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# **REMEDY SELECTION REPORT**

## **BYPRODUCT STORAGE AREA**

### **C.D. McIntosh Power Plant**

### **3030 East Lake Parker Drive**

### **Lakeland, Polk County, Florida**

*Prepared for*

**Lakeland Electric**

**501 Lemon Street**

**Lakeland, Florida 33801**

*Prepared by*

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Project Number: FR3715A

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**Final Remedy Selection Certification  
Lakeland Electric - C. D. McIntosh Power Plant  
Byproducts Storage Area  
[40 C.F.R. § 257.97]**

Pursuant to 40 C.F.R. § 257.97(a) of The Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals (CCR) From Electric Utilities; Final Rule, the owner or operator of a CCR unit required to initiate an assessment of corrective measures in accordance with 40 C.F.R. § 257.96(a) must prepare a final report describing the selected remedy and how it meets the standards specified in 40 C.F.R. § 257.97(b). The owner or operator must obtain a certification from a qualified professional engineer that the remedy meets the requirements of 40 C.F.R. § 257.97. In accordance therewith, this certification is provided to document that the remedy selected for the above-referenced CCR unit meets the requirements of 40 C.F.R. § 257.97.

**LIMITATIONS**

The signature of Consultant's authorized representative on this document represents that to the best of Consultant's knowledge, information, and belief in the exercise of its professional judgment, it is Consultant's professional opinion that the aforementioned information is accurate as of the date of such signature. Any opinion or decisions by Consultant are made on the basis of Consultant's experience, qualifications, and professional judgment and are not to be construed as warranties or guaranties. Opinions relating to environmental, geologic, and geotechnical conditions or other estimates are based on available data, and actual conditions may vary from those encountered at the times and locations where data are obtained, despite the use of due care.

**CONSULTANT'S CERTIFICATION**

I, Todd D. Anderson, being a Registered Professional Engineer, in accordance with the Florida Professional Engineer's Registration, do hereby certify to the best of my knowledge, information, and belief, that the remedy selected meets the requirements of 40 C.F.R. § 257.97.

FL P.E. No. 51277

This document has been electronically signed and sealed by Todd D. Anderson, PE on 31 March 2021 using a digital signature. Printed copies of this document are not considered signed and sealed and the SHA authentication code must be verified on any electronic copies.

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## 1. INTRODUCTION

Geosyntec Consultants (Geosyntec) has prepared this remedy selection report on behalf of Lakeland Electric (LE) for the Byproduct Storage Area (BSA) at the C. D. McIntosh Power Plant (MPP) located in Lakeland, Florida (**Figure 1**). The report meets the requirements of the United States Environmental Protection Agency's (USEPA) Coal Combustion Residuals (CCR) Rule contained in Subpart D of 40 CFR Part 257. The specific reporting requirements in 40 CFR Section 257.97(a) states that *“Based on the results of the corrective measures assessment conducted under Section 257.96, the owner or operator must, as soon as feasible, select a remedy that, at a minimum, meets the standards listed in paragraph (b) of this section”* and *“Upon selection of a remedy, the owner or operator must prepare a final report describing the selected remedy and how it meets the standards listed in Section 257.97(b).”* Specifically, the remedy must protect human health and the environment, attain the groundwater protection standards, control the sources of releases so as to reduce or eliminate, to the maximum extent practicable, further releases of appendix IV constituents into the environment, and comply with any relevant standards for management of wastes generated as a result of the remedial activities.

### 1.1 Public Meeting

Prior to the preparation of this remedy selection report, a public meeting was held on February 3, 2020, as required in 40 CFR Section 257.96(e). Due to the COVID-19 public health emergency, the meeting was held both in person and virtually via the Cisco WebEx Video Conferencing (WebEx). The in-person meeting was held at the RP Funding Center and the virtual meeting was conducted via WebEx. A notice of the meeting was published in the Lakeland Ledger on January 23 and January 30, 2021. During this meeting, LE presented information regarding the implementation of the CCR Rule requirements at the MPP and a plan to implement various remedies to address the groundwater protection standards (GWPS) exceedances documented at the BSA. No comments were provided to LE during, or as a follow-up to, the public meeting.

## 2. SITE HISTORY

The MPP and associated facilities are located on a 530-acre site at 3030 East Lake Parker Drive in Lakeland, Polk County, Florida (**Figure 1**). The MPP facility has a combined generation capacity of 874 megawatts (MW) consisting of multiple units including; two diesel peaking units, two simple cycle combustion turbines (Units MGT1 and MGT2) a coal fired generator (Unit No. 3), and a combined cycle natural gas unit (Unit No. 5).

On January 2, 1979, construction was started on MPP Unit No. 3, a nominal 334 MW coal-fired steam generating unit which became operational on September 1, 1982. The unit was later modified so that its nominal gross output was increased to 365 MW. In 1999, the construction of MPP Unit No. 5, a 225 MW, simple cycle combustion turbine was completed and placed into commercial operation in May 2001. In September 2001, the unit underwent conversion to a combined cycle unit through the addition of a nominal 120 MW steam turbine generator. Construction was completed in spring 2002 with the unit being declared commercially operational in May 2002.

The BSA was constructed in the 1980s and is an above-grade, earthen containment unit lined with pozzolanic material that encompasses approximately 44 acres, surrounded by a perimeter ditch system and is located east of Unit No. 3 and adjacent to Fish Lake, Lakes B, C, and D, the south sedimentation pond, and the temporary byproduct staging area (**Figure 2**). The BSA has historically received CCR generated by Unit No. 3 and currently receives fly ash, bottom ash, synthetic gypsum, and stabilized flue gas desulfurization (FGD) material. The northern portion of the BSA has been covered with a 1.5-foot thick low permeability layer to minimize erosion and manage stormwater runoff. The southern half of the BSA is actively worked by LE for CCR storage; however, a portion of the CCR is reclaimed for off-site beneficial reuse in the cement industry.

