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CCR SURFACE IMPOUNDMENT ANNUAL INSPECTION REPORT

Big Cajun II Power Plant

New Roads, Pointe Coupee Parish, Louisiana

Prepared for

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Prepared by

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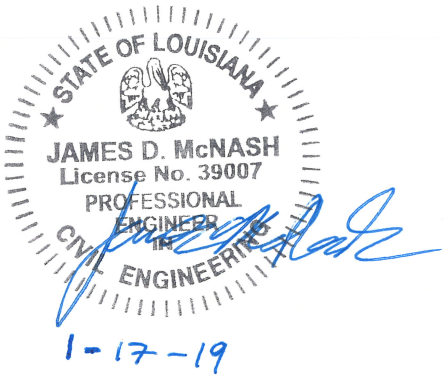


Project Number TXR0944

January 2019

TABLE OF CONTENTS

FIGURES

1. INTRODUCTION

1.1 Purpose

This CCR Surface Impoundment Annual Inspection Report (Report) was prepared for the Louisiana Generating, LLC (LaGen) Big Cajun II Power Plant (Facility) pursuant to the annual inspection requirements of §257.83 of the Federal Coal Combustion Residuals (CCR) Rule (CCR Rule) contained in Title 40 Code of Federal Regulations (CFR) Section (§) 257. The Report describes the inspection of the Fly Ash Basin and Bottom Ash Basin at the Facility, which are classified as existing CCR surface impoundments (i.e., the regulated CCR Units) by the CCR Rule.

1.2 Terms of Reference

Under 40 CFR §257.83(b), existing CCR surface impoundments must be inspected on an annual basis by a qualified professional engineer (P.E.). Mr. James D. McNash (Louisiana P.E. No. 39007), a qualified P.E. employed by Geosyntec Consultants, Inc. (Geosyntec), conducted a visual inspection of the CCR units and their hydraulic structures on 11 October 2018. Prior to the inspection of the CCR units, Geosyntec met with the Facility's environmental coordinator, who is the qualified person responsible for the weekly surface impoundment inspections in accordance with §257.83(a)(1), and discussed current operations within each CCR unit. In addition, Geosyntec reviewed and discussed contents of the weekly surface impoundment inspections with the Facility's environmental coordinator.

The Report was prepared by and under the direction of Mr. James D. McNash, P.E. and was reviewed by the Facility's environmental coordinator to confirm the accuracy of the pertinent information presented herein.

1.3 Scope of Annual Inspection Report

In accordance with the CCR Rule, this Report includes:

- a summary of Geosyntec's review of available information that pertains to the status and condition of the CCR units, which includes files placed within in the Facility's Operating Record (Operating Record), previous periodic structural stability assessments, prior weekly inspections by a qualified person, and previous annual inspections;
- information related to the current annual visual inspection of the CCR units;
- information related to the visual inspection of hydraulic structures that underlie or pass through the CCR unit dike structures;

- identification and discussion of any geometry changes since the prior annual inspection;
- the location and type of existing instrumentation and the maximum recorded readings of each instrument since the previous annual inspection;
- the approximate minimum, maximum, and present depth and elevation of the impounded water and CCR since the previous annual inspection;
- the surface impoundments storage capacity at the time of the inspection;
- the approximate volume of the impounded water and CCR at the time of the inspection;
- information on any appearances of an actual or potential structural weakness of the CCR unit, in addition to any existing conditions that are observed to disrupt or could potentially disrupt the operation and safety of the CCR unit and appurtenant structures; and
- information on any other change(s) which may have affected the stability or operation of the impounding structure since the previous annual inspection.

Geosyntec understands that the prior annual inspection reports (CB&I, 2017; Geosyntec, 2018) were placed in the Operating Record on 18 January 2017 and 18 January 2018, respectively. The deadline identified within the CCR Rule for subsequent reports is one year after the completion date for the preceding annual inspection report. A report is considered complete once placed in the Operating Record. Therefore, this Report was developed to address the period from 18 January 2018 to its issuance date of 18 January 2019, and is intended to be placed in the Operating Record upon issuance.

2. REVIEW OF AVAILABLE INFORMATION

2.1 Documents Reviewed

Prior to the annual inspection, Geosyntec reviewed available information with respect to the status and condition of the CCR units at the Facility. The purpose of the document review was to develop an understanding of the design, construction, assessed integrity, and CCR unit performance prior to the annual inspection. The document review included the relevant portions of the following documents:

- November 2010 Louisiana Department of Environmental Quality (LDEQ) Type I Solid Waste Permit Renewal and Modification Application (Shaw, 2010);
- March 2011 Final (Rev. 2) United States Environmental Protection Agency (USEPA) Dam Assessment Report (Dewberry & Davis, 2011);
- October 2016 Fly Ash Basin and Bottom Ash Basin Structural Integrity Assessment Report (CB&I, 2016b);
- January 2016 CCR Annual Inspection Report (CB&I, 2016a);
- January 2017 CCR Annual Inspection Report (CB&I, 2017);
- January 2018 CCR Annual Inspection Report (Geosyntec, 2018); and
- 2018 Weekly CCR Inspection Logs by a Qualified Person (LaGen, 2018).

