

US EPA ARCHIVE DOCUMENT



**DRAFT REPORT  
ROUND 10 DAM ASSESSMENT – JUNE 2, 2011  
AMEREN ENERGY GENERATING COMPANY – HUTSONVILLE  
POWER STATION  
POND A, POND B, AND POND D  
HUTSONVILLE, ILLINOIS**

**PREPARED FOR:**



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

**PREPARED BY:**



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

***DRAFT***

April 27, 2012  
GZA File No. 170142.30



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

RE: Assessment of Dam Safety of Coal Combustion Surface Impoundments at the  
Hutsonville 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 visual inspection of the AmerenEnergy Generating Company, Hutsonville Power Station Coal Combustion Waste (CCW) Impoundments located in Hutsonville, Illinois. The site visit was conducted on June 2, 2011. The purpose of our efforts was to provide the EPA with a site specific inspection 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 Draft Report directly to the EPA.

Based on our visual inspection, and in accordance with the EPA's criteria Pond A, Pond B and Pond D are currently in **POOR** 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 Pond; (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 visual 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:

GZA GeoEnvironmental, Inc.

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Pond A, Pond B, and Pond D  
Hutsonville Power Station

**DRAFT REPORT**

Date of Inspection: 6/2/11

## EXECUTIVE SUMMARY

This Inspection Report presents the results of a visual inspection of the AmerenEnergy Generating Company (Ameren) – Hutsonville Power Station (HPS) Coal Combustion Waste (CCW) Impoundments located at 15142 East 1900<sup>th</sup> Avenue, Hutsonville, Illinois. These inspections were performed on June 2, 2011 by representatives of GZA GeoEnvironmental, Inc (GZA), accompanied by representatives of Ameren.



The HPS power plant has two coal-fired units with a maximum generating capacity of approximately 150 Megawatts. Commercial operation of the facility began in the 1940s and an earthen embankment CCW Impoundment (Pond D) was commissioned at that time. Subsequently, Pond A was commissioned in 1986 and Ponds B and C were commissioned in 2000. The impoundments were constructed for the purpose of storing and disposing non-recyclable CCW from the HPS facility and clarification of water prior to discharge. A portion of Pond D has since been permanently closed and capped as a landfill.

Pond A receives fly ash from the facility via a sluice transport pipe. Solids are allowed to settle and water is discharged from Pond A into Pond B. Pond B receives fly ash from Pond A and bottom ash from Pond C. Pond C receives bottom ash from the active portion of Pond D and stormwater runoff from the closed portion of Pond D. The active portion of Pond D receives bottom ash from the facility and also receives the water from various drains and treatment systems. Based on discussions with the EPA, analysis of Pond C and the closed portion of Pond D were judged not to fall within our scope of work as the units do not meet the criteria set forth by the U.S. EPA for further evaluation.

For the purposes of this EPA-mandated inspection, the size of the impoundments was based on U. S. Army Corps of Engineers (COE) criteria. Based on the maximum crest height of 22 feet and a storage volume of approximately 250 acre-feet, Pond A is classified as a **Small**-sized structure. Based on the maximum crest height of 17 feet and a storage volume of approximately 70 acre-feet, Pond B is classified as a **Small**-sized structure. Based on the maximum crest height of 15 feet and a storage volume of approximately 6 acre-feet, Pond D 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. Note per the Illinois Administrative code, Pond A qualifies as a Class III dam while Ponds B and D do not qualify as dams.

In GZA's opinion, Pond A, Pond B and Pond D are **Low** Hazard structures as classified under the Environmental Protection Agency (EPA) hazard rating criteria due to their small size, the fact that no loss of life would be expected if there was a failure and the low potential for environmental impacts outside of Utility-owned property. Pond A is considered a Class III dam per Illinois Administrative Code. Similar to the EPA classification system for a **LOW** hazard structure, a dam is considered Class III when failure has a low probability for causing loss of life or substantial economic loss.

In general, the overall condition of Pond A was judged to be **POOR** and was found to have the following deficiencies:

1. Animal burrows along the crest;
2. Minor sloughing on the downstream slope;
3. No documented hydrologic/hydraulic analysis; and,
4. Conditions leading to inadequate freeboard.



In general, the overall condition of Pond B was judged to be **POOR** and was found to have the following deficiencies:

1. No documented stability or hydrologic/hydraulic analysis.

In general, the overall condition of Pond D was judged to be **POOR** and was found to have the following deficiencies:

1. No documented hydrologic/hydraulic analysis.
2. The calculated factor of safety under seismic loading was less than the generally accepted value 1.0.

Please note that access to the downstream slope of Pond D along the Wabash River was limited and additional deficiencies may or may not be present along the slope. The following sections describe the recommended approach to address current deficiencies. Prior to undertaking recommended maintenance, repairs, or remedial measures, the applicability of permits needs to be determined for activities that may occur within the jurisdiction of the appropriate regulatory agencies.

### **Studies and Analyses**

GZA recommends the following studies and analyses:

1. Perform a stability analysis of the slopes of Pond B; and,
2. Perform a hydrologic/hydraulic analysis on Pond A, Pond B and Pond D to establish the maximum allowable water elevation.
3. Perform stability analysis of Pond D embankment using a detailed Site-specific hazard analysis per International Building Code recommendations. In addition, given that the inadequate factor of safety was calculated during a combination of events (i.e. both and earthquake and flooding), a combined risk analysis should be performed in accordance with US Army Corp of Engineers (USACE) recommendations.

### **Recurrent Operation & Maintenance Recommendations**

GZA recommends the following operation and maintenance level activities:

1. Repair sloughing on the downstream slope of Pond A;
2. Fill currently observed animal burrows by injecting grout under low to moderate pressures to ensure the entire limits of the respective burrow is adequately filled;
3. Exercise stoplogs and slide gates; and,
4. Increase frequency of maintenance mowing such that overgrowth of vegetation is minimized.



**Remedial Measures Recommendations**

1. In conjunction with the results of the hydrologic and hydraulic analyses, make provisions for an emergency overflow spillway(s) if appropriate; and
2. In conjunction with the results of the stability analyses, make provisions to address deficiencies if/as necessary.
3. In conjunction with the results of the seismic stability analysis, take measures to increase the factor of safety of the embankment for Pond D under seismic loading to at least 1.0 as appropriate.

POND A, POND B AND POND D  
 AMERENENERGY GENERATING COMPANY, HUTSONVILLE POWER STATION  
 HUTSONVILLE, ILLINOIS

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POND A, POND B AND POND D  
AMERENENERGY GENERATING COMPANY, HUTSONVILLE POWER STATION  
HUTSONVILLE, 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 inspection and develop a report of conditions for the AmerenEnergy Generating Company (Ameren, Owner) Hutsonville Power Station (HPS, Site) Coal Combustion Waste (CCW) Impoundments in Crawford County, Illinois. This inspection was authorized by the EPA under the authority of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), Section 104(e). This inspection 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 inspection generally conformed to the requirements of the Federal Guidelines for Dam Safety<sup>1</sup> and this report is subject to the limitations provided 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 condition of the impoundments and appurtenant structures (the management unit[s]) 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, inspection and maintenance data and procedures for the management unit; 3) perform a visual inspection of the Site; 4) prepare and submit a field assessment checklist; and 5) prepare and submit a draft and 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.

### 1.2 Description of Project

#### 1.2.1 Location

The HPS is located approximately one mile north of the City of Hutsonville in Crawford County, Illinois. The entrance to the Site is on East 1900th Avenue and the CCW

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





impoundments are located about ¼-mile south and southwest of the power plant at approximately latitude 39 07' 50" North and longitude 87 39' 38" West. A Site locus of the impoundments and surrounding area is shown on **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 power plant.

1.2.2 Owner/Caretaker

The CCW impoundments are owned by Ameren and are operated by the HPS.

	Dam Owner/Caretaker
Name	AmerenEnergy Generating Company, Hutsonville Power Station
Mailing Address	15142 East 1900th Avenue
City, State, Zip	Hutsonville, Illinois 62433
Contact	Gregory Musch
Title	Product Superintendent
E-Mail	GMusch@ameren.com
Daytime Phone	618-563-1352
Emergency Phone	911

1.2.3 Purpose of the Impoundments

The HPS power plant has two coal-fired units with a maximum generating capacity of approximately 150 Megawatts. Commercial operation of the facility began in the 1940s and an earthen embankment CCW Impoundment (Pond D) was commissioned at that time. Subsequently, Pond A was commissioned in 1986 and Ponds B and C were commissioned in 2000. The impoundments were constructed for the purpose of storing and disposing non-recyclable CCW from the HPS facility and clarification of water prior to discharge. A portion of Pond D as shown in Figure 2 has been permanently closed and capped as a landfill.

Pond A receives fly ash from the facility via a sluice transport pipe. Solids are allowed to settle and water is discharged from Pond A into Pond B. Pond B receives fly ash from Pond A and bottom ash from Pond C. Pond C receives bottom ash from the active portion of Pond D and stormwater runoff from the closed portion of Pond D. The active portion of Pond D receives bottom ash from the facility and also receives the water from various drains and treatment systems.

During our Site visit, GZA observed the condition of Pond C and the closed portion of Pond D and subsequently completed the EPA checklists. However, after further discussion with the EPA, analysis of these structures does not fall within our scope of work as the units do not meet the criteria set forth by the U.S. EPA for units requiring further evaluation (Pond C is fully incised, and the inactive portion of Pond D is a closed landfill). A few photos of Pond C and the closed portion of Pond D are provided in **Appendix F** for reference, but the structures are not further analyzed in this report.



#### 1.2.4 Description of Pond A and Appurtenances

Pond A was designed Hanson Engineers, Incorporated (Hanson). The following description of the impoundment is based on information provided in the Hanson design drawings and specifications, information received from Ameren and observations made by GZA during our Site visit. During the design and construction phases, Pond A was referred to as the Fly Ash Disposal Pond.

Pond A is located southwest of the HPS. The impoundment was commissioned in 1986, and serves as a settling pond for CCW generated by the HPS. Fly ash discharges into the impoundment through an approximately 10-inch diameter HDPE pipe that is laid over the surface of settled ash and can be moved or modified as necessary. Water and unsettled solids are discharged from Pond A to Pond B through an 18-inch diameter decant structure which is located near the southeast corner of pond. The location of the discharge pipes and decant structure in Pond A are shown on **Figure 3**.

Pond A consists of lined earthen embankments with a crest length of approximately 2,800 feet, a general height (from the lowest downstream toe elevation to the crest of the impoundment) of approximately 22 feet, and a crest elevation of approximately 470.0 feet MSL. The pond embankments were constructed with 2-foot horizontal to one-foot vertical (2H:1V) upstream and downstream slopes consisting of a compacted mixture of clay, silt, sand, and gravel. A liner consisting of 80-mil, high-density polyethylene was placed on the embankment upstream slopes and also keyed into the crest. Drainage pipes were placed beneath the liner on 50 foot centers to transmit water from the top of the slope to the French Drain at the upstream toe. Gravel consisting of CA-6<sup>2</sup> was placed on the crest of the embankment to facilitate an access road near the southeast portion of the impoundment. A plan view of the impoundment design is provided on **Figure 4**. Typical sections of the embankments and other details are provided on **Figures 5, 6 and 7**.

Instrumentation near the impoundment includes four monitoring wells (M-2 through M-5) which are located along the southern and eastern portions of the impoundment, as shown on **Figure 8**.

#### 1.2.5 Description of Pond B Impoundment and Appurtenances

Pond B was designed Hanson Engineers, Incorporated (Hanson). The following description of the impoundment is based on information provided in the Hanson design drawings and specifications, information received from Ameren and observations made by GZA during our Site visit. During the design and construction phases, Pond B was referred to as the Interim Ash Pond.

Pond B is located south of the HPS and east of Pond A as shown on **Figure 2**. This impoundment was commissioned in 2000, and serves as a settling pond for CCW generated by the HPS. Unsettled fly ash enters the impoundment from Pond A through an 18-inch diameter discharge pipe which is located near the western embankment of the impoundment. Unsettled bottom ash and water enters the impoundment from Pond C through a 12-inch diameter pipe which is located near the northeast corner of the impoundment. A 10-inch

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<sup>2</sup> CA-6 is an Illinois Department of Transportation gravel specification.



diameter steel bypass pipe which is located near the northeast corner of the impoundment can bring water and fly ash from the facility to Pond B as necessary. Water is discharged from Pond B to the Wabash River through the decant structure located near the eastern portion of the impoundment. The location of the discharge pipes and decant pipe in Pond B are shown on **Figure 3**.

Pond B consists of lined earthen embankments with a crest length of approximately 1,900 feet and a general height (from the lowest downstream toe elevation to the crest of the impoundment) of approximately 17 feet and a crest elevation of approximately 465.0 feet (MSL). The impoundment embankments were constructed with 2.5H:1V upstream and 3H:1V downstream slopes consisting of a compacted mixture of sand and fly ash. An interior spur dike extends from the eastern embankment into the pond for a distance of approximately 400 feet. A liner consisting of 60-mil, high-density polyethylene was placed on the upstream embankment slopes and also keyed into the crest. Gravel consisting of CA-6 was placed on the crest to facilitate an access road near the southeast portion of the impoundment. Topsoil was placed on the downstream slope and was seeded. A plan view of the impoundment design is provided on **Figure 9**. Typical sections of the embankments and other details are provided on **Figures 10, 11 and 12**.

Instrumentation near this impoundment includes one monitoring well (M-3) which is located along the southwestern portion of the impoundment, as shown on **Figure 8**.

#### 1.2.6 Description of Pond D Impoundment and Appurtenances

Design documents were not available for Pond D. The following description of the impoundment is based on information provided in the global stability analysis which was performed by Geotechnology, Inc.<sup>3</sup> (Stability Evaluation), information received from Ameren and observations made by GZA during our Site visit. As discussed previously, the following description only applies to the active portion of Pond D.

Pond D is located southeast of the HPS and the toe of the eastern embankment is located within the flood plain of the Wabash River. The impoundment was commissioned in 1940, and serves as a settling pond for CCW generated by the HPS. Bottom ash discharges from the plant into the impoundment through a 10-inch diameter pipe which is located near the northern portion of the impoundment and water from various plant drains and treatment systems enters through several discharge pipes. Water and unsettled solids are discharged from Pond D through a slide gate decant structure located near the southern corner of pond into a 24-inch diameter discharge pipe into Pond C. The location of the discharge pipes and decant structure in Pond D are shown on **Figure 13**.

Pond D is incised along the northern, western, and southern portions of the impoundment and consists of an earthen embankment along the eastern portion. Pond D has a crest length of approximately 1,000 feet, a general height (from the lowest downstream toe elevation to the crest of impoundment) of approximately 15 feet along the eastern embankment, and a crest elevation of approximately 453.8 feet (MSL). The embankment was constructed with an approximately 2.5H:1V downstream slope and, according to the Stability Evaluation, consists of compacted silty clay.

<sup>3</sup> "Global Stability Evaluation Hutsonville Power Station Ash Pond D Hutsonville, Illinois" by Geotechnology, Inc. dated January 4, 2011.



### 1.2.7 Operations and Maintenance

The HPS and the impoundments are maintained by Ameren personnel. Maintenance of the HPS facility, including the impoundments, is regulated by the EPA under the National Pollutant Discharge Elimination System (NPDES) Permit No. IL-0004120. Pond A is regulated under Illinois Administrative Code as a Class III dam under permit No. 17983. Under the conditions of the permit, Ameren is required to perform routine maintenance that includes the following:

1. The slopes will be kept clear of brush and tree growth;
2. Embankments must be inspected annually by plant personnel. Gullies or erosion of the embankments should be repaired and reseeded;
3. Logs must be maintained of all inspections and maintenance to Pond A;
4. Annual submittal of forms indicating the maintenance plans are being followed; and,
5. Inspection of Pond A by a professional engineer or other qualified personnel every five years. The results of the inspection are submitted to the Division of Water Resources along with deficiencies identified and remedial measures taken.

HPS personnel perform visual inspections of the impoundments on a quarterly basis and the inspection results from March 18, 2011 were provided to GZA.

### 1.2.8 Size Classification

For the purposes of this EPA-mandated inspection, the size of the impoundments was based on U. S. Army Corps of Engineers (COE) criteria. Based on the maximum crest height of 22 feet and a storage volume of approximately 250 acre-feet, Pond A is classified as a **Small**-sized structure. Based on the maximum crest height of 17 feet and a storage volume of approximately 70 acre-feet, Pond B is classified as a **Small**-sized structure. Based on the maximum crest height of 15 feet and a storage volume of approximately 6 acre-feet, Pond D 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.

### 1.2.9 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 Pond A, Pond B and Pond D 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 low potential for environmental impacts outside of Utility-owned property.



Pond A is considered a Class III dam per Illinois Administrative Code. Similar to the EPA classification system for a **LOW** hazard structure, a dam is considered Class III when failure has a low probability for causing loss of life or substantial economic loss.

1.3 Pertinent Engineering Data

1.3.1 Drainage Area

Pond A and Pond B are raised relative to the surrounding area and have no appreciable drainage areas. The northern, western, and southern portions of Pond D are incised and an area of approximately 2 acres drains into the impoundment, as estimated by GZA from available topographic maps of the area.

1.3.2 Reservoir

Based on information provided by Ameren, Pond A, Pond B and Pond D have surface areas of 14, 4.4 and 1.2 acres at the normal operating levels. The pool areas observed on GZA’s June 2, 2011 Site visit were generally consistent with those reported by Ameren. The storage volumes of Pond A, Pond B, and Pond D are approximately 250, 70, and 6 acre-feet, respectively.

1.3.3 Discharges at the Impoundment Sites

As discussed previously, water from Pond A discharges into Pond B; Pond D discharges into Pond C and then into Pond B. Water discharges from Pond B into the Wabash River. The rate of water discharge was not provided to GZA.

1.3.4 General Elevations (feet – MSL)

Elevations were taken from design drawings, the Stability Evaluation and data provided by Ameren. Unless otherwise noted, elevations were based on the United States Geological Survey (USGS) topographic map MSL vertical datum.

Pond A

A. Top of Embankment (Minimum)	± 470.0 feet
B. Upstream Water at Time of Inspection	± 469.5 feet
C. Downstream Water at Time of Inspection	± 461.8 feet <sup>4</sup> (Pond B)
D. Maximum Pond Water Elevation	± 468.0 feet <sup>5</sup>

Pond B

A. Top of Embankment (Minimum)	± 465.0 feet
B. Upstream Water at Time of Inspection	± 461.8 feet
C. Downstream Water at Time of Inspection	± Not Applicable <sup>6</sup>

<sup>4</sup> The water level in Pond B was taken to be the downstream water level east of Pond A. There is no downstream water level west, north, and south of the impoundment.

<sup>5</sup> The maximum pond water elevation for Pond A was taken from the requirements of the construction permit indicating pond levels should be maintained 2 to 3 feet below the crest.

<sup>6</sup> Given the distance from the decant structure to the discharge point, the water level in the Wabash River is not appropriate to be considered as the downstream water level. No appreciable water was present in Pond C. Therefore, no downstream water elevation is provided.