### 3. PROJECT MILESTONES

The following is a list of project milestones completed at the BSA since the CCR Rule became effective on October 19, 2015.

- **June 2016:** Installed certified monitoring well network around the BSA (**Figure 2**);
- **August 2016 - August 2017:** Conducted groundwater monitoring (9 events) from all CCR wells at the BSA for Appendix III and Appendix IV constituents;
- **October 2017:** Initiated detection monitoring and associated data evaluation;
- **January 2018:** Conducted statistical analyses of Appendix III constituents and identified statistically significant increases (SSIs) above background for Appendix III constituents in CCR wells around the BSA;
- **April 2018:** Transitioned to assessment monitoring;
- **October 2018:** Evaluated groundwater monitoring data for statistically significant levels (SSLs) of Appendix IV constituents exceeding applicable groundwater protection standards (GWPS);
- **February 2019 – March 2019:** Conducted nature and extent characterization at the MPP including supplemental soil and groundwater assessment;
- **June 2019:** Completed alternative source demonstration (ASD) for radium 226 and 228;
- **June 2019:** Completed an assessment of corrective measures (ACM);
- **July 2019 to Present:** Evaluation and design of selected remedy(s); and
- **February 2021:** Public Meeting.

#### 3.1 Completion of Required Reports

The following required reports were completed since compliance activities were initiated.

- Golder, 2016. Monitoring Well Installation Report, CCR Rule Compliance Support, Byproduct Storage Area, Lakeland Electric, C.D. McIntosh Power Plant, Lakeland, Florida, September 2016.
- Golder, 2017a. Technical Memorandum, Groundwater Sampling Methodology and Analytical Procedures, CCR Groundwater Monitoring, Byproduct Storage Area – C.D. McIntosh Power Plant, April 2017.

- Golder, 2017b. CCR Groundwater Monitoring Network Documentation, C.D. McIntosh Power Plant, Byproduct Storage Area, Lakeland Electric, Lakeland, Florida, October 2017.
- Golder, 2017c. Statistical Analysis Plan, CCR Groundwater Monitoring, Lakeland Electric, C.D. McIntosh Power Plant, October 2017.
- Golder, 2018a. Statistically Significant Increase Evaluation, Byproduct Storage Area, C.D. McIntosh Power Plant, Lakeland, Florida, January 2018.
- Golder, 2018b. 2017 Annual Groundwater Monitoring and Corrective Action Report, Byproduct Storage Area, C.D. McIntosh Power Plant, Lakeland, Florida, January 30.
- Golder, 2018c. Abandonment and Replacement of Monitoring Well CCR-10, Lakeland Electric, C.D. McIntosh Power Plant, Lakeland, Florida, April 2018.
- Golder, 2018d. Statistically Significant Level Evaluation, CCR Rule Groundwater Monitoring - Byproduct Storage Area, Lakeland Electric C.D. McIntosh Power Plant, October 2018.
- Golder, 2019a. 2018 Annual Groundwater Monitoring and Corrective Action Report, Byproduct Storage Area, C.D. McIntosh Power Plant, Lakeland, Florida, January 2019.
- Golder, 2019b. Extension of Assessment of Corrective Measures, Byproduct Storage Area – C.D. McIntosh Power Plant, Lakeland, Polk County, Florida, April 2018.
- Golder, 2019c. Alternate Source Demonstration for Radium 226&228 in Groundwater, Byproduct Storage Area B, C.D. McIntosh Power Plant, Lakeland, Polk County, Florida, June 2018.
- Golder, 2019d. Assessment of Corrective Measures, Byproduct Storage Area, C.D. McIntosh Power Plant, Lakeland, Polk County, Florida, June 2019.
- Golder, 2020a. 2019 Annual Groundwater Monitoring and Corrective Action Report, Byproduct Storage Area, C.D. McIntosh Power Plant, Lakeland, Florida, January 2020.
- Golder, 2020b. Groundwater Remedy Selection and Design Semi-Annual Progress Report #1 – C.D. McIntosh Power Plant, Lakeland Electric, December 2019.
- Golder, 2020c. Groundwater Remedy Selection and Design Semi-Annual Progress Report #2 – C.D. McIntosh Power Plant, Lakeland Electric, June 2020.
- Geosyntec, 2021a. Groundwater Remedy Selection and Design Semi-Annual Progress Report #3 – C.D. McIntosh Power Plant, Lakeland Electric, January 2021.
- Geosyntec, 2021b. 2020 CCR Annual Groundwater Monitoring and Corrective Action Report, Byproduct Storage Area, C.D. McIntosh Power Plant, Lakeland, Florida, January 2020.



## 4. ASSESSMENT OF CORRECTIVE MEASURES RESULTS

LE completed an assessment of corrective measures (ACM) report for the BSA in accordance with 40 CFR Section 257.96(a). The ACM report was completed and certified by a qualified professional engineer in June 2019. A summary of the report is provided below.

### 4.1 Groundwater Monitoring and Characterization

Detection monitoring was initiated in 2016, as required by 40 CFR Section 257.90(b)(1)(iii). Sampling was performed to establish background concentrations of constituents listed in 40 CFR Part 257, Subpart D, Appendices III and IV. Sampling for detection monitoring was initiated to meet the requirements of 40 CFR Section 257.94. Nine groundwater sampling events were performed during detection monitoring activities for Appendix III and Appendix IV constituents between January 2016 and September 2017. Assessment monitoring was initiated in 2018 after SSIs were detected above background levels for several Appendix III constituents in groundwater samples collected downgradient of the BSA. Assessment monitoring is still being conducted for the BSA. An alternate source determination (ASD) (Golder, 2019c) for total radium was successfully completed in accordance with 40 CFR Section 257.94(e)(2).

