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T. Barkley: Exhibit G

FINAL REPORT
ROUND 10 DAM ASSESSMENT
DYNEGY MIDWEST GENERATION, LLC – BALDWIN ENERGY COMPLEX
PRIMARY FLY ASH POND, SECONDARY FLY ASH POND, SECONDARY POND, INTERMEDIATE POND, FINAL POND
BALDWIN, ILLINOIS

PREPARED FOR:

U.S. Environmental Protection Agency
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PREPARED BY:

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December 21, 2012
GZA File No. 170142.30

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RE: FINAL Assessment of Dam Safety of Coal Combustion Surface Impoundments at the Baldwin Energy Complex

Dear Mr. Hoffman,

In accordance with our proposal 01.P0000177.11 dated March 28, 2011, and U.S. Environmental Protection Agency (EPA) Contract No. EP10W001313, Order No. EP-B115-00049, GZA GeoEnvironmental, Inc. (GZA) has completed our assessment of the Baldwin Energy Complex Coal Combustion Waste (CCW) Impoundments located in Baldwin, Illinois. The site visit was conducted on May 24 and 25, 2011. The purpose of our efforts was to provide the EPA with a site specific assessment of the impoundments to assist EPA in assessing the structural stability of the impoundments under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 104(e). We are submitting one hard copy and one CD-ROM copy of this Final Report directly to the EPA.

Based on our visual assessment, and in accordance with the EPA's criteria, the Primary Fly Ash Pond, Secondary Pond, Secondary Fly Ash Pond, Intermediate Pond, and Final Pond are currently in **POOR** condition in our opinion. Further discussion of our evaluation and recommended actions are presented in the Task 3 Dam Assessment Report. The report includes: (a) a completed Coal Combustion Dam Inspection Checklist Form for each Basin; (b) a field sketch; and (c) selected photographs with captions. Our services and report are subject to the Limitations found in **Appendix A** and the Terms and Conditions of our contract agreement.

We are happy to have been able to assist you with this assessment and appreciate the opportunity to continue to provide you with dam engineering consulting services. Please contact the undersigned if you have any questions or comments regarding the content of this Task 3 Dam Assessment Report.

Sincerely,

GZA GeoEnvironmental, Inc.

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PREFACE

The assessment of the general condition of the dams/impoundment structures reported herein was based upon available data and visual inspections. Detailed investigations and analyses involving topographic mapping, subsurface investigations, testing and detailed computational evaluations were beyond the scope of this report.

In reviewing this report, it should be realized that the reported condition of the dams and/or impoundment structures was based on observations of field conditions at the time of inspection, along with data available to the inspection team. In cases where an impoundment is lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions, which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is critical to note that the condition of the dam and/or impoundment structures depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the reported condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

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EXECUTIVE SUMMARY

This Assessment Report presents the results of a visual assessment of the Dynegy Midwest Generation, LLC (Dynegy) – Baldwin Energy Complex (BEC) Coal Combustion Waste (CCW) Impoundments located at 10901 Baldwin Road, Baldwin, Illinois. These assessments were performed on May 24 and 25, 2011 by representatives of GZA GeoEnvironmental, Inc (GZA), accompanied by representatives of Dynegy.

The BEC is a three-unit coal-fired power plant, with a maximum generating capacity of approximately 1800 Megawatts. Commercial operation of the facility began in the 1970's. Unlined earthen embankment CCW Impoundments (Primary Fly Ash Pond, Intermediate Pond, and Final Pond) were constructed in conjunction with the BEC facility for the purpose of storing and disposing non-recyclable CCW from the BEC facility and clarification of water prior to discharge. The Primary Fly Ash Pond (PFAP) was expanded in 1981 to the south and west and included the area that was later split into the Secondary Fly Ash Pond (SFAP). The PFAP was originally constructed with 35 foot embankments and was expanded vertically in 1989 with a 20 foot 'raise'. In response to a failure of the southern embankment of the PFAP in February 1995, an Intermediate Embankment was constructed and resulted in the separation of the SFAP from the PFAP. A berm (Secondary Dike) was constructed upstream of the Intermediate Pond in approximately 1998 and resulted in the construction of the Secondary Pond.

Water and CCW is discharged into the PFAP where the CCW is allowed to settle and water is discharged into the SFAP and the Secondary Pond. Solids are further settled in the SFAP prior to water discharge to the Secondary Pond. Water flows sequentially through the Secondary, Intermediate and Final Ponds for further clarification prior to discharge of the water near the southwest corner of the property.

For the purposes of this EPA-mandated assessment, the sizes of the impoundments were based on U. S. Army Corps of Engineers (USACE) criteria. Based on the maximum crest height of 55 feet and a storage volume of approximately 10,000 acre-feet, the PFAP is classified as an **Intermediate** sized structure. Based on the maximum crest height of 55 feet and a current storage volume of 1,650 acre-feet, the SFAP Impoundment is classified as an **Intermediate** sized structure. Based on the maximum crest height of 12 feet and a storage volume of approximately 190 acre-feet, the Secondary Pond is classified as a **Small** sized structure. Based on the maximum crest height of 20 feet and a storage volume of approximately 40 acre-feet, the Intermediate Pond is classified as a **Small** sized structure. Based on the maximum crest height of 32 feet and a storage volume of approximately 72 acre-feet, the Final Pond is classified as a **Small** sized structure.

According to guidelines established by the USACE, dams with a storage volume less than 1,000 acre-feet and/or a height less than 40 feet are classified as Small sized structures and dams with a storage volume between 1,000 acre-feet and 50,000 acre-feet and/or a height between 40 feet and 100 feet are classified as Intermediate sized structures.

Under the EPA classification system, as presented on page 2 of the EPA check list (**Appendix C**) and Definitions section (**Appendix B**), it is GZA's opinion that the PFAP, SFAP and the Final Pond would be considered as having a **Significant** hazard potential. The hazard potential rating is based on no probable loss of human life due to failure and the potential environmental impacts outside of Utility owned property.

Under the EPA classification system, as presented on page 2 of the EPA check list (**Appendix C**) and Definitions section (**Appendix B**), it is GZA's opinion that the Secondary Pond and the Intermediate Pond would be considered as having a **Low** hazard potential. The hazard potential rating is based on no probable loss of human life due to failure and the potential environmental impacts would likely be limited to Utility owned property.

Assessments

In general, the overall condition of the PFAP impoundment was judged to be **POOR**. The PFAP impoundment was found to have the following deficiencies:

1. Thick vegetation and trees along the upstream and downstream slopes;
2. Minor potholes and rutting along the crest gravel access road;
3. Damaged discharge pipe from the northern decant;
4. The absence of erosion protection on the embankment near the discharge location of the northern decant has allowed erosion of the embankment;
5. No hydraulic/hydrologic analysis has been performed to confirm adequate freeboard and decant capacity at the design storm event;
6. The stability analysis completed does not account for storm event loading conditions; and,
7. No stability analysis was provided for the Intermediate Embankment.

In general, the overall condition of the SFAP impoundment was judged to be **POOR**. The SFAP impoundment was found to have the following deficiencies:

1. Thick vegetation and trees along the upstream and downstream slopes;
2. Minor potholes and rutting along the crest gravel access road;
3. Scarp present on the downstream slope of the northern embankment;
4. The stability analysis for the SFAP is incomplete for portions of the embankments and does not indicate that the embankments meet generally accepted levels of stability for the sections analyzed; and
5. No hydraulic/hydrologic analysis has been performed to confirm adequate freeboard and decant capacity at the design storm event.

In general, the overall condition of the Secondary Pond impoundment was judged to be **POOR**. The Secondary Pond impoundment was found to have the following deficiencies:

1. No hydraulic/hydrologic analysis has been performed to confirm adequate freeboard, decant and overflow spillway capacity; and,
2. No seepage and/or stability analysis has been performed for the Secondary Dike.

In general, the overall condition of the Intermediate Pond impoundment was judged to be **POOR**. The Intermediate Pond impoundment was found to have the following deficiencies:

1. Thick vegetation and trees along the upstream and downstream slopes;
2. Potholes along the crest gravel access road;
3. Concrete covering the downstream slope prohibits monitoring of potential erosion;
4. No hydraulic/hydrologic analysis has been performed to confirm adequate freeboard and decant/overflow spillway capacity;
5. In GZA's opinion, the stability analysis for the impoundment was incomplete; and,

   Additional analysis was completed and provided to GZA after issuance of the DRAFT report that satisfies our recommendation. No further analysis is recommended at this time.

6. No evaluation has been conducted to verify the stability of the overflow section against piping or fines erosion.

In general, the overall condition of the Final Pond impoundment was judged to be **POOR**. The Final Pond impoundment was found to have the following deficiencies:

1. Thick vegetation and trees along the downstream slopes;
2. Minor potholes along the crest gravel access road;
3. No hydraulic/hydrologic analysis has been performed to confirm adequate freeboard and decant/overflow spillway capacity;
4. In GZA's opinion, the stability analysis for the impoundment was incomplete; and,

   Additional analysis was completed and provided to GZA after issuance of the DRAFT report that satisfies our recommendation. No further analysis is recommended at this time.

5. No evaluation has been conducted to verify the stability of the overflow section against piping or fines erosion.

The following recommendations and remedial measures generally describe the recommended approach to address current deficiencies at the impoundments. Prior to undertaking recommended maintenance, repairs, or remedial measures, the applicability of permits needs to be determined for activities that may occur under the jurisdiction of the appropriate regulatory agencies.

GZA recommends that BEC/Dynegy conduct the following studies and analysis:

1. Conduct an analysis of the hydraulic/hydrologic condition of the impoundments to establish the rise in water level that occurs during the 100-year, 24-hour rain event to confirm that adequate freeboard is maintained and adequate decant and spillway capacity is available. The loading conditions established during the design storm event should be used in the evaluation of the seepage and stability evaluation of the embankments.

2. Address the deficiencies noted in Section 2.6 and Section 3.1 for the stability and seepage analysis previously conducted for the impoundments and establish a complete seepage and stability analysis for each impoundment.

3. Evaluate the potential for piping and fines erosion along the overflow sections of the Ash Pond Dike and the Settling Pond Dike.

4. Moist soil conditions were observed along the downstream slope and/or toe of the southern embankment of the SFAP. This condition may indicate the presence of seepage in that area and should be evaluated. We recommend removing all trees on the downstream slope and toe area and evaluation of the moist soil conditions.

5. Develop an Emergency Action Plan.

Recurrent Operation & Maintenance Recommendations

GZA recommends the following operation and maintenance level activities:

1. Increased mowing of the grasses on the embankments to facilitate assessments and reduce the risk of burrowing animals;

2. Repair the potholes present in the gravel crest access roads. Grade the road to provide better drainage and reduce future potholing; and,

3. Clear trees and other deep rooted vegetation from the slopes and crests of the embankments.

Repair Recommendations

GZA recommends the following repairs to address observed deficiencies that may affect the stability of the embankments. The recommendations may require design by a professional engineer and construction contractor experienced in impoundment construction.

1. Repair the discharge pipe and the embankment erosion near the discharge pipe from PFAP's northern decant. Protect the embankment with riprap or other erosion control features.

2. Remove the concrete located on the downstream slope of the Ash Pond Dike. Repair any erosion observed beneath the concrete and replace with fill engineered to provide a stable embankment that is not susceptible to erosion or piping.

3. Pending the results of the hydraulic/hydrologic analysis, modify the design or operation of the impoundments to provide adequate capacity.

4. Pending the results of the complete seepage and stability analysis for each impoundment, modify the design or operation of the impoundments to provide conditions that result in embankments that meet the generally accepted factors of safety.

Alternatives

There are no practical alternatives to the repairs itemized above.

PRIMARY FLY ASH, SECONDARY FLY ASH, SECONDARY, INTERMEDIATE AND FINAL POND IMPOUNDMENTS
DYNEGY MIDWEST GENERATION LLC, BALDWIN ENERGY COMPLEX
BALDWIN, ILLINOIS

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PRIMARY FLY ASH, SECONDARY FLY ASH, SECONDARY, INTERMEDIATE AND FINAL IMPOUNDMENT PONDS
DYNEGY MIDWEST GENERATION, LLC, BALDWIN ENERGY COMPLEX
BALDWIN, ILLINOIS

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1.0 DESCRIPTION OF PROJECT

1.1 General

1.1.1 Authority

The United States Environmental Protection Agency (EPA), has retained GZA GeoEnvironmental, Inc. (GZA) to perform a visual assessment and develop a report of conditions for the Dynegy Midwest Generation, LLC, (Dynegy, Owner) Baldwin Energy Complex (BEC, Site) Coal Combustion Waste (CCW) Impoundments in Randolph County, Illinois. This assessment was authorized by the EPA under the authority of the Comprehensive Environmental response, Compensation, and Liability Act (CERCLA) Section 104(e). This assessment and report were performed in accordance with Request for Quote (RFQ) RFQ-DC-16, dated March 16, 2011 and EPA Contract No. EP10W001313, Order No. EP-B11S-00049. The assessment generally conformed to the requirements of the Federal Guidelines for Dam Safety[1], and this report is subject to the limitations contained in **Appendix A** and the Terms and Conditions of our Contract Agreement.

1.1.2 Purpose of Work

The purpose of this investigation was to visually inspect and evaluate the present condition of the impoundments and appurtenant structures (the management unit) to attempt to identify conditions that may adversely affect their structural stability and functionality, to note the extent of any deterioration that may be observed, review the status of maintenance and needed repairs, and to evaluate the conformity with current design and construction standards of care.

The investigation was divided into five parts: 1) obtain and review available reports, investigations, and data from the Owner pertaining to the impoundment and appurtenant structures; 2) perform a review with the Owner of available design, assessment, and maintenance data and procedures for the management unit; 3) perform a visual assessment of the site; 4) prepare and submit a field assessment checklist; and 5) prepare and submit a draft and a final report presenting the evaluation of the structure, including recommendations and proposed remedial actions.

1.1.3 Definitions

To provide the reader with a better understanding of the report, definitions of commonly used terms associated with dams are provided in **Appendix B**. Many of these terms may be included in this report. The terms are presented under common categories associated with dams which include: 1) orientation; 2) dam components; 3) size classification; 4) hazard classification; 5) general; and 6) condition rating.

[1] FEMA/ICODS, April 2004: http://www.ferc.gov/industries/hydropower/safety/guidelines/fema-93.pdf

1.2 Description of Project

1.2.1 Location

The BEC is located about ¾ -miles north of Baldwin in Randolph County, Illinois and the entrance to the Site is on Baldwin Road. The BEC CCW impoundments are located about ½ mile southwest of the power plant, at approximately latitude 38˚ 11' 33" North and longitude 89˚ 52' 05" West. A Site locus of the impoundments and surrounding area is shown in **Figure 1**. An aerial photograph of the impoundments and surrounding area is provided as **Figure 2**. The impoundments can be accessed by vehicles from an earthen access road from the BEC.

1.2.2 Owner/Caretaker

The CCW impoundments are owned by Dynegy Midwest Generation, LLC. and operated by the BEC.

	Dam Owner/Caretaker
Name	Dynegy Midwest Generation, LLC, Baldwin Energy Complex
Mailing Address	10901 Baldwin Road
City, State, Zip	Baldwin, Illinois 62217
Contact	Randy Short
Title	Managing Director
E-Mail	randy.short@dynegy.com
Daytime Phone	618-785-3244
Emergency Phone	911

1.2.3 Purpose of the Impoundments

The BEC is a three-unit coal-fired power plant, with a maximum generating capacity of approximately 1,800 Megawatts. Commercial operation of the facility began in the 1970's. Unlined earthen embankment CCW Impoundments (Primary Fly Ash Pond, Intermediate Pond, and Final Pond) were constructed in conjunction with the BEC facility for the purpose of storing and disposing non-recyclable CCW from the BEC facility and clarification of water prior to discharge. The Primary Fly Ash Pond (PFAP) was expanded in 1981 to the south and west and included the area that was later split into the Secondary Fly Ash Pond (SFAP). The PFAP was originally constructed with 35 foot embankments and was expanded vertically in 1989 with a 20 foot 'raise'. In response to a failure of the southern embankment of the PFAP in February 1995, an Intermediate Embankment was constructed and resulted in the separation of the SFAP from the PFAP. A berm (Secondary Dike) was constructed upstream of the Intermediate Pond in approximately 1998 and resulted in the construction of the Secondary Pond.

Process water and sluiced CCW are discharged into the PFAP, where the CCW is allowed to settle and water is discharged (decanted) into the SFAP and the Secondary Pond. Solids are further settled in the SFAP prior to water discharge to the adjoining Secondary Pond (refer to Figure 2). Water flows sequentially through the Secondary, Intermediate and Final

Ponds for further clarification prior to discharge via the decant structure located near the southwest corner of the property.

1.2.4 Description of the Primary Fly Ash Pond and Appurtenances

The original embankments of the PFAP, which were constructed in 1969, were designed by Sargent & Lundy. The 1981 expansion and 1989 vertical expansion were designed by Illinois Power Company. Following the failure of a portion of the southern embankment in 1995, a failure analysis was conducted by Woodward Clyde Consultants (Failure Analysis).[2] Although it was not one of the remedial options presented by Woodward Clyde, an Intermediate Embankment was designed by Illinois Power Company and was constructed within the PFAP in response to the 1995 failure. The following description of the impoundment is based on information provided in the Failure Analysis, Sargent & Lundy Design Drawings,[3] Illinois Power Company Drawings,[4] other information received from BEC, and observations made by GZA during our Site visit.

The PFAP Impoundment is located southwest of the BEC. The PFAP functions as a sedimentation basin for bottom ash, fly ash and scrubber solids which are discharged into two distinct areas of the impoundment for ease of recycling and disposal. The impoundment receives bottom ash and other scrubber solid slurry in the northern portion of the impoundment through a series of 10-inch diameter steel pipes. Water used to sluice bottom ash and other scrubber solids is discharged to the Secondary Pond through a decant structure which is located along the western embankment of the impoundment. The location of the discharge pipes and decant structure is shown in **Figure 3**.

Fly ash is sluiced into the southern portion of the PFAP for storage and disposal of the fly ash through a 12-inch diameter steel pipe. Fly ash is allowed to settle and water is discharged from the southern portion of the PFAP through five 12-inch diameter decant pipes which are located along the Intermediate Embankment. The location of the decant structures and discharge pipes is shown in **Figure 3**.

The PFAP Impoundment consists of an earthen embankment with a crest length of approximately 3.2 miles and a general height (from the lowest downstream toe elevation to the crest of the impoundment) of approximately 15 feet along the northern embankments and approximately 55 feet along the southern embankments. The following description of the PFAP embankments was provided in the Failure Analysis:

"2.1 ORIGINAL DIKE DESIGN AND CONSTRUCTION

The original dike was constructed during November 1969 using "earthfill" and "impervious fill" material as shown in the drawings. We presume both types of material were actually low plastic clay fill obtained on-site within the present pond area. The original embankment section had a 15-ft wide crest and 3H:1V side slopes between Station 46+66 and 58+77. (Dike stationing refers to stationing for the original dike construction as shown on construction drawings.

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[2] "Geotechnical Investigation, Baldwin Power Station: Fly Ash Pond South Dike, Balwin, Illinois" by Woodward-Clyde Consultants, dated September 7, 1995. (Failure Analysis).
[3] Several Sargent & Lundy drawings from the original impoundment design were available. A complete list of the drawings reviewed is provided in Appendix F.
[4] The 1981 expansion, 1989 Vertical raise and the intermediate embankment were designed by Illinois Power Company Engineers.

The failure area is between Station 50+00 and 57+00.) The crest elevation was el. 435±.

Between Stations 46+66 and 58+77, a 6-inch thick gravel erosion protection layer was placed on the downstream slope surface of the dike between el. 408 ft and 400 ft. A 2-ft thick horizontal sand and gravel blanket drain was placed at the embankment toe and extended approximately 50 ft upstream beneath the embankment. A flat-bottomed drainage ditch was built about 40 ft downstream of the embankment toe. From the embankment toe, the ground surface was sloped at approximately 2 percent towards the drainage ditch. Upstream of the upstream toe at el. 415, the embankment slope transitions at a 6H:1V slope.

Between Station 58+77 and Station 81+00, the side slope changes to 2.5H:1V and the blanket drain was eliminated.

The top of the dike had a 6-inch thick layer of bottom ash surfacing along its entire length.

No construction records were provided documenting placement and compaction of 1969 embankment fill, although tests in this study show that it appears to be well compacted.

2.2 1989 DIKE RAISE DESIGN AND CONSTRUCTION

In 1989, the raise was constructed by first end-dumping bottom ash into the pond against the upstream slope of the embankment and over the fly ash deposited on the pond bottom. The bottom ash created a working platform above the water (Figure 3). The maximum total thickness of this bottom ash material is estimated to be approximately 35 ft. A haul road was built along the top of the original embankment to facilitate construction of the bottom ash working platform. It was constructed by placing a driving surface of bottom ash along the crest of the dike and stabilizing the ash with lime and fly ash. A pozzolonic reaction occurred between the bottom ash and the lime/fly ash, creating a surface resembling a weak concrete. The surface of the bottom ash working platform was placed against the upstream face to EL. 436 ft, or approximately 1 ft above the roadway crest. The design indicated that the ash was to be placed to EL. 434 ft, or approximately 1 ft below the top of the roadway (Figure 2). The fact that the bottom ash was placed to a level above the crest of the lower dike, plus the presence of the stabilized bottom ash roadway, are important factors in the failure, as noted later.

Within the water-inundated area, between approximately Stations 46+50 and Station 75+00, clay fill was placed directly on the surface of the bottom ash working platform to the crest of the present upper dike (EL. 456), a height 20± ft above the original embankment crest.

The downstream slope of the addition was placed as an uninterrupted extension of the original 3H:1V downstream embankment face. (Survey data show that the actual slope is somewhat steeper, about 2.77H:1V) This resulted in the centerline of the upper dike being set back in the upstream direction approximately 60 ft from the original dike centerline. The remainder of the embankment section consisted of a 16 ft wide crest and an upstream face with a 2.5H:1V slope to the top of the bottom ash working platform.

To the east of Station 75+00, the height of the original dike was relatively small and resulted in the toe of the dike being setback relative to the toe of the higher portion of the dike further to the west.

Between Station 65+00 and Station 74+00, a transition section was constructed where the dike centerline moved from the setback position to a position to coincide with the original dike centerline (Figure 4). The added height of the addition over the original embankment centerline results in an absence of a setback in the toe of the eastern portion of the embankment relative to the western portion. The cross-sectional template of the eastern portion of the dike matched that of the western portion. Compacted fill within the transition section and that further to the east consisted of clay and was placed directly on the existing ground surface.

Construction records indicate that the bottom ash (type "B" fill) on the upstream side of the lower dike was not compacted except for the top 12 inches, which was compacted to 90 percent of its maximum dry density according to ASTM D698.

The fill for the 1989 raise was borrowed from an area north of the ash pond north dike. It was generally silty clay, although some clayey silt was also used. It was reportedly compacted in lifts to 95 percent of its maximum dry density according to ASTM D698. Field density tests by PSI indicate that the specified level of compaction was achieved for all materials tested, although the actual test locations are difficult to verify."

A typical design cross section of the 1969 southern embankment of the PFAP is shown in **Figure 4**. The 'as built' cross section of the embankments after the 1989 raise, as recreated by Woodward Clyde and documented in the Failure Analysis, is provided as **Figure 5.** Based on the upstream construction shown on Figure 5, the 1989 raise was partially constructed over wet CCW.

After the failure of the western portion of the southern embankment the normal pool level in the SFAP area was lowered to an elevation of approximately 430 feet (MSL) and the elevation of the embankment lowered to relieve stress on the embankment Subsequently, the Intermediate Embankment was constructed to allow continued operation of the PFAP at a higher elevation. The Intermediate Embankment consists of an earthfill embankment that was constructed with a crest elevation of El. 444 feet MSL in 1996. The embankment was raised to approximately El 455 feet MSL in 1999 using upstream slope design. Based on the information provided in the Illinois Power Company Drawings, the Intermediate Embankment was constructed on the existing fly ash using clay fill. Clay fill was then used to raise the dike to the final elevation. Three stabilizing berms were constructed perpendicular to the downstream slope of the Intermediate Embankment into the SFAP. The stabilizing berms extend 207 feet to 437 feet southwest of the downstream slope of the Intermediate Embankment and are approximately 4 feet to 6 feet high. The slopes of the Intermediate Embankment were constructed with 2H:1V and 2.5H:1V slopes, respectively. A plan view of the Intermediate Embankment is provided as **Figure 6**.

An overflow spillway that is approximately 2 feet deep and 200 feet wide with an invert elevation of 455 feet MLS was constructed in the Intermediate Embankment. The spillway and downstream slope was lined with 12-inch riprap. The water elevation in the southern portion of the PFAP is controlled using five (5) decant pipes that were 12-inches in diameter without trash racks or stop logs. The typical cross sections and decant pipes through the Intermediate Embankment are provided on **Figure 7.**

No drawings were available for the decant structure that transmits water from the northern portion of the PFAP to the Secondary Pond. Based on GZA's observations, the decant structure for the northern portion of the PFAP has an adjustable intake height to regulate the water elevation. The water from the PFAP that enters the northern decant structure discharges upstream of and flows into the Secondary Pond. There was no instrumentation observed at the impoundment**.**

1.2.5 Description of the Secondary Fly Ash Pond Impoundment and Appurtenances

The SFAP was separated from the PFAP after construction of the Intermediate Embankment in 1996. Therefore, the design history for the SFAP follows that described in Section 1.2.4 for the PFAP. The following description of the impoundment is based on information provided in the Failure Analysis,[5] Sargent & Lundy Design Drawings,[6] Illinois Power Company Drawings,[7] other information received from BEC, and observations made by GZA during our Site visit.

The SFAP is located southwest of the BEC and west of the PFAP. The impoundment was constructed in 1969 and serves as a settling pond and final disposal location for CCW generated by the BEC. The SFAP receives water and unsettled solids from the fly ash portion of the PFAP through a series of five decant pipes which extend through the Intermediate Embankment. Water is discharged from the SFAP to the Secondary Pond through a decant structure which is located near the northwest embankment of the SFAP. The location of the discharge pipes from the PFAP and the decant structure are shown in **Figure 8**.

The SFAP consists of an earthfill embankment with a crest length of approximately 1.3 miles and a general height (from the lowest toe elevation to the crest of impoundment) of approximately 30 feet along the northern embankment and approximately 55 feet along the southern portion. The design of the exterior embankments and the Intermediate Embankment that makes up the SFAP are as described in Section 1.2.4 for the PFAP. Please refer to Section 1.2.4 for details of the design.

Instrumentation at the impoundment includes one well, nine vibrating wire piezometers, and four inclinometers in the area of the 1995 failure. The instrument locations are shown on **Figure 9**.

1.2.6 Description of the Secondary Pond Impoundment and Appurtenances

The Secondary Pond is a cross-valley impoundment that was created when the Secondary Dike was constructed upstream of the Ash Pond Dike in the Intermediate Pond. The Secondary Dike was designed by Illinois Power Company. The following description of

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[5] "Geotechnical Investigation, Baldwin Power Station: Fly Ash Pond South Dike, Baldwin, Illinois" by Woodward-Clyde Consultants, dated September 7, 1995. (Failure Analysis).
[6] Several Sargent & Lundy drawings from the original impoundment design were available. A complete list of the drawings reviewed is provided in Appendix F.
[7] The 1981 expansion, 1989 Vertical raise and the intermediate embankment were designed by Illinois Power Company Engineers.

the impoundment is based on information provided in the Illinois Power Company Drawings,[8] other information received from BEC, and observations made by GZA during our Site visit.

The Secondary Pond is located southwest of the BEC and west of the PFAP and SFAP. The impoundment was separated from the Intermediate Pond by the Secondary Dike and serves as a settling pond for solids that may not have settled in the PFAP and the SFAP. The Secondary Pond receives water and unsettled solids from the PFAP through a discharge pipe which is located northeast of the Secondary Dike. Water and solids enter the Secondary Pond from the SFAP through a decant structure and discharge pipe which is located along the southern slope of the valley. Water is discharged from the Secondary Pond into the Intermediate Pond through a series of six (6) 18 inch steel decant pipes that extend through the Secondary Dike. The location of the discharge pipes from the PFAP and SFAP and the decant pipes through the Secondary Dike are shown in **Figure 10**.

The Secondary Pond is formed by a cross valley embankment (Secondary Dike) with a crest length of approximately 700 feet and a general height (from the lowest toe elevation to the crest of impoundment) of approximately 12 feet. Based on the information provided in the Illinois Power Company Drawings, the Secondary Dike was constructed by placing bottom ash on the existing ground surface in the pond area to create a working pad above the partially dewatered pond. Fill of an unknown nature was placed on the bottom ash to form the embankment making it difficult to assess whether any part of the impoundment was constructed from wet ash, slag or other unsuitable materials. The embankments were constructed with 4H:1V upstream and 2H:1V downstream slopes and the crest was 15 feet wide. The embankments were designed with 18-inches of riprap on the upstream and downstream embankments and a 15-foot wide gravel access road on the crest. A 50-foot wide, open channel spillway was designed and constructed along the embankment with an elevation of 400 feet MSL. Typical design cross sections of the Secondary Dike and details of the decant pipes are shown on **Figure 11.**

Instrumentation at the impoundment includes a flow meter located on one of the decant pipes as shown in **Figure 11.**

1.2.7 Description of the Intermediate Pond Impoundment and Appurtenances

The Intermediate Pond is a cross-valley impoundment that was designed by Sargent & Lundy. During design and construction, the embankment that forms the Intermediate Pond was referred to as the Ash Pond Dike[9]. The following description of the impoundment is based on the Sargent & Lundy Design Drawings,[10] information received from BEC, and observations made by GZA during our Site visit.

The Intermediate Pond is located southwest of the BEC, west of the PFAP, and is adjacent to and downstream of the Secondary Pond as shown in **Figure 2**. The impoundment was constructed in 1969 and serves as a settling pond and final settling and disposal location for

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[8] The 1981 expansion, 1989 Vertical raise and the intermediate embankment were designed by Illinois Power Company Engineers.
[9] The term "Ash Pond Dike" was used in the Sargent & Lundy Design Drawings and will be used herein for convenience and consistency.
[10] Several Sargent & Lundy drawings from the original impoundment design were available. A complete list of the drawings reviewed is provided in Appendix F.

fly ash generated by the BEC. The Intermediate Pond originally extended upward into the valley several hundred feet but was modified into the current configuration with the construction of the Secondary Dike. The Intermediate Pond receives water and unsettled solids from the Secondary Pond through the Secondary Pond decant pipes. Water is discharged from the Intermediate Pond into the Final Pond through a decant structure which is located along the Ash Pond Dike. The approximate location of the discharge pipes from the Secondary Pond and the decant structure are shown in **Figure 12**. Design details of the decant structure design are shown in **Figure 14.**

The Ash Pond Dike consists of an earthfill embankment with a crest length of approximately 900 feet and a general height (from the lowest downstream toe elevation to the crest of impoundment) of approximately 20 feet at the decant structure.

Based on the information provided in the Sargent & Lundy Design Drawings, the Ash Pond Dike was designed using an "impervious fill" core and "earthfill" shell. Based on information contained in the Failure Analysis, the impervious fill likely consisted of lean clay and the earthfill likely consists of loess deposits as both materials were generally available on the Site. It does not appear that the impoundment was built over wet ash, slag, or other unsuitable materials. The embankment was designed with 3H:1V upstream slopes and 3.5H:1V downstream slopes. The upstream and downstream slopes were designed with a one (1) foot thick layer of sand and gravel over the earthfill. A one (1) foot, 1.5 feet, and 2 feet thick layer of riprap was designed over the sand and gravel on the upstream, crest and downstream slopes, respectively. Gravel was used to fill in the voids of the riprap at the crest to create an access road. The crest elevation at the decant structure was designed to be approximately elevation 398.33 feet (MSL). The design and typical sections through the Ash Pond Dike are provided on **Figures 13 and 14**.

The overflow spillway was designed for the Ash Pond Dike by 'cutting' a V-shaped spillway into the embankment northwest of the decant structure. The spillway was 14.5 feet wide at the base and 100 feet wide at the top with a designed bottom elevation of 385 feet MSL, which is eight (8) feet below the current inlet elevation (elevation 394 feet MSL) of the decant structure. Therefore, it appears that the overflow spillway has a key role in discharging water from the impoundment. The elevation of the spillway results in continuous flow of water through the overflow spillway. The spillway was filled with "rockfill" and the crest access road was constructed over the spillway. The downstream slope portion of the spillway design included a 12 feet 'thick' (measured parallel to a level surface, not perpendicular to the slope) layer of 'rockfill' that extended to the toe. The typical section for the overflow spillway is shown on **Figure 14**. There was no instrumentation observed at the impoundment**.**

1.2.8 Description of the Final Pond Impoundment and Appurtenances

The Final Pond is a cross-valley impoundment that was designed by Sargent & Lundy. During design and construction, the embankment that forms the Intermediate Pond was referred to as the Settling Pond Dike[11]. The following description of the impoundment is based on the

[11] The term "Settling Pond Dike" was used in the Sargent & Lundy Design Drawings and will be used herein for convenience and consistency

Sargent & Lundy Design Drawings,[12] information received from BEC, and observations made by GZA during our Site visit.

The Final Pond is located southwest of the BEC, west of the PFAP, and adjacent to and downstream of the Intermediate Pond as shown in **Figures 2 and 12**. The impoundment was constructed in 1969 and serves as a settling pond and final settling and disposal location for bottom ash generated by the BEC. The Final Pond receives water and unsettled solids from the Intermediate Pond through the Intermediate Pond decant structure and associated discharge pipe. Water is discharged from the Final Pond to a drainage ditch that is adjacent to the southern portion of the utility property through a decant structure which is located near the southwest edge of the Final Pond. The approximate location of the discharge pipes from the Intermediate Pond and the decant structure are shown in **Figure 12**. Details of the decant structure design are shown in **Figure 14.**

The Settling Pond Dike consists of an earthfill embankment with a crest length of approximately 680 feet and a general height (from the lowest downstream toe elevation to the crest of the impoundment) of approximately 32 feet at the decant structure.

Based on the information provided in the Sargent & Lundy Design Drawings, the Settling Pond Dike was designed using an "impervious fill" core and "earthfill" shell. Based on information contained in the Failure Analysis, the impervious fill likely consisted of lean clay and the earthfill likely consists of loess deposits as both materials were generally available on the Site. It does not appear that the impoundment was built over wet ash, slag, or other unsuitable materials. The embankment was designed with 3H:1V upstream and downstream slopes. The upstream slope was armored with a one (1) foot thick layer of sand and gravel over the earthfill, followed by a one (1) foot thick layer of riprap from the toe to an elevation of 385 feet MSL. Above elevation 385 feet MSL, the upstream slope was armored with a 6-inch thick layer of gravel fill. The downstream slope was armored with a one (1) foot thick layer of sand and gravel over the earthfill. A two (2) foot thick layer of riprap was placed over the sand from the toe to an elevation of approximately 377 feet MSL. Above elevation 377 feet MSL, the downstream slope was armored with a 6-inch thick layer of gravel fill. The Settling Pond Dike included a 2-feet thick, sand and gravel drainage blanket that varied in elevation from 377 feet to 384 feet MSL. The crest elevation was designed to be at approximately elevation 400 feet. The design and typical sections through the Settling Pond Dike are provided on **Figure 13 and 14**.

The overflow spillway designed for the Settling Pond Dike was similar to that designed for the Ash Pond Dike. The difference between the overflow spillway for the Settling Pond Dike was in the details of the downstream toe construction as shown on **Figure 14**. There was no instrumentation observed at the impoundment**.**

1.2.9 Operations and Maintenance

The impoundments are operated and maintained by BEC personnel. Operation of the PFAP Impoundment includes periodic movement of the ash discharge pipelines. Operation of the SFAP, Secondary Pond, Intermediate Pond and Final Pond includes periodic adjustment of the decant elevations.

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[12] Several Sargent & Lundy drawings from the original impoundment design were available. A complete list of the drawings reviewed is provided in Appendix F.

Discharges from the BEC facility, including the impoundments, is regulated by the Illinois EPA under the National Pollutant Discharge Elimination System (NPDES) Permit No. IL0000043. The BEC personnel perform visual assessments of the impoundments on a weekly basis and the assessment results are documented in a field log book. Starting in 2009, the impoundments were inspected by professional engineers on an annual basis.

1.2.10 Size Classification

For the purposes of this EPA-mandated assessment, the sizes of the impoundments were based on U. S. Army Corps of Engineers (COE) criteria. Based on the maximum crest height of 55 feet and a storage volume of approximately 10,000 acre-feet, the PFAP is classified as an **Intermediate** sized structure. Based on the maximum crest height of 55 feet and a current storage volume of 1,650 acre-feet, the SFAP Impoundment is classified as an **Intermediate** sized structure. Based on the maximum crest height of 12 feet and a storage volume of approximately 190 acre-feet, the Secondary Pond is classified as a **Small** sized structure. Based on the maximum crest height of 20 feet and a storage volume of approximately 40 acre-feet, the Intermediate Pond is classified as a **Small** sized structure. Based on the maximum crest height of 32 feet and a storage volume of approximately 72 acre-feet, the Final Pond is classified as a **Small** sized structure.

According to guidelines established by the COE, dams with a storage volume less than 1,000 acre-feet and/or a height less than 40 feet are classified as Small sized structures and dams with a storage volume between 1,000 acre-feet and 50,000 acre-feet and/or a height between 40 feet and 100 feet are classified as Intermediate sized structures.

1.2.11 Hazard Potential Classification

Under the EPA classification system, as presented on page 2 of the EPA check list (**Appendix C**) and Definitions section (**Appendix B**), it is GZA's opinion that the PFAP, SFAP and the Final Pond would be considered as having a **Significant** hazard potential. The hazard potential rating is based on no probable loss of human life due to failure and the potential environmental impacts outside of Utility owned property.

Under the EPA classification system, as presented on page 2 of the EPA check list (**Appendix C**) and Definitions section (**Appendix B**), it is GZA's opinion that the Secondary Pond and the Intermediate Pond would be considered as having a **Low** hazard potential. The hazard potential rating is based on no probable loss of human life due to failure and the potential environmental impacts would likely be limited to Utility owned property.

Please note that Dynegy provided additional information to GZA since submittal of the checklists. The Checklists have been updated to reflect that information and the updated checklists are provided in **Appendix C**. The items that were changed are marked in a 'blue' font.

1.3 Pertinent Engineering Data

1.3.1 Drainage Area

Based on the design documents and visual observations by GZA, the PFAP and the SFAP do not receive surface drainage from the surrounding areas. Based on our estimates of the drainage area from topographic contours on drawing E-BAL1-C130, approximately 6 acres, 9 acres, and 180 acres drain into the Final Pond, Intermediate Pond and Secondary Pond, respectively.

1.3.2 Reservoir

Based on the May 16, 2011 aerial photograph and estimates made by GZA[13], the PFAP has a surface area of 357 acres and a storage volume of approximately 10,000 acre feet at a pool elevation of 448 feet MSL.[14] Approximately 22 acres of pool area was observed during the May of 2011 Site visit by GZA. The SFAP has a surface area of 55 acres and a storage volume of approximately 1,650 acre feet at a pool elevation of 430 feet MSL.[15] Approximately 17 acres of pool area was observed during the May 2011 Site visit by GZA. The Secondary Pond has a surface area of 19 acres and a storage volume of approximately 190 acre feet at a pool elevation of 396 feet MSL. The Intermediate Pond has a surface area of 2 acres and a storage volume of approximately 40 acre feet at a pool elevation of 394 feet MSL. The Final Pond has a surface area of 2.2 acres and a storage volume of approximately 72 acre feet at a pool elevation of 393 feet MSL. The pool areas observed on GZA's May 2011 Site visit are consistent with the surfaces areas noted above.

1.3.3 Discharges at the Impoundment Sites

According to BEC personnel, under normal operating conditions, approximately 8 million gallons of water per day (MGD) to 13 MGD are discharged from the Final Pond to the drainage ditch. The discharges to the different portions of the Primary Fly Ash Pond are not measured.

1.3.4 General Elevations (feet – MSL)

Elevations were taken from design drawings, reports, and data provided by BEC. Elevations were based upon the USGS topographic map MSL vertical datum.

[13] Surface area estimates generated using Google Earth Professional software and available aerial photographs. Volume estimate for the Secondary pond is based on the preconstruction valley topography shown on the Sargent & Lundy design drawings.

[14] Storage capacity of the PFAP is based on an average base elevation of ash of 420 feet as estimated by GZA from drawings provided by BEC personnel.

[15] Storage capacity of the PFAP is based on an average base elevation of ash of 400 feet as estimated by in the Failure Analysis.

Primary Fly Ash Pond Impoundment

A. Top of Embankment (Minimum)	± 455 feet
B. Upstream Water at Time of Assessment	± 447.5 feet
C. Downstream Tail Water at Time of Assessment	396.1 feet (Northwest)[16] 430 feet (Along SFAP)
D. Maximum Pond Water Elevation	Unknown

Secondary Fly Ash Pond Impoundment

A. Top of Embankment (Minimum)	± 434 feet
B. Upstream Water at Time of Assessment	430 feet
C. Downstream Tail Water at Time of Assessment	396.1 feet
D. Maximum Pond Water Elevation	Unknown

Secondary Pond Impoundment

A. Top of Embankment (Minimum)	402 feet
B. Upstream Water at Time of Assessment	396.1 feet
C. Downstream Tail Water at Time of Assessment	394 feet
D. Maximum Pond Water Elevation	Unknown

Intermediate Pond Impoundment

A. Top of Embankment (Minimum)	400 feet
B. Upstream Water at Time of Assessment	394 feet
C. Downstream Tail Water at Time of Assessment	392.7 feet
D. Maximum Pond Water Elevation	Unknown

Final Pond Impoundment

A. Top of Embankment (Minimum)	398 feet
B. Upstream Water at Time of Assessment	392.7 feet
C. Downstream Tail Water at Time of Assessment[17]	± 375 feet
D. Maximum Pond Water Elevation	Unknown

1.3.5 Design and Construction Records and History

Limited construction documentation was available from the BEC with regards to the ash impoundments. No information was available regarding construction of the original 1969 embankments; however Woodward Clyde concluded that the berms were compacted to approximately 95% of the standard proctor based on the results of their subsurface investigation. Based on our review of the Failure Analysis, Woodward Clyde was provided construction documentation of the 1989 raise that included results of density tests conducted on the clay fill. However, such documentation could not be located since reorganization of the BEC files.

As built drawings were available for the Intermediate Embankment but there were no construction photos or documentation of the earthwork construction methodology or testing performed. No as built drawings or other construction documentation was available for the Secondary Dike.

[16] The downstream elevation to the northwest was taken to be the elevation in the Secondary Pond.
[17] Downstream tail water elevation based on visual estimates made by GZA during the Site Visit.

1.3.6 Operating Records

No operating records of the impoundments were provided to GZA.

1.3.7 Previous Inspection Reports

The impoundments were visually inspected by a consulting professional engineer from URS in 2009 and 2010. Copies of the URS inspection reports were reviewed by GZA. On February 20, 2009, URS observed erosion along the southwestern portion of the SFAP and recommended repairs to correct it. In addition, URS noted tall vegetation and trees on the impoundments and recommended removal of the trees. On March 24, 2010, URS observed two large erosion features along the southern embankment and recommended repairing with gravel and seeding. In addition, URS noted tall vegetation and trees on the impoundments and recommended removal of the trees. Copies of the URS inspection reports are provided as **Appendix D**.

2.0 ASSESSMENT

2.1 Visual Assessment

The BEC impoundments were inspected on May 24 and 25, 2011 by Patrick J. Harrison, P.E., and Douglas P. Simon, P.E. (Wisconsin), of GZA GeoEnvironmental, Inc., and accompanied by Phil Morris of Dynegy. The assessment was conducted over the course of two days. For both days, the weather was partly cloudy with occasional rain with temperatures in the 70°s to 80°s Fahrenheit. Photographs to document the current conditions of the impoundments were taken during the assessment and are included in **Appendix E**. At the time of the assessment, the water levels in the impoundments were as provided in Section 1.3.4. Underwater areas were not inspected, as this level of investigation was beyond of GZA's scope of services. Copies of the EPA Checklists are included in **Appendix C**. Please note that the checklists have been updated since they were first submitted to the EPA to reflect additional information that was provided by Dynegy.

During our visual assessment, GZA observed the area of the 1995 failure and also observed a scarp along the northern portion of downstream slope of the SFAP. The history of the 1995 failure has been discussed in Section 1.2.4 and our observations of the failed area are provided in Section 2.2 along with our observations of the scarp on the downstream slope of the SFAP.

2.1.1 PFAP Impoundment General Findings

In general, the BEC PFAP Impoundment was found to be in **POOR** condition. In GZA's professional opinion, the embankment(s) visually appear to be sound and no immediate remedial action appears to be necessary. However, based on EPA's assessment criteria, the impoundment has been given a POOR Condition Rating because complete hydraulic and geotechnical computations were not provided/available for GZA's for review. Thus, the stability of the embankment(s) could not be independently verified.

An overall Site plan showing the impoundments is provided as **Figure 2**. The location and orientation of photographs provided in **Appendix E** is shown on the Photo Plan in **Figure 3**.

2.1.2 PFAP Upstream Slope (Photos 58, 64, 65, 66, and 68)

The water surface elevation at the time of assessment was at elevation 447.5 feet MSL. Therefore, the lower portion of the upstream slope was below the water level or covered by ash deltas and not visible. The upstream slope above the water generally appeared to be in good condition. However, thick vegetation was present along much of the slope not covered by ash making it difficult to inspect the slope. No unusual movement, depressions or sloughing was observed on the slope.

2.1.3 PFAP Crest of Impoundment (Photos 58, 61, 63, 64, 65, and 68)

The crest of the PFAP Impoundment generally had a gravel access road that had grass covering much of the road along the eastern and southern portions of the impoundment crest. The crest of impoundment had occasional pot holes along its entire length; with the frequency of potholes increasing along the eastern and southern embankments. The alignment of the crest appeared generally level, with no large depressions or irregularities observed. Based on information provided by BEC personnel, the crest elevation is approximately elevation 455 feet MSL. No significant settlement was observed at the time of our assessment. There was approximately 7 feet of free board at the time of our assessment.

2.1.4 PFAP Downstream Slope (Photos 55, 56, 57, 59, 60, 62, and 67)

The downstream slope of the impoundment was generally covered in thick vegetation making it difficult to observe during our assessments as shown in Photos 55 through 57. The eastern and southern portions were generally covered with dense trees and shrubs. The western and northern portions were generally covered with grass that had not been recently mowed. No unusual movement or displacement was observed on the slope. A gravel access road was present along the toe of the downstream slope of the northern embankment of the impoundment and generally was in good condition, with minor rutting on the surface.

2.1.5 PFAP Discharge Pipes (Photos 29, 30, 50, 51, 52, 69, 71 through 74)

Water and CCW enters the northern portion of the PFAP through a series of 10 inch diameter steel pipes. The discharge pipes appeared to be in good condition based on our visual observations. Water is removed from the northern portion of the PFAP through the decant structure for the northern portion of the PFAP that appeared to be approximately 24 inches in diameter. However, the decant structure was difficult to access due to dense vegetation. Water that enters the northern decant structure discharges upstream of the Secondary Pond via an approximately 24-inch diameter CMP pipe. The CMP discharge pipe showed signs of damage and significant leaking. The leaking water had eroded the soil around a portion of the discharge pipe as shown in Photos 29 and 30. There was no riprap or other erosion control protection observed near the CMP discharge pipe.

The 12-inch diameter steel decant pipes along the Intermediate Embankment that discharge water from the southern portion of the PFAP to the SFAP were generally in good condition based on our observations. However, most of the pipes were located within ash deltas or surrounded by ponded water and could not be easily accessed.

2.1.6 SFAP Impoundment General Findings

In general, the BEC SFAP Impoundment was found to be in **POOR** condition. An overall Site plan showing the impoundments is provided as **Figure 2**. The location and orientation of photographs provided in **Appendix E** is shown on the Photo Plan in **Figure 8**.

2.1.7 SFAP Upstream Slope (Photos 36 through 39, 47, 48, and 54)

The water surface elevation in the SFAP at the time of assessment was at elevation 430 feet MSL. Therefore, the lower portion of the upstream slope was below the water level or covered by ash deltas and not visible. In the area of the 1995 failure, the impounded ash was generally stockpiled at or above the crest elevation and thus covered the upstream slope. Where visible, the upstream slope generally appeared to be in good condition with no unusual movement, erosion or displacement observed. However, thick vegetation and trees were present along portions of the slope making it difficult to access and inspect the slope.

2.1.8 SFAP Crest of Impoundment (Photos 36, 37, 39, 47 and 48)

The crest of the SFAP Impoundment was generally covered by a gravel access road. The crest of the impoundment had occasional pot holes along its entire length; particularly along the eastern and southern embankments of the impoundment. With the exception of the area of the 1995 Failure, the alignment of the crest appeared generally level, with no large depressions or irregularities observed. Based on information provided by BEC personnel, the crest elevation outside the 1995 Failure area is approximately elevation 455 feet MSL.

The crest was lowered 21 feet to an elevation of 434 feet MSL along a portion of the southern embankment in response to the 1995 Failure as shown in Photo 47. No significant settlement or evidence of continued movement was observed at the time of our assessment. There was approximately 4 feet of free board at the time of our assessment.

2.1.9 SFAP Downstream Slope (Photos 32, 33, 34, 35, 40 through 46, and 49)

The condition of the downstream slope of the SFAP impoundment was obscured along much of the southern embankment due to thick vegetation including trees up to 16 inches in diameter. Grass that had not been recently mowed was present on the remaining portions of the downstream slope.

A scarp was observed near the crest of the downstream slope of the northwestern embankment at the approximate location shown on **Figure 8**. The scarp was approximately 100 feet wide along the slope and extended approximately 30 feet to 40 feet down the slope. The vertical face at the head of the scarp was approximately 2 feet high. The scarp had reportedly developed 2 weeks prior to our assessment and repair of the scarp has been completed since our visit according to BEC personnel. Moist surface conditions that may have been an indicator of seepage were observed along the toe of the southern embankment. However, we were not able to confirm the nature or extent of moist conditions due to the thick vegetation.

2.1.10 SFAP Ash Discharge Pipes (Photos 52 through 54)

Water and CCW enter the SFAP from the southern portion of the PFAP through a series of five (5) steel decant pipes that appeared to be in good condition at the time of our assessment. Water is removed from the SFAP through the decant structure which is located along the northwestern embankment and discharges along the valley slope above the Secondary Pond. The decant structure and discharge pipe appeared to be in good operating condition with no defects or damage observed. The riprap present at the discharge location and down the slope appeared to be in good condition and there were no visible signs of erosion.

2.1.11 Secondary Pond General Findings

In general, the BEC Secondary Pond was found to be in **POOR** condition. In GZA's professional opinion, the embankment(s) visually appear to be sound and no immediate remedial action appears to be necessary. However, based on EPA's assessment criteria, the impoundment has been given a POOR Condition Rating because complete hydraulic and geotechnical computations were not provided/available for GZA's for review. Thus, the stability of the embankment(s) could not be independently verified.

An overall Site plan showing the impoundments is provided as **Figure 2**. The location and orientation of photographs provided in **Appendix E** is shown on the Photo Plan in **Figure 10**.

2.1.12 Secondary Pond Upstream Slope (Photos 22, 24 and 25)

The water surface elevation in the Secondary Pond at the time of assessment was at elevation 396.1 feet MSL. Therefore, the lower portion of the upstream slope was below the water level and not visible. The upstream valley slopes that were above the water were generally thickly vegetated with shrubs and trees up to 24 inches in diameter. The typical conditions of the valley slopes are shown on Photos 26, 27, 28, and 31.

As noted in Section 1.2.6, the Secondary Dike impounds the water that forms the Secondary Pond. The upstream slope of the Secondary Dike that was above the water was generally in good condition and no unusual movement or sloughing was observed. However, thick vegetation greater than 5 feet in height was present along the upstream slope of the Secondary Dike making it difficult to inspect.

2.1.13 Secondary Pond Crest of Impoundment (Photo 24)

The crest of the Secondary Dike had an access road that was generally grassy be appeared to have been graveled in the past. The alignment of the top of Secondary Dike appeared generally level outside of the area of the overflow spillway, with no large depressions or irregularities observed. The crest elevation of the Secondary Dike is approximately 402 feet MSL.

2.1.14 Secondary Pond Downstream Slope (Photo 24)

The water surface elevation in the Intermediate Pond along the downstream slope of the Secondary Pond at the time of assessment was at elevation 394 feet MSL. Therefore, the lower portion of the downstream slope was below the water level and not visible. Thick vegetation was present along portions of the downstream slope above the water level making it difficult to inspect. The visible portions of the downstream slope appeared to be in good condition with no unusual movement or sloughing was observed.

2.1.15 Secondary Pond Ash Discharge Pipes

The decant inlets and the discharge pipe outlets for the Secondary Pond were located below the water surface in the Secondary and Intermediate Ponds, respectively. Therefore, GZA was not able to observe the decant or discharge pipes.

2.1.16 Intermediate Pond General Findings

In general, the BEC Intermediate Pond was found to be in **POOR** condition. An overall Site plan showing the impoundments is provided as **Figure 2**. The location and orientation of photographs provided in **Appendix E** is shown on the Photo Plan in **Figure 12**.

2.1.17 Intermediate Pond Upstream Slope (Photos 1, 75 and 76)

As noted in Section 1.2.7, the Ash Pond Dike impounds the water that forms the Intermediate Pond. The upstream slope of the Ash Pond Dike that was above the water was generally in good condition with no unusual movement or sloughing observed. However, tall grasses along portions of the slope made it difficult to inspect and trees up to 4 inches in diameter were present.

2.1.18 Intermediate Pond Crest of Impoundment (Photos 1, 75 and 76)

The crest of the Intermediate Pond generally had a gravel access road at the location of the Ash Pond Dike. The access road was generally in fair condition but there were several potholes along the roadway. The alignment of the crest of the Ash Pond Dike appeared generally level in the areas outside of the overflow spillway, with no large depressions or irregularities observed. The crest of the Ash Pond Dike elevation is approximately elevation 400 feet MSL.

2.1.19 Intermediate Pond Downstream Slope (Photos 2 through 5)

The water surface elevation in the Final Pond along the downstream slope of the Intermediate Pond was at elevation 392.7 feet MSL at the time of assessment. Therefore, the lower portion of the downstream slope was below the water level and not visible. Thick vegetation and trees up to 4 inches in diameter were present along portions of the downstream slope above the water level making it difficult to inspect. No unusual movement or sloughing was observed on the visible portions of the slope.

A portion of the downstream slope had been covered with concrete to control erosion along the overflow spillway of Ash Pond Dike. Water was flowing from under the concrete in several locations. Due to the concrete, GZA was not able to observe whether erosion was continuing to occurring due to the seepage.

2.1.20 Intermediate Pond Ash Decant Structure (Photos 76 and 77)

The decant structure for the Intermediate Pond appeared to be in good condition at the time of our Site visit and did not appear to be cracked or otherwise damaged. However, the water level in the impoundment was such that the decant pipe appeared to be nearly at capacity as shown on Photo 77. The discharge pipes into the Final Pond are located below the water surface and could not be observed during our Site visit.

