distinguishable from method blank results."
MS	Matrix spike is an aliquot of matrix fortified (spiked) with known quantities of specific analytes that is subjected to the entire analytical procedures in order to determine the effect of the matrix on an approved test method's recovery system. The acceptable recovery range is listed in the QC Package (provided upon request).
MSD	Matrix spike duplicate means a replicate matrix spike that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
MW	Molecular weight
NC	Data is not acceptable for compliance purposes
ND	Not Detected at the Reporting Limit
NELAP	NELAP Accredited
PQL	Practical quantitation limit means the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operation conditions.
RL	The reporting limit the lowest level that the data is displayed in the final report. The reporting limit may vary according to customer request or sample dilution. The reporting limit may not be less than the MDL.
RPD	Relative percent difference is a calculated difference between two recoveries (ie. MS/MSD). The acceptable recovery limit is listed in the QC Package (provided upon request).
SPK	The spike is a known mass of target analyte added to a blank sample or sub-sample; used to determine recovery deficiency or for other quality control purposes.
Surr	Surrogates are compounds which are similar to the analytes of interest in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples.
TIC	Tentatively Identified compound: Analytes tentatively identified in the sample by using a library search. Only results not in the calibration standard will be reported as tentatively identified compounds. Results for tentatively identified compounds that are not present in the calibration standard, but are assigned a specific chemical name based upon the library search, are calculated using total peak areas from reconstructed ion chromatograms and a response factor of one. The nearest Internal Standard is used for the calculation. The results of any TICs must be considered estimated, and are flagged with a "T". If the estimated result is above the calibration range it is flagged "ET"
TNTC	Too numerous to count (> 200 CFU)

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Environmental Laboratory

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Client: CW3M Co. Inc.
Work Order: 23090750

Client Project: Marine Bank Trust
Report Date: 21-Sep-23

Qualifiers

- # - Unknown hydrocarbon
- C - RL shown is a Client Requested Quantitation Limit
- H - Holding times exceeded
- J - Analyte detected below quantitation limits
- ND - Not Detected at the Reporting Limit
- S - Spike Recovery outside recovery limits
- X - Value exceeds Maximum Contaminant Level
- B - Analyte detected in associated Method Blank
- E - Value above quantitation range
- I - Associated internal standard was outside method criteria
- M - Manual Integration used to determine area response
- R - RPD outside accepted recovery limits
- T - TIC(Tentatively identified compound)

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Environmental Laboratory

Case Narrative

http://www.teklabinc.com/

Client: CW3M Co. Inc.
Client Project: Marine Bank Trust

Work Order: 23090750
Report Date: 21-Sep-23

Cooler Receipt Temp: N/A °C

TO15 analysis was performed at the North Bluff Road facility in Collinsville Illinois, Agency Interest No. 166578.

Locations

Collinsville

Address	5445 Horseshoe Lake Road Collinsville, IL 62234-7425
Phone	(618) 344-1004
Fax	(618) 344-1005
Email	jhriley@teklabinc.com

Collinsville Air

Address	5445 Horseshoe Lake Road Collinsville, IL 62234-7425
Phone	(618) 344-1004
Fax	(618) 344-1005
Email	EHurley@teklabinc.com

Springfield

Address	3920 Pintail Dr Springfield, IL 62711-9415
Phone	(217) 698-1004
Fax	(217) 698-1005
Email	KKlostermann@teklabinc.com

Chicago

Address	1319 Butterfield Rd. Downers Grove, IL 60515
Phone	(630) 324-6855
Fax	
Email	arenner@teklabinc.com

Kansas City

Address	8421 Nieman Road Lenexa, KS 66214
Phone	(913) 541-1998
Fax	(913) 541-1998
Email	jhriley@teklabinc.com

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Environmental Laboratory

Accreditations

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Client: CW3M Co. Inc.
Client Project: Marine Bank Trust

Work Order: 23090750
Report Date: 21-Sep-23

State	Dept	Cert #	NELAP	Exp Date	Lab
Illinois	IEPA	100226	NELAP	1/31/2024	Collinsville
Kansas	KDHE	E-10374	NELAP	4/30/2024	Collinsville
Louisiana	LDEQ	05002	NELAP	6/30/2024	Collinsville
Louisiana	LDEQ	05003	NELAP	6/30/2024	Collinsville
Oklahoma	ODEQ	9978	NELAP	8/31/2024	Collinsville
Arkansas	ADEQ	88-0966		3/14/2024	Collinsville
Illinois	IDPH	17584		5/31/2025	Collinsville
Iowa	IDNR	430		6/1/2024	Collinsville
Kentucky	UST	0073		1/31/2024	Collinsville
Missouri	MDNR	00930		5/31/2023	Collinsville
Missouri	MDNR	930		1/31/2025	Collinsville

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Laboratory Results

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Client: CW3M Co, Inc.
Client Project: Marine Bank Trust

Work Order: 23090750
Report Date: 21-Sep-23

Lab ID: 23090750-001
Matrix: AIR CANISTER

Client Sample ID: SGV-1
Collection Date: 09/05/2023 16:01

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
TO-15, VOLATILE ORGANIC COMPOUNDS, BY GC/MS								
Benzene	NELAP	1.00		1.72	ppbv	2	09/19/2023 15:40	212208
MW 78.11184		0.0032		0.0055	mg/m3			
Ethylbenzene	NELAP	1.00		1.54	ppbv	2	09/19/2023 15:40	212208
MW 106.165		0.0043		0.0067	mg/m3			
Isopropanol	NELAP	5.00		5.19	ppbv	2	09/19/2023 15:40	212208
MW 60.09502		0.0123		0.0128	mg/m3			
m,p-Xylene	NELAP	2.00		4.95	ppbv	2	09/19/2023 15:40	212208
MW 106.17		0.0087		0.0215	mg/m3			
Methyl tert-butyl ether	NELAP	0.20		0.26	ppbv	2	09/19/2023 15:40	212208
MW 88.14818		0.0007		0.0009	mg/m3			
Naphthalene	NELAP	0.90		0.99	ppbv	2	09/19/2023 15:40	212208
MW 128.17052		0.0047		0.0052	mg/m3			
o-Xylene	NELAP	1.00		1.90	ppbv	2	09/19/2023 15:40	212208
MW 106.165		0.0043		0.0083	mg/m3			
Toluene	NELAP	1.00		4.72	ppbv	2	09/19/2023 15:40	212208
MW 92.13842		0.0038		0.0178	mg/m3			
Xylenes, Total	NELAP	3.00		6.86	ppbv	2	09/19/2023 15:40	212208
MW 106.165		0.013		0.0298	mg/m3			
Surr: 4-Bromofluorobenzene		46.9-145		91.8	%REC	2	09/19/2023 15:40	212208
MW 174.9983632		46.9-145		91.8	%REC			

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Laboratory Results

http://www.teklabinc.com/

Client: CW3M Co. Inc.
Work Order: 23090750
Client Project: Marine Bank Trust
Report Date: 21-Sep-23

Lab ID: 23090750-002
Client Sample ID: SGV-2
Matrix: AIR CANISTER
Collection Date: 09/05/2023 17:05

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
TO-15, VOLATILE ORGANIC COMPOUNDS, BY GC/MS								
Benzene	NELAP	1250		48100	ppbv	2500	09/18/2023 15:52	212153
MW 78.11184		3.9934		153.6679	mg/m3			
Ethylbenzene	NELAP	250		521	ppbv	500	09/14/2023 22:25	212038
MW 106.165		1.0855		2.2622	mg/m3			
Isopropanol	NELAP	1500		ND	ppbv	500	09/14/2023 22:25	212038
MW 60.09502		3.6868		ND	mg/m3			
m,p-Xylene	NELAP	500		633	ppbv	500	09/14/2023 22:25	212038
MW 106.17		2.1712		2.7487	mg/m3			
Methyl tert-butyl ether	NELAP	250		ND	ppbv	500	09/14/2023 22:25	212038
MW 88.14818		0.9013		ND	mg/m3			
Naphthalene	NELAP	250		ND	ppbv	500	09/14/2023 22:25	212038
MW 128.17062		1.3105		ND	mg/m3			
o-Xylene	NELAP	100		ND	ppbv	500	09/14/2023 22:25	212038
MW 106.165		0.4342		ND	mg/m3			
Toluene	NELAP	250		638	ppbv	500	09/14/2023 22:25	212038
MW 92.13842		0.9421		2.4043	mg/m3			
Xylenes, Total	NELAP	600		633	ppbv	500	09/14/2023 22:25	212038
MW 106.165		2.6053		2.7486	mg/m3			
Surr: 4-Bromofluorobenzene		46.9-145		92.0	%REC	500	09/14/2023 22:25	212038
MW 174.9983632		46.9-145		92.0	%REC			

Elevated reporting limit due to high levels of target and non-target analytes.

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Environmental Laboratory

Quality Control Results

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Client: CW3M Co. Inc.
Client Project: Marine Bank Trust

Work Order: 23090750
Report Date: 21-Sep-23

TO-15, VOLATILE ORGANIC COMPOUNDS, BY GC/MS

Batch 212038 SampType: MBLK Units ppbv
SampID: MBLK-U230914-1

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Benzene		0.50		ND						09/14/2023
Ethylbenzene		0.50		ND						09/14/2023
Isopropanol		3.00		ND						09/14/2023
m,p-Xylene		1.00		ND						09/14/2023
Methyl tert-butyl ether		0.50		ND						09/14/2023
Naphthalene		2.50		ND						09/14/2023
o-Xylene		0.50		ND						09/14/2023
Toluene		0.50		ND						09/14/2023
Xylenes, Total		1.50		ND						09/14/2023
Surr: 4-Bromofluorobenzene				8.37	10.00		83.7	46.9	145	09/14/2023

Batch 212038 SampType: LCSD Units ppbv
SampID: LCSD-U230914-1

RPD Limit: 30

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Benzene		0.50		10.2	10.00	0	101.7	10.26	0.83	09/14/2023
Ethylbenzene		0.50		11.3	10.00	0	113.1	11.44	1.12	09/14/2023
Isopropanol		3.00		8.26	10.00	0	82.6	8.246	0.20	09/14/2023
m,p-Xylene		1.00		21.7	20.00	0	108.4	21.97	1.39	09/14/2023
Methyl tert-butyl ether		0.50		10.4	10.00	0	103.8	10.45	0.63	09/14/2023
Naphthalene		2.50		9.43	10.00	0	94.3	9.348	0.88	09/14/2023
o-Xylene		0.50		10.5	10.00	0	105.2	10.65	1.27	09/14/2023
Toluene		0.50		10.8	10.00	0	107.6	10.82	0.58	09/14/2023
Xylenes, Total		1.50		32.2	30.00	0	107.3	32.63	1.35	09/14/2023
Surr: 4-Bromofluorobenzene				9.19	10.00		91.9			09/14/2023

Teklab, Inc.
Environmental Laboratory

Quality Control Results

http://www.teklabinc.com/

Client: CW3M Co. Inc.
Client Project: Marine Bank Trust

Work Order: 23090750
Report Date: 21-Sep-23

TO-15, VOLATILE ORGANIC COMPOUNDS, BY GC/MS

Batch 212038 SampType: LCS Units ppbv
SampID: LCS-U230914-1

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Benzene	*	0.50		10.3	10.00	0	102.6	73.8	122	09/14/2023
Ethylbenzene	*	0.50		11.4	10.00	0	114.4	76.2	133	09/14/2023
Isopropanol	*	3.00		8.25	10.00	0	82.5	52.3	129	09/14/2023
m,p-Xylene	*	1.00		22.0	20.00	0	109.9	74.8	129	09/14/2023
Methyl tert-butyl ether	*	0.50		10.4	10.00	0	104.5	70.3	126	09/14/2023
Naphthalene	*	2.50		9.35	10.00	0	93.5	50.6	135	09/14/2023
o-Xylene	*	0.50		10.7	10.00	0	106.5	74.2	130	09/14/2023
Toluene	*	0.50		10.8	10.00	0	108.2	76.5	127	09/14/2023
Xylenes, Total	*	1.50		32.6	30.00	0	108.8	76.1	129	09/14/2023
Surr: 4-Bromofluorobenzene	*			9.12	10.00		91.2	84.2	115	09/14/2023

Batch 212153 SampType: MBLK Units ppbv
SampID: MBLK-U230918-1

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Benzene	*	0.50		ND						09/18/2023
Ethylbenzene	*	0.50		ND						09/18/2023
Isopropanol	*	3.00		ND						09/18/2023
m,p-Xylene	*	1.00		ND						09/18/2023
Methyl tert-butyl ether	*	0.50		ND						09/18/2023
Naphthalene	*	2.50		ND						09/18/2023
o-Xylene	*	0.50		ND						09/18/2023
Toluene	*	0.50		ND						09/18/2023
Xylenes, Total	*	1.50		ND						09/18/2023
Surr: 4-Bromofluorobenzene	*			8.33	10.00		83.3	46.9	145	09/18/2023

