Geosyntec consultants

engineers | scientists | innovators

CLECO Connecting Louisiana's future. Cleco Cajun LLC

# CCR SURFACE IMPOUNDMENT ANNUAL INSPECTION REPORT

## Big Cajun II Power Plant

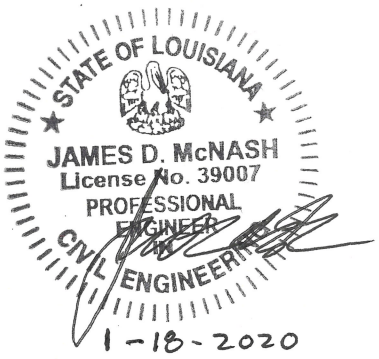
## New Roads, Pointe Coupee Parish, Louisiana

*Prepared for*

**Cleco Cajun, LLC**
10431 Cajun II Road, Highway 981
New Roads, Louisiana 70760

*Prepared by*

Geosyntec Consultants, Inc.
5420 Corporate Boulevard, Suite 202
Baton Rouge, Louisiana 70808




Project Number TXR3568

January 2020

# TABLE OF CONTENTS

# FIGURES

# 1. INTRODUCTION

## 1.1 Purpose

This CCR Surface Impoundment Annual Inspection Report (Report) was prepared for the Big Cajun II Power Plant (Facility), owned by Cleco Cajun, LLC – a subsidiary of Central Louisiana Electric Company (Cleco), 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 annual 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 29 October 2019. During 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; Geosyntec 2019) were placed in the Operating Record on 18 January 2017, 2018, and 2019, 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 2019 to its issuance date of 18 January 2020, 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);
- January 2019 CCR Annual Inspection Report (Geosyntec, 2019); and
- 2019 Weekly CCR Inspection Logs by a Qualified Person (Cleco, 2019).

Annual inspections are held during October of each year and each inspection report, published the following January, documents the preceding inspection event. 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 of prior assessments and inspections is provided within the subsequent sections.

## 2.2 Facility Background

The Cleco Big Cajun II Power Plant (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 Cleco Cajun, LLC., a subsidiary of Cleco, 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 (fly ash and bottom ash). Unit 2 was previously converted to burn 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 industrial surface impoundments.

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 |

| Parameter[1] | Fly Ash Basin | Bottom Ash Basin |
|---|---|---|
| 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 |
| 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 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 routinely 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), as applicable, were implemented in 2015.
- Calculated safety factors were reported to be greater than the minimum required safety factors identified within the CCR Rule.

## 2.5 Review of Previous Inspections

The first annual inspection for the Fly Ash and Bottom ash Basins was performed in October 2015 and was documented in the *2016 Annual Inspection Report* (CB&I, 2016a). Subsequent, inspections were performed in October 2016, 2017, and 2018 as documented by CB&I (2017) and Geosyntec (2018; 2019). Each annual inspection report described observed conditions during the inspection and provided an assessment of the impoundment dikes and hydraulic structures. The prior inspection report observations and recommendations were reviewed by Geosyntec prior to the Facility visit to inform inspection activities.

# 3. ANNUAL SITE INSPECTION

Mr. James D. McNash, P.E., of Geosyntec visited the Facility on 29 October 2019 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 CCR 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 59 °F – 66 °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 0.49 inches and 0.32 inches of rainfall on 26 and 27 October 2019, respectively. The inspected ground surface was generally dry with isolated patches of desiccation cracks and with no areas of standing water outside basin interiors. The exterior perimeter dikes were mowed prior to the inspection and vegetation appeared to be maintained.

## 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 was performed in a counter-clockwise direction around the southern perimeter dike structure. 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-ft to 90-ft long and exhibits a roughly 12-inch escarpment at the crest that is slightly eroded with some vegetation growth. During the inspection, tractor mower tracks were observed which indicated that equipment avoided the affected area. The affected area was previously identified during past annual inspections (CB&I, 2017; Geosyntec, 2018; Geosyntec, 2019) 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. During the inspection, the Facility environmental coordinator identified that the area was scheduled for repair in 2019. In January 2020, the facility notified Geosyntec that the repair was completed in December 2019.

