Prepared by

HDR

Renew Harbor Island

Work today, protect tomorrow.

North Channel Investigation Summary Report

Former J.B. Sims Generating Station

March 21, 2025

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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**.

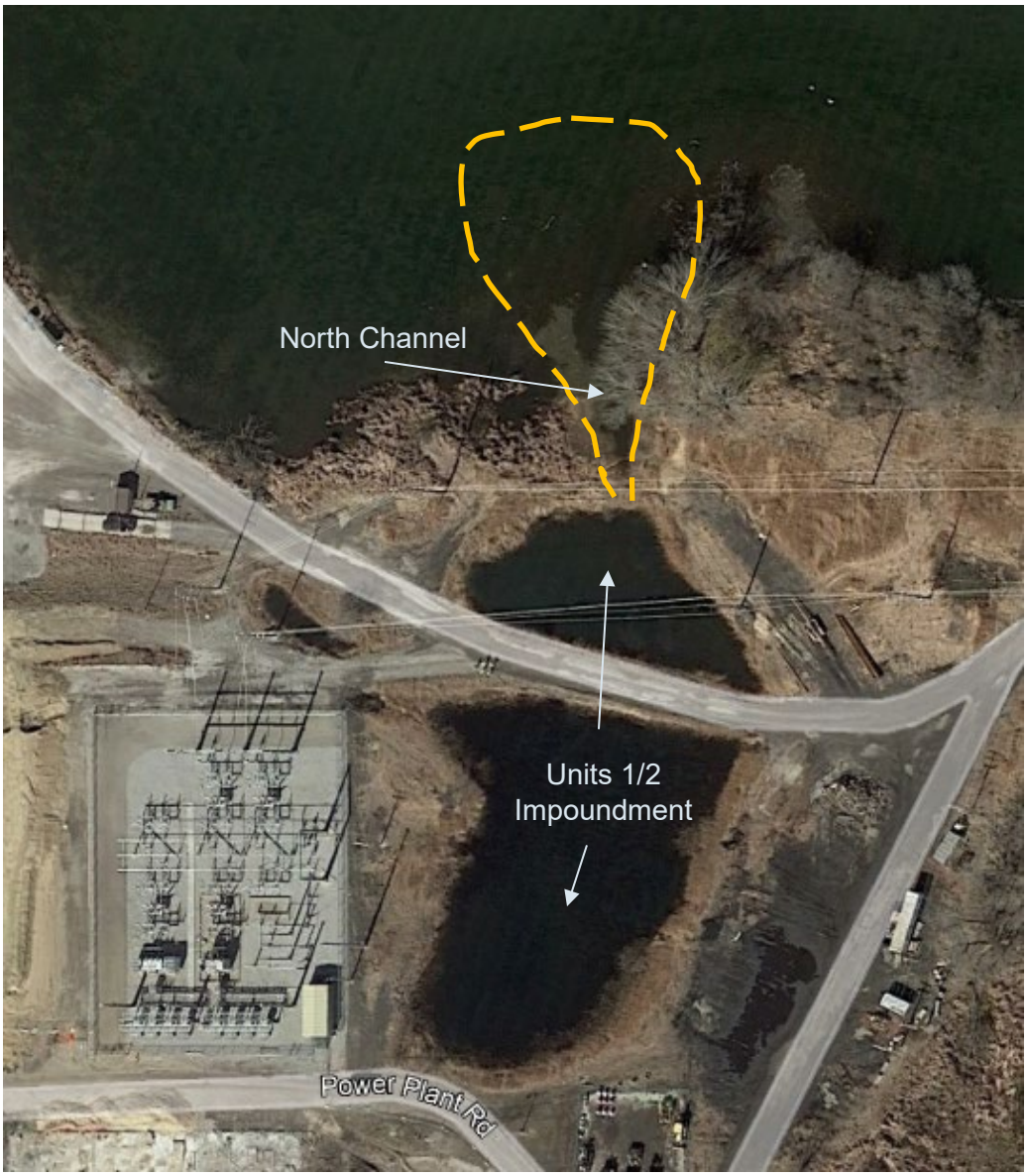

Figure 1. North Channel Location

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

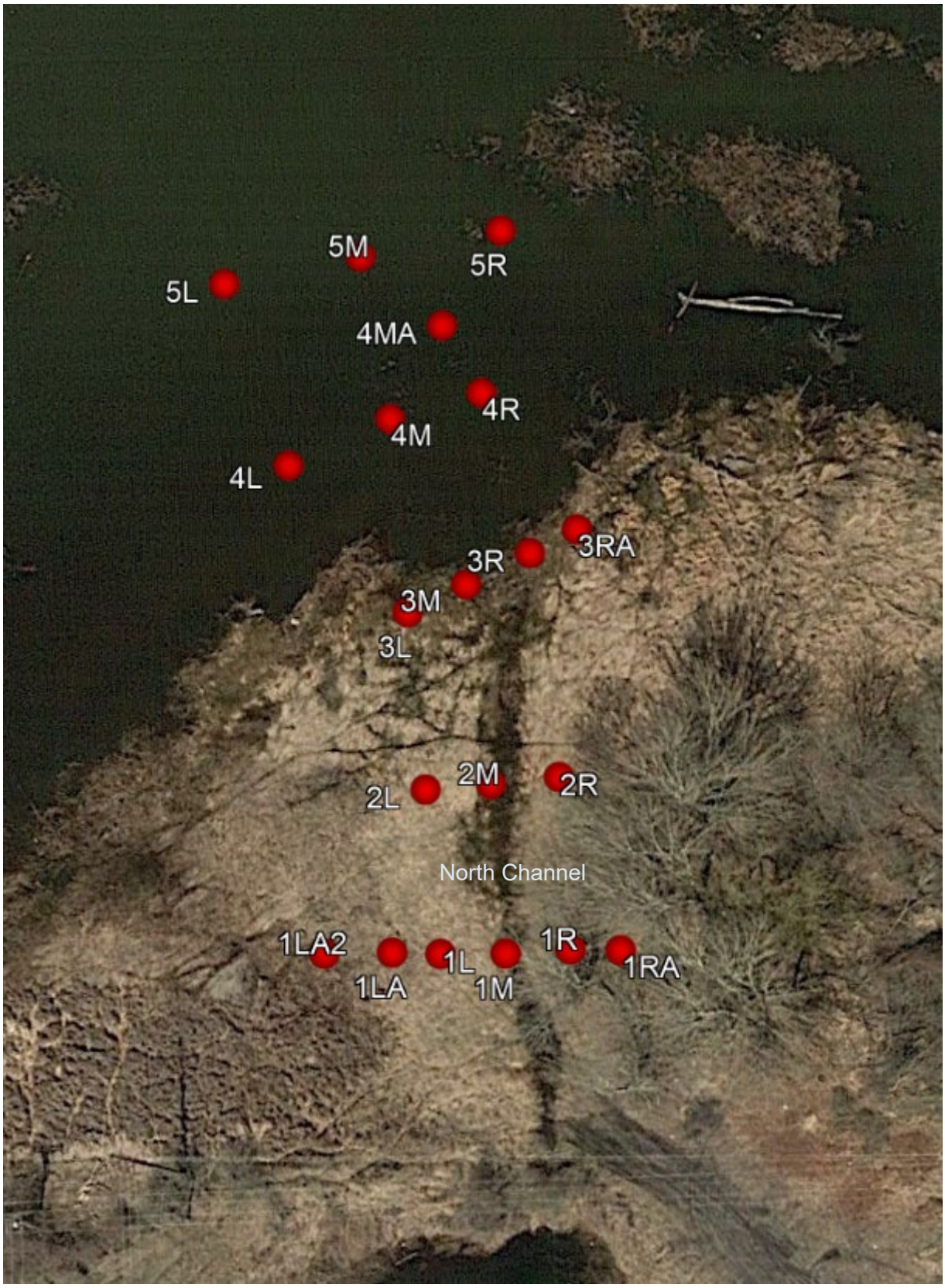

Figure 2. Geoprobe® Boring Locations

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 µm) 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.

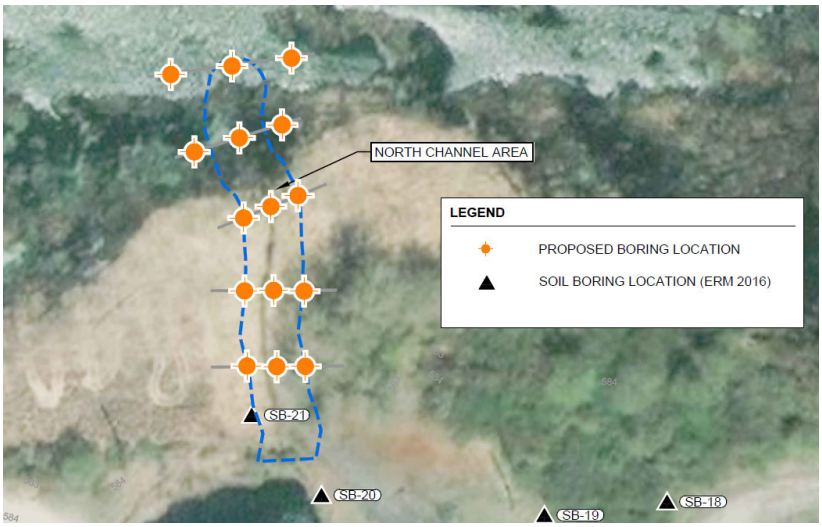

Figure 2: Proposed Boring Locations (2016 Aerial)

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) <WaltersK7@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

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 (BrownC61@michigan.gov, 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

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From: Walters, Kent (EGLE) <WaltersK7@michigan.gov>
Sent: Monday, October 25, 2021 10:37 AM

To: Johnson, Tiffany <Tiffany_Johnson@golder.com>
Cc: Unseld, Timothy (EGLE) <UNSELDT@michigan.gov>; Paul Cederquist <PCederquist@ghblp.org>; Stafford, Sam <Sam_Stafford@golder.com>; Erik Booth <EBooth@ghblp.org>; Litteral, Blaine <Blaine_Litteral@golder.com>; Powrozek, Carolyn <Carolyn_Powrozek@golder.com>; Brown, Cory (EGLE) <BrownC61@michigan.gov>
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 (BrownC61@michigan.gov, 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 <Tiffany_Johnson@golder.com>
Sent: Wednesday, October 13, 2021 4:20 PM
To: Walters, Kent (EGLE) <WaltersK7@michigan.gov>
Cc: Unseld, Timothy (EGLE) <UNSELDT@michigan.gov>; Paul Cederquist <PCederquist@ghblp.org>; Stafford, Sam <Sam_Stafford@golder.com>; Erik Booth <EBooth@ghblp.org>; Litteral, Blaine <Blaine_Litteral@golder.com>; Powrozek, Carolyn <Carolyn_Powrozek@golder.com>
Subject: Northern Channel Work Plan

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

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Appendix B

Geoprobe® Boring Logs

BORING NUMBER 1L

CLIENT City of Grand Haven
PROJECT NAME North Channel Investigation
PROJECT NUMBER 10337505
PROJECT LOCATION Grand Haven, Michigan
LATITUDE 43.07191739
LONGITUDE -86.2329462
DATE STARTED 11/21/22
COMPLETED 11/21/22
STATION ---
OFFSET ---
GROUND ELEVATION 586 ft
HOLE SIZE 2.25 in
DRILLING CONTRACTOR MATECO
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe
AT TIME OF DRILLING 1.0 ft / Elev 585.0 ft
LOGGED BY Tanten Buszka, HDR
CHECKED BY Bryce Burkett, HDR
AT END OF DRILLING ---
NOTES Elevation estimated using Google Earth.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
0	GB 1	MH		**ELASTIC SILT (MH),** brown, with organic material, roots, and clay seams	
			1.0 ▽		585.0
	GB 2	SP		**POORLY GRADED SAND (SP),** dark gray, fine-grained	
			3.0		583.0
5	GB 3	CCR		**COAL COMBUSTION RESIDUALS (CCR),** black, with fine-grained sand	
			5.0		581.0
	GB 4	CL-ML		**SILTY CLAY (CL-ML),** brown, with organic material, fine-grained sand seams, shell fragments	
	GB 5				
	GB 6				
	GB 7				
10	GB 8				
	GB 9				
	GB 10				
	GB 11				
	GB 12				
			14.0		572.0
15	GB 13	OH		**ORGANIC SOIL (OH),** with wood fragments	
			15.0		571.0

Bottom of borehole at 15.0 feet.

BORING NUMBER 1LA

CLIENT City of Grand Haven
PROJECT NAME North Channel Investigation
PROJECT NUMBER 10337505
PROJECT LOCATION Grand Haven, Michigan
LATITUDE 43.07191839 **LONGITUDE** -86.23300063 **DATE STARTED** 11/21/22 **COMPLETED** 11/21/22
STATION --- **OFFSET** --- **GROUND ELEVATION** 586 ft **HOLE SIZE** 2.25 in
DRILLING CONTRACTOR MATECO **GROUND WATER LEVELS:**
DRILLING METHOD Geoprobe ▽ **AT TIME OF DRILLING** 1.0 ft / Elev 585.0 ft
LOGGED BY Tanten Buszka, HDR **CHECKED BY** Bryce Burkett, HDR **AT END OF DRILLING** ---
NOTES Elevation estimated using Google Earth. **AFTER DRILLING** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
0					
	GB 1	CCR		**COAL COMBUSTION RESIDUALS (CCR),** black, with glass fragements and gravel, sand seams, organic material ▽	
	GB 2				
5			5.0		581.0
	GB 3	SM		**SILTY SAND (SM),** brown	
	GB 4				
	GB 5			- with shell fragments from 7'-8'	
			8.0		578.0
	GB 6	ML		**SANDY SILT (ML),** dark gray	
			9.0		577.0
10	GB 7	CL-ML	10.0	**SILTY CLAY (CL-ML),** with organics and fine-grained sand seams	576.0

Bottom of borehole at 10.0 feet.

BORING NUMBER 1LA2

CLIENT City of Grand Haven
PROJECT NAME North Channel Investigation
PROJECT NUMBER 10337505
PROJECT LOCATION Grand Haven, Michigan
LATITUDE 43.07191779
LONGITUDE -86.23307655
DATE STARTED 11/22/22
COMPLETED 11/22/22
STATION ---
OFFSET ---
GROUND ELEVATION 586 ft
HOLE SIZE 2.25 in
DRILLING CONTRACTOR MATECO
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe
AT TIME OF DRILLING 1.0 ft / Elev 585.0 ft
LOGGED BY Tanten Buszka, HDR
CHECKED BY Bryce Burkett, HDR
AT END OF DRILLING ---
NOTES Elevation estimated using Google Earth.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
0	GB 1	OH		**ORGANIC SOIL (OH),** topsoil, with roots	
1.0 ▽					585.0
	GB 2	SP		**POORLY GRADED SAND (SP),** gray, fine-grained	
2.0					584.0
	GB 3	CCR		**COAL COMBUSTION RESIDUALS (CCR),** black, with rock fragments, glass fragments, fine-grained sand seams, and organic material. Hydrocarbon odor present.	
	GB 4				
5	GB 5				
5.0					581.0

Bottom of borehole at 5.0 feet.

