

# **CLECO CAJUN LLC**

## **BIG CAJUN II POWER PLANT**



### **5-YEAR PERIODIC REVIEW**

### **STRUCTURAL STABILITY ASSESSMENT**

### **FLY ASH BASIN**

**OCTOBER 2021**

Providence Engineering and Environmental Group LLC  
1201 Main Street  
Baton Rouge, LA 70802  
(225) 766-7400  
[www.providenceeng.com](http://www.providenceeng.com)  
Providence Project No: 996-018



**TABLE OF CONTENTS**

<b><u>Section</u></b>	<b><u>Page</u></b>
1.0 INTRODUCTION .....	1
2.0 STRUCTURAL STABILITY.....	2
3.0 CONCLUSION .....	3
4.0 REFERENCES .....	3

**LIST OF TABLES**

<b><u>Table</u></b>	
1 Short-Term Factors of Safety .....	2

**LIST OF FIGURES**

<b><u>Figure</u></b>	
1 Site Location Map	
2 Site Map	

**LIST OF APPENDICES**

<b><u>Appendix</u></b>	
A P.E. Certification	

## 1.0 INTRODUCTION

Providence Engineering and Environmental Group LLC (Providence) was contracted by Cleco Cajun LLC (Cleco) to conduct the 5-year periodic review of the structural stability assessment of the Fly Ash Basin at Cleco's Big Cajun II Power Plant (BCII).

The Coal Combustion Residual (CCR) regulations at 40 CFR 257.73(d)(1) established requirements for owners and operators to conduct a structural stability assessment by a qualified professional engineer to document whether the design, construction, operation and maintenance is consistent with recognized and generally accepted good engineering practices. This assessment must, at a minimum, document whether the CCR unit has been designed, constructed, operated, and maintained with:

- Stable foundations and abutments.
- Adequate slope protection to protect against surface erosion, wave action, and adverse effects of sudden drawdown.
- Dikes mechanically compacted to a density sufficient to withstand the range of loading conditions in the CCR unit.
- A single spillway or a combination of spillways designed, operated, and maintained to adequately manage flow during a 1,000-year flood for a significant hazard potential CCR surface impoundment.
- Hydraulic structures underlying the base of the CCR unit or passing through the dike of the CCR unit that maintain structural integrity and are free of significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, and debris which may negatively affect the operation of the hydraulic structure.
- For CCR units with downstream slopes which can be inundated by the pool of an adjacent water body, such as a river, stream or lake, downstream slopes that maintain structural stability during low pool of the adjacent water body or sudden drawdown of the adjacent water body.

This 5-year review of the structural stability assessment pertains to the Fly Ash surface impoundment (Basin) that is utilized for the BCII coal-fired generation unit. BCII is located at 10431 Cajun II Road, New Roads, Pointe Coupee Parish, Louisiana. A site location map showing the BCII Power Plant is included as **Figure 1**. The Fly Ash Basin is shown in **Figure 2**.

CB&I conducted the original Structural Stability Assessment in 2016 that included a review of the construction drawings, operational plan, and the inspection and maintenance procedures for the Fly Ash Basin.

## 2.0 STRUCTURAL STABILITY

### **Stable Foundations and Abutments**

Providence reviewed the 2016 CB&I report and the results of the static maximum surcharge pool factor of safety values. The current operational status of the Fly Ash Basin has not changed, except fly ash has ceased being placed in the basin since April 11, 2021. After a review of the results of the 2016 slope stability analysis, Providence has determined that the following minimum factors of safety will remain the same:

**Table 1 Short-Term Factors of Safety**

Surface Impoundment	Slope Scenario	Storage Pool Elevation (feet)	Calculated Factor of Safety
Fly Ash Basin	Existing Slope	39.3	2.29
Fly Ash Basin	Proposed Capped Slope	39.3	2.71

The calculated short-term static factor of safety under maximum surcharge pool loading conditions is greater than 1.40, therefore these safety factors are adequate.

The interior and exterior slopes of the perimeter levees are approximately on a three horizontal to one vertical and were compacted during the construction of the levees.

### **Adequate Slope Protection to Protect Against Surface Erosion, Wave Action, and Adverse Effects of Sudden Drawdown**

The levees surrounding the Fly Ash Basin have adequate slope protection against surface erosion, wave action, and adverse effects of a sudden drawdown. The levees have a minimum three-foot thick layer of clay on the interior, exterior, and crest of the levee. Vegetation is adequate on the top of the levee where it may be exposed to the elements. As part of Cleco's operational plan, the levees are inspected weekly for any erosion due to weather, animals, or other elements and deficiencies are promptly corrected.