2.1.21 Final Pond General Findings

In general, the BEC Final Pond was found to be in **POOR** condition. An overall Site plan showing the impoundments is provided as **Figure 2**. The location and orientation of photographs provided in **Appendix E** is shown on the Photo Plan in **Figure 12**.

2.1.22 Final Pond Upstream Slope (Photos 7, 8 and 9)

As noted in Section 1.2.8, the Settling Pond Dike impounds the water that forms the Final Pond. The water surface elevation in the Final Pond at the time of assessment was at elevation 392.7 feet MSL. Therefore, the lower portion of the upstream slope was below the water level and not visible. The upstream slope of the Settling Pond Dike that was above the water was generally in good condition and no unusual movement or sloughing was observed. However, tall grasses along the slope made it difficult to inspect.

2.1.23 Final Pond Crest of Impoundment (Photos 10, 18 through 20)

The crest of the Settling Pond Dike was covered by a gravel access road that was generally in fair condition, but there were several potholes along the length of the crest. The alignment of the crest of Settling Pond Dike appeared to be consistent with the design elevation, with no large depressions or irregularities observed. The crest elevation of the Ash Pond Dike is approximately elevation 398 feet MSL.

2.1.24 Final Pond Downstream Slope (Photos 10 through 15)

The water surface elevation in the drainage ditch along the downstream slope was visually estimated by GZA to be at elevation 375 feet MSL. Therefore, the lower portion of the downstream slope and toe was below the water level and not visible. Thick vegetation and trees up to 18 inches in diameter were present along portions of the downstream slope making it difficult to inspect. No unusual movement or sloughing was observed on the visible portions of the slope.

Water was actively discharging from the overflow section of the Settling Pond Dike and flowing along the armored portion of the downstream slope. Thick vegetation and trees were present along the armored portion of the slope.

2.1.25 Final Pond Ash Decant Structure (Photos 9, 16, and 17)

The decant structure for the Final Pond appeared to be in good condition at the time of our Site visit. However, it appeared that water was discharging at a rate that was near the maximum capacity of the decant structure. The discharge pipes into the downstream water way are located below the water surface and could not be observed during our Site visit.

2.2 Caretaker Interview

Maintenance of the impoundments is the responsibility of BEC personnel. GZA met with BEC personnel and discussed the operations and maintenance procedures, regulatory requirements, and the history of the impoundments since their construction.

2.3 Operation and Maintenance Procedures

As discussed in Section 1.2.9, BEC personnel are responsible for the regular operations and maintenance of the impoundments. No formal maintenance plan has been developed for the impoundments. Based on our discussions with BEC personnel, the roadways and slopes are repaired as needed.

2.4 Emergency Action Plan

An Emergency Action Plan (EAP) has not been developed for the impoundments. Note that the hazard potential classification for the dam is discussed in Section 1.2.11.

2.5 Hydrologic/Hydraulic Data

No hydrologic/hydraulic studies have been conducted for the impoundments. GZA did not perform an independent assessment of the hydraulics and hydrology for the impoundments as this was beyond our scope of services.

2.6 Structural and Seepage Stability

No engineering evaluation is available for the 1969 embankments designed by Sargent & Lundy. However, as discussed below seepage and stability analyses were conducted in 1995 and 2011 and relied upon the design drawings for information about embankments.

2.6.1 1995 Failure Analysis

The Failure Analysis evaluated the causes of the 1995 failure, the stability of the failed section, and the stability of the remaining PFAP embankments. Soil borings were drilled, laboratory testing was conducted, and instrumentation was installed to evaluate the stability of the southern embankment of the PFAP and SFAP. Based on the results of the Failure Analysis, the failed section of the embankment had a factor of safety against global failure less than the generally accepted value of 1.5.

The Failure Analysis also indicated that deep seated failure on the high plasticity clay below the embankments could occur for embankments that were greater than about 35 feet high. Based on the results of the failure analysis, the potential for deep failure was greatest between Stations -6-50 and 5+50. In addition, shallow failures due to high hydrostatic pressures in the bottom ash could occur where bottom ash was present near the downstream face of the embankment. The Failure Analysis identified the potential for shallow failure from the southwestern corner of the impoundment to Station 14+00. Relative to the current impoundment configuration, the areas of potential deep and shallow failure are along the southern embankment of what is now the SFAP.

The Failure Analysis presented three remedial options to increase the factor of safety above generally acceptable levels; a parallel wall, a translated dike, and an HDPE wall. However, Dynegy (at that time Illinois Power Company) constructed the Intermediate Embankment in lieu of applying one of the suggested remedial measures. We understand that the Intermediate Embankment was constructed to allow the water levels in the SFAP to be lowered and thus reduce the static loading on the embankments. However, Illinois Power Company did not evaluate the stability of the embankments based on their remedial design.

2.6.2 2011 URS Stability Analysis

Since our Site Visit, Dynegy has contracted URS to conduct an evaluation of the stability of the 1995 failure section, the Ash Pond Dike, and the Settling Pond Dike. The URS analysis evaluated the FOS under four loading conditions that included the static load under drained and undrained conditions, and the seismic load based the 475 year return period event and 2475 year return period event. The 475 year return period event was the applicable standard prior to and including the period of the 1995 failure. The 2475 year return period event corresponds to the current design standard required by the Illinois Department of Natural Resources (IDNR) for Construction and Maintenance of Dams. The impoundments are not subject to the requirements of the IDNR standard; however the use of IDNR criteria is standard practice, in GZA's opinion.

In the 1995 Failure Area, the URS analysis was based on the current embankment configuration and reportedly used the soil properties provided in the 1995 Failure Analysis. The URS analysis indicates that the following factors of safety (FOS) in the 1995 Failure Area:

Condition	Computed FOS	Minimum FOS
Drained static conditions	1.21	1.5
Undrained static conditions	1.73	1.5
475 Year Seismic Load	1.10	1.0
2475 Year Seismic Load	0.57	1.0

The URS analysis indicates that the FOS under drained static conditions and the 2475 year seismic load are below the generally accepted standards of 1.5 and 1.0, respectively. No recommendations for increasing the FOS were provided in the URS analysis.

Based on our review of the URS analysis, it is GZA's opinion that the stability analysis for the SFAP is incomplete. URS stated that the soil parameters used for the analysis were based on the values reported in the Woodward Clyde Failure analysis. However, GZA observed several instances where the values used in the URS analysis did not correlate to the values reported in the Woodward Clyde Failure Analysis. Also, the URS analysis was conducted for the conditions present during normal operating levels rather than during the increased loading that would occur during the 100 year, 24 hour storm event. Also, the URS analysis did not evaluate the stability of the remaining embankments of the SFAP. Therefore, based on the results stated in the Woodward Clyde Failure Analysis, it would be assumed that the remaining portions of the embankments do not meet the generally accepted FOS values, in GZA's opinion.

The URS analysis also evaluated the stability of the Ash Pond Dike and the Settling Pond Dike. The composition and cross sections of the embankments was based on the 1969 design drawings and the soil parameters were reportedly based on the values presented in the Woodward Clyde Failure Analysis for the SFAP. However, no supplemental field or laboratory test data was collected by URS.

The URS analysis indicates the following factors of safety (FOS) for the Ash Pond Dike as noted for Section B-B':

Condition	FOS
Drained static conditions	1.55
Undrained static conditions	5.10
475 Year Seismic Load	3.28
2475 Year Seismic Load	2.00

The URS analysis indicates the following factors of safety (FOS) for the Settling Pond Dike outside of the overflow section as noted for Section A-A':

Condition	FOS
Drained static conditions	1.66
Undrained static conditions	3.34
475 Year Seismic Load	2.31
2475 Year Seismic Load	1.50

The URS analysis indicates the following factors of safety (FOS) for the Settling Pond Dike within the overflow section as noted for Section F-F':

Condition	FOS
Drained static conditions	1.3[18]
Undrained static conditions	3.23
475 Year Seismic Load	2.21
2475 Year Seismic Load	1.40

Based on our review of the URS analysis, it is GZA's opinion that the stability analysis for the SFAP is incomplete for the following considerations:

1. URS stated that the soil parameters used for the analysis were based on the values reported in the Woodward Clyde Failure analysis. However, GZA observed several instances where the values used in the URS analysis did not correlate to the values reported in the Woodward Clyde Failure Analysis. In addition, there were soil types (eg. riprap, sand and gravel filter) that were not part of the Woodward Clyde Failure Analysis and no justification was provided in the URS analysis for the soil parameters used in the analysis.

   The preceding comment was addressed in additional information provided by Dynegy after issuance of the DRAFT report and no additional information is needed.

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[18] Reported FOS is based on revised analysis conducted after draft report was issued.

2. Also, the URS analysis was conducted for the conditions present during normal operating levels rather than during the increased loading that would occur during the 100 year, 24 hour storm event.

3. The analysis of the Ash Pond Dike did not provide justification that the Section used represented the critical section of the embankment.

   The preceding comment was addressed in additional information provided by Dynegy after issuance of the DRAFT report and no additional information is needed.

4. The analysis for Section F-F' through the overflow section of the Settling Pond Dike assumes a water surface that follows the base of the rockfill in the section and exits at the downstream slope near the toe. Based on the conditions observed during GZA's assessment, water exits the downstream slope within several feet of the crest of the impoundment. The analysis also assumed the tail-water elevation to be at the ground surface. However, there appeared to be several feet of water on the downstream toe at the time of our assessment. Therefore, the assumed water table within the embankment and along the downstream toe does not match the observed conditions. An analysis with a modeled water table that more closely matches the observed conditions may result in a lower FOS.

   The preceding comment was addressed in additional information provided by Dynegy after issuance of the DRAFT report and no additional information is needed.

5. Given the use of the overflow sections of the Ash Pond Dike and the Settling Pond Dike to support continuous flow of water, the stability of the materials against erosion or piping should be considered.

3.0 ASSESSMENTS AND RECOMMENDATIONS

3.1 Assessments

In general, the overall condition of the PFAP impoundment was judged to be **POOR**. The PFAP impoundment was found to have the following deficiencies:

1. Thick vegetation and trees along the upstream and downstream slopes;
2. Minor potholes and rutting along the crest gravel access road;
3. Damaged discharge pipe from the northern decant;
4. The absence of erosion protection on the embankment near the discharge location of the northern decant has allowed erosion of the embankment;
5. No hydraulic/hydrologic analysis has been performed to confirm adequate freeboard and decant capacity at the design storm event;
6. The stability analysis completed does not account for storm event loading conditions; and,
7. No stability analysis was provided for the Intermediate Embankment.

In general, the overall condition of the SFAP impoundment was judged to be **POOR**. The SFAP impoundment was found to have the following deficiencies:

1. Thick vegetation and trees along the upstream and downstream slopes;
2. Minor potholes and rutting along the crest gravel access road;
3. Scarp present on the downstream slope of the northern embankment;
4. The stability analysis for the SFAP is incomplete for portions of the embankments and does not indicate that the embankments meet generally accepted levels of stability for the sections analyzed; and
5. No hydraulic/hydrologic analysis has been performed to confirm adequate freeboard and decant capacity at the design storm event.

In general, the overall condition of the Secondary Pond impoundment was judged to be **POOR**. The Secondary Pond impoundment was found to have the following deficiencies:

1. No hydraulic/hydrologic analysis has been performed to confirm adequate freeboard, decant and overflow spillway capacity; and,
2. No seepage and/or stability analysis has been performed for the Secondary Dike.

In general, the overall condition of the Intermediate Pond impoundment was judged to be **POOR**. The Intermediate Pond impoundment was found to have the following deficiencies:

1. Thick vegetation and trees along the upstream and downstream slopes;
2. Potholes along the crest gravel access road;
3. Concrete covering the downstream slope prohibits monitoring of potential erosion;
4. No hydraulic/hydrologic analysis has been performed to confirm adequate freeboard and decant/overflow spillway capacity;
5. In GZA's opinion, the stability analysis for the impoundment was incomplete; and,

   Additional analysis was completed and provided to GZA after issuance of the DRAFT report that satisfies our recommendation. No further analysis is recommended at this time.

6. No evaluation has been conducted to verify the stability of the overflow section against piping or fines erosion.

In general, the overall condition of the Final Pond impoundment was judged to be **POOR**. The Final Pond impoundment was found to have the following deficiencies:

1. Thick vegetation and trees along the downstream slopes;
2. Minor potholes along the crest gravel access road;
3. No hydraulic/hydrologic analysis has been performed to confirm adequate freeboard and decant/overflow spillway capacity;

4. In GZA's opinion, the stability analysis for the impoundment was incomplete; and,

   Additional analysis was completed and provided to GZA after issuance of the DRAFT report that satisfies our recommendation. No further analysis is recommended at this time.

5. No evaluation has been conducted to verify the stability of the overflow section against piping or fines erosion.

The following recommendations and remedial measures generally describe the recommended approach to address current deficiencies at the impoundments. Prior to undertaking recommended maintenance, repairs, or remedial measures, the applicability of permits needs to be determined for activities that may occur under the jurisdiction of the appropriate regulatory agencies.

3.2 Studies and Analyses

GZA recommends that BEC/Dynegy conduct the following studies and analysis:

1. Conduct an analysis of the hydraulic/hydrologic condition of the impoundments to establish the rise in water level that occurs during the 100-year, 24-hour rain event to confirm that adequate freeboard is maintained and adequate decant and spillway capacity is available. The loading conditions established during the design storm event should be used in the evaluation of the seepage and stability evaluation of the embankments.

2. Address the deficiencies noted in Section 2.6 and Section 3.1 for the stability and seepage analysis previously conducted for the impoundments and establish a complete seepage and stability analysis for each impoundment.

3. Evaluate the potential for piping and fines erosion along the overflow sections of the Ash Pond Dike and the Settling Pond Dike.

4. Moist soil conditions were observed along the downstream slope and/or toe of the southern embankment of the SFAP. This condition may indicate the presence of seepage in that area and should be evaluated. We recommend removing all trees on the downstream slope and toe area and evaluation of the moist soil conditions.

5. Develop an Emergency Action Plan.

3.3 Recurrent Operation & Maintenance Recommendations

GZA recommends the following operation and maintenance level activities:

1. Increased mowing of the grasses on the embankments to facilitate assessments and reduce the risk of burrowing animals;

2. Repair the potholes present in the gravel crest access roads. Grade the road to provide better drainage and reduce future potholing; and,

3. Clear trees and other deep rooted vegetation from the slopes and crests of the embankments.

3.4 Repair Recommendations

GZA recommends the following repairs to address observed deficiencies that may affect the stability of the embankments. The recommendations may require design by a professional engineer and construction contractor experienced in impoundment construction.

1. Repair the discharge pipe and the embankment erosion near the discharge pipe from PFAP's northern decant. Protect the embankment with riprap or other erosion control features.

2. Remove the concrete located on the downstream slope of the Ash Pond Dike. Repair any erosion observed beneath the concrete and replace with fill engineered to provide a stable embankment that is not susceptible to erosion or piping.

3. Pending the results of the hydraulic/hydrologic analysis, modify the design or operation of the impoundments to provide adequate capacity.

4. Pending the results of the complete seepage and stability analysis for each impoundment, modify the design or operation of the impoundments to provide conditions that result in embankments that meet the generally accepted factors of safety.

3.5 Alternatives

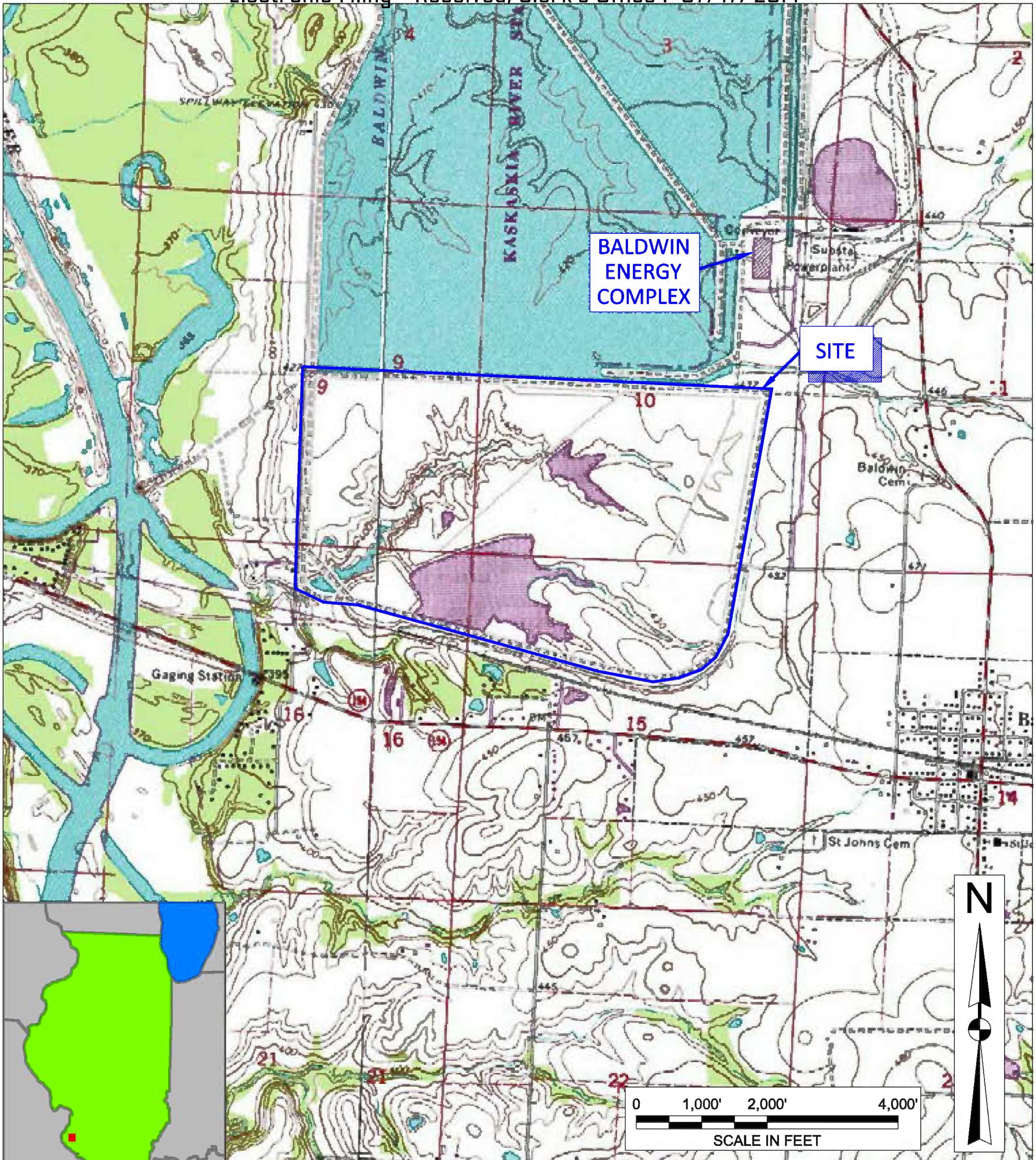
There are no practical alternatives to the repairs itemized above.

4.0 ENGINEER'S CERTIFICATION

I acknowledge that the management unit referenced herein, the BEC Primary Fly Ash Pond, Secondary Pond, Secondary Fly Ash Pond, Intermediate Pond and Final Pond Impoundments have been assessed to be in **POOR** condition on May 24 and 25, 2011.

Patrick J. Harrison, P.E.
Senior Consultant

FIGURES



SOURCE: U.S.G.S. QUADRANGLE MAPS
BALDWIN, IL (1982)
RED BUD, IL (1982)

NO.	ISSUE/DESCRIPTION	BY	DATE

PREPARED BY:

GZA GeoEnvironmental, Inc.
Engineers and Scientists
20900 SWENSON DRIVE, SUITE 150
WAUKESHA, WISCONSIN 53186
(262) 754-2560

PREPARED FOR:

SITE LOCATION MAP

BALDWIN ENERGY COMPLEX
DYNEGY MIDWEST GENERATING, INC.
BALDWIN, ILLINOIS

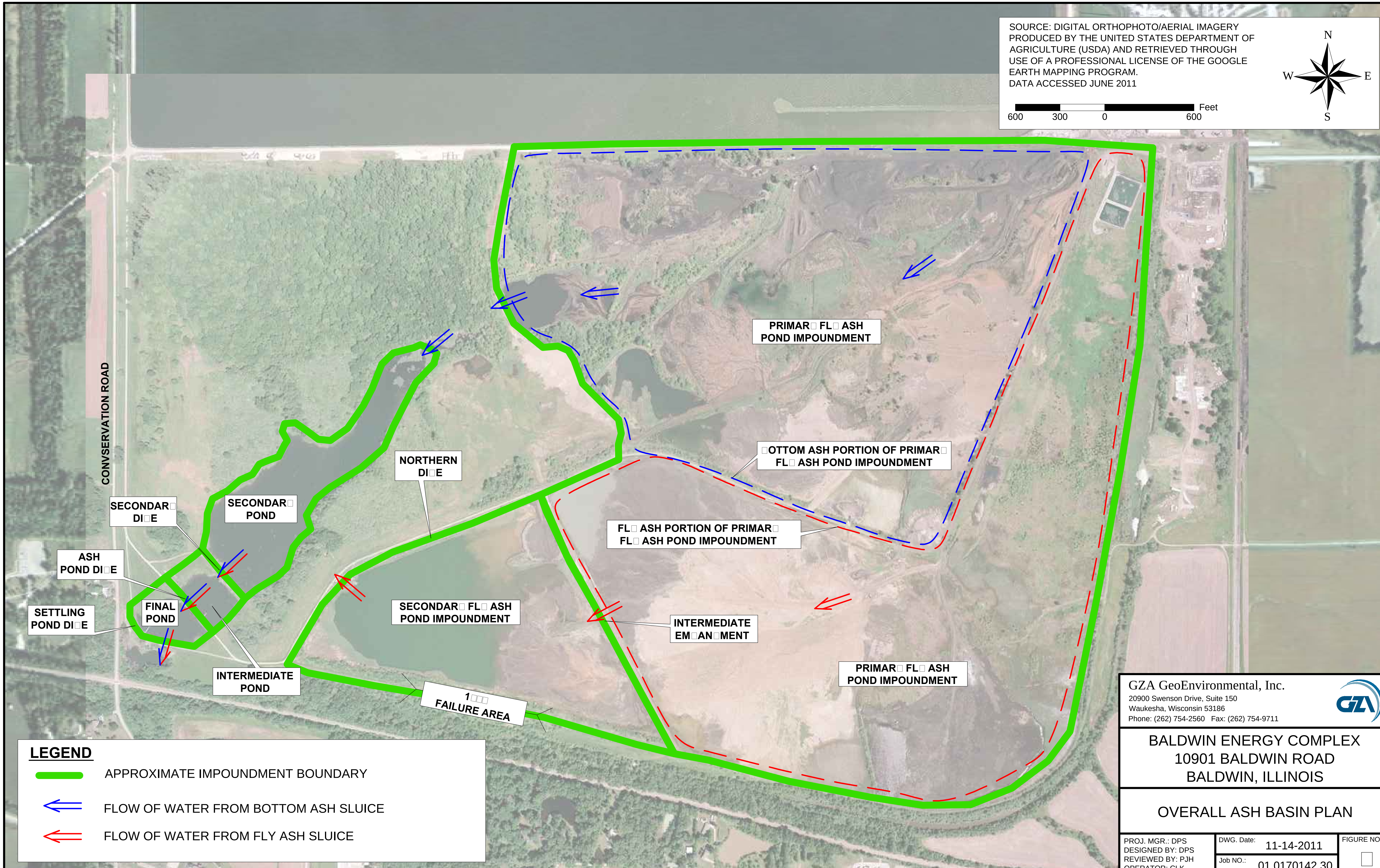
FIGURE

1

SHEET NO.

PROJ MGR: DS	REVIEWED BY: PJH	CHECKED BY: DS	DATE 8/29/11	PROJECT NO. 01.0170142.30	REVISION NO.
DESIGNED BY: DS	DRAWN BY: CLK	SCALE: 1 : 24000			

GZA-J:\GZA_USA#01.0170142.30 Ash Imp. Round 10\01.0170142.30 Task 7 - Baldwin\Drawings\Autocad\SITE LOCATION.dwg [FIGURE 1 - SITE LOCATION] August 29, 2011 - 1:21pm justin.hegarty



GZA GeoEnvironmental, Inc.
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Waukesha, Wisconsin 53186
Phone: (262) 754-2560 Fax: (262) 754-9711

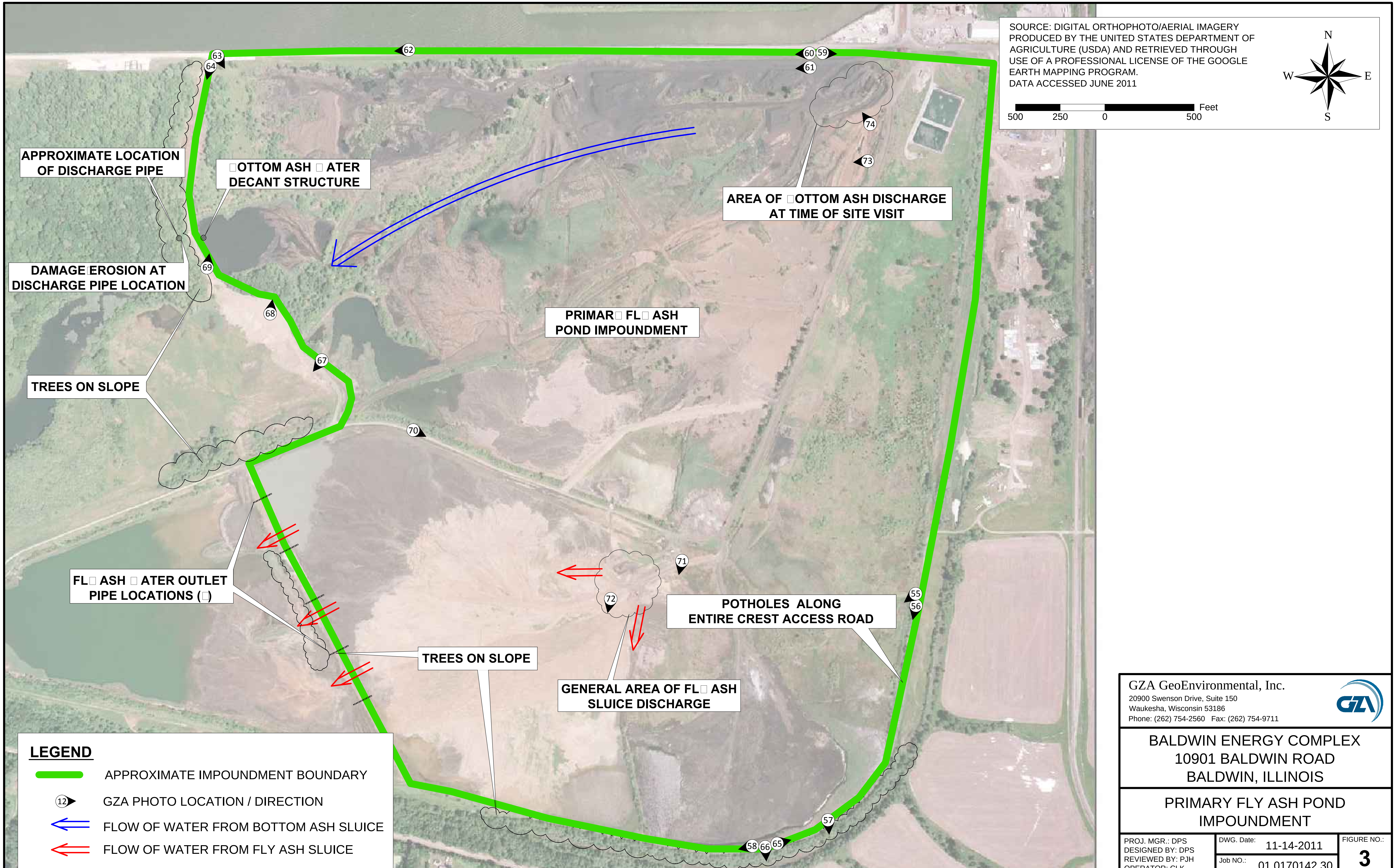
BALDWIN ENERGY COMPLEX
10901 BALDWIN ROAD
BALDWIN, ILLINOIS

OVERALL ASH BASIN PLAN

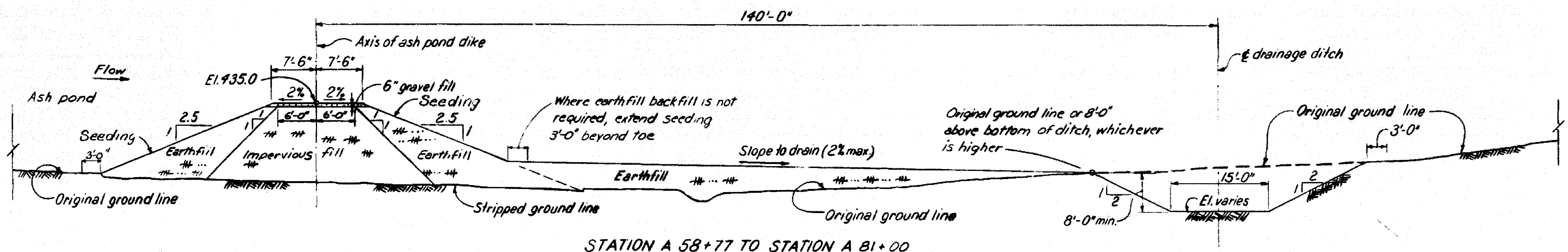
PROJ. MGR.: DPS
DESIGNED BY: DPS
REVIEWED BY: PJH
OPERATOR: CLK
DWG. Date: 11-14-2011
Job NO.: 01.0170142.30
FIGURE NO.: □

GZA-J:\GZA_USA#\01.0170142.30 Ash Imp. Round 10\01.0170142.30 Task 7 - Baldwin\Drawings\Autocad\SITE PLANS.dwg [FIG 2] November 14, 2011 - 10:02am justin.hegarty

Electronic Filing - Received, Clerk's Office : 07/17/2014



GZA-J:\GZA_USA#\01.0170142.30 Ash Imp. Round 10\01.0170142.30 Task 7 - Baldwin\Drawings\Autocad\SITE PLANS.dwg [FIG3 PRIMARY ASH] November 14, 2011 - 10:07am justin.hegarty



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BALDWIN ENERGY COMPLEX
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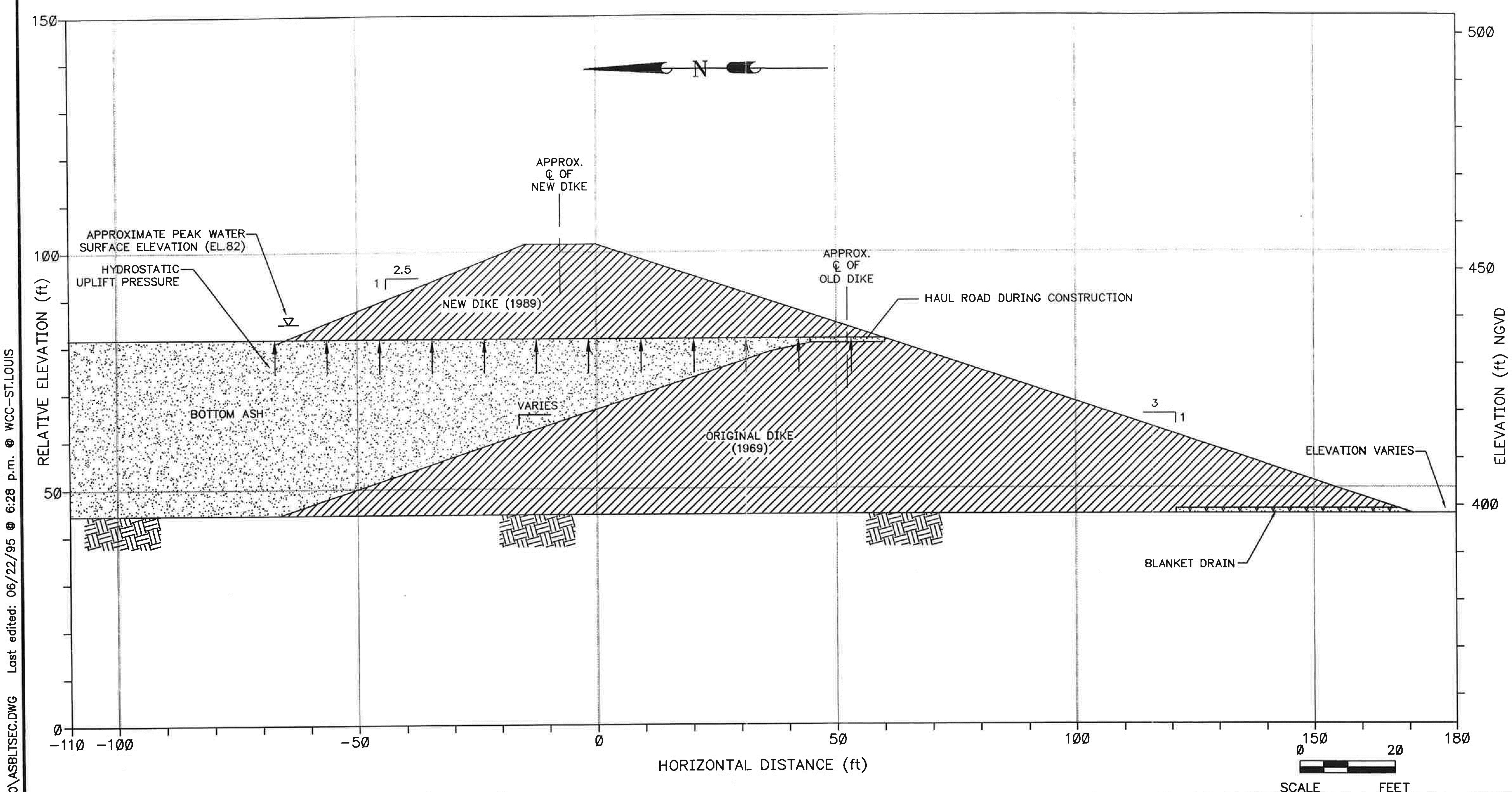
1969 TYPICAL SECTION OF SOUTHERN EMBANKMENT

PROJ. MGR.: DPS DESIGNED BY: DPS REVIEWED BY: PJH OPERATOR: CLK	DWG. Date: 11-14-2011 Job NO.: 01.0170142.30	FIGURE NO.:



Note: This typical cross section is based on the construction drawings and records provided by Illinois Power.

ILLINOIS POWER BALDWIN STATION SOUTH ASH POND DIKE BALDWIN, IL.	PROJECT NO. 5E08560

Woodward-Clyde Consultants
Engineering & sciences applied to the earth & its environment

DRN. BY: bdl 5/22/95 DSGN. BY: gaz CHKD. BY: KMB 6/23/95	As Built Section in Failed Area	FIG. NO. 3

GZA GeoEnvironmental, Inc.

PROJ MGR: DPS
DESIGNED BY: DPS
REVIEWED BY: PJH
OPERATOR: CLK
DATE: 11-11-2011

BALDWIN ENERGY COMPLEX
10901 BALDWIN ROAD
BALDWIN, ILLINOIS

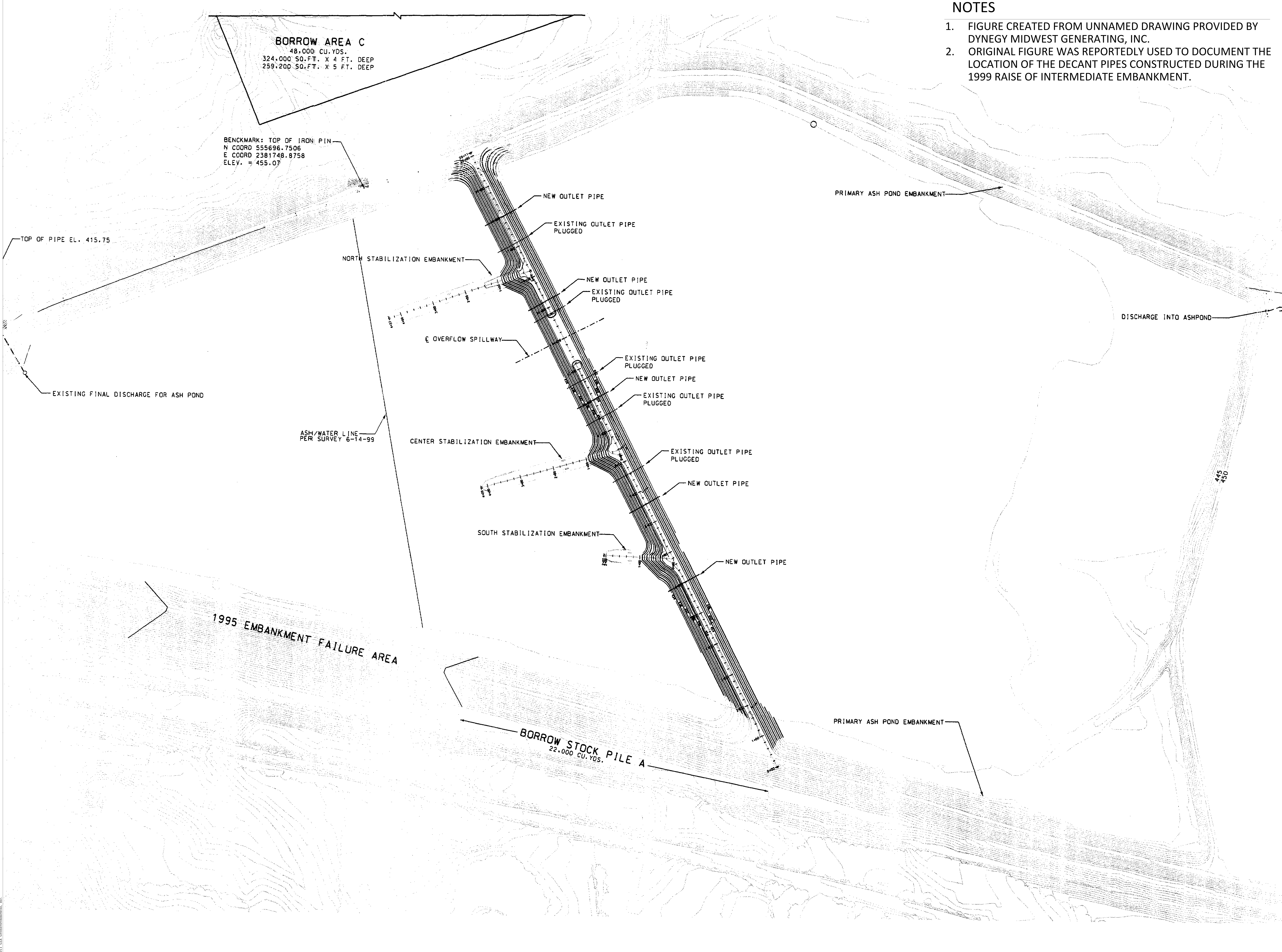
AS BUILT OF SOUTHERN EMBANKMENT OF PRIMARY FLY ASH POND

JOB NO. 01.0170142.30

FIGURE NO. 5

NOTES

1. FIGURE CREATED FROM UNNAMED DRAWING PROVIDED BY DYNEGY MIDWEST GENERATING, INC.
2. ORIGINAL FIGURE WAS REPORTEDLY USED TO DOCUMENT THE LOCATION OF THE DECANT PIPES CONSTRUCTED DURING THE 1999 RAISE OF INTERMEDIATE EMBANKMENT.



REV. NO. | DESCRIPTION | BY | DATE

0 50' 100' 200'
APPROXIMATE SCALE IN FEET

GZA GeoEnvironmental, Inc.

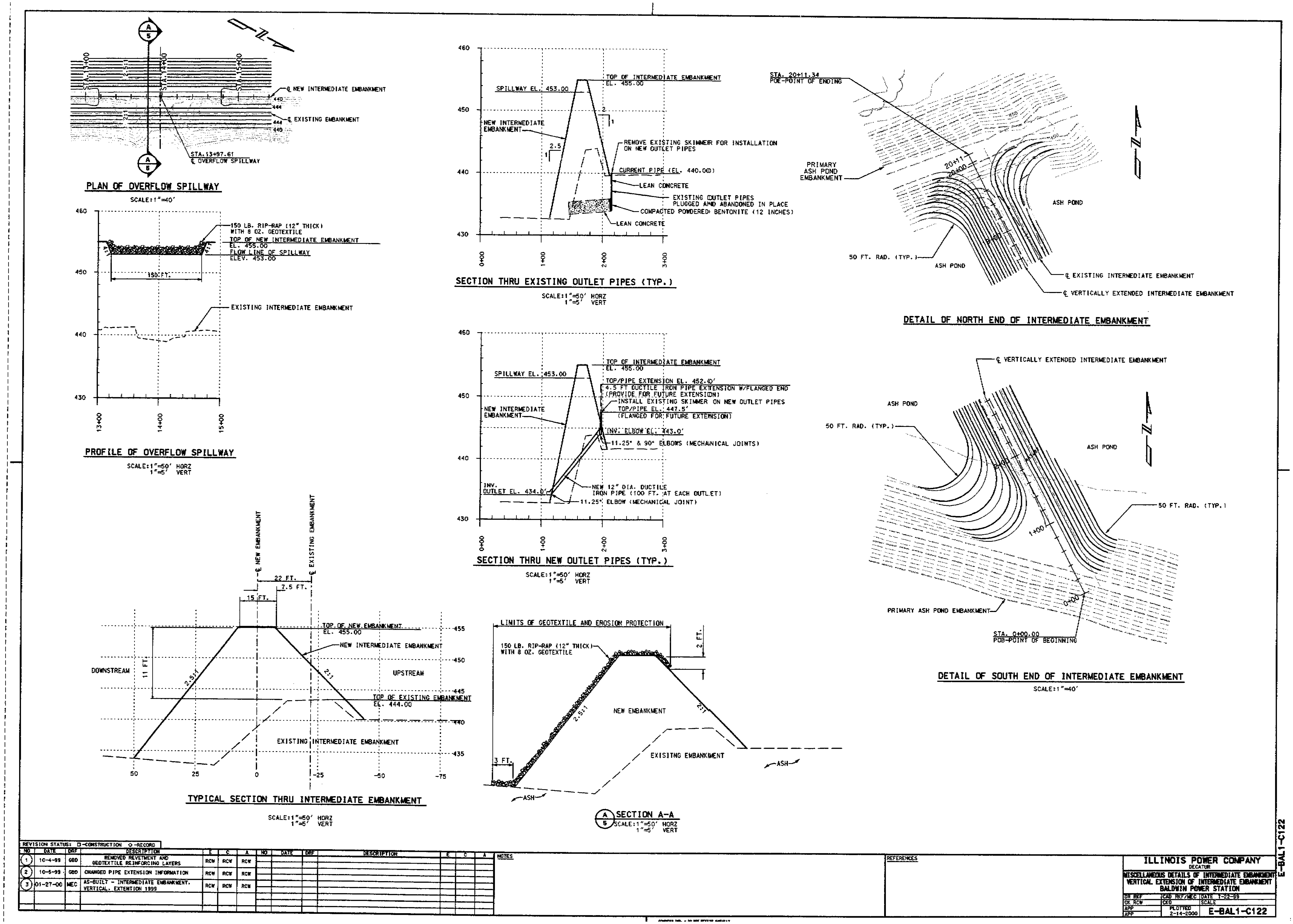
PROJ MGR: DPS
DESIGNED BY: DPS
REVIEWED BY: PJH
OPERATOR: CLK
DATE: 11-14-2011

BALDWIN ENERGY COMPLEX
10901 BALDWIN ROAD
BALDWIN, ILLINOIS

PLAN VIEW OF INTERMEDIATE EMBANKMENT

JOB NO.
01.0170142.30

FIGURE NO.
6



NOTE: IMAGE HAS BEEN REDUCED AND IS NO LONGER TO SCALE

GZA GeoEnvironmental, Inc.

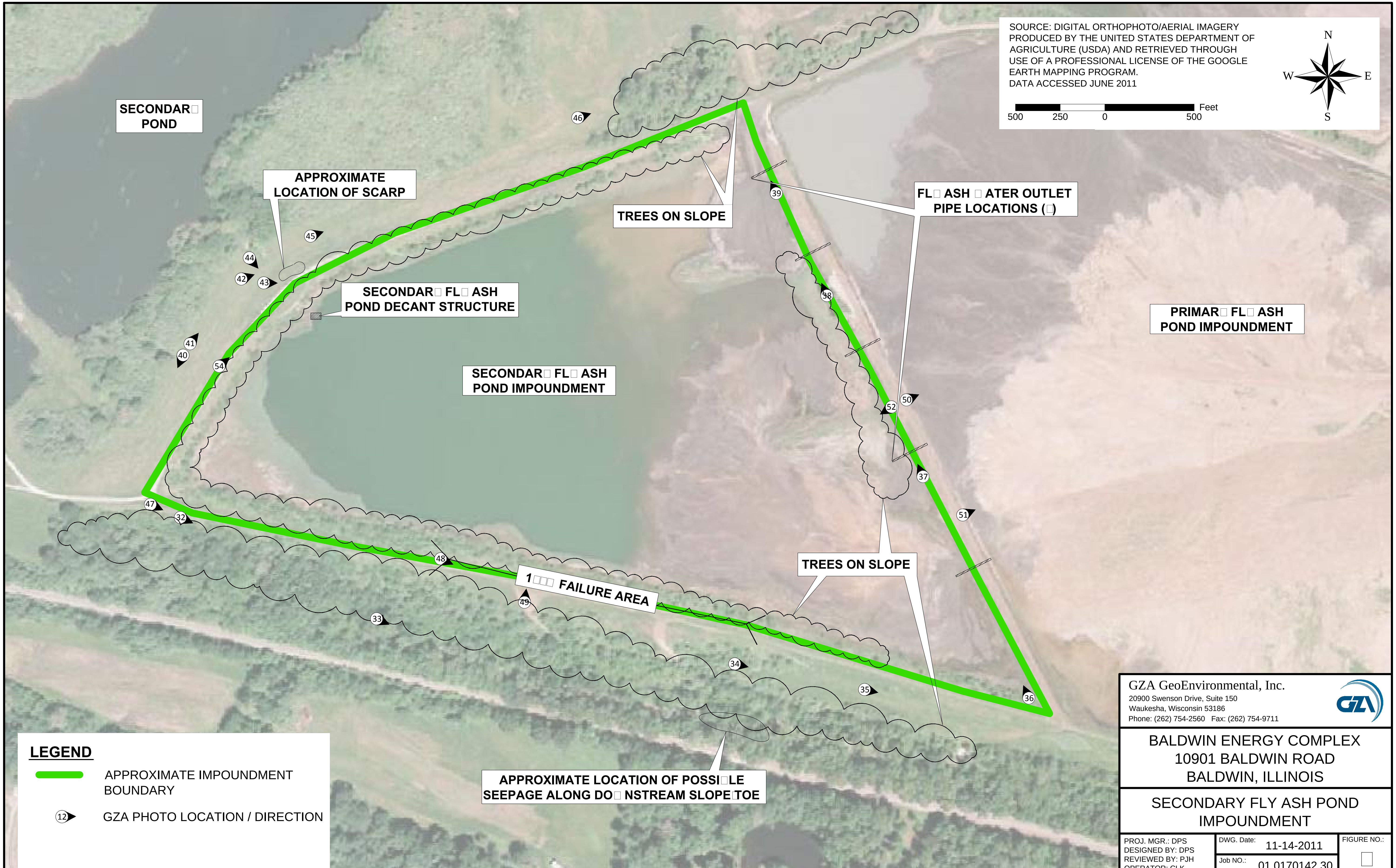
PROJ MGR: DPS
DESIGNED BY: DPS
REVIEWED BY: PJH
OPERATOR: CLK
DATE: 09-01-2011

BALDWIN ENERGY COMPLEX
10901 BALDWIN ROAD
BALDWIN, ILLINOIS

TYPICAL CROSS SECTIONS
THROUGH INTERMEDIATE EMBANKMENT

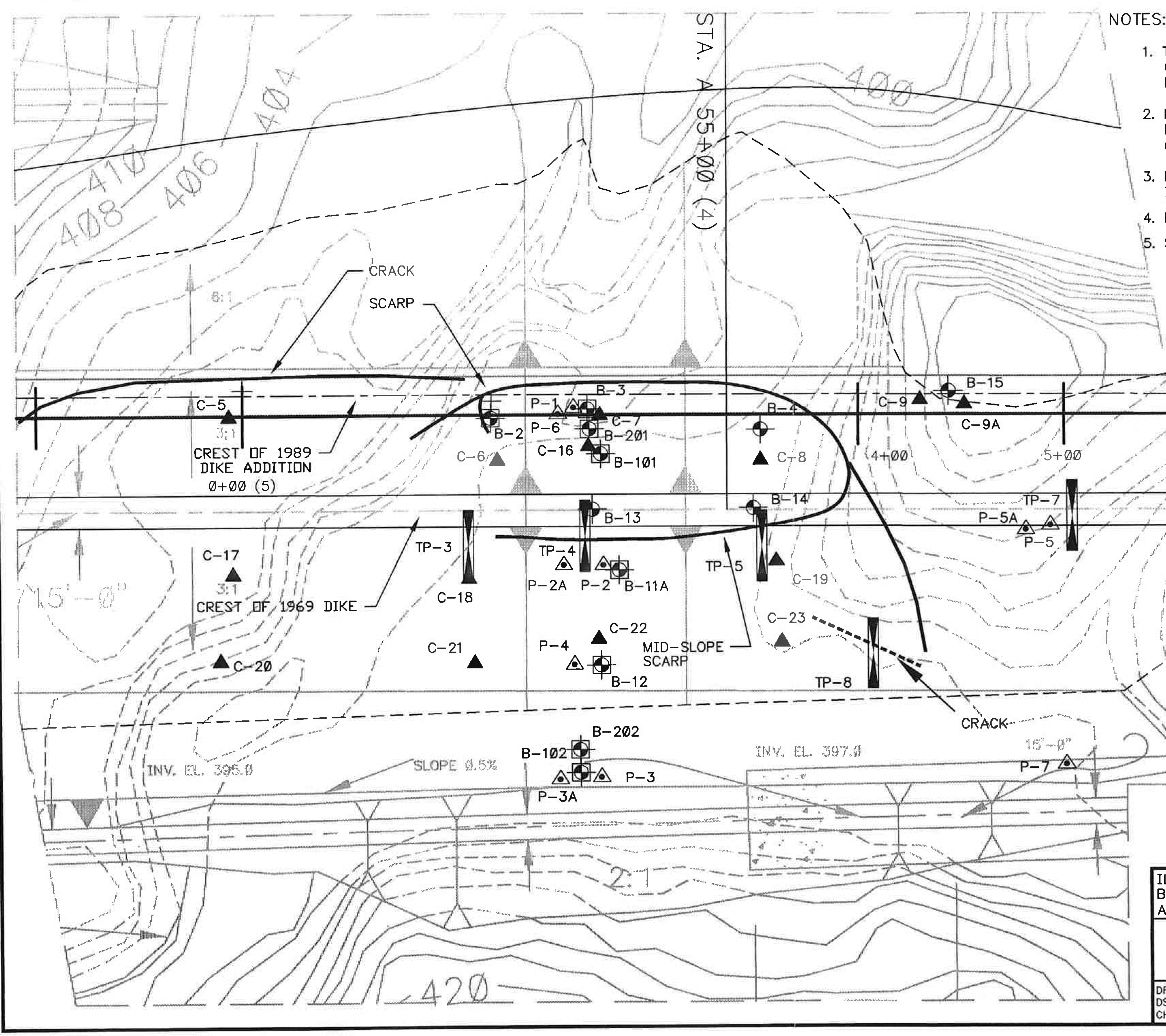
JOB NO.
01.0170142.30

FIGURE NO.
7



GZA-J:\GZA_USA#\01.0170142.30 Ash Imp. Round 10\01.0170142.30 Task 7 - Baldwin\Drawings\Autocad\SITE PLANS.dwg [FIG 8] November 14, 2011 - 10:18am justin.hegarty

File: F:\5E08560\TASK240\SCRPPLAN.DWG Last edited: 08/24/95 @ 4:48 p.m. @ WCC-ST.LOUIS



NOTES:

1. TOPOGRAPHY AND OLD DIKE FOOTPRINT BASED ON SCANNED IMAGE FROM CONSTRUCTION DRAWINGS BY HARZA ENGINEERING COMPANY (SHEET 2),(NOV. 18, 1969).
2. NEW DIKE FOOTPRINT BASED ON CONSTRUCTION DRAWINGS PROVIDED BY ILLINOIS POWER COMPANY (SHEET CE-BAL1-B15-03X),(MAY 14, 1986).
3. EXPLORATORY LOCATIONS SURVEYED BY FREESEN INCORPORATED.
4. DIKE STATIONING FOR ORIGINAL CONSTRUTION
5. STATIONING FOR THIS STUDY

LEGEND

- CPTU
- BORING
- TEST PIT
- PIEZOMETER
- BORING WITH INCLINOMETER

0 50
SCALE FEET

ILLINOIS POWER COMPANY
BALDWIN POWER STATION
ASH POND, SOUTH DIKE

PROJECT NO. 5E08560

Woodward-Clyde Consultants
Engineering & sciences applied to the earth & its environment

DRN. BY: bdl 4/27/95
DSGN. BY: gaz
CHKD. BY: KMB 8/30/95

SITE AND EXPLORATION PLAN IN FAILED AREA

FIG. NO. 7

REV. NO. | DESCRIPTION | BY | DATE

APPROXIMATE SCALE IN FEET

GZA GeoEnvironmental, Inc.