BORING NUMBER 1M

CLIENT City of Grand Haven
PROJECT NAME North Channel Investigation
PROJECT NUMBER 10337505
PROJECT LOCATION Grand Haven, Michigan
LATITUDE 43.07191816
LONGITUDE -86.23287272
DATE STARTED 11/21/22
COMPLETED 11/21/22
STATION ---
OFFSET ---
GROUND ELEVATION 586 ft
HOLE SIZE 2.25 in
DRILLING CONTRACTOR MATECO
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe
AT TIME OF DRILLING 1.0 ft / Elev 585.0 ft
LOGGED BY Tanten Buszka, HDR
CHECKED BY Bryce Burkett, HDR
AT END OF DRILLING ---
NOTES Elevation estimated using Google Earth.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
0	GB 1	OH		**ORGANIC SOIL (OH),** dark brown	
				1.0 ▽	585.0
	GB 2	CCR		**COAL COMBUSTION RESIDUALS (CCR),** black	
	GB 3			- with coal fragments at 4'	
5	GB 4				
				6.0	580.0
	GB 5	SP		**POORLY GRADED SAND (SP),** gray, fine-grained, with organic material and shell fragments	
				7.0	579.0
	GB 6	MH		**SILT (MH),** dark gray, with organic material and shell fragments	
	GB 7				
10	GB 8				
	GB 9				
	GB 10				
				12.0	574.0
	GB 11	SP		**POORLY GRADED SAND (SP),** gray, fine-grained	
				13.0	573.0
	GB 12	MH		**SILT (MH),** gray, with clay seams	
				14.0	572.0
15	GB 13	SP		**POORLY GRADED SAND (SP),** gray, fine-grained	
				15.0	571.0

Bottom of borehole at 15.0 feet.

BORING NUMBER 1R

CLIENT City of Grand Haven
PROJECT NAME North Channel Investigation
PROJECT NUMBER 10337505
PROJECT LOCATION Grand Haven, Michigan
LATITUDE 43.07192199
LONGITUDE -86.2328003
DATE STARTED 11/21/22
COMPLETED 11/21/22
STATION ---
OFFSET ---
GROUND ELEVATION 588 ft
HOLE SIZE 2.25 in
DRILLING CONTRACTOR MATECO
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe
AT TIME OF DRILLING 3.0 ft / Elev 585.0 ft
LOGGED BY Tanten Buszka, HDR
CHECKED BY Bryce Burkett, HDR
AT END OF DRILLING ---
NOTES Elevation estimated using Google Earth.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
0	GB 1, GB 2, GB 3	SP		**POORLY GRADED SAND (SP),** brown, fine-grained, with organics and rock fragments	
				3.0 ▽	585.0
	GB 4	CCR		**COAL COMBUSTION RESIDUALS (CCR),** black, with hydrocarbon odor present	
				4.0	584.0
5	GB 5, GB 6	SP		**POORLY GRADED SAND (SP),** brown, medium-grained, with gravel and trace CCR	
				6.0	582.0
	GB 7	SM		**SILTY SAND (SM),** dark gray, with hydrocarbon odor observed	
				7.0	581.0
	GB 8, GB 9	CL-ML		**SILTY CLAY (CL-ML),** dark gray, with organic material, shell fragments, and fine-grained sand seams	
				9.0	579.0
10	GB 10, GB 11	SP		**POORLY GRADED SAND (SP),** brown, fine-grained, with organics and silt pockets	
				11.0	577.0
	GB 12, GB 13, GB 14	CL-ML		**SILTY CLAY (CL-ML),** dark gray, with organic material	
				14.0	574.0
15	GB 15	SP		**POORLY GRADED SAND (SP),** gray, fine-grained	
				15.0	573.0

Bottom of borehole at 15.0 feet.

BORING NUMBER 1RA

CLIENT City of Grand Haven
PROJECT NAME North Channel Investigation
PROJECT NUMBER 10337505
PROJECT LOCATION Grand Haven, Michigan
LATITUDE 43.07192141
LONGITUDE -86.23274399
DATE STARTED 11/21/22
COMPLETED 11/21/22
STATION ---
OFFSET ---
GROUND ELEVATION 588 ft
HOLE SIZE 2.25 in
DRILLING CONTRACTOR MATECO
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe
AT TIME OF DRILLING 3.0 ft / Elev 585.0 ft
LOGGED BY Tanten Buszka, HDR
CHECKED BY Bryce Burkett, HDR
AT END OF DRILLING ---
NOTES Elevation estimated using Google Earth.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
0	GB 1	SP		**POORLY GRADED SAND (SP),** light brown, fine-grained, with organic material	
				1.0	587.0
	GB 2	ML		**SANDY SILT (ML),** dark brown, with glass fragments and organic material	
				3.0 ▽	585.0
	GB 3	CCR		**COAL COMBUSTION RESIDUALS (CCR),** black, with rock fragments	
5				5.0	583.0
	GB 4	SP		**POORLY GRADED SAND (SP),** dark gray, fine-grained, with trace CCR	
	GB 5				
	GB 6			7.5	580.5
	GB 7	CL-ML		**SILTY CLAY (CL-ML),** dark gray, with sand seams and organic material	
10	GB 8			10.0	578.0

Bottom of borehole at 10.0 feet.

BORING NUMBER 2L

CLIENT City of Grand Haven
PROJECT NAME North Channel Investigation
PROJECT NUMBER 10337505
PROJECT LOCATION Grand Haven, Michigan
LATITUDE 43.07205233
LONGITUDE -86.232963
DATE STARTED 11/21/22
COMPLETED 11/21/22
STATION ---
OFFSET ---
GROUND ELEVATION 586 ft
HOLE SIZE 2.25 in
DRILLING CONTRACTOR MATECO
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe
AT TIME OF DRILLING 1.0 ft / Elev 585.0 ft
LOGGED BY Tanten Buszka, HDR
CHECKED BY Bryce Burkett, HDR
AT END OF DRILLING ---
NOTES Elevation estimated using Google Earth.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
0	GB 1	CCR		**COAL COMBUSTION RESIDUALS (CCR),** dark brown, with roots, organic material, and shell fragments	
			1.0 ▽		585.0
	GB 2	MH		**ELASTIC SILT (MH),** dark gray, with clay pockets, fine-grained sand seams, and organic material	
5	GB 3				
			7.0		579.0
	GB 4	CL-ML		**SILTY CLAY (CL-ML),** gray	
10	GB 5		10.0		576.0
	GB 6	SC		**CLAYEY SAND (SC),** dark gray	
	GB 7		12.0		574.0
	GB 8	CL-ML		**SILTY CLAY (CL-ML),** dark gray, with organic material	
	GB 9			- with sand seams from 13.5' to 15'	
15	GB 10		15.0		571.0

Bottom of borehole at 15.0 feet.

BORING NUMBER 2M

CLIENT City of Grand Haven
PROJECT NAME North Channel Investigation
PROJECT NUMBER 10337505
PROJECT LOCATION Grand Haven, Michigan
LATITUDE 43.07205711
LONGITUDE -86.23288952
DATE STARTED 11/21/22
COMPLETED 11/21/22
STATION ---
OFFSET ---
GROUND ELEVATION 585 ft
HOLE SIZE 2.25 in
DRILLING CONTRACTOR MATECO
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe
AT TIME OF DRILLING 0.0 ft / Elev 585.0 ft
LOGGED BY Tanten Buszka, HDR
CHECKED BY Bryce Burkett, HDR
AT END OF DRILLING ---
NOTES Elevation estimated using Google Earth.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
0				▽	
	GB 1	SP		**POORLY GRADED SAND (SP),** black, with organic material	
				1.0	584.0
	GB 2	CCR		**COAL COMBUSTION RESIDUALS (CCR),** black	
	GB 3			- with sand seams and organic material	
5					
	GB 4			6.0	579.0
	GB 5	SP		**POORLY GRADED SAND (SP),** dark gray, fine-grained, with trace CCR	
				7.5	577.5
	GB 6	CL-ML		**SILTY CLAY (CL-ML),** dark gray	
	GB 7			- with sand seams and organics from 8.5' to 10'	
10	GB 8			10.0	575.0
	GB 9	SM		**SILTY SAND (SM),** gray	
	GB 10			12.0	573.0
	GB 11	CL-ML		**SILTY CLAY (CL-ML),** dark gray	
				13.0	572.0
	GB 12	OH		**ORGANIC SOIL (OH),** brown, with wood fragments	
				14.0	571.0
15	GB 13	SP		**POORLY GRADED SAND (SP),** gray, fine-grained	
				15.0	570.0

Bottom of borehole at 15.0 feet.

BORING NUMBER 2R

CLIENT City of Grand Haven
PROJECT NAME North Channel Investigation
PROJECT NUMBER 10337505
PROJECT LOCATION Grand Haven, Michigan
LATITUDE 43.07206306
LONGITUDE -86.2328129
DATE STARTED 11/21/22
COMPLETED 11/21/22
STATION ---
OFFSET ---
GROUND ELEVATION 586 ft
HOLE SIZE 2.25 in
DRILLING CONTRACTOR MATECO
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe
AT TIME OF DRILLING 1.0 ft / Elev 585.0 ft
LOGGED BY Tanten Buszka, HDR
CHECKED BY Bryce Burkett, HDR
AT END OF DRILLING ---
NOTES Elevation estimated using Google Earth.
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
0	GB 1	MH		**ELASTIC SILT (MH),** brown, with organic material and trace CCR	
				1.0 ▽	585.0
	GB 2	SP		**POORLY GRADED SAND (SP),** gray, fine-grained, with trace CCR, refuse fragments, and plastic fragments	
				3.0	583.0
5	GB 3	MH		**ELASTIC SILT (MH),** dark gray, with clay pockets	
				5.0	581.0
	GB 4	SM		**SILTY SAND (SM),** dark gray	
	GB 5			6.5	579.5
	GB 6	CL-ML		**SILTY CLAY (CL-ML),** brown, with shell fragments	
	GB 7			8.5	577.5
10	GB 8	SM		**SILTY SAND (SM),** gray	
				10.0	576.0
	GB 9	CL-ML		**SILTY CLAY (CL-ML),** dark gray, with sand seams and organic material	
	GB 10			12.0	574.0
	GB 11	OH		**ORGANIC SOIL (OH),** brown, with wood fragments	
				13.0	573.0
	GB 12	SP		**POORLY GRADED SAND (SP),** gray, find-grained	
15	GB 13			15.0	571.0

Bottom of borehole at 15.0 feet.

BORING NUMBER 3L

CLIENT City of Grand Haven
PROJECT NAME North Channel Investigation
PROJECT NUMBER 10337505
PROJECT LOCATION Grand Haven, Michigan
LATITUDE 43.07219836
LONGITUDE -86.23298377
DATE STARTED 11/21/22
COMPLETED 11/21/22
STATION ---
OFFSET ---
GROUND ELEVATION 584 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 ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
0					
	GB 1	CCR		**COAL COMBUSTION RESIDUALS (CCR),** dark brown, with roots and fine-grained sand seams	
				2.0	582.0
	GB 2	CH		**FAT CLAY (CH),** dark brown, with fine-grained sand seams and shell fragments	
5				5.0	579.0
	GB 3	MH		**ELASTIC SILT (MH),** dark brown, with fine-grained sand seams and clay pockets	
	GB 4			- with shell fragments from 7' to 8'	
	GB 5				
10				10.0	574.0

Bottom of borehole at 10.0 feet.

BORING NUMBER 3M

CLIENT City of Grand Haven
PROJECT NAME North Channel Investigation
PROJECT NUMBER 10337505
PROJECT LOCATION Grand Haven, Michigan
LATITUDE 43.07222153
LONGITUDE -86.23291782
DATE STARTED 11/21/22
COMPLETED 11/21/22
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 ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
0	GB 1	CCR		**COAL COMBUSTION RESIDUALS (CCR),** dark brown, with roots	
1.0					582.0
5	GB 2	MH		**ELASTIC SILT (MH),** dark brown, with organic material, clay pockets, and sand seams	
	GB 3				
	GB 4			- with fine-grained sand layer from 7.5' to 8'	
8.0					575.0
10	GB 5	CL-ML		**SILTY CLAY (CL-ML),** dark gray, with organic material	
10.0					573.0

Bottom of borehole at 10.0 feet.

BORING NUMBER 3R

CLIENT City of Grand Haven
PROJECT NAME North Channel Investigation
PROJECT NUMBER 10337505
PROJECT LOCATION Grand Haven, Michigan
LATITUDE 43.07224752
LONGITUDE -86.23284566
DATE STARTED 11/21/22
COMPLETED 11/21/22
STATION ---
OFFSET ---
GROUND ELEVATION 584 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 ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
0	GB 1	CCR		**COAL COMBUSTION RESIDUALS (CCR),** dark brown and black, with roots	
1.0					583.0
	GB 2	CL-ML		**SILTY CLAY (CL-ML),** dark gray, with organic material and shell fragments	
3.0					581.0
5	GB 3	SM		**SILTY SAND (SM),** gray	
	GB 4				
	GB 5			- with organic material from 6' to 7.5'	
7.5	GB 6				576.5
	GB 7	ML		**SILT (ML),** gray, with organic material, clay pockets, and sand seams	
10	GB 8				
10.0					574.0

Bottom of borehole at 10.0 feet.

BORING NUMBER 3RA

CLIENT City of Grand Haven
PROJECT NAME North Channel Investigation
PROJECT NUMBER 10337505
PROJECT LOCATION Grand Haven, Michigan
LATITUDE 43.07226713
LONGITUDE -86.23279258
DATE STARTED 11/21/22
COMPLETED 11/21/22
STATION ---
OFFSET ---
GROUND ELEVATION 584 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 ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
0	GB 1	CCR		**COAL COMBUSTION RESIDUALS (CCR),** dark brown and black, with roots	
2.5					581.5
5	GB 2	SC		**CLAYEY SAND (SC),** gray, with organic material and shell fragments	
5.0					579.0

Bottom of borehole at 5.0 feet.

