**FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION**
BOB MARTINEZ CENTER
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32399-2400

RICK SCOTT
GOVERNOR

CARLOS LOPEZ-CANTERA
LT. GOVERNOR

HERSCHEL T. VINYARD JR.
SECRETARY

**PERMITTEE**

City of Lakeland, Lakeland Electric
501 East Lemon Street
Lakeland, FL 33801-5079

*Authorized Representative:*
Mr. Tony Candales, Associate General Manager of Production

Permit No. 1050004-035-AC
C.D. McIntosh, Jr. Power Plant
Project: Removal of Sulfuric Acid Mist Test Requirements for Unit 3
Polk County

**PROJECT**

This is the final air construction (AC) permit, which is for the removal of sulfuric acid mist test requirements for Unit 3 at the C.D. McIntosh, Jr. Power Plant.

The C.D. McIntosh, Jr. Power Plant is an existing electrical generation plant categorized under Standard Industrial Classification Number (No.) 4911. The existing facility is located in Polk County at 3030 East Lake Parker Drive in Lakeland, Florida. The UTM Coordinates are: Zone 17, 409.0kilometers (km) East and 3106.2 km North. Latitude is: 28° 04' 50" North; and, Longitude is: 81° 55' 32" West.

This final permit is organized into the following sections: Section 1 (General Information); Section 2 (Administrative Requirements); Section 3 (Emissions Unit Specific Conditions); and Section 4 (Appendices). Because of the technical nature of the project, the permit contains numerous acronyms and abbreviations, which are defined in Appendix CF of Section 4 of this permit. As noted in the Final Determination provided with this final permit, only minor changes and clarifications were made to the draft permit.

**STATEMENT OF BASIS**

This air pollution construction permit is issued under the provisions of: Chapter 403 of the Florida Statutes (F.S.) and Chapters 62-4, 62-204, 62-210, 62-212, 62-296 and 62-297 of the Florida Administrative Code (F.A.C.). This project is subject to the general preconstruction review requirements in Rule 62-212.300, F.A.C. and is not subject to the preconstruction review requirements for major stationary sources in Rule 62-212.400, F.A.C. for the Prevention of Significant Deterioration (PSD) of Air Quality. A copy of this permit modification shall be filed with the referenced permit and shall become part of the permit.

Upon issuance of this final permit, any party to this order has the right to seek judicial review of it under Section 120.68 of the Florida Statutes by filing a notice of appeal under Rule 9.110 of the Florida Rules of Appellate Procedure with the clerk of the Department of Environmental Protection in the Office of General Counsel (Mail Station #35, 3900 Commonwealth Boulevard, Tallahassee, Florida, 32399-3000) and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The notice must be filed within 30 days after this order is filed with the clerk of the Department.

Executed in Tallahassee, Florida

(DRAFT)

*for:* Jeffery F. Koerner, Program Administrator
Office of Permitting and Compliance
Division of Air Resource Management

JFK/dlr/sms

DRAFT

## CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this final air permit package (including the Final Determination and Final Permit with Appendices) was sent by electronic mail, or a link to these documents made available electronically on a publicly accessible server, with received receipt requested before the close of business on the date indicated below to the following persons.

Mr. Tony Candales, LE: tony.candales@lakelandelectric.com
Ms. Farzie Shelton, LE: farzie.shelton@lakelandelectric.com
Mr. Kennard F. Kosky, P.E., Golder Associates Inc.: kkosky@golder.com
Mr. Justin B. Green, DEP Siting: justin.b.green@dep.state.fl.us
Ms. Kelley Boatwright, DEP SWD: kelley.boatwright@dep.state.fl.us
Ms. Heather Ceron, U.S. EPA Region 4: ceron.heather@epa.gov
Ms. Katy R. Forney, U.S. EPA Region 4: forney.kathleen@epa.gov
Ms. Barbara Friday, DEP OPC: barbara.friday@dep.state.fl.us
Ms. Lynn Scearce, DEP OPC: lynn.scearce@dep.state.fl.us

Clerk Stamp

**FILING AND ACKNOWLEDGMENT FILED**, on this date, pursuant to Section 120.52(7), Florida Statutes, with the designated agency clerk, receipt of which is hereby acknowledged.