Arsenic, lithium, and total radium were detected at SSLs greater than GWPS in one or more monitoring wells in the upper most aquifer below the BSA. Arsenic was generally detected along the northwestern portion of the BSA and lithium was detected along the western, eastern, and northern portion of the unit. While the total radium exceeded the GWPS in several monitoring wells around the BSA, it is not considered an exceedance of the GWPS at the MPP based on the findings of the ASD (Golder, 2019c). This report demonstrated that naturally occurring radium was present in groundwater and it was associated with historical phosphate mining operations that occurred prior to the construction of the MPP. CCR monitoring well construction details are listed in **Table 1** and assessment monitoring results from 2020 are summarized in **Table 2**.

Due to the presence of Appendix IV constituents observed at SSLs greater than their applicable GWPS for arsenic and lithium, further characterization of the nature and extent of groundwater was performed according to 40 CFR Section 257.95(g)(1). The nature and extent investigation for these constituents was completed in December 2019 and is documented in the ACM report.

### 4.2 Source Control

Source control measures were evaluated to prevent further releases from the source (i.e., the BSA). Source control can limit the migration of the plume and ensure associated remedial technologies are effective. The final remedy(s) must control the source of the contamination to reduce or eliminate further releases by identifying and locating the cause of the release. Source control measures can include modification of operational procedures; effective maintenance activities; excavation of CCR for treatment and/or offsite disposal or beneficial use; and closure in place of the BSA. Closure in place would include, at a minimum, the installation of a final

(low permeability) cover system. Source control measures will substantially reduce the leaching of the constituents of interest (CO). (i.e., arsenic and lithium) into groundwater from the BSA.

### 4.3 Potential Groundwater Remedial Technologies

The following list includes groundwater remedial technologies that were evaluated for potential implementation at the BSA:

- In-Situ Technologies:
  - Groundwater Migration Barriers;
  - In-Situ Chemical Immobilization;
  - Permeable Reactive Barriers (PRBs);
- Groundwater Extraction:
  - Conventional Vertical Well Systems;
  - Phytoremediation;
- Groundwater Treatment; and
- Monitored Natural Attenuation (MNA)

A detailed summary of each technology is included in the ACM report.

### 4.4 Selected Remedy

The proposed remedy for the BSA will consist of source control, including continued beneficial use of CCR material and subsequent closure in place. LE anticipates that the BSA will be closed by leaving CCRs in place and installing a final cover system, as required by 40 CFR Section 257.102(a) once Unit No. 3 (the coal-fired unit) is retired. The BSA will be closed in accordance with the requirements of 40 CFR Section 257.102 and within the timeframes as stated in 40 CFR Section 257.102(e) and (f). The BSA final cover system will be designed to control the post-closure release of contaminants and to minimize the need for long-term maintenance. Closure will also be conducted in accordance with the requirements of the State of Florida Conditions of Certification for MPP and the Combustion By-Product Storage Facility Operations Manual for MPP.

#### 4.4.1 Perimeter Ditch

A perimeter ditch surrounds the BSA (**Figure 2**) and receives contact stormwater associated with operation of the unit. Approximately ¼ to 1/3 of the ditch is soil cement lined. Stormwater runoff from the active landfill (contact stormwater) drains to the soil cement lined ditch. Non-contact stormwater is routed to vegetation lined ditches surrounding the rest of the landfill area. The accumulation of residual amounts of CCR that may be contained in the stormwater in the perimeter ditch is a potential source of CCR to groundwater. LE currently cleans and maintains the perimeter ditch on a regularly scheduled basis and removes any residual CCR that has been deposited. LE will continue this cleaning and maintenance activity until closure of the BSA is

complete. Perimeter ditch cleaning and maintenance removes the residual CCR and mitigates the potential leaching of constituents to groundwater.

#### **4.4.2 South Sedimentation Pond and Temporary Byproduct Staging Area**

The south sedimentation pond is located adjacent (west) of the temporary byproduct staging area (**Figure 2**) and receives contact stormwater from the BSA and the temporary byproduct staging area. The pond is lined with soil cement and CCR is periodically removed, dried, and sold for beneficial use. Contact stormwater from the sedimentation pond is pumped to the existing process wastewater ponds. Excess water from the process wastewater ponds is either utilized in the plant or treated at the MPP's on-site treatment facilities. The temporary byproduct staging area is used to load trucks with CCR from the BSA and to temporarily store gypsum and bottom ash.

#### **4.4.3 Beneficial Use**

LE has historically reclaimed CCR from the MPP for beneficial use in various industries (cement manufacturing, wall board, construction material, etc.). LE will continue this activity until all reusable CCR has been removed or is no longer generated by the MPP. CCR that is not beneficially used will remain in the CCR unit until it is closed in place as described above.

#### **4.4.4 Corrective Action Groundwater Monitoring**

LE will establish and implement a corrective action groundwater monitoring program that meets the requirements of an assessment monitoring program under 40 CFR Section 257.95, documents the effectiveness of the corrective action remedy and demonstrates compliance with the applicable GWPS. LE will review the corrective action groundwater monitoring data to evaluate the effectiveness of the selected remedy. If it appears that the selected remedy is not meeting the objective of achieving compliance with the GWPS, LE will consider additional/alternative remedies for the BSA.

## 5. REMEDY REQUIREMENTS

40 CFR Section 257.97(b) states that “*remedies must: (1) Be protective of human health and the environment; (2) Attain the groundwater protection standard as specified pursuant to Section 257.95(h); (3) Control the source(s) of releases so as to reduce or eliminate, to the maximum extent feasible, further releases of constituents in appendix IV to this part into the environment; (4) Remove from the environment as much of the contaminated material that was released from the CCR unit as is feasible, taking into account factors such as avoiding inappropriate disturbance of sensitive ecosystems; (5) Comply with standards for management of wastes as specified in Section 257.98(d).*”

### 5.1 Human Health & the Environment

The selected remedy can adequately protect human health and the environment, in both the short- and long-term, from risks posed by the CCR present at the site by eliminating, reducing, and/or controlling exposures.

### 5.2 Groundwater Protection

The selected remedy minimizes any future release of CCR to groundwater and enables LE to attain the GWPS established for the BSA.