D. Maximum Pond Water Elevation  $\pm$  462.0 feet

Pond D

A. Top of Embankment (Minimum)  $\pm$  453.8 feet  
 B. Upstream Water at Time of Inspection  $\pm$  449.8 feet  
 C. Downstream Water at Time of Inspection  $\pm$  436 feet<sup>7</sup> (Wabash River)  
 D. Maximum Pond Water Elevation  $\pm$  Not Specified

1.3.5 Design and Construction Records and History

Design drawings and specifications for Pond A and Pond B were provided to GZA. No design documents were available for Pond D. No construction quality control documentation was available from Ameren with regards to the ash impoundments. The Stability Evaluation provides information regarding the materials that comprise Pond D embankments. A list of the documents provided to GZA by Ameren is provided in **Appendix D**.

1.3.6 Operating Records

No operating records were available for the impoundments.

1.3.7 Previous Inspection Reports

The impoundments are visually inspected by Ameren engineers on a quarterly basis in accordance with company policies. The inspection report from March 31, 2011 was reviewed by GZA and is included as **Appendix E**. It was noted during the March 31, 2011 inspection that the required freeboard of 2 feet was not being maintained in areas of Pond A where ash levels had risen to within approximately 1 foot of the crest. It was recommended that the ash be regraded to create the necessary freeboard. In addition, the report recommended that staff gauges be added to the outfall structures.

## 2.0 INSPECTION

### 2.1 Visual Inspection

The HPS impoundments were inspected on June 2, 2011, by Patrick J. Harrison, P.E., and Douglas P. Simon, P.E., of GZA, and accompanied by several Ameren personnel. The weather was overcast with temperatures in the 70's Fahrenheit. Photographs to document the current conditions of the impoundments were taken during the inspection and are provided in **Appendix F**. The water levels in the impoundments at the time of the inspection were as provided in Section 1.3.4. Underwater areas were not inspected, as this level of investigation was beyond GZA's scope of services. Copies of the EPA Checklists are provided in **Appendix C**.

With respect to our visual inspection, there was no evidence of prior releases, failures, or patchwork observed by GZA.

<sup>7</sup> The downstream water elevation was taken to be the normal flood stage elevation reported in the Stability Evaluation.



### 2.1.1 Pond A General Findings

In general, Pond A was found to be in **POOR** condition. An overall Site plan showing the impoundments is provided as **Figure 2**. The location and orientation of Pond A photographs provided in **Appendix F** is shown on **Figure 3**.

### 2.1.2 Pond A Upstream Slope (Photos 1 through 10)

Fly ash had been placed to within 1 foot of the crest elevation along the northern and western portions of the upstream slope. Furthermore, the water surface elevation along the remaining portions of the impoundment was approximately at elevation 469.5 feet at the time of inspection. Therefore, the upstream slope was below the water level or covered by ash and was not visible. No unusual movement, depressions or sloughing was evident through the overlying fly ash.

### 2.1.3 Pond A Crest of Impoundment (Photos 1 through 10)

The crest of Pond A had a gravel access road along the eastern portion and was seeded along the remaining portions. The crest of the impoundment had occasional animal burrows present at the time of inspection. The alignment of the crest of the impoundment appeared generally level with no large depressions or irregularities observed. Based on information provided by Ameren, the crest of the impoundment is at approximately elevation 470.0 feet MSL. No significant settlement was observed at the time of our inspection. There was approximately 6 inches of free board at the time of our inspection.

### 2.1.4 Pond A Downstream Slope (Photos 11 through 19)

The downstream slope of the impoundment was generally vegetated with grass. No seepage was observed on the downstream slope. Minor localized sloughing of the soils was observed along the downstream slope near the northeast corner of the impoundment.

### 2.1.5 Pond A Discharge Pipes (Photos 20 through 22)

Water and CCW from the plant are discharged into Pond A through a 10-inch diameter pipe that was located along the northwestern portion of the impoundment at the time of our inspection. The discharge pipe appeared to be in good condition. GZA observed the condition of the decant structure that transmits water from Pond A into Pond B. The decant structure generally appeared to be in good condition. However, the discharge pipe into Pond B was being repaired at the time of our inspection and no water was allowed to flow through the decant structure. The water levels in Pond A were in the process of being controlled via use of a diesel powered pump to transfer water from Pond A into Pond B. Delay in setting up the pumping system apparently led to the temporarily elevated levels in Pond A (i.e. water rise up to about 0.5 feet below the crest). Soon after our arrival we witnessed the operation of the pump which initiated drawdown of the water level in Pond A. It is understood that once repairs to the discharge pipe are complete, available freeboard in Pond A will return to normal levels.



### 2.1.6 Pond B General Findings

In general, Pond B 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 F** are shown on the Photo Plan in **Figure 3**.

### 2.1.7 Pond B Upstream Slope (Photos 23 through 29)

The water surface elevation at the time of inspection was approximately at elevation 461.8 feet MSL. Therefore, the lower portion of the upstream slope was below the water level and not visible. The upstream slopes were covered with HDPE liner above the water level and generally in good condition. No unusual movement or sloughing was observed on the slopes.

### 2.1.8 Pond B Crest of Impoundment (Photos 25 through 27)

The crest of Pond B is generally covered by a gravel access road and was in good condition at the time of our inspection. The alignment of the crest of the impoundment appeared generally level with no large depressions or irregularities observed. Based on information provided by Ameren, the crest elevation was approximately elevation 465 feet MSL. No significant settlement was observed at the time of our inspection. There was approximately 3 feet of free board at the time of our inspection.

### 2.1.9 Pond B Downstream Slope (Photos 30 through 34)

The western portion of Pond B is adjacent to Pond A. Therefore, the discussion of downstream slopes for Pond B does not include the western embankment. The downstream slopes of the impoundment were generally vegetated with grass. No seepage or sloughing was observed on the downstream slope.

### 2.1.10 Pond B Discharge Pipes (Photos 35 through 38)

Decanted water and CCW from Pond A are discharged into Pond B near the western portion of the impoundment through an 18-inch diameter pipe. The discharge pipe was being repaired at the time of our inspection and a diesel powered pump was used to transfer water from Pond A into Pond B.

Decanted water and CCW from Pond C are discharged into Pond B near the northeastern corner of the impoundment through a 10-inch diameter pipe. In addition, fly ash and water can be diverted from Pond A and discharged directly into Pond B through a 10-inch diameter pipe near the northeast corner. The discharge pipes appeared to be in good condition. GZA observed the condition of the decant structure that transmits water from Pond B to the Wabash River. The visible portions of the decant structure appeared to be in good condition.

### 2.1.11 Pond D General Findings

In general, Pond D 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 F** are shown on the Photo Plan in **Figure 13**.



#### 2.1.12 Pond D Upstream Slope (Photos 44 through 51)

The water surface elevation at the time of inspection was approximately at elevation 449.8 feet MSL. Therefore, the lower portion of the upstream slope was below the water level and not visible. In addition, settled bottom ash covered much of the upstream slope and crest making it difficult to determine the break between the crest and the slope.

#### 2.1.13 Pond D Crest of Impoundment (Photos 42, 45 through 48)

The crest of Pond D was generally covered with bottom ash that was vegetated in areas. The alignment of the crest along the western and southern embankments appeared generally level with no large depressions or irregularities observed. The eastern embankment and northern crest had bottom ash stockpiled on them. The crest elevation was approximately elevation 453.8 feet MSL. No significant settlement was observed at the time of our inspection. There was approximately 4 feet of free board at the time of our inspection.

#### 2.1.14 Pond D Downstream Slope

The eastern embankment of Pond D abuts the Wabash River flood plain and water levels in the river were above the toe elevation at the time of our inspection. The high water levels prohibited access to the embankment from below. A fence at the crest of the embankment prohibited our access from above. Based on our observations through the fence, the downstream slope of the impoundment was vegetated with grass that had not been recently mowed. No seepage or sloughing was observed on the downstream slope from the crest.

#### 2.1.15 Pond D Discharge Pipes (Photos 44, 45, 46, 49, 52 through 56)

Water and CCW from the plant are discharged into Pond D through several discharge pipes and culverts. The discharge pipes and culverts appeared to be in good condition. GZA observed the condition of the decant structure located near the southern corner of the impoundment that transmits water from Pond D into Pond C. The decant structure appeared to be in good condition.

### 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. The observations, descriptions and findings presented in this report reference these discussions.

### 2.3 Operation and Maintenance Procedures

As discussed in Section 1.2.5, HPS personnel are responsible for maintenance of the impoundments. Limited maintenance requirements were included in the permit for Pond A. Otherwise, no formal maintenance program is in place for the impoundments. Based on our discussions with HPS personnel, the impoundments are monitored quarterly and mowed at regular intervals.



## 2.4 Emergency Action Plan

The HPS has a general Emergency Action Plan (EAP) for the facility, however it is not specific to potential situations that may arise at the impoundments. An EAP is not required for Class III structures per Illinois Dam Safety regulations. Note that the hazard potential classification for the impoundments is discussed in Section 1.2.8.

## 2.5 Hydrologic/Hydraulic Data

Based on the information provided, a hydrologic and hydraulic analysis has not been performed for Pond A, Pond B or Pond D. Although an analysis was not included in the permit, the maximum allowable water level for Pond A is limited to 2 to 3 feet below the crest. 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

A stability analysis was conducted as part of obtaining the permit for Pond A. The analysis indicated a factor of safety against global failure of 1.5 without seismic load and 1.3 with seismic load.

A stability analysis was not included in the design documents for Pond B.

A stability analysis of (the active portion of) Pond D was conducted by Geotechnology, Inc. and the results were provided in the Stability Evaluation. Based on the results provided, the calculated factor of safety against global failure without seismic loading ranged from 1.3 to 2.1. Under seismic loading and high groundwater conditions, the calculated factor of safety was 0.9 which is below the typically accepted design of 1.0. GZA did not perform an independent assessment of the structural and seepage stability 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 Pond A was judged to be **POOR** and was found to have the following deficiencies:

1. Animal burrows along the crest;
2. Minor sloughing on the downstream slope;
3. No documented hydrologic/hydraulic analysis; and,
4. Conditions leading to inadequate freeboard.

In general, the overall condition of Pond B was judged to be **POOR** and was found to have the following deficiencies:

1. No documented stability or hydrologic/hydraulic analysis.



In general, the overall condition of Pond D was judged to be **POOR** and was found to have the following deficiencies:

1. No documented hydrologic/hydraulic analysis.
2. The calculated factor of safety under seismic loading was less than the generally accepted value 1.0.

Please note that access to the downstream slope of Pond D along the Wabash River was limited and additional deficiencies may or may not be present along the slope. The following sections describe the recommended approach to address current deficiencies. Prior to undertaking recommended maintenance, repairs, or remedial measures, the applicability of permits needs to be determined for activities that may occur within the jurisdiction of the appropriate regulatory agencies.

### 3.2 Studies and Analyses

GZA recommends the following studies and analyses:

1. Perform a stability analysis of the slopes of Pond B; and,
2. Perform a hydrologic/hydraulic analysis on Pond A, Pond B and Pond D to establish the maximum allowable water elevation.
3. Perform stability analysis of Pond D embankment using a detailed Site-specific hazard analysis per International Building Code recommendations. In addition, given that the inadequate factor of safety was calculated during a combination of events (i.e. both and earthquake and flooding), a combined risk analysis should be performed in accordance with US Army Corp of Engineers (USACE) recommendations.

### 3.3 Recurrent Operation & Maintenance Recommendations

GZA recommends the following operation and maintenance level activities:

1. Repair sloughing on the downstream slope of Pond A;
2. Fill currently observed animal burrows by injecting grout under low to moderate pressures to ensure the entire limits of the respective burrow is adequately filled;
3. Exercise stoplogs and slide gates; and,
4. Increase frequency of maintenance mowing such that overgrowth of vegetation is minimized

### 3.4 Remedial Measures Recommendations

1. In conjunction with the results of the hydrologic and hydraulic analyses, make provisions for an emergency overflow spillway(s) if appropriate; and
2. In conjunction with the results of the stability analyses, make provisions to address deficiencies if/as necessary.

3. In conjunction with the results of the seismic stability analysis, take measures to increase the factor of safety of the embankment for Pond D under seismic loading to at least 1.0 as appropriate

### 3.5 Alternatives

There are no alternatives currently recommended.



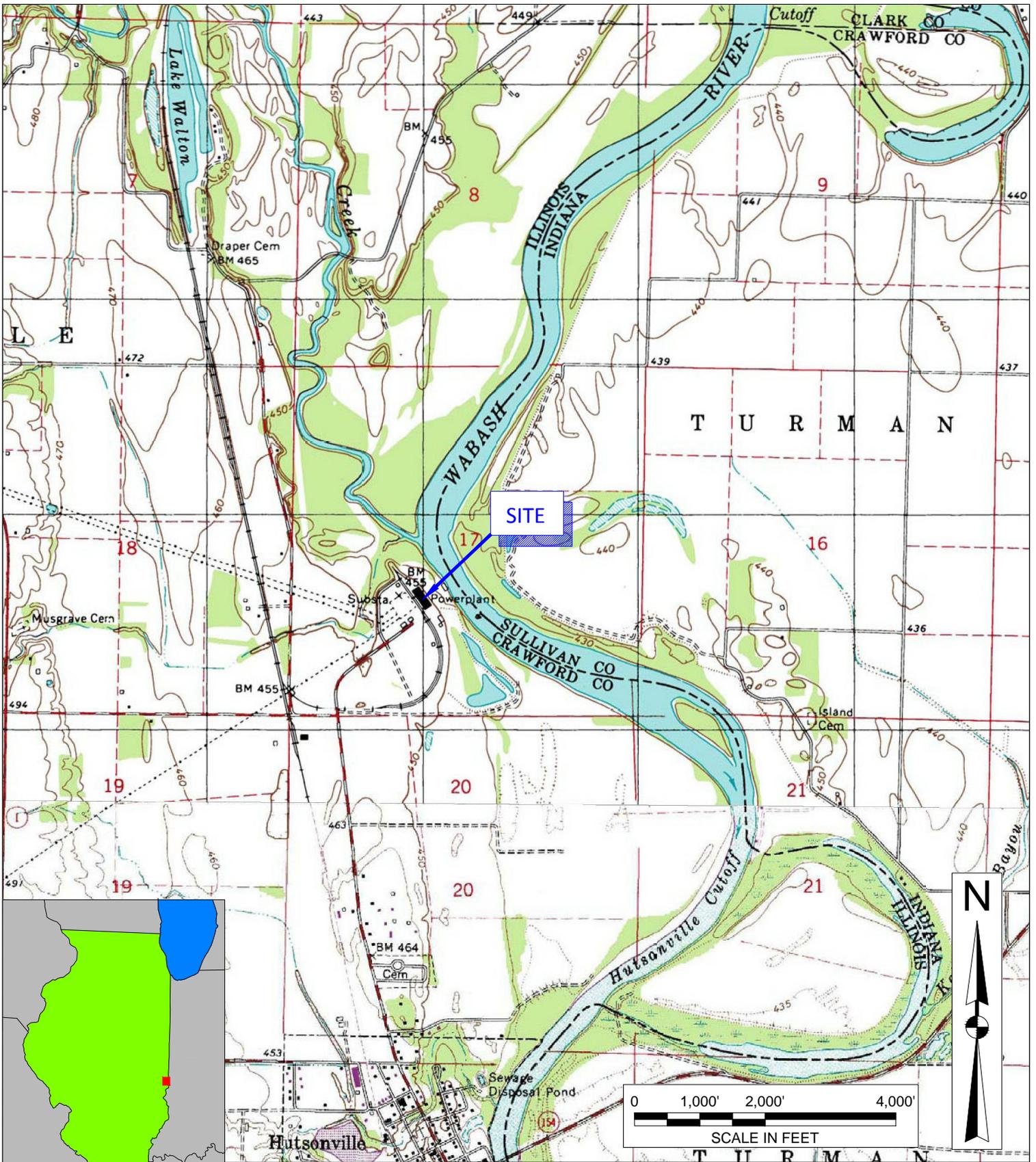
## 4.0 ENGINEER'S CERTIFICATION

I acknowledge that the management units referenced herein, Pond A, Pond B and Pond D have been assessed to be in **POOR** condition on June 2, 2011.

Patrick J. Harrison, P.E.  
Senior Consultant

J:\170,000-179,999\170142\170142-30 Round 10\Hutsonville - Ameren\Stability Calc Edits\3rd DRAFT - Hutsonville Report.docx

**FIGURES**



UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.

SOURCE: U.S.G.S. QUADRANGLE MAPS  
WEST UNION, IN-IL (1998)  
HUTSONVILLE, IL (1966) PHOTOREVISED (1987)

PREPARED BY: **GZA GeoEnvironmental, Inc.**  
**Engineers and Scientists**  
20800 SWENSON DRIVE, SUITE 150  
WAUKESHA, WISCONSIN 53186  
(262) 754-2560

PREPARED FOR:

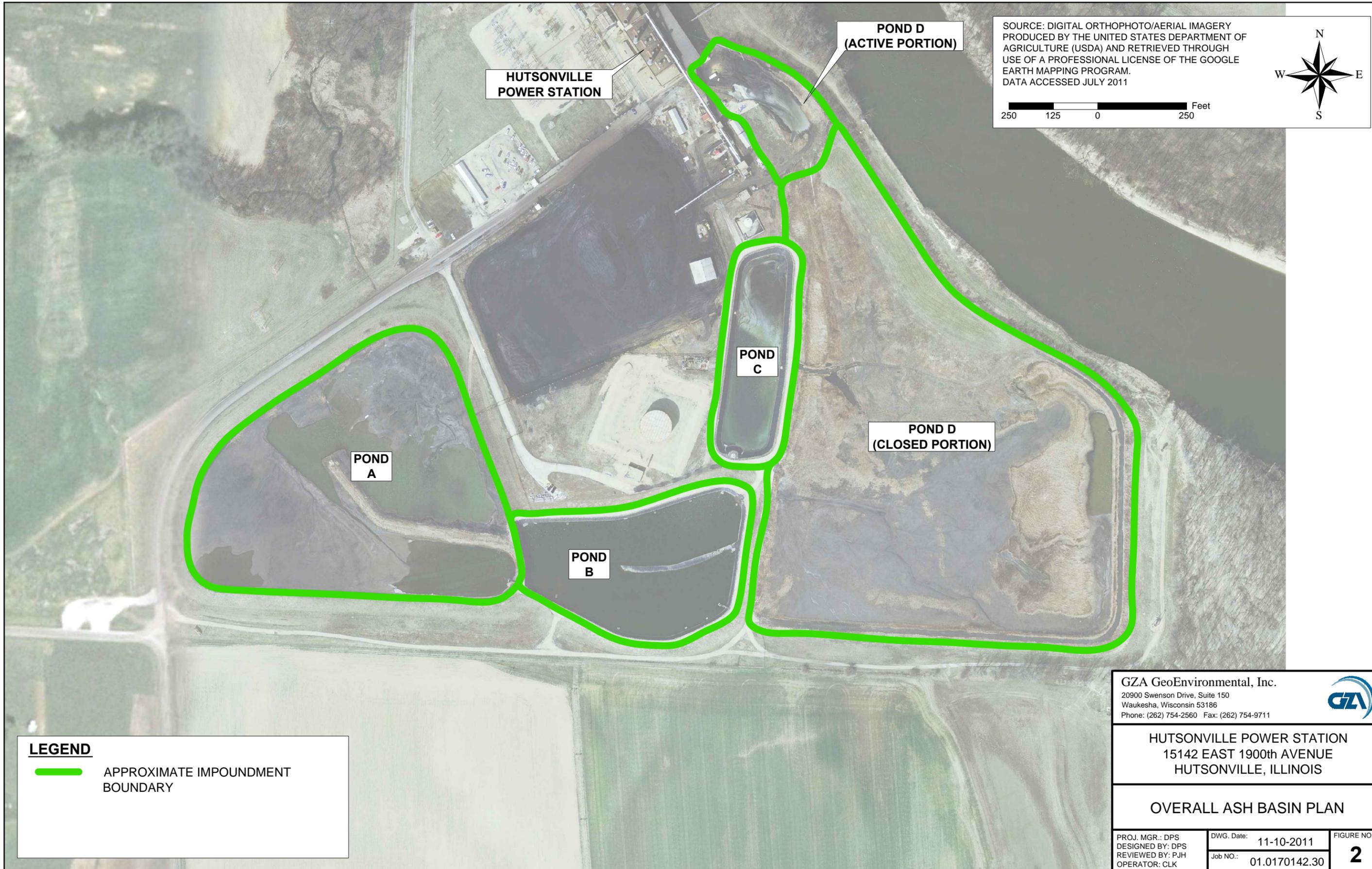
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DESIGNED BY:	DPS	DRAWN BY:	CLK	SCALE:	1 : 24000	PROJECT NO.	01.0170142.30

NO.	ISSUE/DESCRIPTION	BY	DATE

**SITE LOCATION MAP**

**HUTSONVILLE POWER STATION**  
15142 EAST 1900th AVENUE  
HUTSONVILLE, ILLINOIS

FIGURE  
**1**  
SHEET NO.