BORING NUMBER 4L

CLIENT City of Grand Haven
PROJECT NAME North Channel Investigation
PROJECT NUMBER 10337505
PROJECT LOCATION Grand Haven, Michigan
LATITUDE 43.07232006
LONGITUDE -86.23311914
DATE STARTED 11/22/22
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 ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
0	GB 1	CCR		**COAL COMBUSTION RESIDUALS (CCR),** dark brown, with roots, grass, and organic material	
				1.0	582.0
	GB 2	ML		**SANDY SILT (ML),** dark brown, with organic material and shell fragments	
	GB 3				
5	GB 4				
	GB 5			7.0	576.0
	GB 6	CL-ML		**SILTY CLAY (CL-ML),** dark brown, with organic material	
	GB 7			9.0	574.0
10	GB 8	SP		**POORLY GRADED SAND (SP),** gray, fine-grained	
				10.0	573.0

Bottom of borehole at 10.0 feet.

BORING NUMBER 4M

CLIENT City of Grand Haven
PROJECT NAME North Channel Investigation
PROJECT NUMBER 10337505
PROJECT LOCATION Grand Haven, Michigan
LATITUDE 43.07235893 **LONGITUDE** -86.23300396 **DATE STARTED** 11/22/22 **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** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
0	GB 1	CCR		**COAL COMBUSTION RESIDUALS (CCR),** dark brown, with roots and fine-grained sand seams	
				1.0	582.0
	GB 2	MH		**ELASTIC SILT (MH),** dark gray, with clay pockets, shell fragments, roots and sand seams	
	GB 3				
5	GB 4			6.0	577.0
	GB 5	CL-ML		**SILTY CLAY (CL-ML),** dark gray, with organic material and shell fragments	
	GB 6				
	GB 7			9.0	574.0
10	GB 8	SP		**POORLY GRADED SAND (SP),** gray, fine-grained, with shell fragments and organic material	
				10.0	573.0

Bottom of borehole at 10.0 feet.

BORING NUMBER 4MA

CLIENT City of Grand Haven
PROJECT NAME North Channel Investigation
PROJECT NUMBER 10337505
PROJECT LOCATION Grand Haven, Michigan
LATITUDE 43.07243622
LONGITUDE -86.23294529
DATE STARTED 11/22/22
COMPLETED 11/22/22
STATION ---
OFFSET ---
GROUND ELEVATION 582 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 ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
0					
	GB 1	CCR		**COAL COMBUSTION RESIDUALS (CCR),** black, with shell fragments, organic material, and fine-grained sand seams	
1.0					581.0
	GB 2	MH		**ELASTIC SILT (MH),** dark gray, with clay pockets, sand seams, organic material, and shell fragments	
	GB 3				
	GB 4				
5					
5.0					577.0

Bottom of borehole at 5.0 feet.

BORING NUMBER 4R

CLIENT City of Grand Haven
PROJECT NAME North Channel Investigation
PROJECT NUMBER 10337505
PROJECT LOCATION Grand Haven, Michigan
LATITUDE 43.07238032
LONGITUDE -86.23290066
DATE STARTED 11/22/22
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 ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
0					
	GB 1	CCR		**COAL COMBUSTION RESIDUALS (CCR),** dark brown	
1.0					582.0
	GB 2	MH		**ELASTIC SILT (MH),** dark brown, with organic material and shell fragments	
2.0					581.0
	GB 2	SC		**CLAYEY SAND (SC),** dark brown, with organic material and shell fragments	
	GB 3				
5					
5.0					578.0

Bottom of borehole at 5.0 feet.

BORING NUMBER 5L

CLIENT City of Grand Haven
PROJECT NAME North Channel Investigation
PROJECT NUMBER 10337505
PROJECT LOCATION Grand Haven, Michigan
LATITUDE 43.07247056
LONGITUDE -86.23319177
DATE STARTED 11/22/22
COMPLETED 11/22/22
STATION ---
OFFSET ---
GROUND ELEVATION 581 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 ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
0	GB 1	CCR		**COAL COMBUSTION RESIDUALS (CCR),** dark brown	
1.0					580.0
5	GB 2	MH		**ELASTIC SILT (MH),** dark brown, with clay pockets, organic material, shell fragments - with fine-grained sand seams from 3' to 5'	
5.0					576.0
	GB 3	CH		**FAT CLAY (CH),** dark brown	
6.0					575.0
10	GB 4 GB 5 GB 6 GB 7	CL-ML		**SILTY CLAY (CL-ML),** dark brown, with organic material, shell fragments, and sand pockets	
10.0					571.0

Bottom of borehole at 10.0 feet.

BORING NUMBER 5M

CLIENT City of Grand Haven
PROJECT NAME North Channel Investigation
PROJECT NUMBER 10337505
PROJECT LOCATION Grand Haven, Michigan
LATITUDE 43.07249331
LONGITUDE -86.23303769
DATE STARTED 11/22/22
COMPLETED 11/22/22
STATION ---
OFFSET ---
GROUND ELEVATION 581 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 ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
0	GB 1	CCR		**COAL COMBUSTION RESIDUALS (CCR),** dark brown, with roots	
				1.0	580.0
	GB 2	MH		**ELASTIC SILT (MH),** dark brown, with clay pockets, organic material, shell fragments, and sand seams	
	GB 3				
5	GB 4				
	GB 5			7.0	574.0
	GB 6	CL-ML		**SILTY CLAY (CL-ML),** dark brown, with organic material	
	GB 7			9.0	572.0
10	GB 8	SP		**POORLY GRADED SAND (SP),** gray, fine-grained	
				10.0	571.0

Bottom of borehole at 10.0 feet.

BORING NUMBER 5R

CLIENT City of Grand Haven
PROJECT NAME North Channel Investigation
PROJECT NUMBER 10337505
PROJECT LOCATION Grand Haven, Michigan
LATITUDE 43.07251487
LONGITUDE -86.2328787
DATE STARTED 11/22/22
COMPLETED 11/22/22
STATION ---
OFFSET ---
GROUND ELEVATION 581 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 ---

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
0	GB 1	CCR		**COAL COMBUSTION RESIDUALS (CCR),** dark brown, with refuse particles	
			1.0		580.0
	GB 2	MH		**ELASTIC SILT (MH),** dark brown, with organic material and sand seams	
	GB 3			- with clay layers from 3' to 6.5'	
5	GB 4				
	GB 5		6.5		574.5
	GB 6	SP		**POORLY GRADED SAND (SP),** gray, with organic layers, silty clay layers, and shell fragments	
	GB 7				
10	GB 8		10.0		571.0

Bottom of borehole at 10.0 feet.

Appendix C

Geoprobe® Sample Photographs

HDR 10337505
Grand Haven North Channel

Boring: 1L

Depth: 0-5

Date: 11/21/22

HDR 10337505
Grand Haven North Channel
Boring: 1L
Depth: 5-10
Date: 11/21/22

HDR 10337505
Grand Haven North Channel
Boring: 1L
Depth: 10-15
Date: 11/21/22


HDR 10337505
Grand Haven North Channel
Boring: 1LA
Depth: 0-5
Date: 11/21/22

HDR 10337505
Grand Haven North Channel
Boring: LA
Depth: 5-10
Date: 11/21/22

HDR 10337505
Grand Haven North Channel

Boring: 1M

Depth: 0-5

Date: 11/21/22


HDR 10337505
Grand Haven North Channel
Boring: 1M
Depth: 5-10
Date: 11/21/22

HDR 10337505
Grand Haven North Channel
Boring: 1M
Depth: 10-15
Date: 11/21/22


HDR 10337505
Grand Haven North Channel
Boring: 1R
Depth: 0-5
Date: 11/21/22


HDR 10337505
Grand Haven North Channel
Boring: 1R
Depth: 5-10
Date: 11/21/22

HDR .10337505
Grand Haven North Channel
Boring: 1R
Depth: 10-15
Date: 11/21/22

HDR 10337505
Grand Haven North Channel
Boring: IRA
Depth: 0-5
Date: 11/21/22

HDR 10337505
Grand Haven North Channel
Boring: IRA
Depth: 5-10
Date: 11/21/22

HDR 10337505
Grand Haven North Channel

Boring: 2L

Depth: 0-5

Date: 11/21/22

amazon basics
gallon reclosable
storage bags


NITRILE
GLOVES
amazon basics
gallon reclosable
storage bags
Double Zipper Closure
HDR 10337505
Grand Haven North Channel
Boring: 2L
Depth: 5-10
Date: 11/21/22

HDR 10337505
Grand Haven North Channel

Boring: 2L

Depth: 10-15

Date: 11/21/22

amazon basics
gallon reclosable
storage bags

HDR 10337505
Grand Haven North Channel
Boring: 2M
Depth: 0-5
Date: 11/21/22


HDR 10337505
Grand Haven North Channel
Boring: 2M
Depth: 5-10
Date: 11/21/22


HDR 10337505
Grand Haven North Channel
Boring: 2M
Depth: 10-15
Date: 11/21/22


HDR 10337505
Grand Haven North Channel
Boring: 2R
Depth: 0-5
Date: 11/21/22


HDR 10337505
Grand Haven North Channel
Boring: 2R
Depth: 5-10
Date: 11/21/22

HDR 10337505
Grand Haven North Channel
Boring: 2R
Depth: 10-15
Date: 11/21/22

HDR 10337505
Grand Haven North Channel

Boring: 3L

Depth: 0-5

Date: 11/21/22

HDR 10337505
Grand Haven North Channel

Boring: 3L

Depth: 5-10

Date: 11/21/22

HDR 10337505
Grand Haven North Channel

Boring: 3M

Depth: 0-5

Date: 11/21/22


HDR 10337505
Grand Haven North Channel
Boring: 3M
Depth: 5-10
Date: 11/21/22

HDR 10337505
Grand Haven North Channel
Boring: 3R
Depth: 0-5
Date: 11/21/22

HDR 10337505
Grand Haven North Channel
Boring: 3R
Depth: 5-10
Date: 11/21/22


HDR 10337505
Grand Haven North Channel
Boring: 4L
Depth: 0-5
Date: 11/22/22


HDR 10337505
Grand Haven North Channel
Boring: 4L
Depth: 5-10
Date: 11/22/22
HALLIBURTON
GROUTING BENTONITE
UNIFORM GRANULE
WYOMING SODIUM BENTONITE
MM-2LX RAILS/S
TOTAL ASSEMBLY WEIGH

HDR 10337505
Grand Haven North Channel

Boring: 4M

Depth: 0-5

Date: 11/22/22


HDR 10337505
Grand Haven North Channel
Boring: 4M
Depth: 5-10
Date: 11/22/22


HDR 10337505
Grand Haven North Channel
Boring: 4MA
Depth: 0-5
Date: 11/22/22


HDR 10337505
Grand Haven North Channel
Boring: 4R
Depth: 0-5
Date: 11/22/22

HDR 10337505
Grand Haven North Channel

Boring: 5L

Depth: 0-5

Date: 11/22/22

HDR 10337505
Grand Haven North Channel
Boring: 5L
Depth: 5-10
Date: 11/22/22

HDR 10337505
Grand Haven North Channel

Boring: 5M

Depth: 0-5

Date: 11/22/22

HDR 10337505
Grand Haven North Channel

Boring: 5M

Depth: 5-10

Date: 11/22/22

MIM-2LX RAILS/LADDER
TOTAL ASSEMBLY WEIGHT 130 LB.


HDR 10337505
Grand Haven North Channel
Boring: SR
Depth: 0-5
Date: 11/22/22

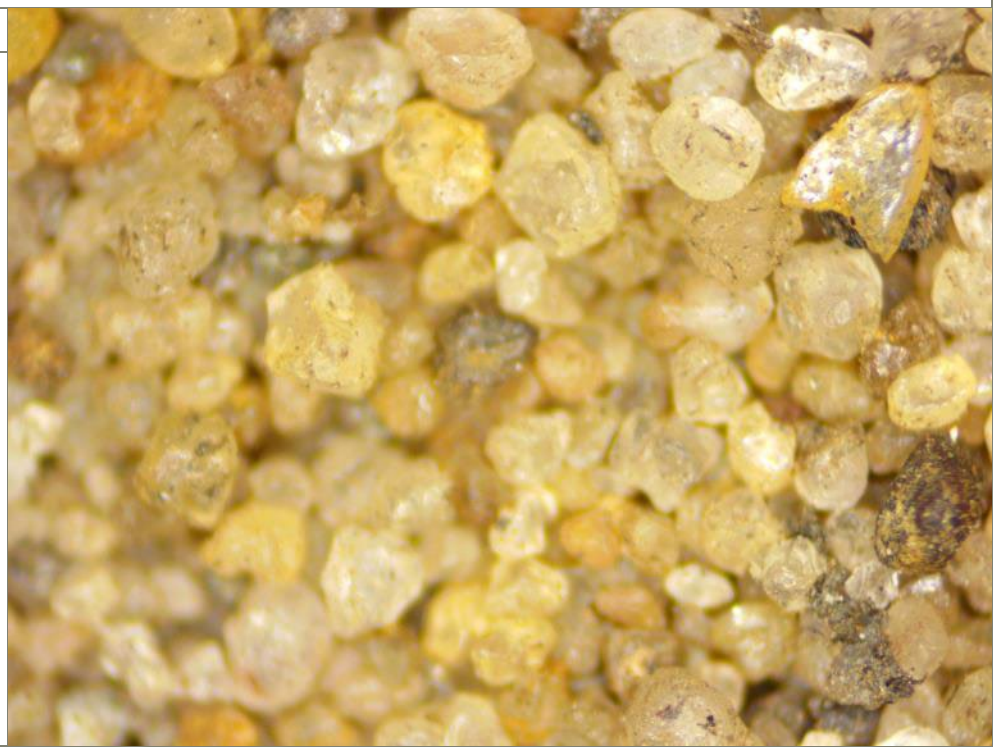

HDR 10337505
Grand Haven North Channel
Boring: 5R
Depth: 5-10
Date: 11/22/22

Appendix D

Microscopy Photographs

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

Photograph No. 1	
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: 0%	

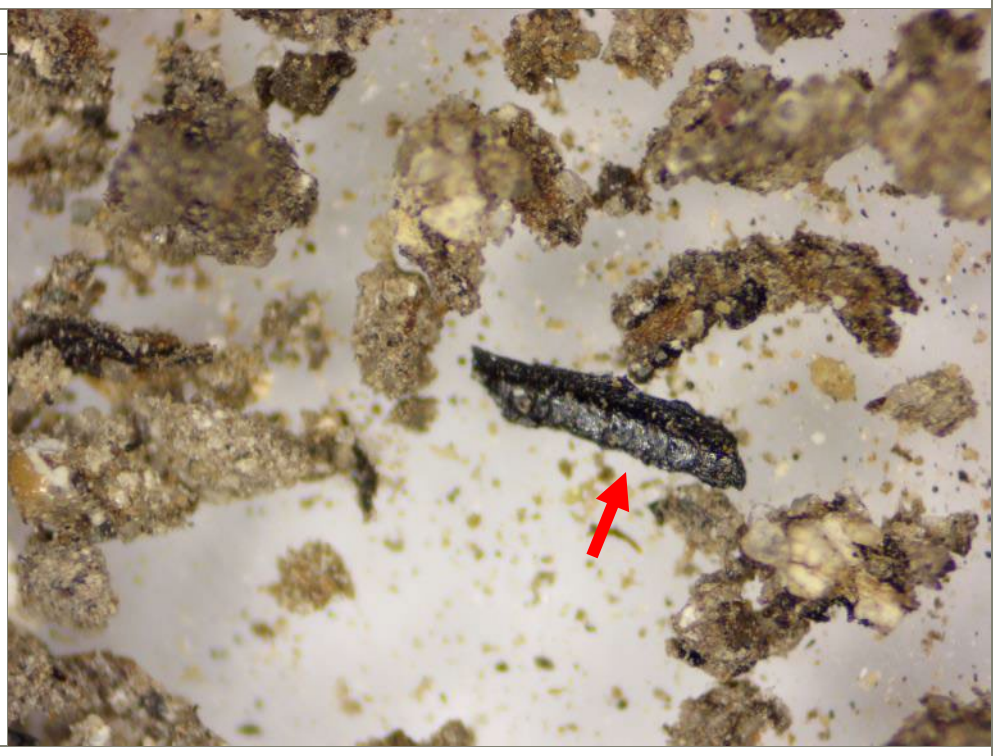
Client Name:	Site Location:	Microscopic Photographic Log
City of Grand Haven	North Channel Muskegon, Michigan	HDR Project No. 10337505