The remainder of Section 2 provides the Facility description and a summary of information relevant to the design, construction, and operation of the CCR Units. Additionally, a summary prior assessments and inspections is also provided below.

2.2 Facility Background

The LaGen Big Cajun II Power Plant or the Facility is a coal- and natural gas-fired, steam turbine electric power generation facility located on 1,939 acres northeast of New Roads, Louisiana (LA). The Facility is currently owned and operated by LaGen, a subsidiary of NRG Energy, Inc., and has operated for over 30 years. A site map, presented on Figure 1, depicts relevant areas at the Facility associated with CCR management and identifies both the Fly Ash Basin and the Bottom Ash Basin, which are the existing CCR surface impoundments onsite.

Coal is delivered via barge to a dock on the Mississippi River immediately east of the generating units. The delivered coal is subsequently unloaded onto a conveyor belt which transports the material to a storage area situated north of the Facility's three generating units. Unit 1 and Unit 3 use coal as the primary source of fuel, and thus generate CCR

material (fly ash and bottom ash). Unit 2 was previously converted to natural gas and no longer generates CCR.

Fly ash generated by Unit 1 and Unit 3 is pneumatically transported to storage silos and is subsequently relocated offsite (for beneficial reuse or disposal) or is conveyed via a closed system into a closed truck which transports the material into the Fly Ash Basin for disposal. As market demand dictates, the CCR within the Fly Ash Basin is excavated, removed, and sold. Bottom ash from Unit 1 is collected within a hopper at the boiler unit and transported hydraulically (sluiced) into the Bottom Ash Basin for storage/disposal. Bottom ash from Unit 3 is removed at the base of the boiler unit, stockpiled, and loaded onto trucks for disposal within the Bottom Ash Basin. The Fly Ash Basin and Bottom Ash Basin are regulated by a LDEQ Solid Waste Permit as an industrial surface impoundment.

The rainwater and wastewater that is collected within the Fly Ash Basin and Bottom Ash Basin flows by gravity to the Rainfall Surge Pond (see Figure 1). The rainwater and wastewater are subsequently routed to a lift station and conveyed to the Primary and Secondary Treatment Ponds for treatment prior to discharge to the Mississippi River. The Facility's discharge to the Mississippi River is regulated under a Louisiana Pollutant Discharge Elimination System (LPDES) permit.

2.3 CCR Unit Design and Construction Information

The Fly Ash Basin and Bottom Ash Basin were formed through the construction of above-grade perimeter dikes (i.e., embankments/berms) to manage CCR and sluice process water. The perimeter dikes are composed of recompacted clayey soils and the underlying soils within the CCR Units interiors consist of naturally occurring and/or recompacted clayey soil that is 3-ft thick (minimum) to over 10-ft thick (CB&I, 2016b). A summary of the design and as-constructed conditions is presented below in Table 1.

Table 1. Summary of CCR Units Design and Constructed Conditions

Parameter[1]	Fly Ash Basin	Bottom Ash Basin
Year of Construction / Start of Operation	1980	1980
Surface Area (ac)	175	66
Impoundment Surface Area (ac)	175	66
Total Permitted CCR Storage Capacity (yd^3)	3,905,000	2,585,000
Impoundment Storage Capacity (to Dike Crest) (yd^3)[2]	2,823,000	1,916,650

Parameter[1]	Fly Ash Basin	Bottom Ash Basin
Impoundment Storage Capacity (to Dike Crest) (ac-ft)	1,750	1,188
Dike Length[3] (ft)	9,560	6,798
Crest Width[4] (ft)	12	12
Dike Crest Elevation (ft, MSL)	40	48
Approximate/Typical Bottom Elevation (ft, MSL)	30	30
Normal Operating Surface Water Elevation (ft, MSL)	35	35
Dike Height (ft)	10	18
Design Slopes (H:V)	3:1	3:1

Notes:
ac = acres. ft = feet. ft, MSL = feet above mean sea level. H:V = horizontal to vertical.
1. Source of Information is October 2016 Structural Integrity Assessment Report (CB&I, 2016b) unless otherwise noted.
2. Source of the information is from the January 2016 Annual Inspection Report (CB&I, 2016a)
3. Dike Length estimated from available maps. Length of divider berm between the Fly Ash Basin and Bottom Ash Basin included within Dike Length for the Bottom Ash Basin.
4. Crest Width obtained from Figure 12 of 2010 LDEQ Solid Waste Permit Renewal Application (Shaw, 2010).

2.4 Review of Structural Integrity Assessment Report

Geosyntec reviewed the *Structural Integrity Assessment Report* (CB&I, 2016b) to understand the design, construction, and previously assessed performance of the Fly Ash Basin and Bottom Ash Basin. A summary of the relevant findings presented in the *Structural Integrity Assessment Report* is provided below.