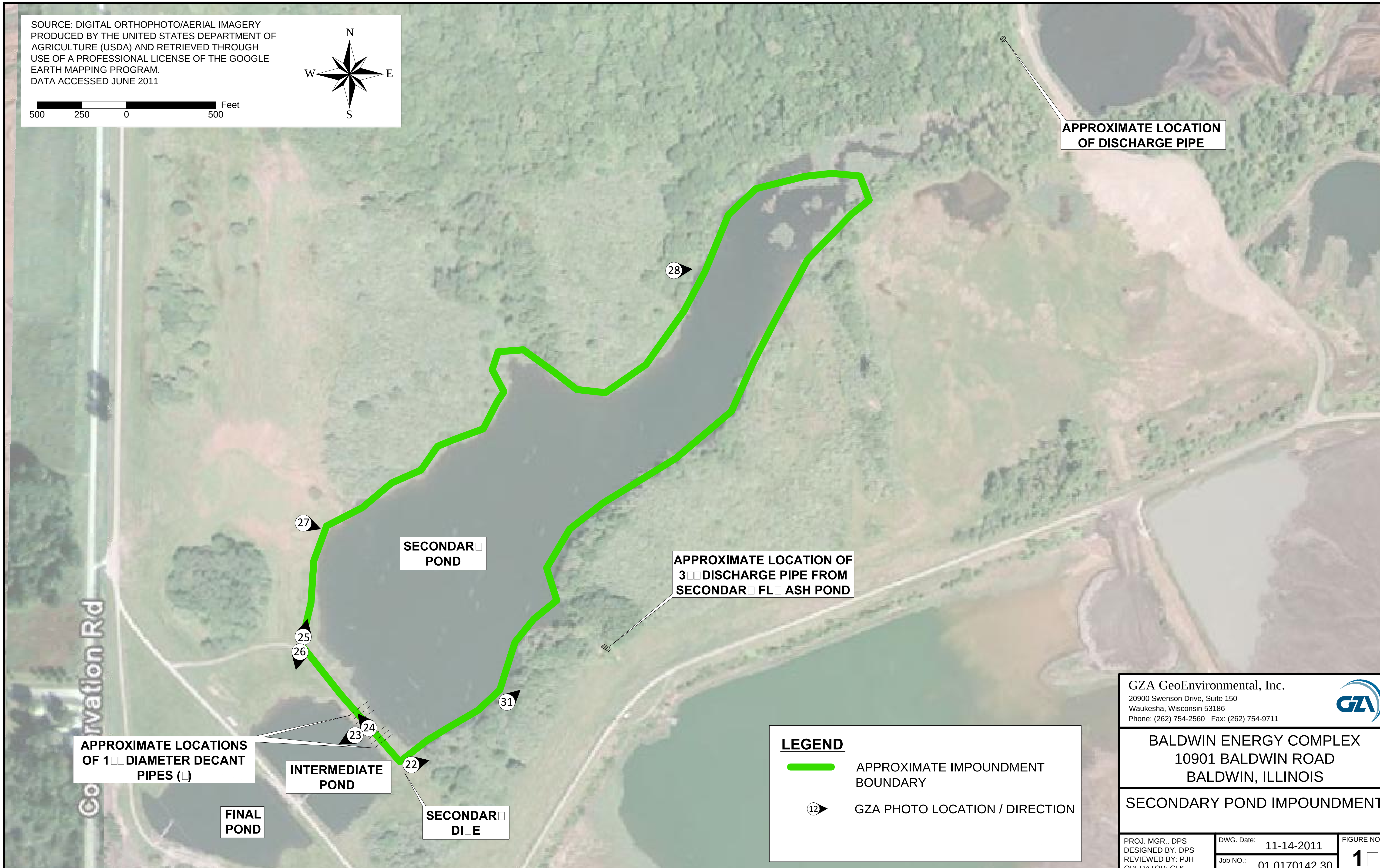
PROJ MGR: DPS
DESIGNED BY: DPS
REVIEWED BY: PJH
OPERATOR: CLK
DATE: 11-11-2011

BALDWIN ENERGY COMPLEX
10901 BALDWIN ROAD
BALDWIN, ILLINOIS

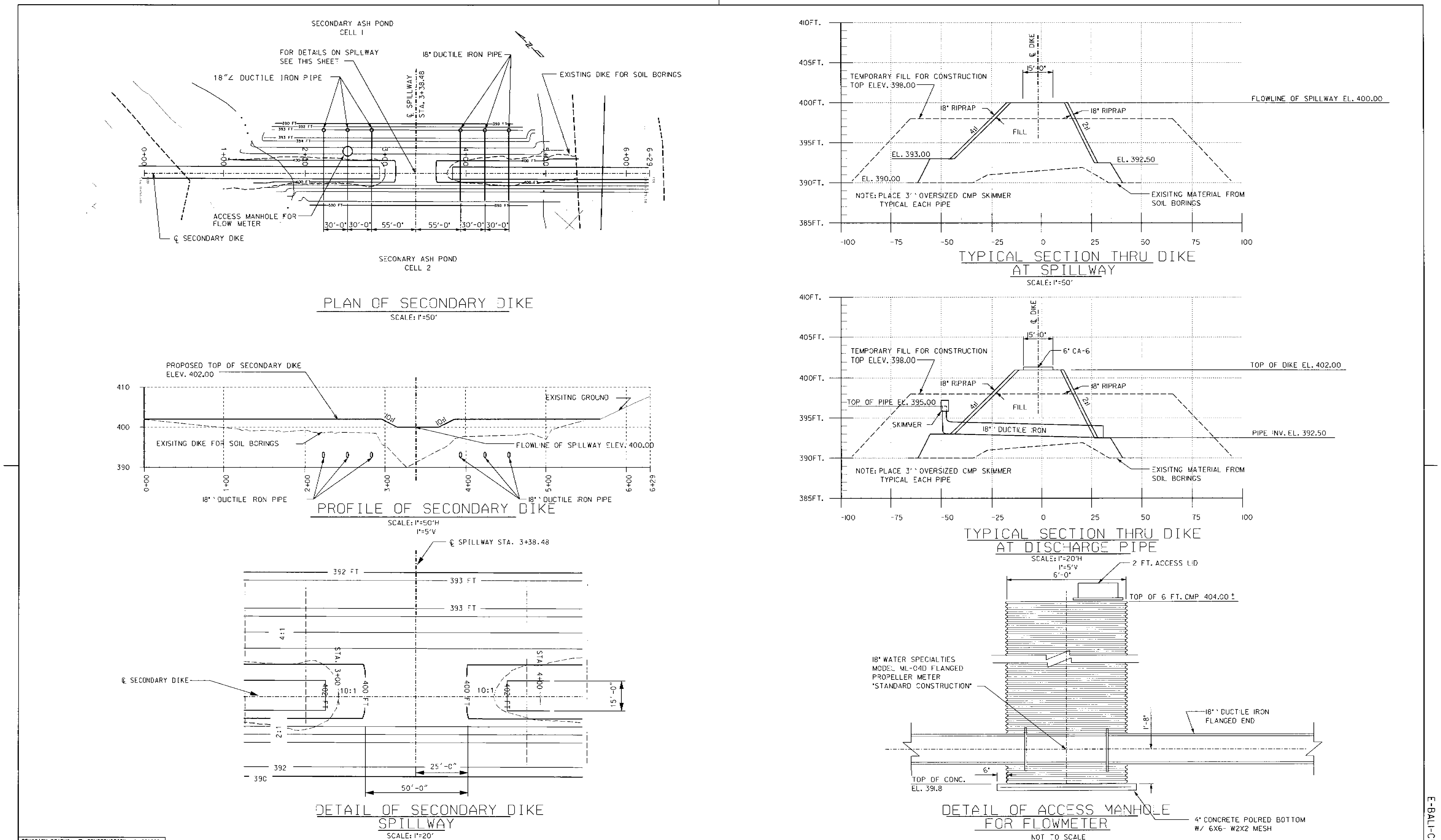
INSTRUMENTATION INSTALLED NEAR 1995 FAILURE AREA

JOB NO. 01.0170142.30

FIGURE NO. 9



GZA-J:\GZA_USA#\01.0170142.30 Ash Imp. Round 10\01.0170142.30 Task 7 - Baldwin\Drawings\Autocad\SITE PLANS.dwg [FIG 10] November 14, 2011 - 10:28am justin.hegarty



REVISION STATUS: ☐ -CONSTRUCTION ○ -RECORD

NO	DATE	DRF	DESCRIPTION	E	C	A	NO	DATE	DRF	DESCRIPTION	E	C	A

NOTES

REFERENCES

ILLINOIS POWER COMPANY
DECATUR

DETAILS FOR
SECONDARY STORM WATER DIKE
BALDWIN POWER STATION

DR RKF	CAD RKF	DATE 11-4-96
CK	CKD	SCALE AS NOTED
APP DDD	PLOTTED 11-4-96	E-BALI-C5I
APP		

PC026693.DGN

COMPUTER DWG. - DO NOT REVISE MANUALLY

REV. NO. | DESCRIPTION | BY | DATE

APPROXIMATE SCALE IN FEET 0 25 50

GZA GeoEnvironmental, Inc.

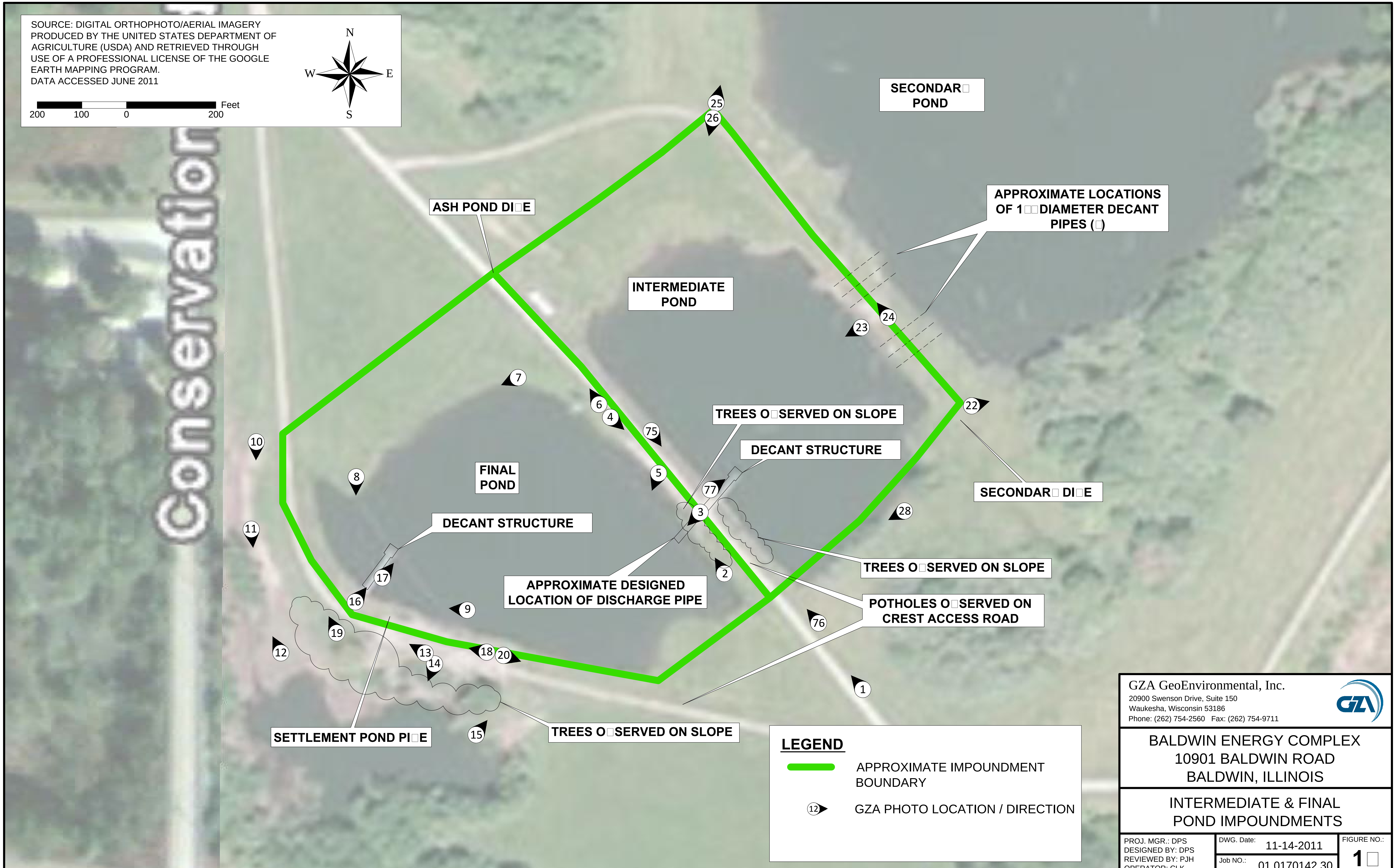
PROJ MGR: DPS
DESIGNED BY: DPS
REVIEWED BY: PJH
OPERATOR: CLK
DATE: 11-14-2011

BALDWIN ENERGY COMPLEX
10901 BALDWIN ROAD
BALDWIN, ILLINOIS

TYPICAL SECTIONS THROUGH SECONDARY DIKE

JOB NO. 01.0170142.30

FIGURE NO. 11


SOURCE: DIGITAL ORTHOPHOTO/AERIAL IMAGERY PRODUCED BY THE UNITED STATES DEPARTMENT OF AGRICULTURE (USDA) AND RETRIEVED THROUGH USE OF A PROFESSIONAL LICENSE OF THE GOOGLE EARTH MAPPING PROGRAM.
DATA ACCESSED JUNE 2011
N
W
E
S
200 100 0 200 Feet
Conservation
SECONDAR□ POND
APPROXIMATE LOCATIONS OF 1□□DIAMETER DECANT PIPES (□)
ASH POND DI□E
INTERMEDIATE POND
TREES O□SERVED ON SLOPE
DECANT STRUCTURE
SECONDAR□ DI□E
FINAL POND
DECANT STRUCTURE
APPROXIMATE DESIGNED LOCATION OF DISCHARGE PIPE
TREES O□SERVED ON SLOPE
POTHOLES O□SERVED ON CREST ACCESS ROAD
SETTLEMENT POND PI□E
TREES O□SERVED ON SLOPE
1
2
3
4
5
6
7
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9
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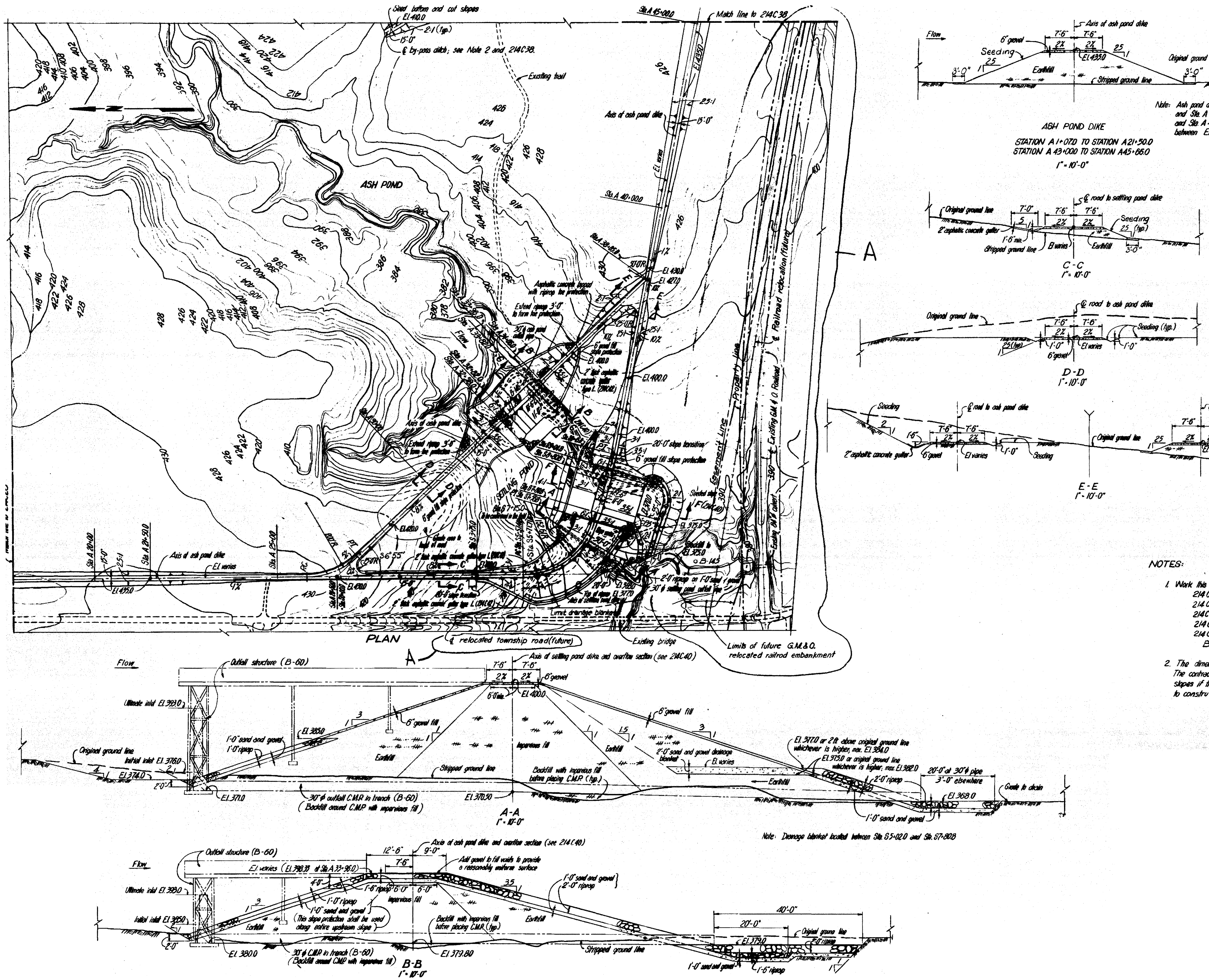
28
75
76
77
LEGEND
APPROXIMATE IMPOUNDMENT BOUNDARY
12 GZA PHOTO LOCATION / DIRECTION
GZA GeoEnvironmental, Inc.
20900 Swenson Drive, Suite 150
Waukesha, Wisconsin 53186
Phone: (262) 754-2560 Fax: (262) 754-9711
GZA
BALDWIN ENERGY COMPLEX
10901 BALDWIN ROAD
BALDWIN, ILLINOIS
INTERMEDIATE & FINAL POND IMPOUNDMENTS
PROJ. MGR.: DPS
DESIGNED BY: DPS
REVIEWED BY: PJH
OPERATOR: CLK
DWG. Date: 11-14-2011
Job NO.: 01.0170142.30
FIGURE NO.: 1□



NOTES:

1. Work this drawing with
   214C13 Dam and Dike Alignment
   214C21 Boring Logs - Sheet 7
   214C28 West Dike - Sheet 3
   214C38 Ash Pond Dike - Sheet 2
   214C40 Ash Pond Dike - Sheet 4
   B-60 Ash Pond Outfall Structures

2. The dimensions of the by-pass ditch are minimum. The contractor may widen the ditch or flatten the slopes if the additional material excavated is used to construct the dikes.

0 50' 100' 200'
APPROXIMATE SCALE IN FEET

GZA GeoEnvironmental, Inc.

REV. NO.	DESCRIPTION	BY	DATE

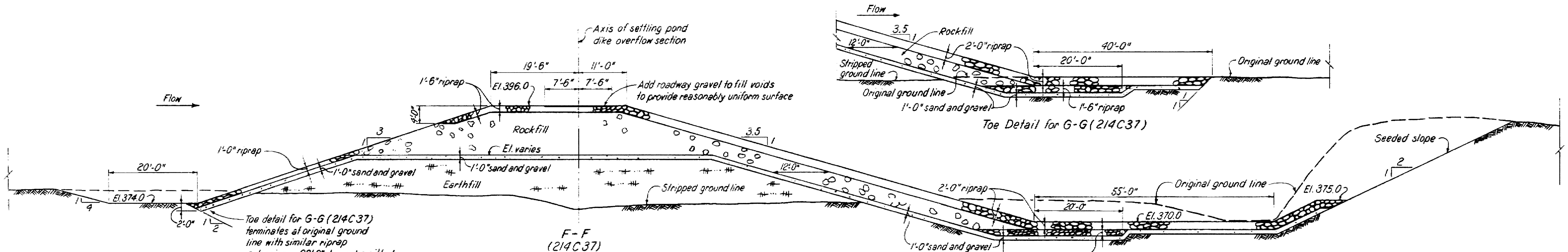
PROJ MGR: DPS
DESIGNED BY: DPS
REVIEWED BY: PJH
OPERATOR: CLK
DATE: 11-11-2011

BALDWIN ENERGY COMPLEX
10901 BALDWIN ROAD
BALDWIN, ILLINOIS

PLAN AND SECTIONS OF ASH POND AND SETTLING POND DIKE

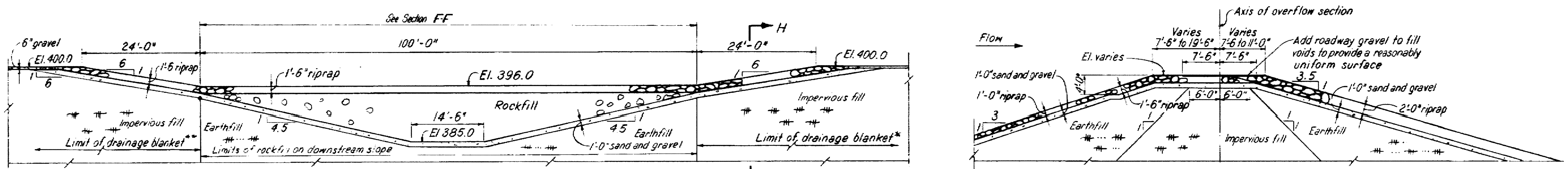
JOB NO. 01.0170142.30

FIGURE NO. 13



F-F
(214C37)

Section G-G (214C37) is similar to Section F-F except for toe details



**Drainage blanket omitted on right abutment of ash pond dike.

TYPICAL LONGITUDINAL SECTION THROUGH OVERFLOW SECTION FOR BOTH THE ASH POND AND SETTLING POND DIKES
(Looking upstream)

*Drainage blanket omitted on the left abutment of the settling pond dike and ash pond dike.

H-H

NOTES:
1. Work this drawing with 21437 Ash Pond Dike - Sheet 1

REV. NO. | DESCRIPTION | BY | DATE

0 5' 10' 20' APPROXIMATE SCALE IN FEET

GZA GeoEnvironmental, Inc.

PROJ MGR: DPS
DESIGNED BY: DPS
REVIEWED BY: PJH
OPERATOR: CLK
DATE: 11-11-2011

BALDWIN ENERGY COMPLEX
10901 BALDWIN ROAD
BALDWIN, ILLINOIS

OVERFLOW SECTIONS FOR ASH POND DIKE AND SETTLING POND DIKE

JOB NO. 01.0170142.30

FIGURE NO. 14

APPENDIX A

LIMITATIONS

DAM ENGINEERING & VISUAL INSPECTION LIMITATIONS

1. The observations described in this report were made under the conditions stated herein. The conclusions presented in the report were based solely on the services described therein, and not on scientific tasks or procedures beyond the scope of described services or the time and budgetary constraints imposed by the United States Environmental Protection Agency (EPA).

2. In preparing this report, GZA GeoEnvironmental, Inc. (GZA) has relied on certain information provided by Dynegy Midwest Generation, LLC (Dynegy) (and their affiliates) as well as Federal, state, and local officials and other parties referenced therein. GZA has also relied on other parties which were available to GZA at the time of the inspection. Although there may have been some degree of overlap in the information provided by these various sources, GZA did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this work.

3. In reviewing this Report, it should be noted that the reported condition of the Ash Ponds is based on observations of field conditions during the course of this study along with data made available to GZA. The observations of conditions at the Ash Ponds reflect only the situation present at the specific moment in time the observations were made, under the specific conditions present. It may be necessary to reevaluate the recommendations of this report when subsequent phases of evaluation or repair and improvement provide more data.

4. It is important to note that the condition of a dam or embankment depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam or embankment will continue to represent the condition of the dam or embankment at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions may be detected.

5. Water level readings have been reviewed and interpretations have been made in the text of this report. Fluctuations in the level of the groundwater and surface water may occur due to variations in rainfall, temperature, and other factors different than at the time measurements were made.

6. GZA's comments on the history, hydrology, hydraulics, and embankment stability for the Ash Ponds are based on a limited review of available design documentation for the Baldwin Energy Complex. Calculations and computer modeling used in these analyses were not available and were not independently reviewed by GZA.

7. This report has been prepared for the exclusive use of EPA for specific application to the existing dam facilities, in accordance with generally accepted dam engineering practices. No other warranty, express or implied, is made.

8. This dam inspection verification report has been prepared for this project by GZA. This report is for broad evaluation and management purposes only and is not sufficient, in and of itself, to prepare construction documents or an accurate bid.

9. The Phase I investigation does not include an assessment of the need for fences, gates, no-trespassing signs, repairs to existing fences and railings and other items which may be needed to minimize trespass and provide greater security for the facility and safety to the public. An evaluation of the project for compliance with OSHA rules and regulations is also excluded.

APPENDIX B

DEFINITIONS

COMMON DAM SAFETY DEFINITIONS

For a comprehensive list of dam engineering terminology and definitions refer to references published by the U.S. Army Corps of Engineers, the Federal Energy Regulatory Commission, the Department of the Interior Bureau of Reclamation, or the Federal Emergency Management Agency.

Orientation

Upstream – Shall mean the side of the dam that borders the impoundment.

Downstream – Shall mean the high side of the dam, the side opposite the upstream side.

Right – Shall mean the area to the right when looking in the downstream direction.

Left – Shall mean the area to the left when looking in the downstream direction.

Dam Components

Dam – Shall mean any artificial barrier, including appurtenant works, which impounds or diverts water.

Embankment – Shall mean the fill material, usually earth or rock, placed with sloping sides, such that it forms a permanent barrier that impounds water.

Crest – Shall mean the top of the dam, usually provides a road or path across the dam.

Abutment – Shall mean that part of a valley side against which a dam is constructed. An artificial abutment is sometimes constructed as a concrete gravity section, to take the thrust of an arch dam where there is no suitable natural abutment.

Appurtenant Works – Shall mean structures, either in dams or separate there from, including but not be limited to, spillways; reservoirs and their rims; low level outlet works; and water conduits including tunnels, pipelines, or penstocks, either through the dams or their abutments.

Spillway – Shall mean a structure over or through which water flows are discharged. If the flow is controlled by gates or boards, it is a controlled spillway; if the fixed elevation of the spillway crest controls the level of the impoundment, it is an uncontrolled spillway.

General

EAP – Emergency Action Plan - Shall mean a predetermined plan of action to be taken to reduce the potential for property damage and/or loss of life in an area affected by an impending dam break.

O&M Manual – Operations and Maintenance Manual; Document identifying routine maintenance and operational procedures under normal and storm conditions.

Normal Pool – Shall mean the elevation of the impoundment during normal operating conditions.

Acre-foot – Shall mean a unit of volumetric measure that would cover one acre to a depth of one foot. It is equal to 43,560 cubic feet. One million U.S. gallons = 3.068 acre feet.

Height of Dam – Shall mean the vertical distance from the lowest portion of the natural ground, including any stream channel, along the downstream toe of the dam to the crest of the dam.

Spillway Design Flood (SDF) – Shall mean the flood used in the design of a dam and its appurtenant works particularly for sizing the spillway and outlet works, and for determining maximum temporary storage and height of dam requirements.

Condition Rating

SATISFACTORY - No existing or potential management unit safety deficiencies are recognized. Acceptable performance is expected under all applicable loading conditions (static, hydrologic, seismic) in accordance with the applicable criteria. Minor maintenance items may be required.

FAIR - Acceptable performance is expected under all required loading conditions (static, hydrologic, seismic) in accordance with the applicable safety regulatory criteria. Minor deficiencies may exist that require remedial action and/or secondary studies or investigations.

POOR - A management unit safety deficiency is recognized for any required loading condition (static, hydrologic, seismic) in accordance with the applicable dam safety regulatory criteria. Remedial action is necessary. POOR also applies when further critical studies or investigations are needed to identify any potential dam safety deficiencies.

UNSATISFACTORY - Considered unsafe. A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution. Reservoir restrictions may be necessary.

Hazard Potential

(In the event the impoundment should fail, the following would occur):

LESS THAN LOW HAZARD POTENTIAL: Failure or misoperation of the dam results in no probable loss of human life or economic or environmental losses.

LOW HAZARD POTENTIAL: Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

SIGNIFICANT HAZARD POTENTIAL: Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

HIGH HAZARD POTENTIAL: Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

APPENDIX C

INSPECTION CHECKLISTS

Coal Combustion Dam Inspection Checklist Form

US Environmental Protection Agency

Site Name:	Baldwin Energy Complex	Date:	5/25/11
Unit Name:	Primary Ash Pond	Operator's Name:	Dynergy Midwest Generation, LLC
Unit I.D.:		Hazard Potential Classification:	High / Significant ✓ / Low
Inspector's Name:	Patrick J. Harrison, P.E. and Doug P. Simon, P.E.		

Check the appropriate box below. Provide comments when appropriate. If not applicable or not available, record "N/A". Any unusual conditions or construction practices that should be noted in the comments section. For large diked embankments, separate checklists may be used for different embankment areas. If separate forms are used, identify approximate area that the form applies to in comments.

	Yes	No		Yes	No
1. Frequency of Company's Dam Inspections?	Weekly		18. Sloughing or bulging on slopes?		✓
2. Pool elevation (operator records)?	447.5		19. Major erosion or slope deterioration?		✓
3. Decant inlet elevation (operator records)?	447.5		20. Decant Pipes:		
4. Open channel spillway elevation (operator records)?	453.5		Is water entering inlet, but not exiting outlet?		✓
5. Lowest dam crest elevation (operator records)?	455.0		Is water exiting outlet, but not entering inlet?		✓
6. If instrumentation is present, are readings recorded (operator records)?	✓		Is water exiting outlet flowing clear?	✓	
7. Is the embankment currently under construction?		✓	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation,stumps, topsoil in area where embankment fill will be placed)?	✓		From underdrain?		✓
9. Trees growing on embankment? (If so, indicate largest diameter below)	✓		At isolated points on embankment slopes?		✓
10. Cracks or scarps on crest?		✓	At natural hillside in the embankment area?		✓
11. Is there significant settlement along the crest?		✓	Over widespread areas?		✓
12. Are decant trashracks clear and in place?		✓	From downstream foundation area?		✓
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		✓	"Boils" beneath stream or ponded water?		✓
14. Clogged spillways, groin or diversion ditches?		✓	Around the outside of the decant pipe?		✓
15. Are spillway or ditch linings deteriorated?		✓	22. Surface movements in valley bottom or on hillside?		✓
16. Are outlets of decant or underdrains blocked?		✓	23. Water against downstream toe?		✓
17. Cracks or scarps on slopes?		✓	24. Were Photos taken during the dam inspection?	✓	

Major adverse changes in these items could cause instability and should be reported for further evaluation. Adverse conditions noted in these items should normally be described (extent, location, volume, etc.) in the space below and on the back of this sheet.

Inspection Issue # Comments

9. Largest tree diameter noted was approximately 16 inches.

U. S. Environmental Protection Agency

Coal Combustion Waste (CCW)
Impoundment Inspection

Impoundment NPDES Permit # Not Provided
INSPECTOR Patrick J. Harrison, P.E.
Doug P. Simon, P.E.
Date May 25, 2011

Impoundment Name Primary Ash Pond
Impoundment Company Dynergy Midwest Generation, LLC
EPA Region Region V
State Agency (Field Office) Addresss Illinois Department of Natural Resources
Springfield, Illinois
Name of Impoundment Primary Ash Pond
(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New X Update ____

	Yes	No
Is impoundment currently under construction?		X
Is water or ccw currently being pumped into the impoundment?		X

IMPOUNDMENT FUNCTION: Settlement and Impoundment of Ash

Nearest Downstream Town : Name Evansville
Distance from the impoundment Approximately 7.5 miles
Impoundment
Location: Longitude 89 Degrees 52 Minutes 05 Seconds
Latitude 38 Degrees 11 Minutes 33 Seconds
State Illinois County Randolph

Does a state agency regulate this impoundment? YES X NO ____

If So Which State Agency? The Illinois Department of Natural Resources regulates the discharge of water (NPDES Permit).

<u>HAZARD POTENTIAL</u> (In the event the impoundment should fail, the following would occur):

______ **LESS THAN LOW HAZARD POTENTIAL:** Failure or misoperation of the dam results in no probable loss of human life or economic or environmental losses.

______ **LOW HAZARD POTENTIAL:** Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

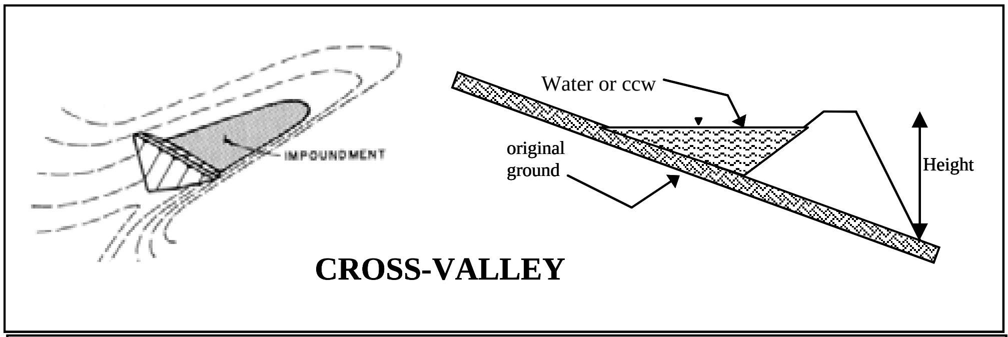
__X___ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

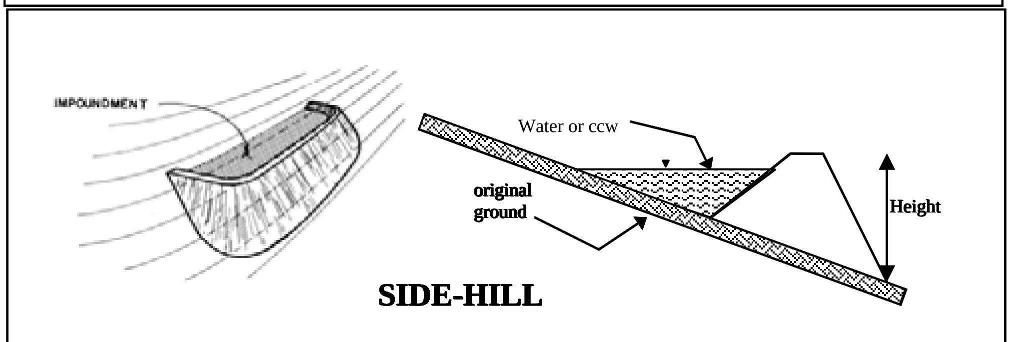
______ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

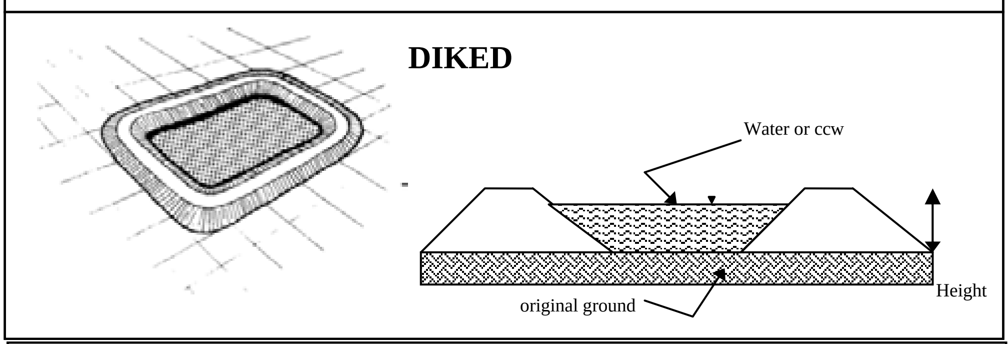
DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

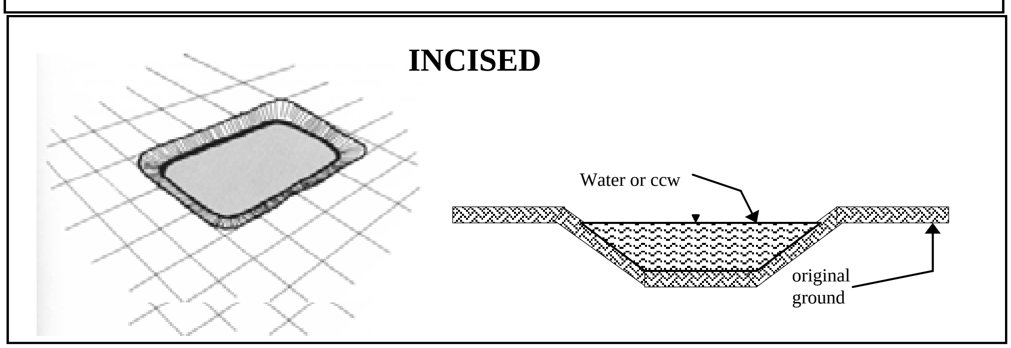
Failure of the dam would not result in probable loss of life but could result in economic and environmental damages to areas outside of the owners property.

CONFIGURATION:









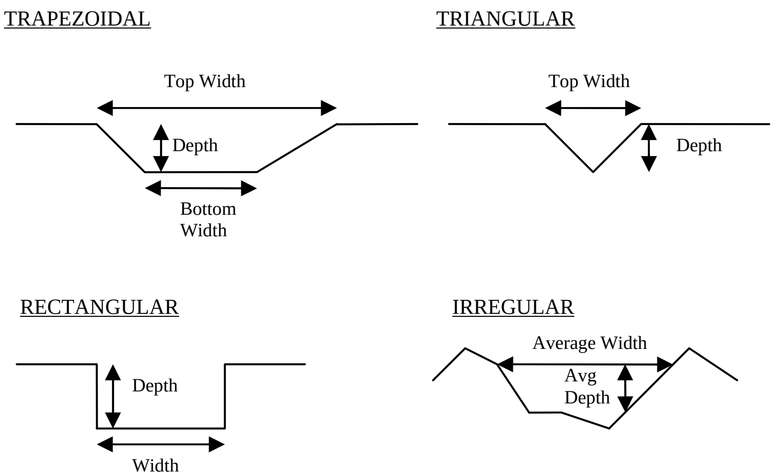
______ Cross-Valley
______ Side-Hill
__X__ Diked
______ Incised (form completion optional)
______ Combination Incised/Diked

Embankment Height __55__ feet   Embankment Material _Impervious Fill_
Pool Area __5__ acres   Liner _No liner present_
Current Freeboard __4__ feet   Liner Permeability _NA_

<u>TYPE OF OUTLET</u> (Mark all that apply)

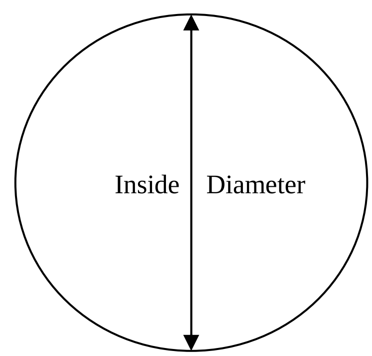
__X__ **Open Channel Spillway**
_____ Trapezoidal
_____ Triangular
_____ Rectangular
_____ Irregular

__1.5 ft__ depth
__175 ft__ bottom (or average) width
__200 ft__ top width



__X__ **Outlet**

__16__ inside diameter
Varies: See Below.



Material
_____ corrugated metal
__X__ welded steel (There are 3 outlet pipes)
_____ concrete
_____ plastic (hdpe, pvc, etc.)
_____ other (specify) ______________________

Is water flowing through the outlet? YES __X__ NO _______

_____ **No Outlet**

_____ **Other Type of Outlet** (specify) ___________________________________

The Impoundment was Designed By __Sargent & Lundy__________________________
____

Has there ever been a failure at this site? YES X NO

If So When? February 1995

If So Please Describe :

The executive summary of a failure analysis completed by Woodward-Clyde Consultants, describes the failure as follows:

"The slide occurred in February 1995 on the ash pond south dike over a distance of about 500 lineal feet at a location where the dike is the tallest (55 ft) and crossed a former creek. The dike was constructed in two phases; a 35 ft high compacted clay dike built in 1969, and a 20 ft high "raise" constructed in 1989 on the upstream slope of the older dike. The 1989 raise consists of two materials: 1) bottom ash placed underwater extending to the creast of the older dike, and 2)compacted clay above the bottom ash extending to the current crest. A former haul road consisting of lime treated bottom ash and gravel existing as the crest of the old dike and is hydraulically connected to the bottom ash fill. Both clay dikes were well compacted; the bottom ash is very loose due to underwater placement....The overall slide consists of two portions: shallow and deep."

The elevation of the failed portion of the embankment was lowered to elevation 434 feet and an intermediate dike built to relieve pressure. Construction of the intermediate dike separated the secondary fly ash pond from the primary ash impoundment.

Has there ever been significant seepages at this site? YES ________ NO __X____

If So When? ______________________________

IF So Please Describe: ____

Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site? YES ________NO __N/A___

If so, which method (e.g., piezometers, gw pumping,...)? ____________________

If so Please Describe : ____________________

Coal Combustion Dam Inspection Checklist Form

US Environmental Protection Agency

Site Name:	Baldwin Energy Complex	Date:	5/24/11
Unit Name:	Secondary Fly Ash Pond	Operator's Name:	Dynergy Midwest Generation, LLC
Unit I.D.:		Hazard Potential Classification:	High / Significant ✓ / Low
Inspector's Name:	Patrick J. Harrison, P.E. and Doug P. Simon, P.E.		

Check the appropriate box below. Provide comments when appropriate. If not applicable or not available, record "N/A". Any unusual conditions or construction practices that should be noted in the comments section. For large diked embankments, separate checklists may be used for different embankment areas. If separate forms are used, identify approximate area that the form applies to in comments.

	Yes	No		Yes	No
1. Frequency of Company's Dam Inspections?	Weekly		18. Sloughing or bulging on slopes?		✓
2. Pool elevation (operator records)?	430.0		19. Major erosion or slope deterioration?		✓
3. Decant inlet elevation (operator records)?	430.0		20. Decant Pipes:		
4. Open channel spillway elevation (operator records)?	NA		Is water entering inlet, but not exiting outlet?		✓
5. Lowest dam crest elevation (operator records)?	434.0		Is water exiting outlet, but not entering inlet?		✓
6. If instrumentation is present, are readings recorded (operator records)?	✓		Is water exiting outlet flowing clear?	✓	
7. Is the embankment currently under construction?		✓	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation,stumps, topsoil in area where embankment fill will be placed)?	✓		From underdrain?		✓
9. Trees growing on embankment? (If so, indicate largest diameter below)	✓		At isolated points on embankment slopes?		✓
10. Cracks or scarps on crest?		✓	At natural hillside in the embankment area?		✓
11. Is there significant settlement along the crest?		✓	Over widespread areas?		✓
12. Are decant trashracks clear and in place?		✓	From downstream foundation area?		✓
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		✓	"Boils" beneath stream or ponded water?		✓
14. Clogged spillways, groin or diversion ditches?		✓	Around the outside of the decant pipe?		✓
15. Are spillway or ditch linings deteriorated?		✓	22. Surface movements in valley bottom or on hillside?		✓
16. Are outlets of decant or underdrains blocked?		✓	23. Water against downstream toe?		✓
17. Cracks or scarps on slopes?		✓	24. Were Photos taken during the dam inspection?	✓	

Major adverse changes in these items could cause instability and should be reported for further evaluation. Adverse conditions noted in these items should normally be described (extent, location, volume, etc.) in the space below and on the back of this sheet.

Inspection Issue #	Comments
4.	There was no open channel spillway present.
9.	Largest tree diameter noted was approximately 16 inches.

U. S. Environmental Protection Agency

Coal Combustion Waste (CCW)
Impoundment Inspection

Impoundment NPDES Permit # Not Provided INSPECTOR Patrick J. Harrison, P.E.
Date May 24, 2011 Doug P. Simon, P.E.

Impoundment Name Secondary Fly Ash Pond
Impoundment Company Dynergy Midwest Generation, LLC
EPA Region Region V
State Agency (Field Office) Addresss Illinois Department of Natural Resources
Springfield, Illinois
Name of Impoundment Secondary Fly Ash Pond
(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New X Update ______

	Yes	No
Is impoundment currently under construction?		X
Is water or ccw currently being pumped into the impoundment?		X

IMPOUNDMENT FUNCTION: Settlement and Impoundment of ash.

Nearest Downstream Town : Name Evansville
Distance from the impoundment Approximately 7.5 miles
Impoundment
Location: Longitude 89 Degrees 52 Minutes 14 Seconds
Latitude 38 Degrees 11 Minutes 26 Seconds
State Illinois County Randolph

Does a state agency regulate this impoundment? YES X NO ______

If So Which State Agency? The Illinois Department of Natural Resources regulates the discharge of water (NPDES Permit).

HAZARD POTENTIAL (In the event the impoundment should fail, the following would occur):

______ **LESS THAN LOW HAZARD POTENTIAL:** Failure or misoperation of the dam results in no probable loss of human life or economic or environmental losses.

______ **LOW HAZARD POTENTIAL:** Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

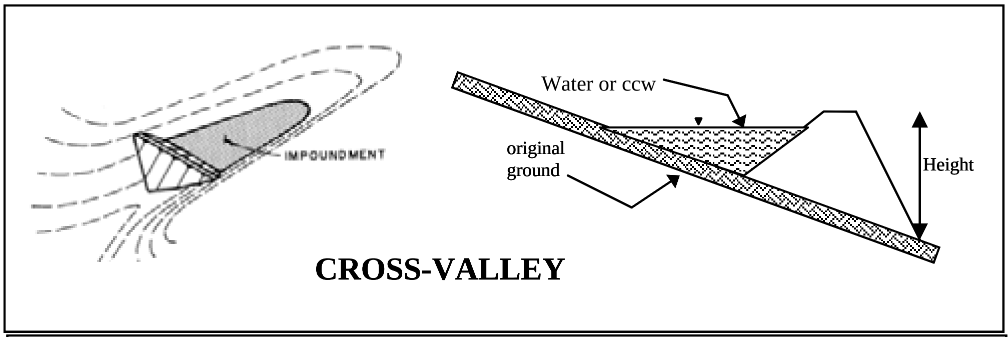
__X___ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

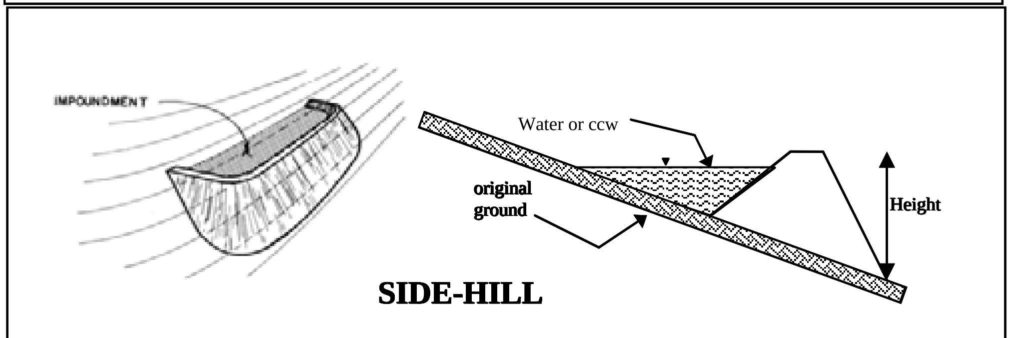
______ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

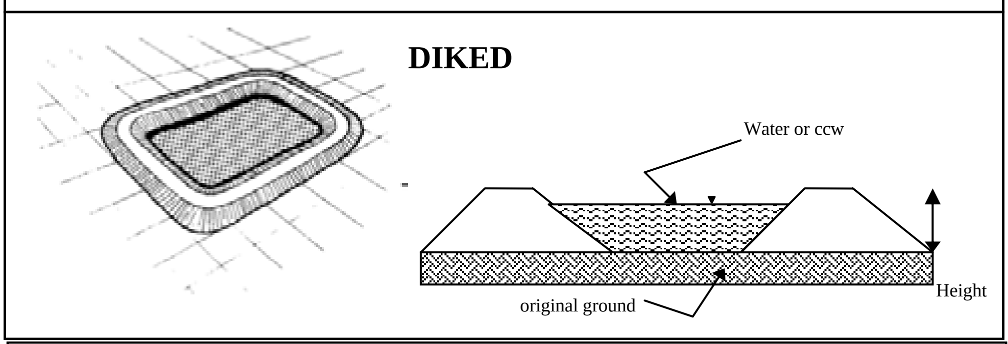
DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

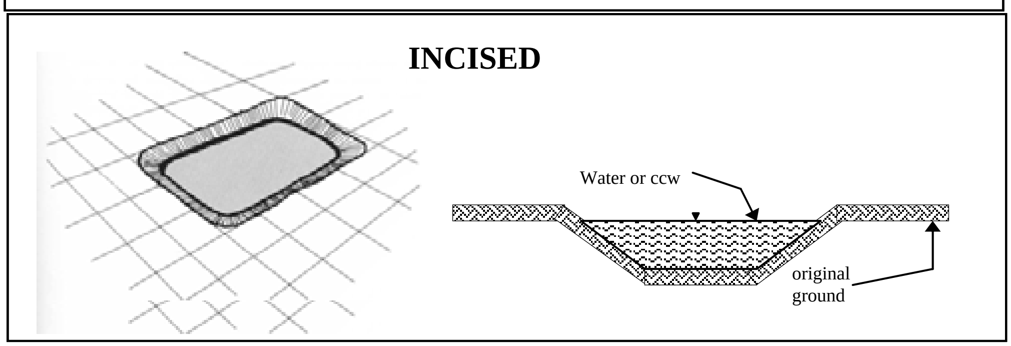
Failure of the dam would not result in probable loss of life but could result in economic and environmental damages to areas outside of the owners property.

CONFIGURATION:









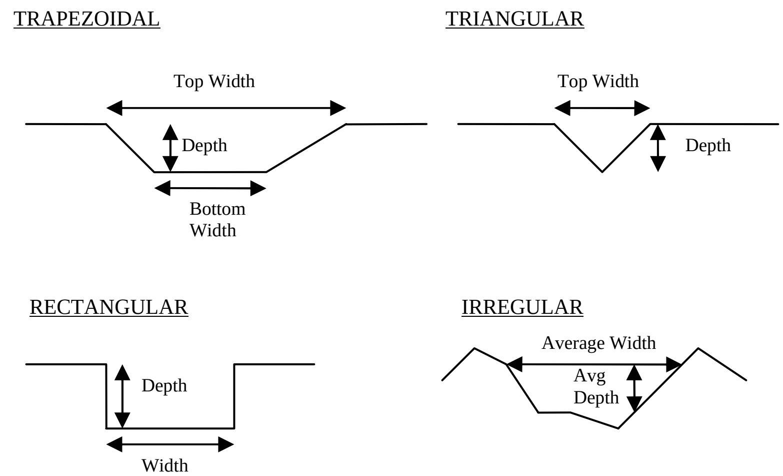
_____ Cross-Valley
_____ Side-Hill
__X__ Diked
_____ Incised (form completion optional)
_____ Combination Incised/Diked

Embankment Height __55______ feet Embankment Material__Impervious Fill__
Pool Area ____17.5__________ acres Liner __No liner present______________
Current Freeboard ____4______ feet Liner Permeability __NA______________

TYPE OF OUTLET (Mark all that apply)

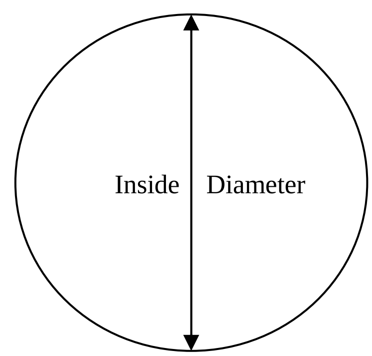
_____ **Open Channel Spillway**
_____ Trapezoidal
_____ Triangular
_____ Rectangular
_____ Irregular

_____ depth
_____ bottom (or average) width
_____ top width



__X__ **Outlet**

__36__ inside diameter
Varies: See Below.



Material
_____ corrugated metal
_____ welded steel
__X__ concrete
_____ plastic (hdpe, pvc, etc.)
_____ other (specify) ______________________

Is water flowing through the outlet? YES __X__ NO _______

_____ **No Outlet**

_____ **Other Type of Outlet** (specify) ____________________________________

The Impoundment was Designed By __Sargent & Lundy____________________
____

Has there ever been a failure at this site? YES ____X____ NO __________

If So When? February 1995

If So Please Describe :

The executive summary of a failure analysis completed by Woodward-Clyde Consultants, describes the failure as follows:

"The slide occurred in February 1995 on the ash pond south dike over a distance of about 500 lineal feet at a location where the dike is the tallest (55 ft) and crossed a former creek. The dike was constructed in two phases; a 35 ft high compacted clay dike built in 1969, and a 20 ft high "raise" constructed in 1989 on the upstream slope of the older dike. The 1989 raise consists of two materials: 1) bottom ash placed underwater extending to the creast of the older dike, and 2)compacted clay above the bottom ash extending to the current crest. A former haul road consisting of lime treated bottom ash and gravel existing as the crest of the old dike and is hydraulically connected to the bottom ash fill. Both clay dikes were well compacted; the bottom ash is very loose due to underwater placement....The overall slide consists of two portions: shallow and deep."

The elevation of the failed portion of the embankment was lowered to elevation 434 feet and an intermediate dike built to relieve pressure. Construction of the intermediate dike separated the secondary fly ash pond from the primary ash impoundment.

Has there ever been significant seepages at this site? YES ________ NO __X____

If So When? ______________________________

IF So Please Describe: ____

Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site? YES ________NO __N/A___

If so, which method (e.g., piezometers, gw pumping,...)? ______________________

If so Please Describe : ____

Coal Combustion Dam Inspection Checklist Form

US Environmental Protection Agency

Site Name:	Baldwin Energy Complex	Date:	5/24/11
Unit Name:	Secondary Pond	Operator's Name:	Dynergy Midwest Generation, LLC
Unit I.D.:		Hazard Potential Classification:	High Significant Low ✓
Inspector's Name:	Patrick J. Harrison, P.E. and Doug P. Simon, P.E.		

Check the appropriate box below. Provide comments when appropriate. If not applicable or not available, record "N/A". Any unusual conditions or construction practices that should be noted in the comments section. For large diked embankments, separate checklists may be used for different embankment areas. If separate forms are used, identify approximate area that the form applies to in comments.

	Yes	No		Yes	No
1. Frequency of Company's Dam Inspections?	Weekly		18. Sloughing or bulging on slopes?		✓
2. Pool elevation (operator records)?	396.1		19. Major erosion or slope deterioration?		✓
3. Decant inlet elevation (operator records)?	395.0		20. Decant Pipes: See Note Below		
4. Open channel spillway elevation (operator records)?	400.0		Is water entering inlet, but not exiting outlet?		
5. Lowest dam crest elevation (operator records)?	402.0		Is water exiting outlet, but not entering inlet?		
6. If instrumentation is present, are readings recorded (operator records)?		✓	Is water exiting outlet flowing clear?		
7. Is the embankment currently under construction?		✓	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation,stumps, topsoil in area where embankment fill will be placed)?	✓		From underdrain?		✓
9. Trees growing on embankment? (If so, indicate largest diameter below)	✓		At isolated points on embankment slopes?		✓
10. Cracks or scarps on crest?		✓	At natural hillside in the embankment area?		✓
11. Is there significant settlement along the crest?		✓	Over widespread areas?		✓
12. Are decant trashracks clear and in place?		✓	From downstream foundation area?		✓
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		✓	"Boils" beneath stream or ponded water?		✓
14. Clogged spillways, groin or diversion ditches?		✓	Around the outside of the decant pipe?		✓
15. Are spillway or ditch linings deteriorated?		✓	22. Surface movements in valley bottom or on hillside?		✓
16. Are outlets of decant or underdrains blocked?	See Note Below		23. Water against downstream toe?	✓	
17. Cracks or scarps on slopes?		✓	24. Were Photos taken during the dam inspection?	✓	

Major adverse changes in these items could cause instability and should be reported for further evaluation. Adverse conditions noted in these items should normally be described (extent, location, volume, etc.) in the space below and on the back of this sheet.

Inspection Issue #	Comments

9. Largest tree diameter noted was approximately 3 inches.

16/20. Outlet not accessible due to location under downstream pond elevation.