(DRAFT)

DRAFT

## FACILITY DESCRIPTION

This *existing* facility consists of three fossil fuel fired steam generators, three diesel powered engines, and two gas turbines. Fossil fuel fired steam generator Unit 1 is fired with natural gas, No. 6 fuel oil or on-specification used oil generated by the City of Lakeland. Fossil fuel fired steam generator Unit 2 is fired with natural gas, propane, No. 2 fuel oil or No. 6 fuel oil. Fossil fuel fired steam generator 3 is fired with coal, natural gas and petroleum coke. Gas Turbine Peaking Unit 1 is primarily fired with natural gas or No. 2 fuel oil with a maximum sulfur content of 0.5 percent by weight. McIntosh Unit 5, a 370 MW combined cycle stationary combustion turbine, is fired with natural gas, or No. 2 or superior grade fuel oil with a maximum sulfur content of 0.05 percent by weight. The three diesel engines are: a 25 horsepower non-emergency Lister Coal Tunnel Sump diesel engine; a 300 horsepower emergency Fire Water UPS Diesel No. 32 engine; and a 500 horsepower black-start CT Startup Diesel engine. Also included at the facility are miscellaneous unregulated/insignificant emissions units and/or activities.

## PROPOSED PROJECT

The applicant applied on April 10, 2014, to the Department for a minor source air construction (AC) permit & Title V air operation permit revision. The minor source AC permit & Title V air operation permit revision is for the removal of sulfuric acid mist test requirements for Unit 3 at the C.D. McIntosh, Jr. Power Plant.

This project affects the following emissions units (E.U.):

| **Facility ID No.** 1050004 | |
|---|---|
| **E.U. ID No.** | **E.U. Brief Description** |
| 006 | McIntosh Unit 3 - Fossil Fuel Fired Steam Generator |

## FACILITY REGULATORY CLASSIFICATION

- The existing facility is a major source of HAP.
- The existing facility is subject to the Acid Rain and Clean Air Interstate Rule (CAIR) provisions of the Clean Air Act (CAA).
- The existing facility is a Title V major source of air pollution in accordance with Chapter 62-213, F.A.C.
- The existing facility is a major stationary source in accordance with Rule 62-212.400 (PSD), F.A.C.
- The proposed project is not a modification of a major stationary source in accordance with Rule 62-212.400 (PSD), F.A.C.
- Unit 3 was originally certified pursuant to the power plant siting provisions of Chapter 62-17, F.A.C.

DRAFT

## SECTION 2. ADMINISTRATIVE REQUIREMENTS

1. Permitting Authority: The permitting authority for this project is the Office of Permitting and Compliance, Division of Air Resource Management, Florida Department of Environmental Protection (Department). The mailing address for the Office of Permitting and Compliance is 2600 Blair Stone Road (MS #5505), Tallahassee, Florida 32399-2400.

2. Compliance Authority: All documents related to compliance activities such as reports, tests, and notifications shall be submitted to the Department's Southwest District at: 13051 N. Telecom Parkway, Temple Terrace, Florida 33637-0926, Telephone: (813) 632-7600, Fax: (813) 632-7665.

3. Appendices: The following Appendices are attached as a part of this permit and the permittee must comply with the requirements of the appendices:

   Appendix CC Common Conditions;

   Appendix CF Citation Formats and Glossary of Common Terms;

   Appendix CTR Common Testing Requirements; and,

   Appendix GC General Conditions.

4. Applicable Regulations, Forms and Application Procedures: Unless otherwise specified in this permit, the construction and operation of the subject emissions units shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of: Chapter 403, F.S.; and Chapters 62-4, 62-204, 62-210, 62-212, 62-213, 62-296 and 62-297, F.A.C. Issuance of this permit does not relieve the permittee from compliance with any applicable federal, state, or local permitting or regulations.

5. New or Additional Conditions: For good cause shown and after notice and an administrative hearing, if requested, the Department may require the permittee to conform to new or additional conditions. The Department shall allow the permittee a reasonable time to conform to the new or additional conditions, and on application of the permittee, the Department may grant additional time. [Rule 62-4.080, F.A.C.]

