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Regulation Compliance Report

Weston Units 3 & 4 Bottom Ash Basin Hazard Potential Classification Assessment and Emergency Action Plan Determination

Weston Generating Station
Rothschild, Wisconsin

Submitted to:
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Project 1609370

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Table of Contents

Figures

Appendix

Tables

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1. Introduction

The Wisconsin Public Service Corporation (WPSC) owns and operates the Weston Generating Station located at 2501 Morrison Avenue in Rothschild, Wisconsin. The facility is a base load, electrical power station having two coal-fired boilers, a natural gas-fired generating unit, and two peaking units used for the production of electricity. The two coal-fired units, Units 3 & 4, have nameplate rated capacities of 325 and 595 MW and were commissioned in 1981 and 2008, respectively. WPSC burns sub-bituminous coal from the Powder River Basin as the primary fuel source in the boilers. As a result, coal combustion residuals (CCR), such as fly ash, bottom ash, and flue-gas desulfurization (FGD) material, are generated.

In general, bottom ash from Unit 3 is collected from the boiler and sluiced to a series of redundant treatment basins (i.e., CCR management units). CCR are sluiced to one of two primary settling basins where the CCR quickly settles out and the sluice water flows to the secondary basin. In general, the primary basins are dry and the dewatered bottom ash is removed from the primary basins on a weekly basis using a front-end loader and transported via dump truck to the ash storage pad for future beneficial use. Water from the secondary bottom ash basins is treated for pH and suspended solids, as needed, and pumped to a Tertiary Basin where the water is either reused as carriage water for sluicing bottom ash in a closed-loop system, used as non-potable water for the power plant, or discharged to the Wisconsin River under WPDES Permit No. WI-0042756-07-0 through Outfall 002. Figure 1: Overall Basin Flow Summary shows known inflows and outflows to the impoundments.

The secondary bottom ash basins are designed to provide a residence time for the CCR fines to settle out from the sluice water. To improve residence time and assist in settling the fines, silt curtains are used in the secondary bottom ash basins. In 2005, to increase the rail car capacity of the plant, the secondary bottom ash basins were bisected to facilitate the construction of a rail line. So rather than having north and south secondary bottom ash basins, Weston has Northeast, Northwest, Southeast, and Southwest secondary bottom ash basins. Equalizing underground conduits were installed beneath the rail lines to maintain the water levels of the Northeast and Northwest bottom ash basins and the Southeast and Southwest bottom ash basins. Based on the modifications to the secondary ash basins, Hard Hat Services (Hard Hat Services, 2015) completed an evaluation of the Northeast and Southeast secondary basins and determined that all bottom ash should settle out before ever reaching the west end of the Northeast and Southeast basins. Any CCR that could potentially accumulate in the Northwest or Southwest basins is considered de minimis.

On April 17, 2015, the U.S. Environmental Protection Agency (US EPA) published the Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule to regulate the disposal of CCR as solid waste under Subtitle D of the Resource Conservation and Recovery Act in the Federal Register. The rule creates a minimum standard for solid waste disposal facilities and solid waste management practices to limit adverse effects on health and/or the environment.

Based on the Rule, the Weston Units 3 & 4 bottom ash basins are regulated under 40 CFR Part 257 Subpart D as an existing CCR surface impoundment. Each CCR unit will record compliance with these requirements in the facility's operating record, notify the state of decisions, and maintain a publicly available website of compliance information.

As part of the design criteria under § 257.73 *Structural integrity criteria for existing CCR surface impoundments*, the owner or operator must operate perform periodic hazard potential classification assessments (§ 257.73 (a)(2)) to determine the need for an Emergency Action Plan (§ 257.73 (a)(3)) and based on the height and storage capacity of the impoundments determine the need for history of construction (§ 257.73 (c)), periodic structural stability assessments (§ 257.73 (d)), and periodic safety factor assessments (§ 257.7(e)). This report provides the hazard potential classification assessment and determinations for the Emergency Action Plan; history of construction; periodic structural stability assessment; and periodic safety assessments. The report contains the following sections:

Section 1 – Introduction

Section 2 – § 257.73 Structural Integrity Criteria for Existing CCR Surface Impoundments

Section 3 – Hazard Potential Assessment

Section 4 – Emergency Action Plan Determination

Section 5 – History of Construction, Periodic Structural Stability Assessments, and Periodic Safety Factor Assessments Determinations

Section 6 – Conclusion

Section 7 – References

2. § 257.73 Structural Integrity Criteria for Existing CCR Surface Impoundments

§ 257.73 Structural integrity criteria for existing CCR surface impoundments.

