



North Channel Investigation Summary Report

Former J.B. Sims Generating Station

March 21, 2025

Former J.B. Sims Generating Station **North Channel Investigation Summary**



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Table of Abbreviations and Acronyms

Abbreviation	Definition
CCR	coal combustion residuals
City	City of Grand Haven
EGLE	Michigan Department of Environment, Great Lakes and Energy
GHBLP	Grand Haven Board of Light & Power
Site	North Channel of the Units 1/2 Impoundment
Work Plan	North Channel Ash Investigation Work Plan

1.0 Introduction and Background

HDR MICHIGAN, Inc. (HDR) has performed a CCR (coal combustion residuals) investigation of the North Channel at the former J.B. Sims Generating Station. The former J.B. Sims Generating Station was a coal-fired power generation facility operated by Grand Haven Board of Light & Power (GHBLP) that ceased operations in February 2020. The facility is located at 1231 North 3rd Street, on Harbor Island, in Grand Haven, Michigan.

The purpose of this investigation was to determine if CCR may have been deposited in the North Channel as discharge from the inactive Units 1/2 Impoundment. The investigation purpose was to conduct sampling to determine the extent of discharge and identify CCR in the North Channel. A former permitted outlet (weir) for overflow discharge exists at the northern end of the Units 1/2 Impoundment, which is why the channel located to the north of this outlet is referred to as the North Channel, **Figure 1**.



Figure 1. North Channel Location

Golder Associates, Inc. (acquired by WSP in 2021) prepared a *North Channel Ash Investigation Work Plan* (Work Plan, Ref. [1]), dated October 28, 2021, for the Site that was reviewed and approved by Michigan Department of Environment, Great Lakes and Energy (EGLE) on October 29, 2021. The Work Plan is included in Appendix A.

HDR was hired as a consultant for the project in 2022 and performed the North Channel investigation in accordance with the Work Plan. In summary, the following was performed:

- A field investigation consisting of Geoprobe[®] borings to identify the presence of CCR in the North Channel;
- Laboratory testing on select samples obtained from the field investigation;
- Select samples were tested using microscopic analyses; and
- Communication with EGLE.

2.0 North Channel Field and Laboratory Tasks

2.1 Geoprobe® Investigation

A Geoprobe® field investigation was performed at locations identified in the Work Plan. The locations of the borings performed are shown on **Figure 2**. The Work Plan identified fifteen (15) boring locations; however, to further delineate the CCR encountered in the borings, five (5) additional borings were performed for a total of twenty (20) borings. HDR subcontracted the geotechnical field services to MATECO, who performed the Geoprobe® investigation on November 21 and 22, 2022 with HDR field personnel on site. The borings were completed to depths ranging from 5 to 15 feet below existing grade at each location.

The field investigation was performed under a Joint Permit Application (JPA) consisting of EGLE Permit No. WRP033864v.1 dated June 16, 2022, and USACE File No. LRE-2001-500120-N22 dated August 1, 2022.

The sediment samples were observed in the field and assessed for the presence of CCR. The CCR was observed to be a black material that could be distinguished from native sediments by color and texture. There was CCR encountered in the drilled borings. **Table 2-1** details the depths of encountered CCR in the borings visually observed in the field.

Generally, CCR was encountered within the center of the North Channel, with less CCR encountered laterally away from the channel; however, the lateral boundary of CCR, away from the center of the North Channel, was not established. It also should be noted that it was hard to visually distinguish between CCR and organic material in the field for the surficial material (0 to 1 foot) in the northern most borings (4- and 5- series borings). Therefore, select samples were prepared for microscopy analysis. CCR was observed to be present during the microscopic analyses discussed in **Section 2.2**.

Table 2-1. Depths of CCR from Borings

Boring ID	Boring Total Depth (feet)	Approximate Surface Elevation* (feet)	Depths of CCR (feet below existing grade)		
1L	15	586	3-5		
1LA	10	586	0-5		
1LA2	5	586	2-5		
1M	15	586	1-5		
1R	15	588	3-4		
1RA	10	588	3-5		
2L	15	586	0-1		
2M	15	585	1-6		
2R	15	586	0-3		
3L	10	584	0-2		
3M	10	583	0-1		
3R	10	584	0-1		
3RA	5	584	0-2.5		
4L	10	583	0-1		
4M	10	583	0-1		
4MA	5	582	0-1		
4R	5	583	0-1		
5L	10	581	0-1		
5M	10	581	0-1		
5R	10	581	0-1		

^{*} Estimated from Google Earth

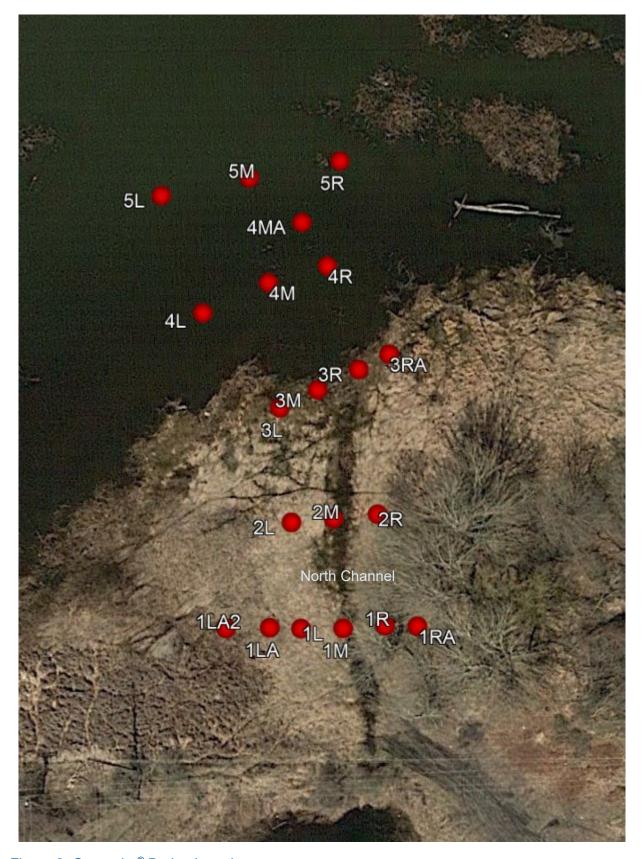


Figure 2. Geoprobe® Boring Locations

The twenty (20) Boring Logs are presented in **Appendix B**. Photographs of the samples obtained from the borings are presented in **Appendix C**.

2.2 Microscopy Analyses

In accordance with the Work Plan, microscopic analysis was performed on select samples obtained from the borings in order to further identify CCR in the obtained samples. Samples where CCR was suspected to be present were oven-dried (100° F) for approximately 12-24 hours to remove moisture for microscopic analyses. The sample was then sieved through a #30 ($600 \ \mu m$) sieve to remove debris and larger granular particles.

Three individual splits from the processed sample were then observed under a Trinocular Microscope (7X-45X zoom magnification) to estimate the visual quantification percent of CCR to natural materials. A summary of the microscopy results is presented in **Table 2-2**.

Table 2-2. Summary of Microscopy Analysis

Geoprobe® Boring ID	Sample Depth (feet)	Approx. %CCR
1L	3-5	40%
1L	6-7	2%
1L	5-6	3%
1LA	0-3	30%
1LA	5-6	0%
1LA2	2-3	95%
1LA2	4-5	50%
1M	1-3	100%
1M	3-5	100%
1M	6-7	1%
1M	7-8	2%
1R	2-3	1%
1R	3-4	70%
1R	4-5	0%
1R	5-6	10%
1R	6-7	2%
1R	7-8	5%
1RA	1-3	1%
1RA	5-6	2%
2L	0-1	70%
2L	1-5	1%
2M	2-3	70%
2M	3-5	50%
2M	6-7	5%
2R	0-1	2%
2R	1-3	4%
3L	0-2	70%
3L	2-5	2%
3M	0-1	90%
3M	1-5	1%
3R	0-1	50%

Geoprobe® Boring ID	Sample Depth (feet)	Approx. %CCR
3RA	0-2.5	100%
3RA	2.5-5	1%
4L	0-1	95%
4L	1-3	5%
4M	0-1	80%
4M	1-3	0%
4MA	0-1	70%
4MA	1-2	10%
4R	0-1	95%
4R	1-3	1%
5L	0-1	80%
5M	0-1	80%
5R	0-1	20%

Example photographs taken during the microscopic quantification by HDR are included in **Appendix D**.

2.3 Laboratory Analyses

In accordance with the Work Plan, geotechnical index testing consisting of grain size distribution (ASTM D422) and specific gravity (ASTM D854) were performed on select samples obtained from the field investigation. The results of the laboratory analyses are presented in **Appendix E**.

3.0 Communication with EGLE

Upon completion of the field and laboratory activities, the results of the investigation were discussed and shared with EGLE on February 16, 2023, detailing the extents of the encountered CCR and to determine what follow-up investigation may be required by EGLE or the Environmental Protection Agency (EPA). Boring location maps, boring logs, depths of encountered CCR, and microscopy results were shared with EGLE via email, and the information was reportedly shared by EGLE with the EPA. Based on EGLE communication, EGLE and EPA determined that the unit boundary of the Units 1/2 Impoundment did not need to be further delineated to include the North Channel. An excerpt from the EPA via email on July 12, 2024 is below:

"We do not believe it is necessary to conduct further sampling to delineate the Units 1/2 boundary. The weir that separates the pond from the North Channel provides a distinct physical boundary for Units 1/2 in this area, therefore the Unit boundary remains unchanged. The facility will need to ensure this unit and any releases or newly identified units and connecting structures in the vicinity are appropriately managed under the regulations." – Ankita Mandelia, EPA

Additionally, EGLE commented that the CCR in the North Channel, while not considered part of the Units 1/2 Impoundment, could meet the definition of a CCR Management Unit (CCRMU):

"EGLE pointed out that while the ash identified in the northern channel will not be considered a part of Unit 1/2, it is ash that could meet the definition of a CCRMU. Any efforts to define CCRMUs onsite would need to be included as a separate workplan as

the original northern channel workplan was devised for the Unit 1/2 boundary definition." – Kent Walters, EGLE

The full email communication between HDR and EGLE is presented in Appendix F.

4.0 References

Ref. [1] Golder Associates. North Channel Ash Investigation Work Plan, Project No. 21480650. October 28, 2021.

Appendix A

Work Plan



October 28, 2021 21480650

Paul Cederquist, Environmental and Safety Specialist

Grand Haven Board of Light and Power 1700 Eaton Drive Grand Haven, Michigan 49417

NORTHERN CHANNEL ASH INVESTIGATION WORK PLAN FORMER JB SIMS GENERATING STATION GRAND HAVEN BOARD OF LIGHT AND POWER GRAND HAVEN, MICHIGAN

Dear Mr. Cederquist,

Golder Associates Inc. (Golder) has prepared this work plan for investigating the extent, if any, of ash that may have been deposited in the northern historical outlet channel from the Inactive Units 1 and 2 Impoundment at the former JB Sims Generating Station.

Investigation Goals

The impoundment boundary of the Inactive Units 1&2 Impoundment has been revised based on review of historical aerial photographs (see **Figure 1**). The northern historical outlet channel was identified as an area requiring additional investigation. The northern channel was a former permitted outlet from the impoundment for overflow discharge. The goal of the northern channel investigation is to determine the extent, if any, of ash that may have been deposited in the northern channel.



Figure 1: 1978 Aerial with Northern Channel Area Shown

Boring Locations and Methodology

Golder has proposed performing 15 borings at the locations shown on **Figure 2**. During soil boring advancement, continuous soil samples will be recovered to boring terminus of approximately 15 feet below water surface when drilling over water or 15 feet below ground surface when drilling over land or when ash is no longer observed in the boring. Sediment/soil will be collected using 5-feet long macro-core samplers. Borings will be performed using a fully amphibious vehicle fitted with a Geoprobe 5400 direct push technology (DPT) drill rig. Drill tooling will be decontaminated prior to each boring, if needed. Spud bars will be used to anchor the rig in place while drilling over open water, if needed. Sediment/soil cuttings containing suspected and/or confirmed ash will be collected for proper disposal by GHBLP. Borings performed at ground surface will be backfilled with bentonite and boring performed over standing water will be allowed to naturally cave. Boring locations will be recorded using Global Positioning System (GPS) methods.



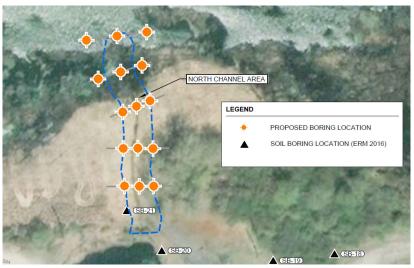


Figure 2: Proposed Boring Locations (2016 Aerial)

Ash Identification Process

The identification of ash in soil and sediment samples will be conducted in a tiered approach. Prior to advancing the borings in the northern channel, samples of ash will be collected for field comparison purposes.

Tier 1 - Visual Inspection

Individual boring logs will be prepared by field personnel and will include classification of soil/sediments encountered, samples collected, relative moisture, equipment used, personnel, and other pertinent information. Soils and sediments will be classified by a Golder geologist or engineer in general conformance with the unified soil classification system (ASTM D-2487). Additionally, each recovered core will be visually examined to identify the presence of coal ash based primarily on color and gradation. Suspect materials will be further inspected using a hand lens and will be compared to known ash samples previously collected at the site. Photographic documentation of each of the cores will be collected.

Tier 2 – Sample Evaluation

A minimum of two samples per boring will be collected for further visual evaluation and geotechnical index testing. Suspected ash material samples will be visually inspected using a microscope at 40x magnification to identify the presence of coal ash. Photographic documentation of the microscope evaluation will be collected. Additionally, geotechnical index testing (grain size distribution per ASTM D422 and specific gravity per ASTM D854) will be performed on suspected coal ash material samples to differentiate ash from the native soil materials. Analytical sampling of the soil/sediment will not be performed.