**LEGEND**

 APPROXIMATE IMPOUNDMENT BOUNDARY

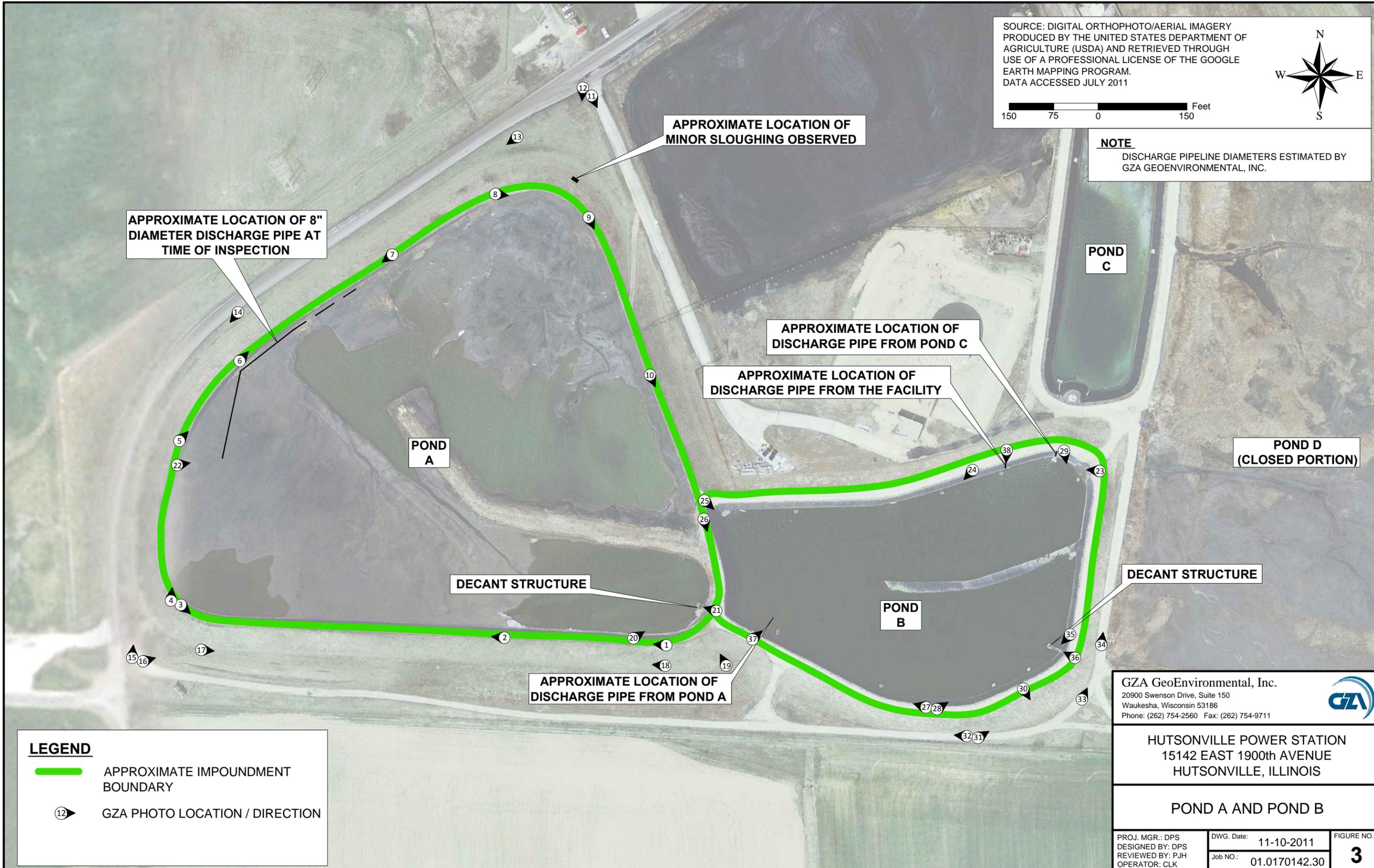
GZA GeoEnvironmental, Inc.  
20900 Swenson Drive, Suite 150  
Waukesha, Wisconsin 53186  
Phone: (262) 754-2560 Fax: (262) 754-9711



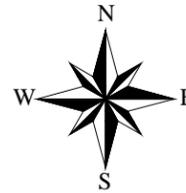
**HUTSONVILLE POWER STATION**  
15142 EAST 1900th AVENUE  
HUTSONVILLE, ILLINOIS

**OVERALL ASH BASIN PLAN**

PROJ. MGR.: DPS	DWG. Date: 11-10-2011	FIGURE NO.:
DESIGNED BY: DPS	Job NO.: 01.0170142.30	<b>2</b>
REVIEWED BY: PJH		
OPERATOR: CLK		



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 JULY 2011



**NOTE**  
 DISCHARGE PIPELINE DIAMETERS ESTIMATED BY  
 GZA GEOENVIRONMENTAL, INC.

**LEGEND**

- █ APPROXIMATE IMPOUNDMENT BOUNDARY
- 12 → GZA PHOTO LOCATION / DIRECTION

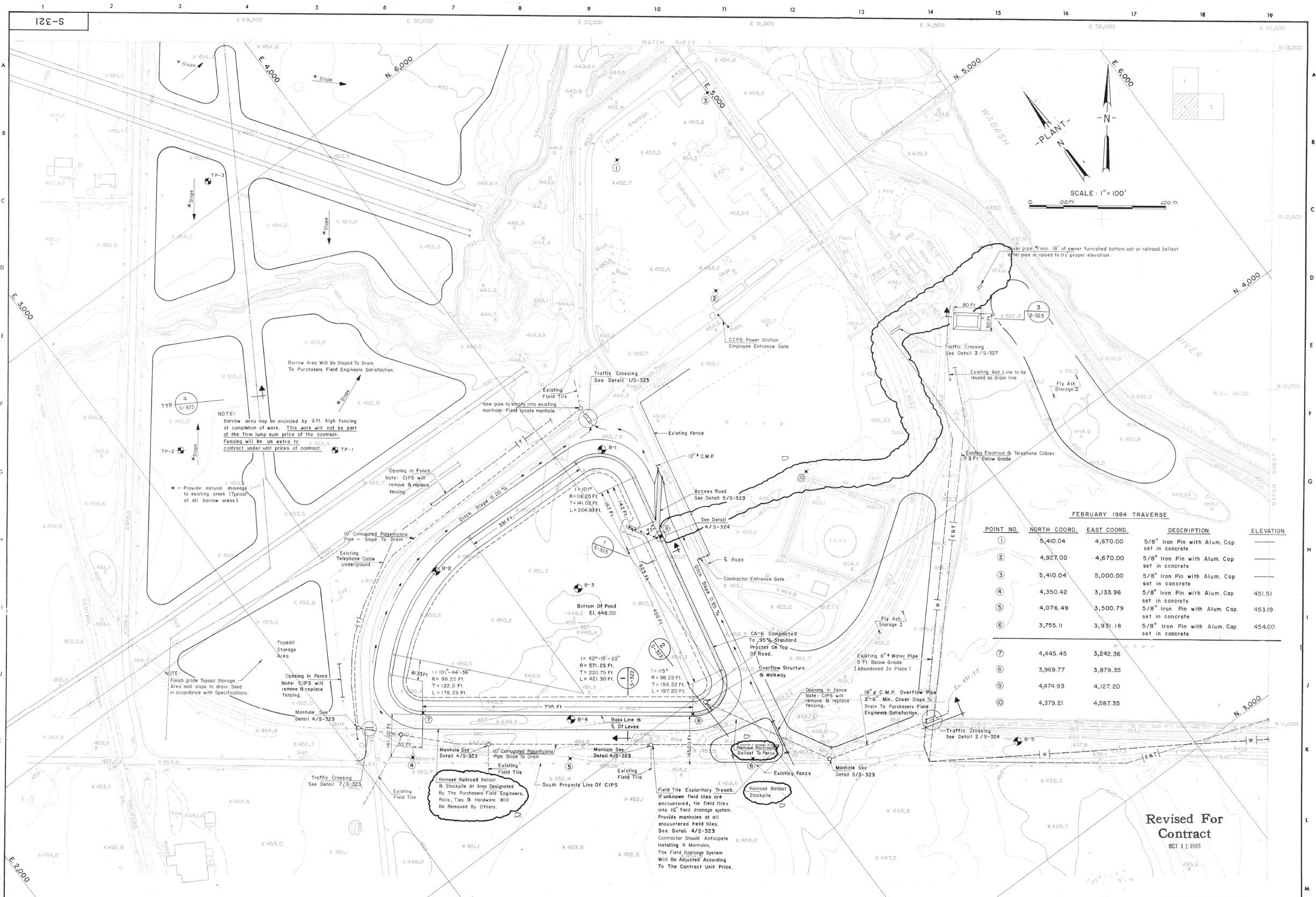
GZA GeoEnvironmental, Inc.  
 20900 Swenson Drive, Suite 150  
 Waukesha, Wisconsin 53186  
 Phone: (262) 754-2560 Fax: (262) 754-9711



HUTSONVILLE POWER STATION  
 15142 EAST 1900th AVENUE  
 HUTSONVILLE, ILLINOIS

POND A AND POND B

PROJ. MGR.: DPS	DWG. Date: 11-10-2011	FIGURE NO.:
DESIGNED BY: DPS	Job NO.: 01.0170142.30	<b>3</b>
REVIEWED BY: PJH		
OPERATOR: CLK		



FEBRUARY 1984 TRAVERSE

POINT NO.	NORTH COORD.	EAST COORD.	DESCRIPTION	ELEVATION
1	5,410.04	4,670.00	5/8" Iron Pin with Alum. Cap set in concrete	
2	4,927.00	4,670.00	5/8" Iron Pin with Alum. Cap set in concrete	
3	5,410.04	5,000.00	5/8" Iron Pin with Alum. Cap set in concrete	
4	4,350.42	3,133.96	5/8" Iron Pin with Alum. Cap set in concrete	451.51
5	4,076.49	3,500.79	5/8" Iron Pin with Alum. Cap set in concrete	453.19
6	3,755.11	3,931.16	5/8" Iron Pin with Alum. Cap set in concrete	454.00
7	4,445.45	3,242.36		
8	3,969.77	3,879.35		
9	4,474.93	4,127.20		
10	4,379.21	4,587.35		

**Revised For Contract**  
OCT 11 1985

**FLY ASH DISPOSAL POND  
SITE PLAN  
HUTSONVILLE POWER STATION  
CENTRAL ILLINOIS PUBLIC SERVICE CO.**

DESIGNED: [Signature]  
CHECKED: C.C.  
DRAWN: C.C.  
FILE NO: 3433012  
DATE: April 1984  
SCALE: As Shown  
PCMS No.: 0801

DRAWING NO. S-321  
REV. D  
SHEET OF

REV	DATE	REVIEWED	APPROVED	DESCRIPTION
A	4-9-84	T.R.G.	S.A.P.	For Bid Purposes Only 0801-01
B	4-17-85	T.R.G.	S.A.P.	For Bid Purposes Only 0801-01 1985
C	9-16-85	T.R.G.	S.A.P.	For Bid Purposes Only 0801-01 1985
D	10-11-85	T.R.G.	S.A.P.	Revised For Contract 0801-01 1985

REV	DATE	REVIEWED	APPROVED	DESCRIPTION

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

PROJ MGR: DPS  
DESIGNED BY: DPS  
REVIEWED BY: PJH  
OPERATOR: CLK  
DATE: 10-24-2011

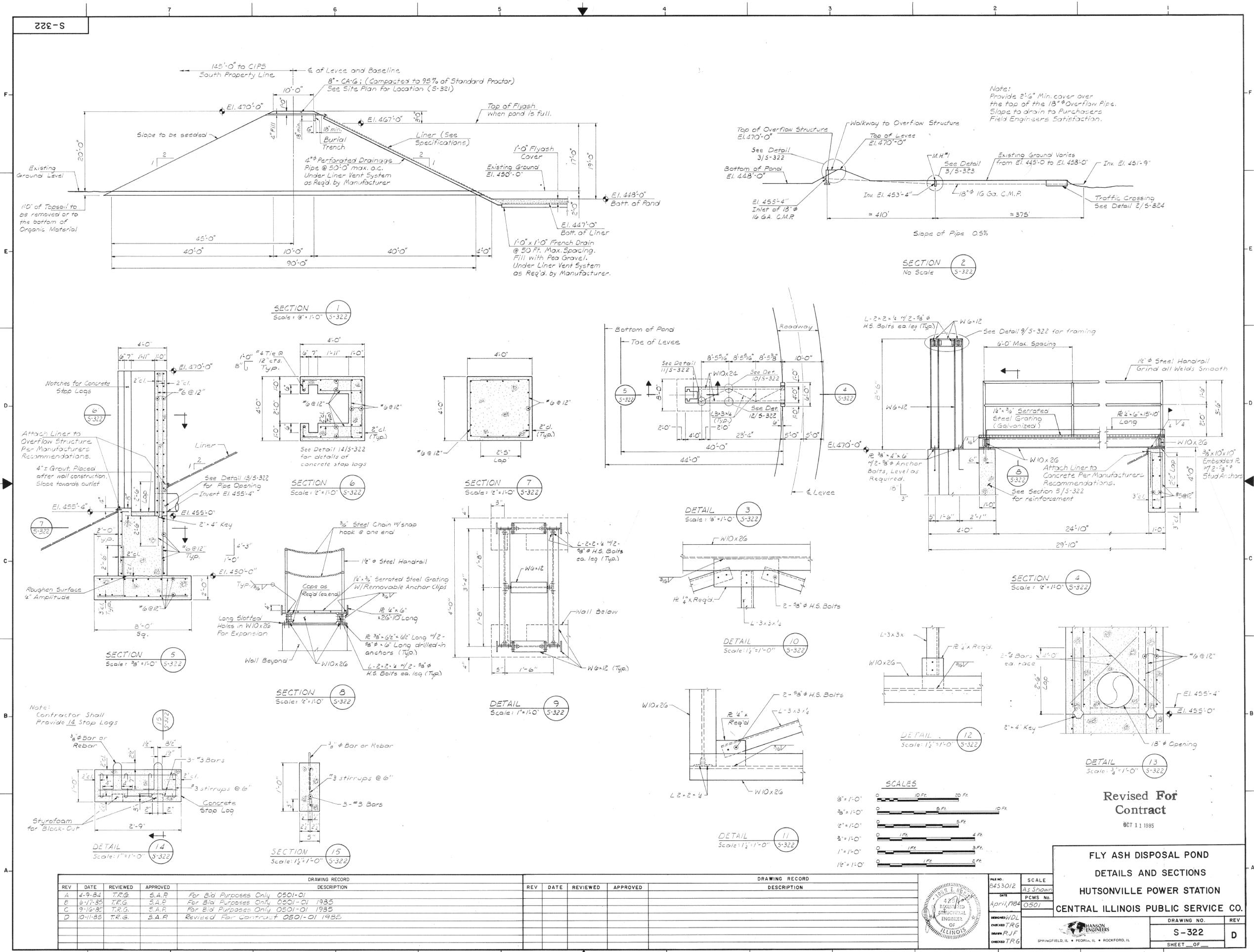
HUTSONVILLE POWER STATION  
15142 EAST 1900th AVENUE  
HUTSONVILLE, ILLINOIS

POND A  
PLAN OF DESIGN

JOB NO. 01.0170142.30  
FIGURE NO. 4

GZA Environmental, Inc.  
500 Environmental Center  
Springfield, Illinois 62761  
Phone (202) 754-2500 • Fax (202) 754-9111

GZA



REV	DATE	REVIEWED	APPROVED	DESCRIPTION
A	4-9-84	T.R.G.	S.A.P.	For Bid Purposes Only 0501-01
B	6-7-85	T.R.G.	S.A.P.	For Bid Purposes Only 0501-01 1985
C	9-16-85	T.R.G.	S.A.P.	For Bid Purposes Only 0501-01 1985
D	0-11-88	T.R.G.	S.A.P.	Revised For Contract 0501-01 1988

REV	DATE	REVIEWED	APPROVED	DESCRIPTION



**FLY ASH DISPOSAL POND**  
**DETAILS AND SECTIONS**  
**HUTSONVILLE POWER STATION**  
**CENTRAL ILLINOIS PUBLIC SERVICE CO.**  
 06T 11 1985