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Environmental Laboratory

Quality Control Results

http://www.teklabinc.com/

Client: CW3M Co. Inc.
Client Project: Marine Bank Trust

Work Order: 23090750
Report Date: 21-Sep-23

TO-15, VOLATILE ORGANIC COMPOUNDS, BY GC/MS

Batch 212153 SampType: LCSD Units ppbv RPD Limit: 30
SamplD: LCSD-U230918-1

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Benzene	*	0.50		10.1	10.00	0	100.6	10.20	1.34	09/18/2023
Ethylbenzene	*	0.50		11.1	10.00	0	111.3	11.24	0.94	09/18/2023
Isopropanol	*	3.00		8.18	10.00	0	81.8	8.153	0.30	09/18/2023
m,p-Xylene	*	1.00		21.2	20.00	0	105.8	21.56	1.88	09/18/2023
Methyl tert-butyl ether	*	0.50		10.3	10.00	0	103.1	10.30	0.07	09/18/2023
Naphthalene	*	2.50		9.08	10.00	0	90.8	8.966	1.21	09/18/2023
o-Xylene	*	0.50		10.2	10.00	0	102.0	10.36	1.52	09/18/2023
Toluene	*	0.50		10.6	10.00	0	105.9	10.71	1.11	09/18/2023
Xylenes, Total	*	1.50		31.4	30.00	0	104.5	31.92	1.76	09/18/2023
Surr: 4-Bromofluorobenzene	*			9.03	10.00		90.3			09/18/2023

Batch 212153 SampType: LCS Units ppbv
SamplD: LCS-U230918-1

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Benzene	*	0.50		10.2	10.00	0	102.0	73.8	122	09/18/2023
Ethylbenzene	*	0.50		11.2	10.00	0	112.4	76.2	133	09/18/2023
Isopropanol	*	3.00		8.15	10.00	0	81.5	52.3	129	09/18/2023
m,p-Xylene	*	1.00		21.6	20.00	0	107.8	74.8	129	09/18/2023
Methyl tert-butyl ether	*	0.50		10.3	10.00	0	103.0	70.3	126	09/18/2023
Naphthalene	*	2.50		8.97	10.00	0	89.7	50.6	135	09/18/2023
o-Xylene	*	0.50		10.4	10.00	0	103.6	74.2	130	09/18/2023
Toluene	*	0.50		10.7	10.00	0	107.1	76.5	127	09/18/2023
Xylenes, Total	*	1.50		31.9	30.00	0	106.4	75.1	129	09/18/2023
Surr: 4-Bromofluorobenzene	*			9.07	10.00		90.7	84.2	115	09/18/2023

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http://www.teklabinc.com/

Client: CW3M Co. Inc.
Client Project: Marine Bank Trust

Work Order: 23090750
Report Date: 21-Sep-23

TO-15, VOLATILE ORGANIC COMPOUNDS, BY GC/MS

Batch 212208 SampType: MBLK Units ppbv
SampID: MBLK-U230919-1

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Benzene	*	0.50		ND						09/19/2023
Ethylbenzene	*	0.50		ND						09/19/2023
Isopropanol	*	3.00		ND						09/19/2023
m,p-Xylene	*	1.00		ND						09/19/2023
Methyl tert-butyl ether	*	0.50		ND						09/19/2023
Naphthalene	*	2.50		ND						09/19/2023
o-Xylene	*	0.50		ND						09/19/2023
Toluene	*	0.50		ND						09/19/2023
Xylenes, Total	*	1.50		ND						09/19/2023
Surr: 4-Bromofluorobenzene	*			8.26	10.00		82.6	46.9	145	09/19/2023

Batch 212208 SampType: LCSD Units ppbv RPD Limit: 30
SampID: LCSD-U230919-1

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Benzene	*	0.50		10.1	10.00	0	101.2	10.09	0.31	09/19/2023
Ethylbenzene	*	0.50		11.2	10.00	0	112.3	11.23	0.04	09/19/2023
Isopropanol	*	3.00		8.09	10.00	0	80.9	7.996	1.17	09/19/2023
m,p-Xylene	*	1.00		21.5	20.00	0	107.3	21.39	0.33	09/19/2023
Methyl tert-butyl ether	*	0.50		10.3	10.00	0	103.3	10.16	1.62	09/19/2023
Naphthalene	*	2.50		9.28	10.00	0	92.8	9.170	1.16	09/19/2023
o-Xylene	*	0.50		10.4	10.00	0	103.9	10.38	0.12	09/19/2023
Toluene	*	0.50		10.7	10.00	0	106.7	10.63	0.38	09/19/2023
Xylenes, Total	*	1.50		31.9	30.00	0	106.2	31.77	0.26	09/19/2023
Surr: 4-Bromofluorobenzene	*			8.99	10.00		89.9			09/19/2023

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Client: CW3M Co. Inc.
Client Project: Marine Bank Trust

Work Order: 23090750
Report Date: 21-Sep-23

TO-15, VOLATILE ORGANIC COMPOUNDS, BY GC/MS

Batch 212208 SampType: LCS Units ppbv
SamplD: LCS-U230919-1

Analyses	Cert	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Benzene	*	0.50		10.1	10.00	0	100.9	73.6	122	09/19/2023
Ethylbenzene	*	0.50		11.2	10.00	0	112.3	76.2	133	09/19/2023
Isopropanol	*	3.00		8.00	10.00	0	80.0	52.3	129	09/19/2023
m,p-Xylene	*	1.00		21.4	20.00	0	107.0	74.8	129	09/19/2023
Methyl tert-butyl ether	*	0.50		10.2	10.00	0	101.6	70.3	126	09/19/2023
Naphthalene	*	2.50		9.17	10.00	0	91.7	50.6	135	09/19/2023
o-Xylene	*	0.50		10.4	10.00	0	103.8	74.2	130	09/19/2023
Toluene	*	0.50		10.6	10.00	0	106.3	76.5	127	09/19/2023
Xylenes, Total	*	1.50		31.8	30.00	0	105.9	75.1	129	09/19/2023
Surr: 4-Bromofluorobenzene	*			9.04	10.00		90.4	84.2	115	09/19/2023

Teklab, Inc.
Environmental Laboratory

Receiving Check List

http://www.teklabinc.com/

Client: CW3M Co. Inc.
Client Project: Marine Bank Trust

Work Order: 23090750
Report Date: 21-Sep-23

Carrier: Paul Reeves

Received By: M8P

Completed by: Amber Difallo
On: 12-Sep-23

Reviewed by: Elizabeth A. Hurley
On: 12-Sep-23

Pages to follow: Chain of custody 1 Extra pages included 2

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	Temp °C N/A
Type of thermal preservation?	None ☑	Ice ☐	Blue Ice ☐	Dry Ice ☐
Chain of custody present?	Yes ☑	No ☐		
Chain of custody signed when relinquished and received?	Yes ☑	No ☐		
Chain of custody agrees with sample labels?	Yes ☑	No ☐		
Samples in proper container/bottle?	Yes ☑	No ☐		
Sample containers intact?	Yes ☑	No ☐		
Sufficient sample volume for indicated test?	Yes ☑	No ☐		
All samples received within holding time?	Yes ☑	No ☐		
Reported field parameters measured:	Field ☐	Lab ☐	NA ☑	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐		
When thermal preservation is required, samples are compliant with a temperature between 0.1°C - 6.0°C, or when samples are received on ice the same day as collected.				
Water - at least one vial per sample has zero headspace?	Yes ☐	No ☐	No VOA vials ☑	
Water - TOX containers have zero headspace?	Yes ☐	No ☐	No TOX containers ☑	
Water - pH acceptable upon receipt?	Yes ☐	No ☐	NA ☑	
NPDES/CWA TCN interferences checked/treated in the field?	Yes ☐	No ☐	NA ☑	

Any No responses must be detailed below or on the COC.

Clients sample id, canister id and clients final vacuum gauge readings followed by readings taken upon arrival at the laboratory. Ideal vacuum on sampled canisters is between -5 and -12 "Hg. - kkizer - 9/13/2023 12:10:15 PM
SGV-1 9020 -6/-7
SGV-2 9025 -7/-8

Samples were transferred to Collinsville Air Lab on 9/13/23 at 0947. - ehopkins - 9/18/2023 2:28:04 PM

TEKLAB, INC.
5445 Horseshoe Lake Road, Collinsville, IL 62234 Phone (618) 344-1004 Fax (618) 344-1005

pg 1 of 1 Lab Work Order # 23090750

AIR SAMPLING FIELD FORM AND CHAIN OF CUSTODY

Client Name: CWM Company, Inc.
Address: 701 South Grand Ave. W.
Phone: (217) 522-8001
Email: CWM@CWMCompany.com
Project ID: Marine Bank Trust
Project Manager: Carol L. Rowe
Sampler: LTR / JKK
PO Number:

Results Requested (check one)	Sample Type (check one)	
X Standard (7-10 day)	___Ambient Air	X Soil Gas/Vapor
___1 Day (200% surcharge)	___Indoor Air	___Landfill Gas
___2-3 Day (100% surcharge)	___Indoor Sub-Slab	___Other (specify)
___4-5 Day (50% surcharge)	___Stack	

Lab Use Only: Sample pick up: ___Y ___N Samples on: ___Ice/Blue ___No Ice ___Temp. °C
Comments: COURIER

Lab Use Only				Sample Start Parameters			Sample Stop Parameters			Requested Analysis (list metals/other below in comments)						
Laboratory ID	Sample Identification	Canister Number	Controller Number	Date	Time	Vacuum (in. Hg)	Date	Time	Vacuum (in. Hg)	TO-15 Lists (circle) Standard / Extended	TO-15 select BTEX MBTE / Naphthalene / Isopropanol / TPH-GRO	TO-13	TO-4	PM10/ TSP	Metals	Other
23090750 01	SGV-1	9020	259	9/5/23	3:54	30	9/5/23	4:01	6	X	X					
02	SGV-2	9025	250	9/5/23	4:40	30	9/5/23	5:05	7	X	X					

Are these samples known to be involved in litigation? If yes, a level IV data package will be generated and a surcharge will apply. ___Yes ___No
Are these samples known to be hazardous? ___Yes X No
Special QC Requirements/Special Instructions/Comments:

Shipping Company and Tracking Number:

Relinquished By	Date/Time	Received By	Date/Time
	9/12/23 8:05		9.12.23 0805
	9.12.23 1410		9.12.23 1410
	9/12/23 1410		9-13-23 9:47

The individual signing this agreement on behalf of the client, acknowledges that he/she has read and understands the terms and conditions of this agreement, and that he/she has the authority to sign on behalf of the client. See www.teklabinc.com for terms and conditions.

White & Yellow Copy - Laboratory Pink Copy - Sampler

000390

Illinois Environmental Protection Agency

Bureau of Land • 1021 N. Grand Avenue E. • P.O. Box 19276 • Springfield • Illinois • 62794-9276

The Agency is authorized to require this information under Section 4 and Title XVI of the Environmental Protection Act (415 ILCS 5/4, 5/57 – 57.17). Failure to disclose this information may result in a civil penalty of not to exceed $50,000.00 for the violation and an additional civil penalty of not to exceed $10,000.00 for each day during which the violation continues (415 ILCS 5/42). Any person who knowingly makes a false material statement or representation, orally or in writing, in any label, manifest, record, report, permit, or license, or other document filed, maintained or used for the purpose of compliance with Title XVI commits a Class 4 felony. Any second or subsequent offense after conviction hereunder is a Class 3 felony (415 ILCS 5/44 and 57.17). This form has been approved by the Forms Management Center.