Additional Soil Borings

If ash materials are identified in the field, a limited number of additional borings may be performed to delineate the extent of the coal ash in the northern channel area. Borings will step out from identified ash locations to delineate the coal ash extents. The step out distances may vary based on drill rig accessibility and depth of water/sediment.



Reporting

A summary report will be prepared following the sample collection and evaluation. The letter report will summarize the findings of the evaluation and will include a revised delineation drawing of the northern channel and the Inactive 1&2 Impoundment.

If you have questions or comments about this work plan, please contact the undersigned.

Sincerely,

Golder Associates Inc.

Samuel F. Stafford, PE

Senior Engineer

Tiffany Johnson, PE

Principal

SFS/TDJ

Cc: Blaine Litteral - Golder Associates Inc.



From: Walters, Kent (EGLE)

To: Stafford, Sam

Cc: Unseld, Timothy (EGLE); Paul Cederquist; Erik Booth; Litteral, Blaine; Johnson, Tiffany; Brown, Cory (EGLE)

Subject: RE: Northern Channel Work Plan

Date: Friday, October 29, 2021 2:51:50 PM

Attachments: image001.png

image002.png image004.png

EXTERNAL EMAIL

Erik,

EGLE has reviewed the revised northern channel ash investigation work plan for the JB Sims Generating Station.

This workplan is approved.

Please notify EGLE when the borings are scheduled to be collected.

As a reminder, collection of soil borings in a wetland area requires proper permitting from EGLEs Water Resources Division. Please touch base with Cory Brown as to the updated quantity of borings to be installed in the proposed area.

Please also note if water depth is greater than 15' or at a depth where only minimal sediment is collected, EGLE expects GHBLP to collect a sufficient amount of material to document the presence or absence of coal ash at the approved soil boring locations.

Kent.

From: Stafford, Sam <Sam_Stafford@golder.com>

Sent: Thursday, October 28, 2021 12:48 PM

To: Walters, Kent (EGLE) < Walters K7@michigan.gov>

Cc: Unseld, Timothy (EGLE) <UNSELDT@michigan.gov>; Paul Cederquist <PCederquist@ghblp.org>; Erik Booth <EBooth@ghblp.org>; Litteral, Blaine <Blaine_Litteral@golder.com>; Johnson, Tiffany <Tiffany_Johnson@golder.com>

Subject: RE: Northern Channel Work Plan

CAUTION: This is an External email. Please send suspicious emails to abuse@michigan.gov

NOTE: This email chain appears to contain email from outside Golder

Good Afternoon Kent -

On behalf of the Grand Haven Board of Light and Power, attached is the revised northern channel ash investigation work plan for the JB Sims Generating Station. Below we have restated the comments from your October 25 email and provided our responses in bold and italic.

1. The workplan states that, "continuous soil samples will be recovered to boring terminus of approximately 15 feet below water surface". Please clarify. Does this indicate 15' below the air-surface water interface or surface water-sediment interface?

Based on review of past aerials, we expect a shallow water depth and therefore have selected an amphibious DPT drill rig to collect samples in these assumed marshy conditions. The proposed amphibious DPT equipment has drilling depth limitations but we believe the 15-ft depth below water surface (air-water surface) to be sufficient for the proposed investigation.

2. The soil boring location map does not appear sufficient to document potential coal ash deposition in the Northern Channel. The figure indicates 2 out of 10 borings are potentially located within the channel to determine if coal ash is present. Given that the exact location of the channel is not known and has likely migrated during operation in the 1970s through 1980s, it is recommended to add a series of boring transects perpendicular to the channel. The spacing of the boring locations in the transects would be placed in close proximity in attempt to document the relatively narrow area of coal ash deposition, if any.

A revised soil boring location map is provided in the revised Work Plan. Borings will be performed along a series of transects in the Northern Channel Area.

3. The soil boring location map does not appear to consider potential coal ash underwater deltas similar to what has been documented in the East Channel. In the attached figure, there appears to be a plume discharging from the mouth of the Northern channel. It is recommended that borings be installed in the area documented in the attached figure to document coal ash deposition, if any.

An additional transect has been added to the work plan to document a potential underwater delta. Please see revised Work Plan and proposed boring location figure.

4. EGLE reminds GHBLP that necessary wetland permits must be obtained if work is to be completed in regulated wetlands. Please reach out to Cory Brown (<u>BrownC61@michigan.gov</u>, 616-560-1968) of EGLEs Water Resources Division if you have questions about wetland permitting. Cory has also been cc'd on this email for ease of contact.

A limited number of borings for this northern channel were included with the temporary wetland permit that was obtained for the piezometer work, however, we will update the number of borings with Cory Brown once this work plan is approved.

Please let us know if you have any additional comments or questions. Kind Regards,

Sam

Samuel F. Stafford, PE

Senior Engineer

Golder Associates Inc.

15851 South US 27, Suite 50, Lansing, Michigan, USA 48906 **T**: +1 517 482-2262 | **C**: +1 904 200 1532 | **golder.com**

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From: Walters, Kent (EGLE) < <u>WaltersK7@michigan.gov</u>>

Sent: Monday, October 25, 2021 10:37 AM

To: Johnson, Tiffany < <u>Tiffany Johnson@golder.com</u> >

Cc: Unseld, Timothy (EGLE) < <u>UNSELDT@michigan.gov</u>>; Paul Cederquist < <u>PCederquist@ghblp.org</u>>; Stafford, Sam < <u>Sam_Stafford@golder.com</u>>; Erik Booth < <u>EBooth@ghblp.org</u>>; Litteral, Blaine < <u>Blaine_Litteral@golder.com</u>>; Powrozek, Carolyn < <u>Carolyn_Powrozek@golder.com</u>>; Brown, Cory (EGLE) < <u>BrownC61@michigan.gov</u>>

Subject: RE: Northern Channel Work Plan

EXTERNAL EMAIL

Erik,

EGLE has reviewed the proposed workplan titled, "Northern Channel Ash Investigation Work Plan Former JB Sims Generating Station Grand Haven Board of Light and Power Grand Haven, Michigan" and has the following questions and recommendations.

- 1. The workplan states that, "continuous soil samples will be recovered to boring terminus of approximately 15 feet below water surface". Please clarify. Does this indicate 15' below the air-surface water interface or surface water-sediment interface?
- 2. The soil boring location map does not appear sufficient to document potential coal ash deposition in the Northern Channel. The figure indicates 2 out of 10 borings are potentially located within the channel to determine if coal ash is present. Given that the exact location of the channel is not known and has likely migrated during operation in the 1970s through 1980s, it is recommended to add a series of boring transects perpendicular to the channel. The spacing of the boring locations in the transects would be placed in close proximity in attempt to document the relatively narrow area of coal ash deposition, if any.
- 3. The soil boring location map does not appear to consider potential coal ash underwater deltas similar to what has been documented in the East Channel. In the attached figure, there appears to be a plume discharging from the mouth of the Northern channel. It is recommended that borings be installed in the area documented in the attached figure to document coal ash deposition, if any.
- 4. EGLE reminds GHBLP that necessary wetland permits must be obtained if work is to be completed in regulated wetlands. Please reach out to Cory Brown (<u>BrownC61@michigan.gov</u>, 616-560-1968) of EGLEs Water Resources Division if you have questions about wetland permitting. Cory has also been cc'd on this email for ease of contact.

Please let EGLE know if you would like to discuss any of the above in more detail. Kent.

From: Johnson, Tiffany < <u>Tiffany Johnson@golder.com</u>>

Sent: Wednesday, October 13, 2021 4:20 PM

To: Walters, Kent (EGLE) < <u>WaltersK7@michigan.gov</u>>

Cc: Unseld, Timothy (EGLE) <<u>UNSELDT@michigan.gov</u>>; Paul Cederquist <<u>PCederquist@ghblp.org</u>>; Stafford, Sam <<u>Sam_Stafford@golder.com</u>>; Erik Booth <<u>EBooth@ghblp.org</u>>; Litteral, Blaine <<u>Blaine_Litteral@golder.com</u>>; Powrozek, Carolyn <<u>Carolyn_Powrozek@golder.com</u>>

Subject: Northern Channel Work Plan

CAUTION: This is an External email. Please send suspicious emails to abuse@michigan.gov

Good Afternoon Kent,

On behalf of the Grand Haven Board of Light and Power (GHBLP), please see attached for a work

plan to investigate the historical northern channel at the former JB Sims Generating Station for the presence of ash materials. We would like to request your approval of this plan prior to performing the work. Please let us know if you have any comments or want to discuss.

Thank you and have a nice evening!

Tiffany Johnson, P.E.

WSP - Midwest Earth & Environment District Leader, Senior Consultant

Golder Associates Inc.

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Appendix B

Geoprobe® Boring Logs

)3						В	ORING NUMBER PAGE 1				
CLIEN	T City o	of Gra	nd Ha	aven		PRO I	ECT NAME North Channel Investi	gation				
∐				37505			ECT LOCATION Grand Haven, Mi					
<u>-</u>					LONGITUDE86.2329462		STARTED 11/21/22	-				
							IND ELEVATION 586 ft		-			
2 1				MATECO								
9 I	ING MET					_	$\sqrt{2}$ AT TIME OF DRILLING 1.0 ft /	Elev 585.0 ft				
LOGG	ED BY _	Tante	n Bus	szka, HDR	CHECKED BY Bryce Burkett,	HDR						
NOTE	S Eleva	ition e	stima	ted using Go	ogle Earth.		AFTER DRILLING					
DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC				ERIAL DESCRIPTION					
	GB 1	МН			ASTIC SILT (MH), brown, with org	anic mat	erial, roots, and clay seams					
	' 			1.0 <u>▽</u>	ORLY GRADED SAND (SP), dark	gray fine	e-grained		585.0			
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·L ⊸i				3.0					583.0			
5				CC	OAL COMBUSTION RESIDUALS (CCR), bla	ck, with fine-grained sand					
-	GB 3	CCR	_ :									
5				5.0					581.0			
	GB				TY CLAY (CL-ML), brown, with or	ganic ma	aterial, fine-grained sand seams, sh	nell fragments				
	4											
7	GB											
	5											
	GB 6											
	GB	1										
	7											
10	GB 8	CL- ML										
10	GB											
	9											
	GB 10											
	GB											
	11											
0.00 00.00	GB											
7	12 CB			14.0 OF	GANIC SOIL (OH), with wood frag	ments			572.0			
2 15	GB 13	ОН		15.0	()	,			571.0			
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L HAVEN.G)3									BOF	RING NUI	MBER 1LA PAGE 1 OF 1
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DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG				MATE	RIAL DESC	RIPTION			
L ISLANDYOU NOW	GB 1				AL COMBUSTIC erial	ON RESIDUALS (C	CCR), blac	k, with glass	fragemen	ts and grave	el, sand seams,	organic
Slokand Haven - Haker	GB 2	CCR		5.0								581.0
A, INCAMICHIGAN PROJECT	GB 3 GB 4 GB 5	SM		- wit	TY SAND (SM),	ts from 7'-8'						578.0
	GB 6 GB 7	ML CL- ML		9.0	NDY SILT (ML), (L), with organics						577.0 576.0
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E)3				BO	RING NUMBER 1L PAGE 1	
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PROJI	ECT NU	MBER	10337505		PROJECT LOCATION Grand Haven,	Michigan	
LATIT	UDE _4	3.0719	1779	LONGITUDE86.23307655	DATE STARTED _11/22/22	COMPLETED _11/22/22	
STATI	ON			OFFSET	GROUND ELEVATION 586 ft	HOLE SIZE 2.25 in	
DRILL	ING CO	NTRAC	TOR MATECO	0			
			Geoprobe		$\sqrt{2}$ AT TIME OF DRILLING 1.01		
				Checked BY Bryce Burkett,			
NOTE	S Elev	ation es	stimated using (Google Earth.	AFTER DRILLING		
O DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG		MATERIAL DESCRIPTION		
	GB	ОН	C C	DRGANIC SOIL (OH), topsoil, with roo	ots		
	1		1.0 ▽	OODI V CRADER CAND (CR)	fine analysis		58
	GB 2	SP		POORLY GRADED SAND (SP), gray,	fine-grained		
	GB		2.0	COAL COMBUSTION RESIDUALS (C	CR), black, with rock fragments, glass fr	agments, fine-grained sand	58
	3		s	seams, and organic material. Hydroca	arbon odor present.		
	GB	CCR					
	4						
_	GB 5						
5	<u> </u>		5.0		Bottom of borehole at 5.0 feet.		58