(a) The requirements of paragraphs (a)(1) through (4) of this section apply to all existing CCR surface impoundments, except for those existing CCR surface impoundments that are incised CCR units. If an incised CCR surface impoundment is subsequently modified (*e.g.*, a dike is constructed) such that the CCR unit no longer meets the definition of an incised CCR unit, the CCR unit is subject to the requirements of paragraphs (a)(1) through (4) of this section.

(1) No later than, December 17, 2015, the owner or operator of the CCR unit must place on or immediately adjacent to the CCR unit a permanent identification marker, at least six feet high showing the identification number of the CCR unit, if one has been assigned by the state, the name associated with the CCR unit and the name of the owner or operator of the CCR unit.

(2) *Periodic hazard potential classification assessments.*

(i) The owner or operator of the CCR unit must conduct initial and periodic hazard potential classification assessments of the CCR unit according to the timeframes specified in paragraph (f) of this section. The owner or operator must document the hazard potential classification of each CCR unit as either a high hazard potential CCR surface impoundment, a significant hazard potential CCR surface impoundment, or a low hazard potential CCR surface impoundment. The owner or operator must also document the basis for each hazard potential classification.

(ii) The owner or operator of the CCR unit must obtain a certification from a qualified professional engineer stating that the initial hazard potential classification and each subsequent periodic classification specified in paragraph (a)(2)(i) of this section was conducted in accordance with the requirements of this section.

(3) *Emergency Action Plan (EAP)*

(i) *Development of the plan.* No later than April 17, 2017, the owner or operator of a CCR unit determined to be either a high hazard potential CCR surface impoundment or a significant hazard potential CCR surface impoundment under paragraph (a)(2) of this section must prepare and maintain a written EAP. At a minimum, the EAP must:

(A) Define the events or circumstances involving the CCR unit that represent a safety emergency, along with a description of the procedures that will be followed to detect a safety emergency in a timely manner;

(B) Define responsible persons, their respective responsibilities, and notification procedures in the event of a safety emergency involving the CCR unit;

(C) Provide contact information of emergency responders;

(D) Include a map which delineates the downstream area which would be affected in the event of a CCR unit failure and a physical description of the CCR unit; and

(E) Include provisions for an annual face-to-face meeting or exercise between representatives of the owner or operator of the CCR unit and the local emergency responders.

(ii) *Amendment of the plan.*

(A) The owner or operator of a CCR unit subject to the requirements of paragraph (a)(3)(i) of this section may amend the written EAP at any time provided the revised plan is placed in the facility's operating record as required by § 257.105(f)(6). The owner or operator must amend the written EAP whenever there is a change in conditions that would substantially affect the EAP in effect.

(B) The written EAP must be evaluated, at a minimum, every five years to ensure the information required in paragraph (a)(3)(i) of this section is accurate. As necessary, the EAP must be updated and a revised EAP placed in the facility's operating record as required by § 257.105(f)(6).

(iii) *Changes in hazard potential classification.*

(A) If the owner or operator of a CCR unit determines during a periodic hazard potential assessment that the CCR unit is no longer classified as either a high hazard potential CCR surface impoundment or a significant hazard potential CCR surface impoundment, then the owner or operator of the CCR unit is no longer subject to the requirement to prepare and maintain a written EAP beginning on the date the periodic hazard potential assessment documentation is placed in the facility's operating record as required by § 257.105(f)(5).

(B) If the owner or operator of a CCR unit classified as a low hazard potential CCR surface impoundment subsequently determines that the CCR unit is properly re-classified as either a high hazard potential CCR surface impoundment or a significant hazard potential CCR surface impoundment, then the owner or operator of the CCR unit must prepare a written EAP for the CCR unit as required by paragraph (a)(3)(i) of this section within six months of completing such periodic hazard potential assessment.

(iv) The owner or operator of the CCR unit must obtain a certification from a qualified professional engineer stating that the written EAP, and any subsequent amendment of the EAP, meets the requirements of paragraph (a)(3) of this section.
(v) *Activation of the EAP.* The EAP must be implemented once events or circumstances involving the CCR unit that represent a safety emergency are detected, including conditions identified during periodic structural stability assessments, annual inspections, and inspections by a qualified person.

