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Holding Pond Annual Inspection Report Shiras Steam Plant

Marquette, Michigan

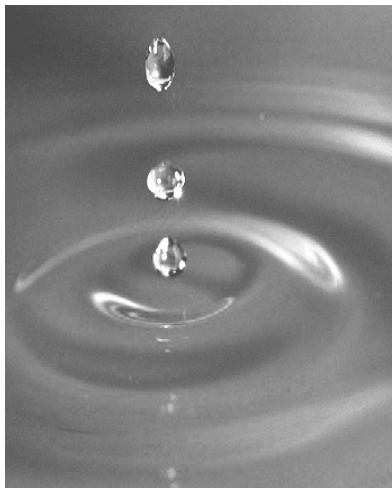
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GEI Project No. 1903625



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1. Introduction

Title 40 Code of Federal Regulations (40 CFR) Part 257.83 Inspection Requirements for Coal Combustion Residual (CCR) Surface Impoundments requires annual inspections of all CCR surface water impoundments by a qualified professional engineer to ensure that the design, construction, operation, and maintenance is consistent with recognized and generally accepted engineering standards. The Shiras Steam Plant owned by the Marquette Board of Light and Power (MBLP) has a CCR holding pond (WDS ID# 478988) at the northwest corner of the plant site, located in the City of Marquette, Michigan. GEI Consultants of Michigan, PC (GEI) performed the annual inspection of the holding pond on November 13, 2019. Ms. Steffanie Pepin, PE, and Mr. Bruce Peterson, EIT, performed the inspection. The inspection included a visual inspection of the sheet piles above the water line. No material tests, sediment samples, or additional measurements were taken during the inspection. The 2018 Holding Pond Annual Inspection Report by AECOM was referenced during the inspection and throughout this report.

2. Annual Inspection

2.1 Holding Pond Configuration

The CCR surface water impoundment at the MBLP Shiras Steam Plant is comprised of five cells that are enclosed and divided by sheet pile walls. Riprapped shoreline forms the west and south boundaries of the holding pond. Sheet pile walls form the north and east boundaries between the holding pond and Lake Superior. Interior sheet pile walls divide the area into five cells. Three concrete ramps south of the holding pond provide equipment access for periodic removal of CCR ash from the surface water impoundment to an off-site landfill.

The overall holding pond configuration is shown in plan view on Drawing 1 of Appendix A. Photo 1 of Appendix C shows Cells 3, 2, and 1 from the South. Photo 2 of Appendix C shows Cells 1, 4, and 5 from the South.

In 2013, an additional north sheet pile wall was installed slightly south of the original north boundary wall because the original wall was found to be in poor condition. The original north wall remains in place but no longer provides containment for the CCR surface water impoundment. The 2013 sheet pile wall provides containment at the north boundary as shown in Photo 3 of Appendix C.

2.2 Instrumentation

Similar to past reports, water levels in the holding pond cells were monitored by measuring down from points of known elevation on the cell access walkways. The approximate location and known elevation of each measure down point (MDP) were obtained from the 2018 report. The known elevations were determined by an AECOM survey crew during their initial annual inspection on October 15, 2015.

Movement monitoring targets were also installed by AECOM during the October 15, 2015 survey work. Because the MBLP is in the process of decommissioning the plant, which includes removal of the steel sheet pile walls, GEI did not conduct a movement monitoring survey as part of the 2019 annual inspection.

2.3 Water Surface Elevations

The water elevation in each of the cells was collected using the measure down system described above. The following table summarizes the water elevation in each cell on November 13, 2019.

Table 2-1: 2019 Water Surface Elevations

Cell	MDP Elevation	Depth to Water (ft)	Present Water Elevation
1	609.38	3.49	605.89
2	609.39	3.24	606.15
3	609.34	2.76	606.58
4	609.40	3.60	605.80
5	609.37	3.53	605.84
Lake Superior			603.0

During the inspection, the Cell 5 ice agitator was operational to prevent ice formation and may have slightly impacted the accuracy of the depth reading at this MDP.

Plant operations stopped in June 2018 and was officially retired in April 2019. The MBLP has confirmed that no CCR entered the pond during 2019. Therefore, GEI did not collect elevations of the CCR ash deposits as part of the 2019 annual inspection because the elevation of the CCR would not have changed from the previously recorded measurement taken on November 8, 2018 by AECOM. The ponds are currently used for stormwater management.