### 5.3 Source Control

Source control measures and subsequent closure of the BSA will minimize, if not eliminate the release of CCR to the surrounding environment and groundwater.

### 5.4 CCR Removal

Beneficial use of CCR material from the BSA will continue until it is capped and closed in place in accordance with all applicable requirements.

### 5.5 Waste Management

All CCR that is managed pursuant to this remedy required under 40 CFR Section 257.97, or an interim measure described in Section 257.98 (a)(3), shall be managed in a manner that complies with all applicable RCRA requirements.

## **6. REMEDY CONSIDERATIONS**

LE considered the following evaluation factors in selecting the remedy for the BSA to meet the requirements described in Section 5 of this report.

### **6.1 Effectiveness and Protectiveness of Remedy**

LE believes the selected remedies will provide both short-and long-term effectiveness as well as protectiveness of groundwater at the BSA. Continued beneficial use of CCR generated at the MPP or currently stored in the BSA will significantly reduce the risk of a CCR release at the site. CCR deposited in the sedimentation basin will be relocated to the active portion of the CCR unit. The regular periodic cleaning and maintenance currently performed by LE on the perimeter ditch surrounding the BSA will continue to be performed until it is closed. Capping and closing in place of the BSA after retirement of Unit No. 3 will eliminate the possibility of any CCR release and result in long-term effectiveness as well as protectiveness of groundwater at the site.

The likelihood of further CCR releases following implementation of the remedy is minimal and virtually no short- or long-term risks are posed to the community or the environment during implementation, including potential threats to human health and the environment associated with excavation, transportation, and beneficial use of CCR. However, LE will consider additional/alternative remedies for the BSA if the desired goals (to meet the GWPS) are not achieved.

### **6.2 Control of Future Potential Releases**

The BSA will be capped and closed after the retirement of Unit No. 3. This will eliminate the possibility of any future potential CCR releases at the site.

### **6.3 Implementability**

The degree of difficulty associated with constructing and implementing the proposed remedies is minimal. Continued site maintenance, CCR beneficial use and subsequent closure of the BSA is a straightforward and reliable approach to contain CCR within the BSA. No special equipment is required to design, construct, or implement the proposed remedies. However, a modification to the MPP's conditions of certification (COC - in effect, the State of Florida's authorization to operate) will be required. Additionally, the MPP has available capacity and locations for treatment, storage, and disposal services required to support implementation of the proposed remedies.

### **6.4 Community Concerns**

As stated in § 257.979(c)(4), LE must consider the degree to which community concerns are addressed by the selected remedy. LE did not receive any public comments during the public meeting conducted on February 3, 2021 but believes that the selected remedy (source control) sufficiently addresses the groundwater issues at the MPP. Current data indicates that the reported GWPS exceedances for arsenic and lithium associated with CCR at the MPP are limited to the vicinity of the landfill are not migrating away from the BSA. Source control measures consisting

of landfill and perimeter ditch maintenance, beneficial use of existing CCR and subsequent closure (cap and close in place) of the BSA will result in improved groundwater quality. Corrective action groundwater monitoring will be conducted during and after the implementation of the proposed remedy to assess its effectiveness.

LE also believes that the proposed remedy is sufficient based on the following:

- Public and private groundwater resources have not, and will not become affected by the groundwater impacts identified near the BSA;
- Adjacent surface water bodies (Fish Lake, Lakes B, C & D) at the MPP have not been, and will not be affected by the groundwater impacts identified near the BSA; and
- The source control measures, specifically the closure of the BSA, proposed by LE are proven and effective methods that will minimize the source of groundwater contamination by reducing the leaching of arsenic and lithium into groundwater from the CCR in the BSA.

## 7. IMPLEMENTATION SCHEDULE

LE has developed a schedule (**Table 3**) for implementing and completing remedial activities for the BSA based on the following factors.

### 7.1 Nature and Extent of Groundwater Contamination

The extent of GPWS exceedances are limited to the CCR wells near the BSA and wholly contained within the MPP site. Due to the limited extent of groundwater impacts at the BSA, the proposed remediation time frame is appropriate.

### 7.2 Remedy Reliability

Based on previous studies performed at the MPP, the detection of COIs in groundwater around the BSA is primarily due to leaching of constituents from residual CCR around the perimeter of the BSA. Eliminating this source and subsequent closure of the BSA will result in the attenuation of current GWPS exceedances and prevent future groundwater impacts associated with CCR which will enhance the remediation time frame.

### 7.3 Waste Management

The MPP has available capacity and locations for treatment, storage, and disposal services required to support implementation of the proposed remedies. All CCR that is managed during the proposed remedy will be managed in a manner that complies with all applicable RCRA requirements. Waste management activities will not impede the proposed remediation time frame. Beneficial use of CCR will continue to occur during and after the remedy implementation process.

### 7.4 Potential Risk to Human Health & the Environment

Potential risks to human health and the environment from exposure to contamination prior to completion of the remedy is extremely limited. The closest residence is more than one-half mile east of the BSA and hydraulically upgradient. Additionally, no future residential development is anticipated on City and State properties surrounding BSA and MPP. Therefore, LE does not anticipate any delays in the remediation time frames from risk to human health and the environment.

### 7.5 Potential Impacts to Groundwater Resources

There are no public groundwater supply sources in the vicinity or downgradient from the BSA. The closest public water supply (owned and operated by the City of Lakeland) is located approximately 1.5 miles north and hydraulically upgradient of the MPP. LE currently uses groundwater from its industrial supply wells located on the MPP property with no impact to other groundwater users in the area. The impacted groundwater near the BSA was only detected in the upper most aquifer (surficial aquifer) and groundwater in this aquifer is not potable because it has been impacted by historical phosphate mining. Additionally, all public water supplies wells in Lakeland obtain water from the Floridan aquifer, which in Polk County is

separated from the surficial aquifer by a confining unit that is over 100 feet thick. These factors do not present any potential delays to project implementation and completion.