- 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. Adjacent to and west of the historical slough, rutting was observed in the downstream dike slope, which appeared to be associated with tractor style mowing equipment used to maintain vegetation on the slope.
- The perimeter road on top of the dike was generally in good condition with no observed signs of problematic desiccation cracking or deformations.
- Three animal burrows with approximate diameters between 4 and 8 inches, were observed.
- 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 channelized towards the southeast corner of the impoundment. Temporary diesel driven pumps were present around the Bottom Ash Basin, but were not operational during the inspection. Process water was pumped into the south end of the basin. The hydraulic structure conditions are 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 clockwise around the basin perimeter. The notable observations are shown on Figure 2 and described as follows:

- Wet areas identified in the *2018 Annual Inspection Report* held in October 2017 (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.
- Limited areas of ponded water were observed on the north side of the Fly Ash Basin against an existing fence line. Topography north and outside of the fence line is slightly higher and prevents surface water runoff. The adjacent downstream

dike slope was observed to be dry; as such, the retained water does not appear to be the result of seepage through the containment structures.

- A minor rut, approximately 6 inches in depth, was identified in the dike crest in the south Fly Ash Basin perimeter dike.
- 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.
- An area of uneven ground surface or a tension crack along the exterior about 250 feet east of the southwestern corner was observed in prior annual inspections. The southwest corner of the Fly Ash Basin was also previously identified as having potential sloughs/slope instability and was subsequently repaired. During this inspection, evidence movement or instability (i.e., seepage, wet areas, and additional slumping) was not observed. The area merits continued annual inspection and observation weekly for geometric changes or other signs of movement/weakness.
- Uneven ground surface and/or equipment rutting was observed on the downstream 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. Further observation to identify changes or other signs of movement/weakness and/or regrading activities to smooth the slope for future inspections is recommended.
- In the northwest corner, a few minor ruts within the dike crest were observed. The perimeter road along the perimeter dike crest was generally observed to be in 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 between four to eight inches in diameter were observed on the southern and northern-facing exterior dike slopes. 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 4-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 concrete headwalls which can direct overflow 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 between 2.0-ft and 2.25-ft, approximately 2.15-ft.
- 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 and Bottom Ash Basin surface water elevations were observed to be below the pipe invert between the pond and basin and surface water was not observed to overflow between the units 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 isolated erosion in the area.
- 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. ANNUAL INSPECTION RESULTS

## 4.1 Observed Conditions

Observed conditions during the Fly Ash Basin and Bottom Ash Basin annual inspection at the Facility 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 alterations 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 (Geosyntec, 2019) 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 CCR Units, which is located in the northeastern corner of the Fly Ash Basin. During the annual inspection, the observed staff gauge level was between 2.0 ft and 2.25 ft and appeared to be approximately 2.15 ft, which indicated a freeboard of approximately >4-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 prior inspection.

## 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) |

| Parameter [1] | Fly Ash Basin | Bottom Ash Basin |
|---|---|---|
| Approximate Elevation of Impounded Water (ft, MSL)[2] | 35.15 | 35.15 |
| 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) | 2 - 5 ft | 2 - 5 ft |
| Approximate Typical Thickness of CCR (ft) | 3 - 10 ft | 10 - 18 ft |
| Approximate Maximum Above-Dike Height of Stockpiled CCR (ft)[4] | 100 | 22 |
| Approximate Maximum Elevation of Stockpiled CCR (ft, MSL) [4] | 50 | 70 |
| Approximate Maximum Typical Thickness of Stockpiled CCR (ft) [4] | 20 | 40 |

Notes:

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

1. Present conditions are those estimated from visual inspection on 29 October 2019.
2. Based on the staff gauge measurement during visual inspection on 29 October 2019. 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. Approximate temporary CCR stockpile heights within the interior of each CCR unit.

## 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 |

| Parameter | Fly Ash Basin | Bottom Ash Basin |
|---|---|---|
| ***Present (at Time of Inspection) Conditions[2]*** | | |
| Approximate Volume of Impounded Water[3] (CY) | 800,000 | 6,000 |
| Approximate Volume of Stored CCR (CY) | 1,244,000 | 1,152,000 |
| Remaining Storage Capacity Available - Water[4] (CY) | 2,023,000 | 764,650 |
| Remaining Storage Capacity Available - CCR (CY) | 2,661,000 | 1,433,000 |

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 10/29/2019. CCR Storage Volume is based on Geosyntec (2019) reported volumes, adjusted for Cleco's estimated CCR placement volumes added (or removed) from each basin prorated to the date of inspection as provided by the Facility's environmental coordinator.
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 one area of potential structural weakness: a tension crack or uneven ground surface within the exterior slope in the southwest corner. However, the tension crack did not appear to have displaced recently, and the environmental coordinator indicated that the area would be maintained or repaired in early 2020.
- For the Bottom Ash Basin, Geosyntec noted one 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, and scheduled for a repair that was completed in December 2019.