Leaking Underground Storage Tank Program
Laboratory Certification for Chemical Analysis

A. Site Identification

IEMA Incident # (6- or 8-digit): 20030135 IEPA LPC# (10-digit): 1670255005

Site Name: Marine Bank Trust # 53-0051

Site Address (Not a P.O. Box): 9520 State Rt. 29

City: Cantrall. County: Sangamon ZIP Code: 62625

Leaking UST Technical File

B. Sample Collector

I certify that:

1. Appropriate sampling equipment/methods were utilized to obtain representative samples. JKK (Initial)
2. Chain-of-custody procedures were followed in the field. JKK (Initial)
3. Sample integrity was maintained by proper preservation. JKK (Initial)
4. All samples were properly labeled. JKK (Initial)

C. Laboratory Representative

I certify that: 23090750

1. Proper chain-of-custody procedures were followed as documented on the chain-of-custody forms MLDII (Initial)
2. Sample integrity was maintained by proper preservation. MLDII (Initial)
3. All samples were properly labeled. MLDII (Initial)
4. Quality assurance/quality control procedures were established and carried out. MLDII (Initial)
5. Sample holding times were not exceeded. MLDII (Initial)

23090150

23091752

6. SW-846 Analytical Laboratory Procedure (USEPA) methods were used for the analyses. MLD II (Initial)

7. An accredited lab performed quantitative analysis using test methods identified in 35 IAC 186.180 (for samples collected on or after January 1, 2003). MLD II (Initial)

D. Signatures

I hereby affirm that all information contained in this form is true and accurate to the best of my knowledge and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sample Collector		Laboratory Representative	
Name	John Kveton	Name	Marvin L. Darling II
Title	Project Mgr.	Title	Project Manager
Company	CWM Company, Inc.	Company	~~Suburban Laboratories, Inc.~~ TekLab, Inc.
Address	701 South Grand Ave. West	Address	~~1950 S. Batavia Ave., Suite 150~~ 5445 Horseshoe Lake Rd.
City	Springfield	City	~~Geneva~~ Collinsville
State	IL	State	~~IL~~ IL
Zip Code	62704	Zip Code	~~60134~~ 62234
Phone	217-522-8001	Phone	~~708-544-3260~~ (618) 344-1004
Signature	John Kveton	Signature	Marvin L. Darling II
Date	9/5/23	Date	9/21/23

APPENDIX H

PLA DOCUMENTATION

CORRECTIVE ACTION PLAN AND BUDGET AMENDMENT

MARINE BANK TRUST # 53-0051
CANTRALL, ILLINOIS

Project Labor Agreement Form.

The purpose of this form is to provide information with regard to Project Labor Agreement criteria.

Project Labor Agreements potentially apply under the following circumstances: (a) approval is requested of a Corrective Action Plan; (b) the plan involves field work activities; (c) the field work activities would be performed by a subcontractor (as opposed to the consultant); (d) an approval letter would be issued by the Illinois EPA on or after July 25, 2013; and (e) reimbursement would be sought from the Illinois Underground Storage Tank Fund. Project Labor Agreement determinations are required by Section 57.7(c)(3) of the Illinois Environmental Protection Act.

The field work activities which are proposed in the Corrective Action Plan (Advancement of soil borings and collection of soil samples) may potentially be subject to the use of a Project Labor Agreement.

Please answer the following questions either "yes" or "no", and please discuss the basis for each answer:

1. Will the use of a Project Labor Agreement advance the state's interest in reducing project costs paid from the Illinois Underground Storage Tank Fund?

   ☐ Yes ☒ No

   Discussion:
   The original intent of PLAs was for large scale construction projects. These projects would include multiple trades working together or in conjunction with one another and could make disputes between parties a potential liability as the project might last a few years. However, LUST sites differ in that one to two trades are typically necessary to complete the work. The "teams" that work together on hazardous sites, such as LUST sites, train together and develop cohesive relationships. Only a handful of workers are necessary to conduct the work; jurisdictional disputes are non-existent as the parties work in harmony.

   Further, the number of trades on this work is minimal as well; the work will be done by separate contractors without a mix of union and non-unionized work force. The site's small project will easily more than double the cost of the project with a PLA required, contradicting the idea to minimize site remediation cost.

2. Will the use of a Project Labor Agreement advance the state's interest in efficiency, timeliness, and quality of project work, based upon the overall size, scope, complexity, and remediation objectives of the project?

   ☐ Yes ☒ No

   Discussion:
   PLAs were first used in Illinois for large scale, large cost, and long duration highway development projects. All LUST work, no matter size or scope, is deemed small in comparative size to work normally prescribed a PLA. Collective bargaining agreements are unneeded as the number of facets required for any work does not reach a quantity warranting these agreements.

   Specifically, the Marine Bank Trust # 53-0051 site in Cantrall, Illinois requires a minimal amount of work to be completed during the corrective action stage. Concrete placement will comprise the work for the entirety of this proposed plan. This should take no more than a day.

3. Does the project present safety concerns, including but not limited to the threat to human health and the environment? Will the use of a Project Labor Agreement advance the state's interest in promoting safety?

   ☐ Yes ☒ No

   Discussion:
   LUST sites do not typically involve working within roadways unless the Corrective Action is within rights-of-way, on ingress / egress creates roadway issues which is not commonplace. Specifically, the Marine Bank Trust # 53-0051 site in Cantrall, Illinois is located on a moderately traveled road. Drilling activities should take no more than a day and therefore the length of time that safety of the traveling public as an issue is null. As for safety, consultants co-train teams in OSHA HAZWOPER to ensure not only worker safety, but safety for those who may enter or be near the work environment.

4. Will the use of a Project Labor Agreement advance the state's interest in labor continuity and stability in completing the project work in accordance with the plan approved by the Illinois EPA?

☐ Yes ☒ No

Discussion:
The timetable for the work to be performed at the Marine Bank Trust # 53-0051 site is no more than a couple days; not exceeding or coming remotely close to 110 days in duration. On a scale of a day, labor force continuity and stability does not arise as an issue to complete the project as it does not span the duration of collective bargaining agreements. Simply put, the scale of time and scope of work is so small that a labor agreement would not expire, causing workers to walk out of the job.

5. Will the use of a Project Labor Agreement advance the state's interest in performance of the project work by a skilled labor force, thereby achieving the remediation objectives of the project?

☐ Yes ☒ No

Discussion:
Attracting workers from a union hall for non-sequential days of work puts them at a disadvantage for the bulk of the time, and is not an enticing option to union workers. Simply put, small LUST projects are not going to attract the workforce that would conduct "efficient" and "safe" work. A PLA, then, does not guarantee skilled workers.

Because of the small scope of work, the bidding process would significantly increase the cost of activities at the Marine Bank Trust # 53-0051 site in Cantrall, Illinois. This would only increase the hardship of the owner and solely be detrimental to the efficiency of the project, which is the opposite of the objective put in place to push the project along towards closure.

6. Will the use of a Project Labor Agreement provide timely completion of the project work, thereby reducing the threat to human health and the environment that would result from delays in achieving the remediation objectives?

☐ Yes ☒ No

Discussion:
With only its consultant and local contractors present at the Marine Bank Trust # 53-0051 site during the "construction event", which will last a day, there are not multiple trades with closely or paralleled functions to create a work stoppage. The work will be completed within a day for the placement of concrete.

7. Will the use of a Project Labor Agreement advance the state's interest of advancing minority owned and women owned businesses and minority and female employment?

☐ Yes ☒ No

Discussion:
By applying a PLA to a project, the Agency may in fact directly negate one of its primary objectives, as stated to advance disadvantaged businesses. The Agency has provided no basis or discussion as to how the PLA will actually increase WBE participation. We believe that the opposite effect will occur.

Furthermore, IEPA correspondence approving PLAs for various projects states that a "PLA will advance the State's interest of advancing minority-owned and women-owned business and minority and female employment". A PLA only requires that if a minority or woman employee or business is used for the project, then additional reports are required. In the competitive bidding process, it is unlikely that all bidders are female or minority; or it is far-fetched to think that all one-day construction projects with one to two workers will have either a female or minority represented in the workforce on site. There are no incentives to entice disadvantaged business participation.

In this instance, the box should not be checked if there are no incentives to hire minority workers, for example, the apprenticeship program offers $10.00/hour back to prime contractors when minority participation is required. Use of this screening criteria needs understood and not used loosely. If in fact any disadvantaged businesses are utilized under a PLA, their reporting costs are increased, increasing the project costs.

SCREENING CRITERIA

With the lack of detailed screening criteria from the IEPA for deciding which projects require the use of a PLA, CW³M has followed screening criteria that IDOT uses for government funded programs in their department as that State Agency follows the executive orders of Illinois Governors Pritzker, and President Biden. Attached at the end of this appendix is a copy of the IDOT PLA Determination screening criteria and it lists twelve seemingly ubiquitous standards used to determine the applicability of PLA for construction projects. It has been included for your reference but will be used herein as a systematic way to show how each criterion has been evaluated for applicability for 'yes/no' answers and whether or not the use of a PLA should be considered. CW³M recognizes that these standards may not be the same standards IEPA uses to determine the applicability of PLA for LUST sites, but IEPA correspondence issuing PLA for various sites appears to have very closely matched various IDOT screening criterion as determined in LUST Incidents 2002-0851, 2006-0366, 2009-1397, 2009-0202, 2009-0203, 2011-0859, 2012-0382, 2012-0695, 2013-0906, and 2013-1123.

1. *The project is being awarded and administered by a governmentally funded program.*

   The "project" is privately contracted, a similar means as when a party secures legal counsel and other services. A contract is in place between a private company or citizen and a consultant or contractor who may also serve as a general contractor. That consultant will interface with governmental agencies on their behalf. They will submit claims for reimbursement after the completion of work, budgets and plan approval, and review of claims. The LUST Fund is a motor fuel tax collected by petroleum distributors, for reimbursement of LUST claims managed by the IEPA, so the answer to this question is "no". The IEPA administers the LUST Program to process claims and review technical plans and budgets not to award or administer the actual work done. As indicated on the PLA documents, the prime contractor is to secure the PLA. There is no "award" or "payment guarantee".

2. *The project is being constructed using state or local funds.*

   The project is constructed using private funds, which ultimately may or may not be reimbursed with state funds. The current rates that the IEPA grants for LUST work have not been modified to reflect the recent changes regarding mandated payment of prevailing wages. That disport is placed on the owner/operator and their contractors. UST owners/operators collect sales tax into the LUST Fund for reimbursement of remediation work; thus, it is no longer a clear "yes" answer and the owner/operator pays

a deductible and is then reimbursed for "eligible" costs. The legislative intent of Public Act was for the IPCB to remedy rates to pay prevailing wages and rectify costs of PLAs and attorney fees.

3. *The overall size, scope, sequencing, logistics, or other aspects of the project make it particularly challenging to manage, and use of a PLA is expected to help assure that the construction work is performed properly and efficiently under the circumstances.*

As stated, PLAs were first used in Illinois for large scale, large cost, and long duration highway development projects. All LUST work, no matter size or scope, is deemed small in comparative size to work normally prescribed a PLA, therefore disqualifying it from any PLA consideration. Collective bargaining agreements are unneeded as the number of facets required for any work does not reach a quantity warranting these agreements.

Specifically, the Marine Bank Trust # 53-0051 site in Cantrall, Illinois requires a minimal amount of work to be completed during the corrective action stage. Installing an engineered barrier will comprise the entirety of this proposed plan. This can and will be done in a day.

4. *The duration of construction activity on the project is expected to exceed one construction season (110 or more working days), or the nature of the project results in a heightened need for labor force continuity and stability over a substantial period of time.*

The timetable for the work to be performed at the Marine Bank Trust # 53-0051 site is no more than a couple days; not exceeding or coming remotely close to 110 days in duration. On a scale of a day, labor force continuity and stability does not arise as an issue to complete the project as it does not span the duration of collective bargaining agreements. Simply put, the scale of time and scope of work is so small that a labor agreement would not expire, causing workers to walk out of the job.

5. *There is a firm construction completion date established for the project thereby increasing the adverse consequences of any work stoppage or other labor disruption.*

It is on the discretion of the consultant as to how quickly a plan is implemented once it is approved. With the Agency having 120 days to approve, modify, or deny a plan, consultants cannot pre-plan or schedule the work until approved. Once approved, they

coordinate with owners/operators and any subcontractors necessary with weather contingencies. Therefore, adverse consequences of labor disruptions or work stoppage are non-existent on a job that lasts a few hours to a day for corrective action for actual remediation to complete. Many contractors can perform remediation services in-house or from a pool of reliable subcontractors, with easily adjustable start dates; however, it is fiscally advantageous for the consultant to complete the work as quickly as possible with fewer workers.

The norm on small projects like this is to solicit contractors who provide estimates as to how much the cost to complete each individual task after the contract is awarded. Because this process cannot be completed, prices will ultimately change and push the project into being "stuck" as the costs cannot be met.

6. *The time required to complete the project is expected to extend beyond the expiration date of one or more existing collective bargaining agreements covering trades likely to be involved in the project, thereby increasing the likelihood of work stoppages or other labor disruptions during construction of the project.*

With only its consultant and local contractors present at the Marine Bank Trust # 53-0051 site during the "construction event", which will last a day, there are not multiple trades with closely or paralleled functions to create a work stoppage. The time required to complete the project will in no way come close to extending beyond the expiration of any existing collective bargaining agreements covering any of the trades.

7. *In the absence of a PLA, there is an increased likelihood of jurisdictional disputes among unions or of conflict between unionized and non-unionized workers on the project that could have a potentially material adverse effect on the time, cost, or quality of work performed on the project.*

As stated, the original intent of PLAs was for large scale construction projects. These projects would include multiple trades working together or in conjunction with one another and could make disputes between parties a potential liability as the project might last a few years. However, LUST sites differ in that one to two trades are typically necessary to complete the work. The "teams" that work together on hazardous sites, such as LUST sites, train together and develop cohesive relationships. Only a handful of workers are necessary to conduct the work; jurisdictional disputes are non-existent as the parties work in harmony.