Photograph No. 3

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: 100%

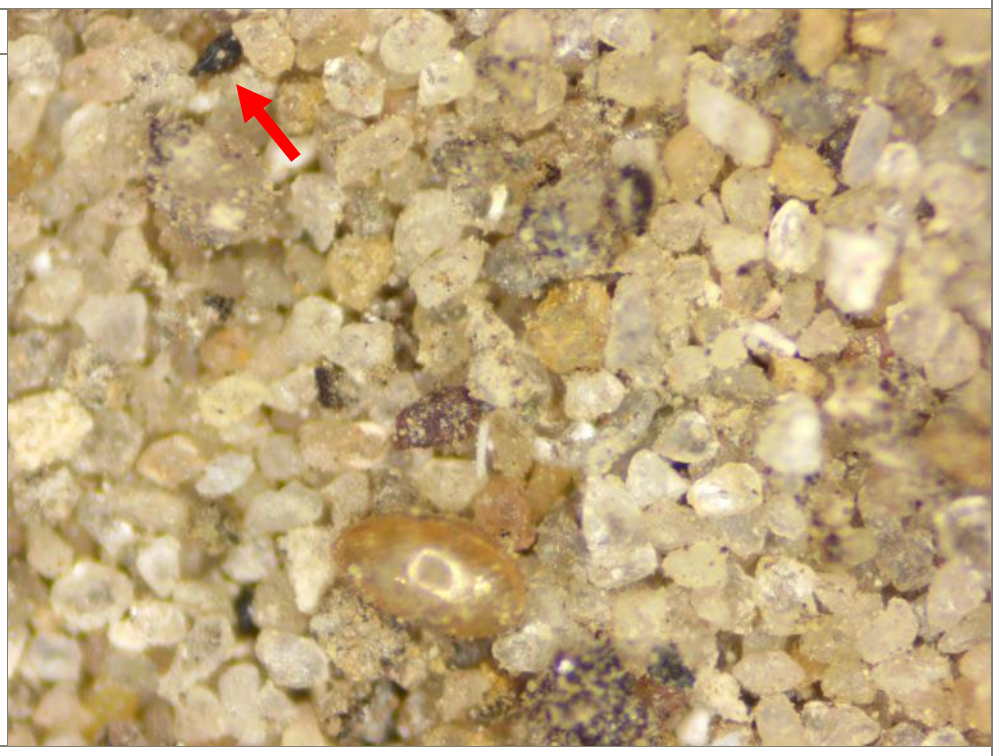
Client Name:	Site Location:	Microscopic Photographic Log
City of Grand Haven	North Channel Muskegon, Michigan	HDR Project No. 10337505

Photograph No. 5

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: 70%

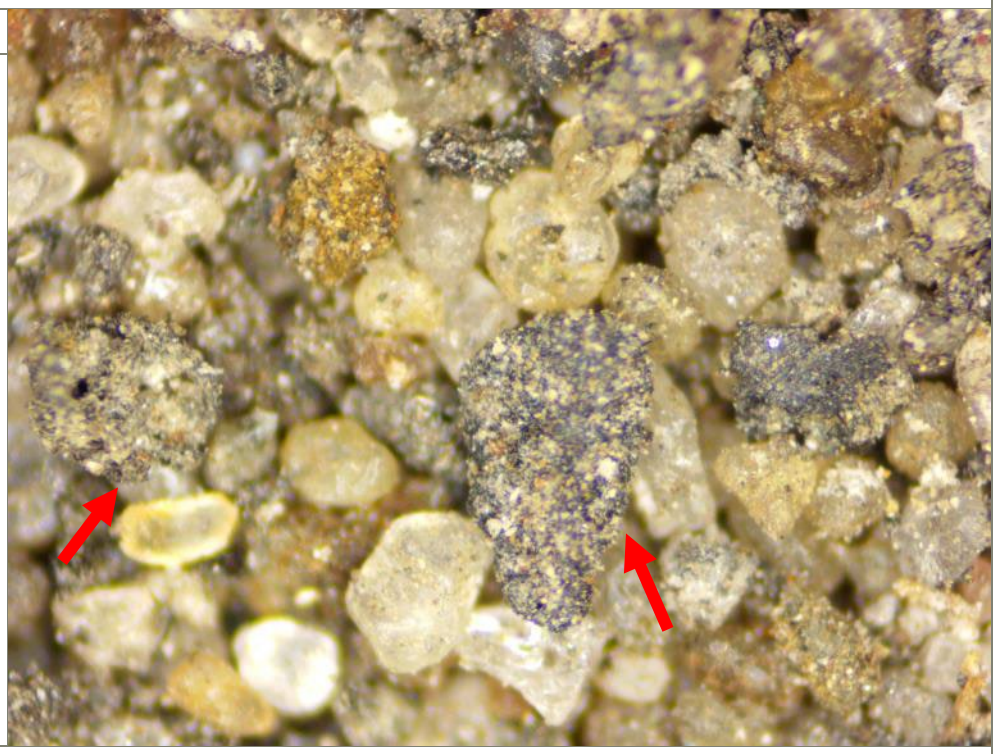
Client Name:	Site Location:	Microscopic Photographic Log
City of Grand Haven	North Channel Muskegon, Michigan	HDR Project No. 10337505

Photograph No. 7

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%

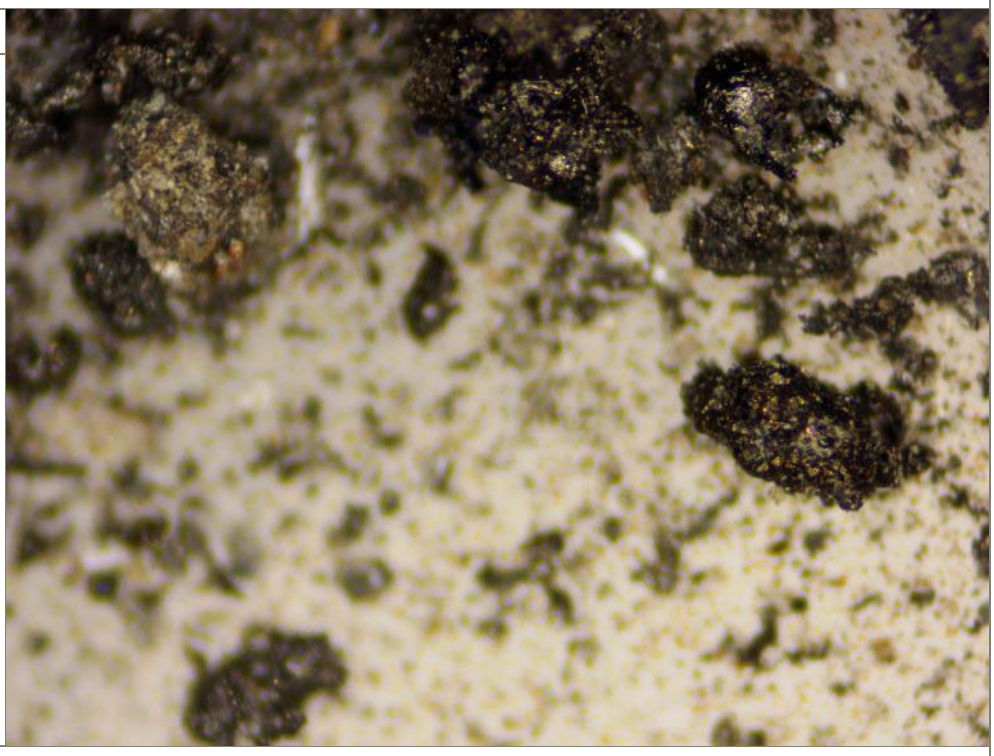
Note: Clean sand with various organic material present. Scarce spherical CCR present (red arrow).

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

Photograph No. 9

Boring: 3RA
Depth: 0-2.5 feet

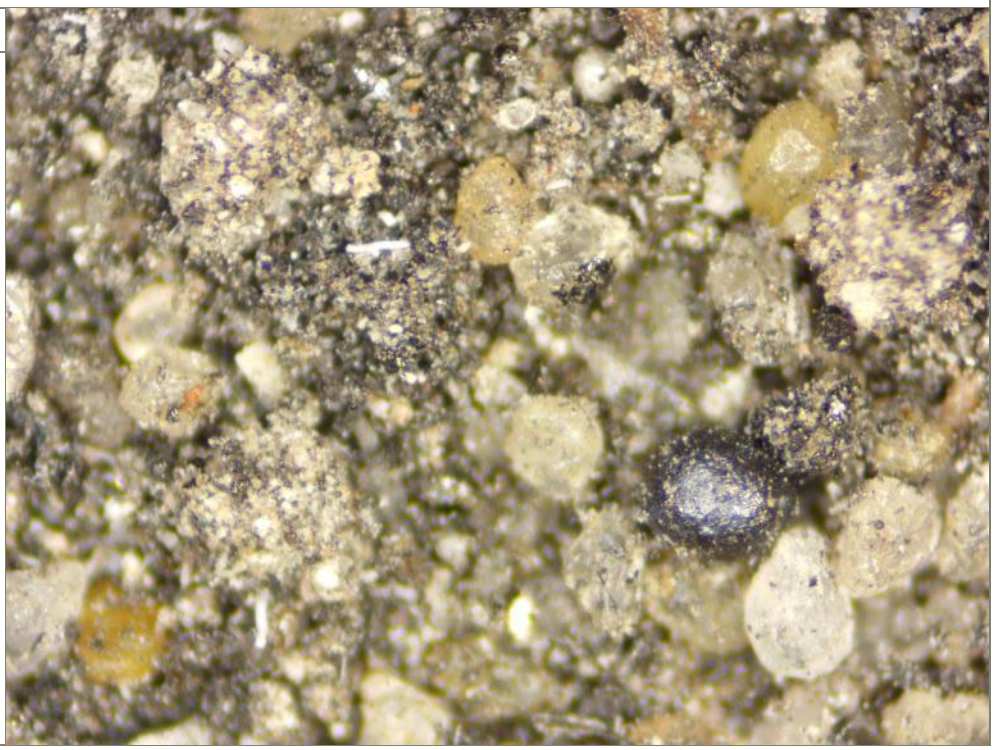
HDR Microscopic Quantification Result: 100%