ND HAVEN.GPJ)3					BORING NUMBER 1M PAGE 1 OF 1				
E GR	LIEN	T City	of Gra	nd Haven		PROJECT NAME North Channel	Investigation				
₩ F	ROJI	ECT NU	MBER	10337505		PROJECT LOCATION Grand Haven, Michigan					
ᅨᆫ	ATIT	UDE _4	3.0719	1816	LONGITUDE86.23287272	DATE STARTED 11/21/22	COMPLETED 11/21/22				
티	TATI	ON			OFFSET	GROUND ELEVATION 586 ft	HOLE SIZE 2.25 in				
SS C	RILL	ING CO	NTRAC	CTOR MATE	ECO						
의	RILL	ING ME		Geoprobe		$ar{ar{ar{ar{ar{ar{ar{ar{ar{ar{$					
	.OGG	ED BY			DR CHECKED BY Bryce Burkett,						
ŽĮ.	IOTE	S Elev	ation e	stimated usir	ng Google Earth.	AFTER DRILLING					
STH CHANNEL INVESTIG	CLIEN PROJICE TO THE PROJECT CONTROL (1) OF THE	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG		MATERIAL DESCRIPTION					
		GB	ОН		ORGANIC SOIL (OH), dark brown						
000		1	Оп	1.0 7	7		585.0				
SLAN					COAL COMBUSTION RESIDUALS (C	CCR), black					
EN - HARBOR IS	_	GB 2		3							
S/GRAND HAVE	- 5	GB 3	CCR		- with coal fragments at 4'						
JECT		GB									
욊	_	4		6.0	DOODLY ODADED CAND (OD)	Consider the consideration of the constant of	580.0				
QAN QAN		GB 5	SP		POORLY GRADED SAND (SP), gray,	ine-grained, with organic material ar					
ĕ⊢	-	CP		7.0	SILT (MH), dark gray, with organic ma	aterial and shell fragments	579.0				
S N		GB 6			<i>, , , , , , , , , , , , , , , , , , , </i>	C					
H Y		GB	1								
<u></u>		7									
EDR		GB	МН								
É -	10	8	-								
X E		GB 9									
	-	GB	1								
SERS		10		12.0			574.0				
Ö Ö		GB	ep.		POORLY GRADED SAND (SP), gray,	fine-grained	574.0				
3:28		11	SP	13.0			573.0				
/25 08		GB	МН		SILT (MH), gray, with clay seams						
2/12	-	12		14.0	POORLY GRADED SAND (SP), gray,	fine-grained	572.0				
GPJ-	15	GB 13	SP	1.1	FOORET GRADED SAND (SF), gray,	iiiie-graiiieu					
Ğ F	15			15.0		Bottom of borehole at 15.0 feet.	571.0				
GENERAL BH / TP / WELL - GINT STD US LAB.GPJ - 2/12/25 08:28 - C:\USERS\TBURKETT\ONEDRIVE -											

AD HAVEN.GP.	-)	3				E	BORING NUMBER 1R PAGE 1 OF 1
NV009 LOGS/NORTH CHANNEI NV009 LOGS/NORTH C	OJE TITU ATIO ILLI GGE	ECT NUI JDE 4: DN NG COI NG ME ED BY	MBER 3.0719 NTRAG THOD Tante	2199 CTOR <u>M</u> Geoprol n Buszka	05 LONGITUDE -86.2328003 OFFSET ATECO	GROUND ELEVATION $\underline{588 \text{ ft}}$ GROUND WATER LEVELS: $\underline{\nabla} \text{ AT TIME OF DRILLING } \underline{3.0}$	Michigan COMPLETED _11/21/22 HOLE SIZE _2.25 in ft / Elev 585.0 ft
STH CHANNEL INVESTIGA DEPTH	(H)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG		MATERIAL DESCRIPTION	
RBOR ISLAND/007 NO	_	GB 1 GB 2	SP		POORLY GRADED SAND (SP), bro	own, fine-grained, with organics and rock fra	agments
HAVEN - HAF		3 GB 4	CCR			(CCR), black, with hydrocarbon odor prese	584.0
JECTS/GRAND		GB 5 GB 6	SP		POORLY GRADED SAND (SP), bro	own, medium-grained, with gravel and trace	CCR
MICHIGAN PRC		GB 7	SM	7.0	SILTY SAND (SM), dark gray, with	hydrocarbon odor observed ith organic material, shell fragments, and fi	582.0 581.0 ne-grained sand seams
RIVE - HDR, INC		8 GB 9	CL- ML	9.0		own, fine-grained, with organics and silt poo	579.0 Skets
URKETT/ONED	0	GB 10 GB 11	SP	11.		van, mie grames, mai ergames and ent pee	577.0
:8 - C:\USERS\TB		GB 12 GB 13	CL- ML		SILTY CLAY (CL-ML), dark gray, w	ith organic material	
PJ - 2/12/25 08:2		GB 14	SP	14.	POORLY GRADED SAND (SP), gra	ay, fine-grained	574.0
INT STD US LAB.GF	5	15		15.	.0	Bottom of borehole at 15.0 feet.	573.0
/ TP / WELL - GII							
GENERAL BH							

ID HAVEN.GP.)	5											ВО	RING	NUN		1 1RA 1 OF 1
CLIEI PROCEINOGO FOR THE CHANNER CONTROL CONTR	PROJECT NUMBER 10337505 LATITUDE 43.07192141 LONGITUDE -86.23274399					GROUND ELEVATION _588 ft											
DEPTH (ft)	SAMPLETVE	SAMPLE I YPE NUMBER	U.S.C.S.	GRAPHIC					MATE	ERIAL	DESCRI	PTION					
0 000		GB 1	SP			ORLY GRA	ADED SA	ND (SP), light	brown, fin	e-grair	ned, with	organic	material				
AKBOK ISLANDIG	-	GB 2	ML		√. 1.0 SA I	NDY SILT ((ML) , darl	k brown, with	glass frag	ments	and orga	nic mate	erial				587.0
SKAND HAVEN - H	-	GB 3	CCR		3.0 ∑ CO	AL COMBU	JSTION F	RESIDUALS (CCR), blac	ck, with	ı rock fraç	gments					585.0
		GB 4 GB 5	SP		5.0 PO	ORLY GRA	ADED SA	ND (SP), dark	gray, fine	-graine	ed, with tr	ace CCF	₹				583.0
		GB 6	CI		7.5 SIL	TY CLAY (CL-ML),	dark gray, wit	h sand sea	ams ar	nd organio	c materia	al				580.9
10 10 10 10 10 10 10 10 10 10 10 10 10 1		7 GB 8	CL- ML		10.0				Bottom	of bor	rehole at	10.0 feet	t.				578.
GENERAL BH / IP / WELL - GIN SID US LAB. GPJ - 2712/25 08:28 - C:USERS/I BURKET I KONEDRIVE - HDK, INC. MICHIGAN PROJECT SIGRAND PAVEN - PARBOR ISLANDING OF LAB. INC. MICHIGAN PROJECT SIGRAND PAVEN - PARBOR ISLANDING OF LAB. INC. MICHIGAN PROJECT SIGRAND PAVEN GRAND PAV																	

ND HAVEN.G		3						E	BORING NUMBER PAGE 1	
S CLIE	NT	City o	of Gran	nd Ha	ven		PROJ	ECT NAME North Channel Inves	stigation	
PRO.	JEC.	T NUN						ECT LOCATION Grand Haven,		
[LATI	TUD	E _43	.0720	5233		LONGITUDE 86.232963	_ DATE	STARTED 11/21/22	COMPLETED _11/21/22	2
STAT	TION					OFFSET	_ GROL	JND ELEVATION 586 ft	HOLE SIZE 2.25 in	
DRIL	LING	G CON				CO CO	_ GROU	JND WATER LEVELS:		
DRIL	LING	G MET			probe		_	$\sqrt{2}$ AT TIME OF DRILLING 1.0 f		
LOG	GED	BY _				CHECKED BY Bryce Burkett,		·		
≧ NOTE	ES _	Eleva	tion es	stimat	ed using	g Google Earth.		AFTER DRILLING		
DEPTH (ft)	T	SAMPLE I 7 PE NUMBER	U.S.C.S.	GRAPHIC LOG			MAT	ERIAL DESCRIPTION		
		GB	CCR	_		COAL COMBUSTION RESIDUALS (CCR), da	rk brown, with roots, organic mate	erial, and shell fragments	
		1	OOK		1.0 ∑	ELASTIC SILT (MH), dark gray, with				585.0
CLIEI CHIANDEL INVENICIALI DI CONTROLLE PRANCEL INVESTIGATION CONTROLLE PRANCEL PRANCE		GB 2	МН							
	-	GB 3			7.0	SILTY CLAY (CL-ML), gray				579.0
- 10 K I I I I I I I I I I I I I I I I I I	_	GB 4 GB 5	CL- ML		10.0					570.0
10		GB			10.0	CLAYEY SAND (SC), dark gray				576.0
Ž		6								
		GB	SC							
		7			12.0					574.0
اَدُ		GB				SILTY CLAY (CL-ML), dark gray, wit	h organic	material		
87.80 		8 CB	Ci							
97/7		GB 9	CL- ML			- with sand seams from 13.5' to 15'				
		GB								
15		10			15.0					571.0
GENERAL BH / IP / WELL - GIN SID US LAB. GPU - Z712/25 08:28 - C.USERSI BURKE I UNEDRIVE							Bottor	n of borehole at 15.0 feet.		

ND HAVEN.GPJ	F.		3					BORING NUMBER 2M PAGE 1 OF 1
GRAI	CLIE	NT	City	of Gra	nd Haven		PROJECT NAME North Channel	Investigation
NNE								
₹ H C H	LATI	TUE	DE _43	3.0720	5711	LONGITUDE -86.23288952	DATE STARTED 11/21/22	COMPLETED _11/21/22
R F	STAT	ΓIΟI	N			OFFSET	GROUND ELEVATION 585 ft	HOLE SIZE 2.25 in
GS/N						ECO		
03 0					Geoprobe	IDD OUTONED BY David Builder	_ AT TIME OF DRILLING	
0NO						IDR CHECKED BY Bryce Burkett, ing Google Earth.	AFTER DRILLING	
1GAT		 T	Liove	1		ing Google Laran.		
STH CHANNEL INVEST	o DEPTH		SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	abla	MATERIAL DESCRIPTION	
0\007 NOF			GB 1	SP	1.0	POORLY GRADED SAND (SP), black	k, with organic material	584.0
LAND	-				4	COAL COMBUSTION RESIDUALS (C	CCR), black	
N - HARBOR IS		-	GB 2					
GRAND HAVEN		-	GB 3	CCR		- with sand seams and organic mater	rial	
ROJECTS	5		GB 4		6.0			579.0
CHIGAN PI			GB 5	SP		POORLY GRADED SAND (SP), dark	gray, fine-grained, with trace CCR	3.5.5
NC/MIC			GB 6		7.5	SILTY CLAY (CL-ML), dark gray		577.5
HDR,			GB	CL-				
NEDRIVE -			7 GB 8	ML		- with sand seams and organics from	1 8.5' to 10'	
ETTO	_10_		GB		10.0	SILTY SAND (SM), gray		575.0
RS/TBURK			9 GB	SM				
:\USE			10	01	12.0	SILTY CLAY (CL-ML), dark gray		573.0
3:28 - C			GB 11	CL- ML	13.0			572.0
12/25 0			GB 12	ОН	14.0	ORGANIC SOIL (OH), brown, with wo	ood fragments	571.0
3PJ - 2/			GB 13	SP		POORLY GRADED SAND (SP), gray,	, fine-grained	
LAB.0	15	 			15.0		Bottom of borehole at 15.0 feet.	570.0
GENERAL BH / TP / WELL - GINT STD US LAB.GPJ - 2/12/25 08:28 - C:USERSITBURKETTIONEDRIVE - HDR, INCIMICHIGAN PROJECTSIGRAND HAVEN - HARBOR ISLANDI007 NORTH CHANNEL INVESTIGATION 1009 LOGSINORTH CHANNEL GRAND HAVEN GP.								

D HAVEN.GPJ)3							BORING NUMBE PAGE	ER 2R E 1 OF 1
ATION/009 LOGS/NORTH CHANNEL GRAN	ROJI ATIT TATI RILL RILL OGG	UDE _4 ON ING CO ING ME	MBER 3.0720 NTRAC THOD Tante		MATECO	LONGITUDE86.2328129 OFFSET CHECKED BY _Bryce Burkett,	PROJECT LO DATE STARTI GROUND ELE GROUND WA AT HDR AT	CATION Grand Have ED 11/21/22 EVATION 586 ft TER LEVELS: TIME OF DRILLING 1 END OF DRILLING	n, Michigan COMPLETED 11/22 HOLE SIZE 2.25 in	
TH CHANNEL INVESTIG	O (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG			MATERIAL I	DESCRIPTION		
007 NOF	Ŭ	GB 1	МН	Ш		ASTIC SILT (MH), brown, with orga	anic material and	trace CCR		505 (
HARBOR ISLAND\	_	GB 2	SP		frag	ORLY GRADED SAND (SP), gray, grents	fine-grained, wit	th trace CCR, refuse fr	agments, and plastic	585.0
GRAND HAVEN -	5	GB 3	МН		3.0 ELA 5.0	ASTIC SILT (MH), dark gray, with o	clay pockets			583.0 581.0
ROJECTS	J	GB 4	SM			TY SAND (SM), dark gray				
C/MICHIGAN PF	_	GB 5	CL-		6.5 SIL	TY CLAY (CL-ML), brown, with sh	ell fragments			579.5
HDR, IN	_	6 GB	ML							577.5
EDRIVE -	_	7 GB	SM		SIL	TY SAND (SM), gray				
TBURKETT\ON	10	8 GB 9	CL-		10.0 SIL	TY CLAY (CL-ML), dark gray, with	sand seams an	d organic material		576.0
NUSERS	_	GB 10			12.0	GANIC SOIL (OH), brown, with wo	od fragments			574.0
08:28 - C	_	GB 11	ОП		13.0	ORLY GRADED SAND (SP), gray,				573.0
- 2/12/25	_	GB 12	SP			one: order of the (or), gray,	mia gramoa			
AB.GPJ	15	GB 13			15.0		Bottom of bore	ehole at 15.0 feet.		571.0
GENERAL BH / TP / WELL - GINT STD US LAB.GPJ - 2/12/25 08:28 - C:USERSITBURKETTONEDRIVE - HDR, INCIMICHIGAN PROJECTSIGRAND HAVEN.GP GENERAL BH / TP / WELL - GINT STD US LAB.GPJ - 2/12/25 08:28 - C:USERSITBURKETTONEDRIVE - HDR, INCIMICHIGAN PROJECTSIGRAND HAVEN.GP GENERAL BH / TP / WELL - GINT STD US LAB.GPJ - 2/12/25 08:28 - C:USERSITBURKETTONEDRIVE - HDR, INCIMICHIGAN PROJECTSIGRAND HAVEN.GP GENERAL BH / TP / WELL - GINT STD US LAB.GPJ - 2/12/25 08:28 - C:USERSITBURKETTONEDRIVE - HDR, INCIMICHIGAN PROJECTSIGRAND HAVEN.GP GENERAL BH / TP / WELL - GINT STD US LAB.GPJ - 2/12/25 08:28 - C:USERSITBURKETTONEDRIVE - HDR, INCIMICHIGAN PROJECTSIGRAND HAVEN.GP GENERAL BH / TP / WELL - GINT STD US LAB.GPJ - 2/12/25 08:28 - C:USERSITBURKETTONEDRIVE - HDR, INCIMICHIGAN PROJECTSIGRAND HAVEN.GP GENERAL BH / TP / WELL - GINT STD US LAB.GPJ - 2/12/25 08:28 - C:USERSITBURKETTONEDRIVE - HDR, INCIMICHIGAN PROJECTSIGRAND HAVEN.GP GENERAL BH / TP / MED TH										