2.4 Storage Capacity

The total storage capacity of the holding ponds was calculated to be 5,808 cubic yards by AECOM in 2018. GEI concurs with this estimate.

2.5 Current Volume of Impounded Water and CCR

The volume of CCR ash was calculated to be 2,202 cubic yards by AECOM in 2018. GEI concurs with this estimate.

The volume of water impounded at the time of the inspection was calculated using the results of GEI's water depth measurements. The present volume of impounded water is 3,074 cubic yards. The calculations for the impounded water volume are included in Appendix B.

2.6 Structural Field Evaluation

A visual structural evaluation of the holding pond sheet pile walls was performed by GEI on November 13, 2019. The sheet pile used for the exterior walls are hot rolled Z-shaped sections with 12-inch depth and 3/8-inch nominal thickness, similar to a PZ-27 sheet pile (AECOM, 2018). As shown in Photo 4 of Appendix C, the north wall installed in 2013 is in good condition and provides adequate containment. The east wall is also in good condition overall, as shown in Photo 5.

In 2018, AECOM marked a spot of localized corrosion to monitor at a joint between two sheets on the east wall. As shown in Photo 6, the white paint that AECOM used to circle the location is still visible and there appears to be no changes in the sheet pile condition over the past year. The exterior sheets provide adequate containment for the CCR surface water impoundment and no seepage to Lake Superior was evident during GEI's inspection. Although a movement monitoring survey was not conducted as part of this inspection, there appeared to be no indication of movement or distress in the exterior walls. The east wall alignment is shown in Photo 7.

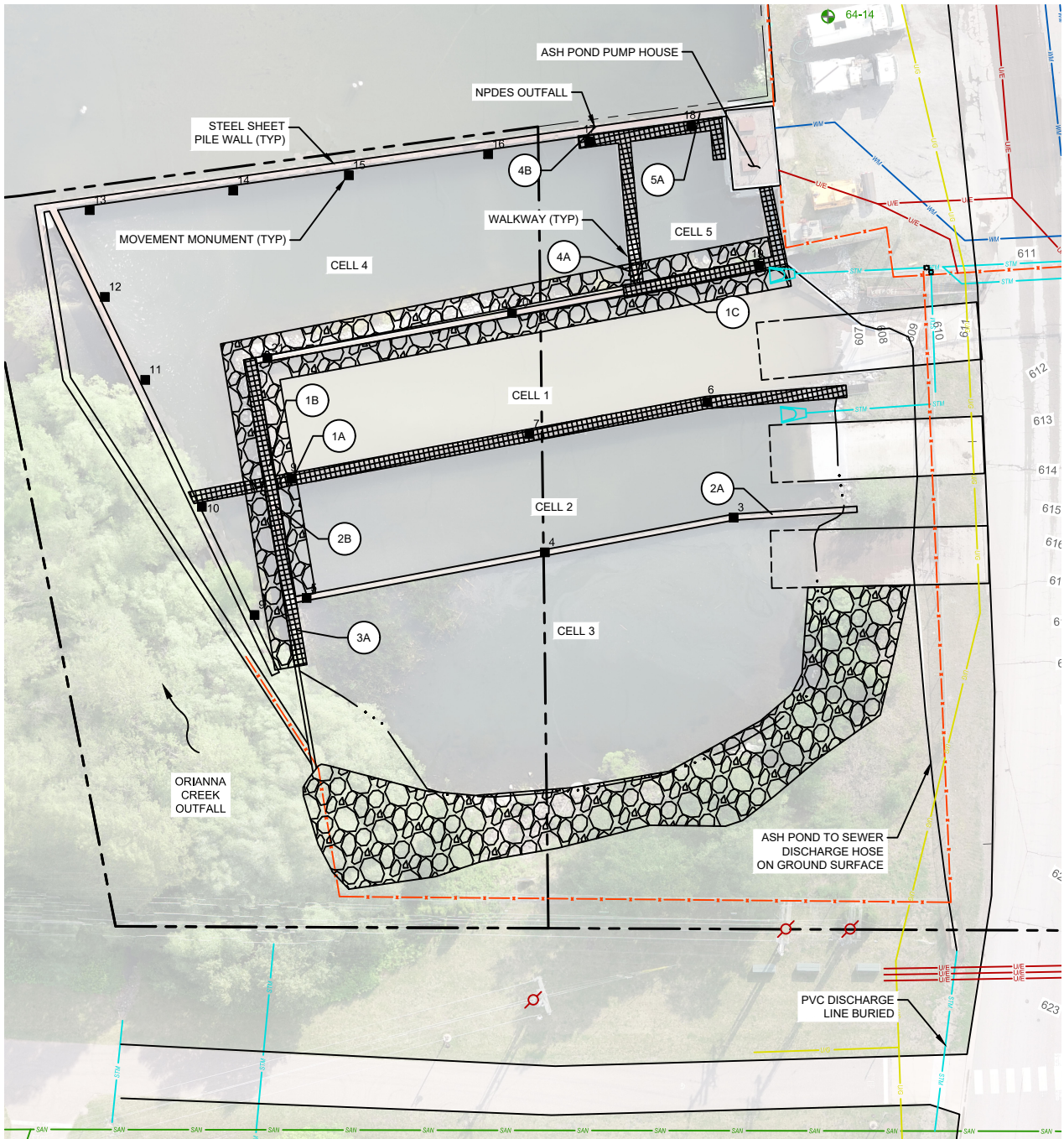
The interior sheet pile walls are constructed of a different type of sheet pile than the exterior walls. The interior walls are in very poor condition and some locations have 100% section loss (Photo 8). Many of the interior walls have had an adjacent sheet pile wall installed to provide a replacement barrier between the cells (Photo 9). The quality of the interior walls does not impact the ability of the exterior walls to contain CCR ash from Lake Superior. No indication of interior wall movement was visually apparent during the inspection.