Photograph No. 10

Boring: 4M
Depth: 0-1 feet

HDR Microscopic Quantification Result: 80%



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

Photograph No. 11

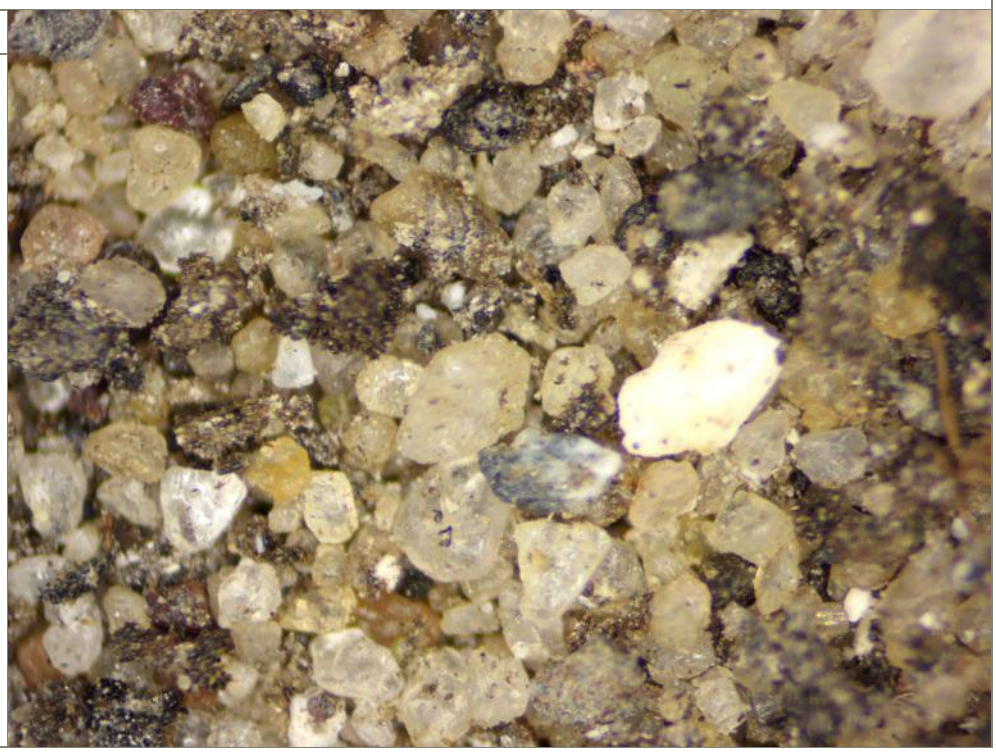
Boring: 4MA
Depth: 0-1 feet

HDR Microscopic Quantification Result: 70%

Photograph No. 12

Boring: 5M
Depth: 0-1 feet

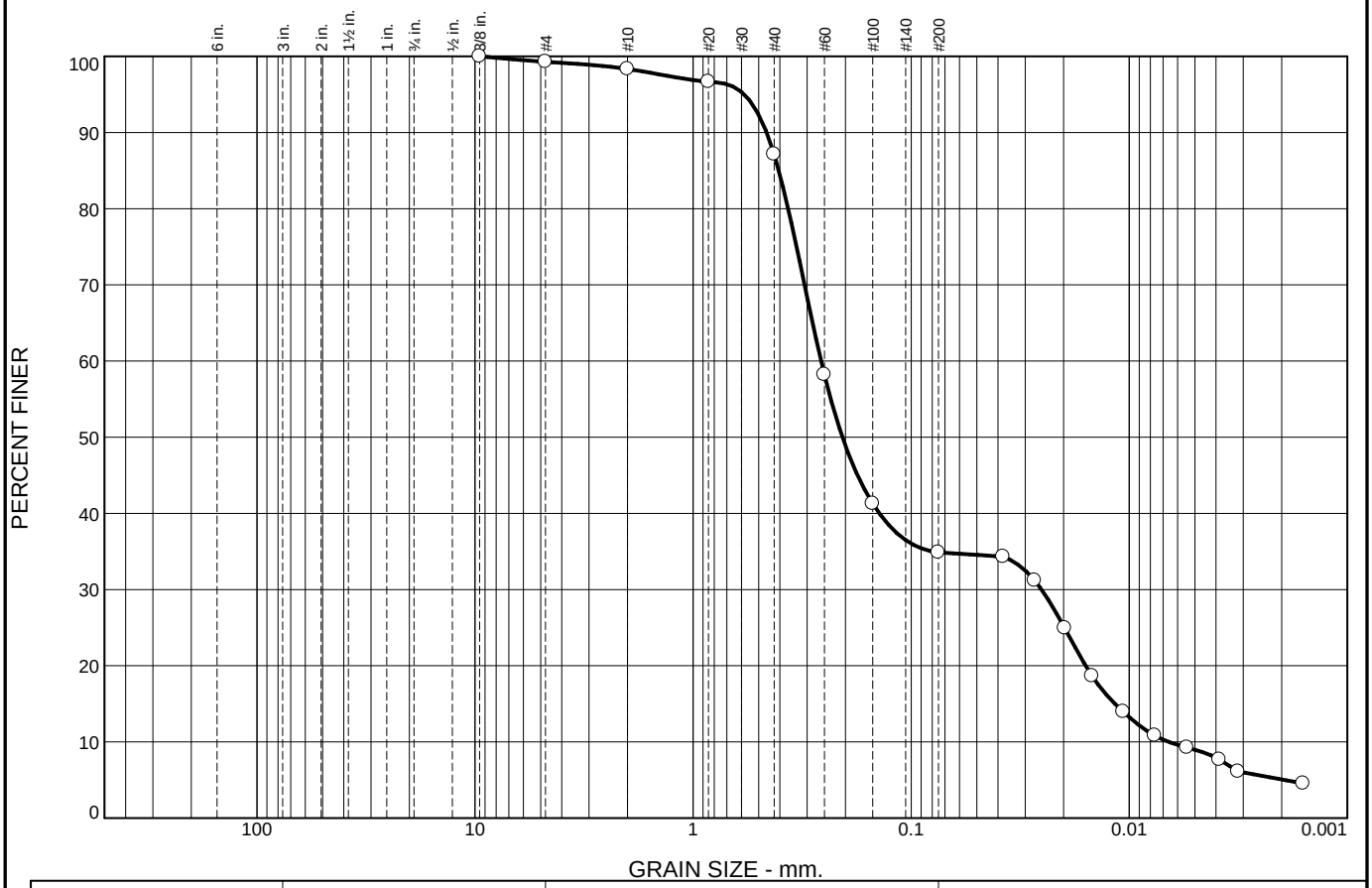
HDR Microscopic Quantification Result: 80%



Appendix E

Laboratory Test Results

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.7	1.0	11.2	52.2	25.9	9.0

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NA	NA	0.4047	0.2588	0.2067	0.0253	0.0116	0.0066	0.37	39.29

Material Description	USCS	AASHTO
○ Fine to Medium Silty SAND	SM	

Project No. 091538.00 **Client:** HDR Michigan Inc

Project: Harbor Island - North Channel Soil Tests

○ **Depth:** 3'-5' **Sample Number:** 1L

Remarks:

○Specific Gravity = 2.15

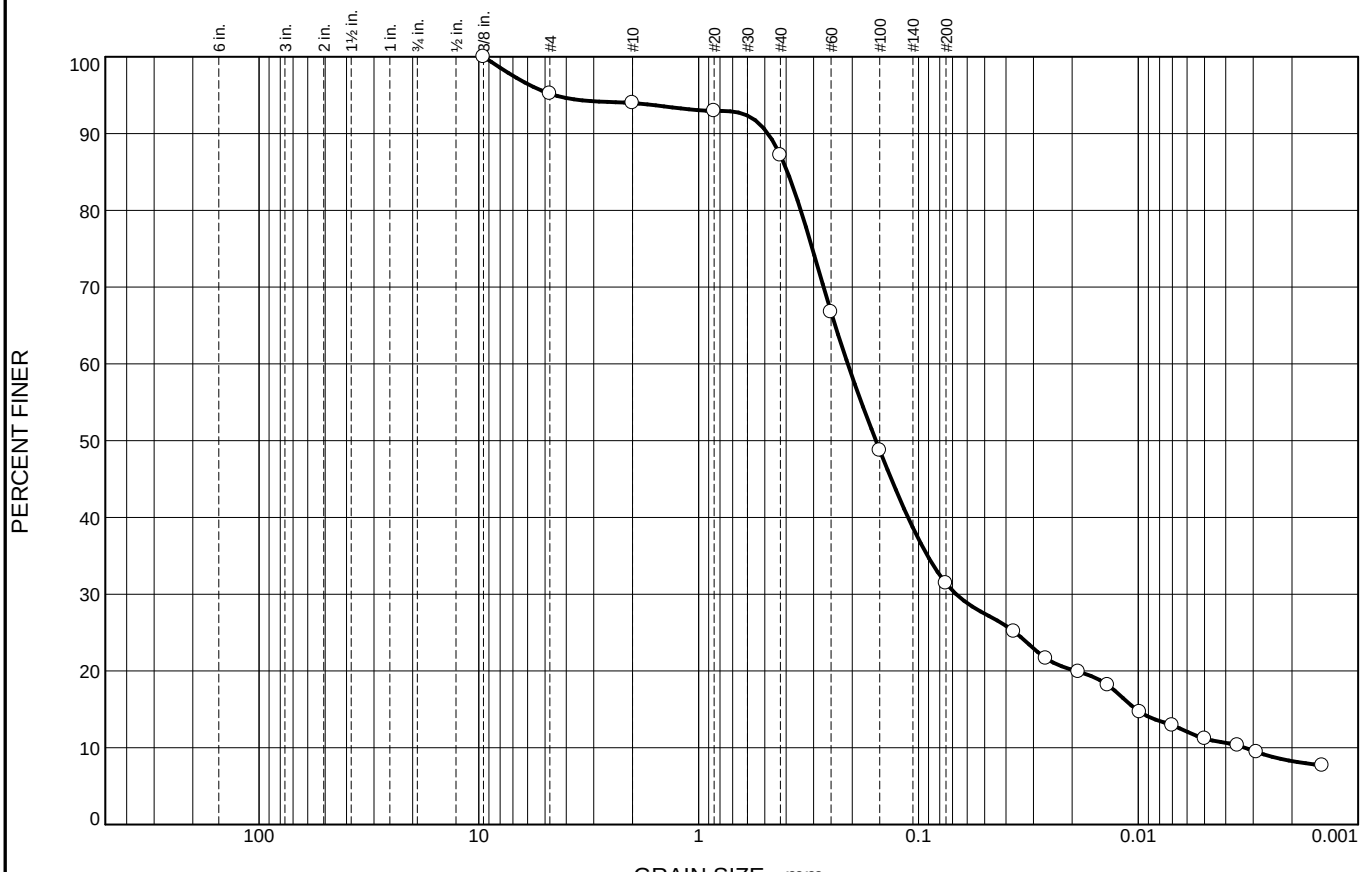
Soil and Materials Engineers, Inc.

Plymouth, MI

Figure

Tested By: Kyle Tobin **Checked By:** Nick Atkins

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	4.8	1.2	6.8	55.8	20.2	11.2

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NA	NA	0.3944	0.2098	0.1561	0.0674	0.0102	0.0033	6.61	64.11

Material Description	USCS	AASHTO
○ Fine to Medium Silty SAND	SM	

Project No. 091538.00 **Client:** HDR Michigan Inc

Project: Harbor Island - North Channel Soil Tests

○ **Depth:** 5'-6' **Sample Number:** 1L

Remarks:

○Specific Gravity = 2.38

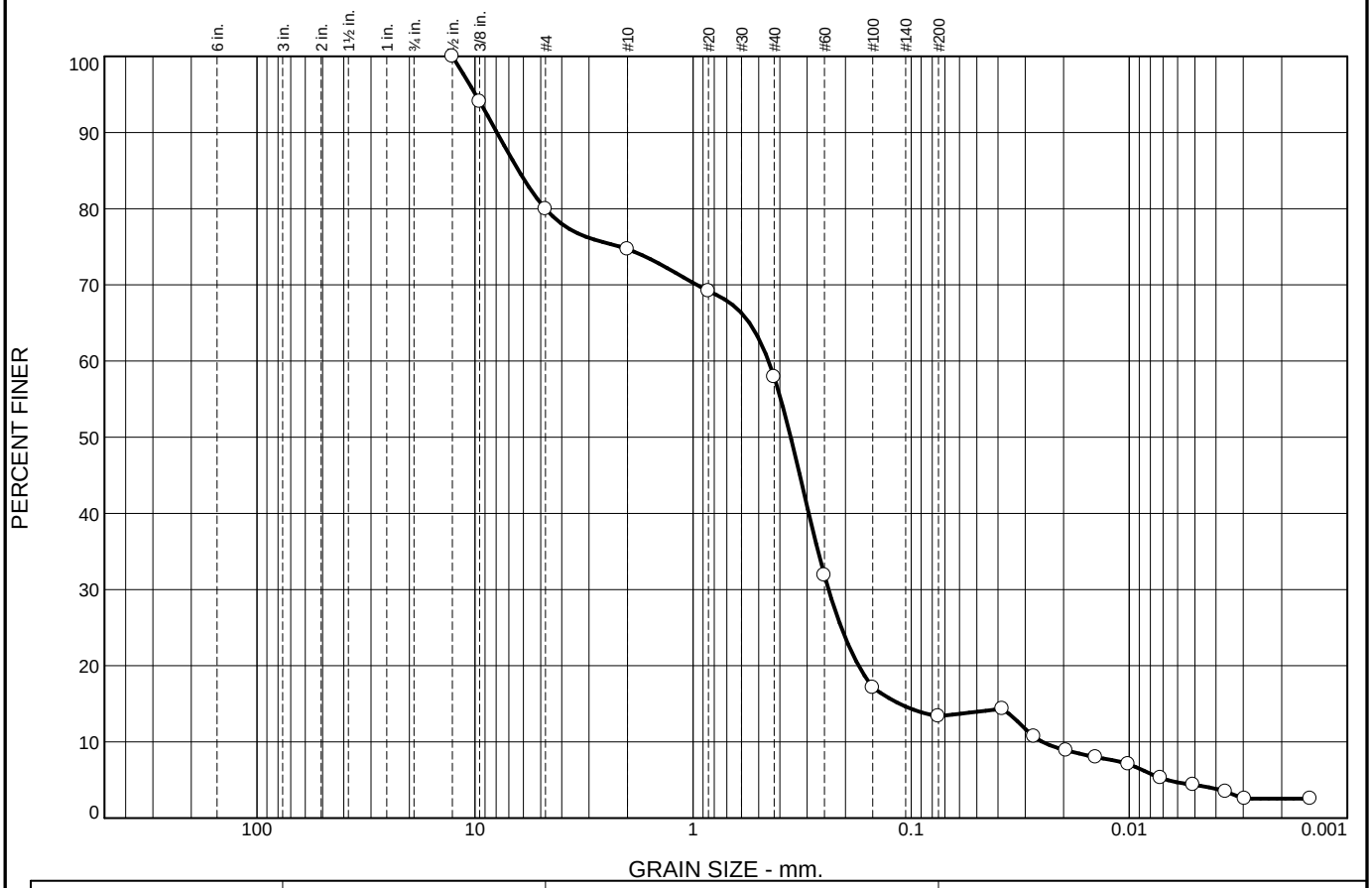
Soil and Materials Engineers, Inc.