ID HAVEN.GPJ	-)	3							BORING NUMBE	
CIGRAN	LIEN	Γ _City o	of Gra	nd Ha	ıven		PROJE	CT NAME North Channel In	nvestigation	
	ROJE	CT NUM	/IBER	1033	37505			CT LOCATION Grand Have		
ᆌᇈ	ATITL	JDE 43				LONGITUDE86.23298377				22
[S	TATIO	ON								
	RILLI	NG CON				50		ID WATER LEVELS:		
م اق	RILLI	NG MET					_			
	OGGE	D BY				CHECKED BY Bryce Burkett,	- HDR			
Ž N	OTES	Fleva				Google Earth.		AFTER DRILLING		
GAT TE			1	1	 					_
TH CHANNEL INVEST	LIENT ROJE ATITU (H) 0	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG			MATE	RIAL DESCRIPTION		
NON	0			1		COAL COMBUSTION RESIDUALS (C	CCR), dark	brown, with roots and fine-g	grained sand seams	
000		GB	CCR							
¥		1								
2 2 2 3	-				2.0					582.0
4RBC						FAT CLAY (CH), dark brown, with fine	e-grained	sand seams and shell fragm	nents	
<u></u>	_									
		GB	СН							
<u></u>	-8	2								
AN AN										
S	5				5.0					579.0
		GB		Ш		ELASTIC SILT (MH), dark brown, with	h fine-graii	ned sand seams and clay po	ockets	
& [3		Ш						
A N				Ш						
뛼		GB		Ш						
Ĭ S		4	МН	Ш		- with shell fragments from 7' to 8'				
Ž ~i-				Ш						
휘				Ш						
ÿL	_	GB		Ш						
EDR		5		Ш						
<u>~</u>	10			Ш	10.0		- · ·			574.0
Ä							Bottom	of borehole at 10.0 feet.		
BUR										
RS/T										
NSE C										
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98:28										
/25 (
2/12										
<u>-</u>										
AB.O										
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STD										
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WEI										
TP/										
H/										
RAL										
SENERAL BH / TP / WELL - GINT STD US LAB.GPJ - 2/12/25 08:28 - C:\USERS\TBURKETT\ONEDRIVE - \\ \text{INSERS\TBURKETT\ONEDRIVE} - \\ \text{INSERS\TBURKETT\ONEDRIVE} \\ INSERS\TBURKET\ONE\ONE\ONE\OMEGA\TBURKET\ONE\ONE\ONE\ONE\ONE\ONE\ONE\ONE\ONE\ONE										

HAVEN.GPJ	-)	3							BORING NUMBER 3	
EL GRAND	LIENT	_City	of Gra	nd Haven			PROJEC	CT NAME North Channel	Investigation	
\ F	ROJE	CT NUI	MBER	1033750	5		PROJE	CT LOCATION Grand Have	ven, Michigan	
힑ᆫ	ATITU	IDE _43	3.0722	2153		LONGITUDE86.23291782	DATE S	TARTED 11/21/22	COMPLETED _11/21/22	
<u></u>	TATIC	ON				OFFSET				
	RILLII	NG COI	NTRAC	CTOR MA	TECO			D WATER LEVELS:		
S c	RILLII	NG ME		Geoprob				AT TIME OF DRILLING		
60 L	.OGGE	D BY		-		CHECKED BY Bryce Burkett,	HDR			
Ž N	IOTES	Eleva				ogle Earth.		AFTER DRILLING		
TIGAI		111								
STH CHANNEL INVE	CLIENT PROJECT ATITUS TATION OF THE PROJECT A	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG			MATE	RIAL DESCRIPTION		
		GB	CCR		COA	AL COMBUSTION RESIDUALS (C	CR), dark	brown, with roots		
	- 8	1	COIN	1.0						582.0
SLAN					ELA	STIC SILT (MH), dark brown, with	organic n	naterial, clay pockets, and	sand seams	
8	-8									
ARB										
护	-88	GB								
		2								
	-8									
ZA ZA			МН							
5 - 	5									
		GB								
& 		3	_							
¥										
		GB								
ĕ		4								
ĭ ~i−				8.0		h fine-grained sand layer from 7.5				575.0
빍					SIL	「Y CLAY (CL-ML), dark gray, with	organic m	aterial		
ÿL		GB	CL-							
D.B.		5	ML							
	10			10.0)					573.0
							Bottom	of borehole at 10.0 feet.		
Ž										
SER										
اڌ										
- 58										
22.08										
112/										
7-7										
B.G.										
S LA										
S										
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IENERAL BH / TP / WELL - GINT STD US LAB.GPJ - 2/12/25 08:28 - C:\USERS\TBURKETT\ONEDRIVE - 										
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D HAVEN.GPJ)3						BORING NUMBER 3R PAGE 1 OF 1
CLIEI CLIEI			and Hav			PROJECT NAME North Channel I	
LATI LATI STAT		43.072	24752			PROJECT LOCATION Grand Have DATE STARTED 11/21/22 GROUND ELEVATION 584 ft	COMPLETED _11/21/22
DRIL DRIL LOGG NOTE	LING O LING N GED B	ONTRA IETHOI Y Tant	ACTOR _ O _Geop en Busz	MATECO robe ka, HDR		GROUND WATER LEVELS: AT TIME OF DRILLING	
TH CHANNEL INVESTIG DEPTH (ft)	SAMPLE TYPE	U.S.C.S.	GRAPHIC LOG			MATERIAL DESCRIPTION	
0 007 NORT	G	B CCI		CO	AL COMBUSTION RESIDUALS (C	CCR), dark brown and black, with roots	583.0
HARBOR ISLAND	G	B CL 2 ML	-	SIL	.TY CLAY (CL-ML), dark gray, with	organic material and shell fragments	
R. INCIMICHIGAN PROJECT'S/GRAND HAVEN - HARBOR ISLAND/007 NORTH CHANNEL INVESTIGATION/009 LOGS/NORTH CHANNEL GRAND HAVEN GP. O DEPTH ON OTHER CRAND HAVEN GP. O DEPTH ON OTHER CRAND HAVEN GP. (ft) (ft) (ft) (ft)	G				.TY SAND (SM), gray		581.0
IICHIGAN PRO.	G	B			ith organic material from 6' to 7.5'		
E - HDR, INC/M	G	В В			. T (ML) , gray, with organic materia	l, clay pockets, and sand seams	576.5
TONEDRIVE	G	В		10.0		Bottom of borehole at 10.0 feet.	574.0
GENERAL BH / TP / WELL - GINT STD US LAB.GPJ - 2/12/25 08:28 - C:USERS)TBURKETTONEDRIVE - HD 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0							

CLIENT City of Grand Haven PROJECT NUMBER 19337605 PROJECT TOUTH INTO Grand Haven PROJECT NUMBER 19337605 PROJECT LOCATION Grand Haven, Michigan LATITUDE 4507226713 LONGTUDE -86.23279258 DATE STARTED 15/21/22 COMPLETED 15/	H	3					E	BORING NUMBER PAGE	R 3RA = 1 OF 1
PROJECT LOCATION Grand Haven, Michigan— LATTUDE 4307226713 LONGTUDE 486 23279528 DATE STATED 11/21/21/22 COMPLETED 11/21/22 COM	CLIENT	_City o	of Gra	nd Haven		PROJE	CT NAME North Channel I	nvestigation	
LAITIUDE 4307228713 LONGTUDE -86.23279258 DATE STATRIED 11/21/22 COMPLETED 11/21/22 STATION OFFSET GROUND ELEVATION 594 ft HOLE SIZE 2.25 in DRILLING METHOD Geopode AT TIME OF DRILLING AT TI	PROJE	CT NUM	IBER	10337505	j	PROJE	CT LOCATION Grand Have	en, Michigan	
STATION — OFFSET — GROUND BLEVATION _ SP41 II HOLE SIZE _225 in DebtLuns Contractor MATECO — GROUND Watter Levels: PRILLING METHOD _Geographe	LATITU	DE 43	3.0722	6713	LONGITUDE86.23	279258 DATE S	TARTED 11/21/22	COMPLETED _11/2	1/22
DRILLING CONTRACTOR MATECO BRILLING METHOD Geoprobe LOGGED BY Janien Buszka, HDR. CHECKED BY Brose Burkett, HDR. AT END OF DRILLING — MOTES Elevation estimated using Google Earth. MATERIAL DESCRIPTION MATERIAL DESCRIPTION COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots CLAYEY SAND (SC), gray, with organic material and shell fragments Bottom of borehole at 5.0 feet.	STATIO	ON			OFFSET	GROUN	D ELEVATION 584 ft	HOLE SIZE 2.25 in	1
DRILLING METHOD GEOGROPE LOGGED BY Tanton Buscka, HDR CHECKED BY Bryce Burkett, HDR AFTER DRILLING NOTES Elevation estimated using Google Earth. COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots COAL COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots COAL COAL COAL COAL COAL COAL COAL COAL	DRILLIN	NG CON	NTRAC	CTOR MA	TECO	GROUN	D WATER LEVELS:		
LOGGED BY Tartien Buska, HDR CHECKED BY Bryce Burkett, HDR AFTER DRILLING COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots CB S S C CLAYEY SAND (SC), gray, with organic material and shell fragments SS1. Bottom of borehole at 5.0 feet.	DRILLIN	NG MET		-					
MATERIAL DESCRIPTION COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots CLAYEY SAND (SC), gray, with organic material and shell fragments Set. Solution of borehole at 5.0 feet.	LOGGE	D BY _				e Burkett, HDR			
MATERIAL DESCRIPTION COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots CB CCR CLAYEY SAND (SC), gray, with organic material and shell fragments Settle CB Scott State	NOTES	Eleva	tion e	stimated us	sing Google Earth.		AFTER DRILLING		
COAL COMBUSTION RESIDUALS (CCR), dark brown and black, with roots GB CCR 2.5 CLAYEY SAND (SC), gray, with organic material and shell fragments S81. S81. S82. S83. S84. S84. S85. S86. S86.	DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG		MATE	RIAL DESCRIPTION		
GB CCR 25 SC CLAYEY SAND (SC), gray, with organic material and shell fragments S81. S81. S82. S83. S83. S84. S85. S86. S879. Bottom of borehole at 5.0 feet.				1	COAL COMBUSTION RES	IDUALS (CCR), dark	brown and black, with roots	;	
2.5 CLAYEY SAND (SC), gray, with organic material and shell fragments GB 2 SC SS1. Bottom of borehole at 5.0 feet.		GB 1	CCR						
GB SC				2.5					581.5
GB 2 SC					CLAYEY SAND (SC), gray,	with organic materia	al and shell fragments		
Bottom of borehole at 5.0 feet.		GB	00						
Bottom of borehole at 5.0 feet.		2	SC						
3 Biss 1/2/2/45.0 Bottom of borehole at 5.0 feet.	- III								F70.6
	5 🔯	331		<u>r./////</u> 5.0	:	Bottom	of borehole at 5.0 feet.		5/9.0

AND HAVEN.GF	-)	3															I	BOR	ING	NU		ER	
S CL	IENT	City	of Gra	nd l	Haν	/en						PI	ROJE	CT NAM	IE Nort	h Chan	nel Inve	estigatio	n				
FR	OJE	CT NUI	MBER	_10	033	7505						PI	ROJE	CT LOC	ATION	Grand	Haven,	Michiga	an				
칠 LA	TITU	DE _43	3.0723	3200)6			LONGI	TUDE	-86.23	311914	D	ATE S	TARTE	D 11/2	2/22			СОМР	LETED	11/2	2/22	
ੂੰ st.	ATIO	N						OFFSE	T			G	ROUN	D ELEV	/ATION	583 ft			HOLE	SIZE _	2.25 in	1	
Ng DR	ILLIN	NG COI	NTRA	СТС	R	MATE	CO					G	ROUN	D WATE	ER LEV	ELS:							
Ğ DR	ILLIN	NG ME													ME OF								
E LO	GGE	D BY _											ξ		ND OF D								
OT NO	TES	Eleva	ation e	stin	nate	ed using	g Goo	gle Eartl	h.					AFTE	R DRIL	LING	-						
E. HDR, INCIMICHIGAN PROJECTSIGRAND HAVEN - HARBOR ISLANDI007 NORTH CHANNEL INVESTIGATION)009 LOGSINORTH CHANNEL GRAND HAVEN.GF	(#)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC	907							ı	MATEI	RIAL DE	ESCRIP	TION							
ON L		GB	CCR	1			COA	L COME	BUSTIO	N RESI	IDUALS	(CCR)	, dark	brown, v	with roo	ts, gras	s, and	organic	materi	al			
0 0 1	-	1	Joon		~	1.0											_						582.0
IN - HARBOR ISLAN	-	GB 2	-				SAN	DY SILT	(ML), c	dark bro	own, wit	h orgai	nic ma	terial ar	nd shell	fragmer	nts						
TS/GRAND HAVE	- j	GB 3	ML																				
N PROJEC	-	GB 4 GB																					
MICHIGA	-	5 GB				7.0	SILT	Y CLAY	(CL-MI	L), dark	brown,	with o	rganic	materia	al								576.0
HDR, INC	-	6 GB	CL- ML																				
- SKE -	-	<u> </u>				9.0	POO	RLY GR	ADED	SAND ((SD) ar	ov fino	arain	od									574.0
	n 📗	GB 8	SP			10.0	100	IXET GIV	ADED .	SAND ((31 °), gra	ay, iii le	-graint	-u									573.0
	<u> </u>	934		11-11-	• • • •	10.0						Во	ottom o	of boreh	nole at 1	0.0 feet							373.0
GENERAL BH / TP / WELL - GINT STD US LAB.GPJ - 2/12/25 08:28 - C:\USERS\TBURKETT\ONEDRIVE																							