- The Fly Ash Basin and Bottom Ash Basin were both assigned a low hazard potential in accordance with the hazard classification assessment criteria set forth in the CCR Rule.
- CB&I (2016a) included documentation that the CCR Units were designed, constructed, operated, and maintained consistent with recognized and generally accepted good engineering practices to manage the maximum volume of CCR and water that can be impounded.
- Prior records or knowledge of structural instability were addressed or are monitored. In summary, the initial assessment noted that pre-2015 information

indicated that the perimeter dikes are generally stable, but noted some items for consideration or continued observation, including erosion, vegetation growth, desiccation cracks, animal burrows, limited sloughing/slope instability areas, and toe seepage areas. Corrective measures (maintenance/repair of areas of potential instability) were implemented in 2015.

- Calculated safety factors were reported to be greater than the required safety factors identified within the CCR Rule.

2.5 Review of Previous Inspections

Inspections in October 2015 as part of the *Initial Annual Inspection* (CB&I, 2016a) noted minor erosion, some animal burrows, and a few desiccation cracks. The *Initial Annual Report* noted that previously-identified areas of sloughing/slope instability were repaired since the prior inspection. No sloughing, slope instability areas, or signs of distress or malfunction that may indicate actual or potential structural weakness in either CCR Basin were observed in prior reports. The condition of each CCR unit was found to be adequate with respect to design, construction and operation.

The annual inspection performed in October 2016 for the *2017 Annual Inspection Report* (CB&I, 2017) noted for the Fly Ash Basin: numerous animal burrows along the exterior dike side slopes; a CCR accumulation around the discharge pipe between the Fly Ash and Bottom Ash Basins; minor and isolated surficial desiccation cracks; no wet toe/seepage or erosion areas; and two areas in the northwest portion of the basin with surface slope irregularities that may have been equipment wheel ruts or may have indicated the initial formation of sloughs. The identified and previously repaired slough referenced in the *Initial Annual Inspection* (CB&I, 2016a) was reported to appear stable. The *2017 Annual Inspection Report* further noted for the Bottom Ash Basin: a few animal burrows were present, no desiccation cracks; no wet toe/seepage or erosion areas; and the subsequently repaired area of sloughing along the northern perimeter dike. The previous unstable area referenced in the *Initial Annual Inspection* (CB&I, 2016a) was reported to appear stable and no additional areas required repair. CB&I concluded that there were no signs of distress or malfunction that would indicate actual or potential structural weakness of either basin.

Geosyntec reviewed the *2018 Annual Inspection Report* (Geosyntec, 2018) and the available CCR impoundment inspection logs during 2018. The *2018 Annual Inspection Report* identified a few isolated wet areas at the Fly Ash Basin southern impoundment toe, isolated dike rut areas within the dike crest and toe, and limited areas of uneven slopes or animal burrows. The Facility received a significant rainfall the week prior to the 2018 inspection and the wet areas were identified to be low-lying areas and not seeps. Meanwhile, the northern slope of the Bottom Ash Basin was identified with a crack and contained limited slumping at the dike toe. Geosyntec (2018) recommended that the dike

be repaired, but did not indicate an immediate concern as CCR is sufficiently offset from the dike structure and the surface water is maintained well below the dike crest. Overall, the Fly Ash Basin, Bottom Ash Basin, and associated hydraulic structures were found to be in good condition during the inspection. The routine inspection checklists indicate that the CCR basins and outlet/surface drainage structures are inspected weekly, and that embankment conditions or stability concerns are identified as appropriate. The 2018 inspection checklist records indicate that the crack and slump identified in the northern Bottom Ash Basin dike did not displace further during the inspection period.

3. ANNUAL SITE INSPECTION

Mr. James D. McNash, P.E., of Geosyntec visited the Facility on 11 October 2018 to visually inspect the Fly Ash Basin and Bottom Ash Basin and to interview the Facility's environmental coordinator. During this inspection, Geosyntec traversed the entire length of the Fly Ash Basin and Bottom Ash Basin perimeter dikes and the divider dike between the two units. Geosyntec visually inspected and recorded observations with regards to the condition of the dike crest, upstream and downstream slopes, dike toe, and the discharge/stormwater conveyance structures to identify conditions or features that may potentially indicate distress or instability. A site map which depicts notable observations is presented on Figure 2

Weather conditions during the inspection were observed to be clear, with temperatures of about 65 – 70 °F during the visit. Significant rainfall was not experienced in New Roads, LA during the week prior to inspection (data from nearby New Roads False River, LA). However, New Roads, LA received 0.38 inches and 0.23 inches of rainfall on 1 October and 6 October 2018, respectively. The inspected ground surface was generally dry with isolated patches of desiccation cracks and with no areas of standing water except for the basin interiors. The exterior perimeter dikes were not mowed prior to the inspection; however, the north perimeter dike northern slope was mowed during Geosyntec's inspection.