- 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 CCR Unit inspection on 29 October 2019 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. Geosyntec understands that the Facility, scheduled and completed the repair of this area in December 2019.
2. **Heightened Awareness During Routine Inspections**. This Report identifies a few areas that warrant close observation 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. Geosyntec understands that the southwest corner of the Fly Ash Basin may be repaired in January 2020 during routine maintenance activities.
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 problems or concerns (e.g., as identified during periodic inspections by a qualified person, or as otherwise identified). Ruts should be regraded and 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 the aforementioned recommended corrective measure to the perimeter dike, include Construction Quality Assurance (CQA) monitoring by a 3rd party during implementation 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 Cleco. 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.

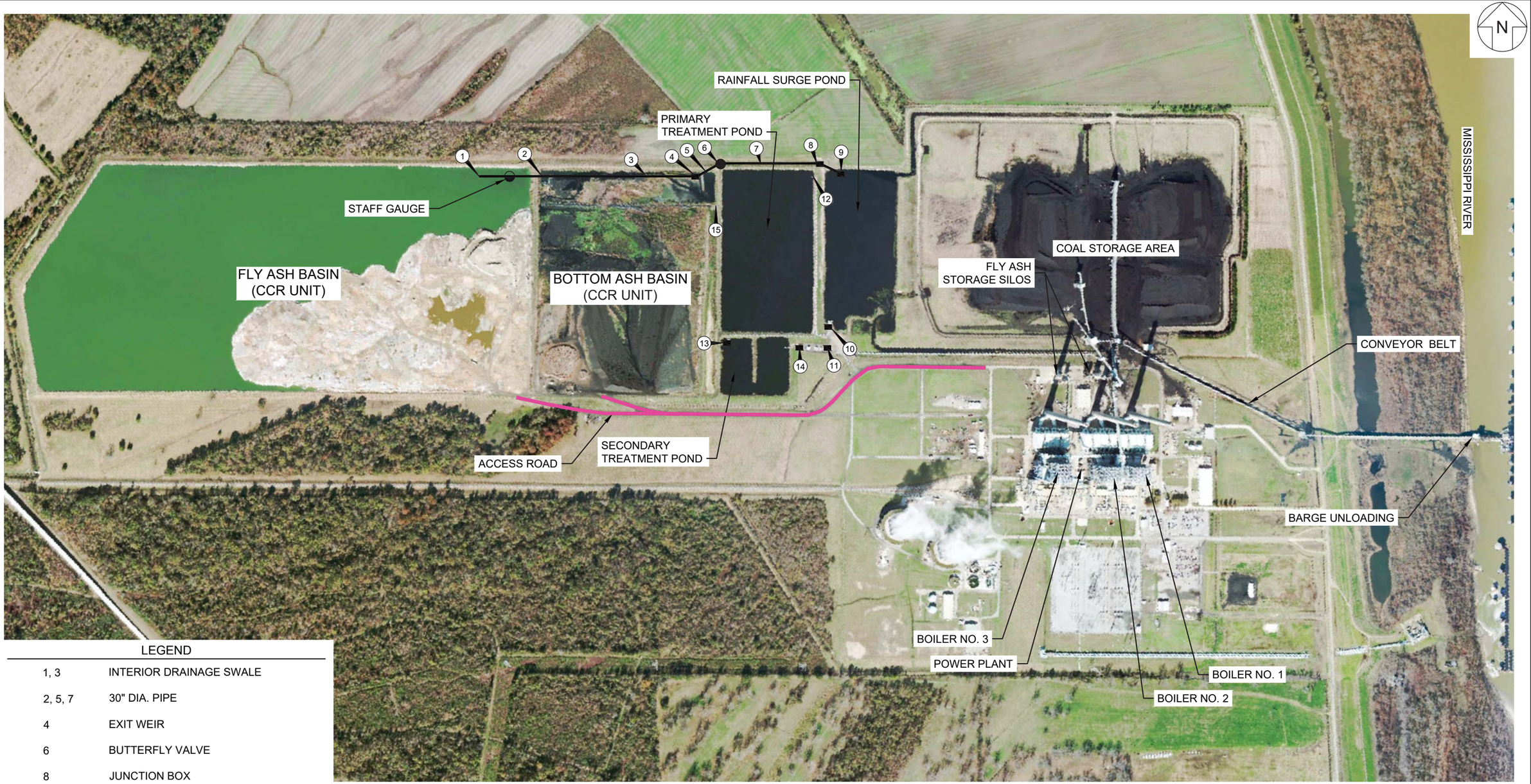
Cleco, 2019. CCR Impoundment Inspection Log (Weekly Inspections), January to October 2019.

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

Geosyntec, 2019. 2019 Annual Inspection Report. Cleco Cajun, LLC., Big Cajun II, January 2019.