(4) The CCR unit and surrounding areas must be designed, constructed, operated, and maintained with vegetated slopes of dikes not to exceed a height of 6 inches above the slope of the dike, except for slopes which are protected with an alternate form(s) of slope protection.

(b) The requirements of paragraphs (c) through (e) of this section apply to an owner or operator of an existing CCR surface impoundment that either:

(1) Has a height of five feet or more and a storage volume of 20 acre-feet or more; or
(2) Has a height of 20 feet or more.

(c) *History of construction*

(1) No later than October 17, 2016, the owner or operator of the CCR unit must compile a history of construction, which shall contain, to the extent feasible, the information specified in paragraphs (c)(1)(i) through (xi) of this section.

(i) The name and address of the person(s) owning or operating the CCR unit; the name associated with the CCR unit; and the identification number of the CCR unit if one has been assigned by the state.
(ii) The location of the CCR unit identified on the most recent U.S. Geological Survey (USGS) 7½ minute or 15 minute topographic quadrangle map, or a topographic map of equivalent scale if a USGS map is not available.
(iii) A statement of the purpose for which the CCR unit is being used.
(iv) The name and size in acres of the watershed within which the CCR unit is located.
(v) A description of the physical and engineering properties of the foundation and abutment materials on which the CCR unit is constructed.
(vi) A statement of the type, size, range, and physical and engineering properties of the materials used in constructing each zone or stage of the CCR unit; the method of site preparation and construction of each zone of the CCR unit; and the approximate dates of construction of each successive stage of construction of the CCR unit.
(vii) At a scale that details engineering structures and appurtenances relevant to the design, construction, operation, and maintenance of the CCR unit, detailed dimensional drawings of the CCR unit, including a plan view and cross sections of the length and width of the CCR unit, showing all zones, foundation improvements, drainage provisions, spillways, diversion ditches, outlets, instrument locations, and slope protection, in addition to the normal operating pool surface elevation and the maximum pool surface elevation following peak discharge from the inflow design flood, the expected maximum depth of CCR within the CCR surface impoundment, and any identifiable natural or manmade features that could adversely affect operation of the CCR unit due to malfunction or mis-operation.
(viii) A description of the type, purpose, and location of existing instrumentation.
(ix) Area-capacity curves for the CCR unit.
(x) A description of each spillway and diversion design features and capacities and calculations used in their determination.
(xi) The construction specifications and provisions for surveillance, maintenance, and repair of the CCR unit.
(xii) Any record or knowledge of structural instability of the CCR unit.

(2) *Changes to the history of construction.* If there is a significant change to any information compiled under paragraph (c)(1) of this section, the owner or operator of the CCR unit must update the relevant information and place it in the facility's operating record as required by § 257.105(f)(9).

(d) *Periodic structural stability assessments.*

(1) The owner or operator of the CCR unit must conduct initial and periodic structural stability assessments and document whether the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering practices for the maximum volume of CCR and CCR wastewater which can be impounded therein. The assessment must, at a minimum, document whether the CCR unit has been designed, constructed, operated, and maintained with:

(i) Stable foundations and abutments;
(ii) Adequate slope protection to protect against surface erosion, wave action, and adverse effects of sudden drawdown;
(iii) Dikes mechanically compacted to a density sufficient to withstand the range of loading conditions in the CCR unit;
(iv) Vegetated slopes of dikes and surrounding areas not to exceed a height of six inches above the slope of the dike, except for slopes which have an alternate form or forms of slope protection;
(v) A single spillway or a combination of spillways configured as specified in paragraph (d)(1)(v)(A) of this section. The combined capacity of all spillways must be designed, constructed, operated, and maintained to adequately manage flow during and following the peak discharge from the event specified in paragraph (d)(1)(v)(B) of this section.

(A) All spillways must be either:

(*1*) Of non-erodible construction and designed to carry sustained flows; or

(*2*) Earth- or grass-lined and designed to carry short-term, infrequent flows at non-erosive velocities where sustained flows are not expected.

(B) The combined capacity of all spillways must adequately manage flow during and following the peak discharge from a:

(*1*) Probable maximum flood (PMF) for a high hazard potential CCR surface impoundment; or

(*2*) 1000-year flood for a significant hazard potential CCR surface impoundment; or

(*3*) 100-year flood for a low hazard potential CCR surface impoundment.