Further, the number of trades on this work is minimal as well; the work will be done by separate contractors without a mix of union and non-unionized work force.

8. *The project presents specific safety concerns to the travelling public and a PLA will ensure labor force continuity and stability, decreasing the length of the safety concern.*

LUST sites do not typically involve roads unless the Corrective Action is within rights-of-way, on ingress / egress creates roadway issues which is not commonplace. Specifically, the Marine Bank Trust # 53-0051 site in Cantrall, Illinois is located on a moderately traveled road to one site, but the work will be conducted on the property. As stated, construction activities will take day and therefore the length of time that safety of the traveling public as an issue is null. As for safety, consultants co-train teams in OSHA HAZWOPER to ensure not only worker safety, but safety for those who may enter or be near the work environment.

9. *Use of the PLA is expected to result in improved access to skilled labor, improved efficiency, or improved safety performance on the project.*

Attracting workers from a union hall for only a day to a partial day of work puts them at a disadvantage for the bulk of the time, and is not an enticing option to union workers. Simply put, small LUST projects are not going to attract the workforce that would conduct "efficient" and "safe" work. A PLA, then, does not guarantee skilled workers.

Because of the small scope of work, the bidding process would significantly increase the cost of activities at the Marine Bank Trust # 53-0051 site in Cantrall, Illinois. This would only increase the hardship of the owner and solely be detrimental to the efficiency of the project, which is the opposite of the objective put in place to push the project along towards closure.

10. *Use of the PLA on the project is not expected to have a material adverse effect on the competitive bidding process.*

The use of a PLA on the project does have a material adverse effect on bidding, financing and completion of the project. The contract award process takes place long before the work or construction ever begins. As stated, budgets are approved or modified at the discretion of the IEPA Project Managers and pre-approved IEPA rates. Competitive bidding is an option when work cannot be performed at the Agency's approved rates.

The key factor here is financing. No owner can afford to pay cash for work that is bid on that they would pay double, wait months or even years to get paid for nominal handling charges, no payment guarantee (below what contractors outside of LUST get paid), and be responsible for the extra business costs of the PLA. They are not banks and NATLUST realized very quickly that having an approved budget meant nothing for security of payment, folded its tent, leaving owner/operators no other option than to pay or let contractors carry the burden. The legislative intent was to adjust the rates paid every day to the mandated prevailing wage rate and make the use of PLA's limited in scope.

11. *Use of a PLA on the project is not expected to have an adverse material effect on the ability of the Department to achieve other Departmental goals, (e.g. utilization of disadvantaged business, utilization of Illinois domiciled businesses, development of competitive vendor alternatives over time, etc.).*

By applying a PLA to a project, the Agency may in fact directly negate one of its primary objectives, as stated to advance disadvantaged businesses. The Agency has provided no basis or discussion as to how the PLA will actually increase WBE participation. We believe that the opposite effect will occur.

Furthermore, IEPA correspondence approving PLAs for various projects states that a "PLA will advance the State's interest of advancing minority-owned and women-owned business and minority and female employment". A PLA only requires that if a minority or woman employee or business is used for the project, then additional reports are required. In the competitive bidding process, it is unlikely that all bidders are female or minority; or it is far-fetched to think that all day construction projects with one to two workers will have either a female or minority represented in the workforce on site. There are no incentives to entice disadvantaged business participation.

In this instance, the box should not be checked if there are no incentives to hire minority workers, for example, the apprenticeship program offers $10.00/hour back to prime contractors when minority participation is required. Use of this screening criteria needs understood and not used loosely. If in fact any disadvantaged businesses are utilized under a PLA, their reporting costs are increased, increasing the project costs.

12. *There are other material considerations favoring or disfavoring use of a PLA on this project as follows:*

- The total cost for current corrective action field activities involving skilled labor totals an estimated $ 3,992.88 for installing an engineered barrier, not warranting a PLA in any program.

- The site's small project will easily increase the cost of the project with a PLA required, contradicting the idea to minimize site remediation cost.

- No reason was given by the IEPA for the implementation of a PLA on what may and should be the final step to gain closure on site; this will only further delay the goal of the Agency: closing the project, which the client is eager to finish.

- The common goal of the Agency and owner/operators is closure. A PLA on an extremely small plan will delay or indefinitely stall closure when closure is within the grasp of all parties involved.

Contract Number
County

IDOT PROJECT LABOR AGREEMENT DETERMINATION

To:

From:

Date:

Re:

In accordance with Executive Order 2003-13 (Blagojevich), it is recommended that a project labor agreement (PLA) be utilized for the above-captioned Project. This recommendation is based on the considerations indicated below.

1) The Project is being awarded and administered by IDOT (i.e., not by another governmental agency).

2) The Project is being constructed using state or local funds only (i.e., no federal funds).

3) The overall size, scope, sequencing, logistics or other aspects of the Project make it particularly challenging to manage, and use of a PLA is expected to help assure that the construction work is performed properly and efficiently under the circumstances.

4) The duration of construction activity on the Project is expected to exceed one construction season (i.e., 110 or more working days), or the nature of the Project results in a heightened need for labor force continuity and stability over a substantial period of time.

5) There is a firm construction completion date established for the Project thereby increasing the adverse consequences of any work stoppage or other labor disruption.

6) The time required to complete the Project is expected to extend beyond the expiration date of one or more existing collective bargaining agreements covering trades likely to be involved in the Project, thereby increasing the likelihood of work stoppage(s) or other labor disruption(s) during construction of the Project.

7) In the absence of a PLA, there is an increased likelihood of jurisdictional disputes among unions or of conflict between unionized and non-unionized workers on the Project that could have a potentially material adverse effect on the time, cost, or quality of work performed on the Project.

Contract Number
County

8) This project presents specific safety concerns to the traveling public and a PLA, will ensure labor force continuity and stability, decreasing the length of the safety concern.

9) Use of a PLA is expected to result in improved access to skilled labor, improved efficiency, or improved safety performance on the Project.

10) Use of a PLA on the Project is not expected to have a material adverse effect on the competitive bidding process.

11) Use of a PLA on the Project is not expected to have a material adverse effect on the ability of the Department to achieve other Departmental goals (e.g., utilization of disadvantaged businesses, utilization of Illinois domiciled businesses, development of competitive vendor alternatives over time, etc.).

12) There are other material considerations favoring or disfavoring use of a PLA on this Project as follows:

_____

_____

_____

Based upon the identified considerations, we recommend that you approve use of a PLA on this Project. Upon your approval, the Department shall undertake to negotiate in good faith a PLA with the relevant labor organization(s), and shall include in all necessary bid specifications and other documents information regarding the actual or form of PLA that is binding upon all contractors and their employees.

Agreed: _____
{Division Chief} (Date)

Agreed: _____
{Bureau of Design & Environment} (Date)

Agreed: _____
{Regional Engineer} (Date)

Approved: _____
Gary Hannig, Secretary (Date)

FHWA concurrence in the PLA for the above mentioned contract.

_____
Division Administrator FHWA (Date)

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

Ann L. Schneider, Secretary

PROJECT LABOR AGREEMENTS

Illinois Department of Transportation

Revised 01/01/13

TABLE OF CONTENTS

STATE OF ILLINOIS
PROJECT LABOR AGREEMENTS

- **Definition of (Project Labor Agreement)** – A Project Labor Agreement is a comprehensive pre-hire collective bargaining agreement that is negotiated between a project's owner (a state for example) and an appropriate labor organization (an area or state building and construction trades council) which sets out the basic terms and work conditions for that particular project.

- **Intent of a Project Labor Agreement** – A Project Labor Agreement's intent is to ensure the efficient, timely and most cost-effective completion of a construction project.

- **General Provisions Contained in a Project Labor Agreement**

  - A skilled and trained workforce is available through the craft's hiring halls.
  - Work schedules and general terms for labor are made uniform among the crafts.
  - Monthly meetings established throughout the project with the trade unions and contractors to help coordinate manpower and settle disputes.
  - Dispute resolution procedures are put into place addressing contractual and jurisdictional disputes.
  - Ensures a timely completion of the project with no work stoppages.
  - Levels the playing field for potential bidders.
  - Prevailing wage laws are applied to wage rates and fringe benefits.

- **History of the Project Labor Agreement** – Project Labor Agreements (PLAs) have a long history of use in the construction industry dating back before World War II. PLAs have been used on federal construction projects since the 1930s. Some examples include the Grand Coulee Dam 1937-1938, Kennedy Space Center and Nuclear missile sites.

  In February of 1993, President Clinton signed Executive Order 12836, which revoked Executive Order 12818 issued in October of 1992 by President Bush that prohibited the use of PLAs on federal construction contracts. In June of 1997, President Clinton issued a presidential memorandum for the Heads of Executive Departments and Agencies expressing his support for the use of PLAs and encouraging their use within the federal government. President Clinton asked department heads to consider their use on a project-by-project basis for use on large scale projects where cost savings, efficiency and quality could be advanced.

  On February 6, 2009, President Obama signed Executive Order 13502 allowing the use of PLAs by Executive Agencies on projects where federal funds will be obligated in excess of $25 million. This order revokes Executive Orders 13202 and 13208, signed by President George W. Bush in 2001, and which prohibited the use of PLAs on federally-funded construction projects. President Obama's Executive Order lists the same advantages and the same requirements for a PLA that IDOT has recognized and required for many years. Importantly, the use of PLAs is not precluded for projects receiving federal financial assistance. Illinois received the first PLA granted on a federal-aid project under the Obama administration. (See Attachments A-E for complete text of Executive Orders referenced herein.)

- **History of the Project Labor Agreement in Illinois** – Project Labor Agreements have been used on a limited basis since 1992. The first agreement was implemented on the Supermax Prison project in Tamms, Illinois. The agreement was negotiated by the Building & Construction Trades Council, the Builder's Association and the Capital Development Board (state of Illinois). The agreements have been used on a project-by-project basis when they meet the criteria for their use.

  In May of 2003, the Governor issued an executive order on Project Labor Agreements. The executive order allows a state department, agency, authority, board or instrumentality, which is under the control of the Governor, to include a PLA on a public works project where said department, agency, authority, board or instrumentality has determined that such agreement advances the state's interests of cost, efficiency, quality, safety, timeliness, skilled labor force, labor stability or the state's policy to advance minority- and female-owned businesses and minority and female employment.

  After months of experience with Executive Order 2003-13, it became apparent that a statewide PLA committee needed to be established to provide better communication and efficiency between the state of Illinois and Labor. As a result, beginning February 25, 2005 an Illinois AFL-CIO Statewide Project Labor Agreement Committee was created.

  On March 31, 2010, Executive Order 2010-03 was issued by Governor Pat Quinn which supersedes Executive Order 2003-13.

  The Project Labor Agreements Act (30 ILCS 571) became effective July 27, 2011. Additional diversity language and reporting provisions were included.

- **Criteria for Use of a Project Labor Agreement**

  - project size
  - complexity
  - length of project
  - disruption to the public
  - impact on quality of life
  - availability of skilled workforce
  - history of workforce harmony
  - cost savings from use of a PLA
  - geographical area (benefit to the state for keeping payrolls within the state)
  - request by Using Agencies
  - other factors as determined by the department

- **Strategy for Use of Project Labor Agreements**

  - Continue to meet with the 21 Building and Construction Trades Councils promoting the use of PLAs on projects that meet the criteria for their use.

  - Meet with AFL-CIO and other labor organizations at their quarterly meetings.

  - Meet with other Using Agencies including the Capital Development Board to share language and discuss the benefits of PLAs.

ILLINOIS AFL-CIO BUILDING & CONSTRUCTION TRADES STATEWIDE PROJECT LABOR AGREEMENT COMMITTEE

On May 7, 2003 Executive Order 2003-13 was signed allowing the use of Project Labor Agreements on a project-by-project basis for a state department, an agency, an authority, a board or instrumentality, which is under the control of the Governor. The Governor ordered that Project Labor Agreements should be utilized on a public works project where said department, agency, authority, board or instrumentality had determined that such agreement advances the state's interests.

After months of experience with Executive Order 2003-13, it became apparent that a statewide PLA committee needed to be established to provide better communication and efficiency between the state of Illinois and Labor.

As a result, beginning February 25, 2005 an Illinois AFL-CIO Statewide Project Labor Agreement Committee was created. The PLA committee members will:

- Meet as determined by the Illinois AFL-CIO. The meeting will be chaired by an officer (or their designee) of the Illinois AFL-CIO.
- Be comprised of one authorized representative from each craft from the Illinois Building and Construction Trades.
- Seek input from and work in concert with the twenty-one (21) Illinois Building and Construction Trades councils.
- Will have full authority and responsibility to attend statewide PLA committee meetings and to negotiate PLAs with the state of Illinois; to sign PLAs with the state of Illinois; and, to have decision-making capabilities on any and all matters which may arise regarding Executive Order 2003-13 on behalf of their respective craft.
- Promulgate PLA committee procedures and rules as necessary in order to conduct business in an efficient and respectful manner and to bring a unified bargaining team to the PLA negotiating process.