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

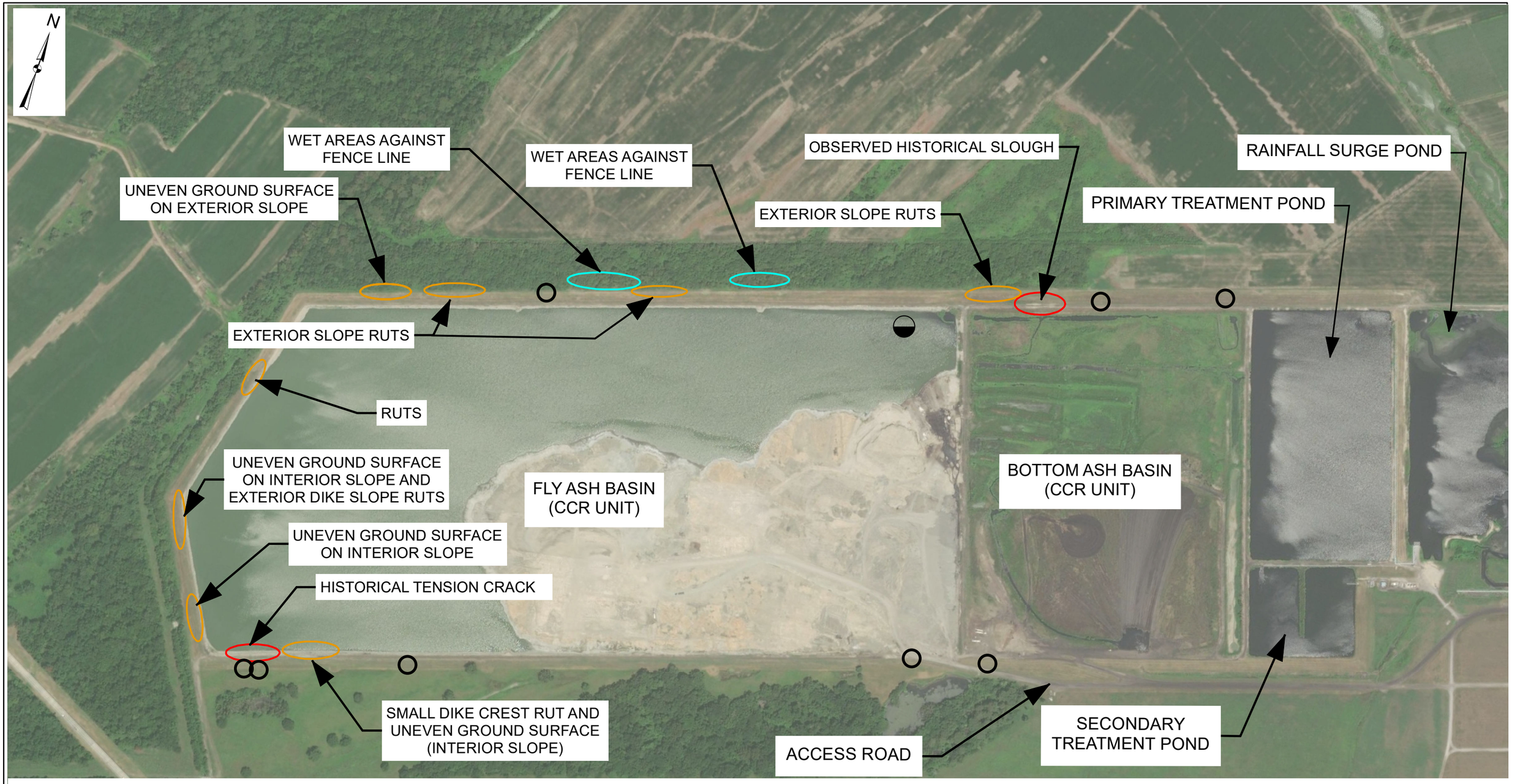
# SITE PLAN
# BIG CAJUN II POWER PLANT
# 10431 CAJUN II ROAD
# NEW ROADS, LA 70760

Geosyntec consultants

BATON ROUGE, LA | JANUARY 2020

FIGURE 1

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




LEGEND

- STAFF GAUGE
- UNEVEN GROUND SURFACE
- WET AREA
- DISTRESSED GROUND
- ANIMAL BURROWS

NOTES:

1. AERIAL PHOTO SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY
2. MAPPED FEATURES AND PHOTOGRAPH LOCATIONS FROM GEOSYNTEC'S INSPECTION ON 29 OCTOBER 2019.

0 500'

SCALE IN FEET

10/29/2019 INSPECTION MAP
BIG CAJUN II POWER PLANT
10431 CAJUN II ROAD
NEW ROADS, LA 70760

Geosyntec consultants

BATON ROUGE, LA | JANUARY 2020

FIGURE 2