3. Conclusion

The sheet pile walls that form the north and east boundaries of the holding pond are structurally stable and provide containment of CCR materials from Lake Superior. The shoreline provides containment of CCR materials on the west and south boundaries of the holding pond. The interior sheet pile walls that divide the holding pond into five cells are in poor condition but do not show any visible signs of structural instability. The interior walls do not provide complete containment of the CCR ash between the five cells; however, this does not impact the integrity of the holding pond to contain the CCR surface water impoundment from Lake Superior.

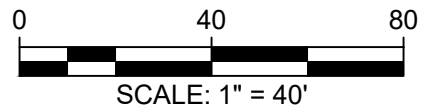
Appendix A

Holding Pond Configuration Drawing



WEIR ID	ELEVATION (FT)*
1A	606.58
1B	606.58
1C	606.58
2A	606.42
2B	606.42
3A	606.25
4A	606.25
4B	606.58
5A	607.40

* ELEVATION REFERENCED TO IGLD BENCHMARK IS LOCATED AT EASTERN INTAKE BUILDING DOOR SLAB. TOP OF BOLT EL. = 609.82' IGLD



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Project 1903625

HOLDING POND
 CONFIGURATION

November 2019

Drawing 1

Appendix B

Volume Calculations

Appendix C

Photo Log

Holding Pond Annual Inspection Photos

Date: 11/13/2019

GEI Project No.: 1903625

Client: Marquette Board of Light and Power



<i>Photo No. 1 – Cells 3, 2, and 1</i>	<u>1</u>
<i>Photo No. 2 – Cells 1, 4, and 5</i>	<u>1</u>
<i>Photo No. 3 – North Sheet Pile Wall</i>	<u>2</u>
<i>Photo No. 4 – North Sheet Pile Wall Condition</i>	<u>2</u>
<i>Photo No. 5 – East Sheet Pile Wall Condition</i>	<u>3</u>
<i>Photo No. 6 – East Wall Joint to Monitor</i>	<u>3</u>
<i>Photo No. 7 – East Wall Alignment</i>	<u>4</u>
<i>Photo No. 8 – Interior Wall Condition</i>	<u>5</u>
<i>Photo No. 9 – Adjacent Interior Walls</i>	<u>5</u>