ND HAVEN.GP){)												BOI	RING	NUN	MBEF PAGE	R 4M 1 OF 1
GRA	CLIEN	IT C	ity c	of Grai	nd H	aven					PROJ	ECT NAI	ME North	Channel	Investiga	ation			
NN I	PROJ	ECT	NUN										CATION _						
₽JI	_ATIT	UDE	43						UDE86	6.23300396	DATE	STARTE	ED 11/22	/22		COMP	LETED	11/22/	22
削	STAT	ION _											VATION _						
3S/N(DRILL	ING	CON	ITRAC	TOF	R MAT	ECO				GROU	IND WAT	TER LEVE	LS:					
Š I	ORILL	ING	MET			oprobe							TIME OF D						
00\N	_OGG	ED E	3Y _					_		Bryce Burke	tt, HDR	•		-					
SATIC	NOTE	s <u>⊦</u>	leva	tion e	stima	ated us	ing Go	ogle Earth				AFT	ER DRILLI	ING					
RTH CHANNEL INVESTION	O DEPTH (ft)	SAMPLE TYPE	NUMBER	U.S.C.S.	GRAPHIC	901							DESCRIPT						
NO V			GB	CCR			CO	AL COMBI	JSTION F	RESIDUALS	(CCR), da	rk brown,	, with roots	s and fine	-grained	sand sea	ıms		
ND/OK	-		1		Ŧ	1.0		ACTIC CIL	F (MLI) do	ark gray, wit	h alay naal	rota aba	II fragmen	to roots (and cond	000000			582.0
HAVEN - HARBOR ISLAI	_		GB 2	МН			EL	ASTIC SIL	i (Min), da	ark gray, wit	л сіау росі	eis, sne	en nagmen	15, 10015 6	anu sanu	seams			
CTS/GRAND H	5		3 3																
COJEC		(GB 4		Ш	6.0													5 77 0
AP-	-		GB			6.0	SIL	TY CLAY (CL-ML), c	dark gray, w	ith organic	material	l and shell	fragment	s				577.0
HIG/			5																
DR, INC/MIC	_	(GB 6	CL- ML															
되		***	GB 7			9.0													574.0
DRIV	-		GB		m	3.0	РО	ORLY GRA	ADED SAI	ND (SP), gra	ay, fine-gra	ined, with	h shell fraç	gments ar	nd organi	c materia	ıl		374.0
ONE	10		8	SP		10.0													573.0
GENERAL BH / TP / WELL - GINT STD US LAB.GPJ - 2/12/25 08:28 - C.\USERS\TBURKETT	CLIEN PROJECTION (#) DRILL DRILL DRILL DRILL (#) 5 10										Botton	n of bore	shole at 10	.0 feet.					

F)	5						BORING NUMBER 4	
CLIENT _	City c		nd Haven		_	CT NAME North Channel		
PROJECT	T NUN	/IBER	10337505		PROJE	CT LOCATION Grand Ha	ven, Michigan	
LATITUDI	E <u>43</u>	.0724	3622				COMPLETED _11/22/2	2
STATION	l <u></u>						HOLE SIZE 2.25 in	
DRILLING	G CON		TOR MAT		GROUN	ID WATER LEVELS:		
DRILLING	3 MET		Geoprobe		-			
NOTES	Flove			HDR CHECKED BY Bryce Burkett, ing Google Earth.	HDK	AFTER DRILLING		
NOTES _	∟ieva	uon e	sumated us	ing Google Earth.		AFTER DRILLING		
CLIENT PROJECT LATITUDE STATION DRILLING LOGGED NOTES STATION (1) O STATION	SAMPLE I YPE NUMBER	U.S.C.S.	GRAPHIC LOG		MATE	RIAL DESCRIPTION		
0	GB 1	CCR		COAL COMBUSTION RESIDUALS (Cosand seams	CCR), blac	k, with shell fragments, org	ganic material, and fine-grained	
-	GB		1.0	ELASTIC SILT (MH), dark gray, with	clay pocke	ets, sand seams, organic n	naterial, and shell fragments	58
-	2 GB							
-	3	МН						
	GB							
	4							
5			5.0		Pottom	of borehole at 5.0 feet.		57
					DOLLOITI	of boreflole at 5.0 feet.		

BORING NUMBER 4R PAGE 1 OF 1 **CLIENT** City of Grand Haven PROJECT NAME North Channel Investigation GENERAL BH / TP / WELL - GINT STD US LAB.GPJ - 2/12/25 08:28 - C:USERSITBURKETTIONEDRIVE - HDR, INCIMICHIGAN PROJECTSIGRAND HAVEN - HARBOR ISLAND1007 NORTH CHANNEL INVESTIGATION1009 LOGSINORTH CHANNEL PROJECT NUMBER 10337505 PROJECT LOCATION Grand Haven, Michigan **LATITUDE** 43.07238032 **LONGITUDE** <u>-86.23290066</u> **DATE STARTED** <u>11/22/22</u> COMPLETED 11/22/22 STATION ---OFFSET _-- GROUND ELEVATION 583 ft HOLE SIZE 2.25 in DRILLING CONTRACTOR MATECO GROUND WATER LEVELS: DRILLING METHOD Geoprobe AT TIME OF DRILLING _---LOGGED BY _Tanten Buszka, HDR _ CHECKED BY _Bryce Burkett, HDR AT END OF DRILLING _---NOTES Elevation estimated using Google Earth. AFTER DRILLING _--SAMPLE TYPE NUMBER GRAPHIC LOG U.S.C.S. DEPTH (ft) MATERIAL DESCRIPTION COAL COMBUSTION RESIDUALS (CCR), dark brown GB CCR 582.0 ELASTIC SILT (MH), dark brown, with organic material and shell fragments MH GB 581.0 CLAYEY SAND (SC), dark brown, with organic material and shell fragments SC GB 3 578.0 Bottom of borehole at 5.0 feet.

GRAND HAVEN.G

ND HAVEN.GPJ	CLIENT _City of Grand Haven PROJECT NUMBER							BORING NUMBER 5L PAGE 1 OF 1				
S CL	CLIENT _City of Grand Haven							PROJECT NAME North Channel Investigation				
FR	PROJECT NUMBER 10337505								OCATION Grand	d Haven, Michig	jan	
[LA	LATITUDE 43.07247056 LONGITUDE -86.23319177 STATION OFFSET			19177 DA	DATE STARTED _11/22/22			COMPLETED 11/22/22				
ਲੂ st≀				GR	GROUND ELEVATION 581 ft							
NS DR	DRILLING CONTRACTOR MATECO				GR	OUND WA	ATER LEVELS:					
Ğ DR	ILLII	NG MET							TIME OF DRILL	ING		
ğ LO	GGE	ED BY _				CHECKED BY Bryce	Burkett, HDR		END OF DRILLI			
일 NO	TES	<u>Eleva</u>	ition e	stima	ted using (Google Earth.		AF	TER DRILLING			
TH CHANNEL INVESTIGE DEPTH	(#)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG			M	ATERIAL	DESCRIPTION			
N N		GB	000	1	C	COAL COMBUSTION RESID	DUALS (CCR),	dark brow	'n			
) (007		1	CCR		1.0							580.0
SRAND HAVEN - HARBOR ISLANI	_	GB 2	МН		-	ELASTIC SILT (MH), dark br			organic material,	shell fragments	5	
5 STORY		GB	СН		5.0	AT CLAY (CH), dark brown						576.0
PR0	3 CIT (CLAY (CLAY) double brown with expense motorial chall frogments and condings to						575.0					
SILTY CLAY (CL-ML), dark brown, with organic material, shell fragments, and sand pockets												
NC/M		GB 5	CL-									
휘		GB	ML									
AN H		6	1									
	า 🏻	GB 7			10.0							571.0
	<u> </u>	3000		иии	M 10.0		Bot	tom of bo	rehole at 10.0 fee	et.		37 1.0
GENERAL BH / TP / WELL - GINT STD US LAB.GPJ - 2/12/25 08:28 - C:USERS\TBURKETT\ONEDRIVE -												

ND HAVEN.GPJ	CLIENT City of Grand Haven PROJECT NUMBER 10337505 LATITUDE 43.07249331 LONGITUDE -86.23303769 STATION OFFSET DRILLING CONTRACTOR MATECO DRILLING METHOD Geoprobe LOGGED BY Tanten Buszka, HDR CHECKED BY Bryce Burkett, F NOTES Elevation estimated using Google Earth. THE BURNAL OF HEAVEN OF STATION RESIDUALS (CITY) O GB 1 CCR 1.0 COAL COMBUSTION RESIDUALS (CITY) LASTIC SILT (MH), dark brown, with GB 3 MH GB 5 T.0 GB 6 CL- GB ML SILTY CLAY (CL-ML), dark brown, with GB 6 CL- GB ML SILTY CLAY (CL-ML), dark brown, with GB 6 CL- GB ML SILTY CLAY (CL-ML), dark brown, with GB 6 CL- GB ML SILTY CLAY (CL-ML), dark brown, with GB 6 CL- GB ML SILTY CLAY (CL-ML), dark brown, with GB 6 CL- GB ML SILTY CLAY (CL-ML), dark brown, with GB 6 CL- GB ML SILTY CLAY (CL-ML), dark brown, with GB 6 CL- GB ML SILTY CLAY (CL-ML), dark brown, with GB 6 CL- GB ML SILTY CLAY (CL-ML), dark brown, with GB 6 CL- GB ML SILTY CLAY (CL-ML), dark brown, with GB 6 CL- GB ML SILTY CLAY (CL-ML), dark brown, with GB 6 CL- GB ML SILTY CLAY (CL-ML), dark brown, with GB 6 CL- GB ML SILTY CLAY (CL-ML), dark brown, with GB 6 CL- GB ML SILTY CLAY (CL-ML), dark brown, with GB 6 CL- GB ML SILTY CLAY (CL-ML), dark brown, with GB 6 CL- GB CL							BORING NUMBER 5M PAGE 1 OF 1			
S CLI								PROJECT NAME North Channel Investigation			
PR	OJE	CT NUM	/IBER	10337	505		PROJEC	CT LOCATION Grand Ha	aven, Michigan		
힑ఠ	TITUI	DE _43	3.0724	9331		LONGITUDE86.23303769	DATE S	TARTED 11/22/22	COMPLETED _11/22/22	2	
통 ST/	STATION OFFSET				OFFSET	GROUN	D ELEVATION 581 ft	HOLE SIZE 2.25 in			
NS DR	ILLIN	IG CON	NTRAC	TOR _	MATECO		GROUN	D WATER LEVELS:			
S DR	ILLIN	IG MET		Geopre			-				
ğ LO	GGE	D BY _				CHECKED BY Bryce Burkett,	HDR				
₽ NO.	TES	Eleva	tion es	stimated	d using Go	oogle Earth.		AFTER DRILLING			
DEPTH O C DEPTH	(E)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG			MATE	RIAL DESCRIPTION			
ON L		GB	CCR		CO	AL COMBUSTION RESIDUALS (C	CR), dark	brown, with roots			
000		1	CCIN	1						580.0	
N - HARBOR ISLAN	-	GB 2			EL	STIC SILT (MH), dark brown, with clay pockets, organic material, shell fragments, and sand seams					
CTS/GRAND HAVE	-	GB 3	MH								
IGAN PROJE	GB 4 GB 5										
S, INC/MICH	-	GB 6	CL-	7		.TY CLAY (CL-ML), dark brown, w	ith organic	material		574.0	
후		GB 7	ML								
	-	<u> </u>		9	.0 PO	ORLY GRADED SAND (SP), gray,	fine-grain	ed		572.0	
팅 10)	GB 8	SP	1	0.0	(7,0 7,	Ü			571.0	
	1000						Bottom	of borehole at 10.0 feet.			
GENERAL BH / TP / WELL - GINT STD US LAB.GPJ - 2/12/25 08:28 - C:USERSITBURKETT\ONEDRIVE -											

ID HAVEN.GPJ	F.)3					BORING NUMBER 5R PAGE 1 OF 1			
VEL GRANI	CLIEN	NT City				PROJECT NAME North Channel Investigation				
ATION\009 LOGS\NORTH CHANN	PROJ LATIT STATI DRILL DRILL LOGG NOTE	ECT NUI TUDE 4: ION LING COI LING ME GED BY SELEVI	NTRAC THOD	CTOR MATEO Geoprobe en Buszka, HDF	LONGITUDE	GROUND ELEVATION 581 ft GROUND WATER LEVELS: AT TIME OF DRILLING HDR AT END OF DRILLING	COMPLETED 11/22/22			
TH CHANNEL INVESTIG	DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG		MATERIAL DESCRIPTION				
007 NOR	0	GB 1	CCR	1.0	COAL COMBUSTION RESIDUALS (C	CCR), dark brown, with refuse particles				
E - HDR, INC\MICHIGAN PROJECTS\GRAND HAVEN - HARBOR ISLAND\		GB 2 GB 3 GB 4 GB 5 GB 6 GB 7	MH	6.5	POORLY GRADED SAND (SP), gray,		580.0 574.5 and shell fragments			
ONEDRIV	10	GB 8		10.0			571.0			
NERAL BH / TP / WELL - GINT STD US LAB.GPJ - 2/12/25 08:28 - C:\USERS\TBURKETT\	CLIEN PROJ LATIT STATI DRILLI LOGG NOTE H1d30 0					Bottom of borehole at 10.0 feet.				