(vi) Hydraulic structures underlying the base of the CCR unit or passing through the dike of the CCR unit that maintain structural integrity and are free of significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, and debris which may negatively affect the operation of the hydraulic structure; and

(vii) For CCR units with downstream slopes which can be inundated by the pool of an adjacent water body, such as a river, stream or lake, downstream slopes that maintain structural stability during low pool of the adjacent water body or sudden drawdown of the adjacent water body.

(2) The periodic assessment described in paragraph (d)(1) of this section must identify any structural stability deficiencies associated with the CCR unit in addition to recommending corrective measures. If a deficiency or a release is identified during the periodic assessment, the owner or operator unit must remedy the deficiency or release as soon as feasible and prepare documentation detailing the corrective measures taken.

(3) The owner or operator of the CCR unit must obtain a certification from a qualified professional engineer stating that the initial assessment and each subsequent periodic assessment was conducted in accordance with the requirements of this section.

(e) *Periodic safety factor assessments.*

(1) The owner or operator must conduct an initial and periodic safety factor assessments for each CCR unit and document whether the calculated factors of safety for each CCR unit achieve the minimum safety factors specified in paragraphs (e)(1)(i) through (iv) of this section for the critical cross section of the embankment. The critical cross section is the cross section anticipated to be the most susceptible of all cross sections to structural failure based on appropriate engineering considerations, including loading conditions. The safety factor assessments must be supported by appropriate engineering calculations.

(i) The calculated static factor of safety under the long-term, maximum storage pool loading condition must equal or exceed 1.50.

(ii) The calculated static factor of safety under the maximum surcharge pool loading condition must equal or exceed 1.40.

(iii) The calculated seismic factor of safety must equal or exceed 1.00.

(iv) For dikes constructed of soils that have susceptibility to liquefaction, the calculated liquefaction factor of safety must equal or exceed 1.20.

(2) The owner or operator of the CCR unit must obtain a certification from a qualified professional engineer stating that the initial assessment and each subsequent periodic assessment specified in paragraph (e)(1) of this section meets the requirements of this section.

(f) *Timeframes for periodic assessments*

(1) *Initial assessments.* Except as provided by paragraph (f)(2) of this section, the owner or operator of the CCR unit must complete the initial assessments required by paragraphs (a)(2), (d), and (e) of this section no later than October 17, 2016. The owner or operator has completed an initial assessment when the owner or operator has placed the assessment required by paragraphs (a)(2), (d), and (e) of this section in the facility's operating record as required by § 257.105(f)(5), (10), and (12).

(2) *Use of a previously completed assessment(s) in lieu of the initial assessment(s).* The owner or operator of the CCR unit may elect to use a previously completed assessment to serve as the initial assessment required by paragraphs (a)(2), (d), and (e) of this section provided that the previously completed assessment(s):

(i) Was completed no earlier than 42 months prior to October 17, 2016; and

(ii) Meets the applicable requirements of paragraphs (a)(2), (d), and (e) of this section.

(3) *Frequency for conducting periodic assessments.* The owner or operator of the CCR unit must conduct and complete the assessments required by paragraphs (a)(2), (d), and (e) of this section every five years. The date of completing the initial assessment is the basis for establishing the deadline to complete the first subsequent assessment. If the owner or operator elects to use a previously completed assessment(s) in lieu of the initial assessment as provided by paragraph (f)(2) of this section, the date of the report for the previously completed assessment is the basis for establishing the deadline to complete the first subsequent assessment. The owner or operator may complete any required assessment prior to the required deadline provided the owner or operator places the completed assessment(s) into the facility's operating record within a reasonable amount of time. In all cases, the deadline for completing subsequent assessments is based on the date of completing the previous assessment. For purposes of this paragraph (f)(3), the owner or operator has completed an assessment when the relevant assessment(s) required by paragraphs (a)(2), (d), and (e) of this section has been placed in the facility's operating record as required by § 257.105(f)(5), (10), and (12).

(4) *Closure of the CCR unit.* An owner or operator of a CCR unit who either fails to complete a timely safety factor assessment or fails to demonstrate minimum safety factors as required by paragraph (e) of this section is subject to the requirements of § 257.101(b)(2).

(g) The owner or operator of the CCR unit must comply with the recordkeeping requirements specified in § 257.105(f), the notification requirements specified in § 257.106(f), and the internet requirements specified in § 257.107(f).