U. S. Environmental Protection Agency

Coal Combustion Waste (CCW)
Impoundment Inspection

Impoundment NPDES Permit # Not Provided

INSPECTOR Patrick J. Harrison, P.E.
Doug P. Simon, P.E.

Date May 24, 2011

Impoundment Name Secondary Pond
Impoundment Company Dynergy Midwest Generation, LLC
EPA Region Region V
State Agency (Field Office) Addresss Illinois Department of Natural Resources
Springfield, Illinois
Name of Impoundment Secondary Pond
(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New X Update ______

	Yes	No
Is impoundment currently under construction?		X
Is water or ccw currently being pumped into the impoundment?		X

IMPOUNDMENT FUNCTION: Clarification of water prior to discharge.

Nearest Downstream Town : Name Evansville
Distance from the impoundment Approximately 7.5 miles
Impoundment
Location: Longitude 89 Degrees 52 Minutes 33 Seconds
Latitude 38 Degrees 11 Minutes 32 Seconds
State Illinois County Randolph

Does a state agency regulate this impoundment? YES X NO ______

If So Which State Agency? The Illinois Department of Natural Resources regulates the discharge of water (NPDES Permit).

HAZARD POTENTIAL (In the event the impoundment should fail, the following would occur):

______ **LESS THAN LOW HAZARD POTENTIAL:** Failure or misoperation of the dam results in no probable loss of human life or economic or environmental losses.

__X___ **LOW HAZARD POTENTIAL:** Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

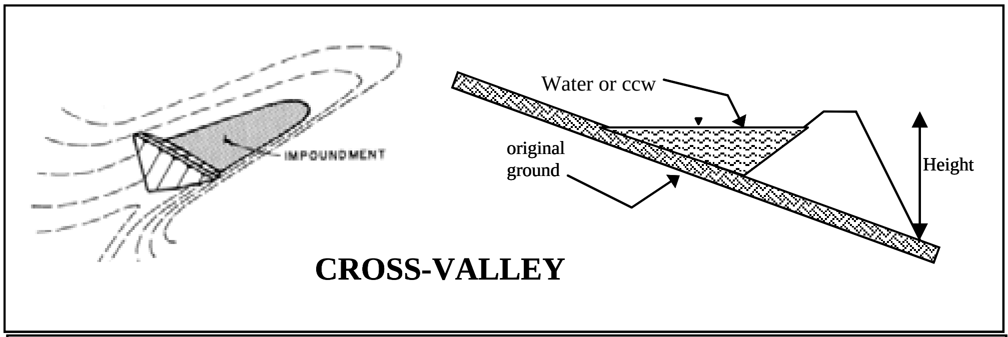
______ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

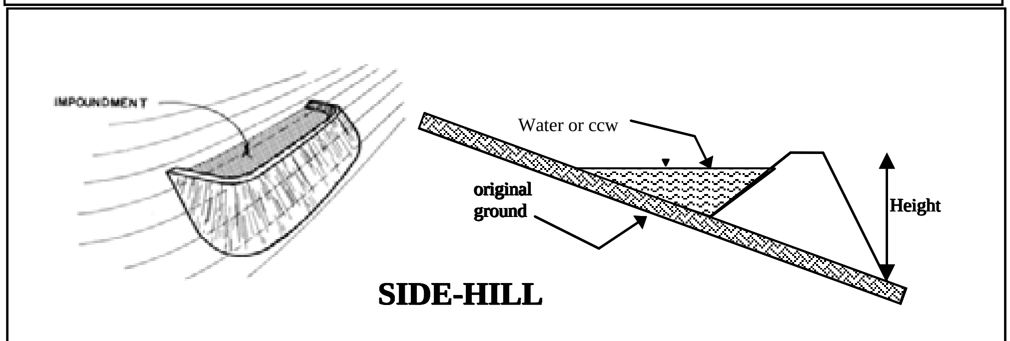
______ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

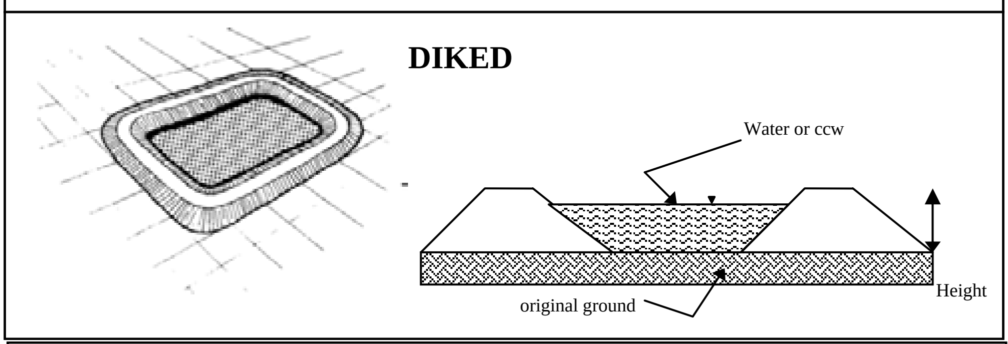
DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

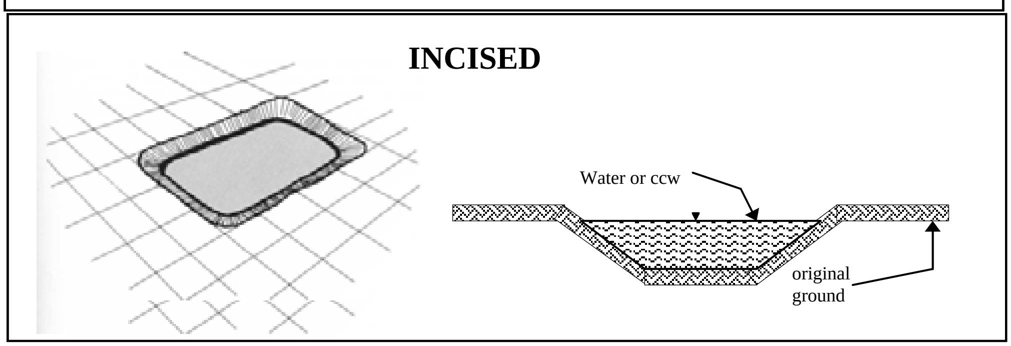
Failure of the dam would not result in probable loss of life and economic and environmental damages would be principally limited to the owner's property.

CONFIGURATION:









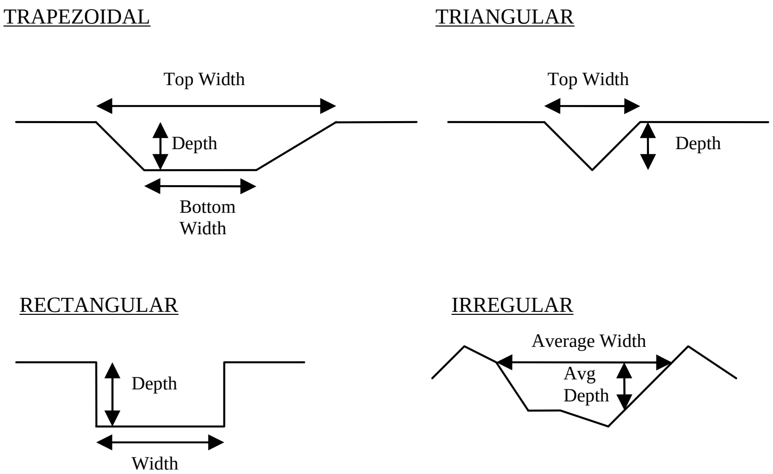
_____ Cross-Valley
_____ Side-Hill
_____ Diked
_____ Incised (form completion optional)
_X__ Combination Incised/Diked

Embankment Height _10_____ feet Embankment Material _Unknown___
Pool Area __18.5_____ acres Liner _No liner present____
Current Freeboard _3.9____ feet Liner Permeability _Unknown____

TYPE OF OUTLET (Mark all that apply)

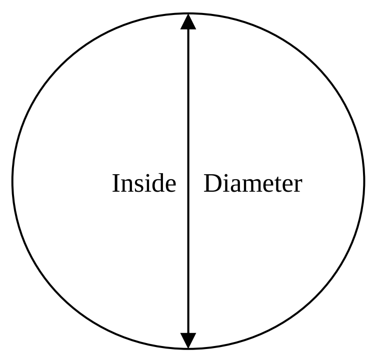
__X__ **Open Channel Spillway**
__X__ Trapezoidal
______ Triangular
______ Rectangular
______ Irregular

__2 ft_ depth
_50 ft_ bottom (or average) width
_100 ft top width



__X__ **Outlet**

_18__ inside diameter
Varies: See Below.



Material
______ corrugated metal
__X__ welded steel (There are 6 outlet pipes)
______ concrete
______ plastic (hdpe, pvc, etc.)
______ other (specify) ______________________

Is water flowing through the outlet? YES ________ NO ________

______ **No Outlet** The outlet structure was not accessible due to its location below the downstream pond elevation.

______ **Other Type of Outlet** (specify) __________________________________

The Impoundment was Designed By ____Illinois Power Company______________
____

Has there ever been a failure at this site? YES ___________ NO ___X_______

If So When? ______________________________

If So Please Describe : ____

Has there ever been significant seepages at this site? YES ________ NO __X____

If So When? ______________________________

IF So Please Describe: ____

Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site? YES ________NO __N/A___

If so, which method (e.g., piezometers, gw pumping,...)? ____________________

If so Please Describe : ____

Coal Combustion Dam Inspection Checklist Form

US Environmental Protection Agency

Site Name:	Baldwin Energy Complex	Date:	5/24/11
Unit Name:	Intermediate Pond	Operator's Name:	Dynergy Midwest Generation, LLC
Unit I.D.:		Hazard Potential Classification: High Significant Low	Low ✓
Inspector's Name:	Patrick J. Harrison, P.E. and Doug P. Simon, P.E.		

Check the appropriate box below. Provide comments when appropriate. If not applicable or not available, record "N/A". Any unusual conditions or construction practices that should be noted in the comments section. For large diked embankments, separate checklists may be used for different embankment areas. If separate forms are used, identify approximate area that the form applies to in comments.

	Yes	No		Yes	No
1. Frequency of Company's Dam Inspections?	Weekly		18. Sloughing or bulging on slopes?		✓
2. Pool elevation (operator records)?	394.0		19. Major erosion or slope deterioration?		✓
3. Decant inlet elevation (operator records)?	394.0		20. Decant Pipes: See Note Below		
4. Open channel spillway elevation (operator records)?	398.9		Is water entering inlet, but not exiting outlet?		
5. Lowest dam crest elevation (operator records)?	400.0		Is water exiting outlet, but not entering inlet?		
6. If instrumentation is present, are readings recorded (operator records)?		✓	Is water exiting outlet flowing clear?		
7. Is the embankment currently under construction?		✓	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation,stumps, topsoil in area where embankment fill will be placed)?	✓		From underdrain?		✓
9. Trees growing on embankment? (If so, indicate largest diameter below)	✓		At isolated points on embankment slopes?		✓
10. Cracks or scarps on crest?		✓	At natural hillside in the embankment area?		✓
11. Is there significant settlement along the crest?		✓	Over widespread areas?	✓	
12. Are decant trashracks clear and in place?		✓	From downstream foundation area?		✓
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		✓	"Boils" beneath stream or ponded water?		✓
14. Clogged spillways, groin or diversion ditches?		✓	Around the outside of the decant pipe?		✓
15. Are spillway or ditch linings deteriorated?		✓	22. Surface movements in valley bottom or on hillside?		✓
16. Are outlets of decant or underdrains blocked?	See Note Below		23. Water against downstream toe?	✓	
17. Cracks or scarps on slopes?		✓	24. Were Photos taken during the dam inspection?	✓	

Major adverse changes in these items could cause instability and should be reported for further evaluation. Adverse conditions noted in these items should normally be described (extent, location, volume, etc.) in the space below and on the back of this sheet.

Inspection Issue #	Comments

9. Largest tree diameter noted was approximately 3 inches.

16/20. Outlet not accessible due to dense vegetation.

21. Embankments reportedly designed as flow-through filtration structures. Based on visual estimates, 400 gallons per minute discharge through the embankment.

U. S. Environmental Protection Agency

Coal Combustion Waste (CCW)
Impoundment Inspection

Impoundment NPDES Permit # Not Provided

INSPECTOR Patrick J. Harrison, P.E.
Doug P. Simon, P.E.

Date May 24, 2011

Impoundment Name Intermediate Pond
Impoundment Company Dynergy Midwest Generation, LLC
EPA Region Region V
State Agency (Field Office) Addresss Illinois Department of Natural Resources
Springfield, Illinois
Name of Impoundment Intermediate Pond
(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New X Update ____

	Yes	No
Is impoundment currently under construction?		X
Is water or ccw currently being pumped into the impoundment?		X

IMPOUNDMENT FUNCTION: Clarification of water prior to discharge.

Nearest Downstream Town : Name Evansville
Distance from the impoundment Approximately 7.5 miles
Impoundment
Location: Longitude 89 Degrees 52 Minutes 38 Seconds
Latitude 38 Degrees 11 Minutes 27 Seconds
State Illinois County Randolph

Does a state agency regulate this impoundment? YES X NO ____

If So Which State Agency? The Illinois Department of Natural Resources regulates the discharge of water (NPDES Permit).

HAZARD POTENTIAL (In the event the impoundment should fail, the following would occur):

______ **LESS THAN LOW HAZARD POTENTIAL:** Failure or misoperation of the dam results in no probable loss of human life or economic or environmental losses.

__X__ **LOW HAZARD POTENTIAL:** Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

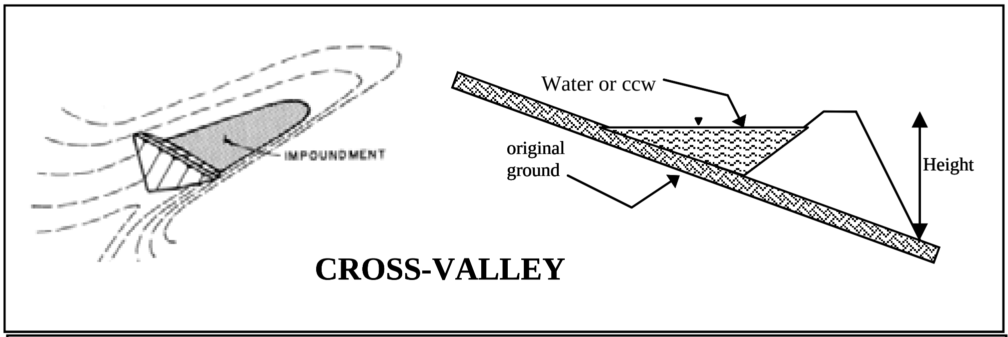
______ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

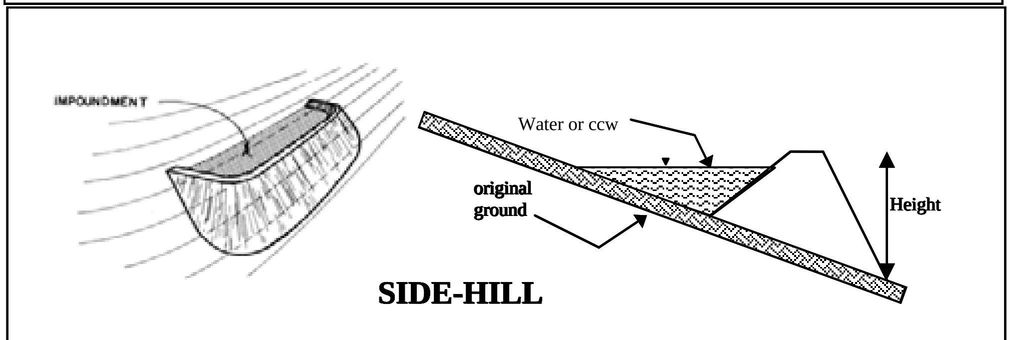
______ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

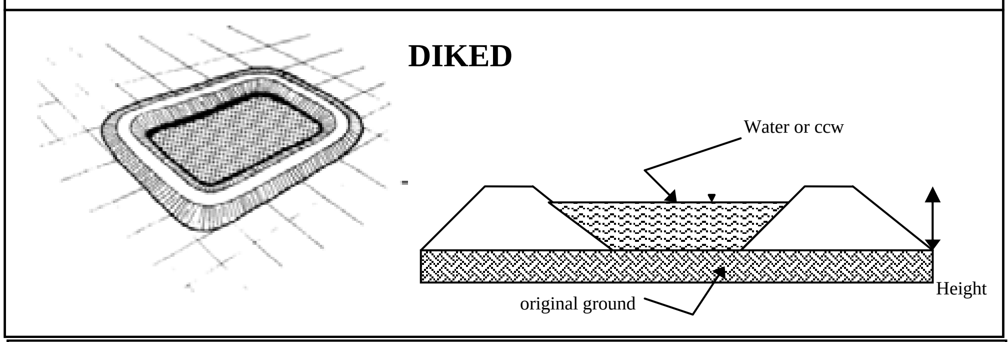
DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

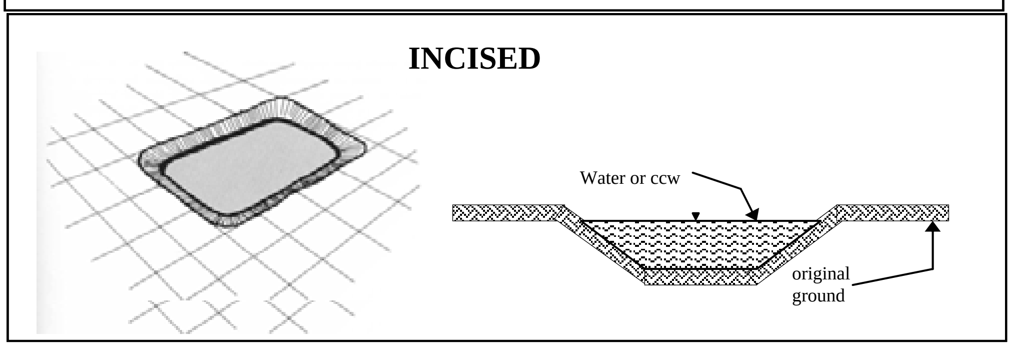
Failure of the dam would not result in probable loss of life and economic and environmental damages would principally limited to the owner's property.

CONFIGURATION:









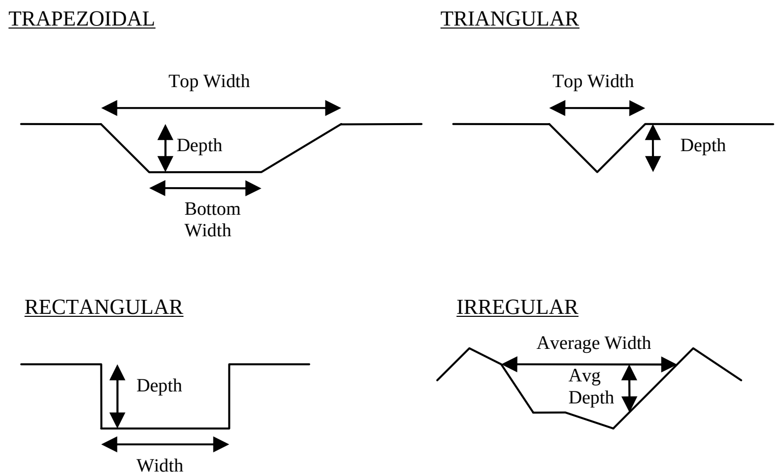
_____ Cross-Valley
_____ Side-Hill
_____ Diked
_____ Incised (form completion optional)
_X___ Combination Incised/Diked

Embankment Height __19______ feet   Embankment Material __Unknown____
Pool Area _______2________ acres   Liner __No liner present____________
Current Freeboard __1.7_______ feet   Liner Permeability __Unknown________

TYPE OF OUTLET (Mark all that apply)

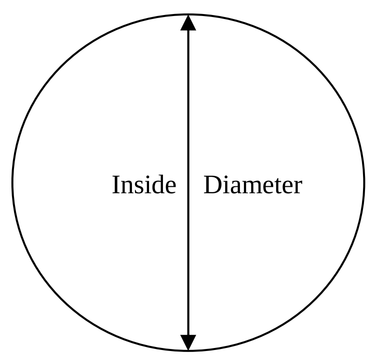
__X__ **Open Channel Spillway**
__X__ Trapezoidal
______ Triangular
______ Rectangular
______ Irregular

1.1 ft depth
75 ft bottom (or average) width
100 ft top width



__X__ **Outlet**

__30__ inside diameter
Varies: See Below.



Material
__X__ corrugated metal
______ welded steel
______ concrete
______ plastic (hdpe, pvc, etc.)
______ other (specify) ______________________

Is water flowing through the outlet? YES ________ NO ________

The outlet structure was not accessible due to heavy vegetation.

______ **No Outlet**

__X__ **Other Type of Outlet** (specify) The embankment is reportedly designed as a "flow-through" embankment and approximately 400 gpm was observed flowing through the embankment

The Impoundment was Designed By ____
Sargent and Lundy

Has there ever been a failure at this site? YES ___________ NO ____X_______

If So When? ______________________________

If So Please Describe : ____

Has there ever been significant seepages at this site? YES __X____ NO ________

If So When? ____________________________

IF So Please Describe: ____
The embankment is reportedly designed as a 'flow through' dam.

Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site? YES ________NO __N/A___

If so, which method (e.g., piezometers, gw pumping,...)? ____________________

If so Please Describe : ____

Coal Combustion Dam Inspection Checklist Form

US Environmental Protection Agency

Site Name:	Baldwin Energy Complex	Date:	5/24/11
Unit Name:	Final Pond	Operator's Name:	Dynergy Midwest Generation, LLC
Unit I.D.:		Hazard Potential Classification:	High / Significant ✓ / Low
Inspector's Name:	Patrick J. Harrison, P.E. and Doug P. Simon, P.E.		

Check the appropriate box below. Provide comments when appropriate. If not applicable or not available, record "N/A". Any unusual conditions or construction practices that should be noted in the comments section. For large diked embankments, separate checklists may be used for different embankment areas. If separate forms are used, identify approximate area that the form applies to in comments.

Item	Yes	No	Item	Yes	No
1. Frequency of Company's Dam Inspections?	Weekly		18. Sloughing or bulging on slopes?		✓
2. Pool elevation (operator records)?	392.7		19. Major erosion or slope deterioration?		✓
3. Decant inlet elevation (operator records)?	392.7		20. Decant Pipes: See Note Below		
4. Open channel spillway elevation (operator records)?	394.3		Is water entering inlet, but not exiting outlet?		
5. Lowest dam crest elevation (operator records)?	398.0		Is water exiting outlet, but not entering inlet?		
6. If instrumentation is present, are readings recorded (operator records)?		✓	Is water exiting outlet flowing clear?		
7. Is the embankment currently under construction?		✓	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation,stumps, topsoil in area where embankment fill will be placed)?	✓		From underdrain?		✓
9. Trees growing on embankment? (If so, indicate largest diameter below)	✓		At isolated points on embankment slopes?		✓
10. Cracks or scarps on crest?		✓	At natural hillside in the embankment area?		✓
11. Is there significant settlement along the crest?		✓	Over widespread areas?	✓	
12. Are decant trashracks clear and in place?		✓	From downstream foundation area?		✓
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		✓	"Boils" beneath stream or ponded water?		✓
14. Clogged spillways, groin or diversion ditches?		✓	Around the outside of the decant pipe?		✓
15. Are spillway or ditch linings deteriorated?		✓	22. Surface movements in valley bottom or on hillside?		✓
16. Are outlets of decant or underdrains blocked?	See Note Below		23. Water against downstream toe?	✓	
17. Cracks or scarps on slopes?		✓	24. Were Photos taken during the dam inspection?	✓	

Major adverse changes in these items could cause instability and should be reported for further evaluation. Adverse conditions noted in these items should normally be described (extent, location, volume, etc.) in the space below and on the back of this sheet.

Inspection Issue #	Comments

9. Largest tree diameter noted was approximately 18 inches.

16/20. Outlet not accessible due to dense vegetation.

21. Embankments reportedly designed as flow-through filtration structures. Based on visual estimates, 400 to 800 gallons per minute discharge through the embankment.

U. S. Environmental Protection Agency

Coal Combustion Waste (CCW)
Impoundment Inspection

Impoundment NPDES Permit # Not Provided INSPECTOR Patrick J. Harrison, P.E.
Date May 24, 2011 Doug P. Simon, P.E.

Impoundment Name Final Pond
Impoundment Company Dynergy Midwest Generation, LLC
EPA Region Region V
State Agency (Field Office) Addresss Illinois Department of Natural Resources
Springfield, Illinois
Name of Impoundment Final Pond
(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New X Update ______

	Yes	No
Is impoundment currently under construction?		X
Is water or ccw currently being pumped into the impoundment?		X

IMPOUNDMENT FUNCTION: Clarification of water prior to discharge.

Nearest Downstream Town : Name Evansville
Distance from the impoundment Approximately 7.5 miles
Impoundment
Location: Longitude 89 Degrees 52 Minutes 41 Seconds
Latitude 38 Degrees 11 Minutes 25 Seconds
State Illinois County Randolph

Does a state agency regulate this impoundment? YES X NO ______

If So Which State Agency? The Illinois Department of Natural Resources regulates the discharge of water (NPDES Permit).

HAZARD POTENTIAL (In the event the impoundment should fail, the following would occur):

______ **LESS THAN LOW HAZARD POTENTIAL:** Failure or misoperation of the dam results in no probable loss of human life or economic or environmental losses.

______ **LOW HAZARD POTENTIAL:** Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

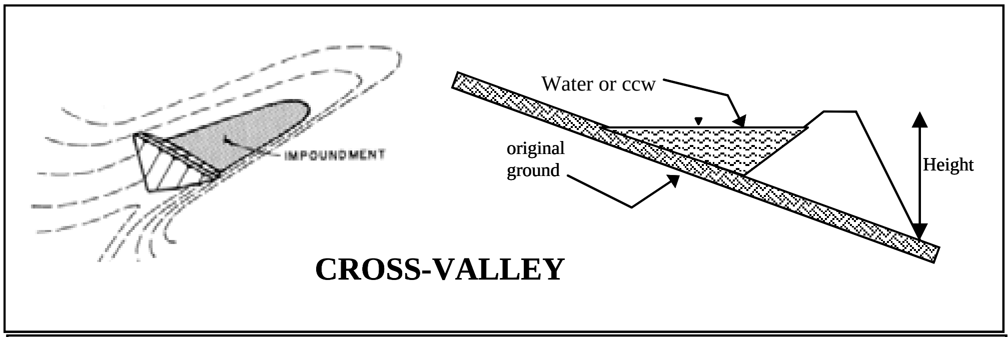
_X____ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

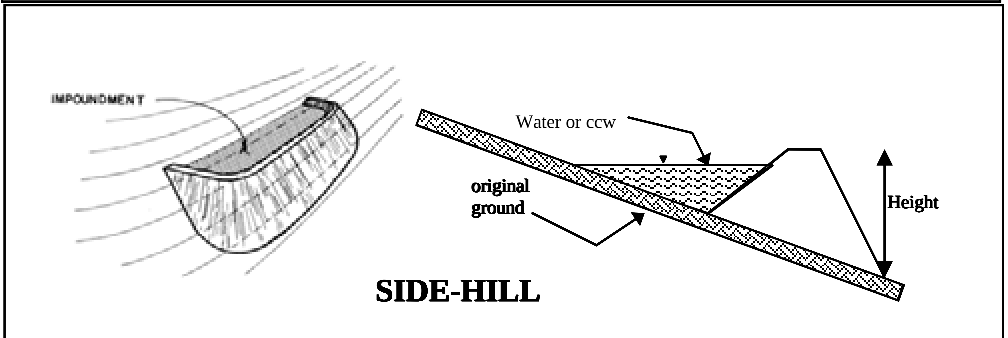
______ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

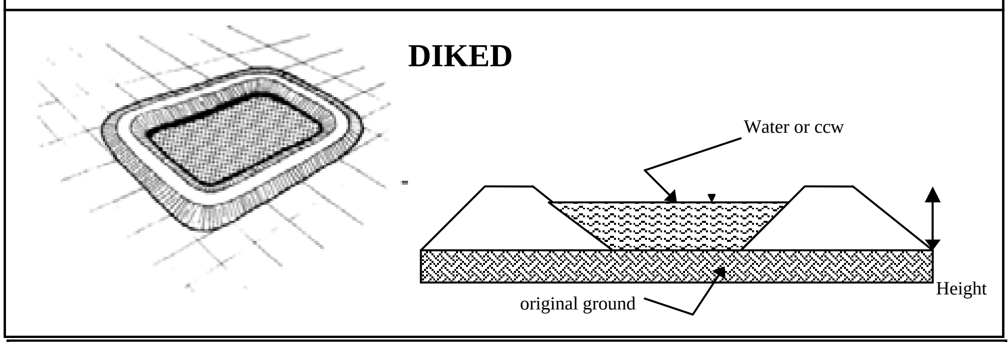
DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

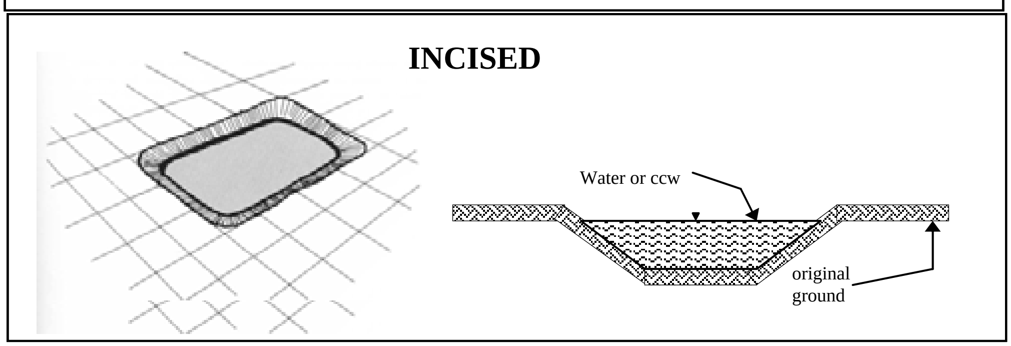
Potential failure of the impoundment embankment could result in significant environmental impacts to areas outside of Utility owned property.

CONFIGURATION:









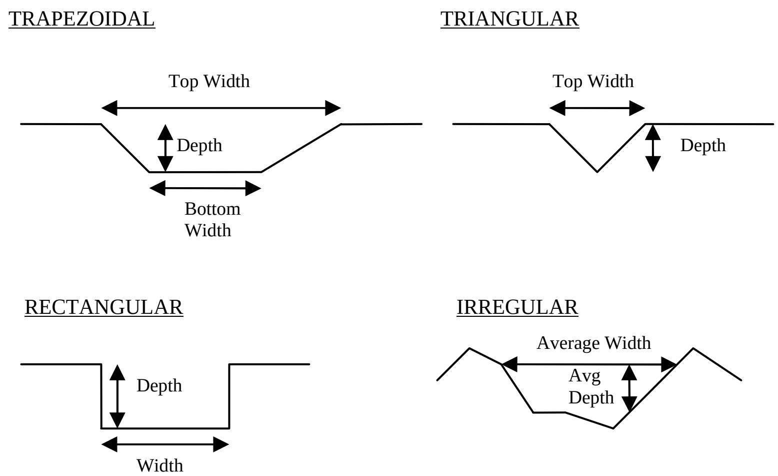
______ Cross-Valley
______ Side-Hill
______ Diked
______ Incised (form completion optional)
_X___ Combination Incised/Diked

Embankment Height _23________ feet   Embankment Material_Unknown______
Pool Area __________2________ acres   Liner _No liner present______________
Current Freeboard _1.7________ feet   Liner Permeability _Unknown_______

TYPE OF OUTLET (Mark all that apply)

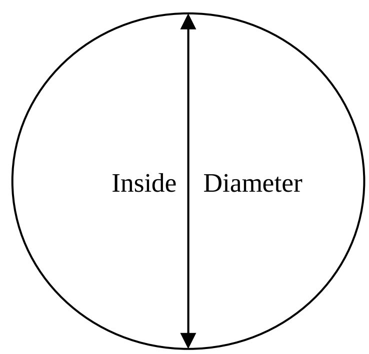
__X__ **Open Channel Spillway**
__X__ Trapezoidal
_____ Triangular
_____ Rectangular
_____ Irregular

__4 ft__ depth
__90 ft__ bottom (or average) width
__130 ft__ top width



__X__ **Outlet**

__30__ inside diameter
Varies: See Below.



Material
__X__ corrugated metal
_____ welded steel
_____ concrete
_____ plastic (hdpe, pvc, etc.)
_____ other (specify) ____________________

Is water flowing through the outlet? YES _______ NO _______

The outlet structure was not accessible due to heavy vegetation.

_____ **No Outlet**

__X__ **Other Type of Outlet** (specify) The embankment is reportedly designed as a "flow-through" embankment and approximately 400 to 800 gpm were flowing through the embankment.

The Impoundment was Designed By ____________________
Sargent & Lundy

Has there ever been a failure at this site? YES ___________ NO ____X_______

If So When? ______________________________

If So Please Describe : ____

Has there ever been significant seepages at this site? YES ___X___ NO ________

If So When? ____________________________

IF So Please Describe: ____

The embankment is reportedly designed as a 'flow through' dam.

Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site? YES ________NO __N/A___

If so, which method (e.g., piezometers, gw pumping,...)? ______________________

If so Please Describe : ______________________

APPENDIX D

PREVIOUS INSPECTION REPORTS

Dam Inspection Report

Name of Dam Baldwin Energy Complex Ash Ponds **Dam ID No.** N/A

Permit Number N/A **Class of Dam** N/A

Location ____ **Section Township** ____ **Range** ____

Owner Dynegy Midwest Generation
Name

618-785-2294
Telephone Number (Day)

10901 Baldwin Rd
Street

618-785-2228
Telephone Number (Night)

Baldwin, IL 62217
City **Zip Code**

County Randolph / St Clair

Type of Dam Homogeneous Earth Dams

Type of Spillway Drop Inlets

Date(s) Inspected February 20, 2009

Weather When Inspected Sunny

Temperature When Inspected 35 degrees F

Pool Elevation When Inspected ____

Tailwater Elevation When Inspected NA

Inspection Personnel:

Name	Title
Kenneth M Berry, P.E.	Sr Proj Engr (URS)
Phil L. Morris, P.E.	Environmental Professional

KENNETH MONROE BERRY
0062-051918
REGISTERED
PROFESSIONAL
ENGINEER
STATE OF ILLINOIS

Kenneth M Berry
9/21/09

Professional Engineer's Seal

The Department of Natural Resources is requesting information that is necessary to accomplish the statutory purpose as outlined under the River, Lakes and Streams Act. 615 ILCS 5. Submittal of this information is REQUIRED. Failure to provide the required information could result in the initiation of non.-compliance procedures as outlined in Section 3702.160 of the "Rules for Construction and Maintenance of Dams.

CONDITION CODES

NE - No evidence of a problem

GC - Good condition

MM - Item needing minor maintenance and/or repairs within the year, the safety or integrity of the item is not yet imperiled

IM - Item needing immediate maintenance to restore or ensure its safety or integrity

EC - Emergency condition which if not immediately repaired or other appropriate measures taken could lead to failure of the dam

OB - Condition requires regular observation to ensure that the condition does not become worse

NA - Not applicable to this dam

NI - Not inspected -list the reason for non-inspection under deficiencies

---

Vegetation needs to be cut and periodic inspections are recommended.

EARTH EMBANKMENT

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Surface Cracks	NE	NA	
Vertical and Horizontal Alignment of Crest	GC	NA	
Unusual Movement or Cracking' At or Beyond Toe	NE	NA	
Sloughing or Erosion of Embankment and Abutment Slopes	OB/MM	NA	Erosion from pumping activities at SW corner of active secondary fly ash pond. Observe and make repairs if erosion worsens. Likewise, observe occasional erosion channels on south exterior embankment. Large stretches of exterior embankments contained thick and tall vegetation which limited vision.
Upstream Face Slope Protection	GC	NA	
Seepage	NE	NA	
Filter and Filter Drains	NE	NA	

EARTH EMBANKMENT
(Continued)

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Animal Damage	NE	NA	
Embankment Drainage Ditches	GC	NA	
Vegetative Cover	MM	MM	Vegetation needs to be cut along interior and exterior of berms. Trees in excess of 3 inches in diameter should be removed and have compacted earth placed where the root ball was removed. Trees less than 3 inches in diameter should be cut or sprayed with a herbicide.
Other (Name)	NA		
Other –	NA		
Other -	NA		
Other	NA		

CONCRETE OR MASONRY DAMS

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Seepage	NA		
Structure to Abutment! Embankment Junctions	NA		
Water Passages	NA		
Foundation	NA		
Surface Cracks in Concrete Surfaces	NA		
Structural Cracking	NA		
Vertical and Horizontal Alignment	NA		

CONCRETE OR MASONARY DAMS
(CONTINUED)

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Monolith Joints	NA		
Contruction Joints	NA		
Spalling of Concrete	NA		
Filters; Drains, etc.	NA		
Riprap	NA		
Other (Name)	NA		

IF THE DAM IS GATED – Fill out the portion of the Principal Spillway Form related to Gated Spillways

PRINCIPAL SPILLWAY APPROACH CHANNEL

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Debris	NA		
Side Slope Stability	NA		
Slope Protection	NA		
Other (Name)	NA		
Other	NA		
Other	NA		
Other	NA		

PRINCIPAL SPILLWAY

x Drop Inlet Spillway ☐ Overflow Spillway Structure ☐ Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NE	Underwater	
Structure to Embankment Junction	GC	Underwater	
Drains	NA	NA	
Seepage Around or Into Structure	NI	Underwater	
Surface Cracks	NI	Underwater	
Structural Cracks	NI	Underwater	

IF THE SPILLWAY IS GATED FILL OUT THE SPILLWAY SECTION

PRINCIPAL SPILLWAY
(Continued)

x Drop Inlet Spillway ☐ Overflow Spillway Structure ☐ Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Alignment of Abutment Walls	NA	NA	
Construction Joints	NA	NA	
Filter and Filter Drains	NA	NA	
Trash Racks	NA	NA	
Bridge and Piers	NA	NA	
Differential Settlement	NA	NA	
Other (Name)	NA	NA	

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY
(Continued)

x Conduit ☐ Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NE	NA	
Joint Separation	NE	NA	
Seepage Around of Into Conduit	NE	NA	
Surface Cracks	NE	NA	
Structural Cracks	NA	NA	
Trash Racks	NA	NA	
Differential Settlement	NE	NA	
Alignment	NE	NA	
Other (Name)	NA	NA	

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY
(Continued)

☐ Chute

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NA		
Structure to Embankment Junction	NA		
Construction Joints	NA		
Expansion and Contraction Joints	NA		
Differential Settlement	NA		
Surface Cracks	NA		
Structural Cracks	NA		
Wall Alignment	NA		
Other (Name)	NA		

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY

☐ Principal Spillway ☐ Dewatering ☐ Other:

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Gate Sill	NA		
Gate Seals	NA		
Gate and Frame	NA		
Operating Machinery	NA		
Emergency Operating Machinery	NA		
Other (Name)	NA		
Other	NA		

OUTLET WORKS
IF SEPARATE FROM PRINCIPAL SPILLWAY STRUCTURE

ITEM	CONDITION CODE'	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion. Spalling, Cavitation	NA		
Joint Separation	NA		
Seepage Around or Into Conduit	NA		
Intake Structure	NA		
Outlet Structure	NA		
Outlet Channel	NA		
Riprap	NA		
Other (Name)	NA		
Other	NA		

ENERGY DISSIPATOR

☐ Principal Spillway ☐ Outlet Works

Type:

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NA		
Structure to Embankment Junction	NA		
Construction Joints	NA		
Surface Cracks	NA		
Structural Cracks	NA		
Differential Alignment	NA		
Expansion and Contraction Joints	NA		

ENERGY DISSIPATOR
(Continued)

☐ Principal Spillway ☐ Outlet Works

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Riprap	NA	NA	
Outlet Channel	NA	NA	
Debris	NA	NA	
Other (Name)	NA		
Other	NA		
Other	NA		
Other	NA		

EMERGENCY SPILLWAY

☐ Earth ☐ Other: Name ________________

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion	NA		
Weeds, Logs. Other Obstructions	NA		
Side Slope Sloughing	NA		
Vegetation	NA		
Sedimentation	NA		
Riprap	NA		
Settlement of Crest	NA		
Downstream Channel	NA		
Other (Name)	NA		

SUMMARY OF MAINTENANCE DONE AND/OR

REPAIRS MADE SINCE THE LAST INSPECTION

DATE OF PRESENT INSPECTION February 20, 2009

DATE OF LAST INSPECTION

1. EARTH EMBANKMENT DAMS

2. CONCRETE MASONARY DAMS

3. PRINCIPAL SPILLWAY

4. OUTLET WORKS

5. EMERGENCY SPILLWAY

DOWNSTREAM DEVELOPMENT
APPROXIMATE WIDTH OF AFFECTED FLOODPLAIN ________ MILES.

MILES DOWNSTREAM FROM DAM	DOWNSTREAM DEVELOPMENT												Loss Of Life Potential			Economic Loss Potential			SKETCH IN DEVELOPMENTS DOWNSTREAM OF THE DAM
	OCCUPIED HOMES	UNOCCUPIED HOMES	AGRICULTURAL BUILDINGS	INDUSTRIAL BUILDINGS	COMMERCIAL BUILDINGS	SCHOOLS	HOSPITALS	ROADS & BRIDGES	DAMS	OVERHEAD UTILITIES	OTHER DEVELOPMENT (Name)	OTHER DEVELOPMENT (Name)	NONE	1 TO 10	OVER 10	MINIMAL EXPECTED	APPRECIABLE EXPECTED	EXCESSIVE EXPECTED	
0 to ¼		0	0	0	0	0	0	0	0	0	0	0	x			x			
¼ to ½													x			x			
½ to ¾													x			x			
¾ to 1													x			x			
1 to 1 ¼													x			x			
1 ¼ to 1 ½													x			x			
1 ½ to 1 ¾													x			x			
1 ¾ to 2													x			x			
OVER 2													x			x			

The number of homes, buildings, or other items in the floodplain downstream of the dam should be placed in the appropriate row and column to designate their location.

Electronic Filing - Received, Clerk's Office : 07/17/2014

Owner's Maintenance Statement

I, ________________, owner of Baldwin PS Ash Disposal Complex dam,

Dam Identification Number __________, in Randolph County,

am maintaining the dam in accordance with the accepted maintenance plan

which is part of Permit Number____________________.

____
Signature

____
Date

Owner's Operation and Maintenance Plan Statement

I, ________________, owner of Dynegy PS Ash Disposal Complex dam,

Dam Identification Number ____________, in Randolph County,

have reviewed the operation and maintenance plan including the Emergency

Action Plan (EAP), which is part of Permit Number_________.

I ☐ have enclosed the appropriate revisions or

☐ have determined that no revisions to the plan are necessary.

____
Signature

____
Date

The Department of Natural Resources is requesting information that is necessary to accomplish the statutory purposes as outlined under the River, Lakes and Streams Act, 615 ILCS 5. Submittal of this information is REQUIRED. Failure to provide the required information could result in the initiation of non-compliance procedures as outlined in Section 3702.160 of the "Rules for Construction and Maintenance of Dams."

Dam Inspection Report

Name of Dam Baldwin Energy Complex Ash Ponds **Dam ID No.** N/A

Permit Number N/A **Class of Dam** N/A

Location____ **Section Township** _____ **Range**_____

Owner Dynegy Midwest Generation
Name

618-785-2294
Telephone Number (Day)

10901 Baldwin Rd
Street

618-785-2228
Telephone Number (Night)

Baldwin, IL 62217
City **Zip Code**

County Randolph

Type of Dam Homogeneous Earth Dams

Type of Spillway Drop Inlets

Date(s) Inspected March 24, 2010

Weather When Inspected Sunny

Temperature When Inspected 50 degrees F

Pool Elevation When Inspected +/- 430 secondary ash pond, +/- 450 primary

Tailwater Elevation When Inspected NA

Inspection Personnel:

KENNETH MONROE BERRY
0062-0[illegible]
REGISTERED
PROFESSIONAL
ENGINEER
STATE OF ILLINOIS
Kenneth M Berry
4/28/10

Name	Title
Kenneth M Berry, P.E.	Sr Proj Engr (URS)
Phil L. Morris, P.E.	Environmental Professional
Dominic Wright, P.E.	Plant Engineer

Professional Engineer's Seal **Name** **Title**

The Department of Natural Resources is requesting information that is necessary to accomplish the statutory purpose as outlined under the River, Lakes and Streams Act. 615 ILCS 5. Submittal of this information is REQUIRED. Failure to provide the required information could result in the initiation of non.-compliance procedures as outlined in Section 3702.160 of the "Rules for Construction and Maintenance of Dams.

CONDITION CODES

NE - No evidence of a problem

GC - Good condition

MM - Item needing minor maintenance and/or repairs within the year, the safety or integrity of the item is not yet imperiled

IM - Item needing immediate maintenance to restore or ensure its safety or integrity

EC - Emergency condition which if not immediately repaired or other appropriate measures taken could lead to failure of the dam

OB - Condition requires regular observation to ensure that the condition does not become worse

NA - Not applicable to this dam

NI - Not inspected -list the reason for non-inspection under deficiencies

---

Vegetation needs to be cut and periodic inspections are recommended.

EARTH EMBANKMENT

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Surface Cracks	NE	NA	Visibility was very limited due to vegetation.
Vertical and Horizontal Alignment of Crest	GC	NA	
Unusual Movement or Cracking' At or Beyond Toe	NE	NA	
Sloughing or Erosion of Embankment and Abutment Slopes	OB/MM	MM	Two deep erosion channels were observed on south exterior embankment. The channels should be cleaned out and backfilled with compacted soil covered with topsoil and reseeded.
Upstream Face Slope Protection	NA	NA	
Seepage	NE	NA	Access and visibility for locating seepage or wet areas was very limited due to vegetation.
Filter and Filter Drains	NE	NA	

EARTH EMBANKMENT
(Continued)

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Animal Damage	NE	NA	
Embankment Drainage Ditches	NE	NA	
Vegetative Cover	MM	MM	Vegetation needs to be cut along interior and exterior of embankments. Trees in excess of 3 inches in diameter should be removed and have compacted earth placed where the root ball was removed. Trees less than 3 inches in diameter should be cut or sprayed with a herbicide.
Other (Name)	NA		
Other –	NA		
Other -	NA		
Other	NA		

CONCRETE OR MASONRY DAMS

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Seepage	NA		
Structure to Abutment! Embankment Junctions	NA		
Water Passages	NA		
Foundation	NA		
Surface Cracks in Concrete Surfaces	NA		
Structural Cracking	NA		
Vertical and Horizontal Alignment	NA		

CONCRETE OR MASONARY DAMS
(CONTINUED)

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Monolith Joints	NA		
Contruction Joints	NA		
Spalling of Concrete	NA		
Filters; Drains, etc.	NA		
Riprap	NA		
Other (Name)	NA		

IF THE DAM IS GATED – Fill out the portion of the Principal Spillway Form related to Gated Spillways

PRINCIPAL SPILLWAY
APPROACH CHANNEL

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Debris	NA		
Side Slope Stability	NA		
Slope Protection	NA		
Other (Name)	NA		
Other	NA		
Other	NA		
Other	NA		

PRINCIPAL SPILLWAY

x Drop Inlet Spillway ☐ Overflow Spillway Structure ☐ Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NE/NI	Underwater	
Structure to Embankment Junction	NA	Underwater	
Drains	NA	NA	
Seepage Around or Into Structure	NI	Underwater	
Surface Cracks	NI	Underwater	
Structural Cracks	NI	Underwater	

IF THE SPILLWAY IS GATED FILL OUT THE SPILLWAY SECTION

PRINCIPAL SPILLWAY
(Continued)

x Drop Inlet Spillway ☐ Overflow Spillway Structure ☐ Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Alignment of Abutment Walls	NA	NA	
Construction Joints	NI	NA	
Filter and Filter Drains	NA	NA	
Trash Racks	NA	NA·	
Bridge and Piers	NA	NA	
Differential Settlement	NA	NA	
Other (Name)	NA	NA	

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY
(Continued)

x Conduit ☐ Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NI	Underwater	
Joint Separation	NI	Underwater	
Seepage Around of Into Conduit	NI	Underwater	
Surface Cracks	NI	Underwater	
Structural Cracks	NI	Underwater	
Trash Racks	NI	NA	
Differential Settlement	NI	Underwater	
Alignment	NI	Underwater	
Other (Name)	NA	NA	

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY
(Continued)

☐ Chute

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NA		
Structure to Embankment Junction	NA		
Construction Joints	NA		
Expansion and Contraction Joints	NA		
Differential Settlement	NA		
Surface Cracks	NA		
Structural Cracks	NA		
Wall Alignment	NA		
Other (Name)	NA		

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY

☐ Principal Spillway ☐ Dewatering ☐ Other:

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Gate Sill	NA		
Gate Seals	NA		
Gate and Frame	NA		
Operating Machinery	NA		
Emergency Operating Machinery	NA		
Other (Name)	NA		
Other	NA		

OUTLET WORKS
IF SEPARATE FROM PRINCIPAL SPILLWAY STRUCTURE

ITEM	CONDITION CODE'	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion. Spalling, Cavitation	NA		
Joint Separation	NA		
Seepage Around or Into Conduit	NA		
Intake Structure	NA		
Outlet Structure	NA		
Outlet Channel	NA		
Riprap	NA		
Other (Name)	NA		
Other	NA		

ENERGY DISSIPATOR

☐ Principal Spillway
Type:

☐ Outlet Works

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NA		
Structure to Embankment Junction	NA		
Construction Joints	NA		
Surface Cracks	NA		
Structural Cracks	NA		
Differential Alignment	NA		
Expansion and Contraction Joints	NA		

ENERGY DISSIPATOR
(Continued)

☐ Principal Spillway ☐ Outlet Works

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Riprap	NA	NA	
Outlet Channel	NA	NA	
Debris	NA	NA	
Other (Name)	NA		
Other	NA		
Other	NA		
Other	NA		

EMERGENCY SPILLWAY

☐ Earth ☐ Other: Name ____________

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion	NA		
Weeds, Logs. Other Obstructions	NA		
Side Slope Sloughing	NA		
Vegetation	NA		
Sedimentation	NA		
Riprap	NA		
Settlement of Crest	NA		
Downstream Channel	NA		
Other (Name)	NA		

SUMMARY OF MAINTENANCE DONE AND/OR

REPAIRS MADE SINCE THE LAST INSPECTION

DATE OF PRESENT INSPECTION ________ March 24, 2010 ________

DATE OF LAST INSPECTION ________ February 20, 2009 ________

1. EARTH EMBANKMENT DAMS

None

2. CONCRETE MASONARY DAMS

3. PRINCIPAL SPILLWAY

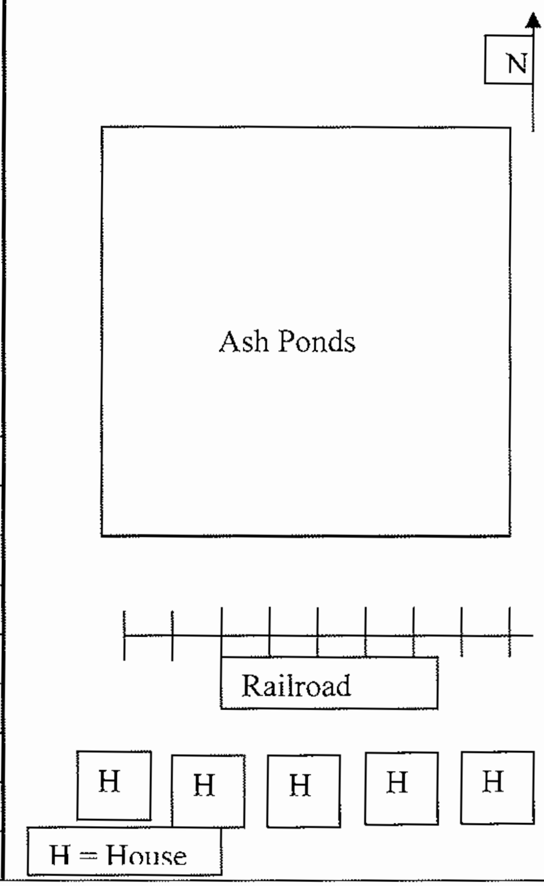
4. OUTLET WORKS

5. EMERGENCY SPILLWAY

DOWNSTREAM DEVELOPMENT
APPROXIMATE WIDTH OF AFFECTED FLOODPLAIN 0.25 MILES.

MILES DOWNSTREAM FROM DAM	DOWNSTREAM DEVELOPMENT												Loss Of Life Potential			Economic Loss Potential		
	OCCUPIED HOMES	UNOCCUPIED HOMES	AGRICULTURAL BUILDINGS	INDUSTRIAL BUILDINGS	COMMERCIAL BUILDINGS	SCHOOLS	HOSPITALS	ROADS & BRIDGES	DAMS	OVERHEAD UTILITIES	OTHER DEVELOPMENT (Name)	OTHER DEVELOPMENT (Name)	NONE	1 TO 10	OVER 10	MINIMAL EXPECTED	APPRECIABLE EXPECTED	EXCESSIVE EXPECTED
0 to ¼	12	0	3	2	0	0	0	0	0	0	0	0		x		x		
¼ to ½													x			x		
½ to ¾													x			x		
¾ to 1													x			x		
1 to 1 ¼													x			x		
1 ¼ to 1 ½													x			x		
1 ½ to 1 ¾													x			x		
1 ¾ to 2													x			x		
OVER 2													x			x		

SKETCH IN DEVELOPMENTS DOWNSTREAM OF THE DAM



The number of homes, buildings, or other items in the floodplain downstream of the dam should be placed in the appropriate row and column to designate their location.

Electronic Filing - Received, Clerk's Office : 07/17/2014

Owner's Maintenance Statement

I, ________________, owner of Baldwin PS Ash Disposal Complex dam,

Dam Identification Number __________, in __Randolph___ County,

am maintaining the dam in accordance with the accepted maintenance plan

which is part of Permit Number__________________.

____
Signature

____
Date

Owner's Operation and Maintenance Plan Statement

I, ________________, owner of Dynegy PS Ash Disposal Complex dam,

Dam Identification Number ___________, in Randolph______ County,

have reviewed the operation and maintenance plan including the Emergency

Action Plan (EAP), which is part of Permit Number_________.

I ☐ have enclosed the appropriate revisions or

☐ have determined that no revisions to the plan are necessary.

____
Signature

____
Date

The Department of Natural Resources is requesting information that is necessary to accomplish the statutory purposes as outlined under the River, Lakes and Streams Act, 615 ILCS 5. Submittal of this information is REQUIRED. Failure to provide the required information could result in the initiation of non-compliance procedures as outlined in Section 3702.100 of the "Rules for Construction and Maintenance of Dams."

APPENDIX E

PHOTOGRAPHS

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. 1	Date: 5/24/11
Direction Photo Taken: Northwest	
Description: Downstream slope and crest of the Ash Pond Dike which retains the water that forms the Intermediate Pond.	

Photo No. 2	Date: 5/24/11
Direction Photo Taken: Northwest	
Description: Downstream slope of the Ash Pond Dike.	