### **Dikes Mechanically Compacted to a Density Sufficient to Withstand the Range of Loading Conditions in the CCR Unit**

At the time of construction, the dikes were mechanically compacted to a density sufficient to withstand the range of loading conditions for the daily operation of the Fly Ash Basin.

**A Single Spillway or a Combination of Spillways Designed, Operated, and Maintained to Adequately Manage Flow During a 100-Year Flood for a Low Hazard Potential CCR Surface Impoundment**

Water discharges from the Fly Ash Basin by means of a 30-inch diameter gravity flow pipe (instead of a spillway) constructed of non-erodible material designed, operated, and maintained to adequately manage flow during a 100-year flood for a low hazard potential Fly Ash Basin.

**Hydraulic Structures Underlying the Base of the CCR Unit or Passing Through the Dike of the CCR Unit that Maintain Structural Integrity and are Free of Significant Deterioration, Deformation, Distortion, Bedding Deficiencies, Sedimentation, and Debris Which May Negatively Affect the Operation of the Hydraulic Structure**

A 30-inch gravity flow pipe (instead of hydraulic structures underlying the base of the Fly Ash Basin) that passes through the dike of the Fly Ash Basin is maintained with structural integrity and is free of significant deterioration, deformation, distortion, bedding deficiencies, sedimentation and debris which may negatively affect the operation of the hydraulic structure.

None of the known pipes lead to offsite locations on the surface or to public drainage systems or waterways or pose any significant risks to Cleco as a result of their operation.

**For CCR Units with Downstream Slopes Which Can Be Inundated By The Pool of an Adjacent Water Body, Such as a River, Stream or Lake, Downstream Slopes Must Maintain Structural Stability During Low Pool of the Adjacent Water Body or Sudden Drawdown of the Adjacent Water Body**

The Fly Ash Basin is not located adjacent to a water body such that the slopes are inundated by water.

### **3.0 CONCLUSION**

Based on the results from the structural stability assessment, the Fly Ash Basin's design, construction, operation and maintenance is consistent with recognized and generally accepted good engineering practices. The Fly Ash Basin meets the requirements at 257.73(d)(1) of the CCR regulations. **Appendix A** contains a P.E. Certification that attests to this 5-Year Periodic Review of the Structural Stability Assessment.

### **4.0 REFERENCES**

The following reports/documents were used to prepare this 5-year periodic review of the structural stability assessment for the Fly Ash Basin:

CB&I Environmental & Infrastructure, Inc.; 2016; Big Cajun II CCR Compliance, Fly Ash and Bottom Ash Basin Structural Integrity Assessment Report, NRG Louisiana Generating, LLC, NRG Energy, Inc., New Roads, Louisiana.

Geosyntec Consultants; 2020; Big Cajun II Power Plant; CCR Surface Impoundment Annual Inspection Report, Cleco Cajun LLC, New Roads, Louisiana.

Environmental Protection Agency; 2015; 40 CFR Parts 257 and 261 Rules and Regulations, Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities, Volume 80, No. 74; Final Rule.

GeoEngineers, Inc.; 2011 (May); Preliminary Geotechnical Engineering Services, Ash Basins/Wastewater Treatment Ponds, Big Cajun II Generating Site, New Roads, Pointe Coupee Parish, Louisiana.

GeoEngineers, Inc.; 2011 (September); Embankment Dike Inspections Services, Ash Basins/Wastewater Treatment Ponds, Big Cajun II Generating Site, New Roads, Pointe Coupee Parish, Louisiana.

GeoEngineers, Inc.; 2012; Geotechnical Engineering Services Report, Big Cajun II Generating Site, New Roads, Pointe Coupee Parish, Louisiana.

GeoEngineers, Inc.; 2014; Preliminary Geotechnical Engineering Services, Ash Basins/Wastewater Treatment Ponds, Big Cajun II Generating Site, New Roads, Pointe Coupee Parish, Louisiana.

GeoEngineers, Inc.; 2015; Dike Slope and Failure Evaluations, Ash Basin Ponds, Big Cajun II Generating Site, New Roads, Pointe Coupee Parish, Louisiana.