3.1 Visual Inspection for Signs of Distress or Malfunction

3.1.1 Observations at Bottom Ash Basin

Geosyntec's inspection of the Bottom Ash Basin started in the southwest corner of the CCR unit and proceeded counter-clockwise initially along the divider dike between the Bottom Ash Basin and the Fly Ash Basin. The following observations were made during the inspection of the Bottom Ash Basin:

- A location of localized slope instability (a localized slough) was observed on the north-facing exterior dike slope of the Bottom Ash Basin, about 400 feet east from the northwestern corner. The observed area is approximately 70 to 90-ft long and exhibits a roughly 12-inch escarpment at the crest that is slightly eroded. The affected area was previously identified during past annual inspections (CB&I, 2017; Geosyntec, 2018) and was repaired prior to 2015 after an inspection. The instability does not appear to have displaced further and weekly inspection records indicate that the slough is monitored routinely. The toe area was slightly bulged, but signs of seepage (i.e., softer soils) were not observed when traversed. At the time of the inspection, CCR material or significant volume of standing water were not impounded on the interior perimeter dike slope adjacent to this area. As such, the affected area appears to be a localized observation for which a repair is

recommended, but not considered an issue that impairs the operation or safety of the CCR unit. As the location coincides with previously-noted slope failures and repairs, slough condition and potential seepage when the CCR basin accumulates significant water volume should be carefully observed for changes and scheduled for repair.

- The perimeter road on top of the dike was generally in good condition with no observed signs of problematic desiccation cracking or deformations.
- Overall, vegetation was observed to be in good condition, with no noted areas of significant distress, no signs of erosion of the exterior dike slopes or seeps exiting the slope. The areas adjacent to the previously identified north facing slough were identified without vegetation and with several animal burrows. Extensive desiccation cracks were not observed in these areas.
- Standing water was observed and was located predominantly along drainage swales on the northern and eastern sides, where CCR placement within the Bottom Ash Basin is set-back from the perimeter dikes. During the inspection, process water was pumped into the southeast corner of the impoundment. The process water appeared clear upon discharge and appeared to slowly migrate through internal rim ditches and pipes towards the northeast and northwest corners of the impoundment. At the beginning of the inspection, a small vortex was observed within the northeast corner of the impoundment, which did not persist throughout the inspection. Further discussion of hydraulic structures is discussed subsequently within this Report.

3.1.2 Observations at Fly Ash Basin

Geosyntec inspected the Fly Ash Basin starting from its southeastern corner and progressed counter-clockwise around the basin perimeter. The following observations were made during the inspection activities of the Fly Ash Basin:

- Wet areas identified in the 2018 inspection (Geosyntec, 2018) on the Fly Ash Basin perimeter south dike toe about 1,300 feet and 2,000 feet west from the southeastern corner were not observed to contain standing water. The natural topography indicates that these are low-lying areas where water tends to naturally accumulate, and seepage of the perimeter dike structure or any signs of distress or malfunction were not identified.
- A minor rut, approximately 6 inches in depth, was identified in the dike crest in the south Fly Ash Basin perimeter dike. In some perimeter dike sections, limited areas of distressed vegetation and shrinkage cracking of surficial soil were observed.

- Surficial material on the interior slopes in several areas of the southwestern, western and northwestern dikes appear to be uneven that result in localized steeper slopes near the crest. In some cases, rills extend near to the interior dike crest edge.
- The area of uneven ground surface along the exterior about 250 feet east of the southwestern corner observed in prior annual inspections (CB&I, 2017; Geosyntec 2018) was not observed. CB&I identified the area with the potential sloughs/slope instability which was subsequently repaired. At the time of Geosyntec's inspection, no evidence of movement or instability (i.e., escarpment, tension cracks, bulging/rotation, or seeps) was observed. However, due to historical instability, the area merits continued annual inspection and observation weekly for changes or other signs of movement/weakness.
- Uneven ground surface and/or equipment rutting was observed on the perimeter dike crest near the Fly Ash Basin's southwest corner. The area exhibited relatively significant equipment rutting which appears to be the predominant contributor to the uneven ground condition. During Geosyntec's inspection, evidence of movement or instability, as previously defined, was not observed. However, this area is identified as a relevant observation due to the uneven ground surface, which may indicate a deeper slope movement or contribute to increase erosion due to ponding of water. Further observation to identify changes or other signs of movement/weakness and/or regrading activities to smooth the dike crest for future inspections is recommended.
- Other than the aforementioned locations, the perimeter road along the perimeter dike crest was observed to be in generally good condition with no observed signs of problematic desiccation or tension cracking and/or other deformations. Continued routine maintenance is recommended to permit access and facilitate routine inspection of the CCR unit.
- Occasional animal burrows less than two inches in diameter were observed on the southern and western-facing exterior dike slopes. One larger animal burrow greater than three inches in diameter was observed on the south face of the Fly Ash Basin. However, some limited bare areas were observed on the exterior dike slopes with desiccation cracks. Extensive desiccation cracks or signs of seepage were not observed in these areas.
- The surface water level within the Fly Ash Basin was below the dike crest and greater than 6-ft of freeboard was maintained during the inspection as indicated by the staff gauge located in the northeast corner of CCR unit. Further discussion of the staff gauge is provided subsequently within this Report.

