AECOM

MONITORING WELL INSTALLATION REPORT

MORROW CCR IMPOUNDMENT

STS HYDROPOWER, LLC

40 CFR 257.91

DECEMBER 12, 2025

VERSION 1.0

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1.0 Introduction

The subject site is an inactive coal combustion residual (CCR) surface impoundment containing CCR generated by the former Morrow Power Plant coal-fired electrical generating station in Comstock Township, Michigan. The impoundment is located adjacent to the Morrow Lake Dam hydroelectric facility on property partially owned by STS Hydropower, LLC (STS). The site location is shown on **Figure 1** below.

Figure 1: Impoundment Location

This Well Installation Report presents the geologic/hydrogeologic setting of the site, the groundwater monitoring system design, and details of the installed monitoring system.

1.1 Geologic/Hydrogeologic Setting

Regional geology consists of surficial outwash plains, morainal highlands, and glaciated channels overlying Mississippian geologic age bedrock. The uppermost aquifer consists of glacial drift, which ranges in thickness from approximately 40 feet along the Kalamazoo River to 350 feet where pre-glacial valleys were eroded into the bedrock surface (Michigan Geological Survey, 1960). In the site vicinity, the glacial drift is reported to consist of unconsolidated outwash deposits of medium to very coarse sand and gravel with localized beds of clayey silt (Monaghan and Larson, 1982). The presence of the Morrow Lake Dam suggests that portions of the outwash are sufficiently impermeable to allow construction of the dam, which is in close proximity to the CCR surface impoundment.

Uppermost groundwater at the site is encountered in the glacial drift at depths ranging from 3.78 to 8.24 feet below ground surface (bgs) (**Table 1**). Groundwater flow in the vicinity of the impoundment is likely heavily influenced by Morrow Lake, which is impounded behind the Morrow Lake Dam. Uppermost groundwater flows west-northwest toward the downstream Kalamazoo River from upstream areas to the east and uphill areas to the south of the lake. The impoundment is located immediately adjacent to the southwest corner of the lake.

1.2 Monitoring System Design

Pursuant to 40 CFR § 257.90(b)(1), the owner or operator of a CCR unit must install a groundwater monitoring system that meets the requirements of 40 CFR § 257.91. The groundwater monitoring system must meet the CCR Rule's performance standard, which requires the system to consist of a sufficient number of wells, installed at appropriate locations and depths, to yield groundwater samples from the uppermost aquifer that accurately represent the quality of:

(1) background groundwater that has not been affected by leakage from a CCR unit; and

(2) groundwater passing the waste boundary of the CCR unit and monitoring all potential contaminant pathways.

To evaluate groundwater conditions in relation to standards protective of the environment, the monitoring system consists of one upgradient (background) monitoring well (MW-5) and six downgradient monitoring wells (MW-1, MW-2, MW-3, MW-4, MW-6, and MW-7). The downgradient monitoring wells line the northern, western, and southwestern boundaries of the CCR impoundment, whereas the upgradient (background) monitoring well is located significantly to the south of the CCR impoundment. The well locations are shown on **Figure 2**.

Monitoring wells were installed to intercept the uppermost groundwater bearing zone in the unconsolidated outwash deposits.

2.0 Installation Specifications

This section provides details of the groundwater monitoring system installed at the site.

Two separate monitoring well installation events were completed, one in November 2024 (MW-1 through MW-5) and the second in July and August 2025 (MW-6 and MW-7). Potentiometric evaluations of the first two groundwater monitoring events indicated that the downgradient monitoring wells installed in November 2024 may not have been spaced adequately to be representative of groundwater passing through the northern portion of the CCR impoundment. Therefore, in July and August 2025, two additional monitoring wells were installed at the northern boundary of the CCR impoundment. The placement of the new wells was restricted to areas accessible to STS, which eliminated a portion of the site near the northern end of the west side of the impoundment (cross-hatched area in Figure 2).

2.1 Staking and Utility Clearances

Prior to the start of well drilling, proposed well locations were staked and evaluated for the presence of potential underground and overhead utility interferences. The well locations were initially inspected with STS personnel and Stock Drilling, Inc. (Stock Drilling) during a field visit on October 7, 2024. Because the two additional monitoring wells installed in July and August 2025 required setting of a protective surface casing through the impoundment dike, Cascade Drilling L.P. (Cascade) was contracted to use rotosonic methods to install MW-6 and MW-7. Michigan's MISS DIG 811 was contacted by the drilling contractors prior to breaking ground to mark out utilities that may be impacted by the planned subsurface activities. AECOM subcontracted private utility locate services to Ground Penetrating Radar Systems, LLC (GPRS) to provide clearance for each proposed boring location. As a final protective measure, the drilling contractors advanced the first five (5) feet of each boring by hand auger to confirm that no utilities existed at each proposed monitoring well location.

Due to the presence of surficial CCR material observed at the initially proposed MW-1 location, Stock Drilling and the AECOM field team proposed moving the location approximately 300 feet to the west where surficial CCR material was not observed. Stock Drilling submitted a ticket to MISS DIG 811 requesting a public utility locate around the new proposed location. Due to the absence of visible private utilities around the new monitoring well location, AECOM submitted an internal variance request on November 7, 2024 to waive the requirement for a private utility locate. The AECOM Safety, Health, and Environment (SH&E) manager approved the variance request on November 8, 2024.