Louis J. Capozzoli and Associates, Inc.; 1974; Preliminary Subsoil Investigation and Foundation Design Data, Big Cajun 2, Site C-2, New Roads, Louisiana, File No. 74-30.

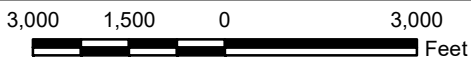
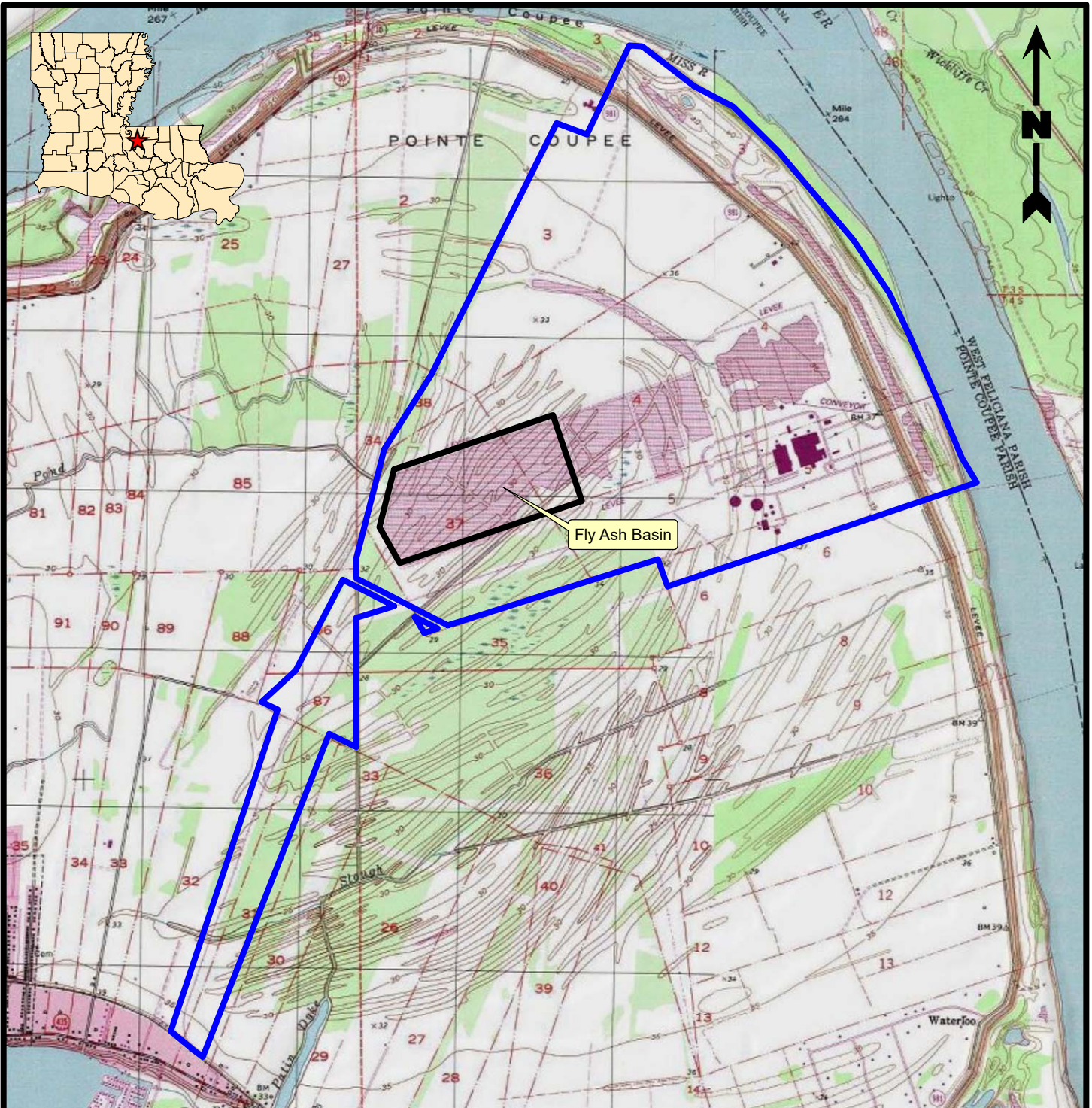
Louis J. Capozzoli and Associates, Inc.; 1977; Preliminary Subsurface Soil Investigation and Laboratory Testing, Ash Storage Area, CEPCO No. 2, Plant Site, New Roads, Louisiana.