On March 31, 2010, Executive Order 2003-13 was superseded by Executive Order 2010-03.

The Project Labor Agreements Act (30 ILCS 571) became effective July 27, 2011. Additional diversity language and reporting provisions were included.

(30 ILCS 571/) Project Labor Agreements Act.

(30 ILCS 571/1)

Sec. 1. Short title. This Act may be cited as the Project Labor Agreements Act. (Source: P.A. 97-199, eff. 7-27-11.)

(30 ILCS 571/5)

Sec. 5. Findings.

(a) The State of Illinois has a compelling interest in awarding public works contracts so as to ensure the highest standards of quality and efficiency at the lowest responsible cost.

(b) A project labor agreement, which is a form of pre-hire collective bargaining agreement covering all terms and conditions of employment on a specific project, can ensure the highest standards of quality and efficiency at the lowest responsible cost on appropriate public works projects.

(c) The State of Illinois has a compelling interest that a highly skilled workforce be employed on public works projects to ensure lower costs over the lifetime of the completed project for building, repairs, and maintenance.

(d) Project labor agreements provide the State of Illinois with a guarantee that public works projects will be completed with highly skilled workers.

(e) Project labor agreements provide for peaceful, orderly, and mutually binding procedures for resolving labor issues without labor disruption, preventing significant lost-time on construction projects.

(f) Project labor agreements allow public agencies to predict more accurately the actual cost of the public works project.

(g) The use of project labor agreements can be of particular benefit to complex construction projects.

(Source: P.A. 97-199, eff. 7-27-11; 97-813, eff. 7-13-12.)

(30 ILCS 571/10)

Sec. 10. Public works projects. On a project-by-project basis, a State department, agency, authority, board, or instrumentality that is under the control of the Governor shall include a project labor agreement on a public works project when that department, agency, authority, board, or instrumentality has determined that the agreement advances the State's interests of cost, efficiency, quality, safety, timeliness, skilled labor force, labor stability, or the State's policy to advance minority-owned and women-owned businesses and minority and female employment.

(Source: P.A. 97-199, eff. 7-27-11.)

(30 ILCS 571/15)

Sec. 15. Public works projects funded with federal funds. When it has been determined that a project labor agreement is appropriate, and in furtherance of the President's Executive Order 13502, the State department, agency, authority, board, or instrumentality responsible for awarding the project may include a project labor agreement on a public works project funded in whole or in part with federal funds.

(Source: P.A. 97-199, eff. 7-27-11.)

(30 ILCS 571/20)

Sec. 20. Negotiation of agreement. When it has been determined that a project labor agreement is appropriate for a particular public works project, the State department, agency, authority, board, or instrumentality responsible for awarding the project shall in good faith negotiate a project

labor agreement with labor organizations engaged in the construction industry. If the State department, agency, authority, board, or instrumentality and the labor organizations engaged in the construction industry ("the parties") cannot agree to the terms of the project labor agreement, the Governor shall appoint a designee to assist the parties in reaching an agreement.
(Source: P.A. 97-199, eff. 7-27-11.)

(30 ILCS 571/25)
Sec. 25. Contents of agreement. Pursuant to this Act, any project labor agreement shall:
(a) Set forth effective, immediate, and mutually binding procedures for resolving jurisdictional labor disputes and grievances arising before the completion of work.
(b) Contain guarantees against strikes, lockouts, or similar actions.
(c) Ensure a reliable source of skilled and experienced labor.
(d) For minorities and females as defined under the Business Enterprise for Minorities, Females, and Persons with Disabilities Act, set forth goals for apprenticeship hours to be performed by minorities and females and set forth goals for total hours to be performed by underrepresented minorities and females.
(e) Permit the selection of the lowest qualified responsible bidder, without regard to union or non-union status at other construction sites.
(f) Bind all contractors and subcontractors on the public works project through the inclusion of appropriate bid specifications in all relevant bid documents.
(g) Include such other terms as the parties deem appropriate.
(Source: P.A. 97-199, eff. 7-27-11.)

(30 ILCS 571/30)
Sec. 30. Publicly disclosed finding. Any decision to use a project labor agreement in connection with a public works project by a State department, agency, authority, board, or instrumentality shall be supported by a written, publicly disclosed finding by the department, agency, authority, board, or instrumentality, setting forth the justification for use of the project labor agreement.
(Source: P.A. 97-199, eff. 7-27-11.)

(30 ILCS 571/35)
Sec. 35. Compliance. All State departments, agencies, authorities, boards, and instrumentalities shall ensure that all public works projects are implemented in a manner consistent with the terms of this Act and are in full compliance with all statutes, regulations, and Executive Orders.
(Source: P.A. 97-199, eff. 7-27-11.)

(30 ILCS 571/37)
Sec. 37. Quarterly report; annual report. A State department, agency, authority, board, or instrumentality that has a project labor agreement in connection with a public works project shall prepare a quarterly report that includes workforce participation under the agreement by minorities and

females as defined under the Business Enterprise for Minorities, Females, and Persons with Disabilities Act. These reports shall be submitted to the Illinois Department of Labor. The Illinois Department of Labor shall submit to the General Assembly and the Governor an annual report that details the number of minorities and females employed under all public labor agreements within the State.
(Source: P.A. 97-199, eff. 7-27-11.)

(30 ILCS 571/40)
Sec. 40. Severability. Nothing in this Act shall be construed to contravene any state or federal law or to jeopardize the State's entitlement to federal funding. If any provision of this Act or its application to any person or circumstance is held invalid by any court of competent jurisdiction, this invalidity does not affect any other provision or application of this Act that can be given effect without the invalid provision or application. To achieve this purpose, the provisions of this Act are declared to be severable.
(Source: P.A. 97-199, eff. 7-27-11.)

(30 ILCS 571/45)
Sec. 45. (Amendatory provisions; text omitted).
(Source: P.A. 97-199, eff. 7-27-11; text omitted.)

(30 ILCS 571/99)
Sec. 99. Effective date. This Act takes effect upon becoming law.
(Source: P.A. 97-199, eff. 7-27-11.)

STATE OF ILLINOIS
EXECUTIVE DEPARTMENT
SPRINGFIELD, ILLINOIS

EXECUTIVE ORDER ON PROJECT LABOR AGREEMENTS (2010-03)

WHEREAS, the State of Illinois has a compelling interest in awarding public works contracts so as to ensure the highest standards of quality and efficiency at the lowest responsible cost; and

WHEREAS, a project labor agreement, which is a form of pre-hire collective bargaining agreement covering all terms and conditions of employment on a specific project, can ensure the highest standards of quality and efficiency at the lowest responsible cost on appropriate public works projects; and

WHEREAS, the State of Illinois has a compelling interest that a highly skilled workforce be employed on public works projects to ensure lower costs over the lifetime of the completed project for building, repairs and maintenance; and

WHEREAS, project labor agreements provide the State of Illinois with a guarantee that public works projects will be completed with highly skilled workers; and

WHEREAS, project labor agreements provide for peaceful, orderly and mutually binding procedures for resolving labor issues without labor disruption, preventing significant lost-time on construction projects; and

WHEREAS, project labor agreements allow public agencies to predict more accurately the actual cost of the public works project; and

WHEREAS, the use of project labor agreements can be of particular benefit to complex construction projects; and

THEREFORE, I, Pat Quinn, Governor of the State of Illinois, pursuant to the supreme executive authority of the Governor as set forth in Article V, Section 8 of the Illinois Constitution, do hereby order as follows:

1. On a project-by-project basis, a State department, agency, authority, board or instrumentality, which is under the control of the Governor, shall include a project labor agreement on a public works project where said department, agency, authority, board or instrumentality has determined that such agreement advances the State's interests of cost, efficiency, quality, safety, timeliness, skilled labor force, labor stability or the State's policy to advance minority- and women-owned businesses and minority and female employment.

2. Where it has been determined that a project labor agreement is appropriate, and in furtherance of the President's Executive Order 13502, the State department, agency, authority, board or instrumentality responsible for awarding the project may include a project labor agreement on a public works project funded in whole or in part with Federal funds.

3. Where it has been determined that a project labor agreement is appropriate for a particular public works project, the State department, agency, authority, board or instrumentality responsible for awarding the project shall in good faith negotiate a project labor agreement with labor organizations engaged in the construction industry. In the event that the State department, agency, authority, board or instrumentality and the labor organizations engaged in the construction industry ("the parties") cannot agree to the terms of the project labor agreement, the Governor shall appoint a designee to assist the parties in reaching an agreement.

4. Pursuant to this Order, any project labor agreement:

   a. shall set forth effective, immediate and mutually binding procedures for resolving jurisdictional labor disputes and grievances arising before the completion of work;

   b. shall contain guarantees against strikes, lockouts, or similar actions;

   c. shall ensure a reliable source of skilled and experienced labor;

   d. shall further public policy objectives as to improved employment opportunities for minorities and women in the construction industry to the extent permitted by state and federal law;

e. shall permit the selection of the lowest qualified responsible bidder, without regard to union or non-union status at other construction sites;

f. shall be made binding on all contractors and subcontractors on the public works project through the inclusion of appropriate bid specifications in all relevant bid documents; and

g. shall include such other terms as the parties deem appropriate.

5. Any decision to use a project labor agreement in connection with a public works project by a State department, agency, authority, board or instrumentality shall be supported by a written, publicly disclosed finding by such department, agency, authority, board or instrumentality, setting forth the justification for use of the project labor agreement.

6. All State departments, agencies, authorities, boards and instrumentalities are hereby ordered to ensure that all public works projects are implemented in a manner consistent with the terms of this Order and are in full compliance with all statutes, regulations and Executive Orders.

7. Nothing in this Executive Order shall be construed to contravene any state or federal law or to jeopardize the State's entitlement to federal funding. If any provision of this Executive Order or its application to any person or circumstance is held invalid by any court of competent jurisdiction, this invalidity does not affect any other provision or application of this Executive Order that can be given effect without the invalid provision or application. To achieve this purpose, the provisions of this Executive Order are declared to be severable.

8. This Order supersedes Executive Order 2003-13.

9. This Order shall be in full force and effect upon its filing with the Secretary of State.

Pat Quinn

Pat Quinn
Governor

Issued by the Governor: March 31, 2010
Filed with the Secretary of State: March 31, 2010

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Research
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Construction Program Guide

IDOT Project Labor Agreement Determination

Contract Number
County

To:

From:

Date:

Re:

In accordance with Executive Order 2003-13 (Blagojevich), it is recommended that a project labor agreement (PLA) be utilized for the above-captioned Project. This recommendation is based on the considerations indicated below.

1. The Project is being awarded and administered by IDOT (i.e., not by another governmental agency).
2. The Project is being constructed using state or local funds only (i.e., no federal funds).
3. The overall size, scope, sequencing, logistics or other aspects of the Project make it particularly challenging to manage, and use of a PLA is expected to help assure that the construction work is performed properly and efficiently under the circumstances.
4. The duration of construction activity on the Project is expected to exceed one construction season (i.e., 110 or more working days), or the nature of the Project results in a heightened need for labor force continuity and stability over a substantial period of time.
5. There is a firm construction completion date established for the Project thereby increasing the adverse consequences of any work stoppage or other labor disruption.
6. The time required to complete the Project is expected to extend beyond the expiration date of one or more existing collective bargaining agreements covering trades likely to be involved in the Project, thereby increasing the likelihood of work stoppage(s) or other labor disruption(s) during construction of the Project.
7. In the absence of a PLA, there is an increased likelihood of jurisdictional disputes among unions or of conflict between unionized and non-unionized workers on the Project that could have a potentially material adverse effect on the time, cost, or quality of work performed on the Project.

More Information

- Contract Administration

Contact

Julie Trunk
Office of Program Administration
202-366-4639
E-mail Julie

Construction Feedback
E-mail Construction

8. This project presents specific safety concerns to the traveling public and a PLA, will ensure labor force continuity and stability, decreasing the length of the safety concern.
9. Use of a PLA is expected to result in improved access to skilled labor, improved efficiency, or improved safety performance on the Project.
10. Use of a PLA on the Project is not expected to have a material adverse effect on the competitive bidding process.
11. Use of a PLA on the Project is not expected to have a material adverse effect on the ability of the Department to achieve other Departmental goals (e.g., utilization of disadvantaged businesses, utilization of Illinois domiciled businesses, development of competitive vendor alternatives over time, etc.).
12. There are other material considerations favoring or disfavoring use of a PLA on this Project as follows:

Based upon the identified considerations, we recommend that you approve use of a PLA on this Project. Upon your approval, the Department shall undertake to negotiate in good faith a PLA with the relevant labor organization(s), and shall include in all necessary bid specifications and other documents information regarding the actual or form of PLA that is binding upon all contractors and their employees.