GZA GeoEnvironmental, Inc.		PHOTOGRAPHIC LOG
Client Name: U.S. EPA	**Site Location:** **Baldwin Energy Complex Baldwin, Illinois**	**Project No.** 01.0170142.30

Photo No. 3	**Date:** 5/24/11
Direction Photo Taken: South	
Description: Seepage from the downstream slope of the Ash Pond Dike.	

Photo No. 4	**Date:** 5/24/11
Direction Photo Taken: Southeast	
Description: Surface grouting/concrete along the downstream slope of Ash Pond Dike. Seepage present beneath the surface grouting in several locations.	

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. 5	Date: 5/24/11
Direction Photo Taken: South	
Description: Seepage beneath the surface grouting on Ash Pond Dike.	

Photo No. 6	Date: 5/24/11
Direction Photo Taken: West	
Description: Valley slope along the Final Pond.	

GZA GeoEnvironmental, Inc.		PHOTOGRAPHIC LOG
Client Name: U.S. EPA	**Site Location: Baldwin Energy Complex Baldwin, Illinois**	**Project No.** 01.0170142.30

Photo No. 7	**Date:** 5/24/11
Direction Photo Taken: Southwest	
Description: Upstream slope of the Final Pond.	

Photo No. 8	**Date:** 5/24/11
Direction Photo Taken: South	
Description: Upstream slope of the Final Pond.	

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA

Site Location: Baldwin Energy Complex Baldwin, Illinois

Project No. 01.0170142.30

Photo No. 9 **Date:** 5/24/11

Direction Photo Taken:
West

Description:
Upstream slope and decant structure of the Final Pond.

Photo No. 10 **Date:** 5/24/11

Direction Photo Taken:
South

Description:
Crest and downstream slope of the Final Pond.

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. **11** **Date:** 5/24/11

Direction Photo Taken:
South

Description:
Downstream slope of the Final Pond.

Photo No. **12** **Date:** 5/24/11

Direction Photo Taken:
North

Description:
Downstream slope of the Final Pond.

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. **13** **Date:** 5/24/11

Direction Photo Taken:
Northwest

Description:
Riprap on downstream slope of the Final Pond.

Photo No. **14** **Date:** 5/24/11

Direction Photo Taken:
Southwest

Description:
Seepage on downstream slope of the Final Pond.

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. 15	Date: 5/24/11
Direction Photo Taken: Northeast	
Description: Gravel lined drainage ditch on downstream slope of the Final Pond.	

Photo No. 16	Date: 5/24/11
Direction Photo Taken: Northeast	
Description: Platform and decant structure for the Final Pond	

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. 17	Date: 5/24/11
Direction Photo Taken: Northeast	
Description: Decant structure of the Final Pond showing the decant pipe appears to be nearly at capacity.	

Photo No. 18	Date: 5/24/11
Direction Photo Taken: West	
Description: Crest of the Settling Pond Dike.	

GZA GeoEnvironmental, Inc.		PHOTOGRAPHIC LOG
Client Name: U.S. EPA	**Site Location: Baldwin Energy Complex Baldwin, Illinois**	**Project No.** 01.0170142.30

Photo No. 19 | **Date:** 5/24/11

Direction Photo Taken:
Northwest

Description:
Crest of the Settling Pond Dike.

Photo No. 20 | **Date:** 5/24/11

Direction Photo Taken:
East

Description:
Crest of the Settling Pond Dike near the overflow section.

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	**Site Location: Baldwin Energy Complex Baldwin, Illinois**	**Project No.** 01.0170142.30

Photo No. 21 **Date:** 5/24/11

Direction Photo Taken: Southwest

Description: Upstream slope of the Intermediate Pond

Photo No. 22 **Date:** 5/24/11

Direction Photo Taken: Northeast

Description: Upstream slope of the Secondary Pond

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. 23	Date: 5/24/11
Direction Photo Taken: Southwest	
Description: Upstream slope of the Ash Pond Dike as seen from Secondary Dike	

Photo No. 24	Date: 5/24/11
Direction Photo Taken: Northwest	
Description: Crest, upstream and downstream slope of the Secondary Dike	

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. 25 **Date:** 5/24/11

Direction Photo Taken: North

Description: Upstream slope of the Secondary Pond

Photo No. 26 **Date:** 5/24/11

Direction Photo Taken: South

Description: Upstream slope of the Secondary Dike.

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. 27	Date: 5/24/11

Direction Photo Taken:
East

Description:
Upstream slope of Secondary Pond

Photo No. 28	Date: 5/24/11

Direction Photo Taken:
East

Description:
Upstream slope of the Secondary Pond

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. 29	Date: 5/24/11

Direction Photo Taken:
East

Description:
Discharge pipe for Bottom Ash Process water from the northern part of the Primary Fly Ash Pond to the Secondary Pond.

Photo No. 30	Date: 5/24/11

Direction Photo Taken:
South

Description:
Discharge pipe for Bottom Ash Process water from the northern part of the Primary Fly Ash Pond to the Secondary Pond.

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. 31 **Date:** 5/24/11

Direction Photo Taken:
East

Description:
Upstream slope of the Secondary Pond

Photo No. 32 **Date:** 5/24/11

Direction Photo Taken:
East

Description:
Downstream slope of the southern embankment of the Secondary Fly Ash Pond.

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. **33** **Date:** 5/24/11

Direction Photo Taken:
East

Description:
Conditions at the downstream toe of the southern embankment of the Secondary Fly Ash Pond.

Photo No. **34** **Date:** 5/24/11

Direction Photo Taken:
East

Description:
Downstream slope and toe of the southern embankment of the Secondary Fly Ash Pond.

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. 35	Date: 5/24/11	
Direction Photo Taken: East		
Description: Downstream slope and toe of the southern embankment of the Secondary Fly Ash Pond.		

Photo No. 36	Date: 5/24/11	
Direction Photo Taken: Northwest		
Description: Downstream slope and crest of Intermediate Embankment.		

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. 37	Date: 5/24/11

Direction Photo Taken:
Northwest

Description:
Downstream slope and crest of the Intermediate Embankment.

Photo No. 38	Date: 5/24/11

Direction Photo Taken:
Northwest

Description:
Downstream slope of the Intermediate Embankment showing an area that had been armored with riprap.

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. **39** | **Date:** 5/24/11

Direction Photo Taken:
Northwest

Description:
Downstream slope and crest of the Intermediate Embankment.

Photo No. **40** | **Date:** 5/24/11

Direction Photo Taken:
Southwest

Description:
Downstream slope and toe of the northern embankment of the Secondary Fly Ash Pond

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. 41 **Date:** 5/24/11

Direction Photo Taken:
Northeast

Description:
Downstream slope and toe of the northern embankment of the Secondary Fly Ash Pond.

Photo No. 42 **Date:** 5/24/11

Direction Photo Taken:
East

Description:
Scarp on downstream slope of the Northern Dike.

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. 43	Date: 5/24/11
Direction Photo Taken: East	
Description: Scarp on downstream slope of the Northern Dike.	

Photo No. 44	Date: 5/24/11
Direction Photo Taken: Southeast	
Description: Scarp on downstream slope of the Northern Dike.	

GZA GeoEnvironmental, Inc.

PHOTOGRAPHIC LOG

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. 45	Date: 5/24/11

Direction Photo Taken:
Northeast

Description:
Downstream slope and toe of the northern embankment of the Secondary Fly Ash Pond.

Photo No. 46	Date: 5/24/11

Direction Photo Taken:
Northeast

Description:
Downstream slope and toe of the northern embankment of the Secondary Fly Ash Pond.

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. 47 **Date:** 5/24/11

Direction Photo Taken:
East

Description:
Crest and upstream Slope of the southern embankment of the Secondary Fly Ash Pond.

Photo No. 48 **Date:** 5/24/11

Direction Photo Taken:
East

Description:
Crest and upstream slope of the Secondary Fly Ash Pond in the area of the 1995 Failure.

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. **49** **Date:** 5/24/11

Direction Photo Taken:
North

Description:
Downstream slope of the southern embankment of the Secondary Fly Ash Pond. Looking up slope in the area of the 1995 Failure.

Photo No. **50** **Date:** 5/24/11

Direction Photo Taken:
Northeast

Description:
One of several decant pipes used to transport water from the southern portion of the Primary Fly Ash Pond to the Secondary Fly Ash Pond.

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. 51	Date: 5/24/11
Direction Photo Taken: Northeast	
Description: Decant pipe transmitting water from the Primary Fly Ash Pond to the Secondary Fly Ash Pond.	

Photo No. 52	Date: 5/24/11
Direction Photo Taken: Southwest	
Description: One of several discharge pipes from the Primary Fly Ash Pond into the Secondary Fly Ash Pond.	

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. 53 **Date:** 5/24/11

Direction Photo Taken:
Southeast

Description:
Discharge pipe from the Secondary Fly Ash Pond into the Secondary Pond.

Photo No. 54 **Date:** 5/24/11

Direction Photo Taken:
Northeast

Description:
Upstream slope and decant structure in the Secondary Fly Ash Pond

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. **55** **Date:** 5/25/11

Direction Photo Taken:
Southwest

Description:
Downstream slope of the eastern embankment of the Primary Fly Ash Pond.

Photo No. **56** **Date:** 5/25/11

Direction Photo Taken:
Southwest

Description:
Downstream slope of the eastern embankment of the Primary Fly Ash Pond.

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. 57	Date: 5/25/11
Direction Photo Taken: South	
Description: Downstream slope of the eastern embankment of the Primary Fly Ash Pond.	

Photo No. 58	Date: 5/25/11
Direction Photo Taken: West	
Description: Crest and upstream slope of the southern embankment of the Primary Fly Ash Pond.	

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. 59	Date: 5/25/11
Direction Photo Taken: East	
Description: Toe and downstream slope of the northern embankment of the Primary Fly Ash Pond.	

Photo No. 60	Date: 5/25/11
Direction Photo Taken: West	
Description: Toe and downstream slope of the northern embankment of the Primary Fly Ash Pond.	

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. 61 **Date:** 5/25/11

Direction Photo Taken:
West

Description:
Crest of the northern embankment of the Primary Fly Ash Pond.

Photo No. 62 **Date:** 5/25/11

Direction Photo Taken:
West

Description:
Toe and downstream slope of the northern embankment of the Primary Fly Ash Pond.

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. 63 | **Date:** 5/25/11

Direction Photo Taken:
Southeast

Description:
Crest of the northern embankment of the Primary Fly Ash Pond.

Photo No. 64 | **Date:** 5/24/11

Direction Photo Taken:
South

Description:
Crest and upstream slope of the northern embankment of the Primary Fly Ash Pond.

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. **65** **Date:** 5/25/11

Direction Photo Taken:
Northeast

Description:
Crest and upstream slope of the southern embankment of the Primary Fly Ash Pond.

Photo No. **66** **Date:** 5/25/11

Direction Photo Taken:
North

Description:
Upstream slope of the Primary Fly Ash Pond.

GZA GeoEnvironmental, Inc.		PHOTOGRAPHIC LOG
Client Name: U.S. EPA	**Site Location: Baldwin Energy Complex Baldwin, Illinois**	**Project No.** 01.0170142.30

Photo No. 67	**Date:** 5/25/11
Direction Photo Taken: Southwest	
Description: Downstream slope of the western embankment of the Primary Fly Ash Pond.	

Photo No. 68	**Date:** 5/25/11
Direction Photo Taken: North	
Description: Crest and upstream area of the western embankment of the Primary Fly Ash Pond.	

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. **69**	**Date:** 5/25/11	
Direction Photo Taken: West		
Description: Decant from the northern portion of the Primary Fly Ash Pond.		

Photo No. **70**	**Date:** 5/25/11	
Direction Photo Taken: Southeast		
Description: Interior berm in Primary Fly Ash Pond separating the northern and southern portions.		

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. **71** **Date:** 5/25/11

Direction Photo Taken:
South

Description:
Intermediate pump station for the fly ash process water.

Photo No. **72** **Date:** 5/25/11

Direction Photo Taken:
South

Description:
Transport pipes for fly ash process water.

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. **73** **Date:** 5/25/11

Direction Photo Taken:
West

Description:
One of several discharge lines into the bottom ash (northern) area of the Primary Fly Ash Pond.

Photo No. **74** **Date:** 5/25/11

Direction Photo Taken:
Northwest

Description:
Several discharge lines into the bottom ash processing area of the Primary Fly Ash Pond.

GZA GeoEnvironmental, Inc. | **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Baldwin Energy Complex Baldwin, Illinois	Project No. 01.0170142.30

Photo No. 75 | **Date:** 5/24/11

Direction Photo Taken:
Southwest

Description:
Crest and upstream slope of the Ash Pond Dike.

Photo No. 76 | **Date:** 5/24/11

Direction Photo Taken:
South

Description:
Crest and upstream slope of the Ash Pond Dike.

GZA GeoEnvironmental, Inc.		PHOTOGRAPHIC LOG
Client Name: U.S. EPA	**Site Location:** **Baldwin Energy Complex Baldwin, Illinois**	**Project No.** **01.0170142.30**

Photo No. 77	**Date:** 5/24/11
Direction Photo Taken: West	
Description: Decant structure of the Intermediate Pond.	

APPENDIX F

REFERENCES

REFERENCE LIST
BALDWIN POWER STATION

Sargent & Lundy Engineers. "Ash Pond Outfall Structures, Baldwin Power Station, Illinois Power Company, Baldwin, Illinois." Drawing No. E-BAL1-B60. Dated January 16, 1967.

Sargent & Lundy Engineers. "Ash Pond Dike; Sheet 1." Drawing No. E-BAL1-B37. Dated March 16, 1967.

Sargent & Lundy Engineers. "Ash Pond Dike; Sheet 2." Drawing No. E-BAL1-B38. Dated March 16, 1967.

Sargent & Lundy Engineers. "Ash Pond Dike; Sheet 3." Drawing No. E-BAL1-B39. Dated March 16, 1967.

Sargent & Lundy Engineers. "Ash Pond Dike; Sheet 4." Drawing No. E-BAL1-B40. Dated March 16, 1967.

Illinois Power Company, Decatur. "Miscellaneous Details of Intermediate Embankment, Vertical Extension of Intermediate Embankment, Baldwin Power Station." Drawing No. E-BAL1-C122. Dated July 22, 1999.

Illinois Power Company, Decatur. "Site Plan, Secondary Ash Pond Storm Water Dike and Detention Basin, Baldwin Power Station." Drawing No. E-BAL1-C50. Dated October 31, 1996.

Illinois Power Company, Decatur. "Details For Secondary Storm Water Dike, Baldwin Power Station." Drawing No. E-BAL1-C51. Dated November 4, 1996.

Illinois Power Company. "Preliminary Secondary Ash Pond Redirection, Baldwin Power Station." Drawing No. CE-BAL1-C31. Dated June 11, 1996.

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Harza Engineering Company. “General Layout – Ash Pond No. 2.” Drawing No. E-BAL1-99-B1490. Dated January 6, 1981.

Illinois Power Company, Decatur. “1991 Control Map, Traverse Around Ash Pond Area, Baldwin Power Station.” Drawing No. CE-BAL1-01.2-2. Dated August 11, 1995.

Illinois Power Company, Decatur. “General Location of Discharge Sewer Pipe Replacement, Ash Pond, Baldwin Power Station.” Drawing No. E-BAL1-C56-1. Dated September 14, 1994.

Illinois Power Company, Decatur. “Plan – Discharge Replacement, Fly Ash Pond, Baldwin Power Station.” Drawing No. E-BAL1-C56-2. Dated September 14, 1994.

Illinois Power Company, Decatur. “Details Outlet Structure, Discharge Pipe Replacement of Fly Ash Pond, Baldwin Power Station.” Drawing No. E-BAL1-C56-4. Dated September 13, 1994.

Illinois Power Company, Decatur. “Flow Diagram, Fly Ash Pond, Baldwin Unit 1, 2 & 3.” Drawing No. E-BAL1-M2425. Dated June 11, 1999.

Illinois Power Company, Decatur. “PRB Coal Conversion Project, Fly Ash Pond – Misc. Foundations, Baldwin Power Station – Units 1-3. Drawing No. B2226. Dated September 24, 1999.

Illinois Power Company, Decatur. “Primary Ash pond Site Plan, Vertical Extension of Intermediate Embankment, Baldwin Power Station.” Drawing No. E-BAL1-C119.

Illinois Power Company, Decatur. “Outlet Pipe Details of North Dike, Ash Pond No. 2.” Drawing No. E-BAL1-99-B1492. Dated June 6, 1979.

Illinois Power Company. “ Preliminary, Secondary Ash Pond Redirection, Baldwin Power Station.” Drawing No. CE-BAL1-. Dated June 11, 1996.

Illinois Power Company, Decatur. “Erection Diagram, Final Pond Outlet Structure, Baldwin Power Station. Drawing No. and date not available.

Illinois Power Company, Decatur. “Topography Survey (1988), Spillway Ash Pond, Baldwin Power Station.” Drawing No. CE-BAL1-B1509. Dated September 21, 1988.

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T. Barkley: Exhibit H

FINAL REPORT
ROUND 10 DAM ASSESSMENT
DYNEGY MIDWEST GENERATION, LLC – HENNEPIN POWER STATION
ACTIVE EAST ASH POND SYSTEM, EAST ASH POND SYSTEM, WEST ASH POND SYSTEM
HENNEPIN, ILLINOIS

PREPARED FOR:

U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

PREPARED BY:

GZA GeoEnvironmental, Inc.
One Edgewater Drive
Norwood, Ma 02062
GZA File No. 01.0170142.30

FINAL REPORT
ROUND 10 DAM ASSESSMENT
DYNEGY MIDWEST GENERATION, LLC – HENNEPIN POWER STATION
ACTIVE EAST ASH POND SYSTEM, EAST ASH POND SYSTEM, WEST ASH POND SYSTEM
HENNEPIN, ILLINOIS

PREPARED FOR:

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1200 Pennsylvania Avenue, NW
Washington, DC 20460

PREPARED BY:

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One Edgewater Drive
Norwood, Ma 02062
GZA File No. 01.0170142.30

GZA GeoEnvironmental, Inc. *Engineers and Scientists*

December 6, 2012
GZA File No. 170142.30

Mr. Stephen Hoffman
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

RE: FINAL Assessment of Dam Safety of Coal Combustion Surface Impoundments at the Hennepin Power Station

Dear Mr. Hoffman,

One Edgewater Drive
Norwood,
Massachusetts 02062
Phone: 781-278-3700
Fax: 781-278-5701
http://www.gza.com

In accordance with our proposal 01.P0000177.11 dated March 28, 2011, and U.S. Environmental Protection Agency (EPA) Contract No. EP10W001313, Order No. EP-B115-00049, GZA GeoEnvironmental, Inc. (GZA) has completed our assessment of the Hennepin Power Station Coal Combustion Waste (CCW) Impoundments located in Hennepin, Illinois. The site visit was conducted on May 23, 2011. The purpose of our efforts was to provide the EPA with a site specific assessment of the impoundments to assist EPA in assessing the structural stability of the impoundments under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 104(e). We are submitting one hard copy and one CD-ROM copy of this Final Report directly to the EPA.

Based on our visual assessment, and in accordance with the EPA's criteria, the Active East Ash Pond System, West Ash Pond System, and East Ash Pond System are currently in **POOR** condition in our opinion. Further discussion of our evaluation and recommended actions are presented in the Task 3 Dam Assessment Report. The report includes: (a) a completed Coal Combustion Dam Assessment Checklist Form for each Basin; (b) a field sketch; and (c) selected photographs with captions. Our services and report are subject to the Limitations found in **Appendix A** and the Terms and Conditions of our contract agreement.

We are happy to have been able to assist you with this inspection and appreciate the opportunity to continue to provide you with dam engineering consulting services. Please contact the undersigned if you have any questions or comments regarding the content of this Task 3 Dam Assessment Report.

Sincerely,

GZA GeoEnvironmental, Inc.

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PREFACE

The assessment of the general condition of the dams/impoundment structures reported herein was based upon available data and visual inspections. Detailed investigations and analyses involving topographic mapping, subsurface investigations, testing and detailed computational evaluations were beyond the scope of this report.

In reviewing this report, it should be realized that the reported condition of the dams and/or impoundment structures was based on observations of field conditions at the time of inspection, along with data available to the inspection team. In cases where an impoundment is lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions, which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is critical to note that the condition of the dam and/or impoundment structures depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the reported condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Prepared by:

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EXECUTIVE SUMMARY

This Assessment Report presents the results of a visual assessment of the Dynegy Midwest Generation, LLC. (Dynegy) – Hennepin Power Station (HPS) Coal Combustion Waste (CCW) Impoundments located at 13498 E 800th Street, Hennepin, Illinois. These assessments were performed on May 23, 2011 by representatives of GZA GeoEnvironmental, Inc (GZA), accompanied by representatives of Dynegy.

The HPS is a two-unit coal-fired power plant, with a maximum generating capacity of approximately 310 Megawatts. Commercial operation of the facility began in the 1950's. Earthen and fly ash embankment CCW Impoundments (Active East Ash Pond System, East Ash Pond System, and West Ash Pond System) were constructed in conjunction with the HPS facility for the purpose of storing and disposing non-recyclable CCW from the HPS facility and clarification of water prior to discharge.

The current HPS operations use the Active East Ash Pond (AEAPS) for disposal of CCW products. The AEAPS consists of three (3) pond units. The first two units, known as the Primary and Secondary Cells, were designed as two chambered wet ash ponds and placed in service in 1997. After several years of operation, the Primary Cell's settling efficiency was reduced due to ash deposition and a third pond, Pond 2 East (2E) was added to the system in 2010.

There are two impoundments areas at the HPS which have been decommissioned and include: 1) East Ash Pond System Ponds 2 and 4 (EAPS) which are located adjacent to AEAPS and have been out of service since 1995; and, 2) West Ash Pond System Ponds 1 and 3 (WAPS) which are located west of the HPS and have been out of service since 1997. Pond 2E was constructed within the eastern footprint of the decommissioned Pond 2 area of the EAPS. The remaining portion of the Pond 2 area of the EAPS has being permitted as a dry fly ash landfill facility.

Process water and sluiced CCW are currently discharged into the Primary Cell of the AEAPS, where the CCW is allowed to settle and water is discharged into Pond 2E. Solids are further settled in Pond 2E prior to water discharge to the adjoining Secondary Cell (refer to Figure 2). Water flows sequentially through the Primary Cell, Pond 2E, and the Secondary Cell prior to discharge through a 5 foot stoplog weir structure and into the system outlet works. The AEAPS final outlet works include a Parshall flume for flow measurement and a final sampling manhole. Flow is then discharged to the Illinois River through NPDES outfall 003.

For the purposes of this EPA-mandated assessment, the sizes of the impoundments were based on U. S. Army Corps of Engineers (COE) criteria. Based on the maximum crest height of 18 feet and a storage volume of approximately 36 acre-feet, the WAPS is classified as a **Small** sized structure. Based on the maximum crest height of 52 feet and a storage volume of approximately 1,560 acre-feet, the AEAPS is classified as an **Intermediate** sized structure. Because there was no pool area associated with the EAPS, no size classification was estimated for the EAPS.

According to guidelines established by the COE, dams with a storage volume less than 1,000 acre-feet and/or a height less than 40 feet are classified as Small sized structures and dams with a storage volume between 1,000 acre-feet and 50,000 acre-feet and/or a height between 40 feet and 100 feet are classified as Intermediate sized structures.

Under the EPA classification system, as presented on page 2 of the EPA check list (**Appendix C**) and Definitions section (**Appendix B**), it is GZA's opinion that the AEAPS, EAPS and the WAPS would be considered as having a **Significant** hazard potential. The hazard potential rating is based on no probable loss of human life due to failure and the potential environmental impacts outside of Utility owned property.

Assessments

In general, the overall condition of the EAPS impoundment was judged to be **POOR**. The EAPS impoundment was found to have the following deficiencies:

1. Trees were present along the upstream and downstream slopes;
2. Minor potholes and rutting along the crest gravel access road; and,
3. The stability analysis completed indicates that the 1979 embankments that support the underlying ash along the Illinois River have a calculated factor of safety less than the generally accepted value and assumptions in the analysis about subsurface conditions should be verified.

In general, the overall condition of the AEAPS impoundments was judged to be **POOR**. The AEAPS impoundment was found to have the following deficiencies:

1. Minor potholes and rutting along the crest gravel access road;
2. Trees were present along the downstream slope of the northern embankment; and,
3. The stability analysis completed indicates that the 1979 embankments that support the underlying ash along the Illinois River have a calculated factor of safety less than the generally accepted value.

In general, the overall condition of the WAPS impoundment was judged to be **POOR**. In GZA's professional opinion, the embankment(s) visually appear to be sound and no immediate remedial action appears to be necessary. However, based on EPA's assessment criteria, the impoundment has been given a POOR Condition Rating, because complete hydraulic and geotechnical computations were not provided/available for GZA's for review. Thus, the stability of the embankment(s) could not be independently verified. The WAPS impoundment was found to have the following deficiencies:

1. Thick vegetation and trees along the downstream slopes;
2. Minor potholes and rutting along the crest gravel access road;

3. Erosion along the downstream slope of the northern embankment;
4. No seepage and/or stability analysis has been performed for the WAPS; and
5. No hydraulic/hydrologic analysis has been performed to confirm adequate freeboard and decant capacity at the design storm event.

The following recommendations and remedial measures generally describe the recommended approach to address current deficiencies at the impoundments. Prior to undertaking recommended maintenance, repairs, or remedial measures, the applicability of permits needs to be determined for activities that may occur under the jurisdiction of the appropriate regulatory agencies.

Studies and Analyses

GZA recommends that HPS/Dynegy conduct the following studies and analysis:

1. Conduct an analysis of the hydraulic/hydrologic condition of the WAPS to establish the rise in water level that occurs during the 100-year, 24-hour rain event to confirm that adequate freeboard is maintained and adequate decant and spillway capacity is available. The loading conditions established during the design storm event should be used in the evaluation of the seepage and stability evaluation of the embankments.

2. Perform a complete structural and seepage stability analysis of the WAPS impoundment including static, seismic and liquefaction loading.

3. Generate a remedial design to address the inadequate factor of safety along the northern embankment of the EAPS and AEAPS adjacent to the Illinois River.

Recurrent Operation & Maintenance Recommendations

GZA recommends the following operation and maintenance level activities:

1. Increased mowing of the grasses on the embankments to facilitate assessments and reduce the risk of burrowing animals;

2. Repair wave action erosion on the downstream slope of the WAPS;

3. Repair the potholes present in the gravel crest access roads. Grade the road to provide better drainage and reduce future potholing; and,

4. Clear trees and other deep rooted vegetation from the slopes and crests of the embankments.

Repair Recommendations

GZA recommends the following repairs to address observed deficiencies that may affect the stability of the embankments. The recommendations may require design by a professional engineer and construction contractor experienced in impoundment construction.

1. Pending the results of the hydraulic/hydrologic analysis, modify the design or operation of the WAPS to provide adequate capacity.

2. Pending the results of the complete seepage and stability analysis for the WAPS, modify the design or operation of the impoundments to provide conditions that result in embankments that meet the generally accepted factors of safety.

3. Based on the geotechnical results for the EAPS and AEAPS embankments, which produced inadequate minimum factors of safety, develop design modifications for those embankments along the Illinois River. These improvements are to result in the embankments meeting generally accepted factors of safety and protect the slope from future erosion.

Alternatives

There are no practical alternatives to the repairs itemized above.

ACTIVE EAST POND SYSTEM, EAST ASH POND SYSTEM AND WEST ASH POND SYSTEM
DYNEGY MIDWEST GENERATION LLC, HENNEPIN POWER STATION
HENNEPIN, ILLINOIS

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1.0 DESCRIPTION OF PROJECT

1.1 General

1.1.1 Authority

The United States Environmental Protection Agency (EPA), has retained GZA GeoEnvironmental, Inc. (GZA) to perform a visual assessment and develop a report of conditions for the Dynegy Midwest Generation,LLC, (Dynegy, Owner) Hennepin Power Station (HPS, Site) Coal Combustion Waste (CCW) Impoundments in Putnam **C**ounty, Illinois. This assessment was authorized by the EPA under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 104(e). This assessment and report were performed in accordance with Request for Quote (RFQ) RFQ-DC-16, dated March 16, 2011 and EPA Contract No. EP10W001313, Order No. EP-B11S-00049. The assessment generally conformed to the requirements of the Federal Guidelines for Dam Safety[1], and this report is subject to the limitations contained in **Appendix A** and the Terms and Conditions of our Contract Agreement.

1.1.2 Purpose of Work

The purpose of this investigation was to visually inspect and evaluate the present condition of the impoundments and appurtenant structures (the management unit) to attempt to identify conditions that may adversely affect their structural stability and functionality, to note the extent of any deterioration that may be observed, review the status of maintenance and needed repairs, and to evaluate the conformity with current design and construction standards of care.

The investigation was divided into five parts: 1) obtain and review available reports, investigations, and data from the Owner pertaining to the impoundment and appurtenant structures; 2) perform a review with the Owner of available design, assessment, and maintenance data and procedures for the management unit; 3) perform a visual assessment of the site; 4) prepare and submit a field assessment checklist; and 5) prepare and submit a draft and a final report presenting the evaluation of the structure, including recommendations and proposed remedial actions.

1.1.3 Definitions

To provide the reader with a better understanding of the report, definitions of commonly used terms associated with dams are provided in **Appendix B**. Many of these terms may be included in this report. The terms are presented under common categories associated with dams which include: 1) orientation; 2) dam components; 3) size classification; 4) hazard classification; 5) general; and 6) condition rating.

[1] FEMA/ICODS, April 2004: http://www.ferc.gov/industries/hydropower/safety/guidelines/fema-93.pdf

1.2 Description of Project

1.2.1 Location

The HPS is located in Sections 26 and 27, Township 33 North, Range 2 West, in Putnam County, Illinois at approximately 41°18'11"N, 89°18'55"W. The HPS is adjacent to the Illinois River at river mile 211.5, approximately four (4) miles north of Hennepin, Illinois. The HPS CCW impoundments are located to the east and west of the power plant. A Site locus of the impoundments and surrounding area is shown in **Figure 1**. An aerial photograph of the impoundments and surrounding area is provided as **Figure 2**. The impoundments can be accessed by vehicles from earthen access roads from the HPS.

1.2.2 Owner/Caretaker

The CCW impoundments are owned by Dynegy Midwest Generation, LLC and operated by the HPS.

	Dam Owner/Caretaker
Name	Dynegy Midwest Generation, LLC, Hennepin Power Station
Mailing Address	13498 E 800th St Hennepin, IL 61327
City, State, Zip	Hennepin, Illinois 62327
Contact	Ted Lindenbusch
Title	Managing Director
E-Mail	Ted.Lindenbusch@dynegy.com
Daytime Phone	815-339-9210
Emergency Phone	911

1.2.3 Purpose of the Impoundments

The HPS is a two-unit coal-fired power plant, with a maximum generating capacity of approximately 310 Megawatts. Commercial operation of the facility began in the 1950's. Earthen and fly ash embankment CCW Impoundments (Active East Ash Pond System, East Ash Pond System, and West Ash Pond System) were constructed in conjunction with the HPS facility for the purpose of storing and disposing non-recyclable CCW from the HPS facility and clarification of water prior to discharge.

The current HPS operations use the Active East Ash Pond (AEAPS) for disposal of CCW products. The AEAPS consists of three (3) pond units. The first two units, known as the Primary and Secondary Cells, were designed as two chambered wet ash ponds and placed in service in 1997. After several years of operation, the Primary Cell's settling efficiency was reduced due to ash deposition and a third pond, Pond 2 East (2E) was added to the system in 2010.

There are two impoundments areas at the HPS which have been decommissioned and include: 1) East Ash Pond System Ponds 2 and 4 (EAPS) which are located adjacent to AEAPS and have been out of service since 1995; and, 2) West Ash Pond System Ponds 1 and 3 (WAPS) which are located west of the HPS and have been out of service since 1997. Pond 2E was constructed within the eastern footprint of the decommissioned Pond 2 area of the EAPS. The remaining portion of the Pond 2 area of the EAPS will be operated as a dry fly ash landfill facility. Impoundments that are not formally closed through the state and can impound water are within the purview of the EPA's assessment criteria.

Process water and sluiced CCW are currently discharged into the Primary Cell of the AEAPS, where the CCW is allowed to settle and water is discharged into Pond 2E. Solids are further settled in Pond 2E prior to water discharge to the adjoining Secondary Cell (refer to Figure 2). Water flows sequentially through the Primary Cell, Pond 2E, and the Secondary Cell prior to discharge through a 5 foot stoplog weir structure and into the system outlet works. The AEAPS final outlet works include a Parshall flume for flow measurement and a final sampling manhole. Flow is then discharged to the Illinois River through outfall 003.

1.2.4 Description of the EAPS Impoundment and Appurtenances

The EAPS was designed by Illinois Power Company. However, available information regarding the original design and/or construction of the EAPS was limited to drawings related to subsequent embankment modifications and references in various documents prepared by Civil & Environmental Consultants, Inc. (CEC) for the design and construction of Pond 2E. The following description of the EAPS is based on the limited available information and observations made by GZA during our Site visit.

Based on the available information, the embankments surrounding the EAPS were constructed in three phases. The original embankments were constructed in 1958, with subsequent modifications in 1978 and 1989. The original embankments were constructed to about elevation 474 feet (MSL) and the north, east and west sides of the EAPS were tied into the bluff on the south side which is also the northern embankment of the Primary and Secondary Cells. In 1978, the embankments were raised to elevation 484 feet (MLS), and to elevation 494 feet (MLS) in 1989. Typical sections of the 1989 embankment extensions are shown on **Figures 3 and 4**.

Borings were performed in 2009 by CEC in the area of the EAPS as part of the design for Pond 2E. Seven of the borings were drilled through the top of the 1989 embankment (at approximate elevation 494 (MLS)) and two borings through the 1978 embankment (at approximate elevation 484 (MLS)). The borings encountered gravelly clays and sands interbedded with layers of loose to medium dense sand, gravel and gravelly sands and clays; stiff to very stiff sandy and silty clays; and loose to very loose, moist to wet, laminated silt with zones of fly ash with a consistency of fine and/or silty sand. There was no evidence that the impoundment embankments were built over wet ash or slag. Several other borings drilled in the EAPS disposal area encountered CCW materials to depths ranging from about 24 to 35 feet below the existing surface grades or elevations ranging about 456 to 453 (MSL), respectively. The boring locations are provided on **Figure 5.**

The original embankment slopes of the EAPS were variable and appear to have been constructed with downstream and upstream slopes that range from approximately 2.5H:1V to about 1.5H:1V. The EAPS crest length is approximately 1 mile with a maximum height (from the lowest downstream toe elevation to the crest of the impoundment) of approximately 52 feet corresponding to a crest elevation of 494.0 (MSL). The upstream and downstream slopes of the raised embankments sections were constructed at approximately 2.5H:1V.

A dry ash landfill has been constructed on the western portion of the Pond 2 area of the EAPS. The landfill has been constructed with a liner placed on the existing ash fill that was subsequently covered with several feet of ash during construction of Pond 2E. The landfill is permitted to extend to a height of 66 feet above the current embankment corresponding to an elevation of approximately 560 feet (MSL). Please note that the embankments of the EAPS are not regulated as a dam by the Illinois Department of Water Resources.

1.2.5 Description of the AEAPS Primary Cell, Secondary Cell and Appurtenances

The embankments of the Primary Cell and Secondary Cells were designed by Illinois Power Company. The following description of the impoundment is based on information provided in various Illinois Power Company Drawings and Documents, various Design Documents prepared by Civil & Environmental Consultants, Inc. (CEC), other information received from HPS, and observations made by GZA during our Site visit.

The AEAPS Primary and Secondary Cells are located east of the HPS and were originally constructed by reshaping an area that was an existing gravel pit to form the current surface impoundment. The ground elevation surrounding most of gravel pit at the time of construction was described to be equal to or greater than the maximum elevation proposed for the impoundments. The northeast corner of the impoundment however required the construction of an embankment with a portion of it being approximately 20 feet above the existing ground level. This area was described as having uneven natural terrain and was stabilized by leveling the existing ground surface and adding fill to the leveled elevation. The natural slopes in this area gave the northeast corner a height of about 32 feet.

The AEAPS Primary and Secondary Cells function as sedimentation basins for coal combustion wastes (CCW) including bottom ash, fly ash, miscellaneous station low volume waste, and coal pile runoff streams which are piped from the plant and discharged into the impoundment. Fly ash is conditioned and transported dry to the primary cell. The CCW enters the Primary Cell through two 12 inch diameter HDPE pipes and two 10 inch diameter steel pipes which are located near the northeast corner of the Primary Cell. Miscellaneous station low volume waste streams and coal pile runoff also enter the Primary Cell to the west of the northeast corner. The CCW settles in the Primary Cell and flow through the pond is discharged into Pond 2E through an 18 inch diameter reinforced concrete pipe (RCP) outlet structure which is located near the northeast corner of the Primary Cell.

The Secondary Cell receives flow from Pond 2E through a 24 inch diameter RCP which is located near the northwest corner of the Secondary Cell. Flow from the Secondary Cell is discharged through a five foot stop log weir structure into a 36 inch diameter RCP which conveys the flows into the final outlet works and into the Illinois River through outfall structure 003. The locations of the discharge pipes and structures are shown in **Figure 6**. Details of the discharge pipes and structures are shown on **Figures 7 and 8**. Prior to the construction of Pond 2E, flow through the Primary Cell was discharged into the Secondary Cell through a five-foot stoplog decant structure. The decant structure was abandoned as part of the construction of Pond 2E.

The AEAPS Primary and Secondary Cells consist of sand and gravel earthen embankments with a crest length of approximately 0.6 miles and 0.4 miles, respectively and a maximum height (from the lowest downstream toe elevation to the crest of the impoundment) of approximately 32 feet corresponding to a crest elevation of 494.0 Mean Sea Level (MSL). The bottom of the impoundments is at approximately Elevation 458.0 (MSL). The embankments of the cells were constructed in 1995 and 1996 and placed in service in 1997 with 4-foot horizontal to one-foot vertical (4H:1V) upstream and downstream slopes consisting of native sand and gravel materials. There was no evidence that the impoundment embankments were built over wet ash or slag. A 4-foot thick clay liner was constructed on the bottom of the cells and up the upstream side slopes of the cells to a height of approximately 20 feet above the base of the impoundments. The upper 12 feet of the upstream slopes were not lined at the time of the initial construction. After construction, operating water levels in the cells were maintained at or below the top elevation of the clay liner. Over the next several years, CCW filled the Primary Cell to levels that required that the upstream liner be raised to provide full depth operating levels for CCW transport, clarification and deposition. The liner in both cells was raised in 2003 by extending the existing liner up the upstream slopes from the original 20 foot level an additional 12 feet to the top of the crest. The construction of the extended liner consisted of 45-mil HDPE geomembrane over a 12-inch layer of compacted clay. A typical section for the liner extension is shown in **Figure 9.**

The intermediate embankment between the AEAPS Primary and Secondary Cells is regulated by the Illinois Department of Transportation, Division of Water Resources (IDOT/DWR) as a small-size, Class III dam under permit no. 21922, issued November 10, 1994. According to guidelines established by the DWR, dams with a storage volume less than 1,000 acre-feet and/or a height less than 40 feet are classified as Small sized structures. *Class III* structures are those for which failure has a low probability of causing loss of life or substantial environmental damage.

Instrumentation near the AEAPS Primary and Secondary Cells include six groundwater monitoring wells, numbered 12 through 16, which are located as shown on **Figure 6**.

1.2.6 Description of the AEAPS Pond 2E and Appurtenances

Pond 2E was constructed within the footprint of the eastern portion of Pond 2 of the EAPS and follows the same history as the EAPS, as discussed in Section 1.2.4, until 2009. Construction of Pond 2E began in 2009 and was completed in 2010. CCW flows are discharged directly from the Primary Cell into Pond 2E along with surface water runoff from EAPS Pond 2. Flow is routed from the Primary Cell through Pond 2E and into the Secondary Pond before discharging to the Illinois River through the system outlet works. According to HPS personnel, Pond 2E was designed to increase the efficiency of the existing pond system by adding additional storage and settling capacity. The associated design plans and calculations for a dry ash landfill which would be located on the EAPS west of Pond 2E have been submitted to IEPA Bureau of Land Management. It should be noted that a landfill permit approval is not required. Once the dry ash landfill has been constructed, Pond 2E will provide sediment control, storm flow storage, and leachate detention.

Pond 2E is located on the eastern portion of the decommissioned EAPS Pond 2 and was constructed by excavating and removing a portion of the ash fill. Flow is routed from the AEAPS Primary Cell to Pond 2E through an 18 inch diameter reinforced concrete pressure pipe

(RCPP) discharge culvert which was installed during the construction of Pond 2E. Operational flows exit Pond 2E through the principal spillway, a 2-foot wide by 1-foot tall orifice, of Pond 2E's concrete outlet structure. The concrete outlet structure includes an auxiliary spillway which is a 3-foot wide by 1-foot tall weir, and an emergency spillway which is a 6-foot by 4-foot drop inlet. The principal and auxiliary spillways were designed to pass the 100-year frequency storm without the emergency spillway functioning. Flows through all three spillways are discharged through a 24-inch diameter RCP into the Secondary Cell.

Pond 2E's earth embankment structure is approximately 11 feet to 52 feet high and 1300 feet long. It has a crest elevation of approximately 494 feet (MLS) and an upstream face with a 3H:1V (horizontal: vertical) slope. A 60-mil smooth HDPE geomembrane was installed on the bottom and upstream slopes of Pond 2E. The liner also caps the underlying ash along the eastern portion of the former ash impoundment. A concrete culvert and headwalls were installed on the southwest side of Pond 2E to allow inflow from the Primary Cell. A gate valve was installed on the Primary Cell headwall to provide flow control, if required, for repairs. A plan view and typical sections of the Pond 2E embankments and other details are provided on **Figures 7 and 8**.

Instrumentation near the AEAPS Pond 2E includes groundwater monitoring wells, numbered 12 through 16, which are located as shown on **Figure 6**.

1.2.7 Description of the WAPS Impoundment and Appurtenances

The WAPS is located to the west of the HPS and based on available records was designed by Illinois Power Company. The following description of the impoundment is based on information provided on various Illinois Power Company drawings, information received from Dynegy and observations made by GZA during our site visit. Information for the original design and construction of the WAPS was limited to drawings which were prepared for the 1989 raise of the original impoundment embankments.

The original WAPS was constructed in 1950's and designated as Ponds 1 and 3. The ponds appear to have been constructed as unlined earthen embankments which consist of sand and gravel materials. The north embankment of WAPS abuts the south bank of the Illinois River. The general height of the original embankments (from the lowest downstream toe elevation to the top of the impoundment) was about 10 feet, corresponding to a crest elevation of 460.0 (MSL). The WAPS embankments were raised in 1989 by adding an average of 5 feet of new fill to the existing embankments, increasing the crest elevation to 465.0 (MSL). There was no evidence that the impoundment embankments were built over wet ash or slag. The perimeter of the WAPS was also extended at that time to enclose Ponds 1 and 3 into a single pond. The crest length of the combined ponds is about 1.2 miles. The WAPS was decommissioned in 1995 and was not receiving or discharging flows at the time of GZA's site visit. The WAPS is not regulated as a dam by the IDNR.

Instrumentation near the WAPS includes groundwater monitoring wells numbered as follows; 21 through 27, 31 through 36 and, L1 and L4, which are located as shown on **Figure 10**. The wells are monitored quarterly and as a condition of the 1996 IEPA approved Closure Work Plan (CWP) for the WAPS.

1.2.8 Operations and Maintenance

The impoundments are operated and maintained by HPS personnel. Operation of the Primary Cell, Secondary Cell and Pond 2E includes periodic adjustment of the decant elevations and includes monitoring of groundwater and repair of the gravel access roads as needed.

Discharges of the HPS facility are regulated by the EPA under the National Pollutant Discharge Elimination System (NPDES) Permit No. IL0001554. A portion of outer embankments of Primary and Secondary Cell of the AEAPS are considered to be a dam that is regulated by the Illinois Department of Natural Resources, Office of Water Resources under permit number DS2004119. As part of the dam permit, there is an Operation and Maintenance Plan that was developed for the Primary and Secondary Cells. That plan includes regular mowing, vegetation management, semi-annual assessments, and assessments by a register professional engineer every 5 years.

An operation and maintenance plan was developed by CEC for Pond 2E. The plan included information about the frequency and scope of periodic assessments. The plan requires assessment of the impoundment on a quarterly basis by HPS staff and every 5 years by a registered professional engineer. The plan also requires maintenance of an emergency drawdown pump at the facility.

1.2.9 Size Classification

For the purposes of this EPA-mandated assessment, the sizes of the impoundments were based on U. S. Army Corps of Engineers (COE) criteria. Based on the maximum crest height of 18 feet and a storage volume of approximately 36 acre-feet, the WAPS is classified as a **Small** sized structure. Based on the maximum crest height of 52 feet and a storage volume of approximately 1,560 acre-feet, the AEAPS is classified as an **Intermediate** sized structure. Because there was no pool area associated with the EAPS, no size classification was estimated for the EAPS.

According to guidelines established by the COE, dams with a storage volume less than 1,000 acre-feet and/or a height less than 40 feet are classified as Small sized structures and dams with a storage volume between 1,000 acre-feet and 50,000 acre-feet and/or a height between 40 feet and 100 feet are classified as Intermediate sized structures.

1.2.10 Hazard Potential Classification

Under the EPA classification system, as presented on page 2 of the EPA check list (**Appendix C**) and Definitions section (**Appendix B**), it is GZA's opinion that the AEAPS, EAPS and the WAPS would be considered as having a **Significant** hazard potential. The hazard potential rating is based on no probable loss of human life due to failure and the potential environmental impacts outside of Utility owned property. The hazard rating for the AEAPS differs from the hazard rating given to the Primary and Secondary Cells by the IDNR due to the inclusion of Pond 2E in the AEAPS since IDNR rating.

1.3 Pertinent Engineering Data

1.3.1 Drainage Area

The existing impoundments are surrounded by exterior dikes with crest elevations that are above the surrounding geographical features. This confines the rainfall sub-basin areas to the impoundment areas themselves resulting in no additional overland flow being introduced to the system.

1.3.2 Reservoir

Based on estimates made by GZA[2], the WAPS has a surface area of 2 acres and a storage volume of approximately 36 acre feet at a pool elevation of 455.6 feet MSL. The AEAPS has a surface area of approximately 30 acres and a storage volume of approximately 1,560 acre feet at a pool elevation of 489.5 feet MSL. The EAPS no longer actively impounds water and therefore a reservoir volume was not calculated. The pool areas observed on GZA's May 23, 2011 Site visit are consistent with the surfaces areas noted above.

1.3.3 Discharges at the Impoundment Sites

According to HPS personnel, under normal operating conditions, approximately 2.4 million gallons of water per day (MGD) are discharged from the Secondary Cell to the Illinois River.

1.3.4 General Elevations (feet – MSL)

Elevations were taken from design drawings, reports, and data provided by HPS. Elevations were based upon the USGS topographic map MSL vertical datum.

AEAPS Impoundment

Primary Cell

A. Top of Embankment (Minimum)	± 494 feet
B. Upstream Water at Time of Assessment	± 489.5 feet
C. Downstream Tail Water at Time of Assessment	485.2 feet (Pond 2E)
D. Maximum Pond Water Elevation	489.5 feet

Secondary Cell

A. Top of Embankment (Minimum)	± 494 feet
B. Upstream Water at Time of Assessment	479.5 feet
C. Downstream Tail Water at Time of Assessment	448 feet (Illinois River)
D. Maximum Pond Water Elevation	480.5 feet

[2] Surface area estimates generated using Google Earth Professional software and available aerial photographs.

Pond 2E

A. Top of Embankment (Minimum)	±494 feet
B. Upstream Water at Time of Assessment	485.2 feet
C. Downstream Tail Water at Time of Assessment	479.5 feet (Secondary Cell)
D. Maximum Pond Water Elevation	480 feet

EAPS Impoundment

A. Top of Embankment (Minimum)	494 feet
B. Upstream Water at Time of Assessment	N/A
C. Downstream Tail Water at Time of Assessment	442 feet
D. Maximum Pond Water Elevation	Unknown

WAPS Impoundment

A. Top of Embankment (Minimum)	465.0 feet
B. Upstream Water at Time of Assessment	455.6 feet
C. Downstream Tail Water at Time of Assessment[3]	± 448 feet
D. Maximum Pond Water Elevation	Unknown

1.3.5 Design and Construction Records and History

The EAPS and WAPS were designed by Illinois Power Company. However, available information regarding the original design and/or construction of the EAPS was limited to drawings related to subsequent embankment modifications and references in various documents prepared by CEC for the design and construction of Pond 2E. The documentation included information about the dimensions of the slopes and the materials used but not about the construction techniques or quality control during construction.

Construction of Pond 2E was documented in a December 2010 report generated by CEC. The report included documentation of the excavation of Pond 2E into the existing ash and construction of the liner on the upstream slopes. The construction did not include modification of the embankments of the existing pond.

1.3.6 Operating Records

No operating records of the impoundments were provided to GZA.

1.3.7 Previous Assessment Reports

The HPS personnel perform visual assessments of the impoundments on a weekly basis and the assessment results are documented in a field log book. Every 5 years the Primary and Secondary Cells are inspected by a consulting engineer. GZA was provided with the 5-year assessments reports from 2001, 2006, and 2010 in Appendix D. The assessment completed March 29, 2010 was conducted by Mr. Kenneth M. Berry, P.E. of URS and indicated no deficiencies for the Primary and Secondary Cells at that time. Observed deficiencies at the WAPS include thick vegetation and trees.

[3] Downstream tail water elevation based on visual estimates made by GZA during the Site Visit.

2.0 ASSESSMENT

2.1 Visual Assessment

The HSP impoundments were inspected on May 23, 2011 by Patrick J. Harrison, P.E., and Douglas P. Simon, P.E. (Wisconsin), of GZA GeoEnvironmental, Inc., and accompanied by Phil Morris of Dynegy. The weather was partly cloudy with temperatures in the 70°s to 80°s Fahrenheit. Photographs to document the current conditions of the impoundments were taken during the assessment and are included in **Appendix E**. The water levels in the impoundments at the time of the assessment were as provided in Section 1.3.4. Underwater areas were not inspected, as this level of investigation was beyond of GZA's scope of services. Copies of the EPA Checklists are included in **Appendix C**.

With respect to our visual assessment, there was no evidence of prior releases, failures, or repairs observed by GZA for most of the impoundment areas. It appeared that the downstream slope of the northwestern embankment of the WAPS had been regraded within the last year.

2.1.1 EAPS Impoundment General Findings

In general, the HPS EAPS Impoundment was found to be in **POOR** condition. An overall Site plan showing the impoundments is provided as **Figure 2**. The location and orientation of photographs provided in **Appendix E** is shown on the Photo Plan in **Figure 6**.

2.1.2 EAPS Upstream Slope (Photos 18, 22, 24, and 74)

The northern portion of the EAPS has been permitted for a dry ash landfill and the upstream slopes are covered with ash along that portion of the impoundment. The southern portion of the EAPS that includes the former Pond 4 is no longer active. The upstream embankments along that portion of the EAPS were generally vegetated with grass that had not been recently mowed. Trees up to 12 inches in diameter were present on the slope.

2.1.3 EAPS Crest of Impoundment (Photos 32 though 35, 45, 52, 71 through 73)

The crest of the EAPS Impoundment generally had a gravel access road along the northern portion of the impoundment. The crest of impoundment had occasional pot holes along its entire length. The alignment of the crest appeared generally level, with no large depressions or irregularities observed. Based on information provided by HPS personnel, the crest elevation is approximately elevation 494 feet MSL. No significant settlement was observed at the time of our assessment. There was no water present in the EAPS at the time of our assessment.

2.1.4 EAPS Downstream Slope (Photos 25 through 28, 55 through 57, 69, and 70)

The downstream slope of the impoundment was generally covered in thick grass vegetation making it difficult to observe during our assessments. In addition, the rough terrain and steep slopes along the northern portion of the impoundment created a personnel safety risk to access the slope. Therefore, our observations along that portion of the impoundment were limited to that which could be observed from the crest of the 1979 embankment. Trees up to 24 inches in diameter generally characterized northern embankment along the Illinois River. No grass was present along that portion of the embankment. The western and southwestern embankment was generally covered with grass that had not been recently mowed. No unusual movement or displacement was observed on the slope.

2.1.5 EAPS Discharge Pipes (Photo 44)

The EAPS no longer functions as an active ash impoundment and no CCW sluice piping is present. Storm water drains have been installed along portions of the perimeter of the permitted landfill as shown in Photo 44. The drains appeared to be in good condition at the time of our assessment.

2.1.6 AEAPS Impoundment General Findings

In general, the HPS AEAPS Impoundment was found to be in **POOR** condition. An overall Site plan showing the impoundments is provided as **Figure 2**. The location and orientation of photographs provided in **Appendix E** is shown on the Photo Plan in **Figure 6**.

2.1.7 AEAPS Upstream Slope (Photos 35 through 43, 45 through 53)

The water surface elevation at the time of assessment was approximately at elevation 489.5 feet, 489.0 feet, and 479.5 feet MSL in the Primary Cell, Pond 2E and Secondary Cell, respectively. Therefore, the lower portion of the upstream slope was below the water level and not visible. Where visible, the upstream slope of Pond 2E was covered with a HDPE liner that was in good condition. The upstream slopes of the Primary and Secondary Cells were generally covered with grass above the water level.

2.1.8 AEAPS Crest of Impoundment (Photos 35 through 43, 45 through 53)

The crest of the AEAPS Impoundment was generally covered by a gravel access road. The crest of impoundment had occasional pot holes along its entire length. The alignment of the crest appeared generally level, with no large depressions or irregularities observed. Based on information provided by HPS personnel, the crest elevation is approximately elevation 494 feet MSL. No significant settlement was observed at the time of our assessment. There was approximately 4 feet to 14 feet of free board at the time of our assessment.

2.1.9 AEAPS Downstream Slope (Photos 29 through 31)

The AEAPS Impoundment shares a common embankment with the EAPS along the western portion of the impoundment and is incised along the southern portion. Therefore, no downstream slope was visible or present along those portions of the impoundment. The northern embankment of the impoundment abuts the Illinois River and is characterized by trees up to 24-inches in diameter. The eastern embankment was covered with grass that had not been recently mowed.

2.1.10 AEAPS Discharge Structures (Photos 58 through 68)

GZA observed the outlet structures that transmit flow from the Primary Cell to Pond 2E and then to the Secondary Cell. Based on our observations, the structures appeared to be in good condition with no defects noted. GZA also observed the condition of the decant structure in the Secondary Cell and the partial flume. Both structures appeared to be in good condition based on our observations.

2.1.11 WAPS Impoundment General Findings

In general, the HPS WAPS Impoundment was found to be in **POOR** condition. An overall Site plan showing the impoundments is provided as **Figure 2**. The location and orientation of photographs provided in **Appendix E** is shown on the Photo Plan in **Figure 10**.

2.1.12 WAPS Upstream Slope (Photos 18, 22, and 24)

The eastern portion of the WAPS has been filled with ash and the upstream slopes along that portion were not visible. The water surface elevation at the time of assessment was approximately at elevation 455.6 feet MSL along the western portion of the impoundment. Therefore, the lower portion of the upstream slope was below the water level and not visible. Where visible, the upstream slope was generally vegetated with grass that had not been recently mowed. Trees and shrubs up to 4 inches in diameter were noted along several portions of the upstream slope.