Louis J. Capozzoli and Associates, Inc.; 2006; Geotechnical Investigation, Bottom Ash Storage Pond Expansion; Big Cajun No. 2, Pointe Coupee Parish Plant Site, Louisiana, LJC&A File 0558.

Providence Engineering and Environmental Group LLC; November 2019; Type I Industrial Surface Impoundments Permit Renewal Application P-0108R1 prepared for Louisiana Generating LLC, Big Cajun II Power Plant, New Roads, Pointe Coupee Parish, Louisiana.

**FIGURE 1**  
**SITE LOCATION MAP**





**Legend**

- Property Boundary
- Facility Boundary

**Reference**

Base map comprised of United States Geological Survey (USGS) 7.5-minute topographic maps, "St. Francisville, LA", "Elm Park, LA", "New Roads, LA", and "Port Hudson, LA".

**Site Location Map**

**5-Year Periodic Review  
Structural Stability Assessment - Fly Ash Basin**  
New Roads, Pointe Coupee Parish, Louisiana

**Cleco Cajun LLC**  
Big Cajun II



**PROVIDENCE**

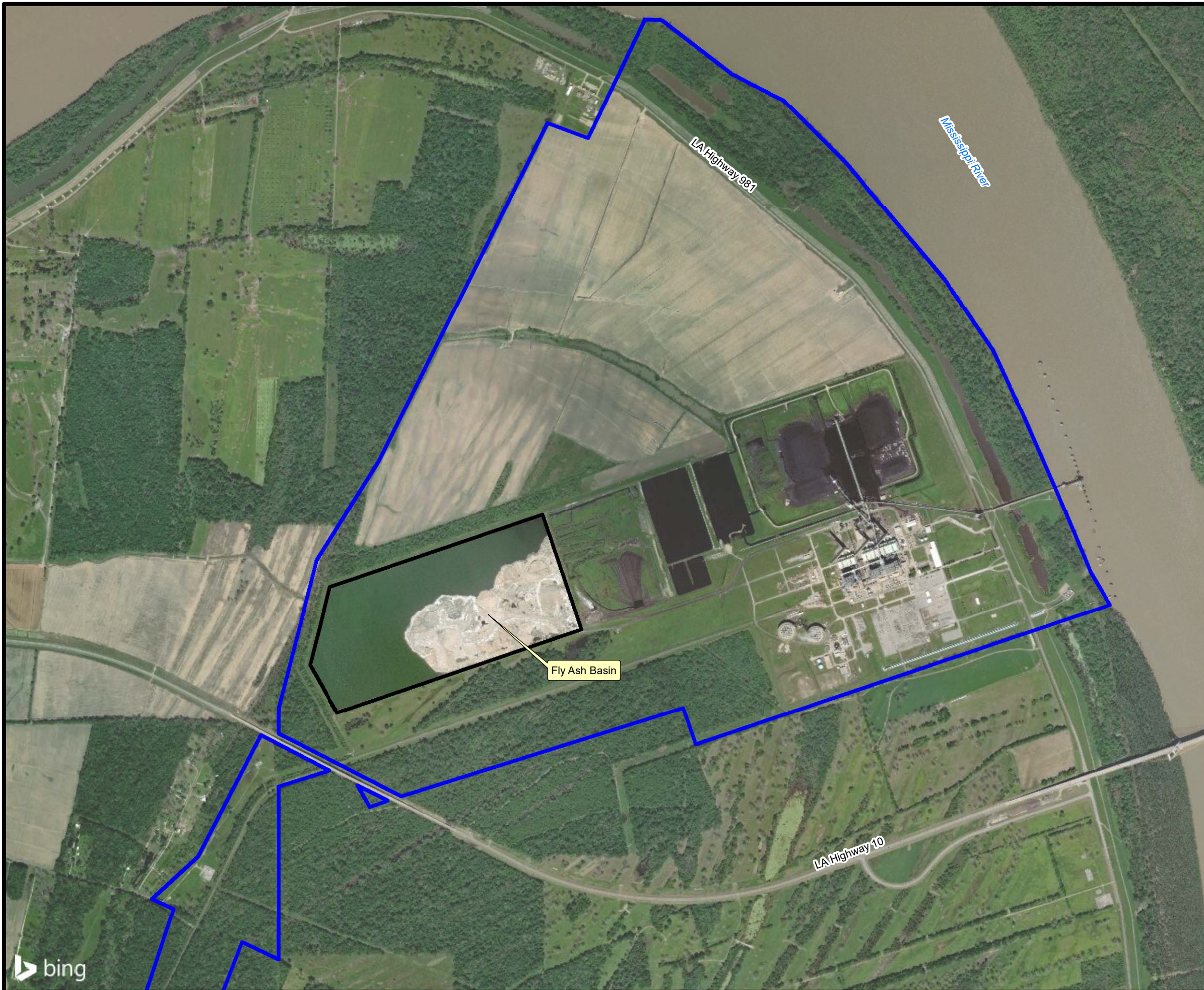
Drawn By	LMH	10/08/21
Checked By	LMH	10/08/21
Approved By	CVH	10/08/21