Plymouth, MI

Figure

Tested By: Kyle Tobin **Checked By:** Nick Atkins

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	20.0	5.3	16.8	44.5	9.1	4.3

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NA	NA	6.3107	0.4507	0.3567	0.2393	0.1128	0.0250	5.08	18.02

Material Description	USCS	AASHTO
○ Fine to Coarse SAND with Silt and Gravel	SP-SM	

Project No. 091538.00 **Client:** HDR Michigan Inc

Project: Harbor Island - North Channel Soil Tests

○ **Depth:** 3'-5' **Sample Number:** 1LA

Remarks:

○Specific Gravity = 2.36

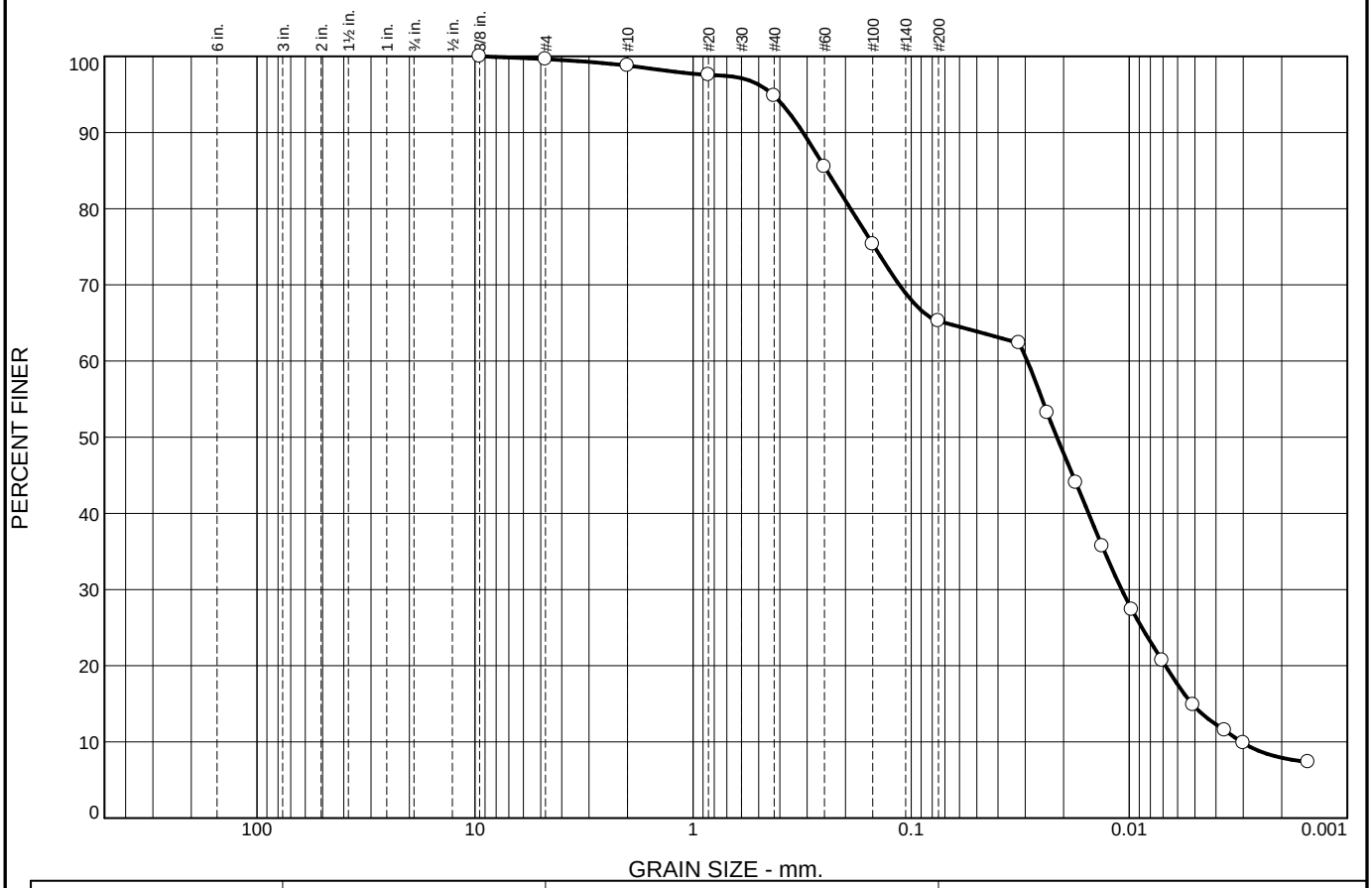
Soil and Materials Engineers, Inc.

Plymouth, MI

Figure

Tested By: Kyle Tobin **Checked By:** Nick Atkins

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.4	0.8	4.0	29.5	50.7	14.6

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NA	NA	0.2438	0.0293	0.0215	0.0108	0.0052	0.0031	1.31	9.59

Material Description	USCS	AASHTO
○ Sandy SILT	ML	

Project No. 091538.00 **Client:** HDR Michigan Inc

Project: Harbor Island - North Channel Soil Tests

○ **Depth:** 3'-4' **Sample Number:** 1LA2

Remarks:

○Specific Gravity = 2.28

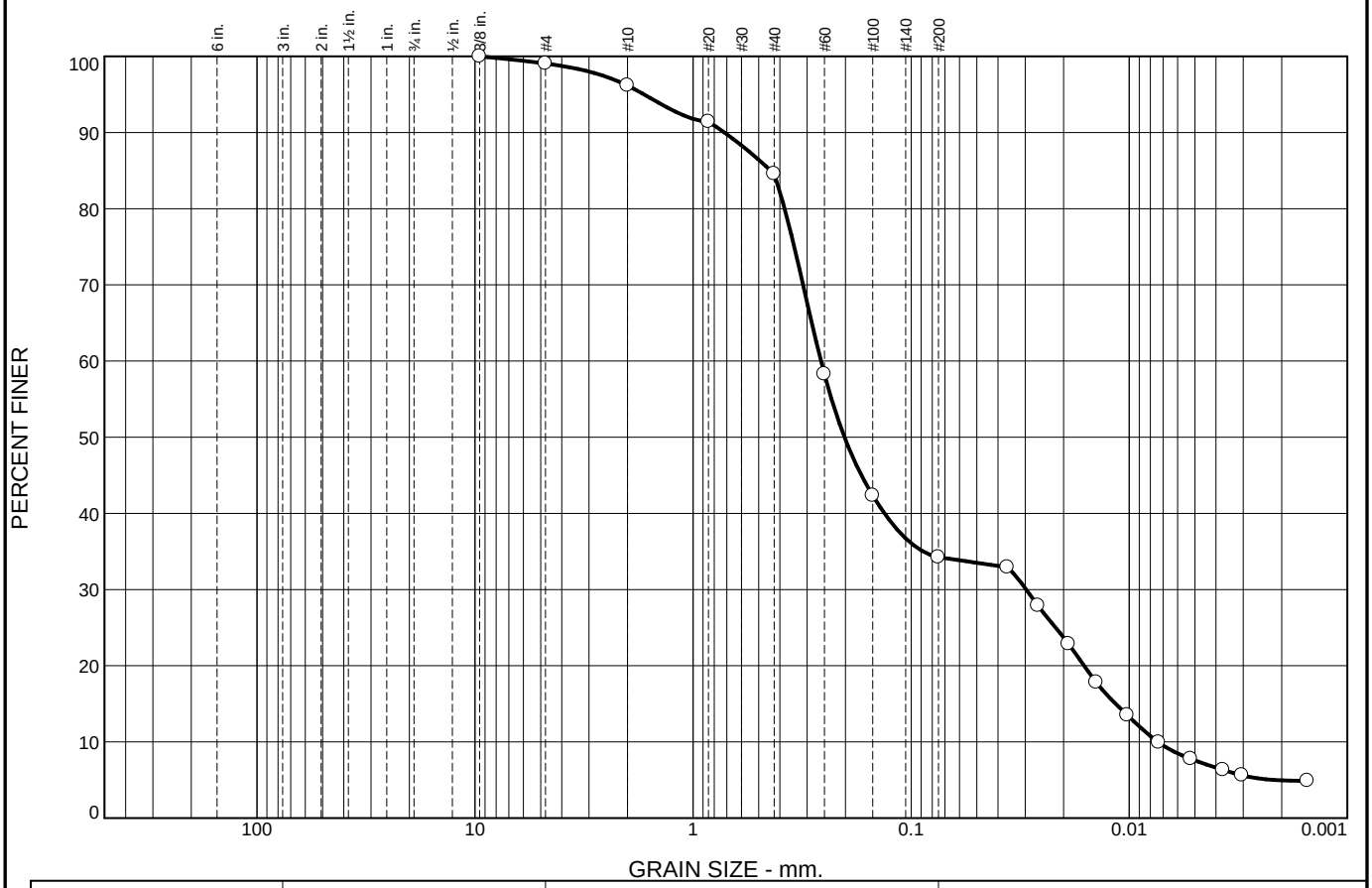
Soil and Materials Engineers, Inc.

Plymouth, MI

Figure

Tested By: Kyle Tobin **Checked By:** Nick Atkins

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.9	2.9	11.6	50.4	26.6	7.6

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NA	NA	0.4410	0.2592	0.2022	0.0297	0.0115	0.0074	0.46	35.09

Material Description	USCS	AASHTO
○ Fine to Medium Silty SAND	SM	

Project No. 091538.00 **Client:** HDR Michigan Inc

Project: Harbor Island - North Channel Soil Tests

○ **Depth:** 1'-3' **Sample Number:** 1M

Remarks:

○Specific Gravity = 2.27

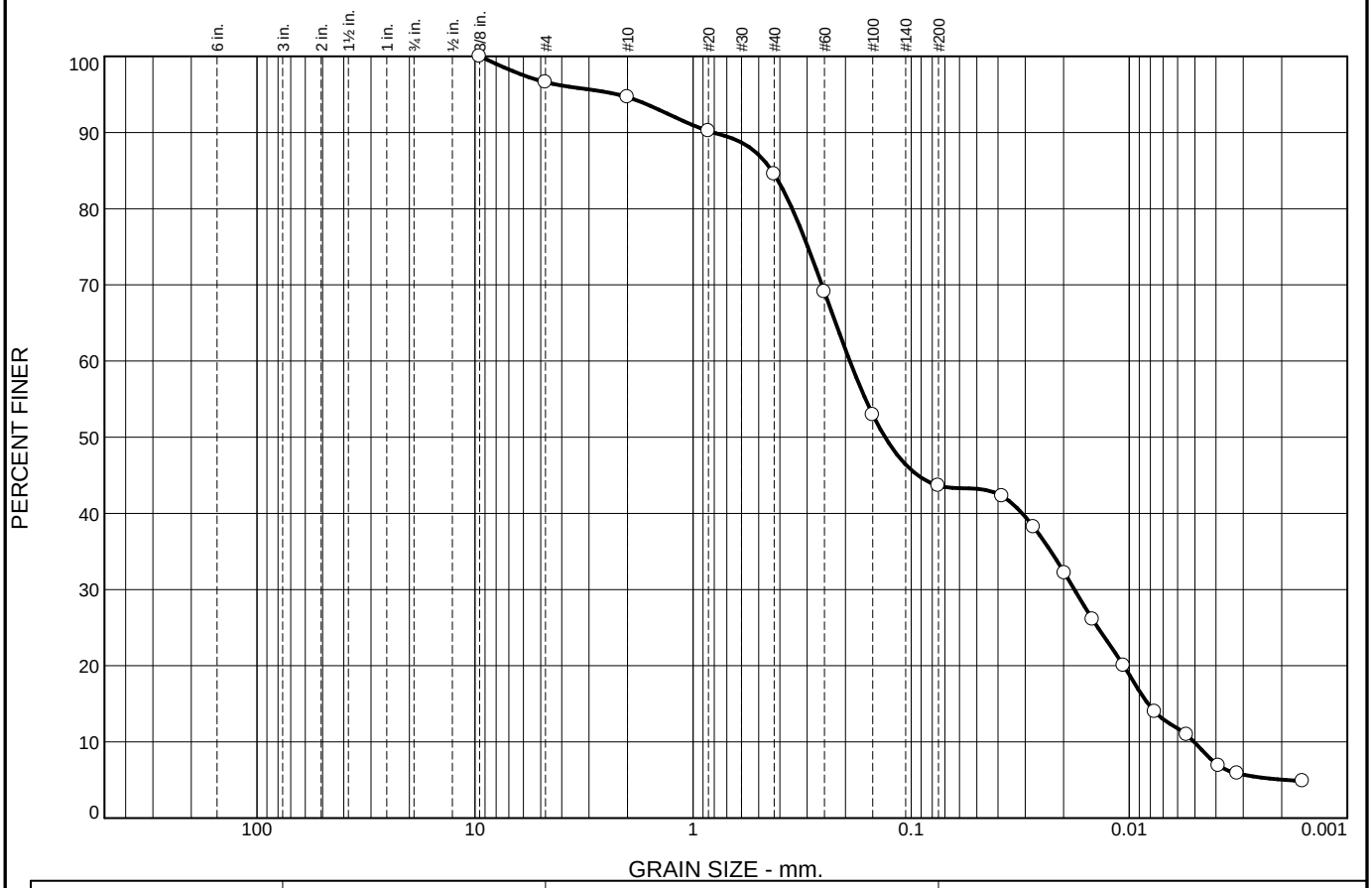
Soil and Materials Engineers, Inc.

Plymouth, MI

Figure

Tested By: Kyle Tobin **Checked By:** Nick Atkins

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	3.4	2.0	10.1	40.9	33.7	9.9

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NA	NA	0.4353	0.1911	0.1318	0.0178	0.0082	0.0050	0.33	37.95

Material Description	USCS	AASHTO
○ Fine to Medium Silty SAND	SM	

Project No. 091538.00 **Client:** HDR Michigan Inc

Project: Harbor Island - North Channel Soil Tests

○ **Depth:** 3'-5' **Sample Number:** 1M

Remarks:

○Specific Gravity = 2.16

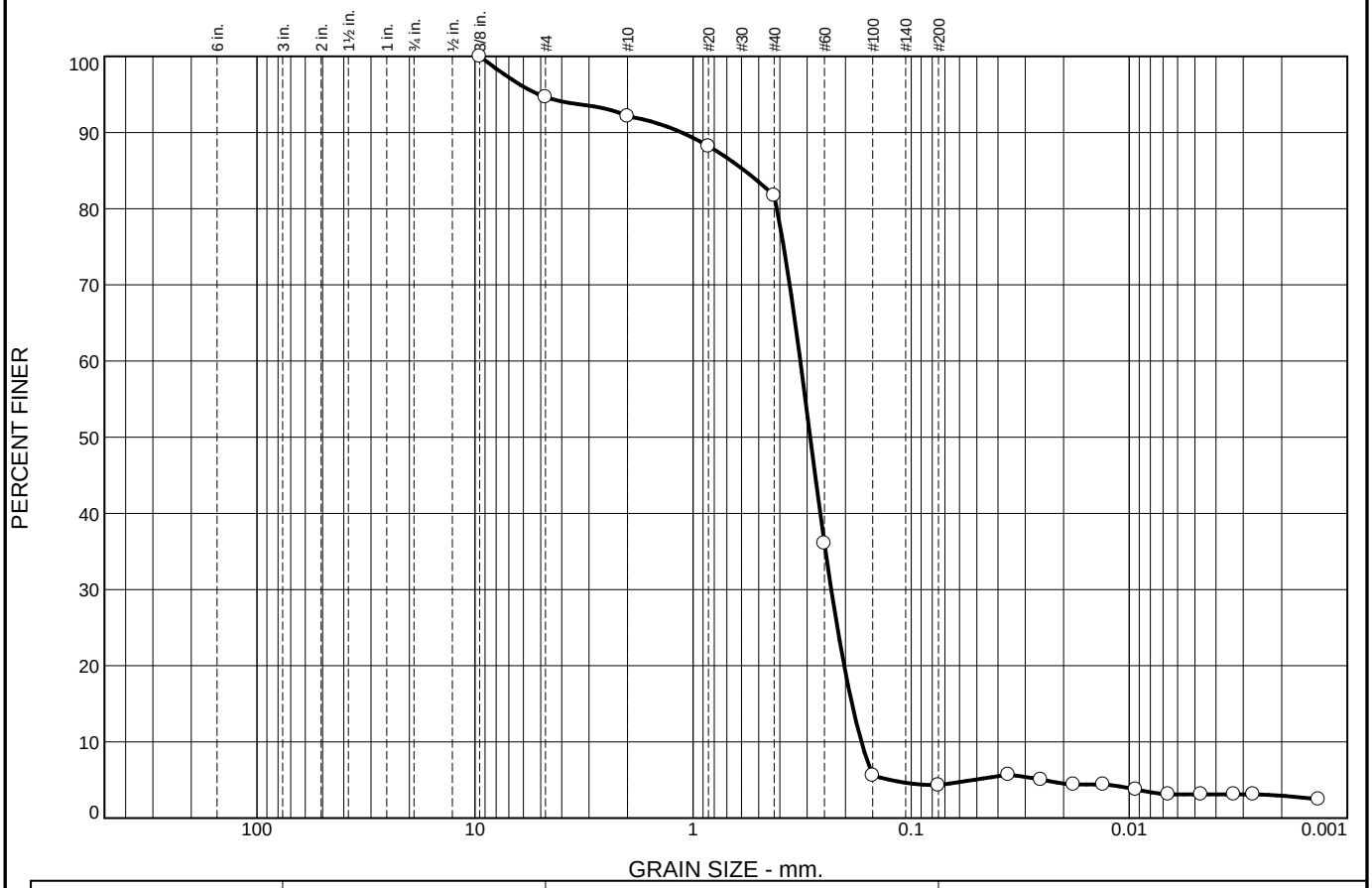
Soil and Materials Engineers, Inc.