2.1.13 WAPS Crest of Impoundment (Photos 14 through 20)

The crest of the WAPS Impoundment was generally covered by a gravel access road. The crest of impoundment had occasional pot holes along its entire length. The alignment of the crest appeared generally level, with no large depressions or irregularities observed. Based on information provided by HPS personnel, the crest elevation is approximately elevation 460 feet MSL. No significant settlement was observed at the time of our assessment. There was approximately 8 feet of free board at the time of our assessment.

2.1.14 WAPS Downstream Slope (Photos 1 through 13)

The downstream slope of the impoundment was generally wooded along the northern portion of the impoundment adjacent to the Illinois River. Trees up to 24-inches in diameter were present along the downstream slope of the northern embankment. The remaining embankments were generally covered with grass that had not been recently mowed. Trees up to 12 inches in diameter were noted along the southern embankment and smaller trees and shrubs were noted along the eastern embankment. There was erosion (likely due to wave action) of the downstream slope of the northern embankment.

2.1.15 WAPS Discharge Pipes (Photos 21 and 22)

The decant structure for the WAPS Impoundment consists of a 12-inch diameter steel pipe with a trash rack as shown in Photo 21. The pipe discharges into the Illinois River and the discharge pipe is shown in Photo 22. The decant and discharge portions of the pipe appeared to be in good condition at the time of our assessment.

2.2 Caretaker Interview

Maintenance of the impoundments is the responsibility of HPS personnel. GZA met with HPS personnel and discussed the operations and maintenance procedures, regulatory requirements, and the history of the impoundments since their construction. Information gathered during that discussion is reflected in this report.

2.3 Operation and Maintenance Procedures

As discussed in Section 1.2.7, HPS personnel are responsible for the regular operations and maintenance of the impoundments. No formal maintenance plan has been developed for the WAPS and EAPS impoundments. An operation and maintenance plan for the Primary and Secondary Cells has been developed along with a separate operation and maintenance plan for Pond 2E. Based on our discussions with HPS personnel, the roadways and slopes are repaired as needed.

2.4 Emergency Action Plan

An Emergency Action Plan (EAP) has not been developed for the impoundments. An emergency action plan is not required for Class III structure per Illinois regulations. Note that the hazard potential classification for the dam is discussed in Section 1.2.11.

2.5 Hydrologic/Hydraulic Data

Illinois Power Company performed a hydrologic/hydraulic analysis in 1994 for the AEAP Primary and Secondary Cells as part of the original impoundment design. The results are provided in the "Hennepin Power Station Ash Surface Impoundment, Hydrologic/Hydraulic Analysis" report. The analysis was used to determine the maximum discharge rates and water elevations the facility would obtain and also to size the discharge piping and determine the required freeboard.

A hydrologic/hydraulic analysis was also conducted in 2009 by CEC for the AEAP Primary and Secondary Cells and for Pond 2E. The results are provided in the "Engineering Basis of Design, Application for a Permit to Construct a New Leachate and Storm Water Runoff Collection Pond, Dynegy – Hennepin Power Station, Hennepin, Illinois" report. In addition to the HPS operating flows and the future effects from the new landfill portion of the EAPS, the ponds were determined by CEC to have sufficient capacity to safely pass the 24-hour 25-year and the 24-hour 100-year frequency rainfall events with a minimum free-broad of more than 2 feet,

Based on the available information, a hydrologic/hydraulic analysis has not been performed for the WAPS.

GZA did not perform an independent assessment of the hydraulics and hydrology for the impoundments as this was beyond our scope of services.

2.6 Structural and Seepage Stability

Illinois Power Company performed a stability and seepage analysis for the AEAP Primary and Secondary Cells as part of the original impoundment design. The results are provided in the "Hennepin Power Station Ash Surface Impoundment, Geotechnical/Structural Design" report. Based on the results of the stability analysis, the factor of safety was calculated for several load conditions. The critical load conditions were determined to be the end of construction and rapid drawdown conditions. Both static and seismic conditions were evaluated. The results indicted minimum static and seismic factors of safety of 2.0 and 1.7, respectively for the upstream embankments and 2.3 and 2.0, respectively for the downstream embankments. The results for the original embankments were within the range of acceptable factors of safety for the types of embankments and load conditions evaluated.

CEC performed a stability analysis for a section of the existing EAPS 1979 embankment as part of the new landfill design. The 1979 embankment is common to the AEAP and the EAP; the ponds were separated into different units in association with the construction of Pond 2E at a later date. Since the embankment is common to both impoundments, we would expect the CEC analyses for the 1979 embankment for the EAP are to be applicable to the 1979 embankment for the AEAP. Based on the results provided, the calculated factor of safety against wedge failure of the 1978 embankment without seismic loading was 1.009. After submittal of the draft report, Dynegy provided additional analysis and discussion for the 1978 embankment. The additional analysis indicated a factor of safety of 1.4 for static loading conditions. This result is less than generally acceptable factors of safety of 1.5 for the types of embankments and load conditions evaluated, in GZA's opinion. In addition, it is our opinion that the assumption of the discontinuity of the stream bed deposits in the analysis should be verified.

No engineering evaluation is available for the WAPS embankments which were designed by Illinois Power Company.

GZA did not perform an independent assessment of the hydraulics and hydrology for the impoundments as this was beyond our scope of services.

3.0 ASSESSMENTS AND RECOMMENDATIONS

3.1 Assessments

In general, the overall condition of the EAPS impoundment was judged to be **POOR**. The EAPS impoundment was found to have the following deficiencies:

1. Trees were present along the upstream and downstream slopes;
2. Minor potholes and rutting along the crest gravel access road; and,
3. The stability analysis completed indicates that the 1979 embankments that support the underlying ash along the Illinois River have a calculated factor of safety less than the generally accepted value and assumptions in the analysis about subsurface conditions should be verified.

In general, the overall condition of the AEAPS impoundments was judged to be **POOR**. The AEAPS impoundment was found to have the following deficiencies:

1. Minor potholes and rutting along the crest gravel access road;
2. Trees were present along the downstream slope of the northern embankment; and,

3. The stability analysis completed indicates that the 1979 embankments that support the underlying ash along the Illinois River have a calculated factor of safety less than the generally accepted value.

In general, the overall condition of the WAPS impoundment was judged to be **POOR**. In GZA's professional opinion, the embankment(s) visually appear to be sound and no immediate remedial action appears to be necessary. However, based on EPA's assessment criteria, the impoundment has been given a POOR Condition Rating, because complete hydraulic and geotechnical computations were not provided/available for GZA's for review. Thus, the stability of the embankment(s) could not be independently verified. The WAPS impoundment was found to have the following deficiencies:

1. Thick vegetation and trees along the downstream slopes;
2. Minor potholes and rutting along the crest gravel access road;
3. Erosion along the downstream slope of the northern embankment;
4. No seepage and/or stability analysis has been performed for the WAPS; and
5. No hydraulic/hydrologic analysis has been performed to confirm adequate freeboard and decant capacity at the design storm event.

The following recommendations and remedial measures generally describe the recommended approach to address current deficiencies at the impoundments. Prior to undertaking recommended maintenance, repairs, or remedial measures, the applicability of permits needs to be determined for activities that may occur under the jurisdiction of the appropriate regulatory agencies.

3.2 Studies and Analyses

GZA recommends that HPS/Dynegy conduct the following studies and analysis:

1. Conduct an analysis of the hydraulic/hydrologic condition of the WAPS to establish the rise in water level that occurs during the 100-year, 24-hour rain event to confirm that adequate freeboard is maintained and adequate decant and spillway capacity is available. The loading conditions established during the design storm event should be used in the evaluation of the seepage and stability evaluation of the embankments.

2. Perform a complete structural and seepage stability analysis of the WAPS impoundment including static, seismic and liquefaction loading.

3. Generate a remedial design to address the inadequate factor of safety along the northern embankment of the EAPS and AEAPS adjacent to the Illinois River.

3.3 Recurrent Operation & Maintenance Recommendations

GZA recommends the following operation and maintenance level activities:

1. Increased mowing of the grasses on the embankments to facilitate assessments and reduce the risk of burrowing animals;

2. Repair wave action erosion on the downstream slope of the WAPS;

3. Repair the potholes present in the gravel crest access roads. Grade the road to provide better drainage and reduce future potholing; and,

4. Clear trees and other deep rooted vegetation from the slopes and crests of the embankments.

3.4 Repair Recommendations

GZA recommends the following repairs to address observed deficiencies that may affect the stability of the embankments. The recommendations may require design by a professional engineer and construction contractor experienced in impoundment construction.

1. Pending the results of the hydraulic/hydrologic analysis, modify the design or operation of the WAPS to provide adequate capacity.

2. Pending the results of the complete seepage and stability analysis for the WAPS, modify the design or operation of the impoundments to provide conditions that result in embankments that meet the generally accepted factors of safety.

3. Based on the geotechnical results for the EAPS and AEAPS embankments, which produced inadequate minimum factors of safety, develop design modifications for those embankments along the Illinois River. These improvements are to result in the embankments meeting generally accepted factors of safety and protect the slope from future erosion.

3.5 Alternatives

There are no practical alternatives to the repairs itemized above.

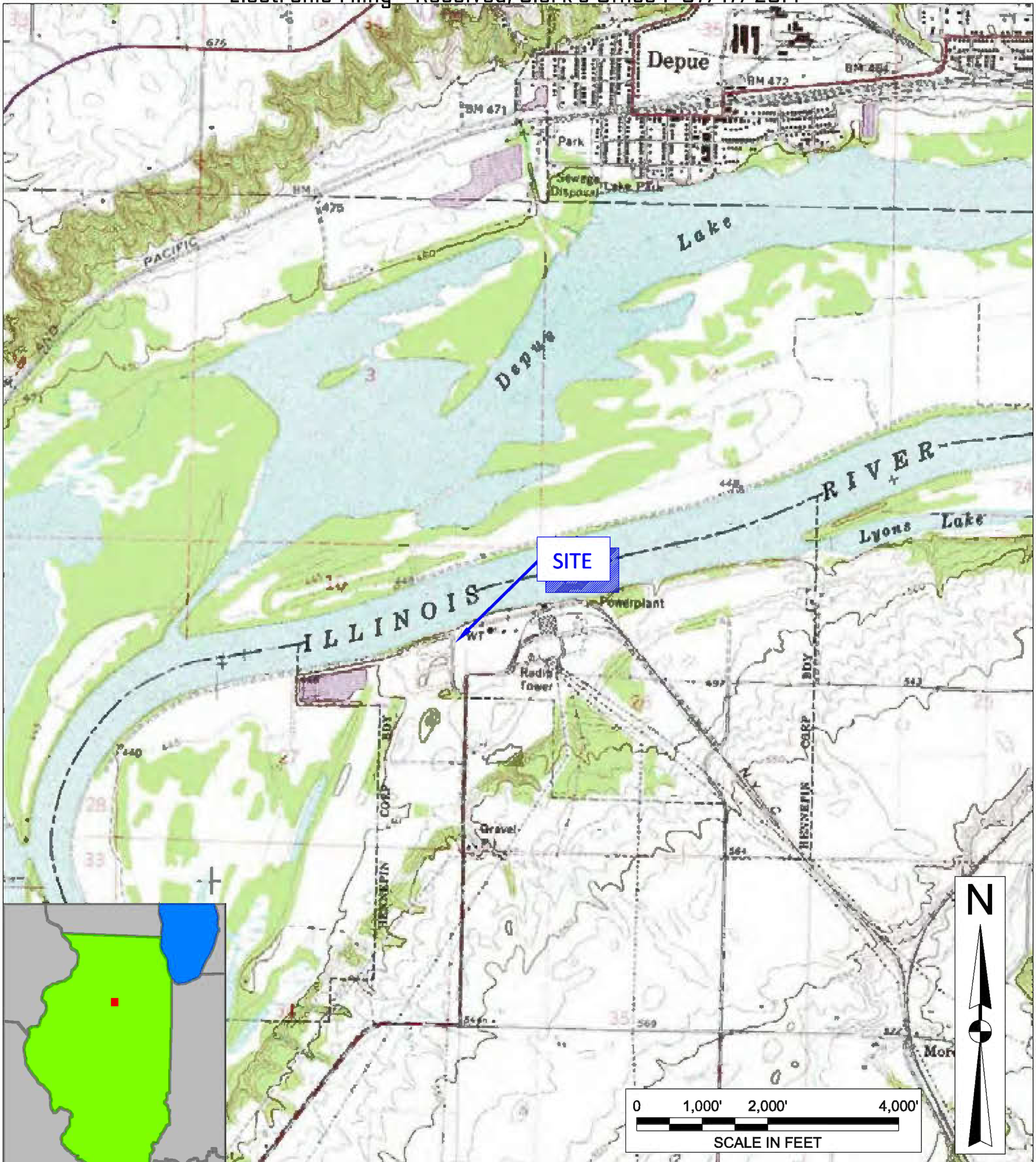
4.0 ENGINEER'S CERTIFICATION

I acknowledge that the management unit referenced herein, the HPS WAPS, AEAPS, and EAPS Impoundments have been assessed to be in **POOR** condition on May 23, 2011.

Patrick J. Harrison, P.E.
Senior Consultant

Electronic Filing - Received, Clerk's Office : 07/17/2014

FIGURES



SOURCE: U.S.G.S. QUADRANGLE MAP
DEPUE, IL (1966)
PHOTOREVISED (1979)

NO.	ISSUE/DESCRIPTION	BY	DATE

PREPARED BY:

GZA GeoEnvironmental, Inc.
Engineers and Scientists
20900 SWENSON DRIVE, SUITE 150
WAUKESHA, WISCONSIN 53186
(262) 754-2560

PREPARED FOR:

SITE LOCATION MAP

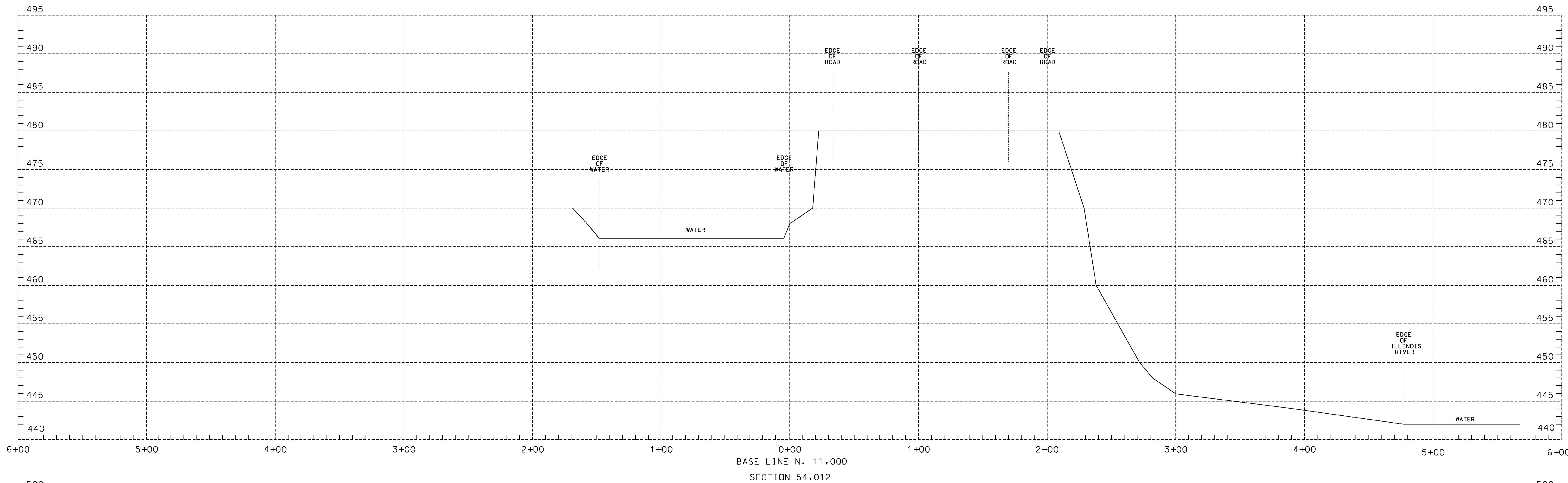
DYNEGY MIDWEST GENERATION, INC.
HENNEPIN POWER STATION
HENNEPIN, ILLINOIS

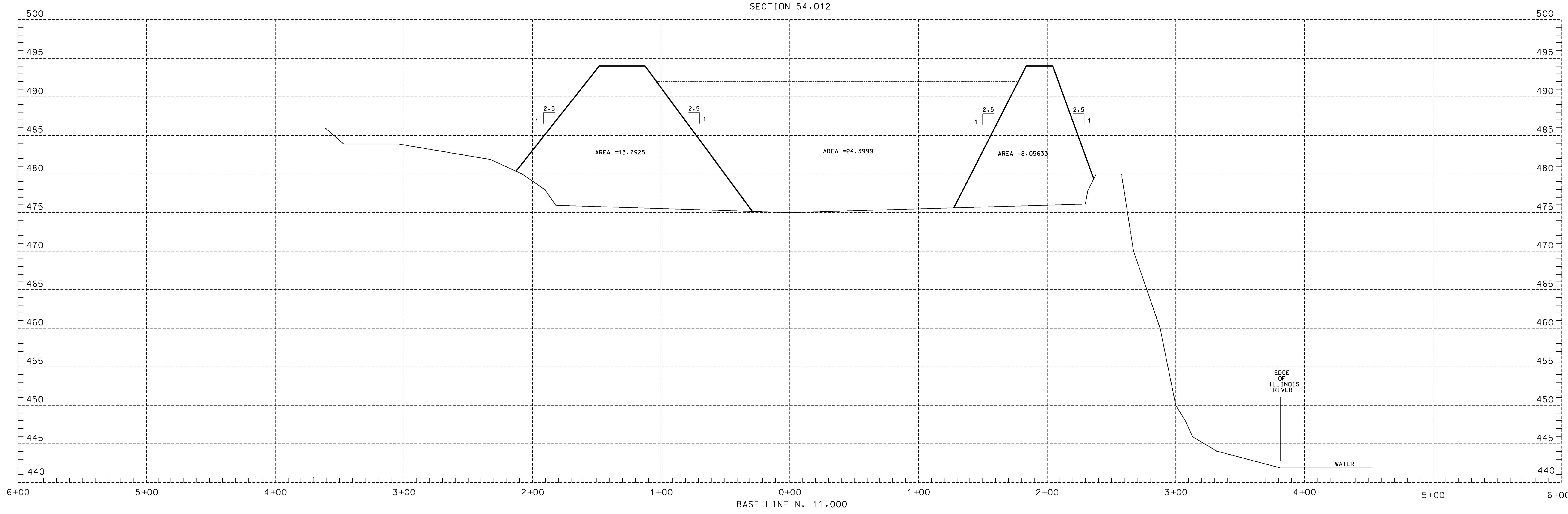
FIGURE 1

PROJ MGR: DPS	REVIEWED BY: PJH	CHECKED BY: DS	DATE	PROJECT NO.	REVISION NO.	SHEET NO.
DESIGNED BY: DS	DRAWN BY: CLK	SCALE: 1 : 24000	12/12/11	01.0170142.30		

GZA-J:\GZA_USA#\01.0170142.30 Ash Imp. Round 10\01.0170142.30 Task 8 - Hennepin\Drawings\Autocad\SITE LOCATION.dwg [FIGURE 1 - SITE LOCATION] December 12, 2011 - 9:23am justin.hegarty

GZA-J:\GZA_USA#\01.0170142.30 Ash Imp. Round 10\01.0170142.30 Task 8 - Hennepin\Drawings\Autocad\SITE PLANS.dwg [FIG 2] December 12, 2011 - 11:29am justin.hegarty





NOTES

1. DATA COLLECTED FROM TOPO ON DWG. CE-HEN1-B-450 DATED NOV. 4, 1987, REV. 0
2. COORDINATES WERE SUPPLIED BY G. DECKARD FIELD INFORMATION TIEING TO J.L. FISHER'S PANELS.

REFERENCES

ILLINOIS POWER COMPANY
DECATUR

CROSS SECTIONS
EAST ASH POND EXTENSION
HENNEPIN POWER STATION

DR WJM	CAD WJM	DATE 1-11-89	
CK	CKD	SCALE 1"=5' V. 1"=30' H.	
APP	PLOTTED 03-08-90	CE-HEN1-B458-1	

DYNEGY MIDWEST GENERATION, INC.
HENNEPIN POWER STATION
HENNEPIN, ILLINOIS

EAST ASH POND TYPICAL SECTIONS OF 1989 EMBANKMENT RAISE

PROJ MGR: DPS
DESIGNED BY: DPS
REVIEWED BY: PJH
OPERATOR: CLK
DATE: 12-12-11

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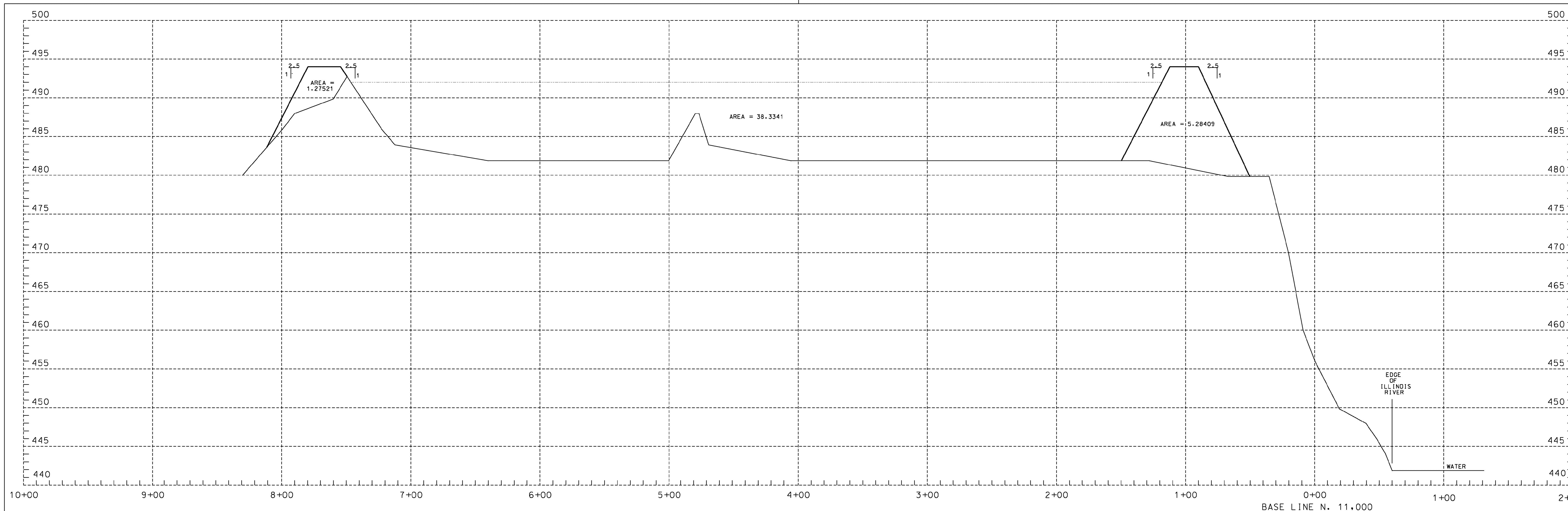
20900 Swenson Drive, Suite 150
Waukesha, Wisconsin 53186 ♦ Phone (262) 754-2560 ♦ Fax (262) 754-9711
www.gza.com

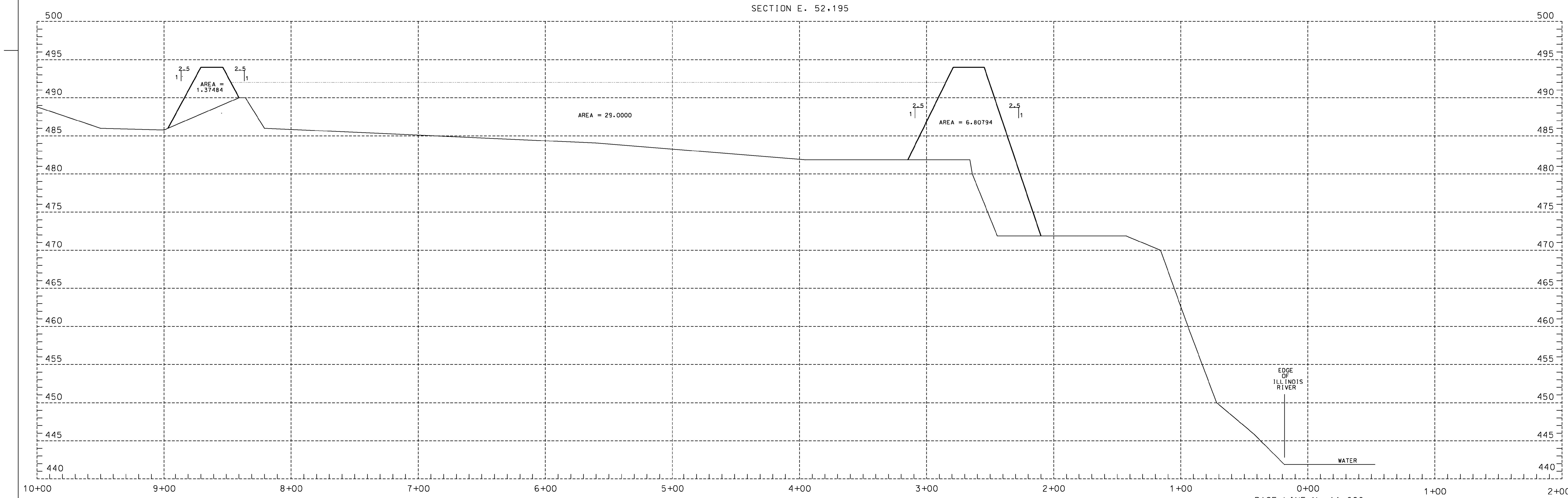
NOTE: IMAGE HAS BEEN REDUCED AND IS NO LONGER TO A SCALE

JOB NO. 01.0170142.30

FIGURE NO. 3



SECTION E. 52,195



SECTION E. 51,920

NOTES

1. DATA COLLECTED FROM TOPO ON DWG. CE-HEN1-B-450 DATED NOV. 4, 1987, REV. 0
2. COORDINATES WERE SUPPLIED BY G. DECKARD FIELD INFORMATION TIEING TO J.L. FISHER'S PANELS.

REFERENCES

ILLINOIS POWER COMPANY
DECATUR

CROSS SECTIONS
EAST ASH POND EXTENSION
HENNEPIN POWER STATION

DR WJM | CAD WJM | DATE 1-12-89
CKD | SCALE 1"=5' V. 1"=30' H.
PLOTTED 03-08-90 | CE-HEN1-B458-5

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DYNEGY MIDWEST GENERATION, INC.
HENNEPIN POWER STATION
HENNEPIN, ILLINOIS

EAST ASH POND ADDITIONAL SECTIONS OF 1989 EMBANKMENT RAISE

PROJ MGR: DPS
DESIGNED BY: DPS
REVIEWED BY: PJH
OPERATOR: CLK
DATE: 12-12-11

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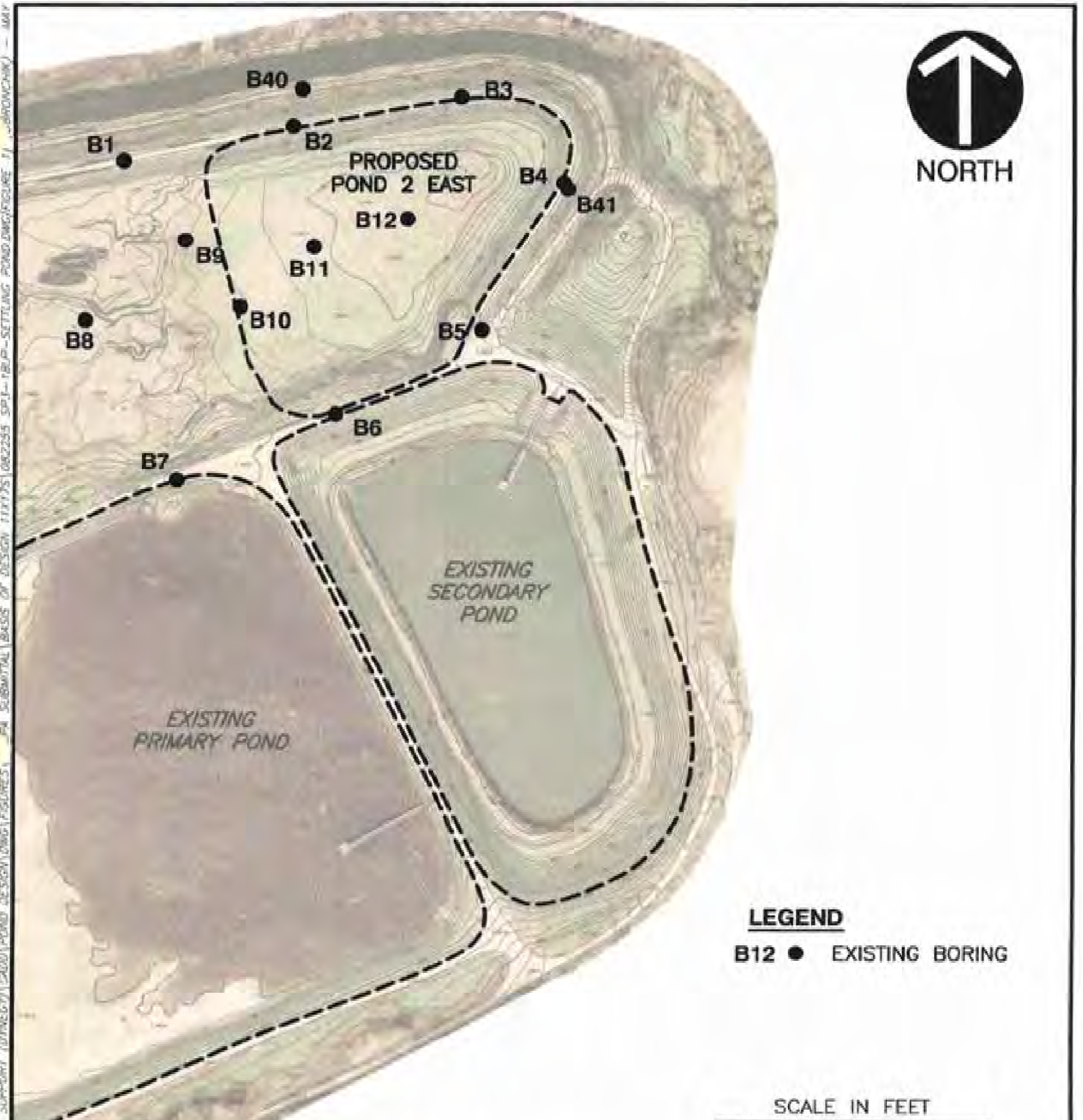
FIGURE NO. 4



LEGEND

B12 ● EXISTING BORING

SCALE IN FEET

0 200 400

DRAWING NOT TO SCALE IF SCALE BAR DOES NOT MEASURE 2 INCHES

* HAND SIGNATURE ON FILE

REFERENCE

1. TOPOGRAPHIC SURVEY PERFORMED BY SURDEX CORPORATION, FLOWN ON OCTOBER 26, 2008.

CEC
Civil & Environmental Consultants, Inc.
5910 Harper Road, Suite 106 · Solon, OH 44139
440-287-0157 · 866-507-2324
www.cecinc.com

DYNEGY
HENNEPIN POWER STATION
PROPOSED POND 2 EAST
BASIS OF DESIGN

BORING LOCATION PLAN

DRAWN BY: WRM	CHECKED BY: MDJ	APPROVED BY: PCC*	FIGURE NO.: 4
DATE: MAY 19, 2009	DWG SCALE: 1"=200'	PROJECT NO: 082-255	

REV. NO.	DESCRIPTION	BY	DATE

PROJ MGR: DPS
DESIGNED BY: DPS
REVIEWED BY: PJH
OPERATOR: CLK
DATE: 12-12-11

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NOTE: IMAGE HAS BEEN REDUCED AND IS NO LONGER TO A SCALE

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HENNEPIN, ILLINOIS

BORING LOCATION PLAN

JOB NO.
01.0170142.30

FIGURE NO.
5

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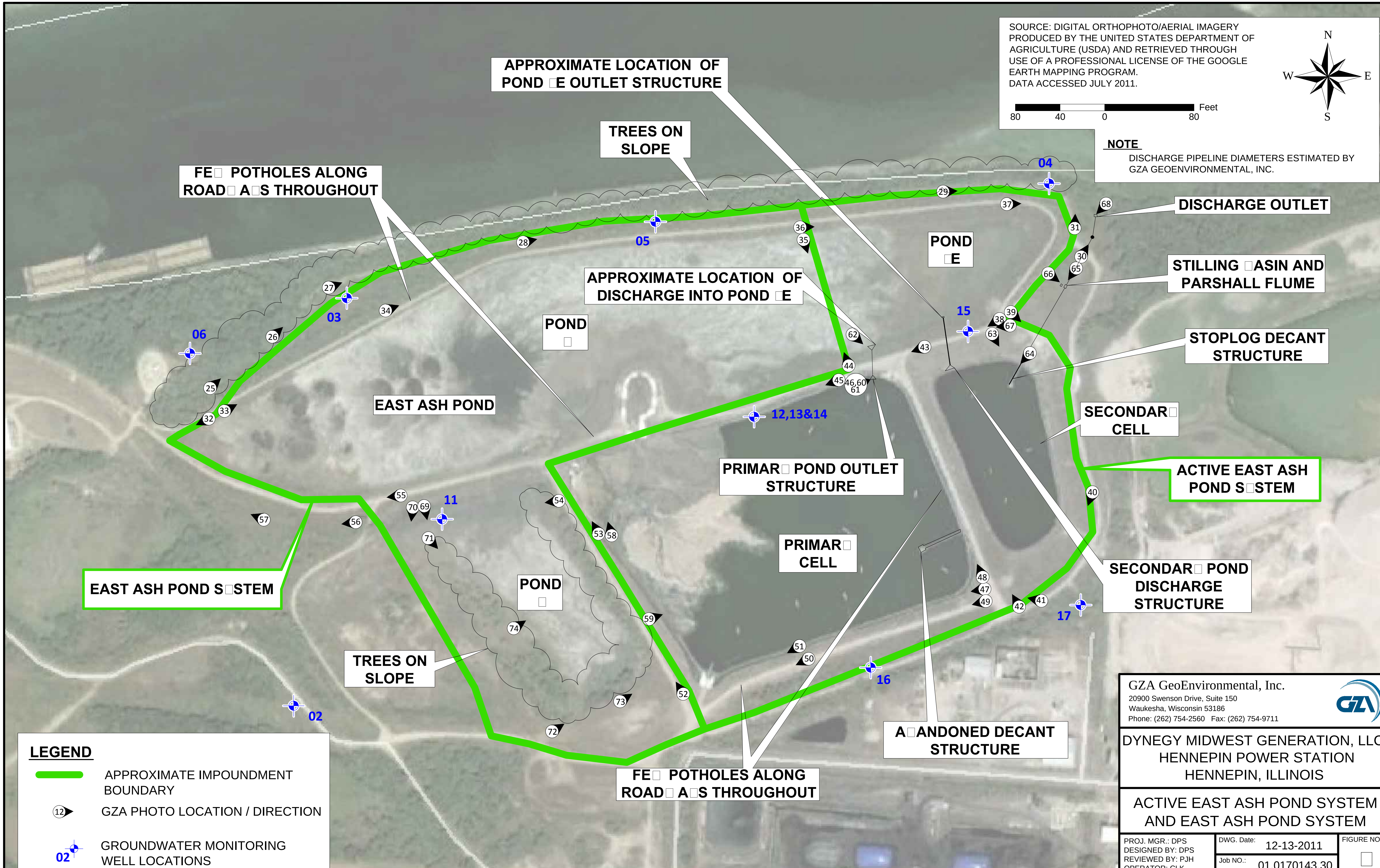

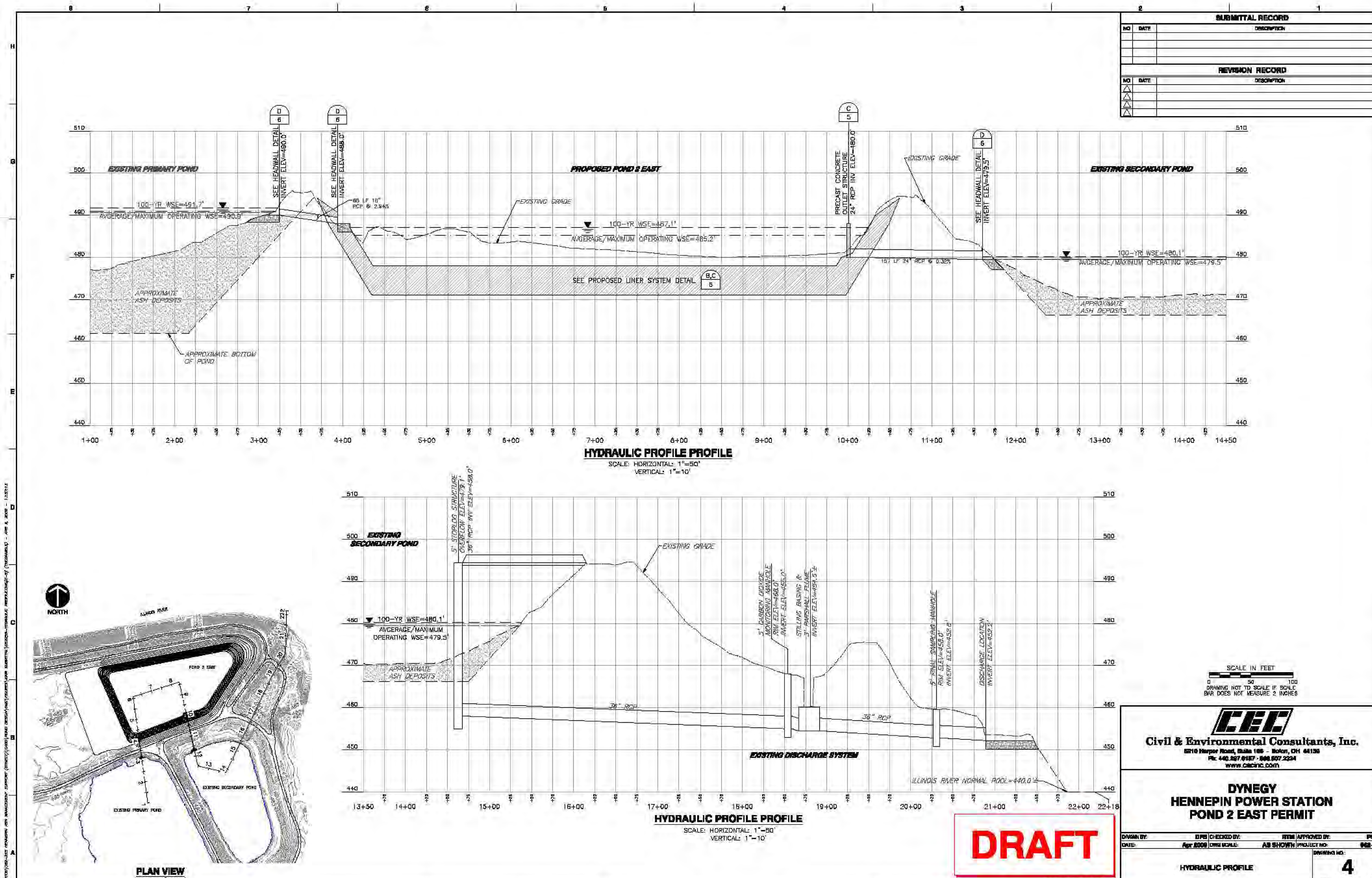

REV. NO. | DESCRIPTION | BY | DATE

PROJ MGR: DPS
DESIGNED BY: DPS
REVIEWED BY: PJH
OPERATOR: CLK
DATE: 12-8-11

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NOTE:
IMAGE HAS BEEN REDUCED AND IS NO LONGER TO A SCALE

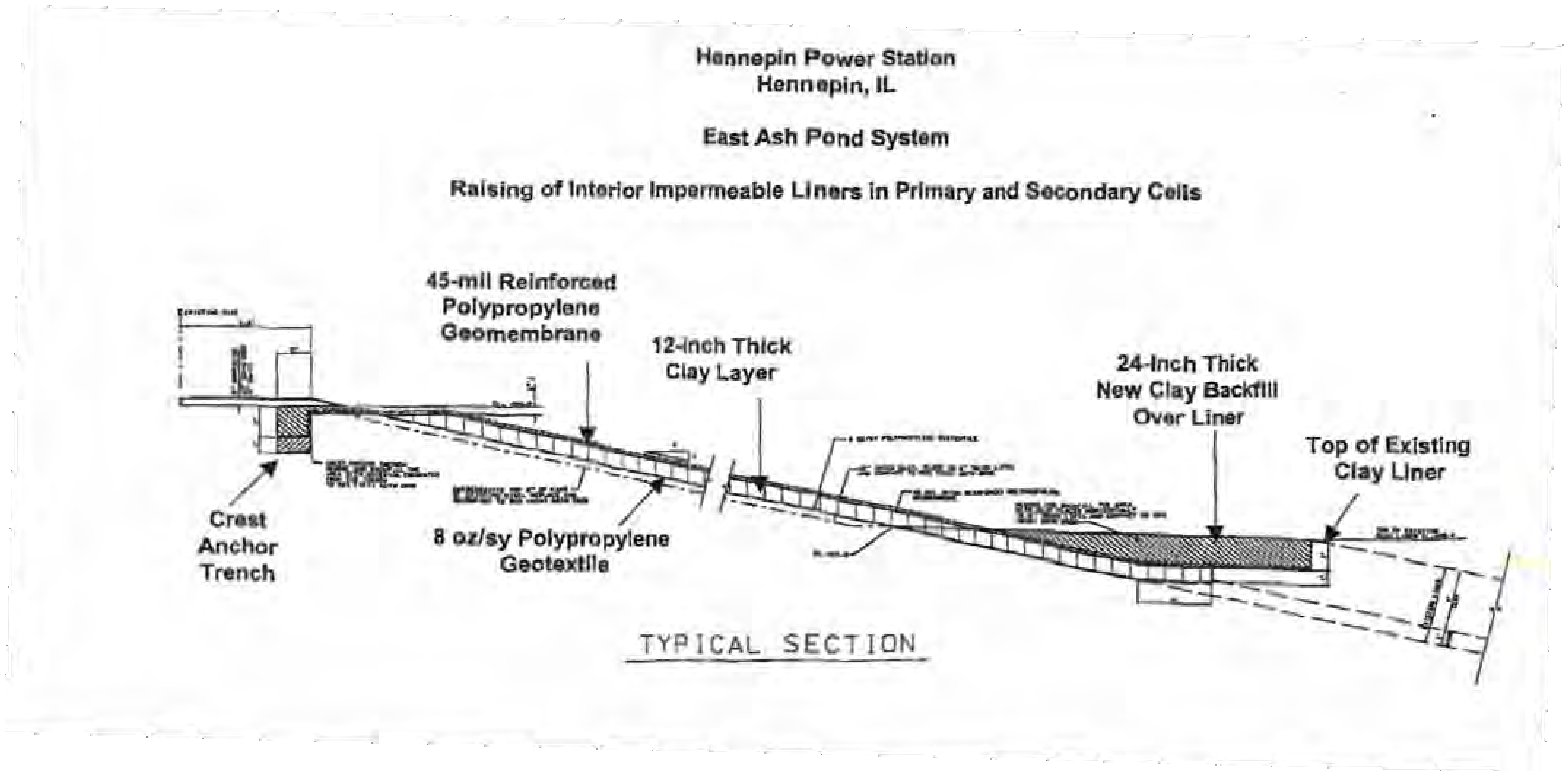
DYNEGY MIDWEST GENERATION, INC.
HENNEPIN POWER STATION
HENNEPIN, ILLINOIS

POND 2E PROFILES AND DETAILS

JOB NO.
01.0170142.30

FIGURE NO.
7


SUBMITTAL RECORD
REVISION RECORD
PROPOSED CLARIFYING POND
EXISTING SECONDARY POND
EXISTING GROUND
EXISTING 4' CLAY LINER
REINFORCED CONCRETE OUTLET STRUCTURE
157 LF 24" DIA. RCP PRESSURE PIPE @ 0.32% SLOPE
REINFORCED CONCRETE HEADWALL
EL. 490.0'
EL. 479.5'
EL. 475.0'
SEE LINER DETAIL
TYPICAL RIPRAP EROSION PROTECTION
EXISTING 1' SAND LAYER
EXISTING GROUND/ STRUCTURAL FILL
DETAIL A
PROPOSED CLARIFYING POND OUTLET STRUCTURE
N.T.S.
EXAGGERATED 5V:1H
EXISTING PRIMARY POND
PROPOSED CLARIFYING POND
68 LF 18" DIA. RCP PRESSURE PIPE @ 2.94% SLOPE
EL. 488.0'
EXISTING 4' CLAY LINER
EXISTING 1' SAND LAYER
DETAIL B
PROPOSED PRIMARY POND OUTLET STRUCTURE
N.T.S.
EXAGGERATED 5V:1H
157 LF OF 24" DIA. RCP PRESSURE PIPE @ 0.32%
GRATE
6" (TYP.)
TOP VIEW
PRE-CAST CONCRETE OUTLET STRUCTURE
GROUT INLET BOX TO CONCRETE FOUNDATION
#6 @ 6" O.C.
CONDITIONED SUBGRADE
DETAIL D
TRASH RACK
TOP OF GRATE EL. 488
WEIR INV. EL. 487
ORIFICE INV. EL. 484.5
24" DIA. PIPE OUTLET
24" RCP PRESSURE PIPE OUTLET INV. EL. 480
CAST-IN-PLACE CONCRETE BASE (SEE DETAIL D)
FRONT VIEW
4" (TYP.)
CAST-IRON GRATE
157 LF OF 24" DIA. RCP PRESSURE PIPE OUTLET @ 0.25%
PSI CONCRETE (MIN.)
SIDE VIEW
DETAIL C
PRECAST CONCRETE OUTLET STRUCTURE
N.T.S.
CEC
Civil & Environmental Consultants, Inc.
www.cecinc.com
DYNEGY
HENNEPIN POWER STATION
POND 2 EAST PERMIT
DRAFT
POND INLET/OUTLET DETAILS
5
AS SHOWN
REV. NO.
DESCRIPTION
BY
DATE
PROJ MGR: DPS
DESIGNED BY: DPS
REVIEWED BY: PJH
OPERATOR: CLK
DATE: 12-8-11
GZA GeoEnvironmental, Inc.
20900 Swenson Drive, Suite 150
Waukesha, Wisconsin 53186
(262) 754-2560 Phone
(262) 754-9711 Fax
www.gza.com
NOTE:
IMAGE HAS BEEN REDUCED AND IS NO LONGER TO A SCALE
DYNEGY MIDWEST GENERATION, INC.
HENNEPIN POWER STATION
HENNEPIN, ILLINOIS
POND 2E STRUCTURE DETAILS
JOB NO.
01.0170142.30
FIGURE NO.
8



REV. NO.	DESCRIPTION	BY	DATE

PROJ MGR: DPS
DESIGNED BY: DPS
REVIEWED BY: PJH
OPERATOR: CLK
DATE: 12-12-11

GZA GeoEnvironmental, Inc.
20900 Swenson Drive, Suite 150
Waukesha, Wisconsin • 53186 • Phone (262) 754-2560 • Fax (262) 754-9711
www.gza.com

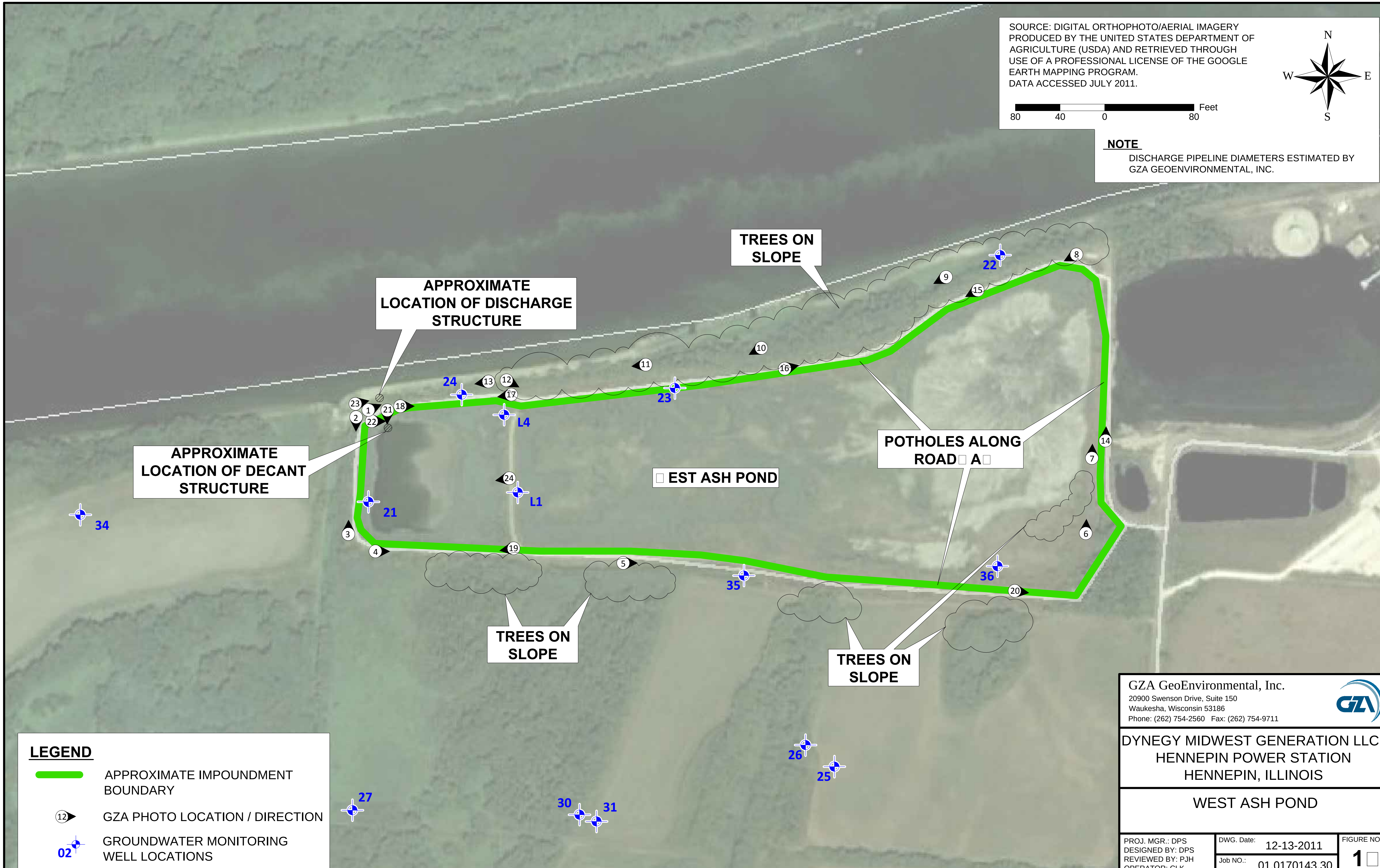
NOTE:
IMAGE HAS BEEN REDUCED AND IS NO LONGER TO A SCALE

DYNEGY MIDWEST GENERATION, INC.
HENNEPIN POWER STATION
HENNEPIN, ILLINOIS

TYPICAL SECTION OF LINER EXTENSION

JOB NO.
01.0170142.30

FIGURE NO.
9



GZA-J:\GZA_USA#\01.0170142.30 Ash Imp. Round 10\01.0170142.30 Task 8 - Hennepin\Drawings\Autocad\SITE PLANS.dwg [fig 10] December 13, 2011 - 10:40am justin.hegarty

APPENDIX A

LIMITATIONS

DAM ENGINEERING & VISUAL ASSESSMENT LIMITATIONS

1. The observations described in this report were made under the conditions stated herein. The conclusions presented in the report were based solely on the services described therein, and not on scientific tasks or procedures beyond the scope of described services or the time and budgetary constraints imposed by the United States Environmental Protection Agency (EPA).

2. In preparing this report, GZA GeoEnvironmental, Inc. (GZA) has relied on certain information provided by Dynegy Midwest Generation, LLC (Dynegy) (and their affiliates) as well as Federal, state, and local officials and other parties referenced therein. GZA has also relied on other parties which were available to GZA at the time of the assessment. Although there may have been some degree of overlap in the information provided by these various sources, GZA did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this work.

3. In reviewing this Report, it should be noted that the reported condition of the Ash Ponds is based on observations of field conditions during the course of this study along with data made available to GZA. The observations of conditions at the Ash Ponds reflect only the situation present at the specific moment in time the observations were made, under the specific conditions present. It may be necessary to reevaluate the recommendations of this report when subsequent phases of evaluation or repair and improvement provide more data.

4. It is important to note that the condition of a dam or embankment depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam or embankment will continue to represent the condition of the dam or embankment at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions may be detected.

5. Water level readings have been reviewed and interpretations have been made in the text of this report. Fluctuations in the level of the groundwater and surface water may occur due to variations in rainfall, temperature, and other factors different than at the time measurements were made.

6. GZA's comments on the history, hydrology, hydraulics, and embankment stability for the Ash Ponds are based on a limited review of available design documentation for the Hennepin Power Station. Calculations and computer modeling used in these analyses were not available and were not independently reviewed by GZA.

7. This report has been prepared for the exclusive use of EPA for specific application to the existing dam facilities, in accordance with generally accepted dam engineering practices. No other warranty, express or implied, is made.

8. This dam inspection verification report has been prepared for this project by GZA. This report is for broad evaluation and management purposes only and is not sufficient, in and of itself, to prepare construction documents or an accurate bid.

9. The Phase I investigation does not include an assessment of the need for fences, gates, no-trespassing signs, repairs to existing fences and railings and other items which may be needed to minimize trespass and provide greater security for the facility and safety to the public. An evaluation of the project for compliance with OSHA rules and regulations is also excluded.

APPENDIX B

DEFINITIONS

COMMON DAM SAFETY DEFINITIONS

For a comprehensive list of dam engineering terminology and definitions refer to references published by the U.S. Army Corps of Engineers, the Federal Energy Regulatory Commission, the Department of the Interior Bureau of Reclamation, or the Federal Emergency Management Agency.

Orientation

Upstream – Shall mean the side of the dam that borders the impoundment.

Downstream – Shall mean the high side of the dam, the side opposite the upstream side.

Right – Shall mean the area to the right when looking in the downstream direction.

Left – Shall mean the area to the left when looking in the downstream direction.

Dam Components

Dam – Shall mean any artificial barrier, including appurtenant works, which impounds or diverts water.

Embankment – Shall mean the fill material, usually earth or rock, placed with sloping sides, such that it forms a permanent barrier that impounds water.

Crest – Shall mean the top of the dam, usually provides a road or path across the dam.

Abutment – Shall mean that part of a valley side against which a dam is constructed. An artificial abutment is sometimes constructed as a concrete gravity section, to take the thrust of an arch dam where there is no suitable natural abutment.