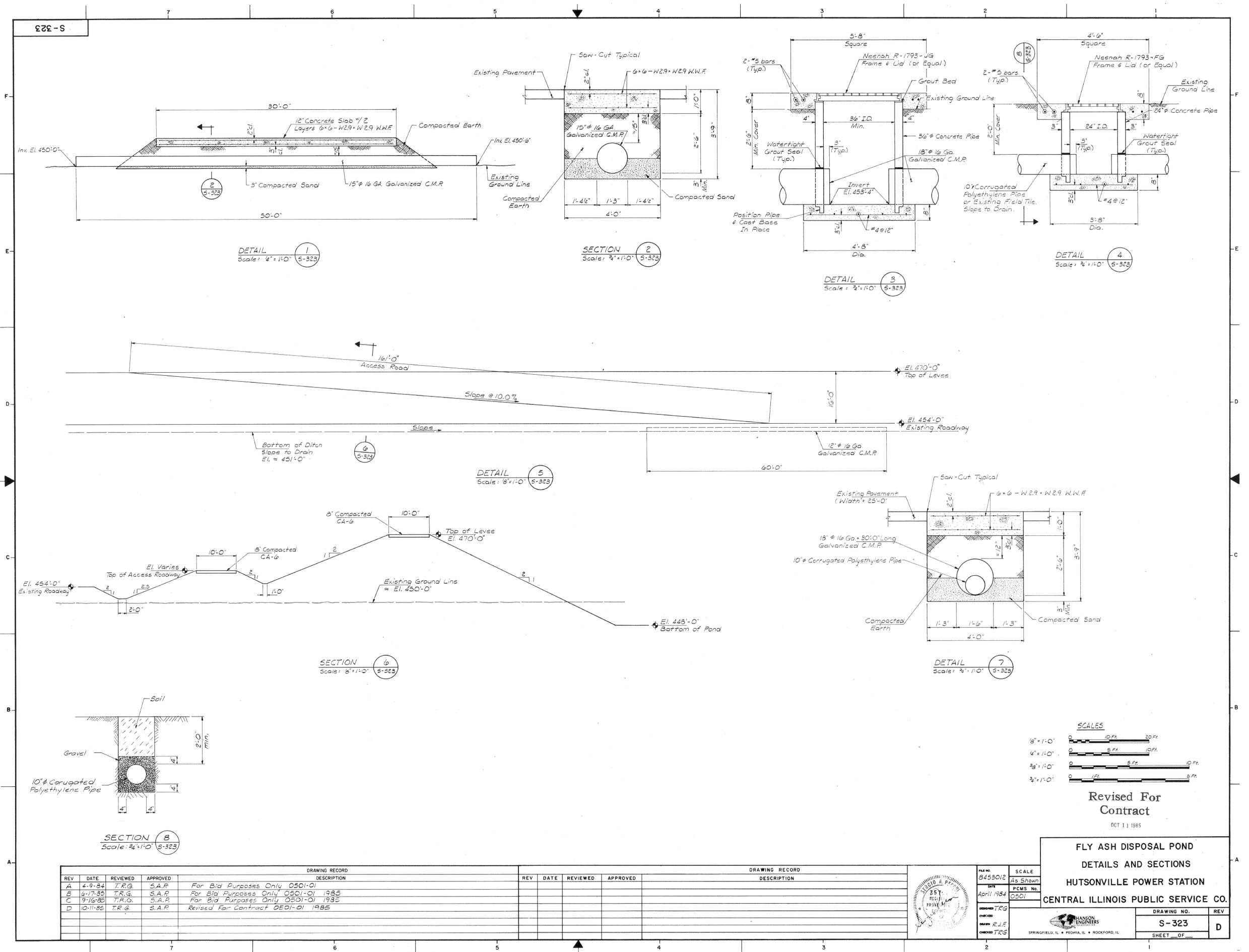
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DATE April, 1984	PCMS No. 0501
DESIGNED W/DL	CHECKED TRG
DRAWN R/JF	CHECKED TRG

DRAWING NO. S-322	REV D
SHEET OF	

HUTSONVILLE POWER STATION  
 15142 EAST 1900th AVENUE  
 HUTSONVILLE, ILLINOIS  
 TYPICAL CROSS SECTION  
 JOB NO. 01.0170142.30  
 FIGURE NO. 5

GZA  
 Environmental Inc.  
 20000 Sandstone Drive • Rosemead, Wisconsin 53196  
 (414) 261-2500 • Fax (414) 261-9111  
 www.gza.com

REV. NO.	DESCRIPTION	BY	DATE



REV	DATE	REVIEWED	APPROVED	DESCRIPTION
A	4-9-84	T.R.G.	S.A.P.	For Bid Purposes Only 0501-01
B	6-17-85	T.R.G.	S.A.P.	For Bid Purposes Only 0501-01 1985
C	9-16-85	T.R.G.	S.A.P.	For Bid Purposes Only 0501-01 1985
D	10-11-85	T.R.G.	S.A.P.	Revised For Contract 0501-01 1985

REV	DATE	REVIEWED	APPROVED	DESCRIPTION



FILE NO: 8483012  
 DATE: April 1984  
 CHECKED: TRG  
 DRAWN: R.J.F.  
 PROJECT: FLY ASH DISPOSAL POND

SCALE: As Shown  
 PCMS NO: 0501

**Revised For Contract**  
 OCT 11 1985

**FLY ASH DISPOSAL POND  
 DETAILS AND SECTIONS  
 HUTSONVILLE POWER STATION  
 CENTRAL ILLINOIS PUBLIC SERVICE CO.**

DRAWING NO. **S-323**  
 SHEET OF **D**

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

GZA  
 Environmental, Inc.  
 5500 Environmental Blvd.  
 Suite 200  
 Phoenix, Arizona 85018  
 Phone (602) 754-2500 • Fax (602) 754-9111  
 www.gza.com

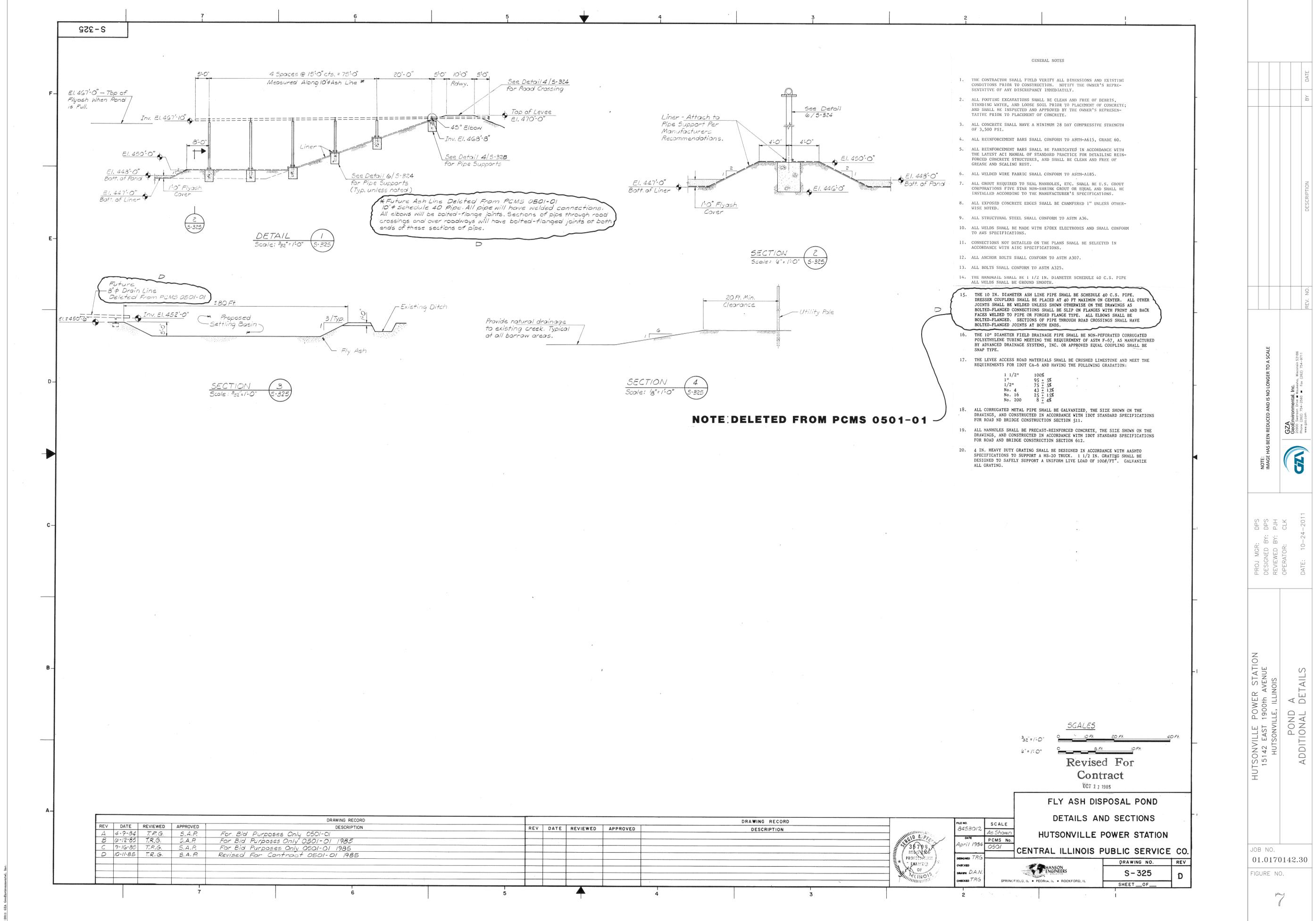
PROJ MGR: DPS  
 DESIGNED BY: DPS  
 REVIEWED BY: PJH  
 OPERATOR: CLK  
 DATE: 10-24-2011

HUTSONVILLE POWER STATION  
 15142 EAST 1900th AVENUE  
 HUTSONVILLE, ILLINOIS

POND A  
 ADDITIONAL SECTIONS

JOB NO.  
 01.0170142.30

FIGURE NO.  
 6



- GENERAL NOTES
1. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS PRIOR TO CONSTRUCTION. NOTIFY THE OWNER'S REPRESENTATIVE OF ANY DISCREPANCY IMMEDIATELY.
  2. ALL FOOTING EXCAVATIONS SHALL BE CLEAN AND FREE OF DEBRIS, STANDING WATER, AND LOOSE SOIL PRIOR TO PLACEMENT OF CONCRETE; AND SHALL BE INSPECTED AND APPROVED BY THE OWNER'S REPRESENTATIVE PRIOR TO PLACEMENT OF CONCRETE.
  3. ALL CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3,500 PSI.
  4. ALL REINFORCEMENT BARS SHALL CONFORM TO ASTM-A615, GRADE 60.
  5. ALL REINFORCEMENT BARS SHALL BE FABRICATED IN ACCORDANCE WITH THE LATEST ACI MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES, AND SHALL BE CLEAN AND FREE OF GREASE AND SCALING RUST.
  6. ALL WELDED WIRE FABRIC SHALL CONFORM TO ASTM-A185.
  7. ALL GROUT REQUIRED TO SEAL MANHOLES, ETC. SHALL BE U.S. GROUT CORPORATION'S FIVE STAR NON-SHRINK GROUT OR EQUAL AND SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS.
  8. ALL EXPOSED CONCRETE EDGES SHALL BE CHAMFERED 1" UNLESS OTHERWISE NOTED.
  9. ALL STRUCTURAL STEEL SHALL CONFORM TO ASTM A36.
  10. ALL WELDS SHALL BE MADE WITH E70XX ELECTRODES AND SHALL CONFORM TO AWS SPECIFICATIONS.
  11. CONNECTIONS NOT DETAILED ON THE PLANS SHALL BE SELECTED IN ACCORDANCE WITH AISC SPECIFICATIONS.
  12. ALL ANCHOR BOLTS SHALL CONFORM TO ASTM A307.
  13. ALL BOLTS SHALL CONFORM TO ASTM A325.
  14. THE HANGNAIL SHALL BE 1/2 IN. DIAMETER SCHEDULE 40 C.S. PIPE. ALL WELDS SHALL BE GROUND SMOOTH.
  15. THE 10 IN. DIAMETER ASH LINE PIPE SHALL BE SCHEDULE 40 C.S. PIPE. DRESSER COUPLERS SHALL BE PLACED AT 40 FT MAXIMUM ON CENTER. ALL OTHER JOINTS SHALL BE WELDED UNLESS SHOWN OTHERWISE ON THE DRAWINGS AS BOLTED-FLANGED CONNECTIONS SHALL BE SLIP ON FLANGES WITH FRONT AND BACK FACES WELDED TO PIPE OR FORGED FLANGE TYPE. ALL ELBOWS SHALL BE BOLTED-FLANGED. SECTIONS OF PIPE THROUGH ROAD CROSSINGS SHALL HAVE BOLTED-FLANGED JOINTS AT BOTH ENDS.
  16. THE 10" DIAMETER FIELD DRAINAGE PIPE SHALL BE NON-PERFORATED CORRUGATED POLYETHYLENE TUBING MEETING THE REQUIREMENT OF ASTM F-457, AS MANUFACTURED BY ADVANCED DRAINAGE SYSTEMS, INC. OR APPROVED EQUAL COUPLING SHALL BE SNAP TYPE.
  17. THE LEVEE ACCESS ROAD MATERIALS SHALL BE CRUSHED LIMESTONE AND MEET THE REQUIREMENTS FOR IDOT CA-6 AND HAVING THE FOLLOWING GRADATION:
 

1 1/2"	100%
1"	95 ± 5%
1/2"	75 ± 5%
No. 4	43 ± 13%
No. 16	25 ± 13%
No. 200	8 ± 4%
  18. ALL CORRUGATED METAL PIPE SHALL BE GALVANIZED, THE SIZE SHOWN ON THE DRAWINGS, AND CONSTRUCTED IN ACCORDANCE WITH IDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION SECTION 511.
  19. ALL MANHOLES SHALL BE PRECAST-REINFORCED CONCRETE, THE SIZE SHOWN ON THE DRAWINGS, AND CONSTRUCTED IN ACCORDANCE WITH IDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION SECTION 612.
  20. 4 IN. HEAVY DUTY GRATING SHALL BE DESIGNED IN ACCORDANCE WITH AASHTO SPECIFICATIONS TO SUPPORT A HS-20 TRUCK. 1 1/2 IN. GRATING SHALL BE DESIGNED TO SAFELY SUPPORT A UNIFORM LIVE LOAD OF 100#/FT<sup>2</sup>. GALVANIZE ALL GRATING.

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



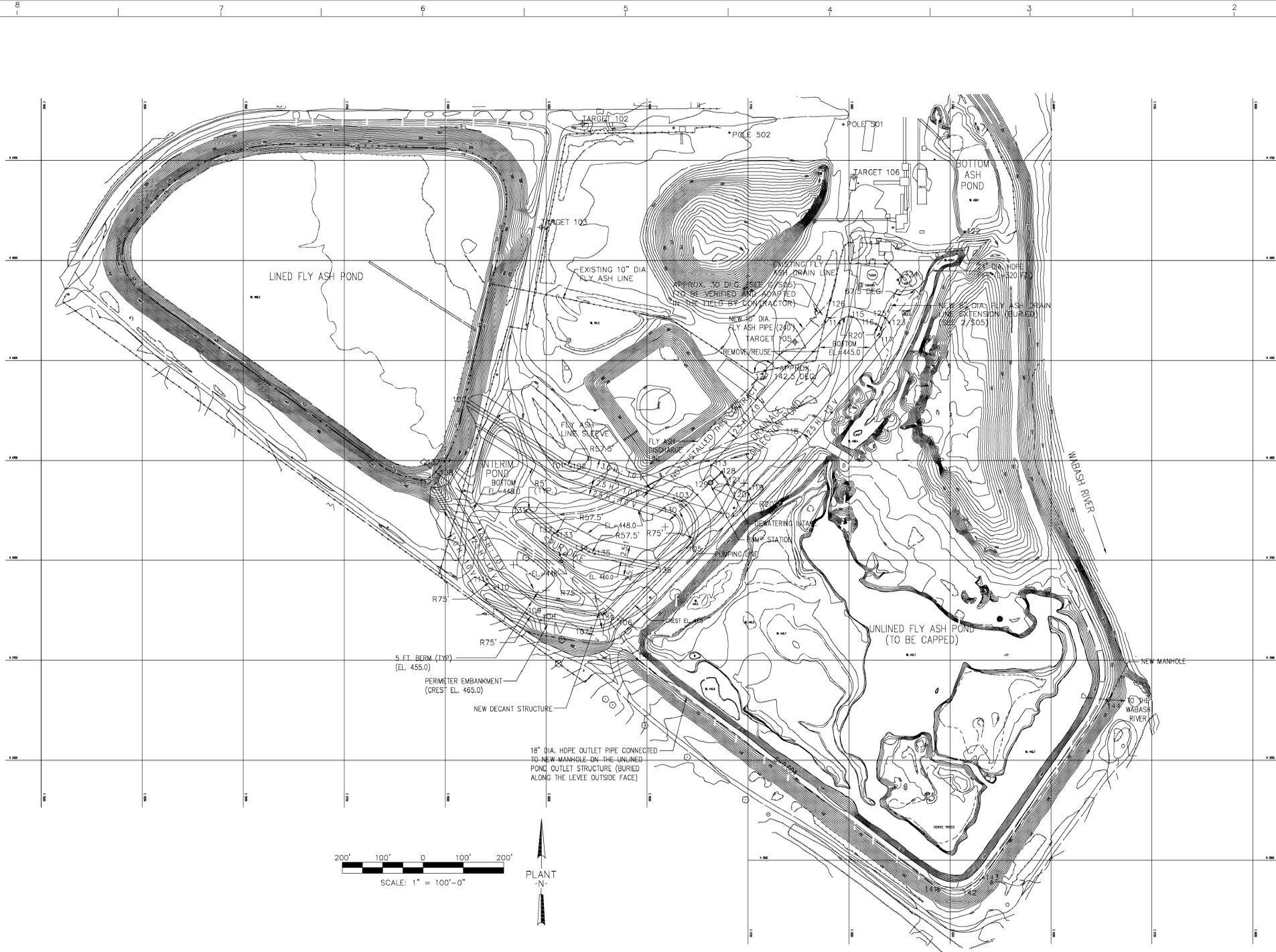
PROJ MGR: DPS  
DESIGNED BY: DPS  
REVIEWED BY: PJH  
OPERATOR: CLK  
DATE: 10-24-2011

HUTSONVILLE POWER STATION  
15142 EAST 1800th AVENUE  
HUTSONVILLE, ILLINOIS

JOB NO.  
01.0170142.30

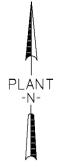
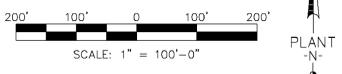
FIGURE NO.  
7





SURVEY CONTROL POINTS			
POINT NO.	NORTHING	EASTING	ELEVATION
POLE 501	4837.64	4985.77	
POLE 502	4819.22	4703.83	
TARGET 102	4841.54	4339.95	455.69
TARGET 103	4582.89	4237.96	453.35
TARGET 105	4295.28	4865.82	453.02
TARGET 106	4707.90	5011.67	453.68

DESIGN COORDINATE POINTS		
POINT NO.	NORTHING	EASTING
100	4144.64	4055.13
101	3990.48	4297.12
102	3984.03	4311.07
103	3905.12	4566.83
104	3869.38	4682.69
105	3781.67	4598.97
106	3602.43	4427.87
107	3580.22	4361.37
108	3600.78	4237.18
109	3616.13	4202.67
110	3680.27	4122.25
111	3701.86	4103.80
112	3932.24	3972.91
113	3988.00	4658.80
114	4353.05	4983.91
115	4358.92	5004.54
116	4340.64	5066.10
117	4309.05	5076.08
118	4058.73	4877.72
119	3929.11	4754.53
120	3924.93	4731.24
121	3939.86	4700.75
122	4571.60	5286.74
123	4344.17	5099.26
124	4459.25	5131.30
125	4355.87	5089.41
126	4400.35	4953.68
127	4223.75	4791.03
128	3969.54	4684.27
129	3944.07	4656.79
130	3862.45	4568.72
131	3874.25	4199.75
132	3818.24	4269.65
133	3812.31	4278.67
134	3771.46	4355.72
135	3766.08	4370.40
136	3732.49	4524.37
137	3991.19	3950.25
138	3964.77	3983.66
139	3616.83	4394.00
140	3503.72	4474.24
141	2930.56	5219.74
142	2927.64	5281.97
143	2956.89	5331.72
144	3398.25	5639.51