3. Hazard Potential Assessment

As part of the design criteria under § 257.73 (a)(2) – Periodic Hazard Potential Assessments, the owner or operator must conduct an initial hazard potential classification assessment of the CCR unit. The hazard potential classification is defined by the Rule as:

> *Hazard potential classification means the possible adverse incremental consequences that result from the release of water or stored contents due to failure of the diked CCR surface impoundment or mis-operation of the diked CCR surface impoundment or its appurtenances. The hazardous potential classifications include high hazard potential CCR surface impoundment, significant hazard potential CCR surface impoundment, and low hazard potential CCR surface impoundment, which terms mean:*
> *(1) High hazard potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation will probably cause loss of human life.*
> *(2) Low hazard potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the surface impoundment owner's property.*
> *(3) Significant hazard potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation results in no probable loss of human life, but can cause economic loss, environmental damage, disruption of lifeline facilities, or impact*

The United State Army Corp of Engineers ER 1110-2-106 - Recommended Guidelines for Safety Inspection of Dams dated 26 September 1979, outlines principal factors to be weighed in the determination of existing or potential hazards. Based on the ER 1110-2-106 the two significant factors in determining the hazard potential classification are the size of the impoundment and the potential for the loss of life. Table 3.1 – Size Classification categorizes the impoundments based on storage capacity and height of the dam.

Table 3.1
Size Classification

Category	Impoundment	
	Storage (acre-feet)	Height (feet)
Small	50 and <1,000	25 and <40
Intermediate	1,000 and <50,000	40 and <100
Large	>50,000	>100

Table 3.2 – Hazard Potential categorizes the impoundments based on the potential for loss of life and economic loss.

Table 3.2 Hazard Potential		
Category	Loss of Life (Extent of Development)	Economic Loss (Extent of Development)
Low	None Expected (No permanent structures for human habitation)	Minimal (undeveloped to occasional structures or agriculture)
Significant	Few (No urban development and no more than a small number of uninhabited structures)	Appreciable (notable agriculture, industry, or structures)
High	More than a few	Excessive (Extensive community, industry, or agriculture)

The hazard potential of the impoundments is dependent on the impoundments' location relative to inhabited structures, industrial and urban development, and critical infrastructure. The area downstream of the impoundments is rural, wooded, and undeveloped. The nearest critical infrastructure downstream of the impoundments is the Mosinee Dam, which is approximately 6.0 miles downstream along the Wisconsin River. This reach of the river is wooded and undeveloped. Figure 2 – Flow Path to Mosinee Dam is an image from Google Earth showing the flow path from the southwest impoundment to the Mosinee Dam.

Table 3.3 – Weston Bottom Ash Basins Size Classification and Hazard Potential summarizes the size, height, and hazard potential for loss of life and economic loss.

Table 3.3 Weston Bottom Ash Basoms Size Classification and Hazard Potential			
Impoundment	Size (acre-feet)	Height (feet)	Hazard Potential
Northeast	9.0	8.5	Low/Low
Southeast	4.6	11.0	Low/Low
Northwest	11.1	8.5	Low/Low
Southwest	3.0	11.0	Low/Low

Based on the capacity and height of the impoundments, the location of the impoundments, and the distance to critical infrastructure, the Weston Units 3 & 4 Bottom Ash Basins are less than small in size and low hazard potential CCR surface impoundments. This determination is consistent with findings presented in dam assessment report for the CCR units conducted by Dewberry Consultants, LLC (Dewberry) as part of the Round 12 CCR Impoundment Dam Assessment Reports completed for the US EPA. Dewberry concluded that the impoundments are small, low-hazard potential dams; critical infrastructure is nearly non-existent within 5 miles downstream of the impoundments; and during the site visit this potential failure path was observed to intersect a perimeter ditch, originally constructed as part of construction storm water management. This ditch terminates at a berm, which would prevent releases from entering the Wisconsin River.

4. Emergency Action Plan Determination

As part of the design criteria, § 257.73 (a)(3) Emergency Action Plan, the owner or operator is required to prepare an Emergency Action Plan no later than April 17, 2017, if the owner or operator determines the CCR surface impoundment is either a high hazard potential or a significant hazard potential CCR surface impoundment. The Units 3 & 4 Bottom Ash Basins at the Weston Generating Station are low hazard potential surface impoundments and WPSC is not required to develop an Emergency Action Plan in accordance with § 257.73 (a)(3).

5. History of Construction, Periodic Structural Stability Assessments, and Periodic Safety Factor Assessments Determinations

As part of the design criteria, § 257.73 (b) exempts low height and low volume CCR surface impoundments from the requirements to document the history of construction, § 257.73 (c), periodic structural stability assessments, § 257.73 (d), and periodic safety factor assessments § 257.7(e).