2.2 Monitoring Well Contracting and Schedule

AECOM subcontracted a Michigan Certified Driller from Stock Drilling of Petersburg, Michigan to perform drilling, well construction, and well development services for monitoring wells MW-1, MW-2, MW-3, MW-4, and MW-5. These activities were completed November 4, 2024 through November 15, 2024. AECOM subcontracted a Michigan Certified Driller from Cascade of Flint, Michigan to perform drilling, well construction, and well development services for monitoring wells MW-6 and MW-7. These activities were completed July 28, 2025 through August 1, 2025.

2.3 Equipment Decontamination and IDW Handling

Downhole drilling equipment was decontaminated by the subcontractors prior to arrival at the site and on site before initiation of each boring. The tooling was decontaminated with pressurized water to remove residual soil cuttings prior to use at the next borehole. All other downhole equipment (pumps, water level indicators, etc.) were decontaminated using potable water and a mild laboratory-grade detergent (Alconox®) solution between holes.

Investigation derived waste (IDW) including drill cuttings, well development water, decontamination water, and solids was containerized in 55-gallon steel drums and transported to the designated waste storage area on STS property north of the monitoring well locations. The waste was characterized and was transported off site for disposal at a licensed facility.

2.4 Drilling and Logging Methods

Boreholes for monitoring wells MW-1 through MW-5 were advanced using a combination of hollow stem auger (HSA) and direct push technology (DPT) methods. Unconsolidated materials were sampled continuously in 5-foot intervals by DPT methods while the borehole was iteratively advanced over the sampled intervals by 4.25-inch inside diameter HSA methods.

DPT samples were used to classify the physical characteristics of the unsaturated and saturated zones. The lithologic characteristics observed by the field geologist were described using the terminology of the Unified Soil Classification System (USCS) (ASTM Method D2487).

Boreholes were advanced until indications of groundwater saturation were encountered, after which the borehole was deepened sufficiently to set a well with a planned 10-foot screened interval. Target depths for all of the boreholes were approximately 15 feet bgs. Groundwater saturation was encountered at all five boreholes.

Boreholes for monitoring wells MW-6 and MW-7 were advanced using rotosonic drilling methods. As noted above, monitoring wells MW-6 and MW-7 were double cased, installing a permanent 7-inch outer steel casing through a 10-inch drill casing advanced through the dike material, and a 2-inch inner PVC well into the native material below. Unconsolidated materials were sampled continuously in 5-foot intervals using a 4-inch sampling tool while the borehole was advanced over the sampled intervals by a 6-inch drill casing.

Samples were used to classify the physical characteristics of the unsaturated and saturated zones. The lithologic characteristics observed by the field geologist were described using the terminology of the USCS (ASTM Method D2487).

Boreholes were advanced until indications of groundwater saturation were encountered below the dike materials containing CCR material that were cased off. The outer casing for monitoring well MW-6 was advanced to a depth of 5 feet bgs and the outer casing for monitoring well MW-7 was advanced to a depth of 25 feet bgs. Target depths for monitoring wells MW-6 and MW-7 were the uppermost aquifer saturated zone below CCR material.

Drilling observations and well construction details are documented on boring installation logs provided in **Appendix A**.

2.5 Monitoring Well Construction

Wells were constructed of 2-inch polyvinyl chloride (PVC) screen and riser. Each well screen is 10 feet in length with 0.010-inch slot openings. Filter sand was placed in the annular space of the well from the bottom of the screen to two feet above the screen. Two feet of bentonite seal was placed in the annular space of the well above the filter sand. The remainder of the annular space was sealed using bentonite chips to within one foot of ground surface at monitoring wells MW-1 through MW-5. One and a half feet of bentonite chips at monitoring well MW-6 and two and a half feet of bentonite chips at monitoring well MW-7 were used to seal the annular space above the filter sand. At monitoring wells MW-6 and MW-7, bentonite grout filled the remaining annular space to approximately one foot below surface grade. Filter sand filled the remaining one foot of annular space to provide a stable foundation for the well casing and pad. Monitoring

wells MW-1 through MW-5 were completed as an above-grade "stick-up" installation. The 2-inch PVC riser is protected by a 4-inch steel protective cover and locking cap. One or two high visibility bollards were installed at monitoring well locations where there was believed to be a threat of vehicle strike. A 2-foot square concrete pad was installed around each of the first five wells. Monitoring wells MW-6 and MW-7 were completed as a flush mount installations, where the 2-inch PVC riser is protected by a steel well lid and a 2-foot square concrete pad around the well.

2.6 Monitoring Well Development

Development methods involved surging and extraction. Water within the well column was agitated (surged) by the raising and lowering of a Geotech Geosquirt submersible pump to agitate and remove sediment that accumulated within the well during drilling and installation. Following each agitation cycle, a minimum of five well volumes of groundwater (based on the measured depth-to-water and total depth of the well at the time of development) was extracted from the well using the submersible pump. Purge water resulting from development was containerized in 55-gallon steel drums. Drums were securely closed and transported to the designated waste storage area on STS property north of the monitoring well locations. The waste was characterized and transported off site for disposal at a licensed facility.

During the development process, water quality parameters and turbidity stabilization were evaluated by collecting at least three measurements of pH, temperature, specific conductance, and turbidity. Water quality was considered stable when readings of pH were within approximately +/- 0.1 standard units (SU), temperature and specific conductivity did not vary more than 3 percent from the previous reading, and turbidity readings were below 10 nephelometric turbidity units (NTUs) prior to concluding the development.

2.7 Monitoring Well Survey

When monitoring well construction was completed, the locations and elevations of all wells in the groundwater monitoring network for the CCR impoundment were surveyed by an AECOM surveyor on November 14, 2024 to survey monitoring wells MW-1 through MW-5 and on August 1, 2025 to survey monitoring wells MW-6 and MW-7. The elevation of the top of the inside (PVC) casing (north side) was surveyed as a well measurement reference point, along with the top of the finished well pad and the ground surface (generally lower than the pad). Final survey data is provided in **Table 2**.