HEI SHEET NO.  
S02A

SITE LAYOUT PLAN  
INTERIM ASH AND DRAINAGE COLLECTION PONDS  
HUTSONVILLE, ILLINOIS

HUTSONVILLE POWER STATION  
UNIT NO.  
Ameren CIPS

Ameren CIPS DRAWING NUMBER REV.  
S376 0  
PAGE NO. 0

SCALE  
1"=100'  
P.C.M.S.  
PROJECT  
DRAFTER  
T.M.  
DATE  
5/22/00

DRAWING RECORD			
REV.	DATE	APPROVED	DESCRIPTION

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

PROJ MGR: DPS  
DESIGNED BY: DPS  
REVIEWED BY: PJH  
OPERATOR: CLK  
DATE: 10-24-2011

HUTSONVILLE POWER STATION  
15142 EAST 1800th AVENUE  
HUTSONVILLE, ILLINOIS

POND B & POND C  
PLAN OF DESIGN

JOB NO.  
01.0170142.30

FIGURE NO.  
9

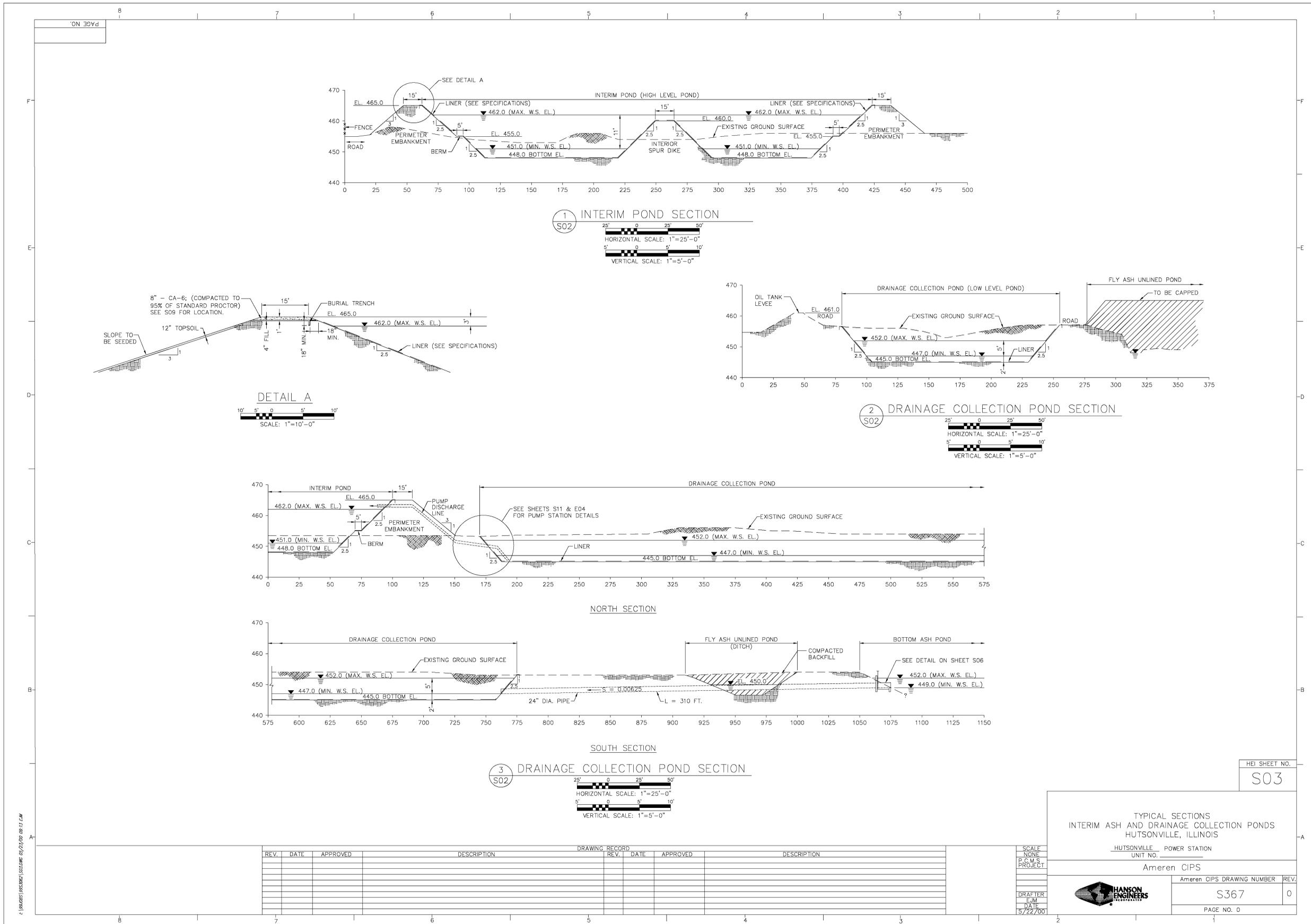
REV. NO. DESCRIPTION

BY DATE

GZA Environmental, Inc.  
Soils & Geotechnical  
Phone (202) 754-2500 • Fax (202) 754-9111  
Washington, DC

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GZA Drawing Name: A:\GZA\_USA\01.0170142.30\_Am\_Inv\_Round\_10\01.0170142.30\_Task\_9 - Hutsonville Drawings\Misc\Scanned Figures - Hutsonville.dwg Last Modified: Oct 24, 2011 - 1:33pm Plotted on: Nov 10, 2011 - 9:36am by Justin Hegarty



DRAWING RECORD			
REV.	DATE	APPROVED	DESCRIPTION

SCALE	NONE
P.C.M.S.	PROJECT
DRAFTER	EJM
DATE	5/22/00
Ameren CIPS DRAWING NUMBER REV. S367 0 PAGE NO. 0	



**HUTSONVILLE POWER STATION**  
 15142 EAST 1900th AVENUE  
 HUTSONVILLE, ILLINOIS

**POND B & POND C TYPICAL SECTIONS**

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 DESIGNED BY: DPS  
 REVIEWED BY: PJH  
 OPERATOR: CLK  
 DATE: 10-24-2011

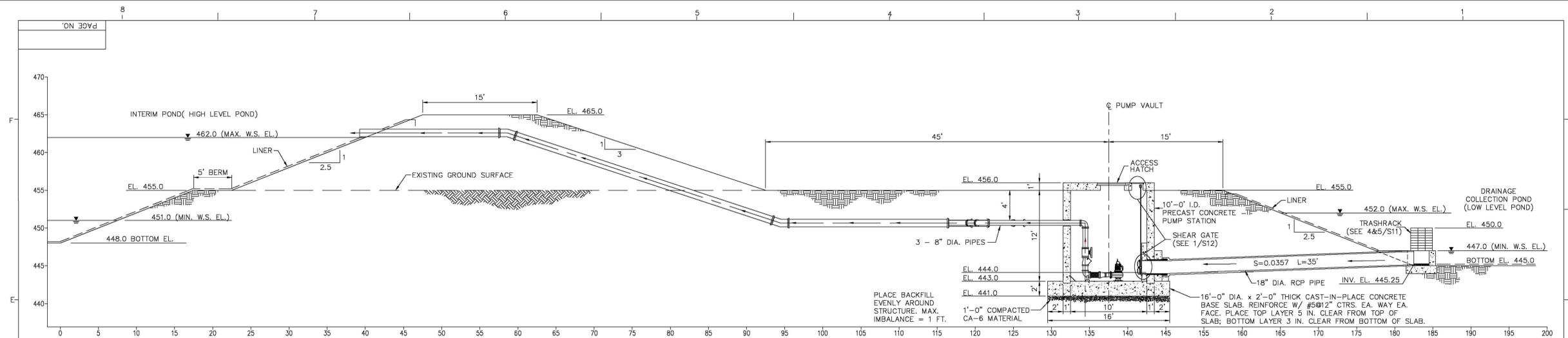
NOTE: IMAGE HAS BEEN REDUCED AND IS NO LONGER TO A SCALE

GZA Environmental, Inc.  
 5600 Westpark Drive, Suite 200  
 Overland Park, Kansas 66204  
 Phone: (913) 754-2500 Fax: (913) 754-9111

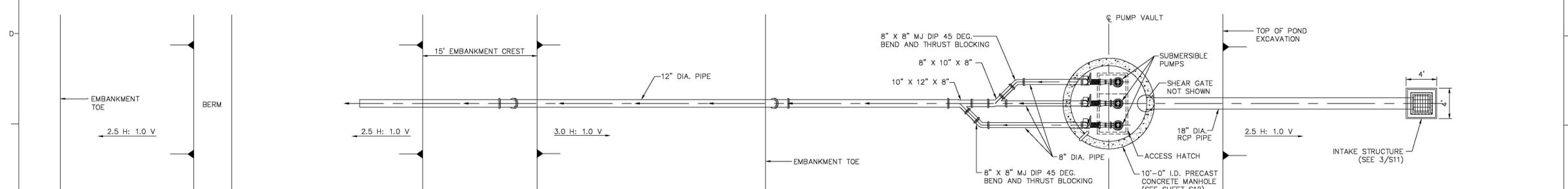
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JOB NO. 01.0170142.30  
 FIGURE NO. 10

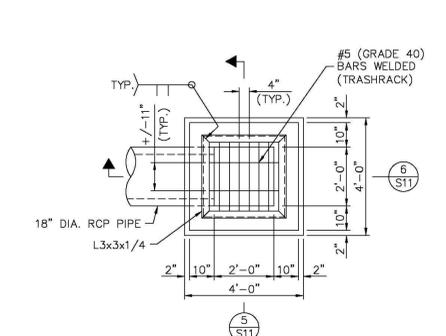




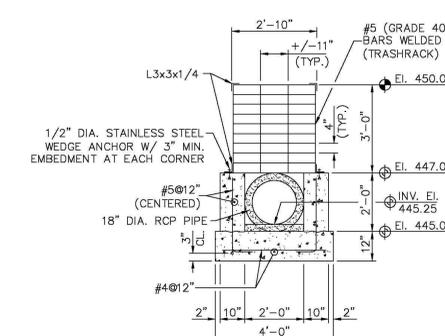
1 LONGITUDINAL SECTION-PUMP STATION  
S11 SCALE: 1"=5'-0"



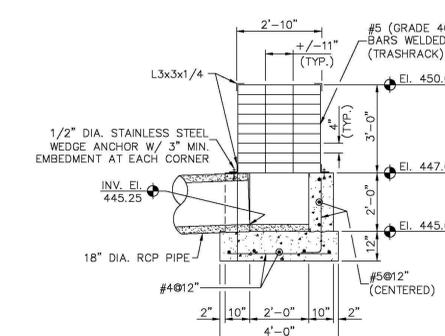
2 PLAN-PUMP STATION  
S11 SCALE: 1"=5'-0"



3 PLAN-INTAKE STRUCTURE  
S11 SCALE: 1"=2'-0"



4 SECTION  
S11 SCALE: 1"=2'-0"



5 SECTION  
S11 SCALE: 1"=2'-0"

REV.			APPROVED			DESCRIPTION		

HUTSONVILLE POWER STATION  
15142 EAST 1900 AVENUE  
HUTSONVILLE, ILLINOIS

SCALE	NONE
P.C.M.S.	PROJECT
DRAFTER	EJM
DATE	5/22/00



HUTSONVILLE POWER STATION	
UNIT NO.	
Amen CIPS	
Amen CIPS DRAWING NUMBER	REV.
S375	0
PAGE NO. 0	

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

PROJ MGR: DPS  
DESIGNED BY: DPS  
REVIEWED BY: PJH  
OPERATOR: CLK  
DATE: 10-24-2011

HUTSONVILLE POWER STATION  
15142 EAST 1900 AVENUE  
HUTSONVILLE, ILLINOIS

PUMP STATION PLAN, SECTIONS & DETAIL  
POND B & POND C

JOB NO.  
01.0170142.30

FIGURE NO.  
12

SCALE: 1"=5'-0"

SCALE: 1"=5'-0"

SCALE: 1"=2'-0"

SCALE: 1"=2'-0"

SCALE: 1"=2'-0"

HEI SHEET NO.  
S11

REV. NO.

DESCRIPTION

BY

DATE

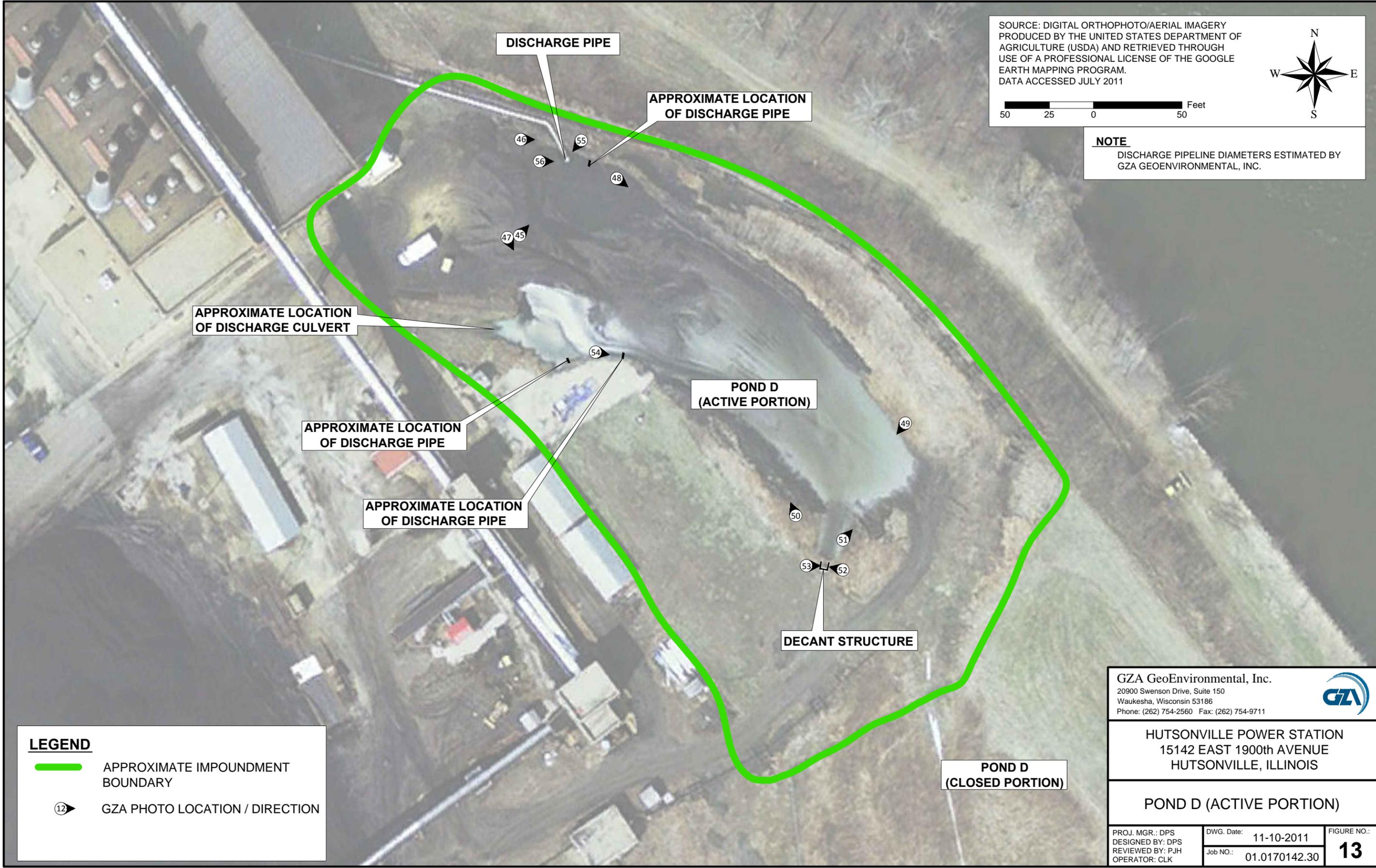
GZA Environmental, Inc.  
5800 Environmental Blvd.  
Suite 200  
Des Moines, IA 50319  
Phone: (515) 281-2500 Fax: (515) 281-9111

GZA

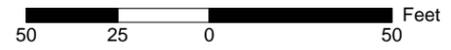
© 2011 GZA Environmental, Inc.

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EARTH MAPPING PROGRAM.  
DATA ACCESSED JULY 2011



**NOTE**  
DISCHARGE PIPELINE DIAMETERS ESTIMATED BY  
GZA GEOENVIRONMENTAL, INC.

**LEGEND**

-  APPROXIMATE IMPOUNDMENT BOUNDARY
-  GZA PHOTO LOCATION / DIRECTION

GZA GeoEnvironmental, Inc.  
20900 Swenson Drive, Suite 150  
Waukesha, Wisconsin 53186  
Phone: (262) 754-2560 Fax: (262) 754-9711



HUTSONVILLE POWER STATION  
15142 EAST 1900th AVENUE  
HUTSONVILLE, ILLINOIS

POND D (ACTIVE PORTION)

PROJ. MGR.: DPS	DWG. Date: 11-10-2011	FIGURE NO.:
DESIGNED BY: DPS	Job NO.: 01.0170142.30	<b>13</b>
REVIEWED BY: PJH		
OPERATOR: CLK		

**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.
2. In preparing this report, GZA GeoEnvironmental, Inc. (GZA) has relied on certain information provided by Alliant Energy (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 dam 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 dam 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 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 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 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 hydrology, hydraulics, and embankment stability for the dam are based on a limited review of available design documentation available from Alliant Energy and the Wisconsin Department of Natural Resources. 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 US 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.

**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 Waste (CCW) Impoundment Inspection

Impoundment NPDES Permit # IL0004120
Date June 2, 2011

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

Impoundment Name Pond A
Impoundment Company Ameren Energy Generating Company
EPA Region Region V
State Agency (Field Office) Address Illinois Department of Natural Resources
Springfield, Illinois

Name of Impoundment Pond A
(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New X Update

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

IMPOUNDMENT FUNCTION: Storage of fly ash and clarification of water prior to discharge to Pond B.