## **7.6 Other Relevant Factors**

There is no potential exposure to CCR constituents to wildlife, crops, vegetation, and physical structures and consequently no potential need for alternative water supplies in the vicinity of the MPP. Therefore, these factors do not represent a potential delay to remedy implementation or completion.



## **8. RECORD KEEPING AND NOTIFICATIONS**

LE will comply with the recordkeeping requirements specified in 40 CFR Section 257.105(h), the notification requirements specified in 40 CFR Section 257.106(h), and the Internet posting requirements specified in 40 CFR Section 257.107(h). This includes documentation of the public meeting for the corrective measures assessment as required by 40 CFR Section 257.96(e) and the selection of remedy report as required by 40 CFR Section 257.97(a).

## 9. SUMMARY

On February 3, 2020, LE held a public meeting to discuss the assessment of corrective measures and proposed remedy for the BSA at the MPP as required by 40 CFR Section 257.96(e).

LE selected a remedy for the BSA to meet the requirements of 40 CFR Section 257.97(b).

The remedy was developed to address the GWPS exceedances reported in groundwater for arsenic and lithium.

The proposed remedy will rely primarily on source control, including maintenance of the perimeter ditch and BSA, continued beneficial use of CCR material and capping and closing in place of the BSA after Unit No. 3 ceases operation.

LE believes the selected remedy can adequately address both short- and long-term risks to human health and the environment. The selected remedy will also minimize any future release of CCR to the environment and will be protective of groundwater quality at the BSA.

LE believes the selected remedy will be effective in both the short-and long-term and will be protective of groundwater at the BSA and significantly reduce the risk of a CCR release from the BSA and will be straightforward to implement.

Due to the geology at the MPP (formerly mined land), characterization of the site's hydrogeology and geochemistry (groundwater flow and contaminant distribution) may require additional time to evaluate. Therefore, the necessary time was added to the schedule to account for this concern.

LE will implement a corrective action groundwater monitoring program to evaluate the effectiveness of the selected remedy. If it appears that the selected remedy is not meeting the ultimate objective of achieving compliance with the GWPS, LE will consider additional/alternative remedies for groundwater at the BSA.

# TABLES

**TABLE 1: GROUNDWATER MONITORING LOCATION DETAILS**  
**Lakeland Electric - C.D. McIntosh Power Plant, Polk County, Florida**

Monitoring Location	Installation Date	Northing	Easting	Ground Elevation	Top of Casing Elevation	Top of Screen Elevation	Bottom of Screen Elevation	Designation
<b>CCR Groundwater Monitoring Network</b>								
CCR-1	6/24/2016	1362405.2	681287.2	138.3	141.30	122.6	113.1	Background
CCR-2	6/23/2016	1362203.9	681787.6	137.6	140.57	121.9	112.4	Background
CCR-3	6/23/2016	1362334.6	682451.3	137.5	137.04	121.6	112.2	Monitoring
CCR-4	6/24/2016	1362450.0	683042.7	140.3	143.13	124.7	115.2	Monitoring
CCR-5	6/22/2016	1362716.0	683376.9	138.6	141.07	122.4	112.9	Monitoring
CCR-6	6/22/2016	1363168.4	683578.6	138.5	141.34	122.8	113.3	Monitoring
CCR-7	6/22/2016	1363631.9	683772.2	139.1	142.10	123.4	113.9	Monitoring
CCR-8	6/22/2016	1363917.6	683411.6	139.4	142.12	123.5	114.0	Monitoring
CCR-9	6/21/2016	1364085.2	683045.3	138.6	141.67	123.1	113.6	Monitoring
CCR-10R	3/13/2018	1364262.1	682706.3	133.8	133.56	119.2	109.7	Monitoring
CCR-11	6/20/2016	1363835.5	682577.2	134.3	137.12	118.7	109.2	Monitoring
CCR-12	6/20/2016	1363353.1	682430.5	134.1	136.99	118.4	108.9	Monitoring
CCR-13	6/21/2016	1362936.6	682164.1	135.0	137.95	119.4	109.9	Monitoring
CCR-14	6/21/2016	1362771.1	681761.2	135.8	138.70	120.4	110.9	Monitoring
<b>Groundwater Monitoring Locations for Nature and Extent</b>								
CCR-15	2/18/2019	1362341.3	683123.5	141.8	144.65	126.4	116.8	Delineation
CCR-16	2/18/2019	1362533.2	683385.6	141.2	144.10	125.9	116.3	Delineation
CCR-17	2/19/2019	1363019.9	683712.7	142.9	145.80	127.5	117.9	Delineation
CCR-18	2/18/2019	1363631.1	683869.7	138.2	140.81	122.6	113.0	Delineation
CCR-19	2/15/2019	1364205.4	683064.5	133.8	136.47	118.3	108.7	Delineation
CCR-20	2/14/2019	1363855.5	682474.9	133.1	136.05	118.2	108.6	Delineation
CCR-21	2/13/2019	1363454.0	682331.4	134.5	137.12	118.9	109.3	Delineation
CCR-22	2/13/2019	1363017.4	682078.7	134.0	137.51	119.2	109.6	Delineation
CCR-23	2/12/2019	1362812.1	681744.7	136.2	135.78	121.1	111.5	Delineation
SW-106	--	--	--	--	--	--	--	Delineation
MW-24S	--	--	--	--	--	--	--	Delineation
MW-25S	--	--	--	--	--	--	--	Delineation

**Notes:**

1. Northing and easting are in feet relative to the State Plane Florida North Datum of 1983.
2. Elevations are in feet relative to the North American Vertical Datum of 1988.