3.0 Summary

In November 2024, a total of five borings were advanced to install the groundwater monitoring network for the surface impoundment containing CCR from the former Morrow Power Plant coal-fired electrical generating station in Comstock Township, Michigan. All five borings were completed as permanent monitoring wells, comprising one background monitoring well and four downgradient monitoring wells. Potentiometric evaluation following two water level gauging events indicated that groundwater flow at the northern area of the CCR impoundment may not be characterized by the five wells. STS determined that two additional downgradient monitoring wells MW-6 and MW-7 would assist in characterizing downgradient groundwater from the northern portion of the CCR impoundment. Groundwater sampling events were completed on

November 15, 2024, February 27, 2025, August 13 through August 15, 2025, and October 3, 2025 (MW-6 and MW-7 only). Potentiometric maps based on water levels recorded during those sampling events (**Table 1**) are provided in **Figures 3a** through **3d.** The Groundwater Monitoring System Certification is provided in **Appendix B.**

4.0 References

Deutsch, M., Vanlier, K.E., Giroux, P.R. Ground-water hydrology and glacial geology of the Kalamazoo area, Michigan. Michigan Geological Survey. 1960; Progress Report 23.

Monaghan, G.W. and Larson, G.J., 1982. Surficial Geology of Kalamazoo County. Michigan State University, Michigan Department of Natural Resources Geological Survey in cooperation with Department of Interior United States Geological Survey.

Tables

Table 1
Groundwater Elevations
Morrow CCR Impoundment
STS Hydropower, LLC

MW ID	TOC ELEV (ft msl)	DATE	DTW (ft btoc)	DTB (ft btoc)	GW ELEV (ft msl)
MW-1	774.32	11/15/2024	4.50	18.32	769.82
		2/27/2025	4.45	18.33	769.87
		8/18/2025	5.40	18.30	768.92
		10/3/2025	5.30	18.30	769.02
MW-2	775.60	11/15/2024	3.89	18.15	771.71
		2/27/2025	3.79	18.14	771.81
		8/13/2025	4.45	18.10	771.15
		10/3/2025	4.93	18.12	770.67
MW-3	779.89	11/15/2024	3.90	17.89	775.99
		2/27/2025	3.78	17.89	776.11
		8/13/2025	4.95	17.85	774.94
		10/3/2025	5.43	17.84	774.46
MW-4	783.39	11/15/2024	4.96	18.08	778.43
		2/27/2025	4.61	18.05	778.78
		8/13/2025	5.94	18.00	777.45
		10/3/2025	6.65	18.00	776.74
MW-5	790.40	11/15/2024	5.32	18.13	785.08
		2/27/2025	5.02	18.12	785.38
		8/14/2025	6.35	18.10	784.05
		10/3/2025	6.95	18.09	783.45
MW-6	779.93	8/13/2025	5.30	37.85	774.63
		10/3/2025	5.56	38.10	774.37
MW-7	780.19	8/13/2025	7.84	18.85	772.35
		10/3/2025	8.24	18.30	771.95

Notes:
ft msl = feet above mean sea level
ft btoc = feet below top of casing
TOC = top of casing
DTW = depth to water
DTB = depth to bottom

Table 2
Monitoring Well Construction Details
Morrow CCR Impoundment
STS Hydropower, LLC

Well Name	Location Relative to CCR Unit [1]	Northing	Easting	Top of Casing Elevation (ft msl)	Total Depth (ft btoc) [2]	Well Screen Interval (ft bgs)	Well Screen Lithology
Morrow CCR Impoundment							
MW-5	Upgradient Well	282949.99	12820013.98	790.40	18.10	5-15	Silt/Sand
MW-1	Downgradient well	285306.73	12818649.92	774.32	18.30	5-15	Sand
MW-2	Downgradient well	284736.67	12818885.98	775.60	18.10	5-15	Silt/Sand
MW-3	Downgradient well	284307.55	12818907.55	779.89	17.85	5-15	Silt/Sand
MW-4	Downgradient well	284018.47	12819116.46	783.39	18.00	5-15	Silt/Sand
MW-6	Downgradient well	286009.90	12818981.86	779.93	37.85	28-38	Gravel
MW-7	Downgradient well	285998.22	12819471.26	780.19	18.85	9-19	Sand/Silt

Notes:
[1] Upgradient and downgradient relative locations will be verified during the first eight rounds of baseline monitoring.
[2] Total depths measured during August 2025 groundwater sampling event
ft msl = feet above mean sea level
ft btoc = feet below top of casing
ft bgs = feet below ground surface
CCR = Coal Combustion Residuals

Figures

AECOM

Project: 60738676

Prepared: 9/26/2025

Map Location

Legend

- Downgradient Monitoring Well
- Upgradient Monitoring Well
- Estimated Outline of STS CCR Material
- Estimated Outline of Non-STS Owned Area of the Impoundment

N

0 200 400 800 Feet

FIGURE 2
WELL LOCATION MAP

CCR SURFACE IMPOUNDMENT
STS HYDROPOWER

L:\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\STS_CCR_Pond\ArcPro\STS_CCR_Pond.aprx, Aug_2025_Water_Elev

Aerial: 2024 NAIP Imagery

AECOM

Project: 60738676

Prepared: 12/12/2024

Map Location

Legend

- Monitoring Well
- Estimated Outline of STS CCR Material
- Estimated Outline of Non-STS Owned Area of the Impoundment
- Groundwater Contours (2 ft interval)
- Groundwater Flow Direction