Holding Pond Annual Inspection Photos

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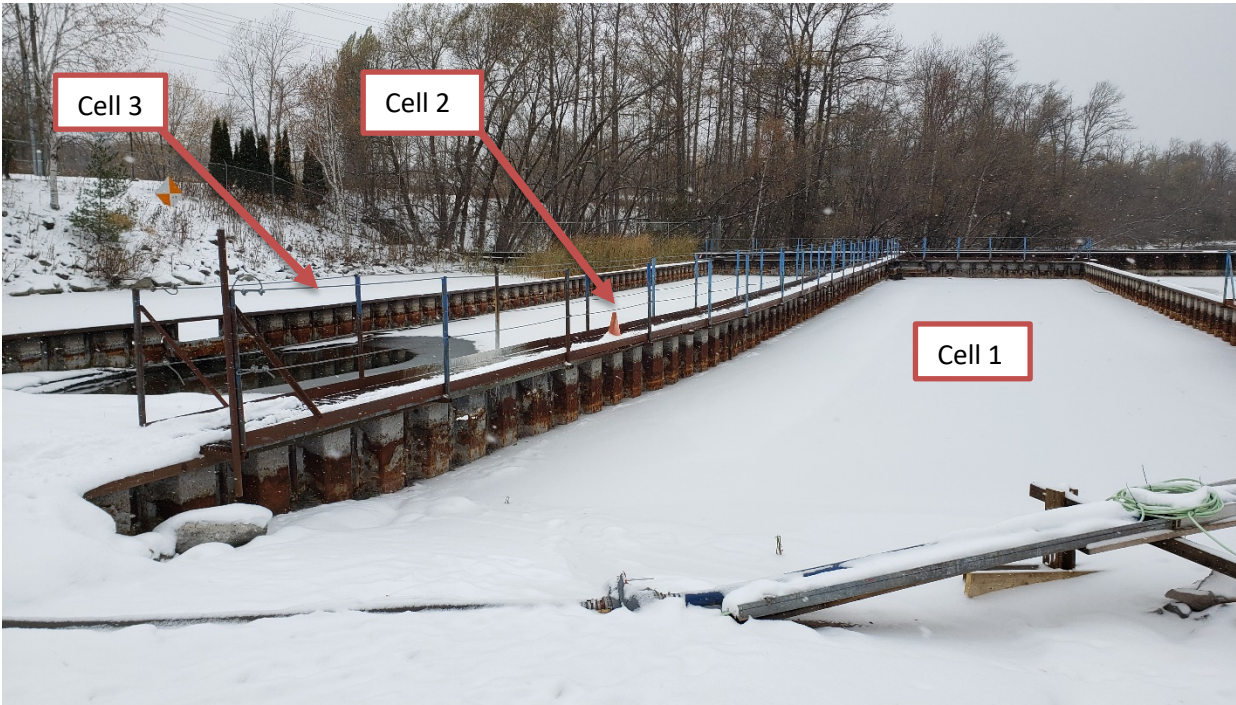