Agreed: _____
{Division Chief} (Date)

Agreed: _____
{Bureau of Design & Environment} (Date)

Agreed: _____
{Regional Engineer} (Date)

Approved: _____
Gary Hannig, Secretary (Date)

FHWA concurrence in the PLA for the above mentioned contract.

_____
Division Administrator FHWA (Date)

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Updated: 04/04/2011

Construction Guide
Fact Sheets
Links
Memos
Publications
Research
Reviews
Technical Advisories
Training & Workshops

Construction Program Guide

Project Labor Agreement

A project labor agreement (PLA) is a pre-hire collective bargaining agreement with one or more labor organizations that establishes the terms and conditions of employment for a specific construction project. For highway projects, PLAs are typically negotiated between a State department of transportation, or another relevant contracting agency, and an appropriate labor organization (such as an area or state building and construction trades councils and relevant local unions). As a condition of being awarded a contract, the contractor must sign the negotiated PLA with the relevant union organizations.

On February 6, 2009 President Obama signed an Executive Order 13502 titled "Use of Project Labor Agreement for Federal Construction Projects." This Executive Order encourages executive agencies to consider requiring the use of PLAs on large-scale direct Federal construction projects (defined as a project with a total cost of $25 million or more). Specifically, section 3 allows agencies to require the use of a PLA in Federal contracts where such use will: " . . . (i) advance the Federal Government's interest in achieving economy and efficiency in Federal procurement, producing labor-management stability, and ensuring compliance with laws and regulations governing safety and health, equal employment opportunity, labor and employment standards, and other matters, and (ii) be consistent with law." By its terms, section 3 applies only to Federal procurement, not contracts awarded under Federal financial assistance programs. With respect to projects receiving Federal financial assistance, section 5 provides, "This order does not require an agency to use a project labor agreement on any construction project, nor does it preclude the use of a project labor agreement in circumstances not covered by the order, including leasehold arrangements and projects receiving Federal financial assistance."

Executive Order 13502 revokes Executive Order 13202 of February 17, 2001, and Executive Order 13208 of April 6, 2001, and directs agencies, to the extent permitted by law to revoke any orders, rules or regulations implementing the two Executive Orders.

Authority/Legal Basis

1. ***Laws***
   - None
2. ***Regulations***
   - None

More Information

- Contract Administration

Contact

Julie Trunk
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202-366-4639
E-mail Julie

Construction Feedback
E-mail Construction

3. *Orders*

   - Executive Order 13502 of February 6, 2009

4. *Policy*

   - FHWA Interim Guidance - May 7, 2010 (Note: FHWA Division Offices should forward a copy of the State's justification and PLA to Michael Harkins (HCC-30) and Julie Trunk (HIPA-30) for review. A recommendation will then be forwarded to the Deputy Administrator for a final determination.)

Guidance

1. General Information
   - Illinois Department of Transportation Project Labor Agreement Master Plan (.pdf)
   - Illinois Department of Transportation PLA Project Determination Criteria
2. 2. Training
   - None

PDF files can be viewed with the Acrobat® Reader®

Updated: 03/15/2012

FAP Route 729(US 136)
Project ACF-0729(014)
Section 36(W,RS-1) & 34Z-2(W,RS)
Vermilion County
Contract No. 90939

Illinois Department of Transportation
PROJECT LABOR AGREEMENT

This Project Labor Agreement ("PLA") is entered into this _____ day of _____, by and between the Illinois Department of Transportation ("IDOT" or "Department") in its proprietary capacity, and each relevant Illinois AFL-CIO Building Trades Council made signatory hereto by the Illinois AFL-CIO Statewide Project Labor Agreement Committee on behalf of itself and each of its affiliated members (individually and collectively, the "Union"). This PLA shall apply to Construction Work (as defined herein) to be performed by IDOT's Prime Contractor and each of its relevant subcontractors of whatever tier ("Subcontractor" or "Subcontractors") on [redacted] (hereinafter, the "Project").

ARTICLE 1 - INTENT AND PURPOSES

1.1. This PLA is entered into in furtherance of Illinois Executive Order No. 2010-03 and P.A. 097-0199. It is mutually understood and agreed that the terms and conditions of this PLA are intended to promote the public interest in obtaining timely and economical completion of the Project by encouraging productive and efficient construction operations; by establishing a spirit of harmony and cooperation among the parties; and by providing for peaceful and prompt settlement of any and all labor grievances or jurisdictional disputes of any kind without strikes, lockouts, slowdowns, delays or other disruptions to the prosecution of the work.

1.2. As a condition of the award of the contract for performance of work on the Project, IDOT's Prime Contractor and each of its Subcontractors shall be required to sign a "Contractor Letter of Assent", in the form attached hereto as Exhibit A, prior to commencing Construction Work on the Project. Each Union affiliate and separate local representing workers engaged in Construction Work on the Project in accordance with this PLA are bound to this agreement by the Illinois AFL-CIO Statewide Project Labor Agreement Committee which is the central committee established with full authority to negotiate and sign PLAs with the State on behalf of all respective crafts. Upon their signing the Letter of Assent, the Prime Contractor, each Subcontractor, and the individual Unions shall thereafter be deemed a party to this PLA. No party signatory to this PLA shall, contract or subcontract, nor permit any other person, firm, company or entity to contract or subcontract for the performance of Construction Work for the Project to any person, firm, company or entity that does not agree in writing to become bound by the terms of this PLA prior to commencing such work.

1.3. It is understood that the Prime Contractor(s) and each Subcontractor will be considered and accepted by the Unions as separate employers for the purposes of collective bargaining, and it is further agreed that the employees working under this PLA shall constitute a bargaining unit separate and distinct from all others. The Parties hereto also agree that this PLA shall be applicable solely with respect to this Project, and shall have no bearing on the interpretation of any other collective bargaining agreement or as to the recognition of any bargaining unit other than for the specific purposes of this Project.

1.8. In the event that the applicable collective bargaining agreement between a Prime Contractor and the Union or between the Subcontractor and the Union expires prior to the completion of this Project, the expired applicable contract's terms will be maintained until a new applicable collective bargaining agreement is ratified. The wages and fringe benefits included in any new applicable collective bargaining agreement will apply on and after the effective date of the newly negotiated collective bargaining agreement, except to the extent wage and fringe benefit retroactivity is specifically agreed upon by the relevant bargaining parties.

ARTICLE II – APPLICABILITY, RECOGNITION, AND COMMITMENTS

2.1 The term Construction Work as used herein shall include all "construction, prosecution, completion, or repair" work performed by a "laborer or mechanic" at the "site of the work" for the purpose of "building" the specific structures and improvements that constitute the Project. Terms appearing within quotation marks in the preceding sentence shall have the meaning ascribed to them pursuant to 29 CFR Part 5.

2.2 By executing the Letters of Assent, Prime Contractor and each of its Subcontractors recognizes the Unions signatory to this PLA as the sole and exclusive bargaining representatives for their craft employees employed on the jobsite for this Project. Unions who are signatory to this PLA will have recognition on the Project for their craft.

2.3 The Prime Contractor and each of its Subcontractors retains and shall be permitted to exercise full and exclusive authority and responsibility for the management of its operations, except as expressly limited by the terms of this PLA or by the terms and conditions of the applicable collective bargaining agreement.

2.4 Except to the extent contrary to an express provision of the relevant collective bargaining agreement, equipment or materials used in the Project may be pre-assembled or pre-fabricated, and there shall be no refusal by the Union to handle, transport, install, or connect such equipment or materials. Equipment or materials delivered to the job-site will be unloaded and handled promptly without regard to potential jurisdictional disputes; any such disputes shall be handled in accordance with the provisions of this PLA.

2.5 Unions commit to furnishing qualified and skilled craft persons as required by the Prime Contractor and its Subcontractors in fulfillment of their obligations to complete the Project. In order to promote the long-term development of a skilled and knowledgeable work force, the parties are encouraged to utilize apprentices to the maximum extent permitted by the applicable collective bargaining agreement.

3.4 Not later than the earlier of (a) five business days following the pre-job conference, or (b) commencement of Construction Work, the Unions and Prime Contractor (on behalf of itself and all its subcontractors of whatever tier) shall confer and jointly designate a slate of three (3) permanent arbitrators (each a "Permanent Arbitrator") for the purpose of hearing disputes pursuant to Articles V and VII of this PLA. The slate of Permanent Arbitrators shall be selected from among the following individuals: Thomas F. Gibbons, Robert Perkovich, Byron Yaffee, and Glenn A. Zipp. In the event that the Unions and Prime Contractor are not able to agree on a full slate of three Permanent Arbitrators, the Department, after consultation with the Unions and Prime Contractor, shall designate such additional Permanent Arbitrators as may be necessary to establish the full slate. A single Permanent Arbitrator shall be selected from the slate of three on a rotating basis to adjudicate each arbitrable matter as it arises. In the event a Permanent Arbitrator is not available to adjudicate a particular matter in the order of rotation, the arbitration assignment shall pass to the next available Permanent Arbitrator.

ARTICLE IV - HOURS OF WORK AND GENERAL CONDITIONS

4.1 The standard work day for Construction Work on the Project shall be an established consecutive eight (8) hour period between the hours of 7:00 a.m. and 5:00 p.m. with one-half hour designated as unpaid period for lunch. The standard work week shall be five (5) consecutive days of work commencing on Monday. Starting time shall be established at the pre-job conference, and shall be applicable to all craft employees on the Project unless otherwise expressly agreed in writing. In the event Project site or other job conditions dictate a change in the established starting time and/or a staggered lunch period for portions of the Project or for specific crafts, the Prime Contractor, relevant Subcontractors and business managers of the specific crafts involved shall confer and mutually agree to such changes as appropriate.

If proposed work schedule changes cannot be mutually agreed upon between the parties, the hours fixed at the time of the pre-job meeting shall prevail.

4.2 Shift work may be established and directed by the Prime Contractor or relevant Subcontractor as reasonably necessary or appropriate to fulfill the terms of its contract with the Department. If used, shift hours, rates and conditions shall be as provided in the applicable collective bargaining agreement.

4.3 The parties agree that chronic and/or unexcused absenteeism is undesirable and must be controlled in accordance with procedures established by the applicable collective bargaining agreement. Any employee disciplined for absenteeism in accordance with such procedures shall be suspended from all work on the Project for not less than the maximum period permitted under the applicable collective bargaining agreement.

5.2.B. Step 2. In the event that the Steward and the contractors' representatives at the job-site cannot reach agreement within two (2) working days after a meeting is arranged and held, the matter shall be referred to the Union Business Manager and to executive representatives of the Prime Contractor and relevant Subcontractor.

5.2.C. Step 3. In the event the dispute is not resolved within five (5) working days after completion of Step 2, the relevant parties shall request a Permanent Arbitrator as determined in accordance with paragraph 3.4 of this PLA, who shall, within ten (10) working days, hear the grievance and make a written decision. Such decisions shall be final and binding on all parties. The parties shall each pay the expense of their own representative. The expense of the Permanent Arbitrator shall be divided equally between (1) the Prime Contractor and/or relevant Subcontractor, and (2) the involved Union.

5.3 Any failure of a party to comply fully with such final and binding decision of the Permanent Arbitrator may result in removal of the non-complying party from the site, in a holdback from the Prime Contractor or Subcontractor of any amounts awarded, or in such other relief as the Department may reasonably determine is necessary to promote final resolution of the dispute.

5.4 In the event any dispute or grievance should arise, the parties expressly agree that it shall be resolved without occurrence of any strike, work stoppage, slow-down or other prohibited activities as provided in Article VII of this PLA. Individuals or parties violating this section shall be subject to immediate discharge or other discipline.

ARTICLE VI - JURISDICTIONAL DISPUTES

6.1 As used in this Agreement, the term "jurisdictional dispute" shall be defined as any dispute, difference or disagreement involving the assignment of particular work to one class or craft of employees rather than to a different class or craft of employees, regardless of that Contractor's contractual relationship to any other employer, contractor, or organization on the site.

6.2 It is agreed by and between the parties to this Agreement that any and all jurisdictional disputes shall be resolved in the following manner; each of the steps hereinafter listed shall be initiated by the parties in sequence as set forth:

(a) Negotiation by and between the Local Business Representative of the disputing Union and Employer shall take place within two (2) business days. Business days are defined as Monday through Friday excluding contract holidays. Such negotiations shall be pursued until it is apparent that the dispute cannot be resolved at the local level.

(3) If the Arbitrator finds that a previous decision of record governs the case, the Arbitrator shall apply the decision of record in rendering his decision except under the following circumstances. After notice to the other parties to the dispute prior to the hearing that it intends to challenge the decision of record, if a trade challenging the decision of record is able to demonstrate that the recognized and established prevailing practice in the locality of the work has been contrary to the applicable decision of record, and that historically in that locality the work in dispute has not been performed by the other craft or crafts, the Arbitrator may rely on such prevailing practice rather than the decision of record.