Monitoring Well ID
Groundwater Elevation (ft-AMSL)
Measured on November 15, 2024

N

0 200 400 800 Feet

FIGURE 3a
POTENTIOMETRIC SURFACE MAP
SHALLOW AQUIFER
NOVEMBER 2024

CCR IMPOUNDMENT INVESTIGATION
STS HYDROPOWER

L:\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\STS_CCR_Pond\MXDs\Nov_2024_Water_Elev.mxd

Aerial: 2022 NAIP Imagery

AECOM

Project: 60738676

Prepared: 4/17/2025

Map Location

Legend

- Monitoring Well
- Estimated Outline of STS CCR Material
- Estimated Outline of Non-STS Owned Area of the Impoundment
- Groundwater Contours (2 ft interval)
- Groundwater Flow Direction

Monitoring Well ID
Groundwater Elevation (ft-AMSL)
Measured on February 27, 2025

N

0 200 400 800 Feet

FIGURE 3b
POTENTIOMETRIC SURFACE MAP
SHALLOW AQUIFER
FEBRUARY 2025

CCR IMPOUNDMENT INVESTIGATION
STS HYDROPOWER

L:\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\STS_CCR_Pond\MXDs\Feb_2025_Water_Elev.mxd

Aerial: 2022 NAIP Imagery

MW-7
772.35

MW-6
774.63

MW-1
768.92*

MW-2
771.15

MW-3
774.94

MW-4
777.45

MW-5
784.05

769
770
771
772
773
774
775
776
777
778
779
780
781
782
783
784

AECOM

Project: 60738676

Prepared: 9/26/2025

Map Location

Legend

- Monitoring Well
- Estimated Outline of STS CCR Material
- Estimated Outline of Non-STS Owned Area of the Impoundment
- Groundwater Contours (1 ft interval)
- Groundwater Flow Direction

Monitoring Well ID
Groundwater Elevation (ft-AMSL)
Measured on August 13-14, 2025
* Measured on August 18, 2025

N

0 200 400 800 Feet

FIGURE 3c
POTENTIOMETRIC SURFACE MAP
SHALLOW AQUIFER
AUGUST 2025

CCR IMPOUNDMENT INVESTIGATION
STS HYDROPOWER

L:\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\STS_CCR_Pond\ArcPro\STS_CCR_Pond.aprx, Aug_2025_Water_Elev

Aerial: 2024 NAIP Imagery

AECOM

Project: 60738676

Prepared: 11/5/2025

Map Location

Legend

- Monitoring Well
- Estimated Outline of STS CCR Material
- Estimated Outline of Non-STS Owned Area of the Impoundment
- Groundwater Contours (1 ft interval)
- Groundwater Flow Direction

Monitoring Well ID
Groundwater Elevation (ft-AMSL)
Measured on October 3, 2025

N

0 200 400 800 Feet

FIGURE 3d
POTENTIOMETRIC SURFACE MAP
SHALLOW AQUIFER
OCTOBER 2025

CCR IMPOUNDMENT INVESTIGATION
STS HYDROPOWER

L:\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\STS_CCR_Pond\ArcPro\STS_CCR_Pond.aprx, Oct_2025_Water_Elev

Aerial: 2024 NAIP Imagery

Appendix A

Boring Logs

WELL NUMBER MW-01

AECOM

TOTAL DEPTH 15 FT BGS
PAGE 1 OF 1

CLIENT STS Hydropower
PROJECT NAME Morrow Dam CCR Well Installation
PROJECT NUMBER 60738676
SITE NAME STS Hydropower Morrow Dam CCR
DATE STARTED 11/12/2024 **COMPLETED** 11/12/2024
SURVEYING BY AECOM
DRILLING CONTRACTOR Stock Drilling
ON 11/22/2024 **GROUND ELEVATION** 771.34 ft
DRILLING EQUIPMENT Geoprobe 7720 DT
EASTING 12818649.92 **NORTHING** 285306.73
DRILLING METHOD Direct Push/Hollow Stem Auger
HOLE DIAMETER 8.25"
LOGGED BY R. Friend **CHECKED BY** B. Potter
CASING TYPE Monument (stickup)

DEPTH (ft)	SAMPLE TYPE	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	
0					WELL DIAGRAM
				0.00 Organic soil with sand (OL), 15-25% fine to medium sand with tree roots. [TOPSOIL] - brown, moist - no odor, no staining	771.3
1				1.00 Well-graded sand with silt (SW-SM), fine to coarse, subangular, 5-15% silt [NATIVE] - brownish gray, moist - no odor, no staining	770.3
2	hand auger				
3				3.00 - wet at 3 ft	768.3
4					
5					
6				6.00 - fining with depth from 6-7.5. fine sand at 7.5. at 6 ft	765.3
7	direct push	100			
8				7.50 Poorly graded sand (SP), fine [NATIVE] - light brown, wet - no odor, no staining	763.8
9					
10					
11	direct push	100			
12					
13					
14	direct push	100			
15					

Well Casing MW-01
Type: Schedule 40 PVC
Diameter: 2 in
Top: 0 ft bgs
Bottom: 5 ft bgs
RISER
Type: Schedule 40 PVC
Diameter: 2 in
0 - 5 ft

Top: 0 ft bgs
Bottom: 1 ft bgs

Well Seal
Type: Bentonite
Top: 1 ft bgs
Bottom: 3 ft bgs
Bentonite
1 - 3 ft

Sand
Type: Sand
Top: 3 ft bgs
Bottom: 15 ft bgs
Sand
3 - 15 ft

Well Screen MW-01
Type: Schedule 40 PVC
Slot Size: 0.01 in
Top: 5 ft bgs
Bottom: 15 ft bgs
SCREEN
Type: Schedule 40 PVC
Diameter: 2 in
5 - 15 ft

Bottom of borehole at 15 feet.