Appendix C

Geoprobe[®] Sample Photographs

































































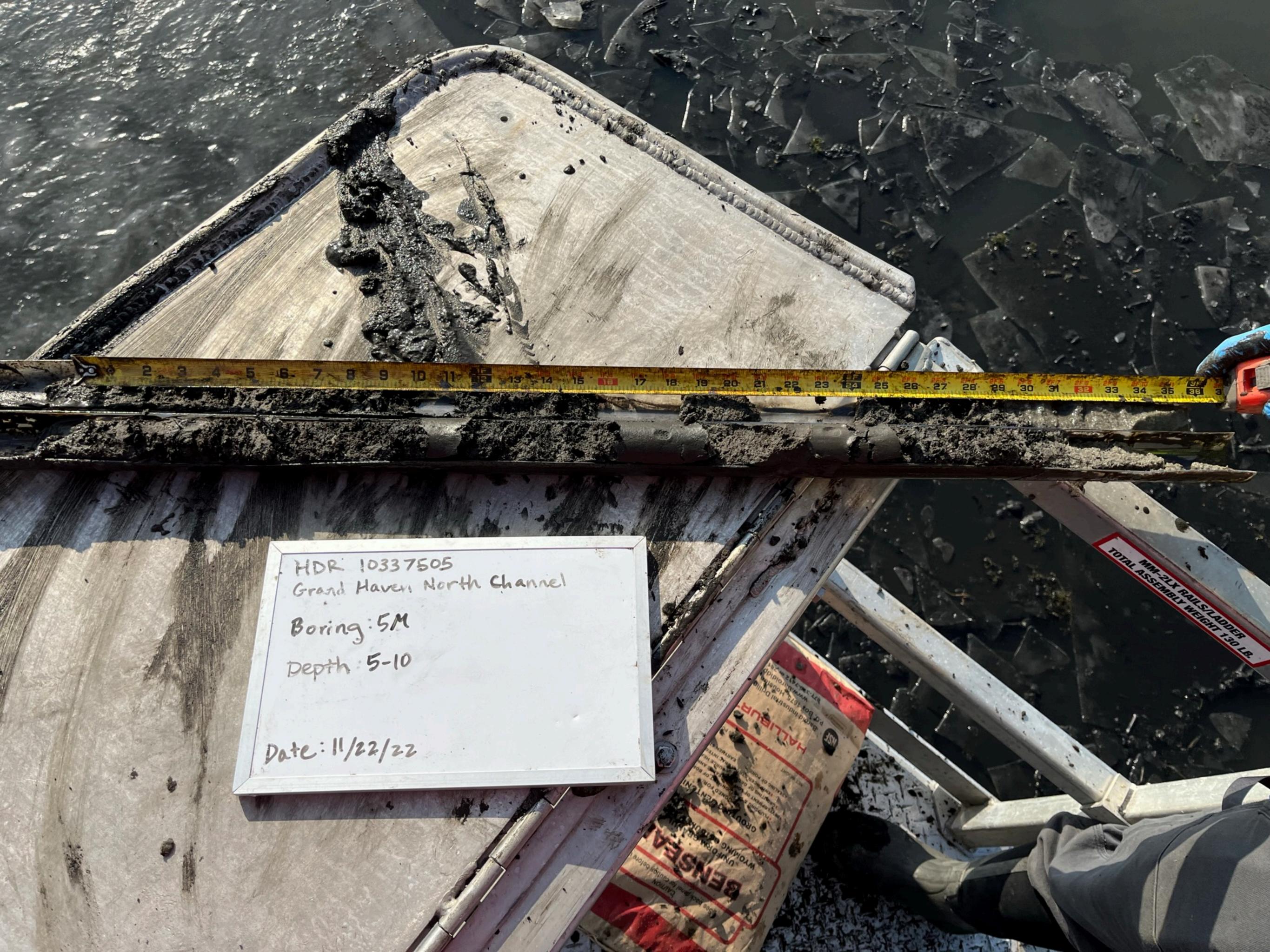
















Appendix D

Microscopy Photographs



Client Name:	Site Location:	Microscopic Photographic Log
City of Grand Haven	North Channel Muskegon, Michigan	HDR Project No. 10337505

Boring: 1LA Depth: 0-3 feet

HDR Microscopic Quantification Result: >40%

Note: CCR particle (red arrows) and natural sands primarily quartz along with small organic material



Photograph No. 2

Boring: 1LA Depth: 5-6 feet

HDR Microscopic
Quantification Result:



Client Name:	Site Location:	Microscopic Photographic Log
City of Grand Haven	North Channel Muskegon, Michigan	HDR Project No. 10337505

Boring: 1LA2 Depth: 4-5 feet

HDR Microscopic Quantification Result:

50%

Note: Large CCR particle (red arrow)



Photograph No. 4

Boring: 1M Depth: 3-5 feet

HDR Microscopic Quantification Result:



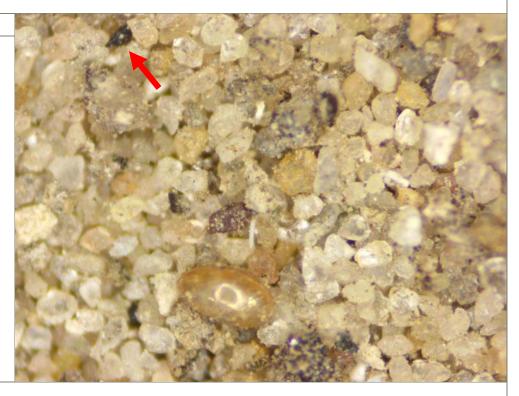


Client Name:	Site Location:	Microscopic Photographic Log
City of Grand Haven	North Channel Muskegon, Michigan	HDR Project No. 10337505

Boring: 1M Depth: 6-7 feet

HDR Microscopic Quantification Result: 1%

Note: Mostly natural sands, note small CCR particle (red arrow)



Photograph No. 6

Boring: 2L Depth: 0-1 feet

HDR Microscopic
Quantification Result:



Client Name:	Site Location:	Microscopic Photographic Log
City of Grand Haven	North Channel Muskegon, Michigan	HDR Project No. 10337505

Boring: 2M Depth: 2-3 feet

HDR Microscopic
Quantification Result:

70%

Note: Large CCR particles (red arrows) and various other CCR present.



Photograph No. 8

Boring: 2R Depth: 0-1 feet

HDR Microscopic Quantification Result:

2%

Note: Clean sand with various organic material present. Scarce spherical CCR present (red arrow).



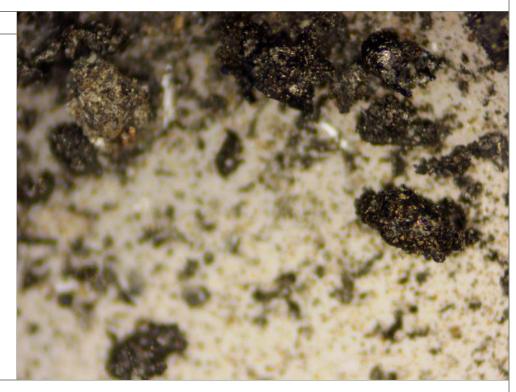


Client Name:	Site Location:	Microscopic Photographic Log
City of Grand Haven	North Channel Muskegon, Michigan	HDR Project No. 10337505

Boring: 3RA Depth: 0-2.5 feet

HDR Microscopic
Quantification Result:

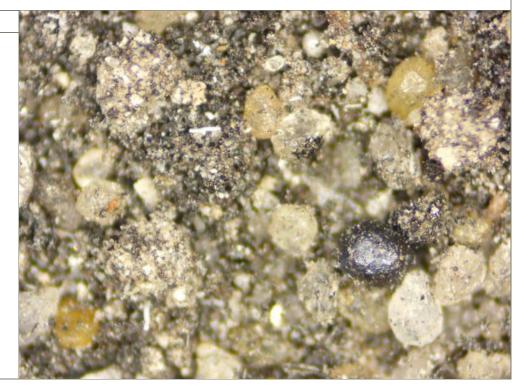
100%



Photograph No. 10

Boring: 4M Depth: 0-1 feet

HDR Microscopic
Quantification Result:



Client Name:	Site Location:	Microscopic Photographic Log
City of Grand Haven	North Channel Muskegon, Michigan	HDR Project No. 10337505

Boring: 4MA Depth: 0-1 feet

HDR Microscopic Quantification Result:

70%



Photograph No. 12

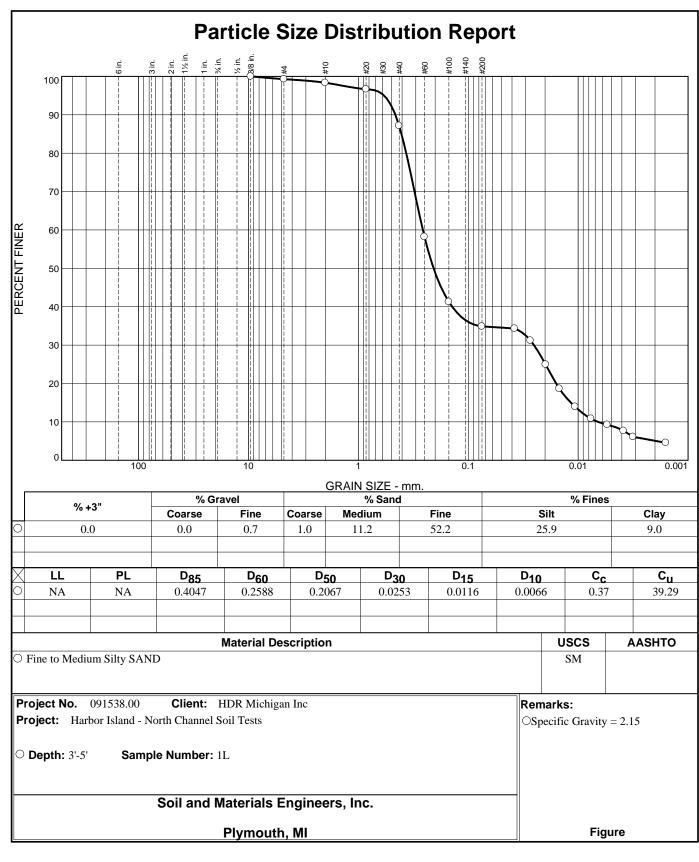
Boring: 5M Depth: 0-1 feet

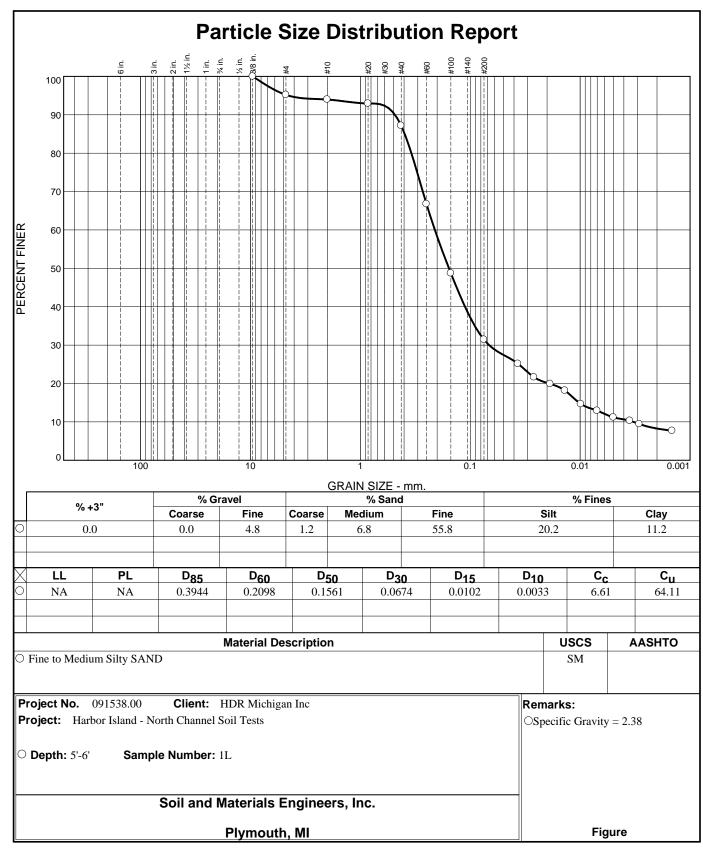
HDR Microscopic Quantification Result:

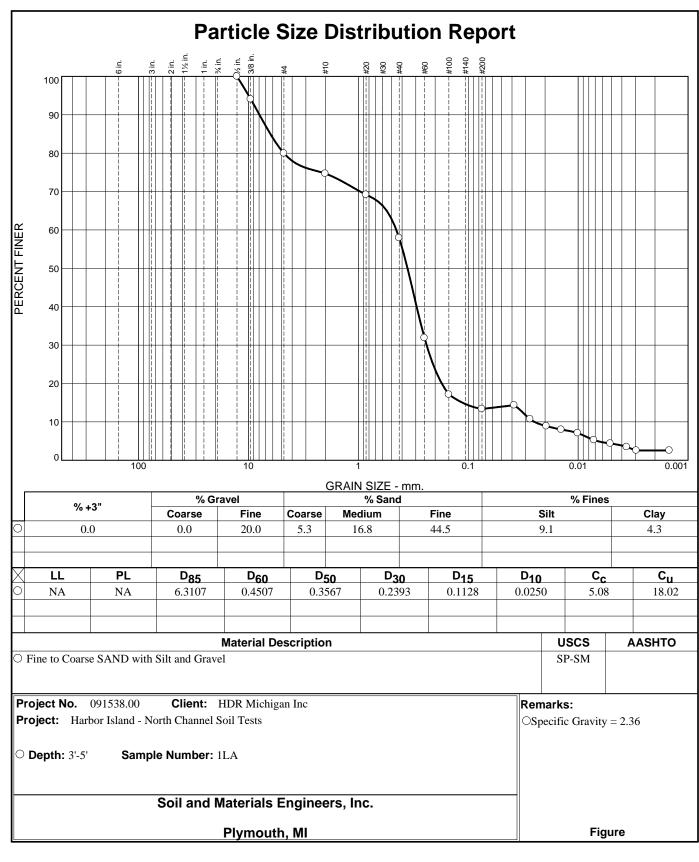


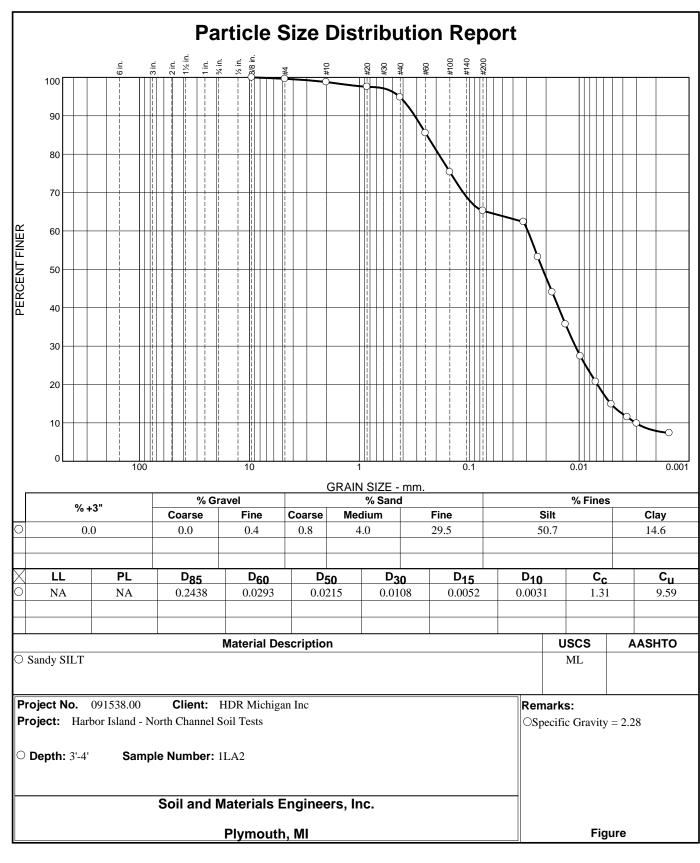
Appendix E

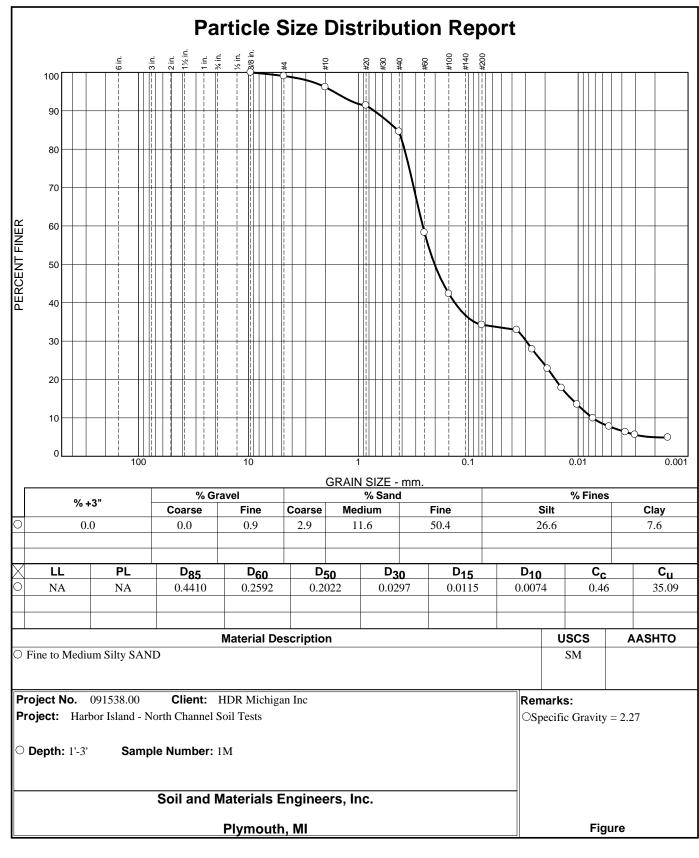
Laboratory Test Results

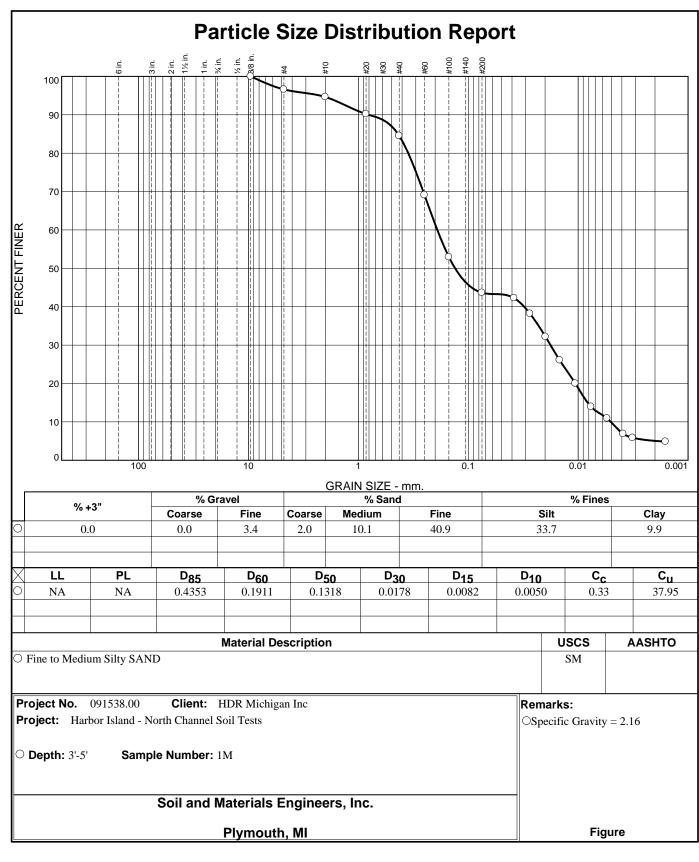


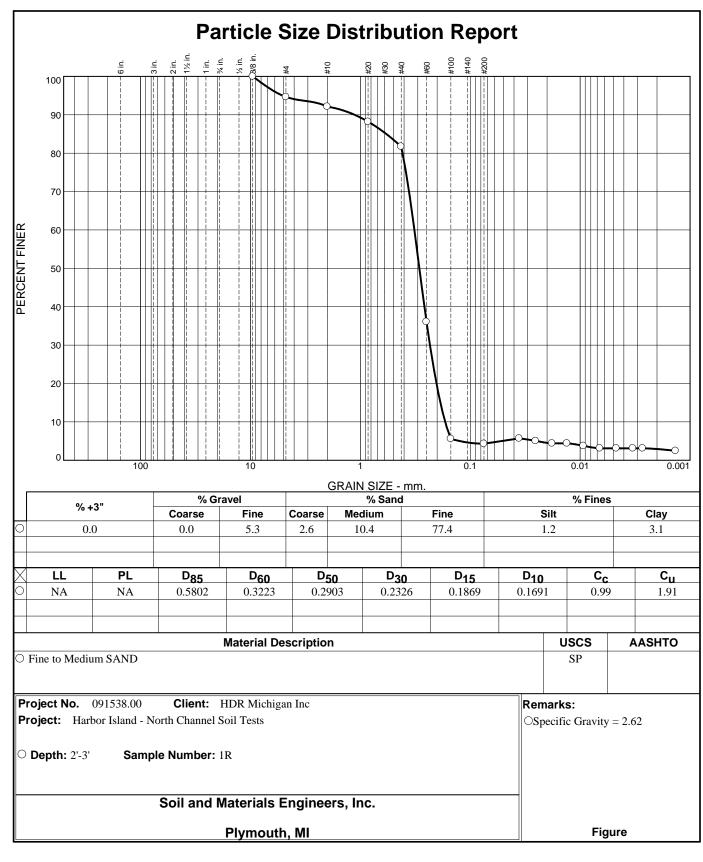


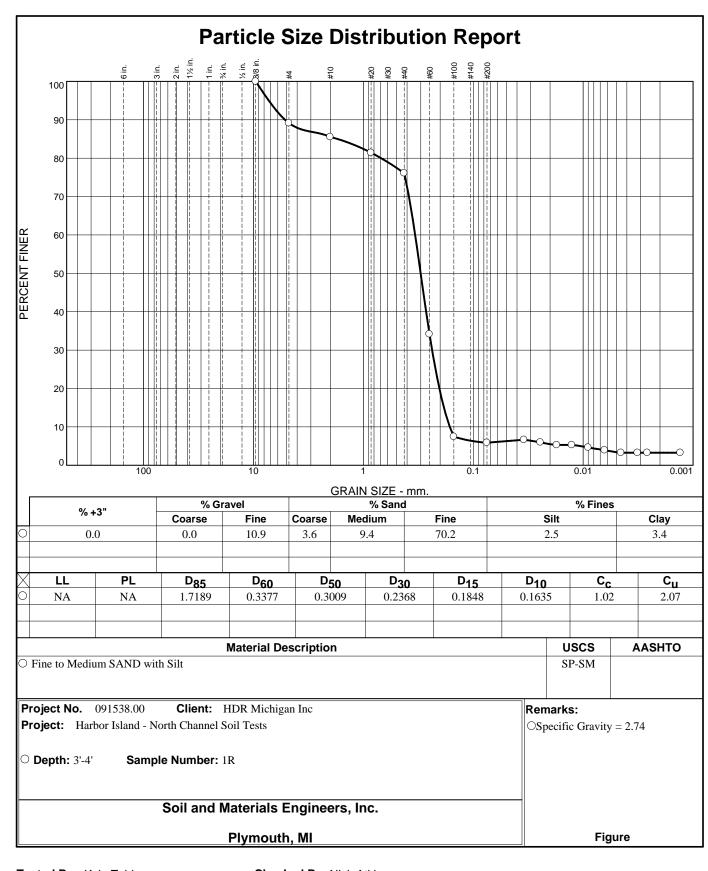


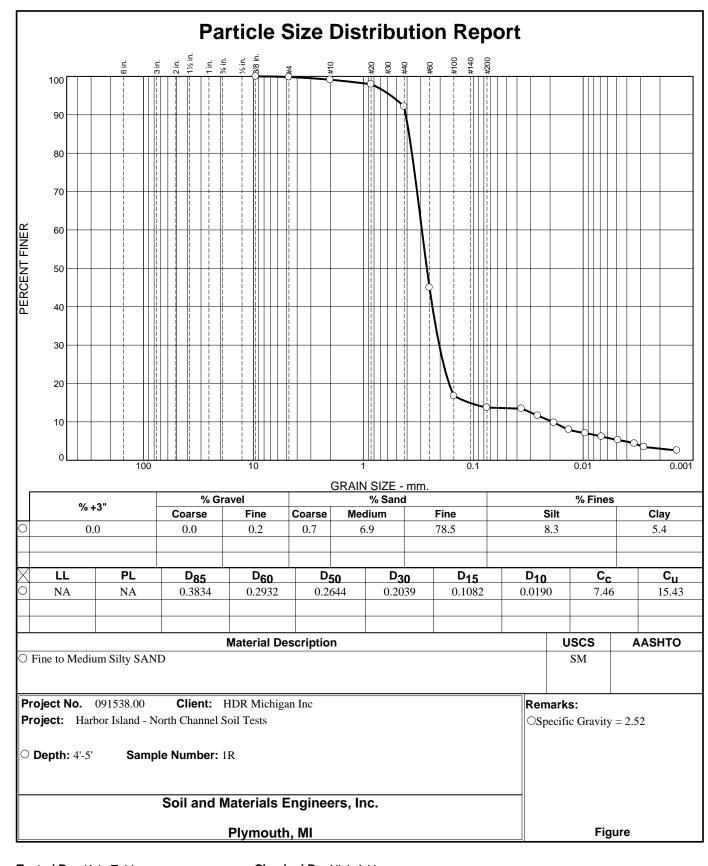


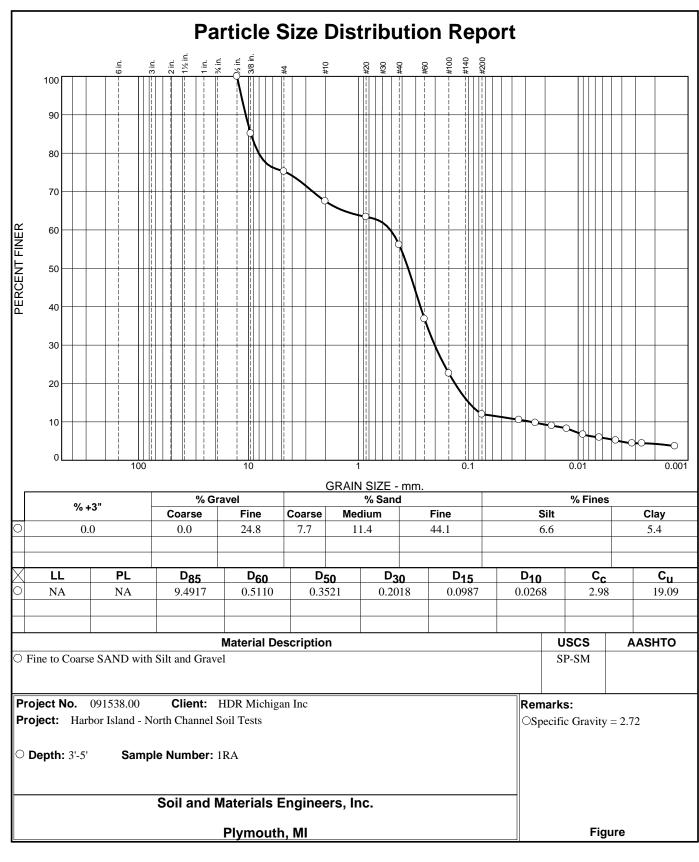


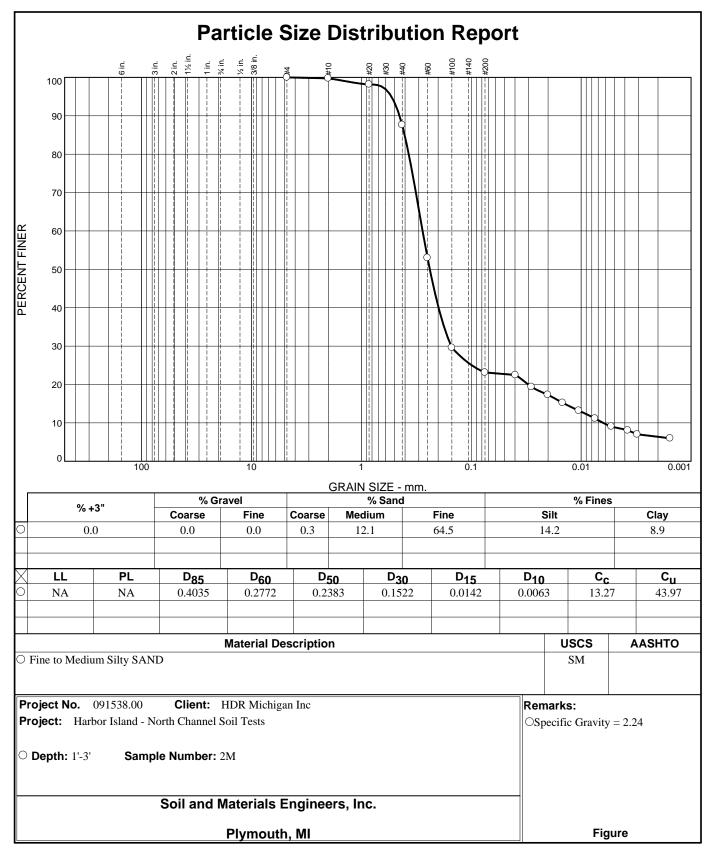


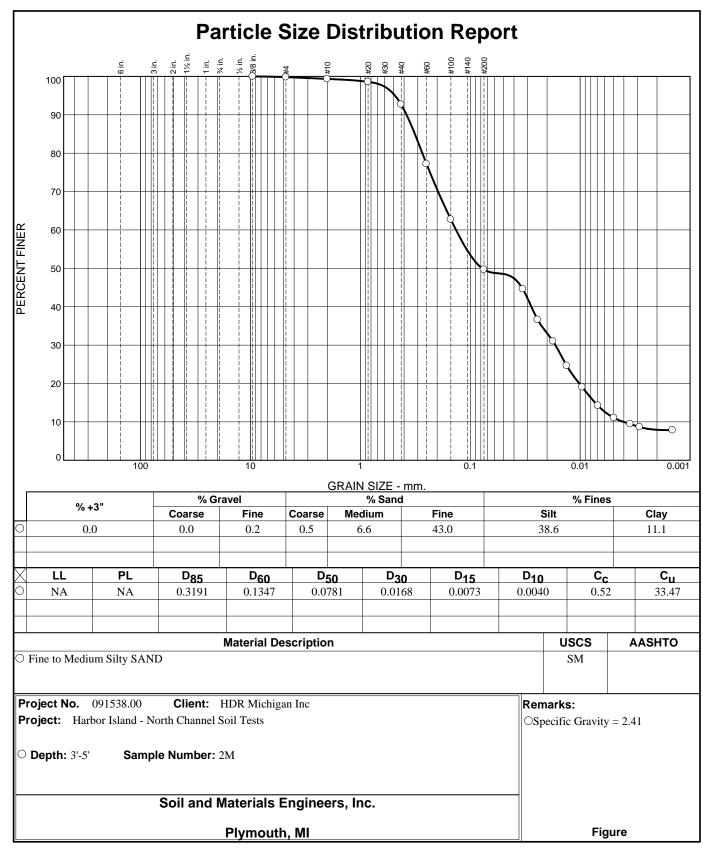












Appendix F

EGLE Email Communication

From: Walters, Kent (EGLE)

To: Reeves, Molly; Zawaideh, Lara; Burkett, Bryce

Cc: Buszka, Tanten; dgajdos@grandhaven.org; Unseld, Timothy (EGLE); Sellers, Fred (EGLE); Ring, Margie (EGLE)

Subject: Re: JB Sims Units 1/2

Date: Thursday, July 18, 2024 4:59:12 PM

Attachments: <u>image001.png</u>

CAUTION: [EXTERNAL] This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Molly,

EGLE interprets EPAs guidance to indicate that further delineation of the northern channel is not needed as it pertains to Unit 1/2. EPA indicates that the current previously agreed upon unit boundary is sufficient.

EGLE pointed out that while the ash identified in the northern channel will not be considered a part of Unit 1/2, it is ash that could meet the definition of a CCRMU. Any efforts to define CCRMUs onsite would need to be included as a separate workplan as the original northern channel workplan was devised for the Unit 1/2 boundary definition.

Kent.

From: Reeves, Molly < Molly. Reeves@hdrinc.com>

Sent: Thursday, July 18, 2024 4:14 PM

To: Walters, Kent (EGLE) < Walters K7@michigan.gov>; Zawaideh, Lara < Lara.Zawaideh@hdrinc.com>; Burkett, Bryce < Bryce.Burkett@hdrinc.com> **Cc:** Buszka, Tanten < Tanten.Buszka@hdrinc.com>; dgajdos@grandhaven.org

 $<\!dgajdos@grandhaven.org\!>; Unseld, Timothy (EGLE) <\!UNSELDT@michigan.gov\!>; Sellers, Fred$

(EGLE) <SELLERSF@michigan.gov>; Ring, Margie (EGLE) <RINGM@michigan.gov>

Subject: RE: JB Sims Units 1/2

CAUTION: This is an External email. Please send suspicious emails to abuse@michigan.gov

Hi Kent,

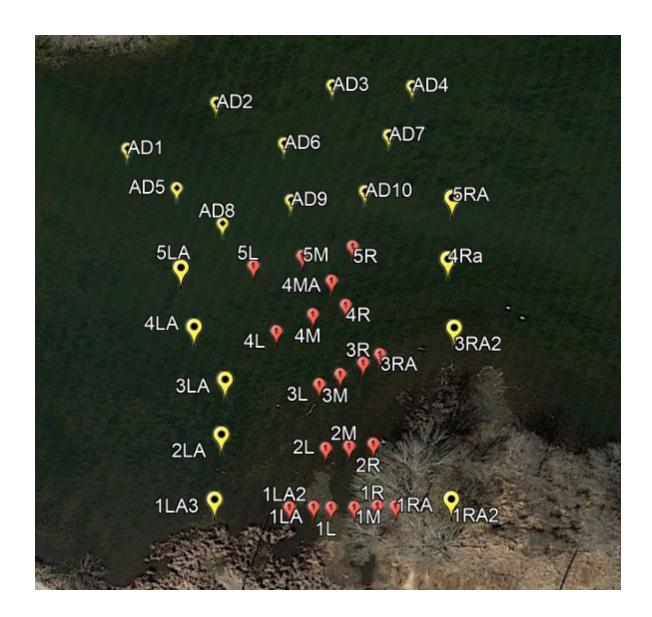
Thank you for the feedback from EGLE and EPA. As a reminder when this communication arose, we were in the process of delineating the North Channel ash and ran into some difficulties following the work plan that had been approved by EGLE. So we were proposing a change to the work plan approach as we extended further into the wetland. A reminder that much of the difficulty has to do with the inability to visually differentiate ash from organics/sludge in the field and requires drying out and review under a microscope. The figure pasted in below is a representation of the proposed field work to delineate the ash and is a deviation from the approved work plan (red points being

completed sample locations and yellow points being the proposed sample points).

It is our interpretation of the closure requirements of both EGLE and EPA that closure needs to address not only the CCR unit boundary but also "all areas affected by releases from the CCR unit." In one of EGLE's letters for denial of the closure of Unit 3A/B, with regard to "spill" areas outside the waste boundary it says any "additional impacted areas will need to be included for documentation of removal and decontamination." Is your email below saying that this overflow area north of Units 1/2 into the North Channel will not be considered as a release from Units 1/2 - but instead it will be a CCRMU?

- If it will be considered a release from Units 1/2, our question (does EGLE and EPA agree with the proposed field plan) still seems to apply because it is our understanding that this ash will have to be addressed during closure of Units 1/2.
- If it will not be considered a release from Units 1/2 and will be defined as a CCRMU then those CCRMU regulations for monitoring and closure/post closure will apply. So for the study to delineate the CCRMU boundary, a Facility Evaluation Report Parts 1 and 2 (2 being the field work to delineate) will be completed and they will be in the same position at that point as they are now trying to determine whether or not the field plan deviation from the work plan is appropriate to define the extents. So under this scenario, we think our question may also still apply.