3.1.3 Observations at Hydraulic Structures

Water from the Fly Ash Basin is transported into the Bottom Ash Basin via a 30-in. diameter drainage pipe (see Figure 1). The combined flow from both CCR units is then directed through another 30-in. diameter drainage pipe and flow control valve into the Rainfall Surge Pond. Additional storage capacity is provided in the Bottom Ash Basin which is connected to an overflow weir (pipe) with headwalls which typically directs water into the Primary Treatment Pond. At the time of inspection, the following observations were made:

- The staff gauge located at the northeast corner of the Fly Ash Basin was functional, with a depth reading of 0.1-ft. Based on discussions with the Facility environmental coordinator, the measured water level was lower than prior inspections because the Facility revised operations such that additional freeboard is provided within the basins.
- Near the staff gauge location, the discharge pipe and headwalls were observed to be submerged and appeared to function as designed between the Fly Ash Basin and Bottom Ash Basin. Erosion, scour, or seepage at or adjacent to the pipe penetration was not observed.
- The Primary Treatment Pond was observed to overflow into the Bottom Ash Basin at the time of visit. The exposed portion of the pipe appeared to be rusted in spots but intact and functional. A small gap between the dike and headwall was observed on the Primary Treatment Pond, but was likely due to limited erosion in the area.
- A small temporary vortex was observed in the northeast corner of the Bottom Ash Basin during the inspection.
- The hydraulic structures associated with the CCR unit appeared to be functional; no issues that would impact the structural integrity or continued safe and reliable operation of the hydraulic structures were observed.

4. RESULTS OF ANNUAL INSPECTION

4.1 Observed Conditions

Results of the Fly Ash Basin and Bottom Ash Basin annual inspection are presented in Section 3.

4.2 Geometry of Impounding Structures

Based on a review of the available information in the Operating Record, discussions with facility personnel, and review of the inspection results with prior observations, no construction or other alternations were made to the impounding structures of the Fly Ash Basin and Bottom Ash Basin. As such, geometry changes of the impounding structures since the last annual inspection report are not reported. The Facility intermittently manages the stacked CCR within each basin, but significant alterations to the CCR units' storage capacity were not observed.

4.3 Instrumentation and Readings

The Facility maintains one staff gauge within the basins, which is located in the northeastern corner of the Fly Ash Basin. During the annual inspection, the observed staff gauge level was 0.25-ft, which indicated a freeboard of approximately >6-ft above the perimeter dike crest. The staff gauge is observed weekly during the inspections by a qualified person and routine measurements have indicated that >2-ft of freeboard was maintained in the Fly Ash Basin since the previous annual inspection report.

4.4 Depth and Elevation of Impounded Water and CCR

A summary of the observed conditions of the impounded water and CCR present in the Fly Ash Basin and Bottom Ash Basin during the annual inspection is presented below in Table 2.

Table 2. Summary of Impounded Water and CCR Conditions at the Time of Inspection

Parameter [1]	Fly Ash Basin	Bottom Ash Basin
Approximate Extent of Basin with Open/Standing Water	55% (north/west two-thirds is water; remainder contains exposed CCR)	3% (limited water on northern and eastern sides; remainder contains exposed CCR)
Approximate Elevation of Impounded Water (ft, MSL)[2]	33.25	33.25

Parameter [1]	Fly Ash Basin	Bottom Ash Basin
Approximate Typical Elevation of CCR (where placed) (ft, MSL)[3]	33 - 40 ft, MSL	40 - 48 ft, MSL
Approximate Typical Depth of Impounded Water (ft)	0 - 3 ft	0 - 3 ft
Approximate Typical Thickness of CCR (ft)	3 - 10 ft	10 - 18 ft
Approximate Maximum Above-Dike Height of Stockpiled CCR (ft)	15	22
Approximate Maximum Elevation of Stockpiled CCR (ft, MSL)	55	70
Approximate Maximum Typical Thickness of Stockpiled CCR (ft)	25	40

Notes:

ac = Acres. ft = feet. ft, MSL = feet above mean sea level.

1. Present conditions are those estimated from visual inspection on 11 October 2018.
2. Based on the staff gauge measurement during visual inspection on 11 October 2018. A zero measurement corresponds to 33.0 ft MSL, which was developed during prior site inspections.
3. Refers to typical estimated elevation and available topographic map.

4.5 Impounded Volume and Storage Capacity of Impounding Structures

Information on the impounded volume and associated storage capacities, estimated at the time of inspection, of the Fly Ash Basin and Bottom Ash Basin is presented below in Table 3. The design (as-permitted) conditions are also provided for reference.

Table 3. Summary of CCR Unit Volumes and Storage Capacities the Time of Inspection

Parameter	Fly Ash Basin	Bottom Ash Basin
Permitted (Design) Information[1]		
Impoundment Surface Area (ac)	175	66
Total Permitted CCR Storage Capacity (CY)	3,905,000	2,585,000
Impoundment Storage Capacity (to Dike Crest) (CY)	2,823,000	1,916,650
Impoundment Storage Capacity (to Dike Crest) (ac-ft)	1750	1188
Present (at Time of Inspection) Conditions[2]		

Parameter	Fly Ash Basin	Bottom Ash Basin
Approximate Volume of Impounded Water[3] (CY)	505,000	6,000
Approximate Volume of Stored CCR (CY)	1,241,000	1,176,000
Remaining Storage Capacity Available - Water[4] (CY)	2,318,000	740,650
Remaining Storage Capacity Available - CCR (CY)	2,664,000	1,409,000

Notes:
ac = Acres. CY = cubic yards. ac-ft = acre-feet.