**TABLE 2: SUMMARY OF 2020 GROUNDWATER LABORATORY ANALYTICAL DATA**  
**Lakeland Electric - C.D. McIntosh Power Plant, Polk County, Florida**

Monitoring Location	Well Designation	Sample Date	Antimony (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Beryllium (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Calcium (mg/L)	Chloride (mg/L)	Chromium (mg/L)	Cobalt (mg/L)	Combined Radium (pCi/L)	Fluoride (mg/L)	Lead (mg/L)	Lithium (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	pH (SU)	Selenium (mg/L)	Sulfate (mg/L)	TDS (mg/L)	Thallium (mg/L)
Semi-Annual Assessment Monitoring Event 1																							
CCR-1	Background	1/13/2020	0.00491 U	0.00289 U	0.0248	0.00200 U	0.0445	0.00351 U	30.2	3.43	0.0037 U	0.000382 U	9.4	0.0168 J3, U	0.0139 U	0.00333 U	0.000152 U	0.00313 U	4.81	0.00309 U	63.1	135	0.000925 U
CCR-2	Background	1/13/2020	0.00491 U	0.00289 U	0.0263	0.00200 U	0.0508	0.00351 U	78.8	12.9	0.0037 U	0.000382 U	4.5	0.11	0.0139 U	0.00333 U	0.000152 U	0.00313 U	4.84	0.00309 U	180	357	0.000925 U
CCR-3	Monitoring	1/13/2020	0.00491 U	0.00289 U	0.0235	NA	1.02	0.00351 U	545	23.7	0.0037 U	0.000382 U	5.3	0.13	0.0139 U	0.015	0.000152 U	0.00313 U	5.35	0.00309 U	1140	1920	0.000925 U
CCR-4	Monitoring	1/13/2020	0.00491 U	0.00289 U	0.149	NA	0.454	0.00751 U	973	2560	0.0037 U	0.000382 U	43	0.145	0.0139 U	0.0674	0.000152 U	0.00313 U	3.78	0.00309 U	518	5100	0.000925 U
CCR-5	Monitoring	1/13/2020	0.00491 U	0.00289 U	0.0782	NA	0.56	0.00351 U	1960	5540	0.0037 U	0.000382 U	24.2	0.084 U	0.0139 U	3.23	0.000152 U	0.00313 U	4.95	0.00309 U	437	10300	0.000925 U
CCR-6	Monitoring	1/13/2020	0.00491 U	0.00289 U	0.021	NA	0.507	0.00351 U	565	742	0.0037 U	0.000382 U	5.5	0.152	0.0139 U	0.452	0.000152 U	0.0102	5.93	0.00309 U	770	2560	0.000925 U
CCR-7	Monitoring	1/13/2020	0.00491 U	0.00289 U	0.0217	NA	1.26	0.00351 U	258	241	0.0037 U	0.000382 U	6.4	0.282	0.0139 U	0.0764	0.000152 U	0.00313 U	4.66	0.00309 U	621	1410	0.000925 U
CCR-8	Monitoring	1/13/2020	0.00491 U	0.00289 U	0.0244	NA	0.0951	0.00351 U	89.9	6.35	0.0037 U	0.000382 U	4.95	0.276	0.0139 U	0.00333 U	0.000152 U	0.0171	6.5	0.00309 U	119	244	0.000925 U
CCR-9	Monitoring	1/14/2020	0.00491 U	0.0092	0.0647	NA	0.43	0.00351 U	727	1250	0.0037 U	0.000382 U	1.2	0.095	0.0139 U	0.105	0.000152 U	0.00313 U	4.92	0.00309 U	999	3720	0.000925 U
CCR-10R	Monitoring	1/14/2020	0.00491 U	0.00289 U	0.0192 I	NA	0.277	0.00351 U	154	30.7	0.0037 U	0.000382 U	3.9	0.205	0.0139 U	0.00333 U	0.000152 U	0.00313 U	5.12	0.00309 U	463	775	0.000925 U
CCR-11	Monitoring	1/14/2020	0.00491 U	0.0644	0.0444	NA	0.412	0.00351 U	586	677	0.0037 U	0.000382 U	0.75	0.512	0.0139 U	0.0284	0.000152 U	0.00313 U	4.07	0.00309 U	1580	3570	0.000925 U
CCR-12	Monitoring	1/14/2020	0.00491 U	0.0727	0.0117 I	NA	0.4	0.00351 U	605	22.8	0.0037 U	0.000382 U	3.6	0.568	0.0139 U	0.0285	0.000152 U	0.018	6.37	0.00309 U	1410	2420	0.000925 U
CCR-13	Monitoring	1/14/2020	0.00491 U	0.00289 U	0.0411	NA	0.155	0.00351 U	517	383	0.0037 U	0.000382 U	13.3	1.17	0.0139 U	0.262	0.000152 U	0.00313 U	3.89	0.00309 U	1380	2790	0.000925 U
CCR-14	Monitoring	1/14/2020	0.00491 U	0.00289 U	0.0215	NA	0.984	0.00351 U	463	90.9	0.0037 U	0.000382 U	38.5	0.476	0.0139 U	0.0215	0.000152 U	0.00313 U	5.1	0.00309 U	1290	2120	0.000925 U
CCR-15	Delineation	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
CCR-16	Delineation	1/15/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0494	NA	NA	3.72	NA	NA	NA	NA
CCR-17	Delineation	1/15/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0107	NA	NA	6.44	NA	NA	NA	NA
CCR-18	Delineation	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
CCR-19	Delineation	1/15/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0322	NA	NA	4.32	NA	NA	NA	NA
CCR-20	Delineation	1/15/2020	NA	0.0672	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.77	NA	NA	NA	NA
CCR-21	Delineation	1/14/2020	NA	0.00289 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.22	NA	NA	NA	NA