Notes:

AECOM SMART LOG_8X11 NO WL - NANAIMO LOGS_DC.GPJ - 11/18/25 14:53 - C:\USERS\FRIENDR\ONEDRIVE\ONEDRIVE - AECOM\GENERAL - STS MORROW HYDROELECTRIC PROJE\400_TECHNICAL\433_GROUNDWATER MONITORING\MONITORING WELL INS

WELL NUMBER MW-02

AECOM

TOTAL DEPTH 15 FT BGS
PAGE 1 OF 1

CLIENT STS Hydropower
PROJECT NAME Morrow Dam CCR Well Installation
PROJECT NUMBER 60738676
SITE NAME STS Hydropower Morrow Dam CCR
DATE STARTED 11/04/2024 **COMPLETED** 11/04/2024
SURVEYING BY AECOM
DRILLING CONTRACTOR Stock Drilling
ON 11/14/2024 **GROUND ELEVATION** 773.13 ft
DRILLING EQUIPMENT Geoprobe 7720 DT
EASTING 12818885.98 **NORTHING** 284736.67
DRILLING METHOD Direct Push/Hollow Stem Auger
HOLE DIAMETER 8.25"
LOGGED BY R. Friend **CHECKED BY** B. Potter
CASING TYPE Monument (stickup)

DEPTH (ft)	SAMPLE TYPE	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION		WELL DIAGRAM
0						
0.00				Lean clay with sand (CL), 20-30% fine to medium sand With organic root material [TOPSOIL] - brown, moist - no odor, no staining	773.1	
1.75	hand auger			Sandy lean clay (CL), 25-35% fine to medium sand [NATIVE] - brown, wet - no odor, no staining	771.4	
3.50				Silty sand (SM), fine to medium, 20-30% silt, trace coarse sand trace gravel [NATIVE] - brownish gray, wet - no odor	769.6	
9.00	direct push	92		Silty sand (SM), fine, 20-30% silt [NATIVE] - grayish brown, wet - no odor, no staining	764.1	
	direct push	100				
	direct push	100				

Well Casing MW-02
Type: Schedule 40 PVC
Diameter: 2 in
Top: 0 ft bgs
Bottom: 5 ft bgs
RISER
Type: Schedule 40 PVC
Diameter: 2 in
0 - 5 ft

Top: 0 ft bgs
Bottom: 1 ft bgs

Well Seal
Type: Bentonite
Top: 1 ft bgs
Bottom: 2.9 ft bgs
Bentonite
1 - 2.9 ft

Sand
Type: Sand
Top: 2.9 ft bgs
Bottom: 15 ft bgs
Filter pack
2.9 - 15 ft

Well Screen MW-02
Type: Schedule 40 PVC
Slot Size: 0.01 in
Top: 5 ft bgs
Bottom: 15 ft bgs
SCREEN
Type: Schedule 40 PVC
Diameter: 2 in
5 - 15 ft

Bottom of borehole at 15 feet.

Notes:

AECOM SMART LOG_8X11 NO WL - NANAIMO LOGS_DC.GPJ - 11/18/25 14:53 - C:\USERS\FRIEND\ONEDRIVE\ONEDRIVE - AECOM\GENERAL - STS MORROW HYDROELECTRIC PROJE\400_TECHNICAL\433_GROUNDWATER MONITORING\MONITORING WELL INS

WELL NUMBER MW-03

AECOM

TOTAL DEPTH 15 FT BGS
PAGE 1 OF 1

CLIENT STS Hydropower
PROJECT NAME Morrow Dam CCR Well Installation
PROJECT NUMBER 60738676
SITE NAME STS Hydropower Morrow Dam CCR
DATE STARTED 11/04/2024 **COMPLETED** 11/04/2024
SURVEYING BY AECOM
DRILLING CONTRACTOR Stock Drilling
ON 11/14/2024 **GROUND ELEVATION** 777.29 ft
DRILLING EQUIPMENT Geoprobe 7720 DT
EASTING 12818907.55 **NORTHING** 284307.55
DRILLING METHOD Direct Push/Hollow Stem Auger
HOLE DIAMETER 8.25"
LOGGED BY R. Friend **CHECKED BY** B. Potter
CASING TYPE Monument (stickup)

DEPTH (ft)	SAMPLE TYPE	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION		WELL DIAGRAM
0						
1	hand auger			0.00 Well-graded sand with clay (SW-SC), fine to medium, 5-15% clay [NATIVE] - brown, moist - no odor, no staining	777.3	
2				1.50 Sandy lean clay (CL), 35-45% fine sand Wet around 2 ft [NATIVE] - brownish gray, moist - no odor	775.8	
3						
4				3.50 Silty sand (SM), fine to coarse, 25-35% silt [NATIVE] - brownish gray, wet - no odor, no staining	773.8	
5						
6	direct push	100				
7						
8						
9						
10						
11	direct push	73		10.00 Silty sand (SM), fine, 20-30% silt [NATIVE] - light brown, wet - no odor	767.3	
12						
13						
14	direct push	150				
15						

Well Casing MW-03
Type: Schedule 40 PVC
Diameter: 2 in
Top: 0 ft bgs
Bottom: 5 ft bgs
RISER
Type: Schedule 40 PVC
Diameter: 2 in
0 - 5 ft

Top: 0 ft bgs
Bottom: 1 ft bgs

Well Seal
Type: Bentonite
Top: 1 ft bgs
Bottom: 3 ft bgs
Bentonite
1 - 3 ft

Sand
Type: Sand
Top: 3 ft bgs
Bottom: 15 ft bgs
Sand
3 - 15 ft

Well Screen MW-03
Type: Schedule 40 PVC
Slot Size: 0.01 in
Top: 5 ft bgs
Bottom: 15 ft bgs
SCREEN
Type: Schedule 40 PVC
Diameter: 2 in
5 - 15 ft

Bottom of borehole at 15 feet.