1. Source of Design Information is October 2016 Structural Integrity Assessment Report (CB&I, 2016b).
2. Present Conditions are those estimated from visual inspection on 10/11/2018. CCR Storage Volume is based on Geosyntec (2018) reported volumes, adjusted for LaGen's estimated CCR volumes added (or removed) from each basin prorated to the date of inspection as provided by the Facility's environmental manager.
3. Approximate Volume of Impounded Water calculated based on observed estimated open water area and estimated average depth.
4. Remaining Water Capacity is estimated for Fly Ash Basin assuming the area occupied by CCR does not contain capacity for water storage.

4.6 Appearance of Actual or Potential Structural Weakness of CCR Units

A description of the observed conditions of the Fly Ash Basin and Bottom Ash Basin was provided previously in Section 3. Based on these observed conditions and review of the other available information as described herein, the structural condition of the CCR Units is summarized as follows:

- For the Fly Ash Basin, Geosyntec noted no appearance of any actual or potential structural weakness at the time of inspection.
- For the Bottom Ash Basin, Geosyntec noted one (1) area of potential structural weakness: an area of slope instability located on the northern-facing exterior slope of the perimeter dike, near the northwest corner of the basin. The identified area was further described in Section 3.1.2. Recommendations for corrective measures (repair) are provided subsequently in Section 5.
- For both the Fly Ash Basin and Bottom Ash Basin, existing conditions observed by Geosyntec at the time of the inspection that disrupt or are considered to have the potential to disrupt the operation and safety of the CCR Units and appurtenant structures were not identified.

4.7 Changes Which May Have Affected the Stability or Operating of the Impounding Structures

Based on the observed conditions and review of the other available information as described herein, there were no changes to either the Fly Ash Basin or Bottom Ash Basin which affect the stability or operation of the impounding structures.

5. RECOMMENDATIONS

Based on the observed conditions during the annual site inspection on 11 October 2018 and review of the other available and relevant information as described herein, the following recommendations are made:

1. **Corrective Measure – Repair**. The area of localized slope instability (area of sloughing) on the northern-facing exterior slope of the perimeter dike (near the northwest corner of the Bottom Ash Basin) should be repaired to rehabilitate a potential structural weakness to the impoundment.
2. **Heightened Awareness During Routine Inspections**. This Report identifies a few areas that merit being more closely observed on a routine basis (e.g., weekly inspections) for signs of changes or progressive worsening of conditions. These areas were locations where wet/soft or uneven ground was observed. While there was no evidence of slope instability or movement, such conditions may be precursors.
3. **Ongoing Maintenance and Repairs as Needed**. Perform maintenance/repairs to the dikes and other appurtenant impoundment features on a routine and ongoing programmatic basis as well as on an as needed basis if warranted by any problems or concerns (e.g., as identified during periodic inspections by a qualified person, or as otherwise identified). Bare areas should be re-seeded to establish vegetation and the existing vegetation maintained in a condition to facilitate inspections. Observed ruts and erosion rills should be repaired before the feature worsens.
4. For any berm repairs, including in particular the aforementioned recommended corrective measure to the perimeter dike, include Construction Quality Assurance (CQA) monitoring by a 3rd party during implementation of the work to document and verify that the repairs are made in accordance with project requirements and sound geotechnical practices.
5. Continue with current practices of maintaining set-back distance between CCR material stockpiles and the dikes.

Limitations

The inspections were performed and this Report was prepared, in accordance with current practices and the standard of care exercised by scientists and engineers performing similar tasks in the field of civil engineering, and no other warranty is provided in connection therewith. The contents of this report are based solely on the observations of the conditions observed by Geosyntec personnel and information provided to Geosyntec by LaGen. Consistent with applicable professional standards of care, our opinions and recommendations were based in part on data furnished by others.

6. RECORDKEEPING, NOTIFICATION, INTERNET REQUIREMENTS

6.1 Recordkeeping Requirements

In accordance with 40 CFR §257.105(g), the Report and related information will be kept in the Operating Record. These items will be maintained in the Operating Record for at least five years.

Documentation which records the inspection and instrumentation monitoring results by a qualified person as well as documentation that details corrective measures will be kept in the Facility Operating Record and will be maintained for at least five years.

6.2 Notification Requirements

In accordance with 40 CFR §257.106(g), the State Director of the LDEQ will be notified that this Report has been placed in the Operating Record and on the publicly accessible internet site.

6.3 Internet Requirements

In accordance with 40 CFR §257.107(g), the most recent CCR Surface Impoundment Annual Inspection Report will be made available on the Facility's publicly accessible internet site within 30 days of it being placed in the Operating Record.

7. REFERENCES

CB&I, 2016a. Big Cajun II Coal Combustion Residual (CCR) Annual Inspection Report. Louisiana Generating, LLC, Big Cajun II, January 2016.

CB&I, 2016b. CCR Compliance Fly Ash Basin and Bottom Ash Basin Structural Integrity Assessment Report. Louisiana Generating, LLC, Big Cajun II, October 2016.