CCR-22	Delineation	1/15/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.112	NA	NA	4.4	NA	NA	NA	NA
CCR-23	Delineation	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
SW-106	Delineation	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-24S	Delineation	1/7/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.00333 U	NA	NA	6.01	NA	NA	NA	NA
MW-25S	Delineation	1/7/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.00333 U	NA	NA	5.68	NA	NA	NA	NA
Semi-Annual Assessment Monitoring Event 2																							
CCR-1	Background	7/14/2020	NA	0.00314 U	0.0134 I	0.00283 U	0.0607	0.0028 U	30.5	4.44	0.0037 U	0.000293 U	NA	0.0300	0.00415 U	0.00722 U	0.000152 U	0.00709 I	5.43	0.00439 U	54.9	142	0.00400 U
CCR-2	Background	7/14/2020	NA	0.00314 U	0.0264	0.00283 U	0.0728	0.0028 U	115	19.3	0.0037 U	0.000293 U	NA	0.125	0.00415 U	0.00722 U	0.000152 U	0.0081 I	4.6	0.00439 U	299 J-7	506 J-7	0.00400 U
CCR-3	Monitoring	7/14/2020	NA	0.00314 U	0.0234	0.00283 U	0.85	0.0028 U	482	16.5 I	0.0037 U	0.000293 U	NA	0.216	0.00415 U	0.00722 U	0.000152 U	0.0125	5.34	0.00439 U	1100 J-7	1830 J-7	0.00400 U
CCR-4	Monitoring	7/14/2020	NA	0.00314 U	0.304	0.00283 U	0.513	0.0233 J-7	1580	4260 J-7, J-8	0.0037 U	0.000293 U	NA	0.350	0.00415 U	0.147	0.000152 U	0.0184	3.69	0.00439 U	791 J-7	8240 J-7	0.00400 U
CCR-5	Monitoring	7/14/2020	NA	0.00314 U	0.0847	0.00283 U	0.601	0.0028 U	2140	5630 J-7, J-8	0.0037 U	0.000293 U	NA	0.125	0.00415 U	4.38	0.000233	0.025	4.94	0.00439 U	406 J-7	10200 J-7	0.00400 U
CCR-6	Monitoring	7/14/2020	NA	0.00314 U	0.0366	0.00283 U	0.83	0.0028 U	955	1580 J-7	0.0037 U	0.000293 U	NA	0.250	0.00415 U	1.11	0.000152 U	0.0362	5.68	0.00439 U	1110 J-7	4440 J-7	0.00400 U
CCR-7	Monitoring	7/14/2020	NA	0.00314 U	0.0328	0.00283 U	1.48	0.0028 U	341	366 J-7	0.0037 U	0.000293 U	NA	0.404	0.00415 U	0.120	0.000152 U	0.0115	4.53	0.00439 U	826 J-7	1920 J-7	0.00400 U
CCR-8	Monitoring	7/14/2020	NA	0.00314 U	0.0303	0.00283 U	0.101	0.0028 U	101	4.74 I	0.0037 U	0.000293 U	NA	0.294	0.00415 U	0.00722 U	0.000152 U	0.0179	6.35	0.00439 U	112	372	0.00400 U
CCR-9	Monitoring	7/15/2020	NA	0.005	0.0665	0.00283 U	0.473	0.0028 U	726	939 J-7	0.0037 U	0.000293 U	NA	0.285	0.00415 U	0.104	0.000152 U	0.0166	5	0.00439 U	1170 J-7	3340 J-7	0.00400 U
CCR-10R	Monitoring	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
CCR-11	Monitoring	7/15/2020	NA	0.0697	0.0676	0.00283 U	0.415	0.0028 U	580	744 J-7	0.0037 U	0.000293 U	NA	1.02	0.00415 U, J-2+	0.00722 U	0.000152 U	0.0149 J-2+	3.96	0.00439 U	1560 J-7	3470 J-7	0.00400 U
CCR-12	Monitoring	7/15/2020	NA	0.0481	0.0204	0.00283 U	0.485	0.0028 U	673	24	0.0037 U	0.000293 U	NA	0.632	0.00415 U	0.00722 U	0.000152 U	0.0267	6.64	0.00439 U	1510 J-7	2550 J-7	0.000925 U
CCR-13	Monitoring	7/15/2020	NA	0.00314 U	0.0436	0.00283 U	0.173	0.0028 U	508	352 J-7	0.0037 U	0.0046	NA	1.38	0.00415 U	0.232	0.000195	0.0121	3.88	0.00439 U	1370 J-7	2710 J-7	0.000925 U
CCR-14	Monitoring	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
CCR-15	Delineation	7/16/2020	NA	0.00314 U	0.0771	0.00283 U	0.0982	0.0028 U	210	220	0.00381 I	0.000293 U	NA	0.134	0.00415 U	0.00722 U	0.000152 U	0.0113	3.94	0.00439 U	407 J-7	1040 J-7	0.000925 U
CCR-16	Delineation	7/16/2020	NA	0.00314 U	0.188	0.00283 U	0.53	0.0028 U	1430	3650 J-7	0.0037 U	0.000293 U	NA	0.017 U	0.00415 U	0.00722 U	0.00051	0.0206	3.69	0.00439 U	936 J-7	7660 J-7	0.000925 U
CCR-17	Delineation	7/16/2020	NA	0.0127	0.00503 U	0.00283 U	0.153	0.0028 U	326	289 J-7	0.0037 U	0.000293 U	NA	0.056	0.00415 U	0.00722 U	0.000152 U	0.0123	6.36	0.00439 U	396 J-7	1310 J-7	0.000925 U
CCR-18	Delineation	7/16/2020	NA	0.00314 U	0.00503 U	0.00283 U	0.0422	0.0028 U	73.1	2.87	0.0037 U	0.000293 U	NA	0.366	0.00415 U	0.00722 U	0.000152 U	0.00894 I	6.26	0.00439 U	32.5	279	0.000925 U
CCR-19	Delineation	7/17/2020	NA	0.00314 U	0.124	0.00283 U	0.305	0.0028 U	753	1380 J-7</													