Notes:

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WELL NUMBER MW-04

AECOM

TOTAL DEPTH 15 FT BGS
PAGE 1 OF 1

CLIENT STS Hydropower
PROJECT NAME Morrow Dam CCR Well Installation
PROJECT NUMBER 60738676
SITE NAME STS Hydropower Morrow Dam CCR
DATE STARTED 11/05/2024 **COMPLETED** 11/05/2024
SURVEYING BY AECOM
DRILLING CONTRACTOR Stock Drilling
ON 11/14/2024 **GROUND ELEVATION** 780.76 ft
DRILLING EQUIPMENT Geoprobe 7720 DT
EASTING 12819116.46 **NORTHING** 284018.47
DRILLING METHOD Direct Push/Hollow Stem Auger
HOLE DIAMETER 8.25"
LOGGED BY R. Friend **CHECKED BY** B. Potter
CASING TYPE Monument (stickup)

DEPTH (ft)	SAMPLE TYPE	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	
0					
	hand auger			0.00 Silty sand (SM), fine, 10-20% silt, with roots/organic material [NATIVE] - brown, moist - no odor	780.8
2				2.00 Poorly graded sand (SP), medium, <10% silt [NATIVE] - brown, moist - no odor	778.8
4				4.00 Silty sand (SM), fine to coarse, 15-25% silt, <10% fine to coarse gravel [NATIVE] - light brown, wet - no odor	776.8
5					
6	direct push	92			
10					
11	direct push	90		11.00 Silty sand (SM), fine, 10-20% silt, <10% coarse sand trace fine gravel [NATIVE] - light brown, wet - no odor	769.8
13					
14	direct push	100			
15					

Bottom of borehole at 15 feet.

Notes:

Well Casing MW-04
Type: Schedule 40 PVC
Diameter: 2 in
Top: 0 ft bgs
Bottom: 5 ft bgs
RISER
Type: Schedule 40 PVC
Diameter: 2 in
0 - 5 ft

Top: 0 ft bgs
Bottom: 1 ft bgs

Well Seal
Type: Bentonite
Top: 1 ft bgs
Bottom: 3 ft bgs
Bentonite
Type: Chip
1 - 3 ft

Sand
Type: Sand
Top: 3 ft bgs
Bottom: 15 ft bgs
Sand
3 - 15 ft

Well Screen MW-04
Type: Schedule 40 PVC
Slot Size: 0.01 in
Top: 5 ft bgs
Bottom: 15 ft bgs
SCREEN
Type: Schedule 40 PVC
Diameter: 2 in
5 - 15 ft

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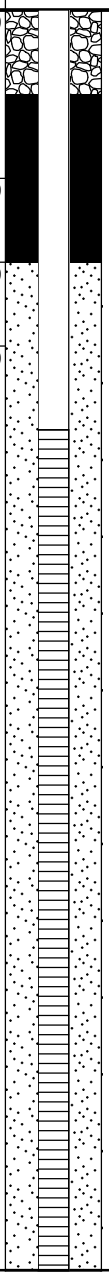
WELL NUMBER MW-05

AECOM

TOTAL DEPTH 15 FT BGS
PAGE 1 OF 1

CLIENT STS Hydropower
PROJECT NAME Morrow Dam CCR Well Installation
PROJECT NUMBER 60738676
SITE NAME STS Hydropower Morrow Dam CCR
DATE STARTED 11/05/2024 **COMPLETED** 11/05/2024
SURVEYING BY AECOM
DRILLING CONTRACTOR Stock Drilling
ON 11/14/2024 **GROUND ELEVATION** 787.89 ft
DRILLING EQUIPMENT Geoprobe 7720 DT
EASTING 12820013.98 **NORTHING** 282949.99
DRILLING METHOD Direct Push/Hollow Stem Auger
HOLE DIAMETER 8.25"
LOGGED BY R. Friend **CHECKED BY** B. Potter
CASING TYPE Monument (stickup)

DEPTH (ft)	SAMPLE TYPE	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION	
0					
				0.00 Organic soil with sand (OL), 20-30% fine sand With roots 0-1'. [TOPSOIL] - dark brown, moist - no odor	787.9
1					
2				2.00 Clayey sand (SC), fine to medium, 15-25% clay [NATIVE] - light gray, wet - no odor, no staining	785.9
3	hand auger				
4				3.00 Well-graded sand with silt (SW-SM), fine to coarse, 5-15% silt [NATIVE] - light gray, wet - no odor	784.9
5				4.00 Silty sand (SM), fine to coarse, 20-30% silt, <10% fine to coarse gravel, Coarse sand and gravel seam from 13.5' to 13.75'. [NATIVE] - light brown, wet - no odor	783.9
6	direct push	76			
7					
8					
9					
10					
11	direct push	80			
12					
13					
14	direct push	100			
15					



Well Casing MW-05
Type: Schedule 40 PVC
Diameter: 2 in
Top: 0 ft bgs
Bottom: 5 ft bgs
RISER
Type: Schedule 40 PVC
Diameter: 2 in
0 - 5 ft

Top: 0 ft bgs
Bottom: 1 ft bgs

Well Seal
Type: Bentonite
Top: 1 ft bgs
Bottom: 3 ft bgs
Bentonite
1 - 3 ft

Sand
Type: Sand
Top: 3 ft bgs
Bottom: 15 ft bgs
Sand
3 - 15 ft

Well Screen MW-05
Type: Schedule 40 PVC
Slot Size: 0.01 in
Top: 5 ft bgs
Bottom: 15 ft bgs
SCREEN
Type: Schedule 40 PVC
Diameter: 2 in
5 - 15 ft

Bottom of borehole at 15 feet.