Plymouth, MI

Figure

Tested By: Kyle Tobin **Checked By:** Nick Atkins

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	5.3	2.6	10.4	77.4	1.2	3.1

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NA	NA	0.5802	0.3223	0.2903	0.2326	0.1869	0.1691	0.99	1.91

Material Description	USCS	AASHTO
○ Fine to Medium SAND	SP	

Project No. 091538.00 **Client:** HDR Michigan Inc

Project: Harbor Island - North Channel Soil Tests

○ **Depth:** 2'-3' **Sample Number:** 1R

Remarks:

○Specific Gravity = 2.62

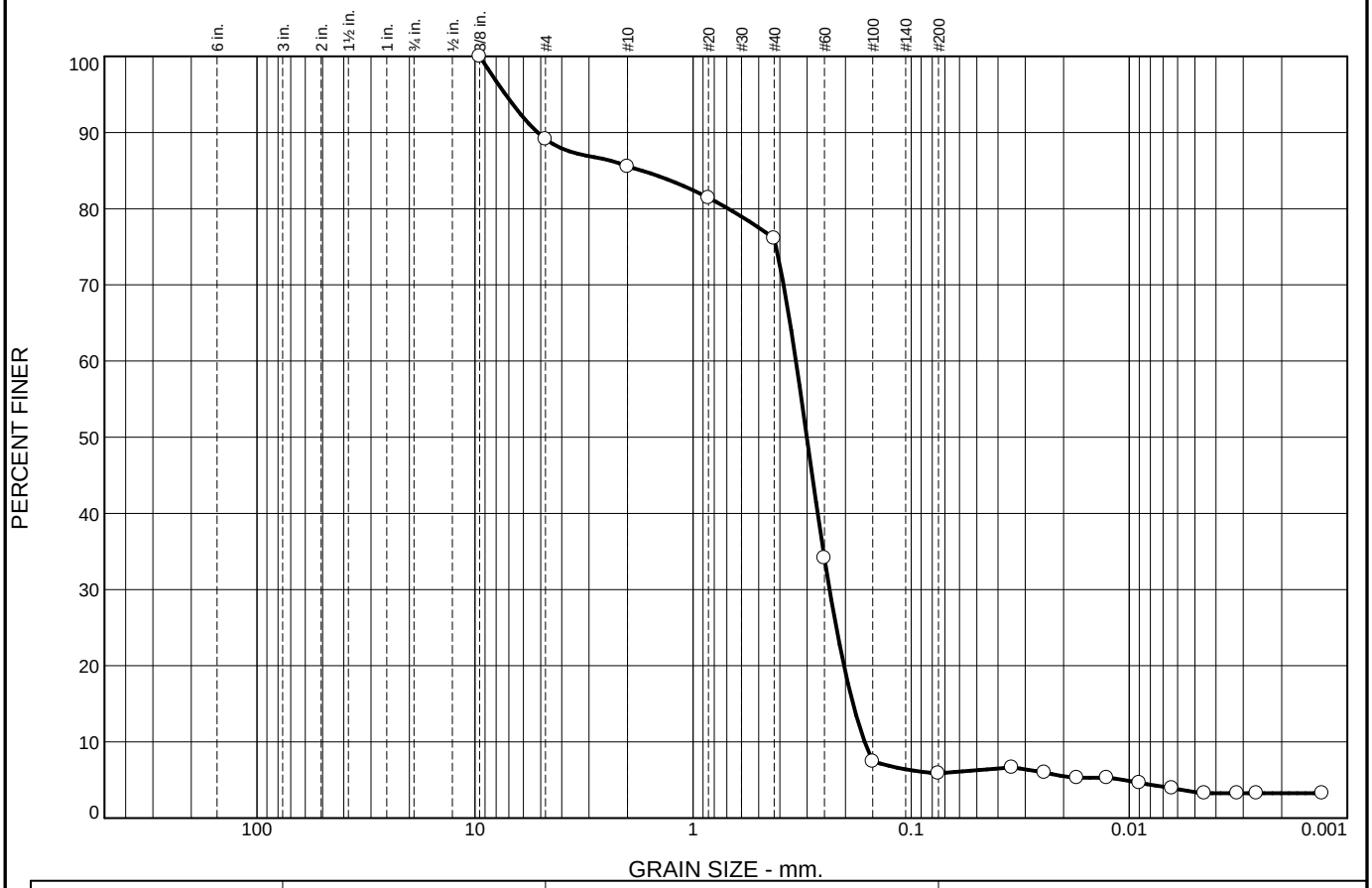
Soil and Materials Engineers, Inc.

Plymouth, MI

Figure

Tested By: Kyle Tobin **Checked By:** Nick Atkins

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	10.9	3.6	9.4	70.2	2.5	3.4

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NA	NA	1.7189	0.3377	0.3009	0.2368	0.1848	0.1635	1.02	2.07

Material Description	USCS	AASHTO
○ Fine to Medium SAND with Silt	SP-SM	

Project No. 091538.00 **Client:** HDR Michigan Inc

Project: Harbor Island - North Channel Soil Tests

○ **Depth:** 3'-4' **Sample Number:** 1R

Remarks:

○Specific Gravity = 2.74

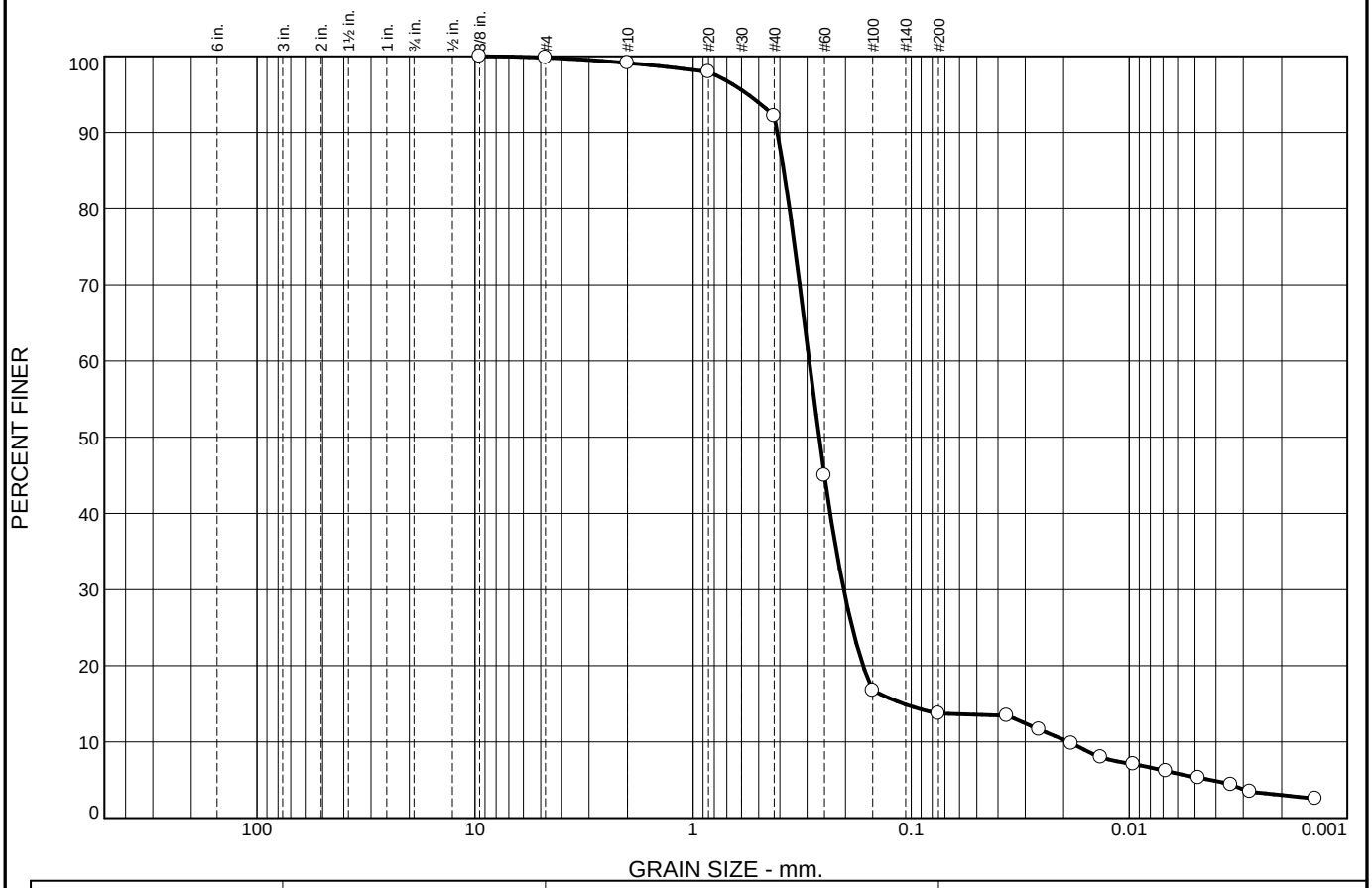
Soil and Materials Engineers, Inc.

Plymouth, MI

Figure

Tested By: Kyle Tobin **Checked By:** Nick Atkins

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.2	0.7	6.9	78.5	8.3	5.4

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NA	NA	0.3834	0.2932	0.2644	0.2039	0.1082	0.0190	7.46	15.43

Material Description	USCS	AASHTO
○ Fine to Medium Silty SAND	SM	

Project No. 091538.00 **Client:** HDR Michigan Inc

Project: Harbor Island - North Channel Soil Tests

○ **Depth:** 4'-5' **Sample Number:** 1R

Remarks:

○Specific Gravity = 2.52

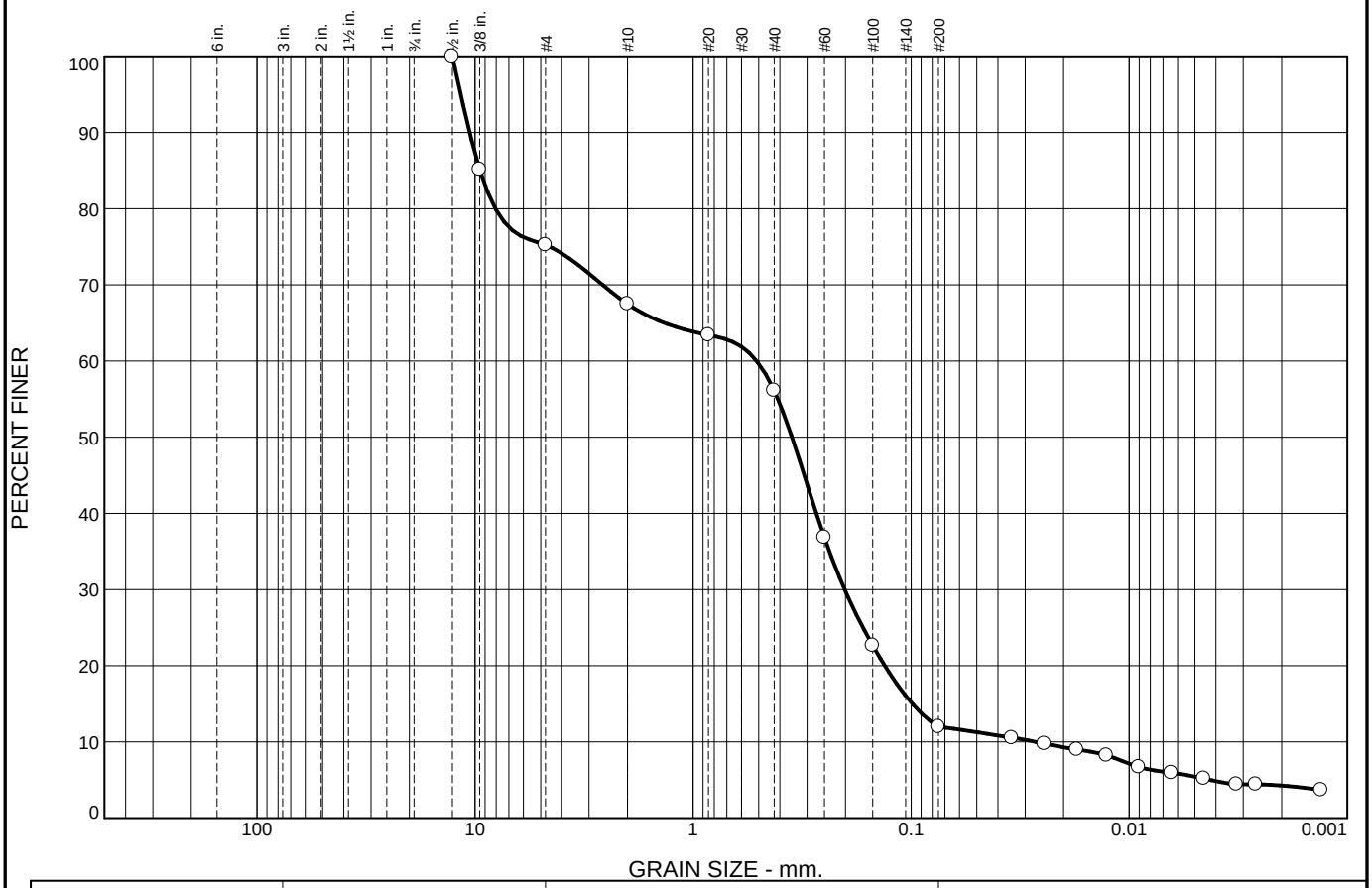
Soil and Materials Engineers, Inc.