Appurtenant Works – Shall mean structures, either in dams or separate there from, including but not be limited to, spillways; reservoirs and their rims; low level outlet works; and water conduits including tunnels, pipelines, or penstocks, either through the dams or their abutments.

Spillway – Shall mean a structure over or through which water flows are discharged. If the flow is controlled by gates or boards, it is a controlled spillway; if the fixed elevation of the spillway crest controls the level of the impoundment, it is an uncontrolled spillway.

General

EAP – Emergency Action Plan - Shall mean a predetermined plan of action to be taken to reduce the potential for property damage and/or loss of life in an area affected by an impending dam break.

O&M Manual – Operations and Maintenance Manual; Document identifying routine maintenance and operational procedures under normal and storm conditions.

Normal Pool – Shall mean the elevation of the impoundment during normal operating conditions.

Acre-foot – Shall mean a unit of volumetric measure that would cover one acre to a depth of one foot. It is equal to 43,560 cubic feet. One million U.S. gallons = 3.068 acre feet.

Height of Dam – Shall mean the vertical distance from the lowest portion of the natural ground, including any stream channel, along the downstream toe of the dam to the crest of the dam.

Spillway Design Flood (SDF) – Shall mean the flood used in the design of a dam and its appurtenant works particularly for sizing the spillway and outlet works, and for determining maximum temporary storage and height of dam requirements.

Condition Rating

SATISFACTORY - No existing or potential management unit safety deficiencies are recognized. Acceptable performance is expected under all applicable loading conditions (static, hydrologic, seismic) in accordance with the applicable criteria. Minor maintenance items may be required.

FAIR - Acceptable performance is expected under all required loading conditions (static, hydrologic, seismic) in accordance with the applicable safety regulatory criteria. Minor deficiencies may exist that require remedial action and/or secondary studies or investigations.

POOR - A management unit safety deficiency is recognized for any required loading condition (static, hydrologic, seismic) in accordance with the applicable dam safety regulatory criteria. Remedial action is necessary. POOR also applies when further critical studies or investigations are needed to identify any potential dam safety deficiencies.

UNSATISFACTORY - Considered unsafe. A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution. Reservoir restrictions may be necessary.

Hazard Potential

(In the event the impoundment should fail, the following would occur):

LESS THAN LOW HAZARD POTENTIAL: Failure or misoperation of the dam results in no probable loss of human life or economic or environmental losses.

LOW HAZARD POTENTIAL: Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

SIGNIFICANT HAZARD POTENTIAL: Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

HIGH HAZARD POTENTIAL: Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

APPENDIX C

INSPECTION CHECKLISTS

Coal Combustion Dam Inspection Checklist Form

US Environmental Protection Agency

Site Name:	Hennepin Power Station	Date:	5/23/11
Unit Name:	East Ash Impoundment	Operator's Name:	Dynergy Midwest Generation, LLC
Unit I.D.:	NPDES IL 0001554	Hazard Potential Classification:	High / Significant ✓ / Low
Inspector's Name:	Patrick J. Harrison, P.E. and Doug P. Simon, P.E.		

Check the appropriate box below. Provide comments when appropriate. If not applicable or not available, record "N/A". Any unusual conditions or construction practices that should be noted in the comments section. For large diked embankments, separate checklists may be used for different embankment areas. If separate forms are used, identify approximate area that the form applies to in comments.

	Yes	No		Yes	No
1. Frequency of Company's Dam Inspections?	Quarterly		18. Sloughing or bulging on slopes?		✓
2. Pool elevation (operator records)? See Note Below			19. Major erosion or slope deterioration?		✓
3. Decant inlet elevation (operator records)? See Note Below			20. Decant Pipes: See Note Below		
4. Open channel spillway elevation (operator records)?			Is water entering inlet, but not exiting outlet?		
5. Lowest dam crest elevation (operator records)?	494.0		Is water exiting outlet, but not entering inlet?		
6. If instrumentation is present, are readings recorded (operator records)?	✓		Is water exiting outlet flowing clear?		
7. Is the embankment currently under construction?	✓		21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation,stumps, topsoil in area where embankment fill will be placed)?	✓		From underdrain?		✓
9. Trees growing on embankment? (If so, indicate largest diameter below)	✓		At isolated points on embankment slopes?		✓
10. Cracks or scarps on crest?		✓	At natural hillside in the embankment area?		✓
11. Is there significant settlement along the crest?		✓	Over widespread areas?		✓
12. Are decant trashracks clear and in place? See Note Below			From downstream foundation area?		✓
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		✓	"Boils" beneath stream or ponded water?		✓
14. Clogged spillways, groin or diversion ditches? See Note Below			Around the outside of the decant pipe?		✓
15. Are spillway or ditch linings deteriorated?			22. Surface movements in valley bottom or on hillside?		✓
16. Are outlets of decant or underdrains blocked?		✓	23. Water against downstream toe?	✓	
17. Cracks or scarps on slopes?		✓	24. Were Photos taken during the dam inspection?	✓	

Major adverse changes in these items could cause instability and should be reported for further evaluation. Adverse conditions noted in these items should normally be described (extent, location, volume, etc.) in the space below and on the back of this sheet.

Inspection Issue # | Comments

2. No pool, decant, or open channel spillway is present in the East Ash Impoundment.

~~7. Dynegy has received a permit to construct a landfill over an inactive portion of Pond 2 and is referred to as the East Ash Impoundment.~~

~~8. Based on boring logs and observations.~~

~~9. Largest tree diameter noted was approximately 30 inches.~~

Items 12, 14, 15 and 20 do not apply to this impoundment.

U. S. Environmental Protection Agency

Coal Combustion Waste (CCW)
Impoundment Inspection

Impoundment NPDES Permit # IL 0001554

INSPECTOR Patrick J. Harrison, P.E.
Doug P. Simon, P.E.

Date May 23, 2011

Impoundment Name East Ash Impoundment
Impoundment Company Dynergy Midwest Generation, LLC
EPA Region Region V
State Agency (Field Office) Addresss Illinois Department of Natural Resources
Springfield, Illinois
Name of Impoundment East Ash Impoundment
(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New X Update ____

	Yes	No	
Is impoundment currently under construction?	X		Dynergy is building a land-fill on the impoundment.
Is water or ccw currently being pumped into the impoundment?		X	

IMPOUNDMENT FUNCTION: This impoundment has been inactive since 1995 and stores CCW from plant operations prior to 1995.

Nearest Downstream Town : Name Hennepin
Distance from the impoundment 4 miles
Impoundment
Location: Longitude 89 Degrees 18 Minutes 28 Seconds
Latitude 41 Degrees 18 Minutes 10 Seconds
State IL County Putnam County

Does a state agency regulate this impoundment? YES X NO ____

If So Which State Agency? The Illinois Environmental Protection Agency regulates the environmental concerns associated with the impoundment through a Closure Protocol.

HAZARD POTENTIAL (In the event the impoundment should fail, the following would occur):

______ **LESS THAN LOW HAZARD POTENTIAL:** Failure or misoperation of the dam results in no probable loss of human life or economic or environmental losses.

______ **LOW HAZARD POTENTIAL:** Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

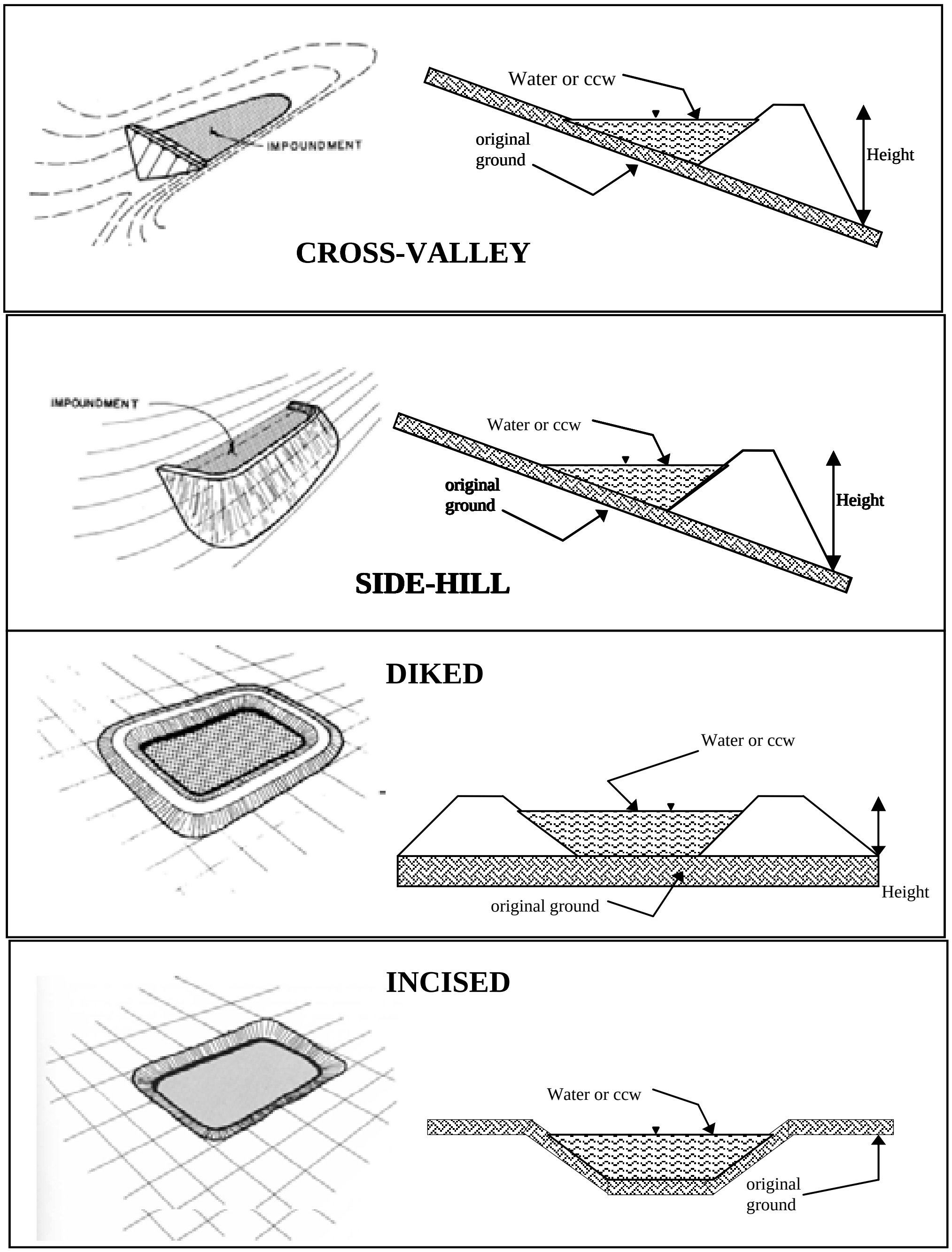
_x____ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

______ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

The Illinois River abuts the northern embankment of the East Ash Impoundment. Potential failure of the northern impoundment embankment could result in significant environmental impacts to areas outside of Utility owned property.

CONFIGURATION:



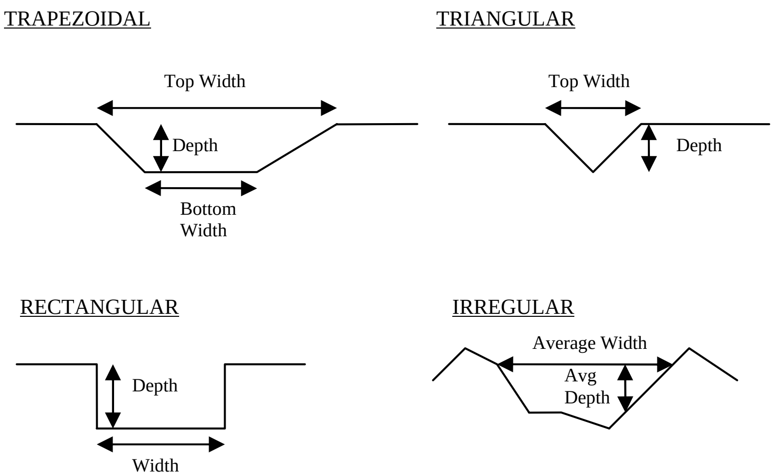
______ Cross-Valley
______ Side-Hill
______ Diked
______ Incised (form completion optional)
__X__ Combination Incised/Diked

Embankment Height __52__ feet Embankment Material __Compacted Native Fill__
Pool Area __No Pool__ acres Liner __None Present__
Current Freeboard __NA__ feet Liner Permeability __________

TYPE OF OUTLET (Mark all that apply)

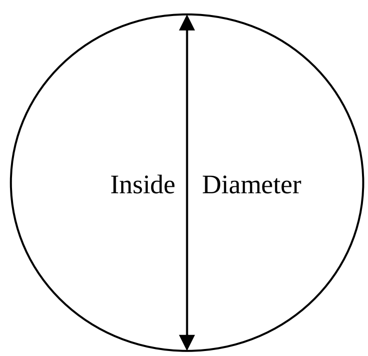
_____ **Open Channel Spillway**
_____ Trapezoidal
_____ Triangular
_____ Rectangular
_____ Irregular

_____ depth
_____ bottom (or average) width
_____ top width



_____ **Outlet**

_____ inside diameter



Material
_____ corrugated metal
_____ welded steel
_____ concrete
_____ plastic (hdpe, pvc, etc.)
_____ other (specify) ______________________

Is water flowing through the outlet? YES _______ NO _______

__X__ **No Outlet**

_____ **Other Type of Outlet** (specify) ________________________________

The Impoundment was designed By Illinois Power Company

Has there ever been a failure at this site? YES ___________ NO ____X_______

If So When? ______________________________

If So Please Describe : ____

Has there ever been significant seepages at this site? YES ________ NO __X____

If So When? ______________________________

IF So Please Describe: ____

Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site? YES ________NO __X_____

If so, which method (e.g., piezometers, gw pumping,...)? ______________________

If so Please Describe : ____

Coal Combustion Dam Inspection Checklist Form

US Environmental Protection Agency

Site Name:	Hennepin Power Station	Date:	5/23/11
Unit Name:	Active Ash Impoundment	Operator's Name:	Dynergy Midwest Generation, LLC
Unit I.D.:	IL50363	Hazard Potential Classification:	High Significant ✓ Low
Inspector's Name:	Patrick J. Harrison, P.E. and Doug P. Simon, P.E.		

Check the appropriate box below. Provide comments when appropriate. If not applicable or not available, record "N/A". Any unusual conditions or construction practices that should be noted in the comments section. For large diked embankments, separate checklists may be used for different embankment areas. If separate forms are used, identify approximate area that the form applies to in comments.

	Yes	No		Yes	No
1. Frequency of Company's Dam Inspections?	Quarterly		18. Sloughing or bulging on slopes?		✓
2. Pool elevation (operator records)? See Note Below	489.5		19. Major erosion or slope deterioration?		✓
3. Decant inlet elevation (operator records)?	489.5		20. Decant Pipes:		
4. Open channel spillway elevation (operator records)? See Note Below			Is water entering inlet, but not exiting outlet?		✓
5. Lowest dam crest elevation (operator records)?	494.0		Is water exiting outlet, but not entering inlet?		✓
6. If instrumentation is present, are readings recorded (operator records)?	✓		Is water exiting outlet flowing clear?	✓	
7. Is the embankment currently under construction?		✓	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation,stumps, topsoil in area where embankment fill will be placed)?	✓		From underdrain?		✓
9. Trees growing on embankment? (If so, indicate largest diameter below)	✓		At isolated points on embankment slopes?		✓
10. Cracks or scarps on crest?		✓	At natural hillside in the embankment area?		✓
11. Is there significant settlement along the crest?		✓	Over widespread areas?		✓
12. Are decant trashracks clear and in place?	✓		From downstream foundation area?		✓
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		✓	"Boils" beneath stream or ponded water?		✓
14. Clogged spillways, groin or diversion ditches?		✓	Around the outside of the decant pipe?		✓
15. Are spillway or ditch linings deteriorated?		✓	22. Surface movements in valley bottom or on hillside?		✓
16. Are outlets of decant or underdrains blocked?		✓	23. Water against downstream toe?	✓	
17. Cracks or scarps on slopes?		✓	24. Were Photos taken during the dam inspection?	✓	

Major adverse changes in these items could cause instability and should be reported for further evaluation. Adverse conditions noted in these items should normally be described (extent, location, volume, etc.) in the space below and on the back of this sheet.

Inspection Issue # Comments

2. There are three ponds that make up this impoundment. The elevation provided refers to that in the Primary pond which is also the highest elevation as referenced in the Operation and Maintenance Plan.

4. No open channel spillway was present.

8. Based on available soil borings.

9. Largest tree diameter noted was approximately 30 inches.

U. S. Environmental Protection Agency

Coal Combustion Waste (CCW)
Impoundment Inspection

Impoundment NPDES Permit # IL 0001554

INSPECTOR Patrick J. Harrison, P.E.
Doug P. Simon, P.E.

Date May 23, 2011

Impoundment Name Active Ash Impoundment
Impoundment Company Dynergy Midwest Generation, LLC
EPA Region Region V
State Agency (Field Office) Addresss Illinois Department of Natural Resources
Springfield, Illinois
Name of Impoundment Active Ash Impoundment
(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New X Update ______

	Yes	No
Is impoundment currently under construction?		X
Is water or ccw currently being pumped into the impoundment?	X	

IMPOUNDMENT FUNCTION: Settlement of CCW that is sluiced into the impoundment.

Nearest Downstream Town : Name Hennepin
Distance from the impoundment 4 miles
Impoundment
Location: Longitude 41 Degrees 18 Minutes 00 Seconds
Latitude 89 Degrees 18 Minutes 13 Seconds
State IL County Putnam County

Does a state agency regulate this impoundment? YES X NO ______

If So Which State Agency? The Illinois Department of Natural Resources regulates discharge of water through NPDES permit and a portion of the Impoundment as a regulated dam.

HAZARD POTENTIAL (In the event the impoundment should fail, the following would occur):

______ **LESS THAN LOW HAZARD POTENTIAL:** Failure or misoperation of the dam results in no probable loss of human life or economic or environmental losses.

______ **LOW HAZARD POTENTIAL:** Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

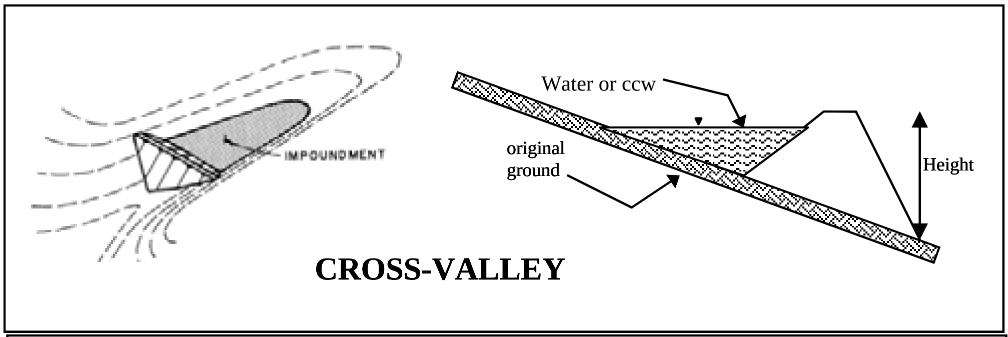
__X__ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

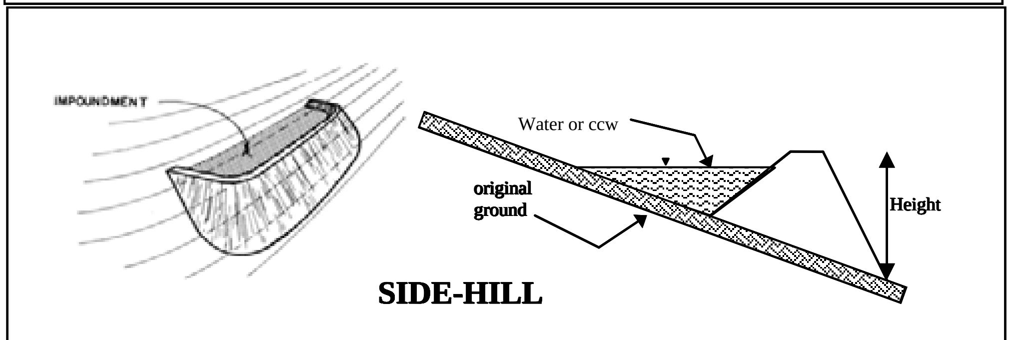
______ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

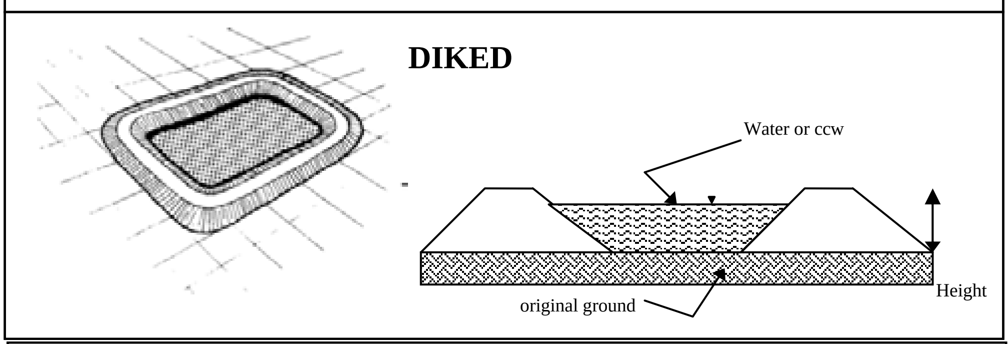
DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

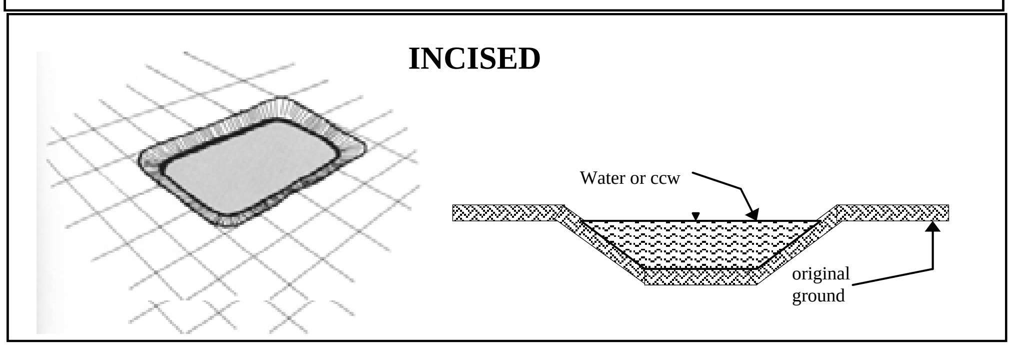
The Illinois River abuts the northern embankment of the Active Ash Impoundment. Potential failure of the northern impoundment embankment could result in significant environmental impacts to areas outside of Utility owned property.

CONFIGURATION:









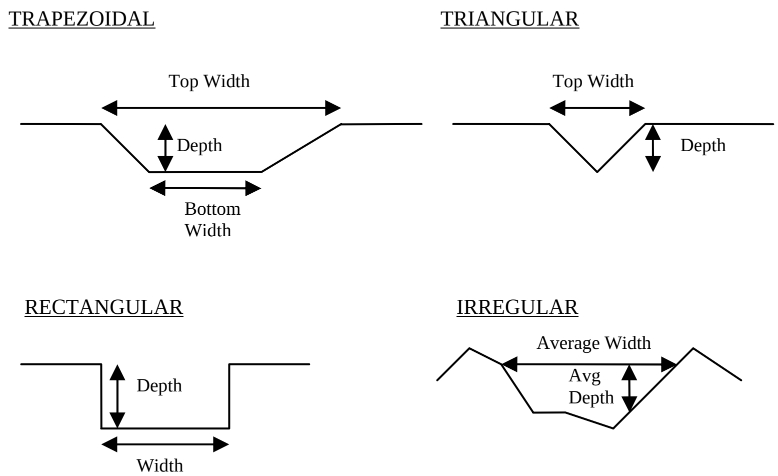
_____ Cross-Valley
_____ Side-Hill
_____ Diked
_____ Incised (form completion optional)
_X___ Combination Incised/Diked

Embankment Height ___52_____ feet Embankment Material_Compacted Native Fill
Pool Area _______30_______ acres Liner __Clay/HDPE________________
Current Freeboard ___3.5_____ feet Liner Permeability ________________

TYPE OF OUTLET (Mark all that apply)

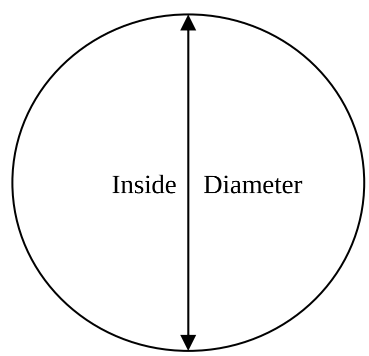
______ **Open Channel Spillway**
______ Trapezoidal
______ Triangular
______ Rectangular
______ Irregular

______ depth
______ bottom (or average) width
______ top width



__X__ **Outlet**

______ inside diameter
Varies: See Below.



Material
______ corrugated metal
______ welded steel
__X__ concrete
______ plastic (hdpe, pvc, etc.)
______ other (specify) ______________________

Is water flowing through the outlet? YES ________ NO __X____

______ **No Outlet**

There are three ponds that make up the active ash pond. The outlet diameters vary from approximately 12 inches to 30 inches.

______ **Other Type of Outlet** (specify) ____________________________________

The Impoundment was Designed By ____
____

Has there ever been a failure at this site? YES ___________ NO ___X_______

If So When? ____________________________

If So Please Describe : ____

Has there ever been significant seepages at this site? YES ________ NO __X____

If So When? ______________________________

IF So Please Describe: ____

Has there ever been any measures undertaken to monitor/lower
Phreatic water table levels based on past seepages or breaches
at this site? YES ________NO __X______

If so, which method (e.g., piezometers, gw pumping,...)? ____________________

If so Please Describe : ____

Coal Combustion Dam Inspection Checklist Form

US Environmental Protection Agency

Site Name:	Hennepin Power Station	Date:	5/23/11
Unit Name:	West Ash Impoundment	Operator's Name:	Dynergy Midwest Generation, LLC
Unit I.D.:	NPDES IL 0001554	Hazard Potential Classification:	High Significant ✓ Low
Inspector's Name:	Patrick J. Harrison, P.E. and Doug P. Simon, P.E.		

Check the appropriate box below. Provide comments when appropriate. If not applicable or not available, record "N/A". Any unusual conditions or construction practices that should be noted in the comments section. For large diked embankments, separate checklists may be used for different embankment areas. If separate forms are used, identify approximate area that the form applies to in comments.

	Yes	No		Yes	No
1. Frequency of Company's Dam Inspections?	Quarterly		18. Sloughing or bulging on slopes?		✓
2. Pool elevation (operator records)?	455.6		19. Major erosion or slope deterioration?		✓
3. Decant inlet elevation (operator records)?	455.6		20. Decant Pipes:		
4. Open channel spillway elevation (operator records)? See Note Below			Is water entering inlet, but not exiting outlet?		✓
5. Lowest dam crest elevation (operator records)?	460.0		Is water exiting outlet, but not entering inlet?		✓
6. If instrumentation is present, are readings recorded (operator records)?	✓		Is water exiting outlet flowing clear? See Note Below		
7. Is the embankment currently under construction?		✓	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation,stumps, topsoil in area where embankment fill will be placed)?	✓		From underdrain?		✓
9. Trees growing on embankment? (If so, indicate largest diameter below)	✓		At isolated points on embankment slopes?		✓
10. Cracks or scarps on crest?		✓	At natural hillside in the embankment area?		✓
11. Is there significant settlement along the crest?		✓	Over widespread areas?		✓
12. Are decant trashracks clear and in place?		✓	From downstream foundation area?		✓
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		✓	"Boils" beneath stream or ponded water?		✓
14. Clogged spillways, groin or diversion ditches?		✓	Around the outside of the decant pipe?		✓
15. Are spillway or ditch linings deteriorated?		✓	22. Surface movements in valley bottom or on hillside?		✓
16. Are outlets of decant or underdrains blocked?		✓	23. Water against downstream toe?	✓	
17. Cracks or scarps on slopes?		✓	24. Were Photos taken during the dam inspection?	✓	

Major adverse changes in these items could cause instability and should be reported for further evaluation. Adverse conditions noted in these items should normally be described (extent, location, volume, etc.) in the space below and on the back of this sheet.

Inspection Issue #	Comments

4. No open channel spillway was present.

8. Based on boring logs and observations.

9. Largest tree diameter noted was approximately 30 inches.

20(c). No water was entering or exiting the impoundment.

U. S. Environmental Protection Agency

Coal Combustion Waste (CCW)
Impoundment Inspection

Impoundment NPDES Permit # IL 0001554
Date May 23, 2011

INSPECTOR Patrick J. Harrison, P.E.
Doug P. Simon, P.E.

Impoundment Name West Ash Impoundment
Impoundment Company Dynergy Midwest Generation, LLC
EPA Region Region V
State Agency (Field Office) Addresss Illinois Department of Natural Resources
Springfield, Illinois
Name of Impoundment West Ash Impoundment
(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New X Update ______

	Yes	No
Is impoundment currently under construction?		X
Is water or ccw currently being pumped into the impoundment?		X

IMPOUNDMENT FUNCTION: This impoundment has been inactive since 1995 and stores CCW from plant operations prior to 1995.

Nearest Downstream Town : Name Hennepin, Illinois
Distance from the impoundment 4 miles
Impoundment
Location: Longitude 89 Degrees 19 Minutes 28 Seconds
Latitude 41 Degrees 18 Minutes 00 Seconds
State IL County Putnam

Does a state agency regulate this impoundment? YES X NO ______

If So Which State Agency? The Illinois Environmental Protection Agency regulates discharge from the impoundment through the NPDES permit.

HAZARD POTENTIAL (In the event the impoundment should fail, the following would occur):

______ **LESS THAN LOW HAZARD POTENTIAL:** Failure or misoperation of the dam results in no probable loss of human life or economic or environmental losses.

______ **LOW HAZARD POTENTIAL:** Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

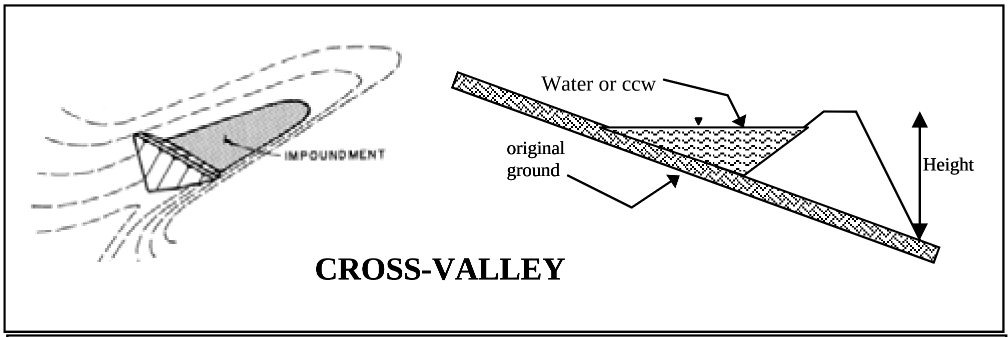
_x____ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

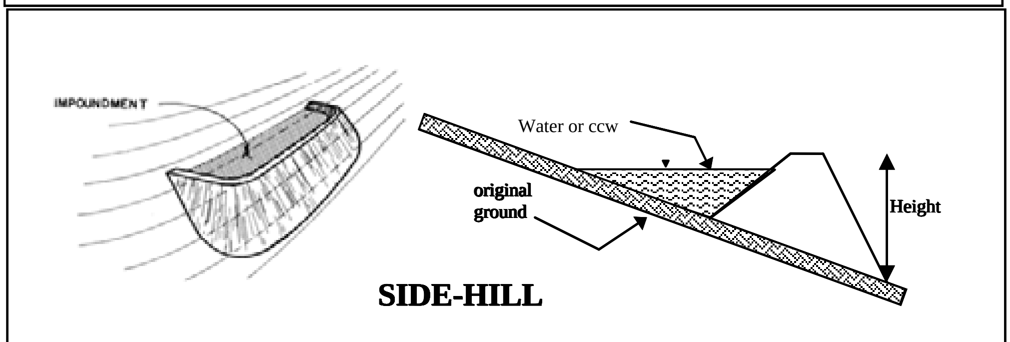
______ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

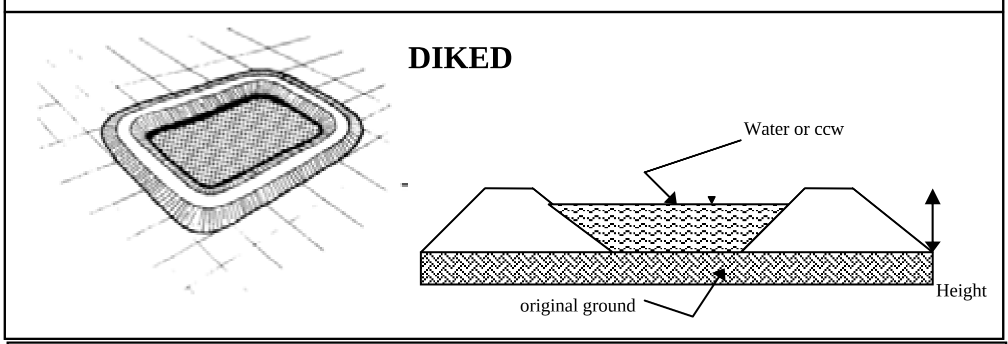
DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

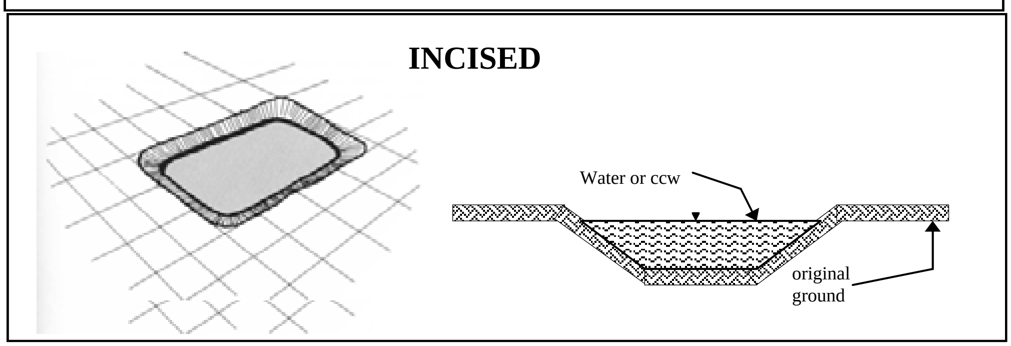
The Illinois River abuts the northern embankment of the West Ash Impoundment. Potential failure of the northern impoundment embankment could result in significant environmental impacts to areas outside of Utility owned property.

CONFIGURATION:









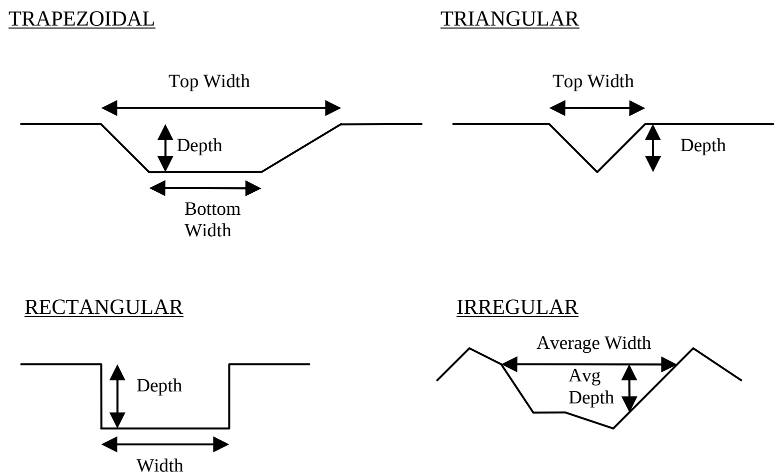
______ Cross-Valley
______ Side-Hill
_X___ Diked
______ Incised (form completion optional)
______ Combination Incised/Diked

Embankment Height 18 feet   Embankment Material Compacted Native Fill
Pool Area 2 acres   Liner None Present
Current Freeboard 4.4 feet   Liner Permeability Unknown

TYPE OF OUTLET (Mark all that apply)

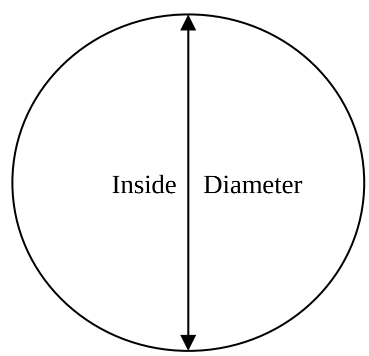
_____ **Open Channel Spillway**
_____ Trapezoidal
_____ Triangular
_____ Rectangular
_____ Irregular

_____ depth
_____ bottom (or average) width
_____ top width



__X__ **Outlet**

12 in. inside diameter



Material
_____ corrugated metal
__X__ welded steel
_____ concrete
_____ plastic (hdpe, pvc, etc.)
_____ other (specify) ______________________

Is water flowing through the outlet? YES ________ NO __X__

_____ **No Outlet**

_____ **Other Type of Outlet** (specify) ____________________________________

The Impoundment was designed By Sargent & Lundy
____

Has there ever been a failure at this site? YES ___________ NO ___X_______

If So When? ______________________________

If So Please Describe : ____

Has there ever been significant seepages at this site? YES ________ NO __X____

If So When? ______________________________

IF So Please Describe: ____

Has there ever been any measures undertaken to monitor/lower
Phreatic water table levels based on past seepages or breaches
at this site? YES ________NO __X______

If so, which method (e.g., piezometers, gw pumping,...)? ______________________

If so Please Describe : ____

APPENDIX D

PREVIOUS INSPECTION REPORTS

Dynegy Midwest Generation, Inc.
2828 North Monroe Street
Decatur, Illinois 62526-3269

December 31, 2001

Mr. Dennis L. Kennedy, P.E.
Senior Water Resources Engineer
Illinois Department of Natural Resources
Office of Water Resources
524 South Second Street
Springfield, IL 62701-1787

DYNEGY

Dear Mr. Kennedy:

Hennepin Power Station; East Ash Pond
Dam Safety Permit No. 21922
Dam I.D. No. IL50363

<u>2001 Five-Year Inspection Report</u>

Enclosed is a signed copy of the 2001 inspection report for the Hennepin Power Station's east ash pond dam. Mr. Jeffrey Lamb, professional civil engineer with Dynegy-Illinois Power's Engineering and Technical Services Department, conducted the professional engineer inspection on November 27, 2001. This inspection is required by Section 702.40(b)(5) of the Rules for the Construction and Maintenance of Dams and the conditions of IDNR Permit No. 21922.

The inspection report shows that the overall condition of the facility is good. The only minor maintenance that needs to be conducted is the continued removal of sapling trees on the embankments. This will be conducted as a part of routine maintenance during next year. Sapling tree removal was also conducted as a part of routine maintenance during the previous five years as recommended in the 1996 inspection report.

An Owner's Maintenance Statement, signed by Mr. James G. Dodson, Plant Manager, Hennepin Power Station, is also included.

If you have any questions regarding this report, please contact me at 217/872-2359.

Sincerely,
Dynegy Midwest Generation

Thomas L. Davis

Thomas L. Davis, P.E.
Senior Environmental Professional

bc: J.G.Dodson, w/att., S-10
J.P.Augspols w/att., S-10
B.J. Marshall/T.E. Tuttle/File: Hennepin PS Dam Inspection Reports, w/att., A-05

Illinois Power Company
500 South 27th Street
Decatur, Il 62521-2200

ILLINOIS POWER
Part of the DYNEGY Performance Team

November 30, 2001

Mr. B. J. Marshall
Dynegy Midwest Generation
2828 N. Monroe St.
Decatur, IL 62526

RE: Hennepin Power Station
Hennepin Ash Surface Impoundment
2001 Dam Inspection

Dear Brett:

Enclosed is the dam inspection report for the Hennepin Ash Improvement. The inspection was performed on Wednesday, November 27, 2001. John Augspol from the plant accompanied me on the inspection.

The following items need attention (Condition Code IM or MM).

Item	Issue	Remediation
Embankment	Scattered trees/saplings on or near the clay liner around perimeter of primary & final ponds	Spray to kill, cut down later

Please forward the inspection form to the plant for execution of the Owner's Maintenance Statement by the Plant Manager.

If you have any questions, please call me.

Sincerely,

J. R. Lamb, P.E.
Manager Civil Engineering

Enclosure

Cc: J. G. Dodson w/o attachments S-10
J. P. Augspol w/attachments S-10
CS 491417

Dam Inspection Report

Name of Dam Hennepin Ash Surface Impoundment Dam ID No. IL 50363

Permit Number 21922 Class of Dam III

Location NE 1/4 Section 26 Township 33 N Range 2W of 3rd PM

Owner Dynegy Midwest Generation (Name) 815-339-9210 (Telephone Number (Day))

RR#1 Box 200 AA (Street) 815-339-9215 (Telephone Number (Night))

Hennepin (City) 61327-9737 (Zip Code) County Putnam

Type of Dam Homogeneous Earthen Dam @ 4' Clay liner on upstream face

Type of Spillway Drop Structure @ Stop logs

Date(s) Inspected November 28, 2001

Weather When Inspected Overcast @ mild wind

Temperature When Inspected 39° F

Pool Elevation When Inspected Primary 481.51 Final 479.59

Tailwater Elevation When Inspected NA

Inspection Personnel:

Name	Title
Jeffry E Lamb	Manager Civil Engineering
John P. Augspol	Chemist

JEFFRY E. LAMB
37890
REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS

Jeffry E Lamb 11/28/01

Professional Engineer's Seal

The Department of Nautural Resources is requesting information that is necessary to accomplish the statutory purpose as outlined under the River, Lakes and Streams Act, 615 ILCS 5. Submittal of this information is REQUIRED. Failure to provide the required information could result in the initiation of non-compliance procedures as outlined in Section 3702.160 of the "Rules for Construction and Maintenance of Dams".

EARTH EMBANKMENT

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Surface Cracks	GC	NE	
Vertical and Horizontal Alignment of Crest	GC	NE	
Unusual Movement or Cracking At or Beyond Toe	GC	NE	
Sloughing or Erosion of Embankment and Abutment Slopes	GC	OB	Small erosion rills @ SEc of primary pond upstream & @ SWc of final pond upstreamface
Upstream Face Slope Protection	GC	NE	
Seepage	GC	NE	
Filter and Filter Drains	NA		

EARTH EMBANKMENT
(Continued)

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Animal Damage	GC	NE	
Embankment Drainage Ditches	GC	NE	
Vegetative Cover	GC	MM	Scattered small trees + saplings on liner - Spray to kill and remove after dead.
Other (Name)			
Other			
Other			
Other			

CONCRETE OR MASONRY DAMS

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Seepage			
Structure to Abutment/ Embankment Junctions			
Water Passages			
Foundation		NA	
Surface Cracks in Concrete Surfaces			
Structural Cracking			
Vertical and Horizontal Alignment			

CONCRETE OR MASONRY DAMS
(CONTINUED)

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Monolith Joints			
Contruction Joints			
Spalling of Concrete			NA
Filters, Drains, etc.			
Riprap			
Other (Name)			

IF THE DAM IS GATED - Fill out the portion of the Principal Spillway Form related to Gated Spillways

PRINCIPAL SPILLWAY
APPROACH CHANNEL

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Debris			
Side Slope Stability			
Slope Protection			
Other (Name)		NA	
Other			
Other			
Other			

PRINCIPAL SPILLWAY

☒ Drop Inlet Spillway ☐ Overflow Spillway Structure ☐ Gated

Ponds 1+2

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	GC	OB	Beam Seats for walkway at drop structures have spalled or cracked surface concrete. Observe for any further spalling/cracking of concrete support.
Structure to Embankment Junction	NI underwater	NE	
Drains		NA	
Seepage Around or Into Structure			
Surface Cracks	GC	NE	
Structural Cracks	GC	NE	

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY
(Continued)

☐ Drop Inlet Spillway ☐ Overflow Spillway Structure ☐ Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Alignment of Abutment Walls	GC	NE	
Construction Joints	GC	NE	
Filter and Filter Drains			
Trash Racks	NA		
Bridge and Piers	GC	OB	Surface rust beginning to appear on beams & bolts.
Differential Settlement	GC	NE	
Other (Name)			

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY
(Continued)

☒ Conduit ☐ Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	GC	NE	
Joint Separation	NI buried + underwater	NE	
Seepage Around of Into Conduit	NI buried + underwater	NE	
Surface Cracks	NI buried + underwater	NE	
Structural Cracks	NI buried + underwater	NE	
Trash Racks	NA		
Differential Settlement	GC	NE	
Alignment	GC	NE	
Other (Name)			

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY
(Continued)

☐ Chute

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation			
Structure to Embankment Junction			
Construction Joints			
Expansion and Contraction Joints			NA
Differential Settlement			
Surface Cracks			
Structural Cracks			
Wall Alignment			
Other (Name)			

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY

[X] Principal Spillway Ponds 1+2 Stop Logs   [ ] Dewatering   [ ] Other:

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Gate Sill	NI underwater	NE	
Gate Seals	NI underwater	NE	
Gate and Frame	GC	NE	
Operating Machinery	NA		
Emergency Operating Machinery	NA		
Other (Name)			
Other			

-46-

OUTLET WORKS
IF SEPARATE FROM PRINCIPAL SPILLWAY STRUCTURE

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation			
Joint Separation			
Seepage Around or Into Conduit			
Intake Structure			NA
Outlet Structure			
Outlet Channel			
Riprap			
Other (Name)			
Other			

ENERGY DISSIPATOR

☐ Principal Spillway Type: 36" Φ RCC Pipe Discharges into a ripraped basin. ☐ Outlet Works

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NA		
Structure to Embankment Junction	GC	NE	
Construction Joints	NA		
Surface Cracks	NA		
Structural Cracks	NA		
Differential Alignment	NA		
Expansion and Contraction Joints	NA		

ENERGY DISSIPATOR
(Continued)

☐ Principal Spillway ☐ Outlet Works

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Riprap	GC	NE	
Outlet Channel	NA		
Debris	NA		
Other (Name)			
Other			
Other			
Other			

EMERGENCY SPILLWAY

☐ Earth Other:Name ______________________

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion			
Weeds, Logs, Other Obstructions			
Side Slope Sloughing			
Vegetation		NA	
Sedimentation			
Riprap			
Settlement of Crest			
Downstream Channel			
Other (Name)			

-50-

SUMMARY OF MAINTENANCE DONE AND/OR

REPAIRS MADE SINCE THE LAST INSPECTION

DATE OF PRESENT INSPECTION November 28, 2001

DATE OF LAST INSPECTION November 12, 1996

1. EARTH EMBANKMENT DAMS

Repaired gate latch on primary pond outlet structured noted in last inspection.

2. CONCRETE MASONRY DAMS

3. PRINCIPAL SPILLWAY

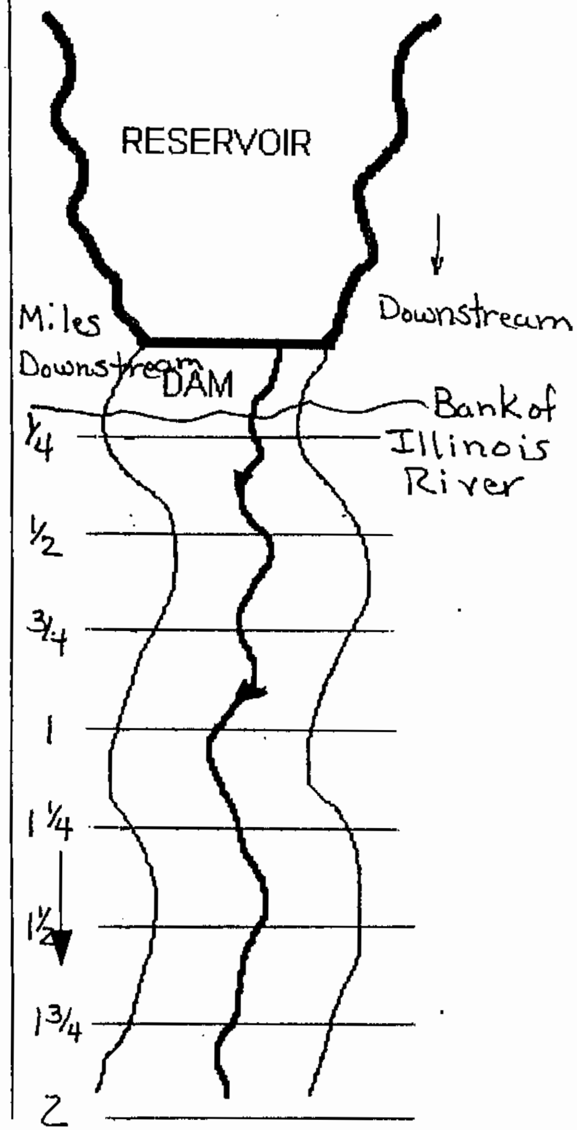
4. OUTLET WORKS

5. EMERGENCY SPILLWAY

DOWNSTREAM DEVELOPMENT
APPROXIMATE WIDTH OF AFFECTED FLOODPLAIN < 1/4 MILES

MILES DOWNSTREAM FROM DAM	DOWNSTREAM DEVELOPMENT												Loss of Life Potential			Economic Loss Potential		
	OCCUPIED HOMES	UNOCCUPIED HOMES	AGRICULTURAL BUILDINGS	INDUSTRIAL BUILDINGS	COMMERCIAL BUILDINGS	SCHOOLS	HOSPITALS	ROADS & BRIDGES	DAMS	OVERHEAD UTILITIES	OTHER DEVELOPMENT (Name)	OTHER DEVELOPMENT (Name)	NONE	1 TO 10	OVER 10	MINIMAL EXPECTED	APPRECIABLE EXPECTED	EXCESSIVE EXPECTED
0 to 1/4													X			X		
1/4 to 1/2																		
1/2 to 3/4																		
3/4 to 1																		
1 to 1-1/4					NA													
1-1/4 to 1-1/2																		
1-1/2 to 1-3/4																		
1-3/4 to 2																		
OVER 2																		

SKETCH IN DEVELOPMENTS DOWNSTREAM OF THE DAM



The number of homes, buildings, or other items in the floodplain downstream of the dam should be placed in the appropriate row and column to designate their location.

Owner's Maintenance Statement

I, ____________________, owner of Hennepin Ash Impoundment dam,

Dam Identification Number IL 50363, in Putnam County,

am maintaining the dam in accordance with the accepted maintenance plan which is part of

Permit Number 21922.

James G Dodson
Signature

12/27/01
Date

Owner's Operation and Maintenance Plan Statement

I, ____________________, owner of Hennepin Ash Impoundment dam,

Dam Identification Number IL 50363, in Putnam County,

have reviewed the operation and maintenance plan including the Emergency Action Plan (EAP),

which is part of, Permit Number 21922.

I ( ) have enclosed the appropriate revisions or

(✓) have determined that no revisions to the plan are necessary.

James G Dodson
Signature

12/27/01
Date

The Department of Nautural Resources is requesting information that is necessary to accomplish the statutory purpose as outlined under the River, Lakes and Streams Act, 615 ILCS 5. Submittal of this information is REQUIRED. Failure to provide the required information could result in the initiation of non-compliance procedures as outlined in Section 3702.160 of the "Rules for Construction and Maintenance of Dams".

Dynegy Midwest Generation, Inc
2828 North Monroe Street
Decatur, IL 62526 3269
Phone 217.876.3900 fax 217.876.7475
www.dynegy.com

DYNEGY

December 11, 2006

Mr. Mike Diedrichsen, Acting Manager
Downstate Regulatory Programs
Division of Water Resources Management
Office of Water Resources
Illinois Department of Natural Resources
One Natural Resources Way
Springfield, IL 62702-1271

Dear Mr. Diedrichsen:

Hennepin Power Station; East Ash Pond
Dam Safety Permit No. DS2004119
Dam I.D. No. IL50363

2006 Five-Year Inspection Report

Enclosed is a signed copy of the 2006 inspection report for the Hennepin Power Station's east ash pond dam. Mr. Joseph P. Kimlinger, and Illinois-registered professional civil engineer (no. 062-049181) with Dynegy Midwest Generation's Construction and Maintenance Department, conducted the professional engineer inspection of the embankments and outlet structures on November 20, 2006. This inspection is required by Section 3702.40(b)(5) of the Rules for the Construction and Maintenance of Dams and the conditions of IDNR Permit No. DS2004119.

The inspection report shows that the overall condition of the east ash pond system is good. The only minor maintenance that needs to be conducted is the continued removal of sapling trees on the embankments. This will be conducted as a part of routine maintenance during 2007. Sapling tree removal was also conducted as a part of the routine maintenance performed during the previous five years as recommended in the 2001 inspection report. Some spalling of concrete and rusting of steel walkway beams was also noted.

An Owner's Maintenance Statement, signed by Mr. James G. Dodson, Plant Manager, Hennepin Power Station, is also included.

If you have any questions regarding this report, please contact me at 217/872-2354 or Tom Davis at 217-872-2315.

Sincerely,
Dynegy Midwest Generation, Inc.

Rick D. Diericx
Sr. Director – Operations Environmental Compliance
Environmental Health and Safety

Dam Inspection Report

Name of Dam: Hennepin PS, Ash Surface Impoundment Dam ID No. IL 50363

Permit Number: DS2004119 Class of Dam: III

Location: NE 1/4 Section: 26 Township: 33N Range: 2W of 3rd PM

Owner: Dynegy Midwest Generation (Name) 815-339-9210 (Telephone Number (Day))

RR1, Box 200 AA (Street) 815-339-9215 (Telephone Number (Night))

Hennepin, IL (City) 61327 (Zip Code) County: Putnam

Type of Dam: Homogeneous Earthen Dam with clay and geosynthetic/clay liner

Type of Spillway: Drop structure and stop logs

Date(s) Inspected: November 20, 2006

Weather When Inspected: Sunny and Breezy

Temperature When Inspected: 36 deg. F

Pool Elevation When Inspected: Primary 481.5; Secondary 479.6

Tailwater Elevation When Inspected: NA

Inspection Personnel:

Name	Title
Joseph P. Kimlinger P.E.	Construction Manager
John Augspols	Sr. Env & Chem. Engineer

JOSEPH P. KIMLINGER
062-049161
REGISTERED
PROFESSIONAL
ENGINEER
STATE OF ILLINOIS

12/7/06
LIC EXPIRES 11/30/07

Professional Engineer's Seal

The Department of Natural Resources is requesting information that is necessary to accomplish the statutory purpose as outlined under the Rivers, Lakes and Streams Act, 615 ILCS 5. Submittal of this information is REQUIRED. Failure to provide the required information could result in the initiation of non-compliance procedures as outlined in Section 3702.160 of the "Rules for Construction and Maintenance of Dams".