**Table 3. Implementation and Cleanup Timeframe Schedule**  
**Lakeland Electric - C.D. McIntosh Power Plant, Polk County, Florida**

<b>Anticipated Source Control Activities</b>	<b>Anticipated Timeframe for Initiation/Implementation</b>	<b>Approximate Duration</b>
CCR Beneficial Use	Ongoing	1 - 5 years <sup>1</sup>
Conceptual Design Selection	2021	2 - 3 months
Final Closure Design and Permitting	Q3 2021	4 - 8 months
Closure Cover Installation	2022	12 months
Corrective Action Groundwater Monitoring	Ongoing <sup>2</sup>	Per CCR rule requirements
Remedy Performance Evaluation	5 Years after Remedy Implementation Completion - 2027 <sup>3</sup>	N/A
Post Closure Care	30 Years after Remedy Implementation Completion	30 years

1 - Activity will continue while the BSA is in service and/or CCR with beneficial use value can be removed.

2 - Groundwater monitoring will continue until groundwater complies with groundwater protection standards.

3 - Remedy performance evaluations will be completed every five years to determine if additional corrective actions are required.

# FIGURES





**Legend**

- BSA Boundary
- Approximate BSA Perimeter Ditch
- City of Lakeland Property
- C.D. McIntosh Power Plant Boundary
- Approximate Lake Boundary

Note:  
1. BSA indicates byproduct storage area.  
2. 2019 ESRI World Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.  
3. ESRI Street Map Source (inset image): Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community.



0 1,250 Feet

**Site Location - Byproduct Storage Area**

C.D. McIntosh Power Plant  
Lakeland, Polk County, Florida

**Geosyntec**  
consultants

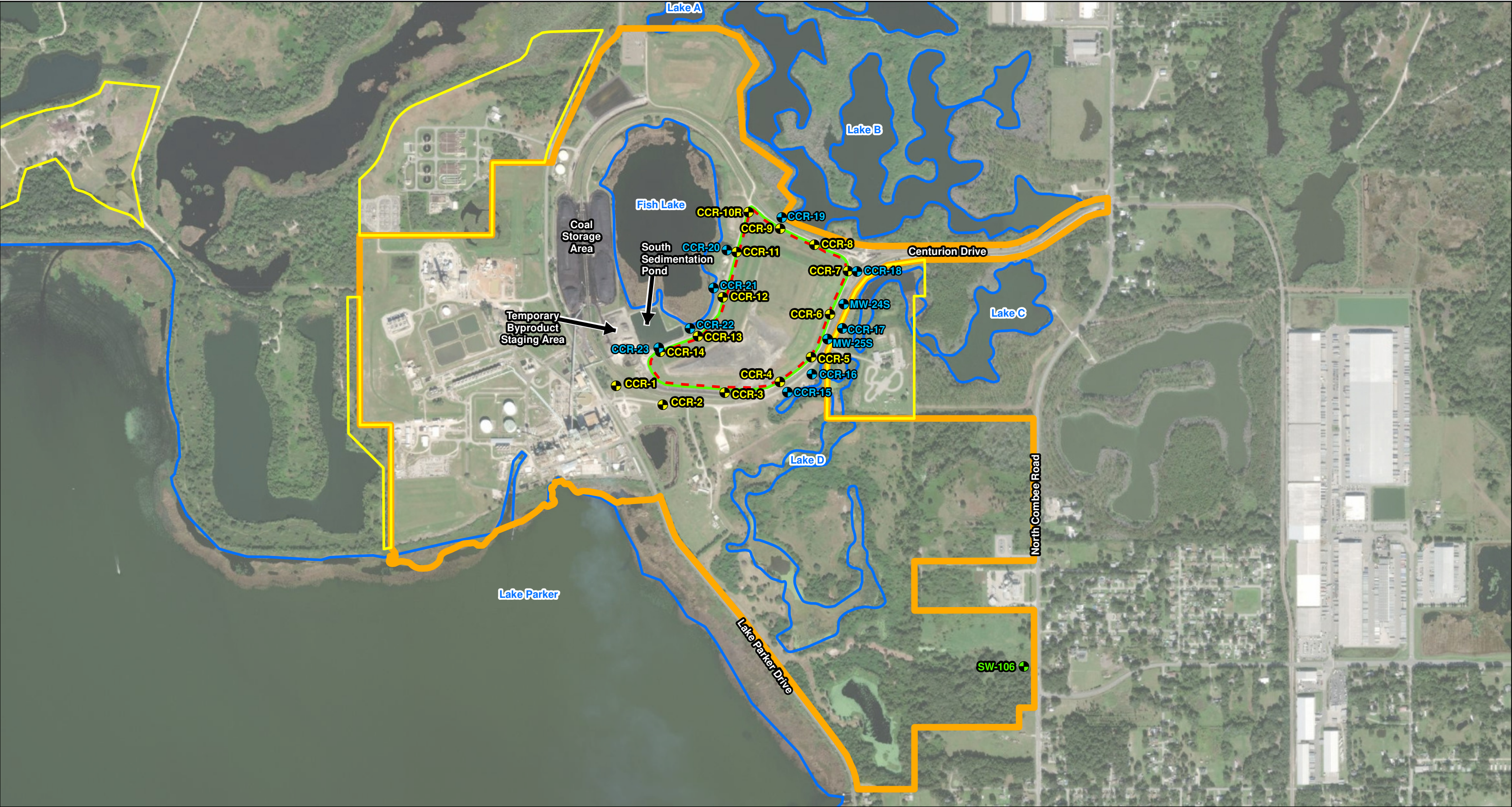
Tampa, FL

January 2021

**Figure**

**1**

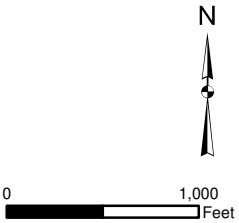




Legend

- CCR Monitoring Well
- Nature and Extent Monitoring Well
- Sampling Location
- BSA Boundary
- Approximate BSA Perimeter Ditch
- City of Lakeland Property
- C.D. McIntosh Power Plant Boundary
- Approximate Lake Boundary

Note:  
1. CCR indicates Coal Combustion Residual.  
2. BSA indicates byproduct storage area.  
3. The location of SW-106 is approximate.  
4. 2019 ESRI World Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.



Well Locations - Byproduct Storage Area

C.D. McIntosh Power Plant  
Lakeland, Polk County, Florida

Geosyntec  
consultants

Tampa, FL

January 2021

Figure  
2