We appreciate your thoughts on the matter to help us determine the most efficient approach. Thank you, Molly



Molly Reeves, CPG, CPESC Senior Hydrogeologist Professional Associate

HDR

M 734.263.7138 molly.reeves@hdrinc.com

hdrinc.com/follow-us

From: Walters, Kent (EGLE) < Walters K7@michigan.gov>

Sent: Monday, July 15, 2024 9:59 AM

To: Zawaideh, Lara <Lara.Zawaideh@hdrinc.com>; Burkett, Bryce <Bryce.Burkett@hdrinc.com> **Cc:** Buszka, Tanten <Tanten.Buszka@hdrinc.com>; Reeves, Molly <Molly.Reeves@hdrinc.com>; dgajdos@grandhaven.org; Unseld, Timothy (EGLE) <UNSELDT@michigan.gov>; Sellers, Fred (EGLE) <SELLERSF@michigan.gov>; Ring, Margie (EGLE) <RINGM@michigan.gov> **Subject:** Fw: JB Sims Units 1/2

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Hi Lara/Bryce,

Please see the below information regarding the Northern Channel investigation of Unit 1/2.

EGLE points out that while EPA has determined the unit boundary for 1 and 2 does not need to extend out further than previously determined, the ash identified in the northern channel borings seems to fall under the definition of a CCRMU under the new legacy rule and would need to be managed accordingly.

Please let me know if you would like to have further discussions on this topic.

Kent.

From: Mandelia, Ankita (she/her/hers) < Mandelia. Ankita@epa.gov>

Sent: Friday, July 12, 2024 4:43 PM

To: Walters, Kent (EGLE) < Walters K7@michigan.gov>

Cc: Ring, Margie (EGLE) <RINGM@michigan.gov>; Unseld, Timothy (EGLE)

<UNSELDT@michigan.gov>; Sellers, Fred (EGLE) <SELLERSF@michigan.gov>; Finn, Molly

(she/her/hers) <Finn.Molly@epa.gov>; Jackson, Mary <Jackson.Mary@epa.gov>; Brandon, William

<Brandon.Bill@epa.gov>
Subject: JB Sims Units 1/2

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Greetings Kent,

Hope you are doing well.

We have reviewed the results of the sampling and the information regarding the CCR generation activities you have provided to answer your question regarding continued sampling to establish the northern boundary of Units 1/2 at JB Sims.

As you know, according to 40 CFR 257.53, a CCR surface impoundment means "a natural topographic depression, man-made excavation, or diked area, which is designed to hold an accumulation of CCR and liquids, and the unit treats, stores, or disposes of CCR." Defining the Units 1/2 boundary has been a point of discussion in the past. In 2020, EPA, EGLE, and the facility agreed to a unit boundary relying on the visual presence of coal ash using aerial photos, with the

understanding that further sampling would be done to find its northernmost extent.

The data confirm that there are CCR present in all the sampling conducted to-date. Given the hydraulic nature of this area and the fact that it is a flood plain (which is sometimes under-water), we suspect the presence of CCR may extend beyond the sampled area further into the flood plain (and further, into Grand River). However, the hydraulic nature of this area, combined with the sampling results and the knowledge of historical CCR disposal activities, also makes it difficult either to determine how much farther out sampling should be extended to support potentially extending the Units 1/2 boundary, or to cease sampling at this point and include what has been sampled to-date as part of the unit.

We do not believe it is necessary to conduct further sampling to delineate the Units 1/2 boundary. The weir that separates the pond from the North Channel provides a distinct physical boundary for Units 1/2 in this area, therefore the Unit boundary remains unchanged. The facility will need to ensure this unit and any releases or newly identified units and connecting structures in the vicinity are appropriately managed under the regulations.

Please let us know if you would like any further information. We are happy to meet with you if you would like to discuss this.

Best regards,

Ankita

Ankita Mandelia
Environmental Engineer
Waste Management Permitting Section
Land and Chemicals Branch
Land, Chemicals and Redevelopment Division
U.S. Environmental Protection Agency, Region 5
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