Project Number	996-018	<b>1</b> Figure
Drawing Number	996-018-A006	





**FIGURE 2**  
**SITE MAP**



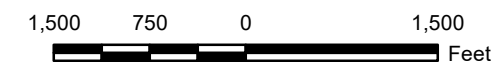


**Legend**

-  Property Boundary
-  Facility Boundary

**Reference**

Base map comprised of Bing Maps aerial imagery from (c) 2021 Microsoft Corporation and its data suppliers.



**Site Map**

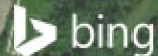
**5-Year Periodic Review  
Structural Stability Assessment - Fly Ash Basin**  
New Roads, Pointe Coupee Parish, Louisiana

**Cleco Cajun LLC**  
Big Cajun II



**PROVIDENCE**

Drawn By	LMH	10/08/21
Checked By	LMH	10/08/21
Approved By	CVH	10/08/21
Project Number	996-018	
Drawing Number	996-018-B014	
	<b>2</b>	Figure





**APPENDIX A**  
**P.E. CERTIFICATION**

**BIG CAJUN II POWER PLANT  
FLY ASH BASIN  
5-YEAR PERIODIC REVIEW - CCR STRUCTURAL STABILITY ASSESSMENT**

**PROFESSIONAL ENGINEER CERTIFICATION**

I hereby certify that I have performed the 5-year periodic review of the structural stability assessment for Cleco Cajun LLC (Cleco) Big Cajun II Power Plant Fly Ash Basin in accordance with the 40 CFR 257.73(d)(1) CCR requirements. This 5-year periodic review of the structural stability assessment has determined that the Fly Ash Basin's design, construction, operation and maintenance is consistent with recognized and generally accepted good engineering practices. It has been designed, constructed, operated, and maintained with:

- Stable foundations and abutments.
- Adequate slope protection to protect against surface erosion, wave action, and adverse effects of sudden drawdown.
- Dikes mechanically compacted to a density sufficient to withstand the range of loading conditions in the CCR unit.
- The discharge structures are designed, operated, and maintained to adequately manage rainfall during a 1,000-year flood for a significant hazard potential CCR surface impoundment.
- Hydraulic structures underlying the base of the CCR unit or passing through the dike of the CCR unit that maintain structural integrity are free of significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, and debris which may negatively affect the operation of the hydraulic structure.
- For CCR units with downstream slopes which can be inundated by the pool of an adjacent water body, such as a river, stream or lake, downstream slopes must maintain structural stability during low pool of the adjacent water body or sudden drawdown of the adjacent water body.

**James C. Van Hoof**

Name

**24630**

Registration No.

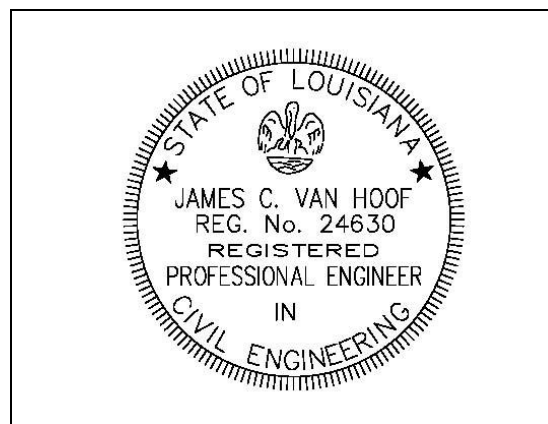
**LA**

State

Signature

10/15/2021

Date



(Seal)