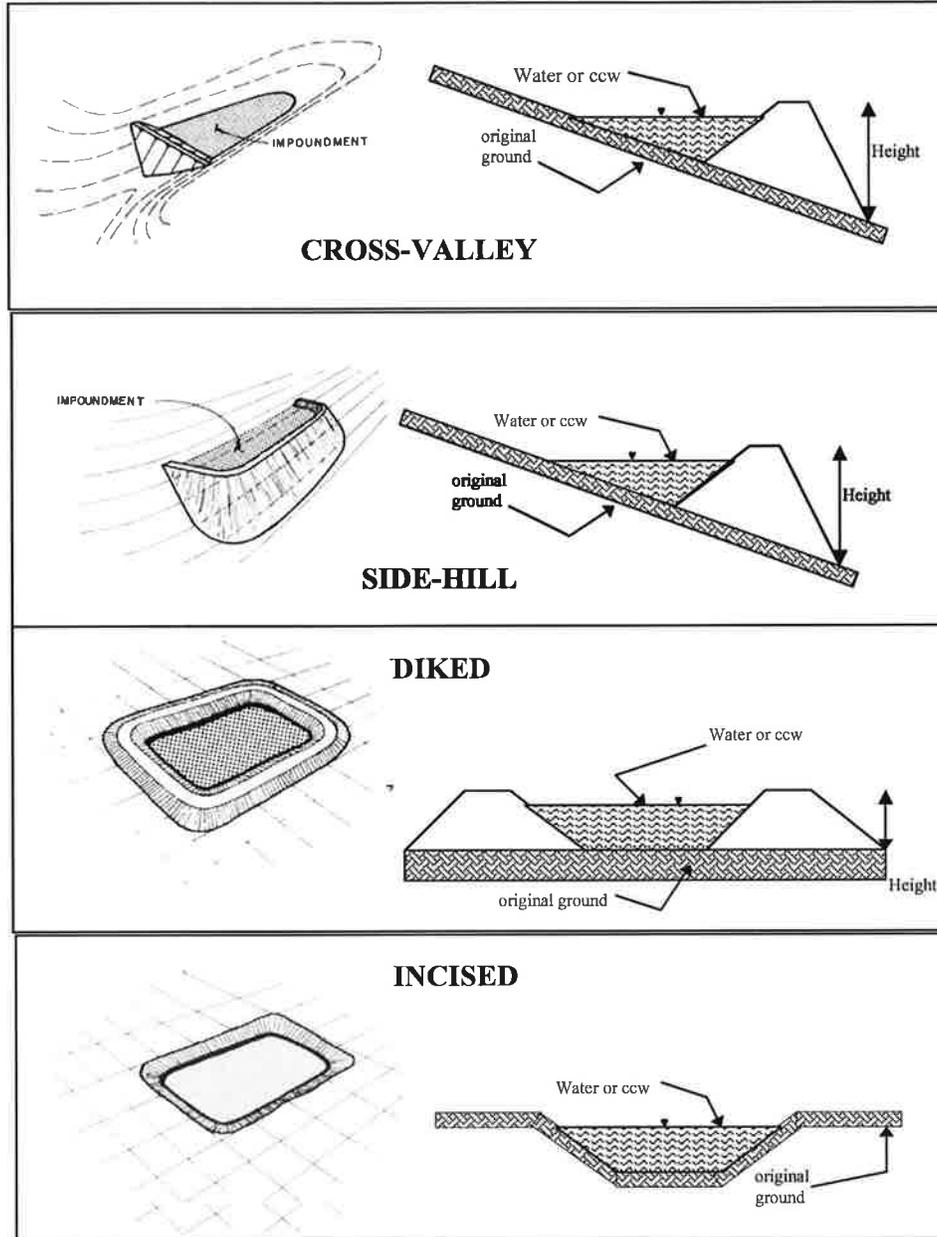
Nearest Downstream Town : Name Hutsonville, Illinois
Distance from the impoundment Approximately 2.1 miles
Impoundment Location: Longitude 87 Degrees 39 Minutes 44 Seconds
Latitude 39 Degrees 07 Minutes 46 Seconds
State Illinois County Crawford

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) and it is a state regulated dam.



**CONFIGURATION:**



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

Embankment Height 22 feet      Embankment Material Compacted fill  
 Pool Area 14 acres      Liner geomembrane  
 Current Freeboard 0.5 feet      Liner Permeability Not available

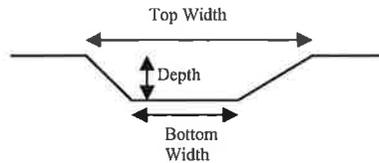
**TYPE OF OUTLET** (Mark all that apply)

       **Open Channel Spillway**

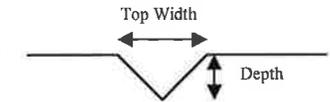
- Trapezoidal
- Triangular
- Rectangular
- Irregular

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

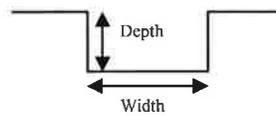
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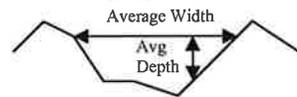
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RECTANGULAR



IRREGULAR

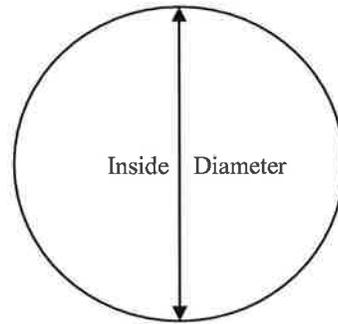


  X   **Outlet**

  18   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** Outlet was being repaired at the time of inspection. Decant was bypassed using pumps.

       **Other Type of Outlet** (specify) \_\_\_\_\_

The Impoundment was Designed By   Hanson Engineers    
  Springfield, Illinois









Site Name: Hutsonville Power Station Date: 6/2/11  
 Unit Name: Pond B Operator's Name: Ameren Energy Generating Co.  
 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?	Daily/Annual			18. Sloughing or bulging on slopes?			✓
2. Pool elevation (operator records)?	461.8			19. Major erosion or slope deterioration?			✓
3. Decant inlet elevation (operator records)?	461.8			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)?	465.0			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
1.	Inspections are done daily by plant operations staff but not typically recorded. Annual inspections are performed by Ameren engineers.
4.	No open channel spillway is present.



Coal Combustion Waste (CCW) Impoundment Inspection

Impoundment NPDES Permit # IL0004120
Date June 2, 2011

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

Impoundment Name Pond B
Impoundment Company Ameren Energy Generating Company
EPA Region Region V
State Agency (Field Office) Addresss Illinois Department of Natural Resources
Springfield, Illinois

Name of Impoundment Pond B
(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New X Update

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

IMPOUNDMENT FUNCTION: Storage of fly ash and bottom ash; clarification of water prior to discharge.

Nearest Downstream Town : Name Hutsonville, Illinois
Distance from the impoundment Approximately 2.1 miles

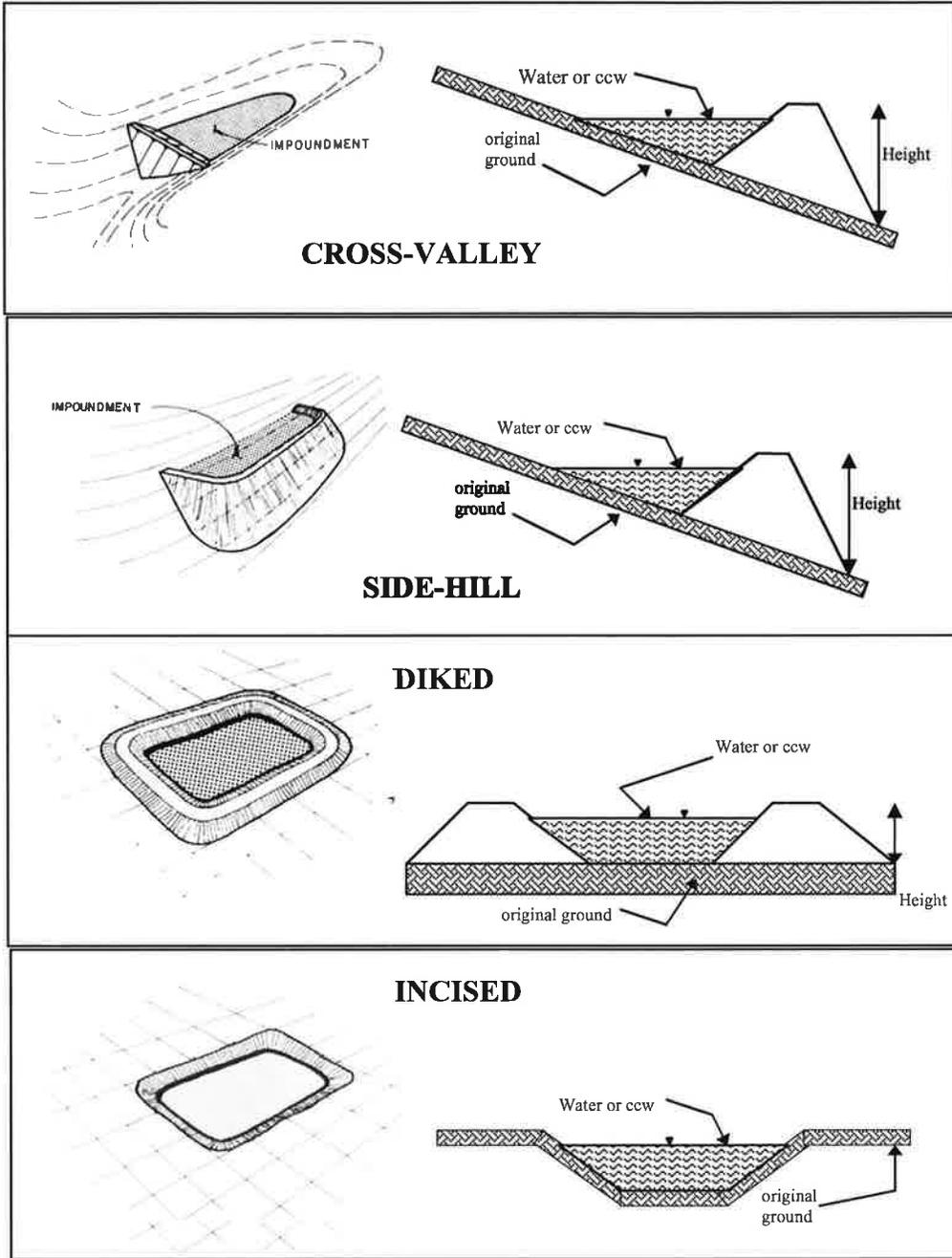
Impoundment Location: Longitude 87 Degrees 39 Minutes 34 Seconds
Latitude 39 Degrees 07 Minutes 46 Seconds
State Illinois County Crawford

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).



**CONFIGURATION:**



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

Embankment Height 17 feet      Embankment Material Compacted fill  
 Pool Area 4.4 acres      Liner geomembrane  
 Current Freeboard 3.2 feet      Liner Permeability Not available

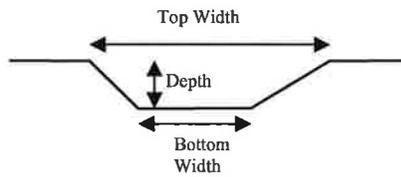
**TYPE OF OUTLET** (Mark all that apply)

       **Open Channel Spillway**

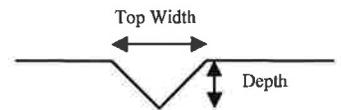
- Trapezoidal
- Triangular
- Rectangular
- Irregular

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

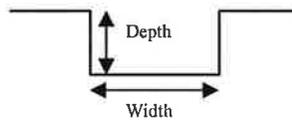
TRAPEZOIDAL



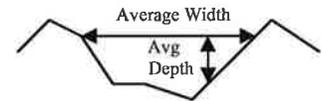
TRIANGULAR



RECTANGULAR



IRREGULAR

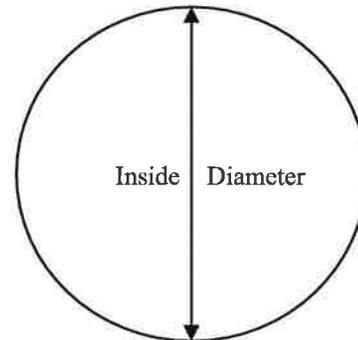


  X   **Outlet**

  18   inside diameter

**Material**

- corrugated metal
- welded steel
- concrete
- X   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   Hanson Engineers    
  Springfield, Illinois









Site Name: Hutsonville Power Station Date: 6/2/11  
 Unit Name: Pond C Operator's Name: Ameren Energy Generating Co.  
 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?	Daily/Annual			18. Sloughing or bulging on slopes?			✓
2. Pool elevation (operator records)?	449.6			19. Major erosion or slope deterioration?			✓
3. Decant inlet elevation (operator records)?	449.6			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)?	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
1.	Inspections are done daily by plant operations staff but not typically recorded. Annual inspections are performed by Ameren engineers.
4.	There is no open channel spillway or associated structures.
3, 12, 20.	Water is pumped from Pond C to Pond B.



Coal Combustion Waste (CCW) Impoundment Inspection

Impoundment NPDES Permit # IL0004120
Date June 2, 2011

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

Impoundment Name Pond C
Impoundment Company Ameren Energy Generating Company
EPA Region Region V
State Agency (Field Office) Address Illinois Department of Natural Resources
Springfield, Illinois

Name of Impoundment Pond C
(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New X Update

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

IMPOUNDMENT FUNCTION: Storage of bottom ash; clarification of water prior to discharge to Pond B.

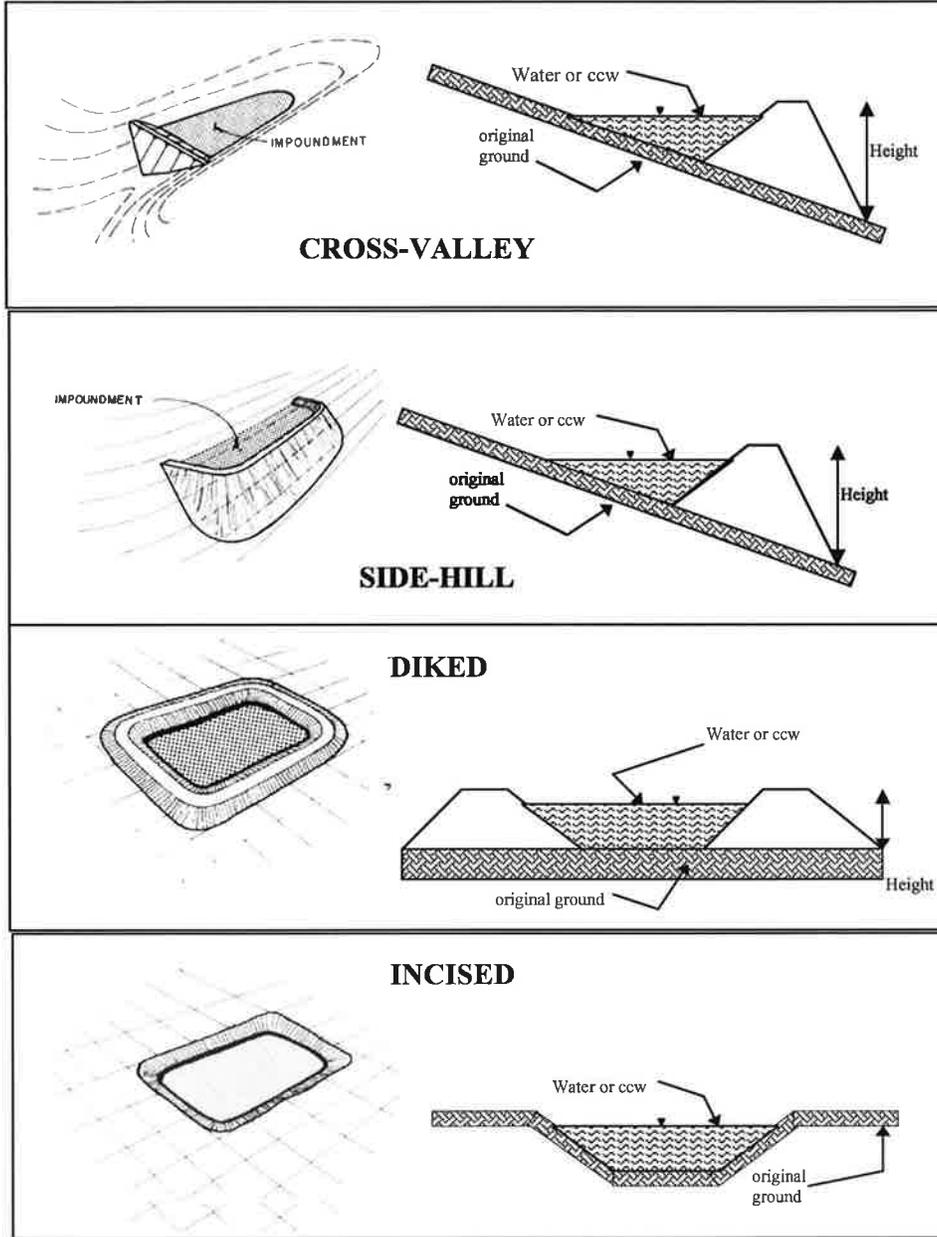
Nearest Downstream Town : Name Hutsonville, Illinois
Distance from the impoundment Approximately 2.1 miles
Impoundment
Location: Longitude 87 Degrees 39 Minutes 30 Seconds
Latitude 39 Degrees 07 Minutes 52 Seconds
State Illinois County Crawford

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).



**CONFIGURATION:**



Cross-Valley  
 Side-Hill  
 Diked  
 Incised (form completion optional)  
 Combination Incised/Diked  
 Embankment Height 12 feet    Embankment Material Compacted fill  
 Pool Area 2 acres    Liner geomembrane  
 Current Freeboard 5.4 feet    Liner Permeability Not available

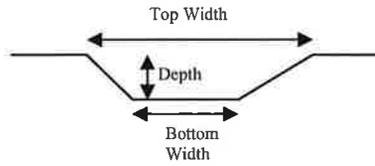
**TYPE OF OUTLET** (Mark all that apply)

       **Open Channel Spillway**

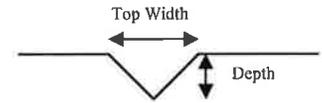
- Trapezoidal
- Triangular
- Rectangular
- Irregular

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

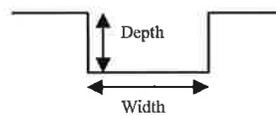
TRAPEZOIDAL



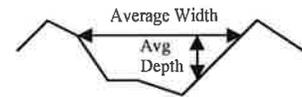
TRIANGULAR



RECTANGULAR



IRREGULAR

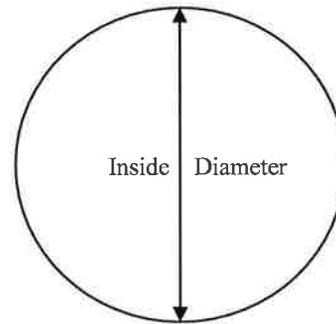


  X   **Outlet**

  12   inside diameter

**Material**

- corrugated metal
- X   welded steel
- 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   Hanson Engineers    
  Springfield, Illinois









Site Name: Hutsonville Power Station Date: 6/2/11  
 Unit Name: Pond D Operator's Name: Ameren Energy Generating Co.  
 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?	Wkly/Annual			18. Sloughing or bulging on slopes?			✓
2. Pool elevation (operator records)?	449.8			19. Major erosion or slope deterioration?			✓
3. Decant inlet elevation (operator records)?	449.8			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)?	453.8			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
1.	Inspections are done weekly by plant operations staff. Annual inspections are performed by Ameren engineers.
4.	There is no open channel spillway or associated structures.
23.	The Wabash River is adjacent to the downstream toe during high water events.



Coal Combustion Waste (CCW) Impoundment Inspection

Impoundment NPDES Permit # IL0004120
Date June 2, 2011

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

Impoundment Name Pond D
Impoundment Company Ameren Energy Generating Company
EPA Region Region V
State Agency (Field Office) Address Illinois Department of Natural Resources
Springfield, Illinois

Name of Impoundment Pond D
(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New X Update

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

IMPOUNDMENT FUNCTION: Storage of bottom ash; clarification of water prior to discharge to Pond C.