If the craft relying on the decision of record demonstrates that it has performed the work in dispute in the locality of the job, then the Arbitrator shall apply the decision of record in rendering his decision. If the Arbitrator finds that a craft has improperly obtained the prevailing practice in the locality through raiding, the undercutting of wages or by the use of vertical agreements, the Arbitrator shall rely on the decision of record rather than the prevailing practice in the locality.

(4) If no decision of record is applicable, the Arbitrator shall then consider the established trade practice in the industry and prevailing practice in the locality; and

(5) Only if none of the above criteria is found to exist, the Arbitrator shall then consider that because efficiency, cost or continuity and good management are essential to the well being of the industry, the interest of the consumer or the past practice of the employer shall not be ignored.

The Arbitrator shall set forth the basis for his decision and shall explain his findings regarding the applicability of the above criteria. If lower-ranked criteria are relied upon, the Arbitrator shall explain why the higher-ranked criteria were not deemed applicable. The Arbitrator's decision shall only apply to the job in dispute.

(6) Agreements of record are applicable only to the party's signatory to such agreements. Decisions of record are applicable to all trades.

(7) The Arbitrator is not authorized to award back pay or any other damages for a mis-assignment of work. Nor may any party bring an independent action for back pay or any other damages, based upon a decision of an Arbitrator.

7.4 Upon notification of violations of this Article, the principal officer or officers of the local area Building and Construction Trades Council, and the Illinois AFL-CIO Statewide Project Labor Agreement Committee as appropriate, will immediately instruct, order and use their best efforts to cause the affiliated union or unions to cease any violations of this Article. A Trades Council and the Committee otherwise in compliance with the obligations under this paragraph shall not be liable for unauthorized acts of its affiliates.

7.5 In the event that activities in violation of this Article are not immediately halted through the efforts of the parties, any aggrieved party may invoke the special arbitration provisions set forth in paragraph 7.6 of this Article.

7.6 Upon written notice to the other involved parties by the most expeditious means available, any aggrieved party may institute the following special arbitration procedure when a breach of this Article is alleged:

7.6.A The party invoking this procedure shall notify the individual designated as the Permanent Arbitrator pursuant to Article III of the nature of the alleged violation; such notice shall be by the most expeditious means possible. The initiating party may also furnish such additional factual information as may be reasonably necessary for the Permanent Arbitrator to understand the relevant circumstances. Copies of any written materials provided to the arbitrator shall also be contemporaneously provided by the most expeditious means possible to the party alleged to be in violation and to all other involved parties.

7.6.B Upon receipt of said notice the Permanent Arbitrator shall set and hold a hearing within twenty-four (24) hours if it is contended the violation is ongoing, but not before twenty-four (24) hours after the written notice to all parties involved as required above.

7.6.C The Permanent Arbitrator shall notify the parties by facsimile or any other effective written means, of the place and time chosen by the Permanent Arbitrator for this hearing. Said hearing shall be completed in one session. A failure of any party or parties to attend said hearing shall not delay the hearing of evidence or issuance of an Award by the Permanent Arbitrator.

7.6.D The sole issue at the hearing shall be whether a violation of this Article has, in fact, occurred. An Award shall be issued in writing within three (3) hours after the close of the hearing, and may be issued without a written opinion. If any party desires a written opinion, one shall be issued within fifteen (15) days, but its issuance shall not delay compliance with, or enforcement of, the Award. The Permanent Arbitrator may order cessation of the violation of this Article, and such Award shall be served on all parties by hand or registered mail upon issuance.

8.6 The failure or refusal of a party to exercise its rights hereunder in one or more instances shall not be deemed a waiver of any such rights in respect of a separate instance of the same or similar nature.

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LEAKING UST TECHNICAL REVIEW NOTES

Reviewed by: Scott Rothering
Date Reviewed: 5/6/21

Re: 1670255005 -- Sangamon County
Cantrall / Springfield Marine Bank Trust #530051
9520 Illinois State Route 29
Leaking UST Incident 20030135
Leaking UST Technical File

Document(s) Reviewed:
Corrective Action Plan and Budget – dated January 18, 2021 and received January 26, 2021

General Site Information:

Site subject to: 734

IEMA date(s): 2/4/03	Payment from the Fund? (Y/N/unknown): yes
UST system removed? (Y/N): yes	OSFM Fac. ID #: 5-040470
Encountered groundwater? (Y/N/unknown): yes	SWAP mapping and evaluation completion date: 4/27/21
Free product? (Y/N/unknown): no	Site placement correct in SWAP? (Y/N): yes
Current/past land use: commercial, residential, agricultural	Inspection Required? (Date/Plan):
Size & product of USTs: 1 500-gallon gasoline, 1 1000 gasoline, 1 500 gallon diesel, 1 150 gallon used oil	
Is site located in EJ area? no	Is investigation of indoor inhalation exposure route required? They are performing new sampling to determine, based on old results, it does not appear it would be required
Has enough sampling been completed to perform a Right-to-Know Evaluation? Previously sampling indicates right to know is not required. However, will be reevaluated when new sample results are received	PLA Checklist Complete? yes

The site has had three previous caps. However, all three were for the removal of contaminated soil which exceeds Tier 2 remediation objectives. The method of determining the Tier 2 remediation objective has been debated throughout these caps. Also, there was an issue of off-site access denial which originally wasn't proven. The final CAP in 2009 approved the plan but not the budget. Nothing has been approved since then, and it doesn't appear as though any work has been performed.

This current submittal is for sampling at the site again, to determine the current level of contamination. They think a lot of the issues which previously arose on the site will be not present anymore because the contamination levels will be down. It has been 12 years since the site was sampled.
They propose to do this sampling at the locations which previously had levels of contamination which exceeded Tier 1 ROs. The locations, method of sampling, appear to be okay.
They also

Groundwater investigation is for resampling wells MW 1, 2, 3,4, 5, 9, 14. However, they are also proposing installation of 7 monitoring wells in case the wells on site have been removed or cannot be found. They will not install the 7 new wells if the wells on site can be found and used.

After performing this sampling, they will develop a CAP to address the contamination if necessary.

Vapor Intrusion: Looking at previous sample results, it doesn't appear they would trigger a vapor intrusion investigation. This will be evaluated again with the new results.

Right to Know: Previous soil and groundwater results off site do not show exceedances to remediation objectives. However, previous modeling does indicate that the contamination (benzene) has the potential to migrate off site to the south (industrial/commercial) and west into Route 29. Based on contamination levels from 2004, RTK may be triggered. However, since they are resampling, we can determine that after getting new results.

PLA: Requested language why it should not be needed. As they are proposing 11 PUSH borings for soil samples and potentially 7 HSA borings for wells it is unlikely one will be required.

Land Trust: This form was received by the previous project manager. I have included it with this submittal.

Budget:

The budget has some cuts.

Field work: Boring logs/tabulate analytical results – I cut this because I found reference that doing this work is part of writing CACR. In writing CACR, they have 40 hours, so I think it should be included in the 40 hours.

Field Work: I cut Engineer III to Senior Technician: This is part of the pairing with a Senior PM.

Field work: For the same reason as above, I cut groundwater sampling/surveying.

Taco 2 or3; hydraulic conductivity calculation: I cut these costs since they are part of CACR writing and there is 40 hours allowed for it.

CACR – Senior PM – NFR IEPA correspondence: I cut these costs because it is my understanding, they are not reimbursable.

Updated July 3, 2023:

The corrective action plan approved 5/19/21 was performed. The results indicated exceedances of Tier 2 remediation objectives remain on site. Additionally, the soil results at SB-15 exceeded Csat exceedances for total xylenes (163 ppm).

Additionally, the soil results at SB-7 indicate exceedances of the calculated Tier 2 remediation objectives. There is some debate with the previous PM about the validity of the previous Tier 2 RO calculation. This is due to soil bulk density and soil particle density not meeting the requirements of 35 Ill. Adm. Code 742. The information about this is listed in depth in previous PM notes and can be referenced in docuware. The point is that the consultant now wants to recalculate the Tier 2 ROs and then compare the generated remediation objectives to the current soil sample results. However, due to the concentration of benzene (16.3 ppm) at SB-7 – the consultant argues that even with the new objective, the objective will likely be exceeded by this sample result. It should be noted that the previous Tier 2 RO was 3.95 ppm. Due to this, the consultant argues that an engineered barrier will almost certainly be needed for this area of the site. Therefore, they are proposing three soil borings to determine the area of an engineered barrier required for closure of the site. SB-7 is located between the tank bed and the dispensers. (former). Contamination is present at 6 feet bgs. For these three samples, the consultant is proposing sampling at 0-5 feet bgs, and 5-10 feet bgs. This depth of sampling appears to be okay. In the end, these borings were approved.

The consultant is also proposing performing a vapor sample, citing the need for it. Previously I had noted that a vapor sample would likely not be necessary. However, with these new results and the levels of benzene discovered at the depths it was, the vapor sample will be necessary.

Finally, the consultant notes that ELUCs will almost certainly be required for the site. A groundwater ordinance with the Village of Cantrell is likely not attainable and the site is not located within the limits of the village as well. These will be submitted later.

Budget: The budget is cut for two samples analyzed for PNAs which are vertical soil saturation samples and only need to be analyzed for BTEX. Costs are added for drilling for vapor boring (what exceeds the minimum charge) and analysis. A variety of personnel costs were cut after a response.

Updated May 17, 2024

The previous CAP was performed.

This CAP consisted of basically three areas:

1) Determining the extent of an engineered barrier which will need to be installed on site, due to exceedance of Tier 2 remediation objectives for I/C outdoor inhalation

2) Determination of vertical extent of groundwater contamination at SB-21

3) performing a soil sample for site specific geotechnical parameters because the previous PM rejected the ones which were proposed.

4) Collection of a soil gas sample (two were performed)

The new Tier 2 numbers were generated. They have been checked. The new numbers are higher than the original numbers, but not drastically, and not enough to change the scope of work for the site. The new Tier 2 numbers are as follows:

S/C of groundwater

Benzene – 5.42 ppm
EB – 58.0 ppm
Toluene – 736.66 ppm
Xylenes (total) – 98.7 ppm
Naphthalene – 3.34

I/C Inhalation

Benzene – 5.42
Ethylbenzene – 34.94
Toluene – 113,871.29
Xylenes – 3,820.73
Naphthalene – 324.57

CW Inhalation

Benzene – 7.62
Ethylbenzene – 49.14
Toluene – 736.66
Xylenes – 98.87
Naphthalene – 3.34

There are exceedances of these Tier 2 numbers:

SB-7, SB-15, SB-19 all are at or above 6 feet bgs.

The I/C Inhalation is exceeded at SB-7 and SB-19. These will require an engineered barrier due to exceedance of I/C Inhalation.

CW Caution is exceeded at SB-15 and SB-19, SB-7. This will require a CA caution.

This is all proposed in this plan.

Groundwater contamination is present on site as Class I groundwater. Modeling has determined that groundwater contamination will migrate off site to the east and southeast directions. This will involve three properties which will be affected by this groundwater ordinance. This appears to be fine. I have requested a draft ordinance from the consultant on May 20, 2024. I ran the R26 equations on May 20, 2024.

Finally – the consultant performed soil vapor sampling on site. The results of the sampling indicated that there are exceedances of Tier 1 vapor sample remediation objectives.

Benzene – 153.67 mg/m^3

So, they are proposing to accept the on site the concrete base, no sumps restriction.

Groundwater is encountered across the site at 8 feet bgs.

ELUC – They are proposing an ELUC for soil contamination off site.

Csat delineation:

Exceedance of Tier 1 Csat for Xylenes was encountered at SB-21. The previous plan proposed (and was approve) for delineating vertically this exceedance. It previously was 163 ppm at 5-10 feet bgs. It has been delineated at the next interval of 10 -15 feet bgs. Additionally, the Tier 2 number (324ppm) is higher.

I requested a copy of the groundwater ordinance, and it was provided. However, I found out I also have to have proof that the Fancy Prairie Township. I have received a draft ordinance which I also am going to send to legal. They provided email communication which they have had with the township about the groundwater ordinance.

After request, they provided a signed ELUC.

Prior to approval of Cap it was decided the CAP needed to be amended for 5 different reasons:

1) The CAP would need information which indicated the work of installing the concrete barrier could be covered by the Subpart H rate.
2) A BCT would be required on site for future buildings.
3) Modeling should be required via a half circle instead of a cone to insure the proper notifications are made.
4) The well at the school across Route 29 will have to be properly abandoned, not simply stated that it will not be used.
5) there is no evidence the groundwater ordinance will be approved, therefore the costs for obtaining the groundwater ordinance are reviewed as part of this budget.

The approved items were worked into the letter and budget prior to final review.

Illinois EPA Decision:
Modification of plan and budget

Response Due:

Amended CAP and budget with the above requirements.