Plymouth, MI

Figure

Tested By: Kyle Tobin **Checked By:** Nick Atkins

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	24.8	7.7	11.4	44.1	6.6	5.4

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NA	NA	9.4917	0.5110	0.3521	0.2018	0.0987	0.0268	2.98	19.09

Material Description	USCS	AASHTO
○ Fine to Coarse SAND with Silt and Gravel	SP-SM	

Project No. 091538.00 **Client:** HDR Michigan Inc

Project: Harbor Island - North Channel Soil Tests

○ **Depth:** 3'-5' **Sample Number:** 1RA

Remarks:

○Specific Gravity = 2.72

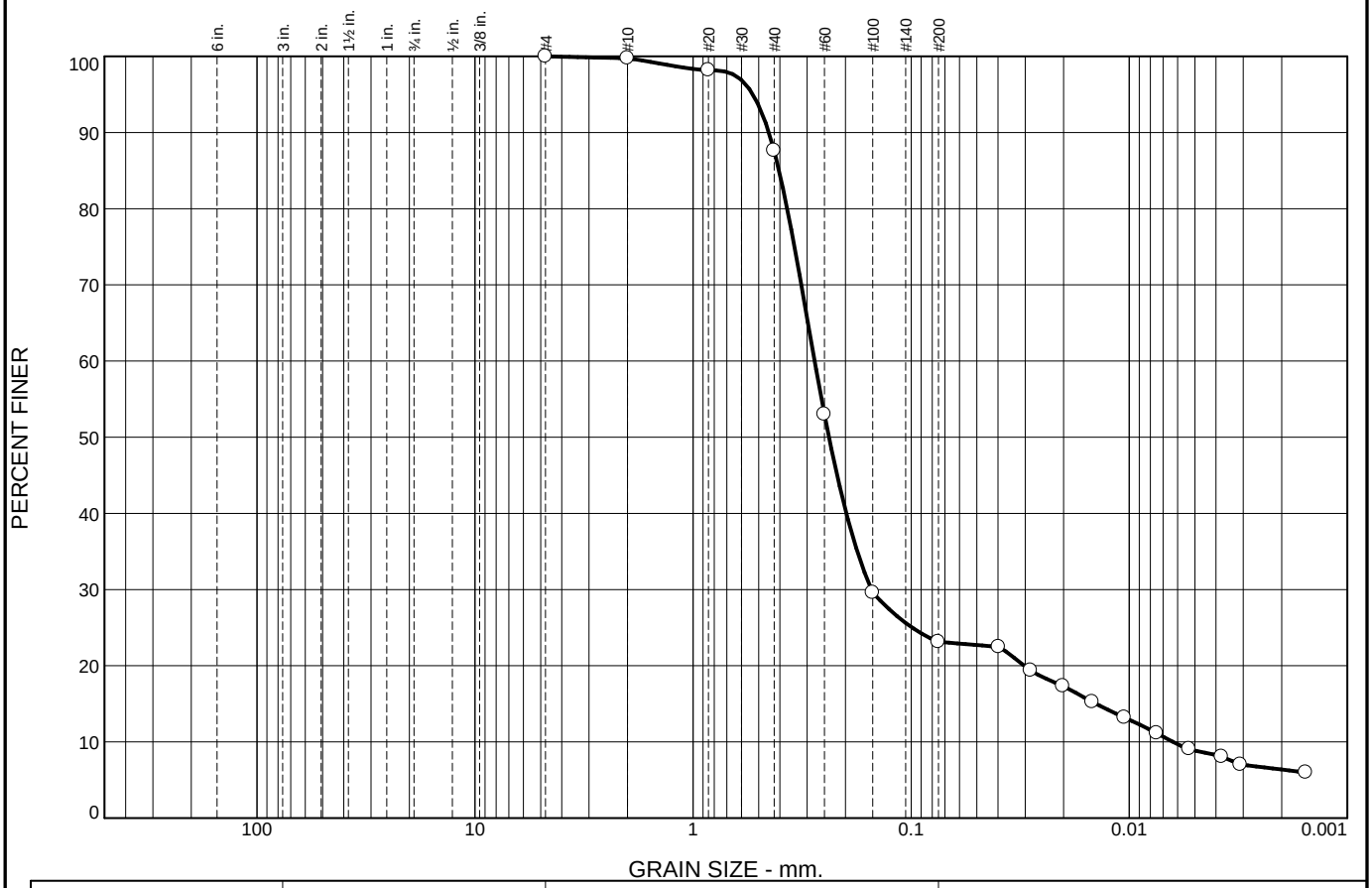
Soil and Materials Engineers, Inc.

Plymouth, MI

Figure

Tested By: Kyle Tobin **Checked By:** Nick Atkins

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.3	12.1	64.5	14.2	8.9

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NA	NA	0.4035	0.2772	0.2383	0.1522	0.0142	0.0063	13.27	43.97

Material Description	USCS	AASHTO
○ Fine to Medium Silty SAND	SM	

Project No. 091538.00 **Client:** HDR Michigan Inc

Project: Harbor Island - North Channel Soil Tests

○ **Depth:** 1'-3' **Sample Number:** 2M

Remarks:

○Specific Gravity = 2.24

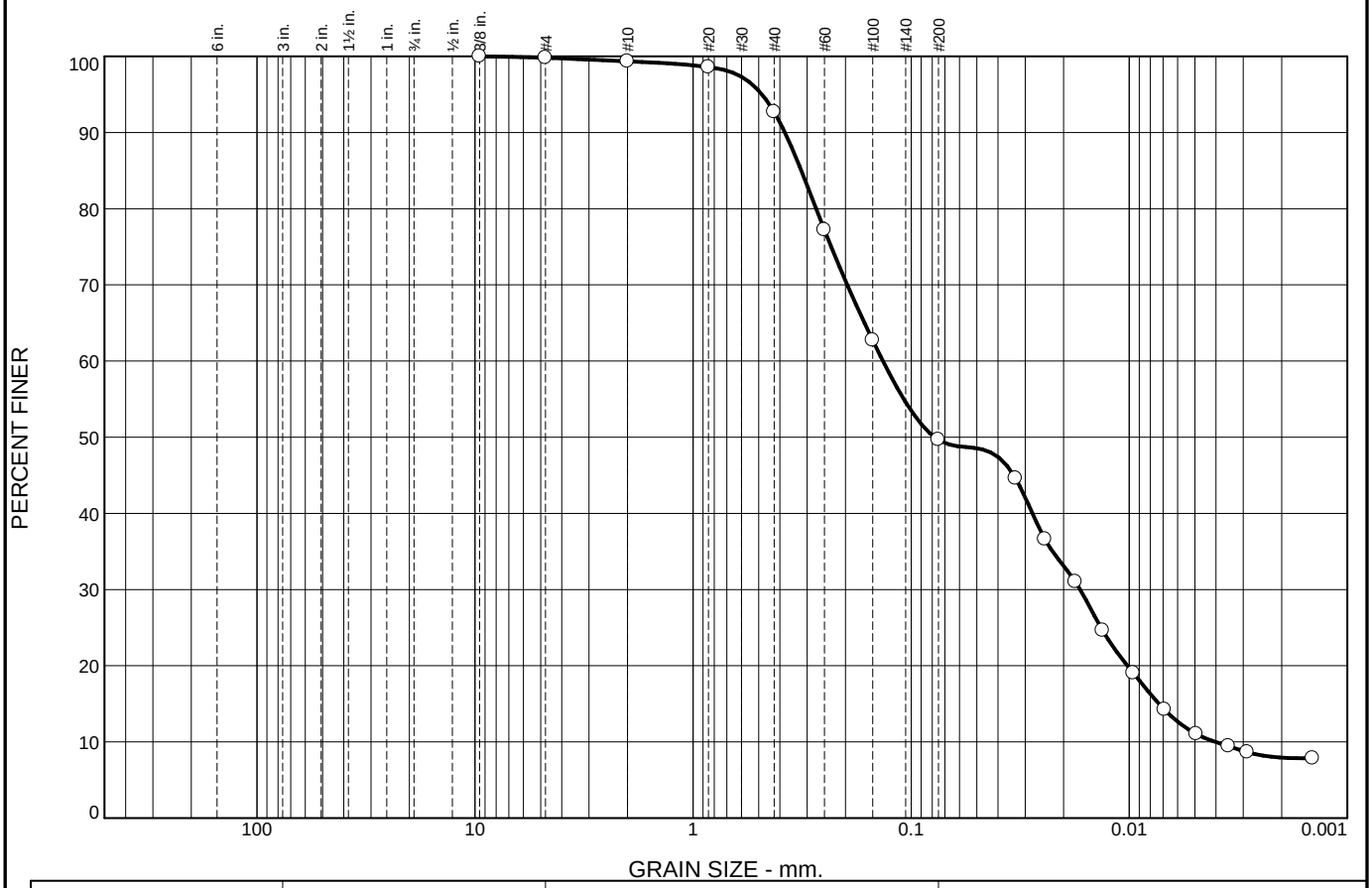
Soil and Materials Engineers, Inc.

Plymouth, MI

Figure

Tested By: Kyle Tobin **Checked By:** Nick Atkins

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.2	0.5	6.6	43.0	38.6	11.1

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NA	NA	0.3191	0.1347	0.0781	0.0168	0.0073	0.0040	0.52	33.47

Material Description	USCS	AASHTO
○ Fine to Medium Silty SAND	SM	

Project No. 091538.00 **Client:** HDR Michigan Inc

Project: Harbor Island - North Channel Soil Tests

○ **Depth:** 3'-5' **Sample Number:** 2M

Remarks:

○Specific Gravity = 2.41

Soil and Materials Engineers, Inc.

Plymouth, MI

Figure

Tested By: Kyle Tobin **Checked By:** Nick Atkins

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: image001.png

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) <WaltersK7@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

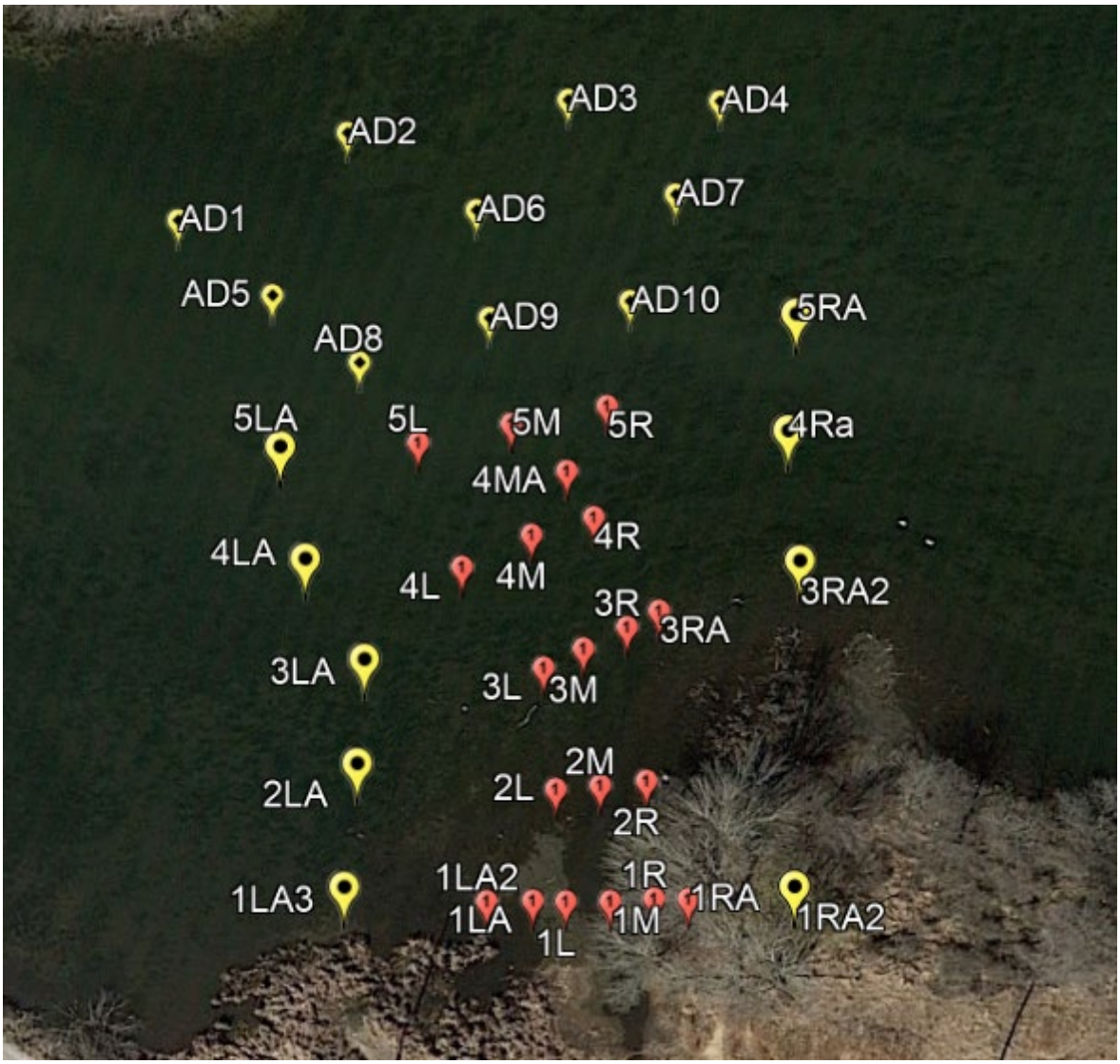
Hi Kent,
Thank you for the feedback from EGLE and EPA. As a reminder when this communication arose, we were in the process of delineating the North Channel ash and ran into some difficulties following the work plan that had been approved by EGLE. So we were proposing a change to the work plan approach 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



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From: Walters, Kent (EGLE) <WaltersK7@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

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) <WaltersK7@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

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
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