Notes:

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WELL NUMBER MW-06

AECOM

TOTAL DEPTH 40 FT BGS

CLIENT STS Hydropower
PROJECT NAME Morrow Dam CCR Well Installation
PROJECT NUMBER 60738676
SITE NAME STS
DATE STARTED 07/28/2025 **COMPLETED** 07/30/2025
SURVEYING BY AECOM
DRILLING CONTRACTOR Cascade
ON 8/1/2025 **GROUND ELEVATION** 780.62 ft
DRILLING EQUIPMENT Sonic
EASTING 12819471.26 **NORTHING** 285998.22
DRILLING METHOD Sonic
HOLE DIAMETER 8" diameter to 20". 6" diameter to 40'.
LOGGED BY E. Kosiara **CHECKED BY** B. Potter
CASING TYPE Flushmount

DEPTH (ft)	SAMPLE TYPE	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION		WELL DIAGRAM
0				0.00 Organic soil with gravel and sand (OL), brown, moist, with roots, no odor, no staining.	780.6	
1				0.50 Silt (ML), 10-20% clay, trace gravel, black/gray, moist, CCR material.	780.1	
2						
3	Sonic	60				
4						
5						
6				6.00 Wet at 6'	774.6	
7						
8	Sonic	40				
9						
10						
11						
12						
13						
14						
15	Sonic	20				
16						
17						
18						
19						
20						
21						

Well Riser
Type: Schedule 40 PVC
Diameter: 2 in
Top: 0.5 ft bgs
Bottom: 28 ft bgs

Surface Seal
Type: Cement / Bentonite Grout
Top: 1 ft bgs
Bottom: 24.5 ft bgs

Isolation Casing
0.5"-20': 7" OD Steel

(Continued Next Page)

WELL NUMBER MW-06

AECOM

TOTAL DEPTH 40 FT BGS

CLIENT STS Hydropower **PROJECT NAME** Morrow Dam CCR Well Installation

PROJECT NUMBER 60738676 **SITE NAME** STS

DEPTH (ft)	SAMPLE TYPE	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION		WELL DIAGRAM
21						
22	Sonic	100		0.50 Silt (ML), 10-20% clay, trace gravel, black/gray, moist, CCR material. *(continued)*	780.1	
23						
24				23.00 Well Graded Sand with Fine Gravel (SW), 30% gravel, 10-20% silt, light gray.	757.6	
25						
26	Sonic	60		25.00 Poorly Graded Fine Sand with Gravel (SW), 20-30% gravel, trace silt, wet, gray.	755.6	
27						
28				27.00 Well Graded Gravel with Sand (GW), 30% sand, fine grained, gray, wet.	753.6	
29				28.00 Poorly Graded Fine Sand with Fine Gravel (SP), 20-30% gravel, trace silt, light gray/brown, wet.	752.6	
30						
31						
32						
33						
34	Sonic	100		33.00 Silt with Fine Gravel (ML), 10-20% gravel, trace clay, gray/light gray, dry.	747.6	
35						
36						
37						
38				37.00 Highly weathered rock, dry.	743.6	
39						
40						

Annular Seal
Type: Bentonite Medium Chip
Top: 24.5 ft bgs
Bottom: 26 ft bgs

Filter Pack
Type: #2 Filter Sand
Top: 26 ft bgs
Bottom: 40 ft bgs

Well Screen
Type: Schedule 40 PVC
Slot Size: 0.01 in
Top: 28 ft bgs
Bottom: 38 ft bgs

Bottom of borehole at 40 feet.

Notes:
1. Permanent 7" steel casing installed to 20' bgs.

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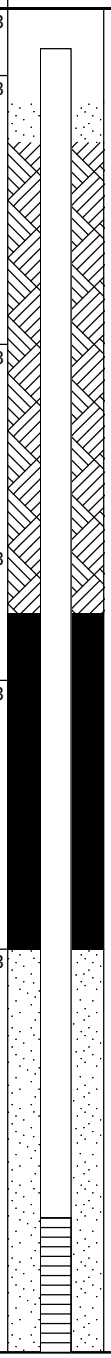
WELL NUMBER MW-07

AECOM

TOTAL DEPTH 20 FT BGS

CLIENT STS Hydropower
PROJECT NAME Morrow Dam CCR Well Installation
PROJECT NUMBER 60738676
SITE NAME STS
DATE STARTED 07/29/2025 **COMPLETED** 07/29/2025
SURVEYING BY AECOM
DRILLING CONTRACTOR Cascade
ON 8/1/2025 **GROUND ELEVATION** 780.32 ft
DRILLING EQUIPMENT Sonic
EASTING 12818981.86 **NORTHING** 286009.9
DRILLING METHOD Sonic
HOLE DIAMETER 8" diameter to 5". 6" diameter to 20'.
LOGGED BY E. Kosiara **CHECKED BY** B. Potter
CASING TYPE Flushmount