Fw: Fancy Creek Township/ Groundwater Ordinance

Mickey Davis <mickey@cwmcompany.com>
Thu 5/23/2024 9:01 AM
To:matts cwmcompany.com <matts@cwmcompany.com>
Here is the communication.

From: fancycreek township <fancycreektownship@yahoo.com>
Sent: Tuesday, May 21, 2024 4:14 PM
To: Mickey Davis <mickey@cwmcompany.com>
Cc: jmanley37@yahoo.com <jmanley37@yahoo.com>
Subject: Re: Fancy Creek Township/ Groundwater Ordinance

You can email it if you wish or mail to 6409 Reinders Rd Springfield Il 62707

Sent from Yahoo Mail for iPhone

On Tuesday, May 21, 2024, 8:32 AM, Mickey Davis <mickey@cwmcompany.com> wrote:

> Jill and Jim,
>
> I represent an environment consulting company which works with the Ilinois EPA and clients to remediate contaminated sites through the Leaking Underground Storage Tank (LUST) program. One of our sites is located in Cantrall and within the Fancy Creek Township. When we reach the final stages of closing a site, the IEPA requires us to implement certain corrective actions. One of the most common corrective actions is a groundwater ordinance. I have attached a couple maps of the area which the groundwater ordinance would cover. Since Fancy Creek Township has jurisdiction over this area, where do I send a groundwater ordinance for the Fancy Creek Township officials to review and approve?
>
> Thank you for your time and if you have any questions, feel free to contact me.
> -
>
> Mickey Davis
>
> Project Manager
> CW3M Company, Inc.
> 701 South Grand Avenue West
> Springfield, IL 62704
> (217) 522-8001

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 · (217) 782-3397
JB PRITZKER, GOVERNOR JOHN J. KIM, DIRECTOR

(217) 524-3300

CERTIFIED MAIL
9589 0710 5270 0477 0527 90

MAY 28 2024

Jeffrey M. Ulrich
Marine Bank Trust #53-0051
201 Clock Tower Drive
East Peoria, IL 61611

Re: 1670255005 -- Sangamon County
Cantrall/Marine Bank Trust #53-0051
9520 Illinois State Route 29
Leaking UST Incident 20030135
Leaking UST Technical File

Dear Mr. Ulrich:

The Illinois Environmental Protection Agency (Illinois EPA) has reviewed the Corrective Action Plan (plan) submitted for the above-referenced incident. This plan, dated February 2, 2024, was received by the Illinois EPA on February 2, 2024. Citations in this letter are from the Environmental Protection Act (415 ILCS 5) (Act) and Title 35 of the Illinois Administrative Code (35 Ill. Adm. Code).

The Illinois EPA requires modification of the plan; therefore, the plan is conditionally approved with the Illinois EPA's modifications. The following modifications are necessary, in addition to those provisions already outlined in the plan, to demonstrate compliance with Title XVI of the Act (Sections 57.7(b)(2) and 57.7(c) of the Act and 35 Ill. Adm. Code 734.505(b) and 734.510(a)):

1. Pursuant to 35 Ill. Adm. Code 742.312 (B), since remediation objectives are exceeded for benzene in both groundwater and soil gas, a building control technology which meets the requirements of Title 35 Subpart L must be utilized for any future buildings.

2. Pursuant to 35 Ill. Adm. Code 734.355 (a) (3)(A) the Corrective Action Plan must include a description of the remedial technologies selected and how each fit into the overall corrective action plan strategy. The Corrective Action Plan states ISGS Well ID 00210 (Athens Community School District) is not in use. Proof of abandonment of this well must be submitted prior to issuance of an NFR letter.

3. Pursuant to 35 Ill. Adm. Code 734.355 (a) (3)(A) the Corrective Action Plan must include a description of the remedial technologies selected and how each fit into the overall corrective action plan strategy. The groundwater plume extends off site in the

western direction to groundwater wells MW-6, MW-7, and MW-8. Additionally, the groundwater plume extends off site in the southern direction to groundwater wells MW-20 and MW-21. The Corrective Action Plan must demonstrate how groundwater contamination off site in these directions will be addressed.

4. Pursuant to Section 57.7(b)(2) of the Act and 35 Ill. Adm. Code 742.320(d), the groundwater ingestion exposure route may be excluded from consideration if, as demonstrated in accordance with Section 742.1015, for any area within the measured and modeled extent of groundwater contamination above what would otherwise be the applicable Tier 1 groundwater remediation objectives, an ordinance adopted by a unit of local government is in place that effectively prohibits the installation of potable water supply wells (and the use of such wells).

   To ensure that all possibly affected off-site properties are notified of the use of the groundwater ordinance, the Illinois EPA requests that all modeling be done using a semicircle in the direction of groundwater flow.

Please note that all activities associated with the remediation of this release proposed in the plan must be executed in accordance with all applicable regulatory and statutory requirements, including compliance with the proper permits. In addition, the budget is modified pursuant to Sections 57.7(b)(3) and 57.7(c) of the Act and 35 Ill. Adm. Code 734.505(b) and 734.510(b). Based on the modifications listed in Section 2 of Attachment A, the amounts listed in Section 1 of Attachment A have been approved. Please note that the costs must be incurred in accordance with the approved plan. Be aware that the amount of payment from the Fund may be limited by Sections 57.7(c), 57.8(d), 57.8(e), and 57.8(g) of the Act, as well as 35 Ill. Adm. Code 734.630 and 734.655.

Further, pursuant to 35 Ill. Adm. Code 734.145, it is required that the Illinois EPA be notified of field activities prior to the date the field activities take place. This notice must include a description of the field activities to be conducted; the name of the person conducting the activities; and the date, time, and place the activities will be conducted and shall be made to EPA.FieldNotifications@illinois.gov. This notification of field activities must be provided at least two weeks prior to the scheduled field activities.

Pursuant to Sections 57.7(b)(4) and 35 Ill. Adm. Code 734.305 and 734.335(c), the Illinois EPA requires that a Corrective Action Completion Report that achieves compliance with applicable remediation objectives be submitted on or before December 1, 2025, to:

Illinois Environmental Protection Agency
Bureau of Land - #24
Leaking Underground Storage Tank Section
1021 North Grand Avenue East
Post Office Box 19276
Springfield, IL 62794-9276

Please submit all correspondence in duplicate and include the Re: block shown at the beginning of this letter.

An underground storage tank system owner or operator may appeal this decision to the Illinois Pollution Control Board. Appeal rights are attached.

If you have any questions or need further assistance, please contact the undersigned at (217) 785-1858 or at Scott.Rothering@illinois.gov.

Sincerely,

for

Scott Rothering
Project Manager
Special Projects and Financial Unit
Leaking Underground Storage Tank Section
Bureau of Land

Attachments: Attachment A
Appeal Rights

c: Carol Rowe, CWM Company (electronic copy)
BOL File

Attachment A

Re: 1670255005 -- Sangamon County
Cantrall/Marine Bank Trust #53-0051
9520 Illinois State Route 29
Leaking UST Incident 20030135
Leaking UST Technical File

SECTION 1

Based on the modifications in Section 2 of this Attachment A, the following amounts have been approved:

$0.00	Drilling and Monitoring Well Costs
$0.00	Analytical Costs
$0.00	Remediation and Disposal Costs
$0.00	UST Removal and Abandonment Costs
$1,552.95	Paving, Demolition, and Well Abandonment Costs
$12,198.05	Consulting Personnel Costs
$89.92	Consultant's Materials Costs

Handling charges will be determined at the time an application for payment is reviewed by the Illinois EPA. The amount of allowable handling charges will be determined in accordance with Section 57.1(a) of the Environmental Protection Act (415 ILCS 5) (Act) and 35 Illinois Administrative Code (35 Ill. Adm. Code) 734.635.

SECTION 2

1. $887.70 for costs for Senior Project Manager (Review of analytical results/bore log and analytical tabulation)), which lack supporting documentation. Such costs are ineligible for payment from the Fund pursuant to 35 Ill. Adm. Code 734.630(cc). Since there is no supporting documentation of costs, the Illinois EPA cannot determine that costs will not be used for activities in excess of those necessary to meet the minimum requirements of Title XVI of the Act. Therefore, such costs are not approved pursuant to Section 57.7(c)(3) of the Act because they may be used for site investigation or corrective action activities in excess of those required to meet the minimum requirements of Title XVI of the Act.

   Additionally, the costs are not reasonable as submitted. Such costs are ineligible for payment from the Fund pursuant to Section 57.7(c)(3) of the Act and 35 Ill. Adm. Code 734.630(dd).

   This results in a deduction of $887.70 from the Consulting Personnel Costs Form.

2. $1,183.60 for costs for Senior Project Manager (Scheduling, Contractor search/arrangements/coordination for corrective action activities), which lack supporting

documentation. Such costs are ineligible for payment from the Fund pursuant to 35 Ill. Adm. Code 734.630(cc). Since there is no supporting documentation of costs, the Illinois EPA cannot determine that costs will not be used for activities in excess of those necessary to meet the minimum requirements of Title XVI of the Act. Therefore, such costs are not approved pursuant to Section 57.7(c)(3) of the Act because they may be used for site investigation or corrective action activities in excess of those required to meet the minimum requirements of Title XVI of the Act.

Additionally, the costs are not reasonable as submitted. Such costs are ineligible for payment from the Fund pursuant to Section 57.7(c)(3) of the Act and 35 Ill. Adm. Code 734.630(dd).

This results in a deduction of $1,183.60 from the Consulting Personnel Costs Form.

3. $3,992.88 for concrete placement costs which lack supporting documentation. Such costs are ineligible for payment from the Fund pursuant to 35 Ill. Adm. Code 734.630(cc). Since there is no supporting documentation of costs, the Illinois EPA cannot determine that costs will not be used for activities and associated materials or services exceeding the minimum requirements necessary to comply with the Act. Therefore, such costs are not approved pursuant to Section 57.7(c)(3) of the Act and 35 Ill. Adm. Code 734.630(o).

   Pursuant to 35 Ill. Adm. Code 870(d)(1), for costs approved by the Illinois EPA in writing prior to the date the costs are incurred, the applicable maximum payment amounts must be the amounts in effect on the date the Illinois EPA received the budget in which the costs were proposed. Once the Illinois EPA approves a cost, the applicable maximum payment amount for the cost must not be increased. Please provide documentation that the costs for installing the concrete will be at or below the Subpart H rate of $7.86 per square foot.

   This results in a deduction of $3,992.88 from Paving, Demolition, and Well Abandonment Costs.

4. $2,820.23 for costs for obtaining a groundwater ordinance, which lack supporting documentation. The plan must include assurances that the local governmental authority is amenable to the proposed option to address off-site contamination. Such costs are ineligible for payment from the Fund pursuant to 35 Ill. Adm. Code 734.630(cc). Since there is no supporting documentation of costs, the Illinois EPA cannot determine that costs will not be used for activities in excess of those necessary to meet the minimum requirements of Title XVI of the Act. Therefore, such costs are not approved pursuant to Section 57.7(c)(3) of the Act because they may be used for site investigation or corrective action activities in excess of those required to meet the minimum requirements of Title XVI of the Act.

   Additionally, the costs are not reasonable as submitted. Such costs are ineligible for payment from the Fund pursuant to Section 57.7(c)(3) of the Act and 35 Ill. Adm. Code 734.630(dd).

These costs can be submitted for reconsideration once the ordinance has been obtained from Fancy Prairie

This includes the following deductions:

$1,775.40 for Senior Project Manager – 12 hours at $175.95 per hour (Preparation and Distribution of Groundwater Ordinance). Deducted from Consulting Personnel Costs.

$887.70 for Senior Project Manager – 6 hours at $147.97 per hour (groundwater ordinance notifications.). Deducted from Consulting Personnel Costs.

$133.16 for Senior Administrative Assistant – 2 hours at $66.58 per hour (groundwater ordinance notifications). Deducted from Consulting Personnel Costs.

$24.00 for Postage (four notifications at $6.00 per notification). Deducted from Consultant's Materials Costs.

Appeal Rights

An underground storage tank owner or operator may appeal this final decision to the Illinois Pollution Control Board pursuant to Sections 40 and 57.7(c)(4) of the Act by filing a petition for a hearing within 35 days after the date of issuance of the final decision. However, the 35-day period may be extended for a period not to exceed 90 days by written notice from the owner or operator and the Illinois EPA within the initial 35-day appeal period. If the owner or operator wishes to receive a 90-day extension, a written request that includes a statement of the date the final decision was received, along with a copy of this decision, must be sent to the Illinois EPA as soon as possible.

For information regarding the filing of an appeal, please contact:

Clerk of the Board
Illinois Pollution Control Board
60 East Van Buren Street, Ste. 630
Chicago, IL 60605
(312) 814-3461

For information regarding the filing of an extension, please contact:

Illinois Environmental Protection Agency
Division of Legal Counsel
1021 North Grand Avenue East
Post Office Box 19276
Springfield, IL 62794-9276
(217) 782-5544