CB&I, 2017. Big Cajun II Coal Combustion Residual (CCR) Annual Inspection Report. Louisiana Generating, LLC, Big Cajun II, January 2017.

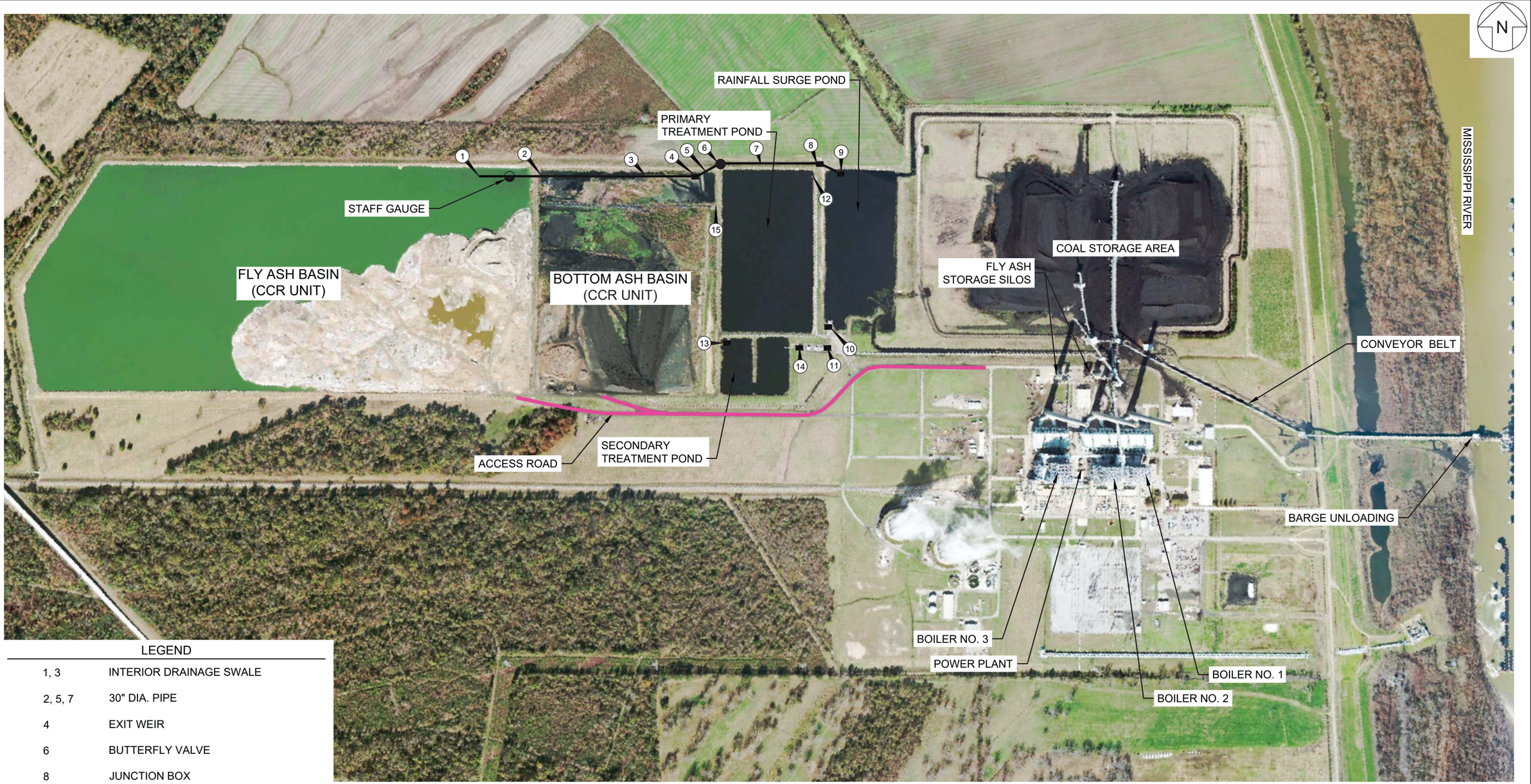
Dewberry & Davis, LLC, 2011, Coal Combustion Waste Impoundment, Round 5 – Dam Assessment Report, Big Cajun II Generating Station, Final Rev. 2, March 2011.

LaGen, 2018. CCR Impoundment Inspection Log (Weekly Inspections), January to October 2018.

Geosyntec, 2018. 2018 Annual Inspection Report. Louisiana Generating, LLC, Big Cajun II, January 2018.

Shaw, 2010. Type I Solid Waste Permit Renewal and Modification Application (LDEQ Permit No. P-0108R1), Big Cajun II Power Plant, November 2010.

FIGURES



LEGEND	
1, 3	INTERIOR DRAINAGE SWALE
2, 5, 7	30" DIA. PIPE
4	EXIT WEIR
6	BUTTERFLY VALVE
8	JUNCTION BOX
9	DISCHARGE
10	LIFT STATION
11	CHEMICAL STORAGE
12	DISCHARGE TO PRIMARY TREATMENT
13	AERATOR
14	LIFT STATION TO MISSISSIPPI RIVER
15	OVERFLOW WEIR

NOTE:

1. AERIAL PHOTO SOURCE: BING MAPS, MICROSOFT CORPORATION, 2017 .
2. LEGEND AND LOCATION OF CCR OPERATIONAL FEATURES TAKEN FROM OCTOBER 2016 STRUCTURAL INTEGRITY ASSESSMENT REPORT BY CB&I ENVIRONMENT & INFRASTRUCTURE, INC.