DEPTH (ft)	SAMPLE TYPE	RECOVERY %	GRAPHIC LOG		MATERIAL DESCRIPTION	
0				0.00	Sandy Organic Soil (OL), 20% fine gravel, 20% silt, brown, dry.	780.3
				0.50	Silt (ML), 10-20% fine sand, 10-20% fine gravel, dark gray and brown, dry, CCR material.	779.8
1						
2						
3	Sonic	80		2.50	Poorly Graded Sand with Gravel (SW), sand fine grained, 10-20% fine gravel, 10% silt, light brown.	777.8
4				4.00	Moist, color change to brown.	776.3
5						
6				5.00	Well Graded Gravel (GW), gravel fine to medium grained, 10-20% fine sand, 10-20% silt, brown, wet.	775.3
7						
8	Sonic	70		7.00	Poorly Graded Sand with Silt and Gravel (SW), sand fine grained, fine gravel 20%, silt 20%, gray/brown, moist.	773.3
9						
10						



Well Riser
Type: Schedule 40 PVC Diameter: 2 in Top: 0.3 ft bgs Bottom: 9 ft bgs

Surface Seal
Type: Cement / Bentonite Grout
Top: 1 ft bgs
Bottom: 4.5 ft bgs

Isolation Casing
0-5':7" OD
Steel

Annular Seal
Type: Bentonite Medium Chip
Top: 4.5 ft bgs
Bottom: 7 ft bgs

Filter Pack
Type: #2 Filter Sand
Top: 7 ft bgs
Bottom: 19 ft bgs

Well Screen
Type: Schedule 40 PVC
Slot Size: 0.01 in
Top: 9 ft bgs
Bottom: 19 ft bgs

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WELL NUMBER MW-07

AECOM

TOTAL DEPTH 20 FT BGS

CLIENT STS Hydropower **PROJECT NAME** Morrow Dam CCR Well Installation

PROJECT NUMBER 60738676 **SITE NAME** STS

DEPTH (ft)	SAMPLE TYPE	RECOVERY %	GRAPHIC LOG	MATERIAL DESCRIPTION		WELL DIAGRAM
10				7.00 Poorly Graded Sand with Silt and Gravel (SW), sand fine grained, fine gravel 20%, silt 20%, gray/brown, moist. *(continued)*	773.3	
11						
12						
13				13.00 Poorly Graded Sand with Silt (SW-SM), fine sand, 30% silt, 20% fine gravel, gray/dark gray, moist.	767.3	
14						**Well Screen** Type: Schedule 40 PVC Slot Size: 0.01 in Top: 9 ft bgs Bottom: 19 ft bgs
15	Sonic	100				
16						
17						
18						
19						Top: 19 ft bgs Bottom: 20 ft bgs
20						

Bottom of borehole at 20 feet.

Notes:
1. Permanent 7" steel casing installed to 5' bgs.

Appendix B

Groundwater Monitoring System Certification

Groundwater Monitoring System Certification

AECOM ("Consultant") has been retained by STS Hydropower, LLC to provide certification of the groundwater monitoring system as required under 40 Code of Federal Regulations (CFR) § 257.91(f) of the Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule, 80 Fed. Reg. 21302 (Apr. 17, 2015) ("CCR Rule") for the coal combustion residual (CCR) surface impoundment located at the site in Comstock Township, Michigan.

Requirements

Pursuant to 40 CFR § 257.90(b)(1), the owner or operator of a CCR unit must install a groundwater monitoring system that meets the requirements of 40 CFR § 257.91. The groundwater monitoring system must meet the CCR Rule's performance standard, which requires the system to consist of a sufficient number of wells, installed at appropriate locations and depths, to yield groundwater samples from the uppermost aquifer that accurately represent the quality of:

(1) background groundwater that has not been affected by leakage from a CCR unit; and

(2) groundwater passing the waste boundary of the CCR unit and monitoring all potential contaminant pathways.

The CCR Rule groundwater monitoring system requirement for the CCR surface impoundment located on the site is addressed by a groundwater monitoring system consisting of one (1) upgradient and six (6) downgradient monitoring wells. Information regarding the groundwater monitoring system design and construction has been provided to the qualified professional engineer as required by 40 CFR § 257.91(e)(1) and is included in the facility operating record per 40 CFR § 257.91(e)(1).

Limitations

The signature of Consultant's authorized representative on this document represents that to the best of Consultant's knowledge, information, and belief in the exercise of its professional judgment, it is Consultant's professional opinion that the aforementioned information is accurate as of the date of such signature. Any opinion or decisions by Consultant are made on the basis of Consultant's experience, qualifications, and professional judgment and are not to be construed as warranties or guaranties. In addition, opinions relating to environmental, geologic, and geotechnical conditions or other estimates are based on available data, and actual conditions may vary from those encountered at the times and locations where data are obtained, despite the use of due care.

CERTIFICATION

I,_____ Matthew McCloskey__, being a Registered Professional Engineer, in accordance with the State of Michigan Professional Engineer's Registration program, possessing the technical knowledge and experience to make the specific technical certifications required under 40 Code of Federal Regulations (CFR) Part 257, Subpart D, Standards for the Disposal of Coal Combustion Residuals (CCRs) in Landfills and Surface Impoundments, and being licensed in the state where the CCR unit(s) is located, do hereby certify to the best of my knowledge, information, and belief, that the groundwater monitoring system that is the subject of this certification has been designed and constructed to meet the requirements of 40 CFR § 257.91.

Signature: 

Date: 12/10/2025

License #: 6201036393

License Renewal Date: 12/10/2026