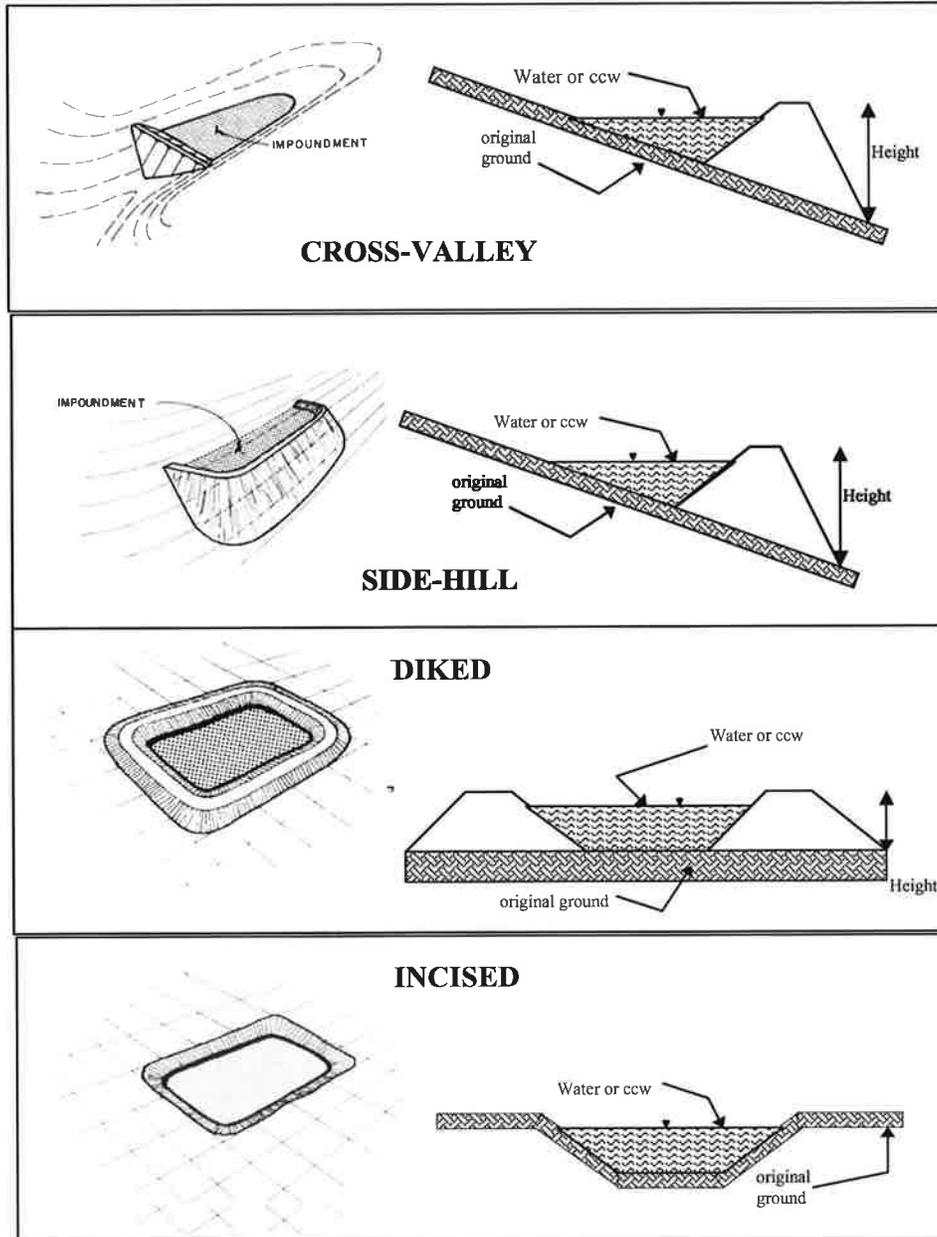
Nearest Downstream Town : Name Hutsonville, Illinois
Distance from the impoundment Approximately 2.1 miles
Impoundment Location: Longitude 87 Degrees 39 Minutes 23 Seconds
Latitude 39 Degrees 07 Minutes 50 Seconds
State Illinois County Crawford

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).



**CONFIGURATION:**



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

Embankment Height 15 feet      Embankment Material Compacted Clay  
 Pool Area 1.2 acres      Liner No Liner Present  
 Current Freeboard 4 feet      Liner Permeability NA

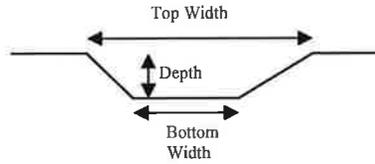
**TYPE OF OUTLET** (Mark all that apply)

       **Open Channel Spillway**

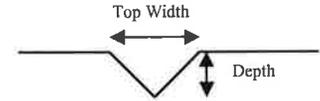
- Trapezoidal
- Triangular
- Rectangular
- Irregular

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

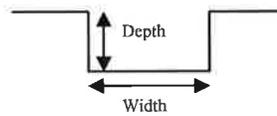
TRAPEZOIDAL



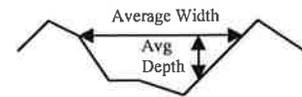
TRIANGULAR



RECTANGULAR



IRREGULAR

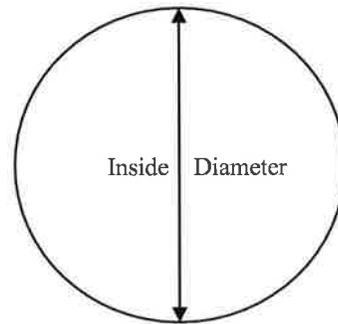


  X   **Outlet**

  24   inside diameter

**Material**

- corrugated metal
- X   welded steel
- 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   Information not available







**APPENDIX D**

REFERENCES

**REFERENCE LIST**  
**HUTSONVILLE POWER STATION**

Hanson Engineers. "Fly Ash Disposal Pond Site View; Hutsonville Power Station; Central Illinois Public Service Co." Drawing No. S-321. Dated April 1984.

Hanson Engineers. "Fly Ash Disposal Pond; Site View, Hutsonville Power Station; Central Illinois Public Service Co." Drawing No. S-321-A. Undated.

Hanson Engineers. "Fly Ash Disposal Pond, Details and Sections; Hutsonville Power Station; Central Illinois Public Service Co." Drawing No. S-322. Dated April 1984.

Hanson Engineers. "Fly Ash Disposal Pond; Details and Sections; Hutsonville Power Station, Central Illinois Public Service Co." Drawing No. S-323. Dated April 1984.

Hanson Engineers. "Fly Ash Disposal Pond; Details and Sections; Hutsonville Power Station, Central Illinois Public Service Co." Drawing No. S-324. Dated April 1984.

Hanson Engineers. "Fly Ash Disposal Pond; Details and Sections; Hutsonville Power Station, Central Illinois Public Service Co." Drawing No. S-325. Dated April 1984.

Hanson Engineers. "Fly Ash Disposal Pond; Monitoring Well Locations; Hutsonville Power Station; Central Illinois Public Service Co." Drawing No. S-326. Dated April 1984.

Hanson Engineers. "Fly Ash Disposal Pond; 10" Ash Line Profile; Hutsonville Power Station; Central Illinois Public Service Co." Drawing No. S-327. Dated June 1985.

Hanson Engineers. "Fly Ash Disposal Pond; Pipe Support Details; Hutsonville Power Station, Central Illinois Public Service Co." Drawing No. S-328. Dated April 1984.

Hanson Engineers. "Fly Ash Disposal Pond; Pipe Rack Details; Hutsonville Power Station; Central Illinois Public Service Co." Drawing No. S-329. Dated June 1985.

Hanson Engineers. "Fly Ash Pond Boring Logs; Hutsonville Power Station." Drawing No. S-330. Dated October 1984.

Geotechnology Inc. *Global Stability Evaluation, Hutsonville Power Station, Ash Pond D, Hutsonville, Illinois*. Geotechnology Project No. J017150.01. Dated January 4, 2011.

Richardson, Donald L., P.E. Letter to Mr. Martin J. Stralow, P.E. regarding the Central Illinois Public Service Co. Hutsonville Generating Station Proposed Fly Ash Pond. Dated April 27, 1984.

Stralow, Martin J., P.E. Letter to Mr. Donald Richardson regarding Permit #17985. Dated May 15, 1984.

State of Illinois Department of Transportation Division of Water Resources. Permit No. 17985. Dated May 15, 1974.

Hanson Engineers. "Flyash Pond, Hutsonville Power Station; Central Illinois Public Service Company." Figure No. 1. Undated.

Anonymous. "Hutsonville Fly-Ash Pond Stability Analysis; Simplified Bishop Method." Figure 1. Undated.

Canonie Contruction Company. Boring Log for Boring No. B-2. Dated August 9, 1983.

Canonie Contruction Company. Boring Log for Boring No. B-4. Dated August 9, 1983.

Canonie Contruction Company. Boring Log for Boring No. B-5. Dated August 9, 1983.

Magstaff, Mike, P.E. and Bluemner, Steve, P.E. Inspection Form for Dams, Levees and Ponds at Ameren Facilities. Dated March 18, 2010. Pages 1-14.

Hanson Engineers. "General Plan; Interim Ash and Drainage Collection Ponds; Hutsonville, Illinois." Drawing No. S366. Dated May 22, 2000.

Hanson Engineers. "Typical Sections; Interim Ash and Drainage Collection Ponds; Hutsonville, Illinois." Drawing No. S367. Dated May 22, 2000.

Hanson Engineers. "New Decant Structure; Interim Ash and Drainage Collection Ponds; Hutsonville, Illinois." Drawing No. S368. Dated May 22, 2000.

Hanson Engineers/ "Fly Ash Sludge Line; Interim Ash and Drainage Collection Ponds; Hutsonville, Illinois." Drawing No. S369. Dated May 22, 2000.

Hanson Engineers. "Bottom Ash-Slide Gate-Connecting Pipe; Interim Ash and Drainage Collection Ponds; Hutsonville, Illinois." Drawing No. S370. Dated May 22, 2000.

Hanson Engineers. "Outlet Pipe and Site Drainage Plan; Interim Ash and Drainage Collection Ponds; Hutsonville, Illinois." Drawing No. S371. Dated May 22, 2000.

Hanson Engineers. "Coal Pile Drainage, Sections, and Details; Interim Ash and Drainage Collection Ponds; Hutsonville, Illinois." Drawing No. S372. Dated May 22, 2000.

Hanson Engineers. "Roads, Ramps, Fences/Gates and Utilities; Interim Ash and Drainage Collection Ponds; Hutsonville, Illinois." Drawing. No. S373. Dated May 22, 2000.

Hanson Engineers. "Structural General Notes; Interim Ash and Drainage Collection Ponds; Hutsonville, Illinois." Drawing No. S374. Dated May 22, 2000.

Hanson Engineers. "Pump Station Plan, Sections & Detail; Interim Ash and Drainage Collection Ponds; Hutsonville, Illinois." Drawing No. S375. Dated May 22, 2000,

Hanson Engineers. "Site Layout Plan; Interim Ash and Drainage Collection Ponds; Hutsonville, Illinois." Drawing No. S376. Dated May 22, 2000.

Hanson Engineers. "Pump Station & Shear Gate Sections & Details; Interim Ash and Drainage Collection Ponds; Hutsonville, Illinois." Drawing No. S377. Dated May 22, 2000.

Hanson Engineers. "Electrical Symbols and Legends; Interim Ash and Drainage Collection Ponds; Hutsonville, Illinois." Drawing No. E805. Dated May 22, 2000.

Hanson Engineers. "Electrical Site Plan; Interim Ash and Drainage Collection Ponds; Hutsonville, Illinois." Drawing No. E806. Dated May 22, 2000.

Hanson Engineers. "Electrical One Line Diagram and Details; Interim Ash and Drainage Collection Ponds; Hutsonville, Illinois." Drawing No. E 807. Dated May 22, 2000.

Hanson Engineers. "Electrical Plans, Sections and Elevations; Interim Ash and Drainage Collection Ponds; Hutsonville, Illinois." Drawing No. E808. Dated May 22, 2000.

Hanson Engineers. "Pump Control Schematic; Interim Ash and Drainage Collection Ponds; Hutsonville, Illinois." Drawing No. E809. Dated May 22, 2000.

Central Illinois Public Service Company. *Instructions to Bidders*. Specification No. 0501-02. Undated.

Specification 0501-02 - Fly Ash Pond Piping. Undated.

Specification 0501-02 – Pond A. Undated

Bremer, C.A., Piening, R.O., Schukar, C.J. Specification – Pond B & C. HEI # 99S3062. Undated.

**APPENDIX E**

PREVIOUS INSPECTION REPORTS

## Inspection Form for Dams, Levees and Ponds at Ameren Facilities

Project Name: Annual Engineering InspectionInspection Date: 03/18/2010Location: Hutsonville Power PlantTemperature: 50'sWeather: SunnySystem Description: Ash Pond APond A Level: NormalAsh Pond BPond B Level: NormalAsh Pond CPond C Level: NormalInactive Ash Pond DPond D Level: NormalBottom Ash PondBottom Ash Pond: Normal

Engineer/Inspectors:

Mike Wagstaff, P.E.Steve Bluemner, P.E.

Owner Representatives:

Jim GrunlohJim Alberda


**Overall System Rating:                      Minimally Acceptable**

### System Rating Codes

**Acceptable System:** Nearly all items or components are rated as GC or NE.

**Minimally Acceptable System:** One or more items are rated as MM or one or more items are rated as IM or EC and an engineering determination concludes that the IM or EC items would not prevent the system from performing as intended.

**Unacceptable System:** One or more items are rated as IM or EC and would prevent the system from performing as intended, or a serious deficiency noted in past inspections (which had previously resulted in a minimally acceptable system rating) has not been corrected within the established timeframe, not to exceed two years.

### Condition Codes

**EC = Emergency Condition.** A serious dam safety condition exists that needs immediate action. Emergency measures implemented as instructed by Supervising Engineer, Dam Safety; i.e. pool draw down, work stoppage, or plant stoppage.

**IM = Item needing Immediate Maintenance** to restore or ensure its safety or integrity. Remediation should be completed within an appropriate timeframe as determined by the Supervising Engineer, Dam Safety.

**MM = Item needing Minor Maintenance** and/or repairs within the year. The safety or integrity of the item is not yet imperiled.

**OB = Condition** requires regular Observation to ensure that the condition does not become worse.

**GC = Good Condition.**

**NE = No Evidence** of a problem.

**NI = Not Inspected.** Reason should be stated in comment

**CONFIDENTIAL**

Item	Condition Code *	Deficiencies	Recommended Remedial Measures and Implementation Schedule	
Inlet and Outlet	Obstruction	NE		
	Inlet Piping Supports	GC	Inlet pipe and supports are in good condition.	
	Leakage	NE	Leakage at the HDPE liner is not evident. The concrete outfall structure does not appear to be cracked or leaking.	
	Outfall Structure Condition	GC	Outlet structure is in good condition (see photo #5).	
	Outfall Pipe	NI	Outlet pipe is not visible.	
	Other	MM	Staff gauge is required to identify changes in water level. Provide staff gauge at outfall structure.	
	Earth Embankment	Vertical & Horizontal Alignment of Crest	GC	The alignment does not show signs of shifting or settlement.
		Animal Control	NE	Animal burrows were not identified.
		Surface Cracks	NE	Surface cracks were not identified.
		Pond Liner	GC	Liner appears to be intact. Previous tears in the HDPE liner have been repaired.
Seepage		NE	There is no evidence of seepage.	
Erosion		GC	No erosion of slopes is evident.	
Slope Stability		GC	Slopes are in good condition.	
Vegetation		GC	Slopes have been mowed and appear to have been mowed at least once per year. There are no trees on the slopes of the berms or within 20 feet of the toe.	
Unusual Movement or Cracking At or Beyond Toe		NE		
Other		MM	Pond appears to be near capacity. Stacking of ash has reduced the freeboard from 2 feet (recommended) to less than 1 foot in some areas around the edge of the pond. If goetubes are to be left in place, recommend removing ash from the perimeter ditches (pond interior) to re-establish drainage between the edge of pond and goetubes. See photos #1, #2, #3, and #4. Re-grade ditches around interior perimeter of pond.	

**CONFIDENTIAL**

Item	Condition Code *	Deficiencies	Recommended Remedial Measures and Implementation Schedule
<b>Inlet and Outlet</b>			
Obstruction	NE		
Inlet Piping Supports	GC	Inlet pipe and supports are in good condition.	
Leakage	NE	Leakage at the HDPE liner is not evident. The concrete outfall structure does not appear to be cracked or leaking.	
Outfall Structure Condition	GC	Outlet structure is in good condition (see photo #6).	
Outfall Pipe	NE	Outlet pipe is not visible.	
Other		Staff gauge is required to identify changes in water level.	Provide staff gauge.
<b>Earth Embankment</b>			
Vertical & Horizontal Alignment of Crest	GC	The alignment did not show signs of shifting or settlement.	
Animal Damage	NE	Animal burrows were not identified.	
Surface Cracks	NE	Surface cracks were not identified.	
Pond Liner	GC	HDPE pond liner is in good condition.	
Seepage	NE	There is no evidence of seepage.	
Erosion	GC	No erosion of slopes is evident.	
Slope Stability	GC	Slopes are in good condition.	
Vegetation	GC	Slopes have been mowed and appear to have been mowed at least once per year. There are no trees on the slopes of the berms or within 20 feet of the toe. See photos #7 and #8.	
Unusual Movement or Cracking At or Beyond Toe	NE		
Other			

**CONFIDENTIAL**

Item	Condition Code *	Deficiencies	Recommended Remedial Measures and Implementation Schedule
Inlet and Outlet	NE		
	GC	Inlet pipe and supports are in good condition.	
	NE	Leakage at the HDPE liner is not evident. The concrete structure does not appear to be cracked or leaking.	
	GC	Outlet structure (pump station) is in good condition.	
	NE	Outlet pipe is not visible.	
		Other	
		GC	The alignment did not show signs of shifting or settlement.
Earth Embankment	NE	Animal burrows were not identified.	
	NE	Surface cracks were not identified.	
	GC	Liner appears to be intact. Previous tears/seam rips in the HDPE liner have been repaired.	
	NE	There is no evidence of seepage.	
	GC	No erosion of slopes is evident.	
	GC	Slopes are in good condition.	
	GC	Slopes have been mowed and appear to have been mowed at least once per year. There are no trees on the slopes of the berms or within 20 feet of the toe.	
	NE	Unusual Movement or Cracking At or Beyond Toe	
		Other	