Photo No. 1 – Cells 3, 2, and 1

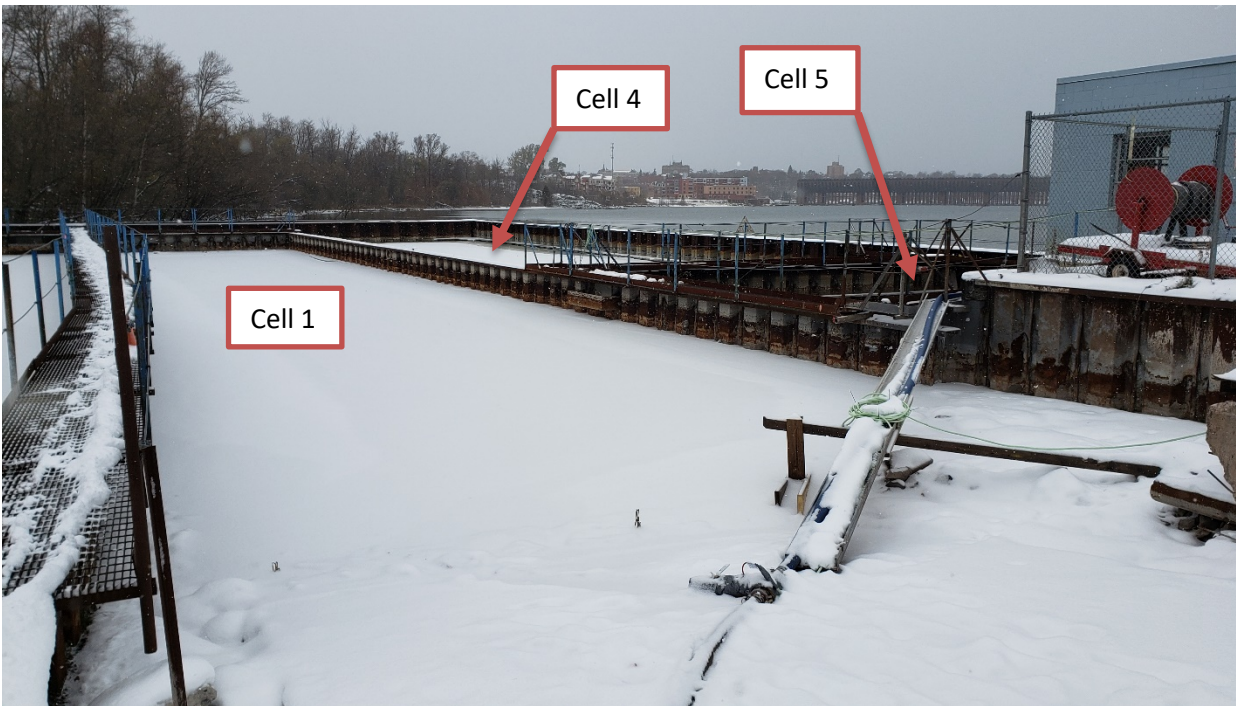


Photo No. 2 – Cells 1, 4, and 5

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Photo No. 3 – North Sheet Pile Wall



Photo No. 4 – North Sheet Pile Wall Condition

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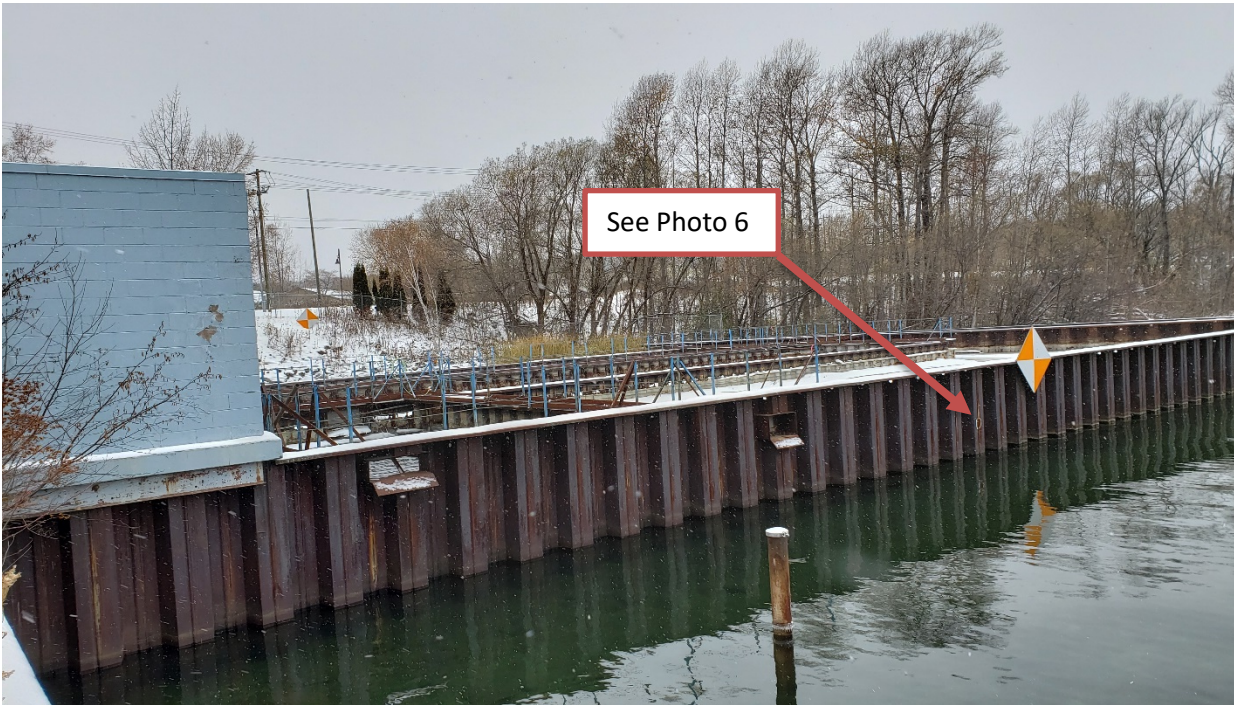


Photo No. 5 – East Sheet Pile Wall Condition



Photo No. 6 – East Wall Joint to Monitor

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Photo No. 7 – East Wall Alignment

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Photo No. 8 – Interior Wall Condition



Photo No. 9 – Adjacent Interior Walls