0 800'
SCALE IN FEET

SITE PLAN
BIG CAJUN II POWER PLANT
10431 CAJUN II ROAD
NEW ROADS, LA 70760

Geosyntec consultants

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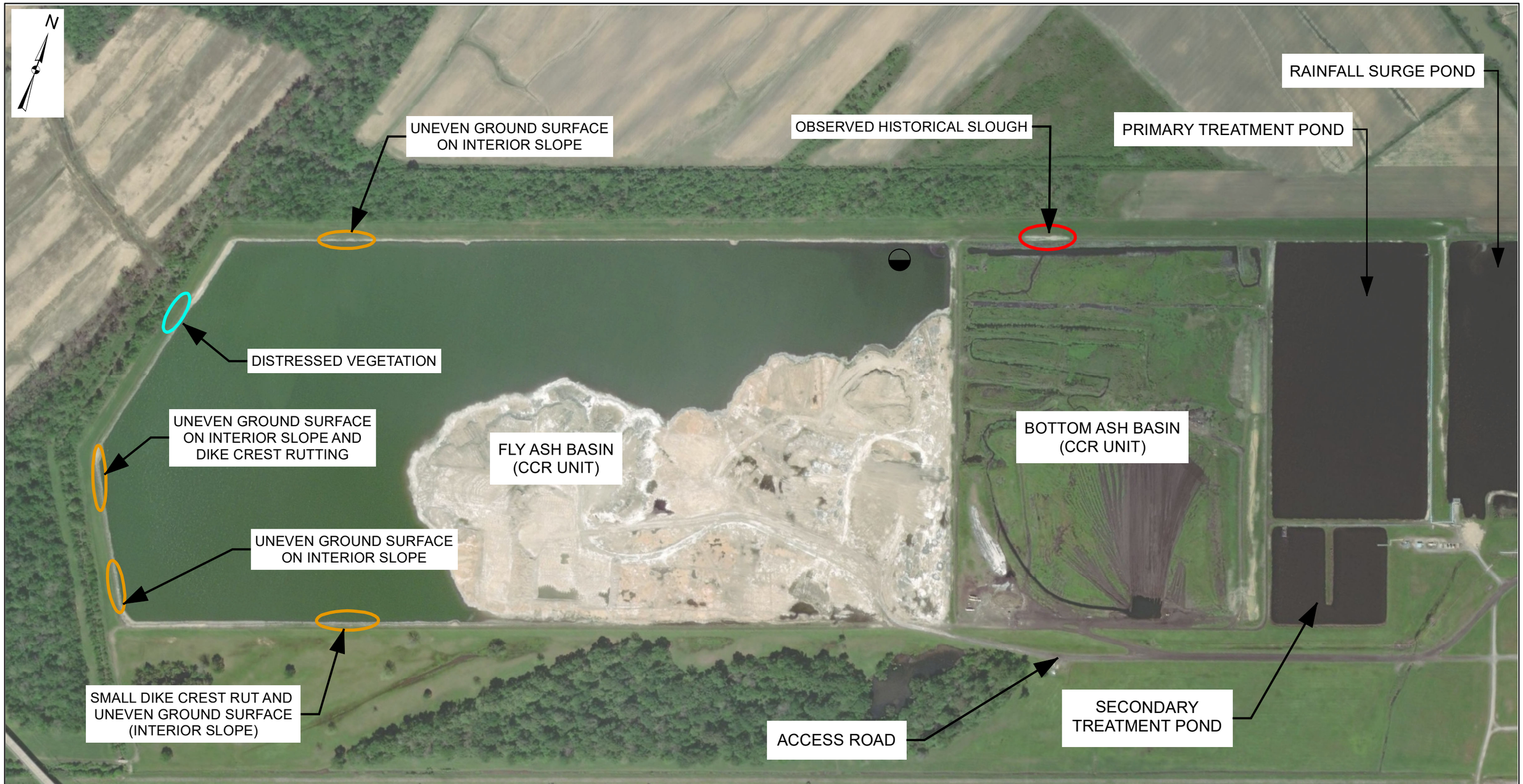
FIGURE
1

P:\CADDPROJECTS\BIG CAJUN\CCR SUPPORT (TXR0771 02)\FIGURES\TXR077102F02



LEGEND

- STAFF GAUGE
- UNEVEN GROUND SURFACE
- DISTRESSED VEGETATION
- DISTRESSED GROUND

NOTES:

1. AERIAL PHOTO SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY
2. MAPPED FEATURE LOCATIONS FROM GEOSYNTEC'S INSPECTION ON 11 OCTOBER 2018.

0 500'

SCALE IN FEET

10/11/2018 INSPECTION MAP
BIG CAJUN II POWER PLANT
10431 CAJUN II ROAD
NEW ROADS, LA 70760

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FIGURE 2