§ 257.73 (b) The requirements of paragraphs (c) through (e) of this section apply to an owner or operator of an existing CCR surface impoundment that either:

(1) Has a height of five feet or more and a storage volume of 20 acre-feet or more; or
(2) Has a height of 20 feet or more.

Based on the size of the impoundments summarized in Table 3.3 – Weston Bottom Ash Basins Size Classification and Hazard Potential and Appendix A – Secondary Bottom Ash Basins Staged-Storage Capacity, WPSC is exempt from the requirements of § 257.73 paragraphs (c) through (e) in accordance with § 257.73 (b)(1) because none of the impoundments have a height of five feet or more and a storage volume of 20 acre-feet or more.

6. Conclusion

The Weston Units 3 & 4 Bottom Ash Basins are regulated under 40 CFR Part 257 Subpart D as an existing CCR surface impoundment. § 257.73 (a) specifies that existing CCR surface impoundments must make an initial hazard potential assessment by October 17, 2016, and if necessary, develop an Emergency Action Plan no later than April 17, 2017. Base on the initial hazard potential assessment, the Weston Units 3 & 4 Bottom Ash Basins are small, low hazard potential impoundments and are not required to develop an Emergency Action Plan in accordance § 257.73 (a)(3).

§ 257.73 (b) requires impoundments having height of five feet or more and a storage volume of 20 acre-feet or more; or a height of 20 feet or more to compile a history of construction, completed periodic structural stability assessments, and periodic safety factor assessments in accordance with paragraphs § 257.73 (c), § 257.73 (d), and § 257.7(e), respectively. Based on the size of the Weston Units 3 & 4 Bottom Ash Basins, WPSC is exempt from compiling a history of construction, completing periodic structural stability assessments, and completing periodic safety factor assessments in accordance with paragraphs § 257.73 (c), § 257.73 (d), and § 257.7(e), respectively.

The Hazard Potential Classification and Emergency Action Plan determination were completed under the direction of John, M. Trast, P.E. I am a licensed professional engineer in the State of Wisconsin in accordance with the requirements of ch. A-E 4, Wisconsin Administrative Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wisconsin Administrative Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in 40 CFR Part 257 Subpart D.