CONDITION CODES

NE - No evidence of a problem

GC - Good condition

MM - Item needing minor maintenance and/or repairs within the year, the safety or integrity of the item is not yet imperiled

IM - Item needing immediate maintenance to restore or ensure its safety or integrity

EC - Emergency condition which if not immediately repaired or other appropriate measures taken could lead to failure of the dam

OB - Condition requires regular observation to ensure that the condition does not become worse

NA - Not applicable to this dam

NI - Not inspected - list the reason for non-inspection under deficiencies

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All Condition Codes will be listed with the following abbreviations:

P = Primary Cell
S = Secondary (polishing) Cell

EARTH EMBANKMENT

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Surface Cracks	NE	NA	
Vertical and Horizontal Alignment of Crest	GC	NA	
Unusual Movement or Cracking At or Beyond Toe	NE	NA	
Sloughing or Erosion of Embankment and Abutment Slopes	GC	NA	
Upstream Face Slope Protection	GC	NA	
Seepage	NE	NA	
Filter and Filter Drains	NA		

EARTH EMBANKMENT
(Continued)

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Animal Damage	NE	NA	
Embankment Drainage Ditches	GC	NA	
Vegetative Cover	OB	Some small trees and saplings near the embankment	Observe the small trees and saplings and spray to kill or remove as time allows. No issue at this time.
Other (Name)	NA		
Other	NA		
Other	NA		
Other	NA		

CONCRETE OR MASONRY DAMS

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Seepage	NA		
Structure to Abutment/ Embankment Junctions	NA		
Water Passages	NA		
Foundation	NA		
Surface Cracks in Concrete Surfaces	NA		
Structural Cracking	NA		
Vertical and Horizontal Alignment	NA		

CONCRETE OR MASONRY DAMS
(CONTINUED)

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Monolith Joints	NA		
Contruction Joints	NA		
Spalling of Concrete	NA		
Filters, Drains, etc.	NA		
Riprap	NA		
Other (Name)	NA		

IF THE DAM IS GATED - Fill out the portion of the Principal Spillway Form related to Gated Spillways

PRINCIPAL SPILLWAY
APPROACH CHANNEL

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Debris	NA		
Side Slope Stability	NA		
Slope Protection	NA		
Other (Name)	NA		
Other	NA		
Other	NA		
Other	NA		

PRINCIPAL SPILLWAY

[X] Drop Inlet Spillway [ ] Overflow Spillway Structure [ ] Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	OB	Some spalling of concrete near walkway beam supports.	Observe the concrete condition in the outfall structures, primarily near the beam seats. Contact a certified engineer if condition worsens.
Structure to Embankment Junction	NI	Underwater	
Drains	NA		
Seepage Around or Into Structure	NI	Underwater	
Surface Cracks	NE	NA	
Structural Cracks	NE	NA	

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY
(Continued)

[X] Drop Inlet Spillway   [ ] Overflow Spillway Structure   [ ] Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Alignment of Abutment Walls	NA	NA	
Construction Joints	GC	NA	
Filter and Filter Drains	NA		
Trash Racks	NA		
Bridge and Piers	OB	Rust forming on bridge beams and connections.	Observe and contact a certified engineer if condition worsens.
Differential Settlement	NE	NA	
Other (Name)	NA		

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY
(Continued)

[X] Conduit [ ] Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NE	NA	
Joint Separation	NE	NA	
Seepage Around of Into Conduit	NI	Underwater	
Surface Cracks	NI	Underwater	
Structural Cracks	NI	Underwater	
Trash Racks	NA		
Differential Settlement	NE	NA	
Alignment	GC	NA	
Other (Name)	NA		

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY
(Continued)

☐ Chute

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NA		
Structure to Embankment Junction	NA		
Construction Joints	NA		
Expansion and Contraction Joints	NA		
Differential Settlement	NA		
Surface Cracks	NA		
Structural Cracks	NA		
Wall Alignment	NA		
Other (Name)	NA		

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY

[X] Principal Spillway [ ] Dewatering [ ] Other:

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Gate Sill	NI	Underwater	The sill and seals are located under stop logs and could not be inspected.
Gate Seals	NI	Underwater	
Gate and Frame	GC	NE	Stop logs and guides were in good condition.
Operating Machinery	NA		
Emergency Operating Machinery	NA		
Other (Name)	NA		
Other	NA		

OUTLET WORKS
IF SEPARATE FROM PRINCIPAL SPILLWAY STRUCTURE

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NA		
Joint Separation	NA		
Seepage Around or Into Conduit	NA		
Intake Structure	NA		
Outlet Structure	NA		
Outlet Channel	NA		
Riprap	NA		
Other (Name)	NA		
Other	NA		

ENERGY DISSIPATOR

☐ Principal Spillway ☒ Outlet Works
Type:

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NE	NA	
Structure to Embankment Junction	GC	NA	
Construction Joints	GC	NA	
Surface Cracks	NE	NA	
Structural Cracks	NE	NA	
Differential Alignment	NE	NA	
Expansion and Contraction Joints	NA		

ENERGY DISSIPATOR
(Continued)

☐ Principal Spillway ☒ Outlet Works

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Riprap	GC	NA	
Outlet Channel	GC	NA	
Debris	NE	NA	
Other (Name)	NA		
Other	NA		
Other	NA		
Other	NA		

EMERGENCY SPILLWAY

☐ Earth

Other:Name ____________________

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion	NA		
Weeds, Logs, Other Obstructions	NA		
Side Slope Sloughing	NA		
Vegetation	NA		
Sedimentation	NA		
Riprap	NA		
Settlement of Crest	NA		
Downstream Channel	NA		
Other (Name)	NA		

SUMMARY OF MAINTENANCE DONE AND/OR

REPAIRS MADE SINCE THE LAST INSPECTION

DATE OF PRESENT INSPECTION ____ November 20, 2006 ____

DATE OF LAST INSPECTION ____ November 28, 2001 ____

1. EARTH EMBANKMENT DAMS

The pond level was raised in 2004 with the extension of the liner. The liner extension consisted of one foot of clay overlain with a polypropylene liner.
Minor erosion repairs, mowing and general maintenance have been performed during the last five years.

2. CONCRETE MASONRY DAMS

NA

3. PRINCIPAL SPILLWAY

NA

4. OUTLET WORKS

NA

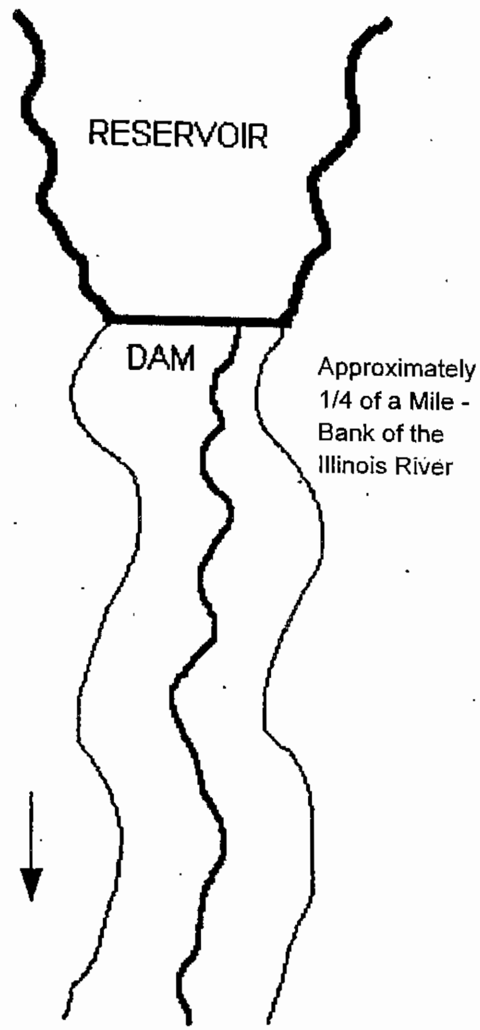
5. EMERGENCY SPILLWAY

NA

DOWNSTREAM DEVELOPMENT
APPROXIMATE WIDTH OF AFFECTED FLOODPLAIN 0.25 MILES

MILES DOWNSTREAM FROM DAM	DOWNSTREAM DEVELOPMENT												Loss of Life Potential			Economic Loss Potential		
	OCCUPIED HOMES	UNOCCUPIED HOMES	AGRICULTURAL BUILDINGS	INDUSTRIAL BUILDINGS	COMMERCIAL BUILDINGS	SCHOOLS	HOSPITALS	ROADS & BRIDGES	DAMS	OVERHEAD UTILITIES	OTHER DEVELOPMENT (Name)	OTHER DEVELOPMENT (Name)	NONE	1 TO 10	OVER 10	MINIMAL EXPECTED	APPRECIABLE EXPECTED	EXCESSIVE EXPECTED
0 to 1/4	0	0	0	0	0	0	0	0	0	0	0	0	X			X		
1/4 to 1/2																		
1/2 to 3/4																		
3/4 to 1																		
1 to 1-1/4																		
1-1/4 to 1-1/2																		
1-1/2 to 1-3/4																		
1-3/4 to 2																		
OVER 2																		

SKETCH IN DEVELOPMENTS DOWNSTREAM OF THE DAM



The number of homes, buildings, or other items in the floodplain downstream of the dam should be placed in the appropriate row and column to designate their location.

Owner's Maintenance Statement

I, James G. Dodson, owner of Hennepin PS Ash Surface Impoundment dam,

Dam Identification Number IL 50363, in Putnam County,

am maintaining the dam in accordance with the accepted maintenance plan which is part of

Permit Number DS2004119.

James G Dodson

Signature

Dec. 7, 2006

Date

Owner's Operation and Maintenance Plan Statement

I, James G. Dodson, owner of Hennepin PS Ash Surface Impoundment dam,

Dam Identification Number IL 50363, in Putnam County,

have reviewed the operation and maintenance plan including the Emergency Action Plan (EAP),

which is part of, Permit Number DS2004119.

I ☐ have enclosed the appropriate revisions or,

☒ have determined that no revisions to the plan are necessary.

James G Dodson

Signature

Dec. 7, 2006

Date

The Department of Natural Resources is requesting information that is necessary to accomplish the statutory purpose as outlined under the Rivers, Lakes and Streams Act, 615 ILCS 5. Submittal of this information is REQUIRED. Failure to provide the required information could result in the initiation of non-compliance procedures as outlined in Section 3702.160 of the "Rules for Construction and Maintenance of Dams".

Close Window

Tracking Detail

Your package has been delivered.

Tracking Number:	1Z V9W 975 03 4525 747 6
Type:	Package
Status:	**Delivered**
Delivered on:	12/13/2006 9:51 A.M.
Signed by:	PATTERSON
Location:	MAIL ROOM
Delivered to:	US
Shipped or Billed on:	12/12/2006
Service Type:	GROUND
Weight:	1.00 Lb

Package Progress

Location	**Date**	**Local Time**	**Description**
SPRINGFIELD, IL, US	12/13/2006	9:51 A.M.	DELIVERY
	12/13/2006	5:01 A.M.	OUT FOR DELIVERY
	12/13/2006	4:05 A.M.	ARRIVAL SCAN
DECATUR, IL, US	12/13/2006	1:26 A.M.	DEPARTURE SCAN
DECATUR, IL, US	12/12/2006	10:08 P.M.	ARRIVAL SCAN
	12/12/2006	8:30 P.M.	DEPARTURE SCAN
	12/12/2006	6:58 P.M.	ORIGIN SCAN
US	12/12/2006	2:52 P.M.	BILLING INFORMATION RECEIVED

Tracking results provided by UPS: 12/13/2006 3:26 P.M. EST (USA)

NOTICE: UPS authorizes you to use UPS tracking systems solely to track shipments tendered by or for you to UPS for delivery and for no other purpose. Any other use of UPS tracking systems and information is strictly prohibited.

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Dynegy Midwest Generation
DAILY SHIPMENT DETAIL REPORT
12/12/06 01:52 PM

Pickup Date: 12/12/06
Pickup Record No.: 2819375 39 2

UPS Account No.: V9W975
Sorted By:Order of Shipment

Name/Address	Shipment Detail		Options	Reference Rate Charges
Ship To: James Eiseman Bluegrass Generation 3095 Commerce Parkway LA GRANGE KY 40031-8799	Service Type: Total Packages: Hundredweight: Billable Wt.: Billing Option:	UPS NEXT DAY AIR 1 No LTR Prepaid	Shipment Service Charge:	$ 17.28
	Tracking No.: Package Type:	1ZV9W9750145360045 UPS Letter	Package Service Charge: **Shipper Amt:** **UPS Total Charge*:**	$ 17.28 $ 17.28 $ 17.28
Ship To: Deirdre K. Hirner IL Environmental Regulatory Group 3150 Roland Ave. SPRINGFIELD IL 62703	Service Type: Total Packages: Hundredweight: Billable Wt.: Billing Option:	UPS GROUND 1 No 1.0 Prepaid	Shipment Service Charge:	$ 3.93
	Tracking No.: Package Type: Weight:	1ZV9W9750343581655 Package 1.0	Package Service Charge: **Shipper Amt:** **UPS Total Charge*:**	$ 3.93 $ 3.93 $ 3.93
Ship To: Julie Armitage IL Environmental Protection Agency Bureau of Air 1021 North Grand Ave., East SPRINGFIELD IL 62794-9276	Service Type: Total Packages: Hundredweight: Billable Wt.: Billing Option:	UPS GROUND 1 No 1.0 Prepaid	Shipment Service Charge:	$ 3.93
	Tracking No.: Package Type: Weight:	1ZV9W9750344879467 Package 1.0	Package Service Charge: **Shipper Amt:** **UPS Total Charge*:**	$ 3.93 $ 3.93 $ 3.93
Ship To: Mr. Mike Diedrichsen Illinois Dept. of Natural Resources Office of Water Resources Division of Water Resources Mgtmnt One Natural Resources Way SPRINGFIELD IL 62702-1270	Service Type: Total Packages: Hundredweight: Billable Wt.: Billing Option:	UPS GROUND 1 No 1.0 Prepaid	Shipment Service Charge:	$ 3.93
	Tracking No.: Package Type: Weight:	1ZV9W9750345257476 Package 1.0	Package Service Charge: **Shipper Amt:** **UPS Total Charge*:**	$ 3.93 $ 3.93 $ 3.93
Ship To: Fiscal Svcs Section, Receipts #2 IL Environmental Protection Agency 1021 North Grand Ave., East SPRINGFIELD IL 62794-9276	Service Type: Total Packages: Hundredweight: Billable Wt.: Billing Option:	UPS GROUND 1 No 1.0 Prepaid	Shipment Service Charge:	$ 3.93
	Tracking No.: Package Type: Weight:	1ZV9W975034530[illegible]80 Package 1.0	Package Service Charge: **Shipper Amt:** **UPS Total Charge*:**	$ 3.93 $ 3.93 $ 3.93
Ship To: Dynegy Midwest Generation 22228 Network Place CHICAGO IL 60673-1222	Service Type: Total Packages: Hundredweight: Billable Wt.: Billing Option:	UPS GROUND 1 No 1.0 Prepaid	Shipment Service Charge:	$ 4.02
	Tracking No.: Package Type: Weight:	1ZV9W9750345270095 Package 1.0	Package Service Charge: **Shipper Amt:** **UPS Total Charge*:**	$ 4.02 $ 4.02 $ 4.02

UPS WorldShip® 8.0.16 winspool 1280

bc: J.G.Dodson, w/o att – Hennepin Station
J.P.Augspols w/att. - Hennepin Station
T.L.~~Davis~~/Hennepin PS Dam Inspection Reports, w/att., Decatur
Rick Diericx Reading File - Decatur

Dam Inspection Report

Name of Dam Hennepin PS, East Ash Surface Impoundment **Dam ID No.** IL 50363

Permit Number DS2004119 **Class of Dam** III

LocationNE 1/4 **Section** 26 **Township** 33N **Range** 2W of 3rd PM

Owner Dynegy Midwest Generation 815-339-9210
Name **Telephone Number (Day)**

RR1, Box 200 AA 815-339-9215
Street **Telephone Number (Night)**

Hennepin, IL 61327 **County** Putnam
City **Zip Code**

Type of Dam Homogeneous Earth Dam with clay and geosynthetic/clay liner

Type of Spillway Drop structure and stop logs

Date(s) Inspected March 29, 2010

Weather When Inspected Sunny

Temperature When Inspected 60 degrees F

Pool Elevation When Inspected Primary 481.5, Secondary 479.6

Tailwater Elevation When Inspected NA

Inspection Personnel:

Kenneth M Berry, P.E. Sr Proj Engr (URS)
Name **Title**

Phil L. Morris, P.E. Environmental Professional
Name **Title**

John Augspols Plant Engineer
Name **Title**

KENNETH MONROE BERRY
062-051918
REGISTERED PROFESSIONAL ENGINEER
STATE OF ILLINOIS

Kenneth M Berry
5/26/2010

Name **Title**

Professional Engineer's Seal

The Department of Natural Resources is requesting information that is necessary to accomplish the statutory purpose as outlined under the River, Lakes and Streams Act, 615 ILCS 5. Submittal of this information is REQUIRED. Failure to provide the required information could result in the initiation of non.-compliance procedures as outlined in Section 3702.160 of the "Rules for Construction and Maintenance of Dams.

CONDITION CODES

NE - No evidence of a problem

GC - Good condition

MM - Item needing minor maintenance and/or repairs within the year, the safety or integrity of the item is not yet imperiled

IM - Item needing immediate maintenance to restore or ensure its safety or integrity

EC - Emergency condition which if not immediately repaired or other appropriate measures taken could lead to failure of the dam

OB - Condition requires regular observation to ensure that the condition does not become worse

NA - Not applicable to this dam

NI - Not inspected -list the reason for non-inspection under deficiencies

---

All Condition Codes will be listed with the following abbreviations:

P = Primary Cell

S = Secondary (polishing) Cell

EARTH EMBANKMENT

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Surface Cracks	NE	NA	
Vertical and Horizontal Alignment of Crest	GC	NA	
Unusual Movement or Cracking' At or Beyond Toe	NE	NA	
Sloughing or Erosion of Embankment and Abutment Slopes	NE	NA	
Upstream Face Slope Protection	NA	NA	No slope protection
Seepage	NE	NA	
Filter and Filter Drains	NA	NA	No evidence of internal filters or drains

EARTH EMBANKMENT
(Continued)

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Animal Damage	NE	NA	
Embankment Drainage Ditches	GC	NA	
Vegetative Cover	NE	NA	
Other (Name)	NA		
Other –	NA		
Other -	NA		
Other	NA		

CONCRETE OR MASONRY DAMS

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Seepage	NA		
Structure to Abutment! Embankment Junctions	NA		
Water Passages	NA		
Foundation	NA		
Surface Cracks in Concrete Surfaces	NA		
Structural Cracking	NA		
Vertical and Horizontal Alignment	NA		

CONCRETE OR MASONARY DAMS
(CONTINUED)

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Monolith Joints	NA		
Contruction Joints	NA		
Spalling of Concrete	NA		
Filters; Drains, etc.	NA		
Riprap	NA		
Other (Name)	NA		

IF THE DAM IS GATED – Fill out the portion of the Principal Spillway Form related to Gated Spillways

PRINCIPAL SPILLWAY
APPROACH CHANNEL

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Debris	NA		
Side Slope Stability	NA		
Slope Protection	NA		
Other (Name)	NA		
Other	NA		
Other	NA		
Other	NA		

PRINCIPAL SPILLWAY

x Drop Inlet Spillway ☐ Overflow Spillway Structure ☐ Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NE	NA	
Structure to Embankment Junction	NI	Underwater	
Drains	NA	NA	
Seepage Around or Into Structure	NI	Underwater	
Surface Cracks	NI	Underwater	
Structural Cracks	NI	Underwater	

IF THE SPILLWAY IS GATED FILL OUT THE SPILLWAY SECTION

PRINCIPAL SPILLWAY
(Continued)

x Drop Inlet Spillway ☐ Overflow Spillway Structure ☐ Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Alignment of Abutment Walls	NA	NA	
Construction Joints	NA	NA	
Filter and Filter Drains	NA	NA	
Trash Racks	NA	NA·	
Bridge and Piers	NE	NA	
Differential Settlement	NE	NA	
Other (Name)	NA	NA	

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY
(Continued)

x Conduit ☐ Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NE	NA	
Joint Separation	NI	NA	
Seepage Around of Into Conduit	NI	Underwater	
Surface Cracks	NI	Underwater	
Structural Cracks	NI	Underwater	
Trash Racks	NA	NA	
Differential Settlement	NI	Underwater	
Alignment	NI	Underwater	
Other (Name)	NA	NA	

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY
(Continued)

☐ Chute

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NA		
Structure to Embankment Junction	NA		
Construction Joints	NA		
Expansion and Contraction Joints	NA		
Differential Settlement	NA		
Surface Cracks	NA		
Structural Cracks	NA		
Wall Alignment	NA		
Other (Name)	NA		

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY

x Principal Spillway ☐ Dewatering ☐ Other:

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Gate Sill (Stoplogs)	NI	Underwater	
Gate Seals (Stoplogs)	NI	Underwater	
Gate and Frame (Stoplogs)	GC	NA	
Operating Machinery	NA		
Emergency Operating Machinery	NA		
Other (Name)	NA		
Other	NA		

OUTLET WORKS
IF SEPARATE FROM PRINCIPAL SPILLWAY STRUCTURE

ITEM	CONDITION CODE'	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion. Spalling, Cavitation	NA		
Joint Separation	NA		
Seepage Around or Into Conduit	NA		
Intake Structure	NA		
Outlet Structure	NA		
Outlet Channel	NA		
Riprap	NA		
Other (Name)	NA		
Other	NA		

ENERGY DISSIPATOR

☐ Principal Spillway   x Outlet Works
Type:

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NE	NA	
Structure to Embankment Junction	NE	NA	
Construction Joints	NE	NA	
Surface Cracks	NE	NA	
Structural Cracks	NI	Underwater	
Differential Alignment	NE	NA	
Expansion and Contraction Joints	NI	Underwater	

ENERGY DISSIPATOR
(Continued)

☐ Principal Spillway ☐ Outlet Works

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Riprap	NE	NA	
Outlet Channel	NE	NA	
Debris	NE	NA	
Other (Name)	NA		
Other	NA		
Other	NA		
Other	NA		

EMERGENCY SPILLWAY

☐ Earth ☐ Other: Name ____________

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion	NA		
Weeds, Logs, Other Obstructions	NA		
Side Slope Sloughing	NA		
Vegetation	NA		
Sedimentation	NA		
Riprap	NA		
Settlement of Crest	NA		
Downstream Channel	NA		
Other (Name)	NA		

SUMMARY OF MAINTENANCE DONE AND/OR

REPAIRS MADE SINCE THE LAST INSPECTION

DATE OF PRESENT INSPECTION March 29, 2010

DATE OF LAST INSPECTION March 19, 2009

1. EARTH EMBANKMENT DAMS

Minor erosion repairs, mowing, tree cutting, and general maintenance have been performed.

2. CONCRETE MASONARY DAMS

3. PRINCIPAL SPILLWAY

4. OUTLET WORKS

5. EMERGENCY SPILLWAY

DOWNSTREAM DEVELOPMENT
APPROXIMATE WIDTH OF AFFECTED FLOODPLAIN 0.25 MILES.

MILES DOWNSTREAM FROM DAM	DOWNSTREAM DEVELOPMENT												Loss Of Life Potential			Economic Loss Potential			SKETCH IN DEVELOPMENTS DOWNSTREAM OF THE DAM
	OCCUPIED HOMES	UNOCCUPIED HOMES	AGRICULTURAL BUILDINGS	INDUSTRIAL BUILDINGS	COMMERCIAL BUILDINGS	SCHOOLS	HOSPITALS	ROADS & BRIDGES	DAMS	OVERHEAD UTILITIES	OTHER DEVELOPMENT (Name)	OTHER DEVELOPMENT (Name)	NONE	1 TO 10	OVER 10	MINIMAL EXPECTED	APPRECIABLE EXPECTED	EXCESSIVE EXPRECTED	
0 to ¼		0	0	0	0	0	0	0	0	0	0	0	x			x			
¼ to ½																			
½ to ¾																			
¾ to 1																			
1 to 1 ¼																			
1 ¼ to 1 ½																			
1 ½ to 1 ¾																			
1 ¾ to 2																			
OVER 2																			

The number of homes, buildings, or other items in the floodplain downstream of the dam should be placed in the appropriate row and column to designate their location.

Owner's Maintenance Statement

I, Ted Lindenbusch, owner of Hennepin PS East Ash Surface Impoundment dam,

Dam Identification Number IL 50363, in Putnam County,

am maintaining the dam in accordance with the accepted maintenance plan

which is part of Permit Number DS2004119.

Signature

Date

Owner's Operation and Maintenance Plan Statement

I, Ted Lindenbusch, owner of Hennepin PS East Ash Surface Impoundment dam,

Dam Identification Number IL 50363, in Putnam County,

have reviewed the operation and maintenance plan including the Emergency

Action Plan (EAP), which is part of Permit Number DS2004119.

I ☐ have enclosed the appropriate revisions or

☐ have determined that no revisions to the plan are necessary.

Signature

Date

The Department of Natural Resources is requesting information that is necessary to accomplish the statutory purposes as outlined under the River, Lakes and Streams Act, 615 ILCS 5. Submittal of this information is REQUIRED. Failure to provide the required information could result in the initiation on non-compliance procedures as outlined in Section 3702.160 of the "Rules for Construction and Maintenance of Dams."

Dam Inspection Report

Name of Dam Hennepin PS, West Ash Surface Impoundment **Dam ID No.** N/A

Permit Number N/A **Class of Dam** N/A

Location NE **Section** **Township** **Range**

Owner Dynegy Midwest Generation
Name

815-339-9210
Telephone Number (Day)

RR1, Box 200 AA
Street

815-339-9215
Telephone Number (Night)

Hennepin, IL 61327
City **Zip Code**

County Putnam

Type of Dam Homogeneous Earth Dam

Type of Spillway Drop structure

Date(s) Inspected March 29, 2010

Weather When Inspected Sunny

Temperature When Inspected 60 degrees F

Pool Elevation When Inspected Unknown

Tailwater Elevation When Inspected NA

Inspection Personnel:

Name	Title
Kenneth M Berry, P.E.	Sr Proj Engr (URS)
Phil L. Morris, P.E.	Environmental Professional
John Augspols	Plant Engineer

KENNETH MONROE BERRY
0062-051918
REGISTERED PROFESSIONAL ENGINEER
STATE OF ILLINOIS

Kenneth Monroe Berry
5/26/2010

Professional Engineer's Seal

The Department of Natural Resources is requesting information that is necessary to accomplish the statutory purpose as outlined under the River, Lakes and Streams Act. 615 ILCS 5. Submittal of this information is REQUIRED. Failure to provide the required information could result in the initiation of non.-compliance procedures as outlined in Section 3702.160 of the "Rules for Construction and Maintenance of Dams.

CONDITION CODES

NE - No evidence of a problem

GC - Good condition

MM - Item needing minor maintenance and/or repairs within the year, the safety or integrity of the item is not yet imperiled

IM - Item needing immediate maintenance to restore or ensure its safety or integrity

EC - Emergency condition which if not immediately repaired or other appropriate measures taken could lead to failure of the dam

OB - Condition requires regular observation to ensure that the condition does not become worse

NA - Not applicable to this dam

NI - Not inspected -list the reason for non-inspection under deficiencies

EARTH EMBANKMENT

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Surface Cracks	NE	NA	
Vertical and Horizontal Alignment of Crest	GC	NA	
Unusual Movement or Cracking' At or Beyond Toe	NI	Underwater	
Sloughing or Erosion of Embankment and Abutment Slopes	OB/MM	Vegetation was high and thick – limited ability to observe.	Sporadic riverbank erosion observed towards the south. Recommend placement of rip rap to repair.
Upstream Face Slope Protection	OB	Vegetation was high and thick, so not able to observe.	Cut vegetation and observe.
Seepage	NE	Mostly underwater	
Filter and Filter Drains	NA	NA	

EARTH EMBANKMENT
(Continued)

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Animal Damage	NE	NA	
Embankment Drainage Ditches	NE	NA	
Vegetative Cover	MM	High vegetation and Sporadic trees	Cut vegetation on interior to facilitate inspection and limit roots. Do not cut trees on river bank since they provide erosion protection from the river.
Other (Name)	NA		
Other –	NA		
Other -	NA		
Other	NA		

CONCRETE OR MASONRY DAMS

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Seepage	NA		
Structure to Abutment! Embankment Junctions	NA		
Water Passages	NA		
Foundation	NA		
Surface Cracks in Concrete Surfaces	NA		
Structural Cracking	NA		
Vertical and Horizontal Alignment	NA		

CONCRETE OR MASONARY DAMS
(CONTINUED)

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Monolith Joints	NA		
Contruction Joints	NA		
Spalling of Concrete	NA		
Filters; Drains, etc.	NA		
Riprap	NA		
Other (Name)	NA		

IF THE DAM IS GATED – Fill out the portion of the Principal Spillway Form related to Gated Spillways

PRINCIPAL SPILLWAY APPROACH CHANNEL

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Debris	NA		
Side Slope Stability	NA		
Slope Protection	NA		
Other (Name)	NA		
Other	NA		
Other	NA		
Other	NA		

PRINCIPAL SPILLWAY

x Drop Inlet Spillway ☐ Overflow Spillway Structure ☐ Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NI	High vegetation	
Structure to Embankment Junction	NI	High vegetation	
Drains	NA	NA	
Seepage Around or Into Structure	NI	High vegetation	
Surface Cracks	NI	High vegetation	
Structural Cracks	NI	High vegetation	

IF THE SPILLWAY IS GATED FILL OUT THE SPILLWAY SECTION

PRINCIPAL SPILLWAY
(Continued)

x Drop Inlet Spillway ☐ Overflow Spillway Structure ☐ Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Alignment of Abutment Walls	NA	NA	
Construction Joints	NA	NA	
Filter and Filter Drains	NA	NA	
Trash Racks	NA	NA	
Bridge and Piers	NA	NA	
Differential Settlement	NA	NA	
Other (Name)	NA	NA	

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY
(Continued)

x Conduit ☐ Gated

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NI	Inaccessible	
Joint Separation	NI	Inaccessible	
Seepage Around of Into Conduit	NI	Inaccessible	
Surface Cracks	NI	Inaccessible	
Structural Cracks	NI	Inaccessible	
Trash Racks	NA	NA	
Differential Settlement	NI	Inaccessible	
Alignment	NI	Inaccessible	
Other (Name)	NA	NA	

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY
(Continued)

☐ Chute

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NA		
Structure to Embankment Junction	NA		
Construction Joints	NA		
Expansion and Contraction Joints	NA		
Differential Settlement	NA		
Surface Cracks	NA		
Structural Cracks	NA		
Wall Alignment	NA		
Other (Name)	NA		

IF THE SPILLWAY IS GATED FILL OUT THE GATES SECTION

PRINCIPAL SPILLWAY

☐ Principal Spillway ☐ Dewatering ☐ Other:

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Gate Sill	NA		
Gate Seals	NA		
Gate and Frame	NA		
Operating Machinery	NA		
Emergency Operating Machinery	NA		
Other (Name)	NA		
Other	NA		

OUTLET WORKS
IF SEPARATE FROM PRINCIPAL SPILLWAY STRUCTURE

ITEM	CONDITION CODE'	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion. Spalling, Cavitation	NA		
Joint Separation	NA		
Seepage Around or Into Conduit	NA		
Intake Structure	NA		
Outlet Structure	NA		
Outlet Channel	NA		
Riprap	NA		
Other (Name)	NA		
Other	NA		

ENERGY DISSIPATOR

☐ Principal Spillway ☐ Outlet Works
Type:

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion, Spalling, Cavitation	NA		
Structure to Embankment Junction	NA		
Construction Joints	NA		
Surface Cracks	NA		
Structural Cracks	NA		
Differential Alignment	NA		
Expansion and Contraction Joints	NA		

ENERGY DISSIPATOR
(Continued)

☐ Principal Spillway ☐ Outlet Works

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Riprap	NA		
Outlet Channel	NA		
Debris	NA		
Other (Name)	NA		
Other	NA		
Other	NA		
Other	NA		

EMERGENCY SPILLWAY

☐ Earth ☐ Other: Name ______________

ITEM	CONDITION CODE	DEFICIENCIES	RECOMMENDED REMEDIAL MEASURES AND IMPLEMENTATION SCHEDULE
Erosion	NA		
Weeds, Logs. Other Obstructions	NA		
Side Slope Sloughing	NA		
Vegetation	NA		
Sedimentation	NA		
Riprap	NA		
Settlement of Crest	NA		
Downstream Channel	NA		
Other (Name)	NA		

SUMMARY OF MAINTENANCE DONE AND/OR

REPAIRS MADE SINCE THE LAST INSPECTION

DATE OF PRESENT INSPECTION March 29, 2010

DATE OF LAST INSPECTION March 19, 2009

1. EARTH EMBANKMENT DAMS

Unknown.

2. CONCRETE MASONARY DAMS

3. PRINCIPAL SPILLWAY

4. OUTLET WORKS

5. EMERGENCY SPILLWAY

DOWNSTREAM DEVELOPMENT
APPROXIMATE WIDTH OF AFFECTED FLOODPLAIN ___0.25___ MILES.

MILES DOWNSTREAM FROM DAM	DOWNSTREAM DEVELOPMENT												Loss Of Life Potential			Economic Loss Potential			SKETCH IN DEVELOPMENTS DOWNSTREAM OF THE DAM
	OCCUPIED HOMES	UNOCCUPIED HOMES	AGRICULTURAL BUILDINGS	INDUSTRIAL BUILDINGS	COMMERCIAL BUILDINGS	SCHOOLS	HOSPITALS	ROADS & BRIDGES	DAMS	OVERHEAD UTILITIES	OTHER DEVELOPMENT (Name)	OTHER DEVELOPMENT (Name)	NONE	1 TO 10	OVER 10	MINIMAL EXPECTED	APPRECIABLE EXPECTED	EXCESSIVE EXPECTED	
0 to ¼		0	0	0	0	0	0	0	0	0	0	0	x			x			
¼ to ½																			
½ to ¾																			
¾ to 1																			
1 to 1 ¼																			
1 ¼ to 1 ½																			
1 ½ to 1 ¾																			
1 ¾ to 2																			
OVER 2																			

The number of homes, buildings, or other items in the floodplain downstream of the dam should be placed in the appropriate row and column to designate their location.

Owner's Maintenance Statement

I, Ted Lindenbusch , owner of Hennepin PS West Ash Surface Impoundment dam,

Dam Identification Number __________, in Putnam County,

am maintaining the dam in accordance with the accepted maintenance plan

which is part of Permit Number__________________.

Signature

Date

Owner's Operation and Maintenance Plan Statement

I, Ted Lindenbusch , owner of Hennepin PS West Ash Surface Impoundment dam,

Dam Identification Number __________, in Putnam County,

have reviewed the operation and maintenance plan including the Emergency

Action Plan (EAP), which is part of Permit Number_________.

I ☐ have enclosed the appropriate revisions or

☐ have determined that no revisions to the plan are necessary.

Signature

Date

The Department of Natural Resources is requesting information that is necessary to accomplish the statutory purposes as outlined under the River, Lakes and Streams Act, 615 ILCS 5. Submittal of this information is REQUIRED. Failure to provide the required information could result in the initiation on non-compliance procedures as outlined in Section 3702.160 of the "Rules for Construction and Maintenance of Dams."

APPENDIX E

PHOTOGRAPHS

Client Name: U.S. EPA	Site Location: Hennepin Power Station Hennepin, Illinois	Project No. 01.0170142.30

Photo No. 1	Date: 5/23/11

Direction Photo Taken:
Northeast

Description:
Downstream slope of the West Ash Pond System (WAPS) Impoundment.

Photo No. 2	Date: 5/23/11

Direction Photo Taken:
South

Description:
Downstream slope of the WAPS.

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Hennepin Power Station Hennepin, Illinois	Project No. 01.0170142.30

Photo No. 3 **Date:** 5/23/11

Direction Photo Taken:
North

Description:
Downstream slope of the WAPS.

Photo No. 4 **Date:** 5/23/11

Direction Photo Taken:
East

Description:
Downstream slope of the WAPS.

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	**Site Location: Hennepin Power Station Hennepin, Illinois**	**Project No.** 01.0170142.30

Photo No. 5 **Date:** 5/23/11

Direction Photo Taken:
East

Description:
Downstream slope of the WAPS.

Photo No. 6 **Date:** 5/23/11

Direction Photo Taken:
North

Description:
Crest and downstream slope of the WAPS.

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Hennepin Power Station Hennepin, Illinois	Project No. 01.0170142.30

Photo No. 7	Date: 5/23/11

Direction Photo Taken:
North

Description:
Crest and downstream slope of the WAPS.

Photo No. 8	Date: 5/23/11

Direction Photo Taken:
West

Description:
Crest and downstream slope of the WAPS.

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Hennepin Power Station Hennepin, Illinois	Project No. 01.0170142.30

Photo No. 9	Date: 5/23/11
Direction Photo Taken: Southwest	
Description: Downstream slope of the WAPS.	

Photo No. 10	Date: 5/23/11
Direction Photo Taken: Southwest	
Description: Downstream slope of the WAPS.	

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Hennepin Power Station Hennepin, Illinois	Project No. 01.0170142.30

Photo No. 11	Date: 5/23/11
Direction Photo Taken: Southwest	
Description: Downstream slope of the WAPS.	

Photo No. 12	Date: 5/23/11
Direction Photo Taken: Southeast	
Description: Downstream slope of the WAPS.	

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Hennepin Power Station Hennepin, Illinois	Project No. 01.0170142.30

Photo No. 13	Date: 5/23/11

Direction Photo Taken:
Southwest

Description:
Downstream slope of the WAPS.

Photo No. 14	Date: 5/23/11

Direction Photo Taken:
North

Description:
Toe access road along the eastern portion of the WAPS.

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	**Site Location: Hennepin Power Station Hennepin, Illinois**	**Project No.** 01.0170142.30

Photo No. 15	**Date:** 5/23/11
Direction Photo Taken: Southwest	
Description: Crest of the WAPS.	

Photo No. 16	**Date:** 5/23/11
Direction Photo Taken: Northeast	
Description: Crest of the WAPS.	

GZA GeoEnvironmental, Inc. | **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	**Site Location: Hennepin Power Station Hennepin, Illinois**	**Project No.** 01.0170142.30

Photo No. 17 | **Date:** 5/23/11

Direction Photo Taken: West

Description: Crest of the WAPS.

Photo No. 18 | **Date:** 5/23/11

Direction Photo Taken: East

Description: Crest and upstream slope of the WAPS.

GZA GeoEnvironmental, Inc.		**PHOTOGRAPHIC LOG**
Client Name: U.S. EPA	**Site Location: Hennepin Power Station Hennepin, Illinois**	**Project No.** 01.0170142.30

Photo No. 19	**Date:** 5/23/11
Direction Photo Taken: West	
Description: Crest and upstream slope of the WAPS.	

Photo No. 20	**Date:** 5/23/11
Direction Photo Taken: Northeast	
Description: Crest and upstream slope of the WAPS.	

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Hennepin Power Station Hennepin, Illinois	Project No. 01.0170142.30

Photo No. 21	Date: 5/23/11
Direction Photo Taken: South	
Description: Decant structure in the WAPS.	

Photo No. 22	Date: 5/23/11
Direction Photo Taken: Southeast	
Description: Decant structure in the WAPS.	

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Hennepin Power Station Hennepin, Illinois	Project No. 01.0170142.30

Photo No. **23** | **Date:** 5/23/11

Direction Photo Taken:
Northeast

Description:
Discharge pipe from the WAPS into the Illinois River.

Photo No. **24** | **Date:** 5/23/11

Direction Photo Taken:
West

Description:
Upstream slope and ponded water in the WAPS.

Client Name: U.S. EPA	Site Location: Hennepin Power Station Hennepin, Illinois	Project No. 01.0170142.30

Photo No. 25 **Date:** 5/23/11

Direction Photo Taken: Northeast

Description: Downstream slope of the EAPS.

Photo No. 26 **Date:** 5/23/11

Direction Photo Taken: Northeast

Description: Downstream slope of the EAPS.

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	**Site Location: Hennepin Power Station Hennepin, Illinois**	**Project No.** 01.0170142.30

Photo No. 27 **Date:** 5/23/11

Direction Photo Taken:
Northeast

Description:
Crest of the 1978 embankment and downstream slope of the 1995 embankment along the EAPS.

Photo No. 28 **Date:** 5/23/11

Direction Photo Taken:
Northeast

Description:
Crest of the 1978 embankment and downstream slope of the 1995 embankment along the EAPS.

Client Name: U.S. EPA	Site Location: Hennepin Power Station Hennepin, Illinois	Project No. 01.0170142.30

Photo No. 29	Date: 5/23/11
Direction Photo Taken: East	
Description: Crest of the 1978 embankment and downstream slope of the 1995 embankment near Pond 2E.	

Photo No. 30	Date: 5/23/11
Direction Photo Taken: North	
Description: Downstream slope of Pond 2E.	

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Hennepin Power Station Hennepin, Illinois	Project No. 01.0170142.30

Photo No. 31 **Date:** 5/23/11

Direction Photo Taken:
Northwest

Description:
Downstream slope of Pond 2E along crest of the 1978 embankment.

Photo No. 32 **Date:** 5/23/11

Direction Photo Taken:
Southwest

Description:
Crest of the EAPS.

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Hennepin Power Station Hennepin, Illinois	Project No. 01.0170142.30

Photo No. 33	Date: 5/23/11
Direction Photo Taken: Northeast	
Description: Crest and upstream slope of the EAPS.	

Photo No. 34	Date: 5/23/11
Direction Photo Taken: Northeast	
Description: Crest and upstream slope of the EAPS.	

Client Name: U.S. EPA	Site Location: Hennepin Power Station Hennepin, Illinois	Project No. 01.0170142.30

Photo No.	Date:
35	5/23/11

Direction Photo Taken:
South

Description:
Crest of embankment between the EAPS and Pond 2E.

Photo No.	Date:
36	5/23/11

Direction Photo Taken:
East

Description:
Crest and upstream slope of Pond 2E.

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Hennepin Power Station Hennepin, Illinois	Project No. 01.0170142.30

Photo No. 37	Date: 5/23/11

Direction Photo Taken:
Southeast

Description:
Crest and upstream slope of Pond 2E.

Photo No. 38	Date: 5/23/11

Direction Photo Taken:
West

Description:
Crest of the embankment between Pond 2E and Secondary Cell.

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Hennepin Power Station Hennepin, Illinois	Project No. 01.0170142.30

Photo No. 39 | **Date:** 5/23/11

Direction Photo Taken:
Southeast

Description:
Crest and upstream slope of the Secondary Cell.

Photo No. 40 | **Date:** 5/23/11

Direction Photo Taken:
Southwest

Description:
Crest and upstream slope of the Secondary Cell.

GZA GeoEnvironmental, Inc.		PHOTOGRAPHIC LOG
Client Name: U.S. EPA	**Site Location: Hennepin Power Station Hennepin, Illinois**	**Project No.** 01.0170142.30

Photo No. 41	**Date:** 5/23/11
Direction Photo Taken: Northwest	
Description: Crest and upstream slope of the Secondary Cell.	

Photo No. 42	**Date:** 5/23/11
Direction Photo Taken: Northwest	
Description: Crest and upstream slope of the Secondary Cell.	

Client Name: U.S. EPA	Site Location: Hennepin Power Station Hennepin, Illinois	Project No. 01.0170142.30

Photo No. 43 **Date:** 5/23/11

Direction Photo Taken:
Southwest

Description:
Crest of the embankment between Pond 2E and the Secondary Cell.

Photo No. 44 **Date:** 5/23/11

Direction Photo Taken:
Northwest

Description:
Upstream slope of the EAPS.

GZA GeoEnvironmental, Inc.		PHOTOGRAPHIC LOG
Client Name: U.S. EPA	**Site Location: Hennepin Power Station Hennepin, Illinois**	**Project No.** 01.0170142.30

Photo No. **45**

Date: 5/23/11

Direction Photo Taken:
Southwest

Description:
Crest and upstream slope of the Primary Cell.

Photo No. **46**

Date: 5/23/11

Direction Photo Taken:
East

Description:
Upstream slope of the Primary Cell.

GZA GeoEnvironmental, Inc.		PHOTOGRAPHIC LOG
Client Name: U.S. EPA	**Site Location: Hennepin Power Station Hennepin, Illinois**	**Project No.** 01.0170142.30

Photo No. 47 **Date:** 5/23/11 **Direction Photo Taken:** Southwest **Description:** Upstream slope of the Primary Cell.	

Photo No. 48 **Date:** 5/23/11 **Direction Photo Taken:** Northwest **Description:** Upstream slope of the Primary Cell near the decant structure.	

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Hennepin Power Station Hennepin, Illinois	Project No. 01.0170142.30

Photo No. 49	Date: 5/23/11

Direction Photo Taken:
Southwest

Description:
Crest and upstream slope of the Primary Cell.

Photo No. 50	Date: 5/23/11

Direction Photo Taken:
Southwest

Description:
Crest and upstream slope of the Primary Cell.

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Hennepin Power Station, Hennepin, Illinois	Project No. 01.0170142.30

Photo No. 51 **Date:** 5/23/11

Direction Photo Taken:
Southwest

Description:
Upstream slope of the Primary Cell.

Photo No. 52 **Date:** 5/23/11

Direction Photo Taken:
Northwest

Description:
Crest and upstream slope of the Primary Cell.

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Hennepin Power Station Hennepin, Illinois	Project No. 01.0170142.30

Photo No. 53 **Date:** 5/23/11

Direction Photo Taken:
Northwest

Description:
Crest and upstream slope of the Primary Cell.

Photo No. 54 **Date:** 5/23/11

Direction Photo Taken:
West

Description:
Downstream slope of the EAPS.

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Hennepin Power Station Hennepin, Illinois	Project No. 01.0170142.30

Photo No. 55	Date: 5/23/11
Direction Photo Taken: West	
Description: Crest and downstream slope of the EAPS.	

Photo No. 56	Date: 5/23/11
Direction Photo Taken: West	
Description: Downstream slope of the EAPS.	

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	**Site Location: Hennepin Power Station Hennepin, Illinois**	**Project No.** 01.0170142.30

Photo No. 57	**Date:** 5/23/11
Direction Photo Taken: Northwest	
Description: Downstream slope of the EAPS.	

Photo No. 58	**Date:** 5/23/11
Direction Photo Taken: North	
Description: Discharge pipe into the northwest portion of the Primary Cell.	

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Hennepin Power Station Hennepin, Illinois	Project No. 01.0170142.30

Photo No. 59	Date: 5/23/11
Direction Photo Taken: East	
Description: Old decant structure in the Primary Cell.	

Photo No. 60	Date: 5/23/11
Direction Photo Taken: East	
Description: Discharge pipe into the Primary Cell near the northeast corner.	

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Hennepin Power Station Hennepin, Illinois	Project No. 01.0170142.30

Photo No. 61 **Date:** 5/23/11

Direction Photo Taken:
East

Description:
Decant structure in the Primary Cell.

Photo No. 62 **Date:** 5/23/11

Direction Photo Taken:
Southeast

Description:
Discharge pipe from the Primary Cell to Pond 2E.

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Hennepin Power Station Hennepin, Illinois	Project No. 01.0170142.30

Photo No. 63	**Date:** 5/23/11
Direction Photo Taken: South	
Description: Decant structure in the Secondary Cell.	

Photo No. 64	**Date:** 5/23/11
Direction Photo Taken: Down	
Description: Decant structure in the Secondary Cell.	

GZA GeoEnvironmental, Inc. | **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Hennepin Power Station Hennepin, Illinois	Project No. 01.0170142.30

Photo No. 65	**Date:** 5/23/11
Direction Photo Taken: Southwest	
Description: Surface features of the flume structure in the discharge line from the Secondary Cell to the Illinois River.	

Photo No. 66	**Date:** 5/23/11
Direction Photo Taken: Down	
Description: Flume structure in the discharge line from the Secondary Cell to the Illinois River.	

Client Name: U.S. EPA	Site Location: Hennepin Power Station Hennepin, Illinois	Project No. 01.0170142.30

Photo No. 67	Date: 5/23/11
Direction Photo Taken: West	
Description: Crest of the interior embankment in the AEAPS with the Pond 2E decant structure shown.	

Photo No. 68	Date: 5/23/11
Direction Photo Taken: Southwest	
Description: Outfall at the Illinois River.	

GZA GeoEnvironmental, Inc. | **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Hennepin Power Station Hennepin, Illinois	Project No. 01.0170142.30

Photo No. 69	Date: 5/23/11
Direction Photo Taken: Southeast	
Description: Downstream slope of EAPS near Pond 4.	

Photo No. 70	Date: 5/23/11
Direction Photo Taken: South	
Description: Downstream slope of the EAPS near Pond 4.	

Client Name: U.S. EPA	Site Location: Hennepin Power Station Hennepin, Illinois	Project No. 01.0170142.30

Photo No. 71	Date: 5/23/11
Direction Photo Taken: Southeast	
Description: Crest of the EAPS near Pond 4.	

Photo No. 72	Date: 5/23/11
Direction Photo Taken: Northeast	
Description: Crest of the EAPS near Pond 4.	

GZA GeoEnvironmental, Inc. **PHOTOGRAPHIC LOG**

Client Name: U.S. EPA	Site Location: Hennepin Power Station Hennepin, Illinois	Project No. 01.0170142.30

Photo No. **73** **Date:** 5/23/11

Direction Photo Taken:
Northeast

Description:
Crest of the EAPS looking over the Primary Cell.

Photo No. **74** **Date:** 5/23/11

Direction Photo Taken:
Northeast

Description:
Crest of the EAPS near Pond 4.

APPENDIX F

REFERENCES

REFERENCE LIST HENNEPIN POWER STATION

Civil & Environmental Consultants, Inc. "Application for a Permit to Construct a New Leachate and Storm Water Runoff Collection Pond, Dynegy-Hennepin Power Station Hennepin, Illinois". Date July 2009.

Civil & Environmental Consultants, Inc. "Pond 2 East Construction Completion Report, Hennepin Power Station, Hennepin, Putnam County, Illinois". Date December 2010.

Sargent & Lundy Engineers. "Roadways at Plant Site, General Location Plan, Hennepin, Power Station, Illinois Power Company, Hennepin, Illinois," Drawing No.B-9. Dated March 27, 1953.

Sargent & Lundy Engineers. "Roadways at Plant Site, General Location Plan, Hennepin, Power Station, Illinois Power Company, Hennepin, Illinois," Drawing No.B-11. Dated March 27, 1953.

Illinois Power Company. "Hennepin Power Station Ash Surface Impoundment Hydrologic/Hydraulic Analysis" Dated September 1994.

Illinois Power Company. "Hennepin Power Station Ash Surface Impoundment Geotechnical/Structural Design" Dated September 1994.

Illinois Power Company, Decatur. "West Ash Pond Topographic Survey, Hennepin Power Station." Drawing No. E-HEN1-B451. Dated September 29, 1987.

Illinois Power Company, Decatur. "Cross Sections of Ash Pond Berm Extension" Hennepin Station." Drawing No. E-HEN1-B452. Dated December 30, 1987.

Illinois Power Company, Decatur. "Cross Sections of Ash Pond Berm Extension" Hennepin Station." Drawing No. E-HENI-B453. Dated December 30, 1987.

Illinois Power Company, Decatur. "Cross Sections of Ash Pond Berm Extension" Hennepin Station." Drawing No. E-HEN1-B454. Dated December 30, 1987.

Illinois Power Company, Decatur. "Cross Sections of Ash Pond Berm Extension" Hennepin Station." Drawing No. E-HEN1-B455. Dated December 30, 1987.

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PREFACE

The assessment of the general condition of the dams/impoundment structures reported herein was based upon available data and visual inspections. Detailed investigations and analyses involving topographic mapping, subsurface investigations, testing and detailed computational evaluations were beyond the scope of this report.

In reviewing this report, it should be realized that the reported condition of the dams and/or impoundment structures was based on observations of field conditions at the time of inspection, along with data available to the inspection team. In cases where an impoundment is lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions, which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is critical to note that the condition of the dam and/or impoundment structures depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the reported condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

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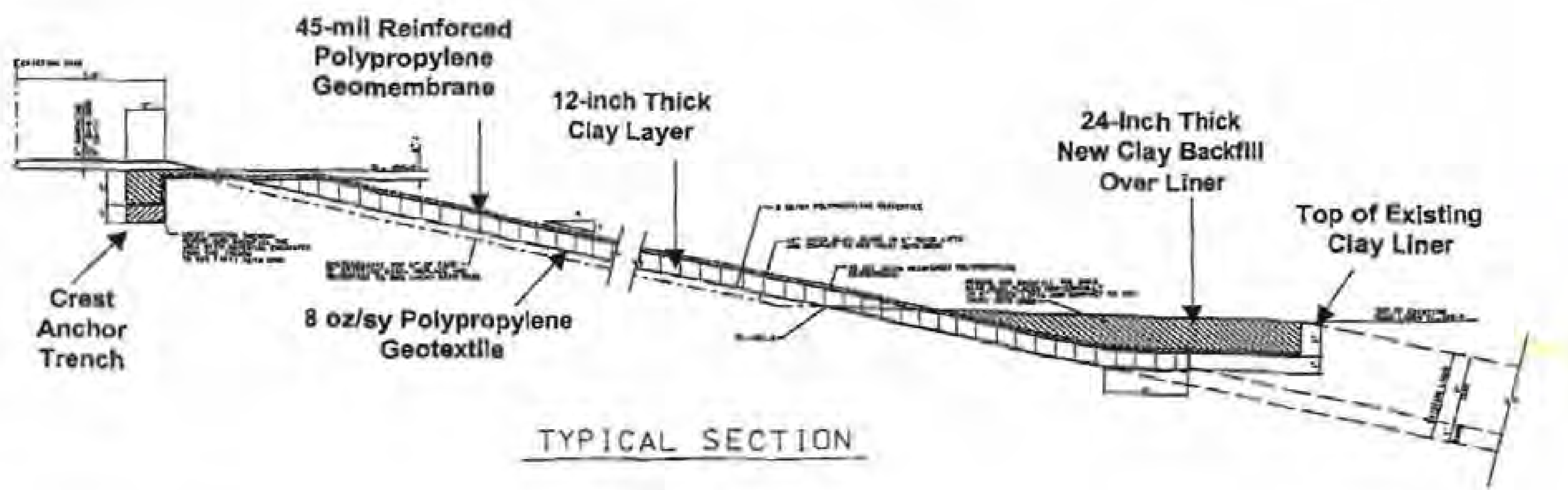
Hennepin Power Station
Hennepin, IL

East Ash Pond System

Raising of Interior Impermeable Liners in Primary and Secondary Cells



TYPICAL SECTION

REV. NO.	
DESCRIPTION	
BY	
DATE	
PROJ MGR: DPS	OPERATOR: CLK
DESIGNED BY: DPS	
REVIEWED BY: PJH	DATE: 12-12-11

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NOTE:
IMAGE HAS BEEN REDUCED AND IS NO LONGER TO A SCALE

DYNEGY MIDWEST GENERATION, INC.
HENNEPIN POWER STATION
HENNEPIN, ILLINOIS

TYPICAL SECTION OF LINER EXTENSION

JOB NO.
01.0170142.30

FIGURE NO.
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