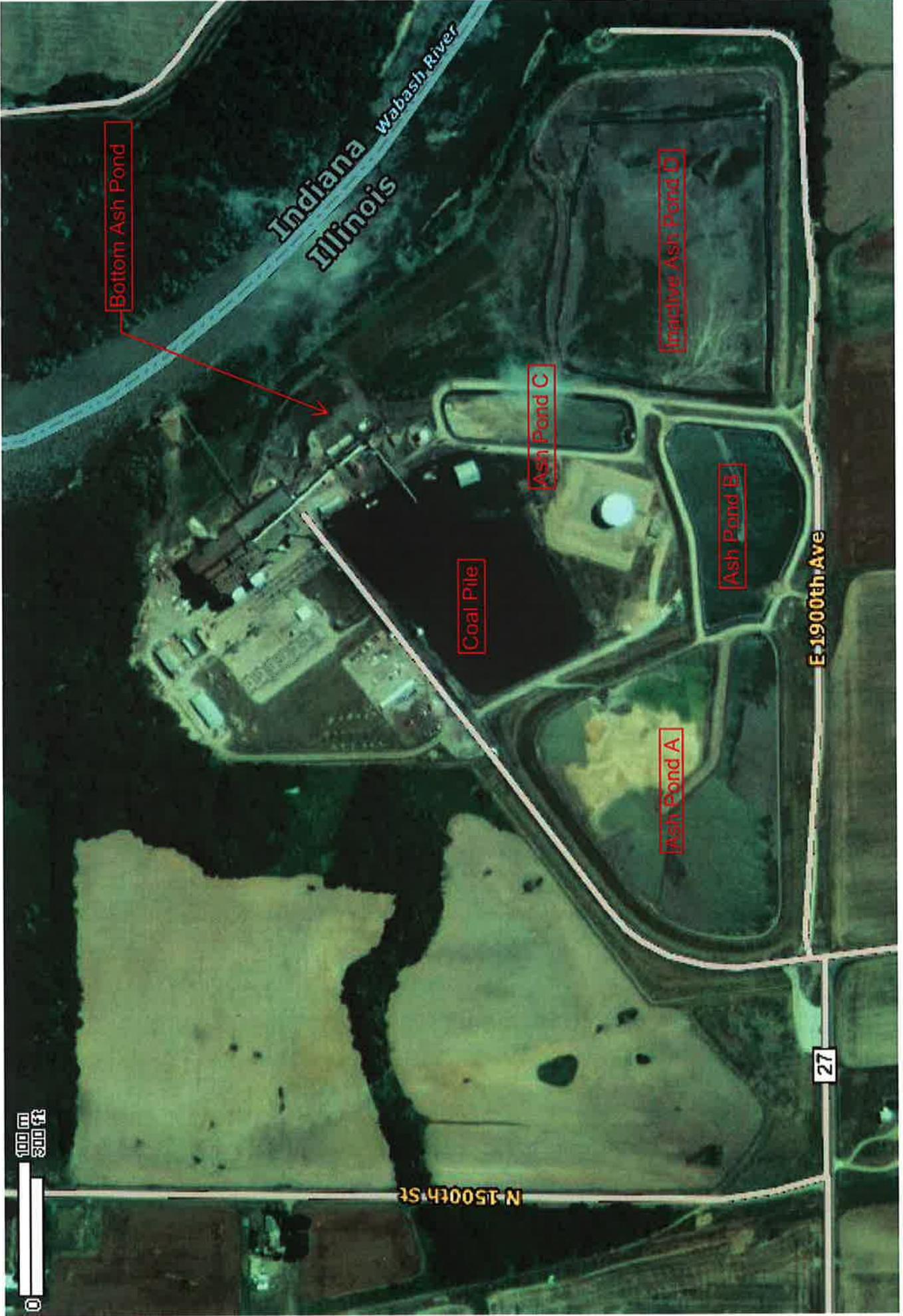
**CONFIDENTIAL**

Inspection Date: 03/18/2010

Item	Condition Code *		
<b>Obstruction</b>	<b>NE</b>		
<b>Inlet Piping Supports</b>	<b>n/a</b>	Fly Ash is not currently being sluiced into Ash Pond D.	
<b>Leakage</b>	<b>GC</b>	The wooden stoplogs are leaking a little.	
<b>Outfall Structure Condition</b>	<b>OB</b>	Outlet structure is in poor condition. The walkway is loose and rusting. Water level is 2-3 feet below the top of the levee.	Pond is inactive. If capping of the pond is not done in the near future, maintenance on the walkway should be performed or it should be removed.
<b>Outfall Pipe</b>	<b>OB</b>	Outlet pipe is not visible. The ash pond is currently inactive. The outlet pipe has not been plugged and storm water/leakage is currently entering the outfall pipe.	Pond is inactive. If capping of the pond is not done in the near future, the pipe should be inspected for deterioration.
<b>Other</b>			
<b>Vertical &amp; Horizontal Alignment of Crest</b>	<b>GC</b>	The alignment did not show signs of shifting or settlement.	
<b>Animal Damage</b>	<b>NE</b>	Animal burrows were not evident.	
<b>Surface Cracks</b>	<b>NE</b>	Surface cracks were not evident.	
<b>Pond Liner</b>	<b>n/a</b>	Pond not lined with HDPE liner.	
<b>Seepage</b>	<b>NI</b>	The Wabash River had recently flooded and the ground adjacent to the toe of levee was saturated, making it difficult to observe seepage at the toe. There is no obvious or excessive seepage at the time of inspection.	AER to re-inspect levee for seepage when river recedes and ground adjacent to toe dries out.
<b>Erosion</b>	<b>GC</b>	No erosion of slopes is evident.	
<b>Slope Stability</b>	<b>GC</b>	Slopes are in good condition.	
<b>Vegetation</b>	<b>GC</b>	Brush and trees have been removed from the berm. Seeding in some areas is a bit sparse. See photos #9 and #10.	
<b>Unusual Movement or Cracking At or Beyond Toe</b>	<b>NE</b>	Sloughing or cracking was not evident.	
<b>Other</b>			



Item	Condition Code *	Deficiencies	Recommended Remedial Measures and Implementation Schedule
Obstruction	NE		
Inlet Piping Supports	GC	Inlet pipe and supports are in good condition.	
Leakage	NE	Leakage at inlet/outlet is not evident.	
Outfall Structure Condition	n/a	No structure.	
Outfall Pipe	GC	Outlet pipe is in good condition.	
Other		Staff gauge is required to identify sudden changes in water level.	Provide staff gauge.
Vertical & Horizontal Alignment of Crest	GC	The alignment of the east berm did not show signs of shifting or settlement.	
Animal Damage	NE	Animal burrows were not identified.	
Surface Cracks	NE	Surface cracks were not identified.	
Pond Liner	n/a	Pond not lined with HDPE liner.	
Seepage	NI	The Wabash River had recently flooded and the ground adjacent to the toe of levee was saturated, making it difficult to observe seepage at the toe. There is no obvious or excessive seepage at the time of inspection. See photo #13.	AER to re-inspect levee for seepage when river recedes and ground adjacent to toe dries out.
Erosion	GC	No erosion of slopes is evident.	
Slope Stability	GC	Slopes are in good condition.	
Vegetation	GC	Brush and trees have been removed from the berm. Seeding in some areas is a bit sparse. See photo #11.	
Unusual Movement or Cracking At or Beyond Toe	NE	Sloughing or cracking was not evident, but further inspection is required after clearing of the slope.	Reinspect after trees and brush are removed from the east berm.
Other		See photo #12.	



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Photo #1 – Ash Pond A – North berm looking northeast



Photo #2 – Ash Pond A – East berm looking north



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Photo #3 – Ash Pond A – East berm looking south



Photo #4 – Ash Pond A - East berm looking south



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Photo #5 - Ash Pond A – Outlet structure



Photo #6 – Ash Pond B – Outlet structure



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Photo #7 – Ash Pond B – South embankment looking west to Pond A in background



Photo #8 – Ash Pond B – South embankment looking west to Pond D in background



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Photo #9 – Ash Pond D - South berm looking east



Photo #10 – Ash Pond D - East berm looking southeast



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Photo #11 – Bottom Ash Pond – Northeast berm looking south



Photo #12 – Bottom Ash Pond – North end looking south



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Photo #13 – Bottom Ash Pond - East berm looking south



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**APPENDIX F**  
**PHOTOGRAPHS**



Client Name: U.S. EPA

Site Location: Hutsonville Power Station  
Hutsonville, Illinois

Project No.  
01.0170142.30

Photo No.  
1

Date:  
6/2/11

Direction Photo  
Taken:  
West

**Description:**

Upstream slope and crest of  
Pond A.



Photo No.  
2

Date:  
6/2/11

Direction Photo  
Taken:  
West

**Description:**

Upstream slope and crest of  
Pond A.





Client Name: U.S. EPA

Site Location: Hutsonville Power Station  
Hutsonville, Illinois

Project No.  
01.0170142.30

Photo No.  
**3**

Date:  
6/2/11

Direction Photo  
Taken:  
East

Description:  
Upstream slope and crest of  
Pond A.



Photo No.  
**4**

Date:  
6/2/11

Direction Photo  
Taken:  
North

Description:  
Upstream slope and  
discharge pipe in Pond A.



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Client Name: U.S. EPA

Site Location: Hutsonville Power Station  
Hutsonville, Illinois

Project No.  
01.0170142.30

Photo No.  
**5**

Date:  
6/2/11

Direction Photo  
Taken:  
Northeast

Description:  
Upstream slope and crest of  
Pond A.



Photo No.  
**6**

Date:  
6/2/11

Direction Photo  
Taken:  
Northeast

Description:  
Upstream slope and crest of  
Pond A.



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**Client Name:** U.S. EPA

**Site Location:** Hutsonville Power Station  
Hutsonville, Illinois

**Project No.**  
01.0170142.30

**Photo No.**  
**7**

**Date:**  
6/2/11

**Direction Photo Taken:**  
Southwest

**Description:**  
Upstream slope and crest of Pond A.



**Photo No.**  
**8**

**Date:**  
6/2/11

**Direction Photo Taken:**  
Southeast

**Description:**  
Upstream slope and crest of Pond A.





Client Name: U.S. EPA

Site Location: Hutsonville Power Station  
Hutsonville, Illinois

Project No.  
01.0170142.30

Photo No.  
**9**

Date:  
6/2/11

Direction Photo  
Taken:  
South

Description:  
Upstream slope and crest of  
Pond A.



Photo No.  
**10**

Date:  
6/2/11

Direction Photo  
Taken:  
South

Description:  
Upstream slope and crest of  
Pond A.



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**Client Name:** U.S. EPA

**Site Location:** Hutsonville Power Station  
Hutsonville, Illinois

**Project No.**  
01.0170142.30

**Photo No.**  
**11**

**Date:**  
6/2/11

**Direction Photo Taken:**  
South

**Description:**  
Downstream slope of Pond A.



**Photo No.**  
**12**

**Date:**  
6/2/11

**Direction Photo Taken:**  
South

**Description:**  
Downstream slope of Pond A.





**Client Name:** U.S. EPA

**Site Location:** Hutsonville Power Station  
Hutsonville, Illinois

**Project No.**  
01.0170142.30

**Photo No.**  
**13**

**Date:**  
6/2/11

**Direction Photo Taken:**  
Southwest

**Description:**  
Downstream slope of Pond A.



**Photo No.**  
**14**

**Date:**  
6/2/11

**Direction Photo Taken:**  
Southwest

**Description:**  
Downstream slope of Pond A.



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Client Name: U.S. EPA

Site Location: Hutsonville Power Station  
Hutsonville, Illinois

Project No.  
01.0170142.30

Photo No.  
**15**

Date:  
6/2/11

Direction Photo  
Taken:  
North

Description:  
Downstream slope of Pond  
A.



Photo No.  
**16**

Date:  
6/2/11

Direction Photo  
Taken:  
East

Description:  
Downstream slope of Pond  
A.



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Client Name: U.S. EPA

Site Location: Hutsonville Power Station  
Hutsonville, Illinois

Project No.  
01.0170142.30

Photo No.  
**17**

Date:  
6/2/11

Direction Photo  
Taken:  
East

Description:  
Downstream slope of Pond  
A.



Photo No.  
**18**

Date:  
6/2/11

Direction Photo  
Taken:  
West

Description:  
Downstream slope of Pond  
A.



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**Client Name:** U.S. EPA

**Site Location:** Hutsonville Power Station  
Hutsonville, Illinois

**Project No.**  
01.0170142.30

**Photo No.**  
**19**

**Date:**  
6/2/11

**Direction Photo Taken:**  
Northwest

**Description:**  
Downstream slope of Pond A.



**Photo No.**  
**20**

**Date:**  
6/2/11

**Direction Photo Taken:**  
Northeast

**Description:**  
Decant structure in Pond A.



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**Client Name:** U.S. EPA

**Site Location:** Hutsonville Power Station  
Hutsonville, Illinois

**Project No.**  
01.0170142.30

**Photo No.**  
**21**

**Date:**  
6/2/11

**Direction Photo Taken:**  
West



**Description:**  
Decant structure in Pond A.

**Photo No.**  
**22**

**Date:**  
6/2/11

**Direction Photo Taken:**  
Northeast



**Description:**  
Discharge pipe in Pond A.



Client Name: U.S. EPA

Site Location: Hutsonville Power Station  
Hutsonville, Illinois

Project No.  
01.0170142.30

Photo No.  
**23**

Date:  
6/2/11

Direction Photo  
Taken:  
West

Description:  
Upstream slope and crest of  
Pond B.



Photo No.  
**24**

Date:  
6/2/11

Direction Photo  
Taken:  
Southwest

Description:  
Upstream slope and crest of  
Pond B.





Client Name: U.S. EPA

Site Location: Hutsonville Power Station  
Hutsonville, Illinois

Project No.  
01.0170142.30

Photo No.  
**25**

Date:  
6/2/11

Direction Photo  
Taken:  
Southeast

Description:  
Upstream slope of Pond B.



Photo No.  
**26**

Date:  
6/2/11

Direction Photo  
Taken:  
South

Description:  
Upstream slope and crest of  
Pond B.



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Client Name: U.S. EPA

Site Location: Hutsonville Power Station  
Hutsonville, Illinois

Project No.  
01.0170142.30

Photo No.  
**27**

Date:  
6/2/11

Direction Photo  
Taken:  
West

Description:  
Upstream slope and crest of  
Pond B.



Photo No.  
**28**

Date:  
6/2/11

Direction Photo  
Taken:  
Northeast

Description:  
Upstream slope and crest of  
Pond B.



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Client Name: U.S. EPA

Site Location: Hutsonville Power Station  
Hutsonville, Illinois

Project No.  
01.0170142.30

Photo No.  
**29**

Date:  
6/2/11

Direction Photo  
Taken:  
South

Description:  
Upstream slope of Pond B.



Photo No.  
**30**

Date:  
6/2/11

Direction Photo  
Taken:  
Southeast

Description:  
Downstream slope of Pond  
B.



US EPA ARCHIVE DOCUMENT



Client Name: U.S. EPA

Site Location: Hutsonville Power Station  
Hutsonville, Illinois

Project No.  
01.0170142.30

Photo No.  
**31**

Date:  
6/2/11

Direction Photo  
Taken:  
Southeast

Description:  
Downstream slope of Pond  
B.



Photo No.  
**32**

Date:  
6/2/11

Direction Photo  
Taken:  
West

Description:  
Downstream slope of Pond  
B.





Client Name: U.S. EPA

Site Location: Hutsonville Power Station  
Hutsonville, Illinois

Project No.  
01.0170142.30

Photo No.  
**33**

Date:  
6/2/11

Direction Photo  
Taken:  
Northeast

Description:  
Downstream slope of Pond  
B.



Photo No.  
**34**

Date:  
6/2/11

Direction Photo  
Taken:  
Northeast

Description:  
Downstream slope of Pond  
B.



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Client Name: U.S. EPA

Site Location: Hutsonville Power Station  
Hutsonville, Illinois

Project No.  
01.0170142.30

Photo No.  
**35**

Date:  
6/2/11

Direction Photo  
Taken:  
West

Description:  
Decant structure in Pond B.



Photo No.  
**36**

Date:  
6/2/11

Direction Photo  
Taken:  
West

Description:  
Decant structure in Pond B.



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Client Name: U.S. EPA

Site Location: Hutsonville Power Station  
Hutsonville, Illinois

Project No.  
01.0170142.30

Photo No.  
**37**

Date:  
6/2/11

Direction Photo  
Taken:  
North

**Description:**

Location of discharge pipe from Pond A. At time of inspection no water was flowing through the pipe to support excavation and maintenance of the pipe.



Photo No.  
**38**

Date:  
6/2/11

Direction Photo  
Taken:  
South

**Description:**

Discharge pipe from the facility.



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Client Name: U.S. EPA

Site Location: Hutsonville Power Station  
Hutsonville, Illinois

Project No.  
01.0170142.30

Photo No.  
**39**

Date:  
6/2/11

Direction Photo  
Taken:  
North

Description:  
Pond C as seen from south.



Photo No.  
**40**

Date:  
6/2/11

Direction Photo  
Taken:  
South

Description:  
Pond C as seen from north.



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Client Name: U.S. EPA

Site Location: Hutsonville Power Station  
Hutsonville, Illinois

Project No.  
01.0170142.30

Photo No.  
**41**

Date:  
6/2/11

Direction Photo  
Taken:  
East

Description:  
Crest of the closed portion of  
Pond D as seen from the  
southwest corner.



Photo No.  
**42**

Date:  
6/2/11

Direction Photo  
Taken:  
East

Description:  
Downstream slope of the  
closed portion of Pond D as  
seen from the southeast  
corner.





Client Name: U.S. EPA

Site Location: Hutsonville Power Station  
Hutsonville, Illinois

Project No.  
01.0170142.30

Photo No.  
**43**

Date:  
6/2/11

Direction Photo  
Taken:  
North

Description:  
Crest of the closed portion of  
Pond D.



Photo No.  
**44**

Date:  
6/2/11

Direction Photo  
Taken:  
Southeast

Description:  
Upstream slope, crest and  
discharge pipes in the active  
portion of Pond D.



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Client Name: U.S. EPA

Site Location: Hutsonville Power Station  
Hutsonville, Illinois

Project No.  
01.0170142.30

Photo No.  
**45**

Date:  
6/2/11

Direction Photo  
Taken:  
Northeast

Description:  
Upstream slope and  
discharge pipe in active  
portion of Pond D.



Photo No.  
**46**

Date:  
6/2/11

Direction Photo  
Taken:  
East

Description:  
Upstream slope, crest, and  
discharge pipe in the active  
portion of Pond D.





Client Name: U.S. EPA

Site Location: Hutsonville Power Station  
Hutsonville, Illinois

Project No.  
01.0170142.30

Photo No.  
**47**

Date:  
6/2/11

Direction Photo  
Taken:  
South

Description:  
Upstream slope and crest and  
in active portion of Pond D



Photo No.  
**48**

Date:  
6/2/11

Direction Photo  
Taken:  
Southeast

Description:  
Upstream slope and crest in  
active portion of Pond D.



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**Client Name:** U.S. EPA

**Site Location:** Hutsonville Power Station  
Hutsonville, Illinois

**Project No.**  
01.0170142.30

**Photo No.**  
**49**

**Date:**  
6/2/11

**Direction Photo Taken:**  
Southwest

**Description:**  
Upstream slope and discharge structure in Pond D.



**Photo No.**  
**50**

**Date:**  
6/2/11

**Direction Photo Taken:**  
Northwest

**Description:**  
Upstream slope in Pond D.



**US EPA ARCHIVE DOCUMENT**



**Client Name:** U.S. EPA

**Site Location:** Hutsonville Power Station  
Hutsonville, Illinois

**Project No.**  
01.0170142.30

**Photo No.**  
**51**

**Date:**  
6/2/11

**Direction Photo Taken:**  
Northeast

**Description:**  
Upstream slope in the active portion of Pond D.



**Photo No.**  
**52**

**Date:**  
6/2/11

**Direction Photo Taken:**  
West

**Description:**  
Decant structure in the active portion of Pond D.





Client Name: U.S. EPA

Site Location: Hutsonville Power Station  
Hutsonville, Illinois

Project No.  
01.0170142.30

Photo No.  
**53**

Date:  
6/2/11

Direction Photo  
Taken:  
East

Description:  
Decant structure in the active  
portion of Pond D.



Photo No.  
**54**

Date:  
6/2/11

Direction Photo  
Taken:  
East

Description:  
Discharge pipe in active  
portion of Pond D.





Client Name: U.S. EPA

Site Location: Hutsonville Power Station  
Hutsonville, Illinois

Project No.  
01.0170142.30

Photo No.  
**55**

Date:  
6/2/11

Direction Photo  
Taken:  
Southwest

Description:  
Discharge pipe in active  
portion of Pond D.



Photo No.  
**56**

Date:  
6/2/11

Direction Photo  
Taken:  
Southeast

Description:  
Discharge pipe in active  
portion of Pond D.