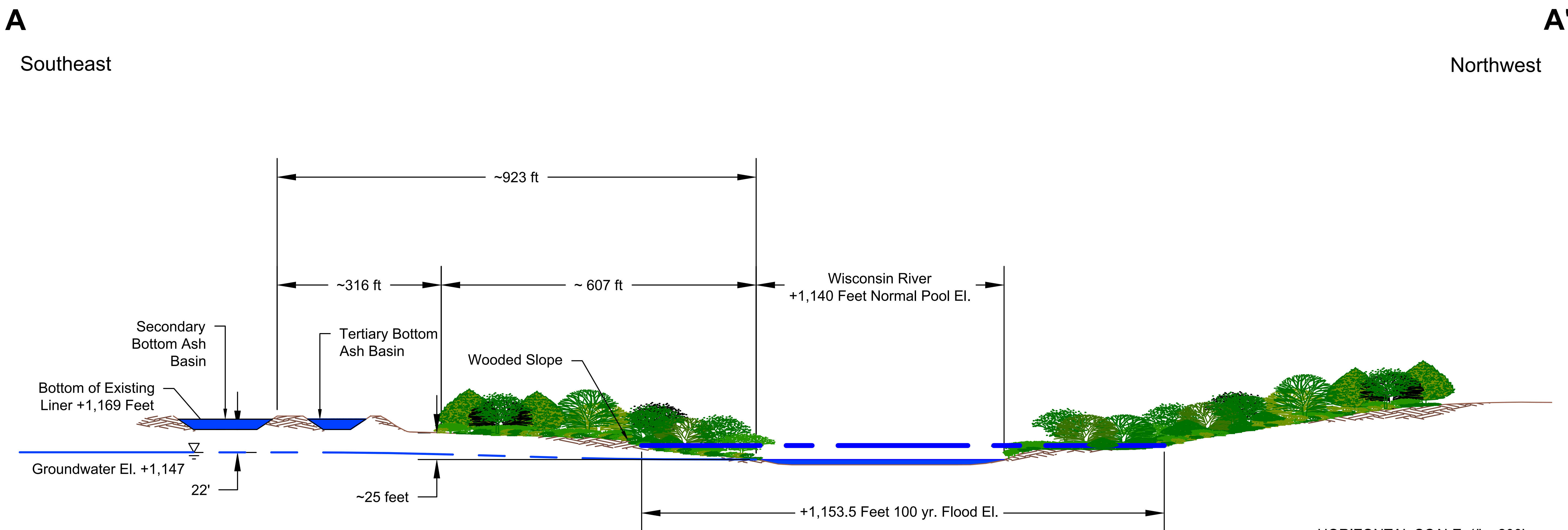
7. References

Dewberry Consultants LLC (2014). Coal Combustion Residue Impoundment Round 12 – Dam Assessment Report. Weston Generating Station (Site 26) Northeastern, Northwestern, Southeastern and Southwestern Secondary Bottom Ash Treatment Ponds. Wisconsin Public Service, Rothschild, WI. February 2014.

Hard Hat Services (2015), Northwest and Southwest Pond Classification, Weston Generating Station, Weston, WI. October 7, 2015

U.S. Army Corp of Engineers, (1979), "Recommended Guidelines for Safety Inspection of Dams," ER 1110-2-106. Washington D.C., September 1979.

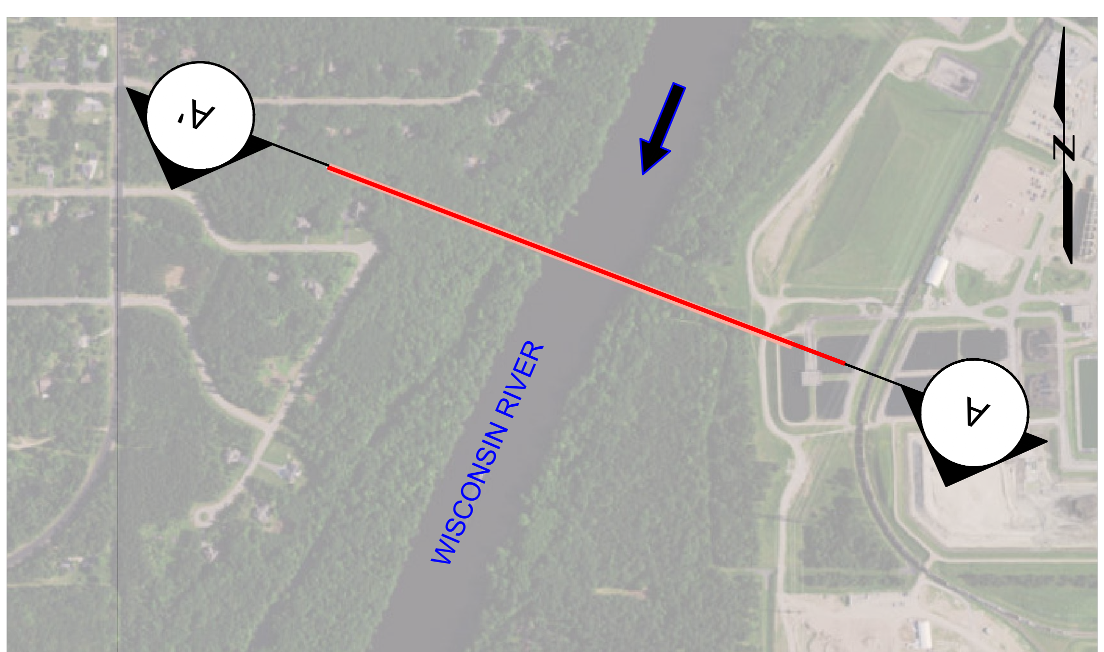
Figures



SECTION VIEW

HORIZONTAL SCALE: 1" = 200'
0 200' 400'

0 100' 200'
VERTICAL SCALE: 1" = 100'
NOTE: 2x VERTICAL EXAGGERATION



PLAN VIEW
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WPS Weston Units 3-4 Ash Impoundments Weston Generating Station, Rothschild, Wisconsin	GEI Consultants	GENERALIZED CROSS SECTION
Wisconsin Public Service Corporation Green Bay, Wisconsin 54301	Project 1609370	August 2016 Fig. 1

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WPS Weston Units 3 & 4 Ash Impoundments Weston Generating Station, Rothschild, Wisconsin	GEI Consultants	Flow Path to Mosinee Dam
Wisconsin Public Service Corporation Green Bay, Wisconsin 54301	1609370	August 2016 — Fig. 2

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Appendix A

Secondary Ash Basins Staged-Storage Capacity

Secondary Bottom Ash Basins Stage-Storage Capacity

GEI Consultants

Elevation (feet) (NAVD 1988)	Storage Capacity by Basin							
	NE Secondary Basin	Cumulative Capacity NE Basin	SE Secondary Basin	Cumulative Capacity SE Basin	NW Secondary Basin	Cumulative Capacity NW Basin	SW Secondary Basin	Cumulative Capacity SW Basin
	(gallons)	(acre-feet)	(gallons)	(acre-feet)	(gallons)	(acre-feet)	(gallons)	(acre-feet)
1,173.00	0	0.0	0	0.0	0	0.0	0	0.0
1,173.25	0	0.0	0	0.0	24,993	0.1	14,142	0.0
1,173.50	0	0.0	0	0.0	49,292	0.2	28,314	0.1
1,173.75	30,832	0.1	57,860	0.2	50,231	0.4	29,032	0.2
1,174.00	85,734	0.4	115,454	0.5	51,178	0.5	29,757	0.3
1,174.25	112,834	0.7	143,253	1.0	52,131	0.7	30,490	0.4
1,174.50	114,740	1.1	145,435	1.4	53,090	0.9	31,229	0.5
1,174.75	116,655	1.4	147,623	1.9	54,056	1.0	31,976	0.6
1,175.00	118,578	1.8	149,818	2.3	55,029	1.2	32,730	0.7
1,175.25	120,509	2.1	152,020	2.8	56,009	1.4	33,491	0.8
1,175.50	122,448	2.5	154,228	3.3	56,995	1.5	34,260	0.9
1,175.75	124,395	2.9	156,442	3.8	57,987	1.7	35,035	1.0
1,176.00	126,351	3.3	158,663	4.2	58,987	1.9	35,819	1.1
1,176.25	128,314	3.7	160,891	4.7	59,993	2.1	36,609	1.2
1,176.50	130,286	4.1	163,128	5.2	61,005	2.3	37,407	1.4
1,176.75	132,267	4.5	165,372	5.7	62,024	2.5	38,213	1.5
1,177.00	134,256	4.9	167,625	6.3	63,049	2.7	39,026	1.6
1,177.25	136,255	5.3	169,886	6.8	64,080	2.9	39,847	1.7
1,177.50	138,262	5.7	172,156	7.3	65,118	3.1	40,675	1.8
1,177.75	140,278	6.2	174,433	7.8	66,162	3.3	41,511	2.0
1,178.00	142,303	6.6	176,719	8.4	67,213	3.5	42,355	2.1
1,178.25	144,336	7.1	179,013	8.9	68,269	3.7	43,206	2.2
1,178.50	146,379	7.5	181,316	9.5	69,332	3.9	44,065	2.4
1,178.75	148,430	8.0	183,628	10.1	70,401	4.1	44,932	2.5
1,179.00	150,490	8.4	185,948	10.6	71,477	4.3	45,806	2.6
1,179.25	152,559	8.9	188,277	11.2	72,558	4.5	46,687	2.8
1,179.50	154,637	9.4	190,615	11.8	73,646	4.8	47,576	2.9
1,179.75	156,723	9.8	192,961	12.4	74,740	5.0	48,473	3.1
1,180.00	158,818	10.3	195,316	13.0	75,841	5.2	49,377	3.2
1,180.25	160,923	10.8	197,679	13.6	76,949	5.5	50,288	3.4
1,180.50	163,035	11.3	200,052	14.2	78,066	5.7	51,206	3.5
1,180.75	165,157	11.8	202,433	14.8	79,192	6.0	52,131	3.7
1,181.00	167,288	12.3	204,822	15.4	80,328	6.2	53,063	3.9
1,181.25	169,387	12.9	207,180	16.1	81,473	6.4	54,002	4.0
1,181.50	171,415	13.4	209,467	16.7	82,628	6.7	54,948	4.2
1,181.75	173,411	13.9	211,722	17.4	83,792	7.0	55,901	4.4
1,182.00	175,416	14.5	213,985	18.0	84,966	7.2	56,861	4.5
1,182.25	177,427	15.0	216,258	18.7	86,066	7.5	57,829	4.7
1,182.50	179,427	15.6	218,558	19.4	87,166	7.8	58,759	4.9
Total Basin Storage Capacity	5,070,555	15.6	6,310,238	19.4	2,525,513	7.8	1,597,028	4.9

Normal maximum operating elevation is El. 1,180.50 feet