6. Modifications: No emissions unit shall be constructed or modified without obtaining an air construction permit from the Department. Such permit shall be obtained prior to beginning construction or modification. [Rules 62-210.300(1) and 62-212.300(1)(a), F.A.C.]

7. Source Obligation:
   (a) At such time that a particular source or modification becomes a major stationary source or major modification (as these terms were defined at the time the source obtained the enforceable limitation) solely by virtue of a relaxation in any enforceable limitation which was established after August 7, 1980, on the capacity of the source or modification otherwise to emit a pollutant, such as a restriction on hours of operation, then the requirements of subsections 62-212.400(4) through (12), F.A.C., shall apply to the source or modification as though construction had not yet commenced on the source or modification.
   (b) At such time that a particular source or modification becomes a major stationary source or major modification (as these terms were defined at the time the source obtained the enforceable limitation) solely by exceeding its projected actual emissions, then the requirements of subsections 62-212.400(4) through (12), F.A.C., shall apply to the source or modification as though construction had not yet commenced on the source or modification. [Rule 62-212.400(12), F.A.C.]

8. Title V Permit: This permit authorizes specific modifications and/or new construction on the affected emissions units as well as initial operation to determine compliance with conditions of this permit. A Title V operation permit is required for regular operation of the permitted emissions unit. The permittee shall apply for a Title V operation permit at least 90 days prior to expiration of this permit, but no later than 180 days after completing the required work and commencing operation. To apply for a Title V operation permit, the applicant shall submit the appropriate application form, compliance test results, and such additional information as the Department may by law require. The application shall be submitted to the appropriate Permitting Authority. [Rules 62-4.030, 62-4.050, 62-4.220, and Chapter 62-213, F.A.C.]

9. Objectionable Odors Prohibited: No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor. [Rule 62-296.320(2), F.A.C.]

DRAFT

*{Note: An objectionable odor is defined in Rule 62-210.200(Definitions), F.A.C., as any odor present in the outdoor atmosphere which by itself or in combination with other odors, is or may be harmful or injurious to human health or welfare, which unreasonably interferes with the comfortable use and enjoyment of life or property, or which creates a nuisance.}*

10. Unconfined Emissions of Particulate Matter: No person shall cause, let, permit, suffer or allow the emissions of unconfined particulate matter from any activity, including vehicular movement; transportation of materials; construction, alteration, demolition or wrecking; or industrially related activities such as loading, unloading, storing or handling; without taking reasonable precautions to prevent such emissions. Any permit issued to a facility with emissions of unconfined particulate matter shall specify the reasonable precautions to be taken by that facility to control the emissions of unconfined particulate matter. General reasonable precautions include the following: a. Paving and maintenance of roads, parking areas and yards; b. Application of water or chemicals to control emissions from such activities as demolition of buildings, grading roads, construction, and land clearing; c. Application of asphalt, water, oil, chemicals or other dust suppressants to unpaved roads, yards, open stock piles and similar activities; d. Removal of particulate matter from roads and other paved areas under the control of the owner or operator of the facility to prevent re-entrainment, and from buildings or work areas to prevent particulates from becoming airborne; e. Landscaping or planting of vegetation; f. Use of hoods, fans, filters, and similar equipment to contain, capture and/or vent particulate matter; g. Confining abrasive blasting where possible; and h. Enclosure or covering of conveyor systems.
[Rule 62-296.320(4)(c), F.A.C.]

DRAFT

## A. Boiler No. 3 (E.U. ID No. 006)

This subsection of the permit addresses the following emissions unit:

| E.U. ID No. | Brief Description |
|---|---|
| 006 | McIntosh Unit 3 - Fossil Fuel Fired Steam Generator |

McIntosh Unit 3 is a nominal 364 megawatt (MW) (electric) dry bottom wall-fired fossil fuel fired steam generator. The unit is fired on coal, residual oil, natural gas and petroleum coke. The maximum heat input rate is 3,640 million Btu per hour. Unit 3 is equipped with an electrostatic precipitator (ESP), a flue gas desulfurization system (FGD), low NOx burners (LNB) and an overfire air (OFA) system to control emissions. McIntosh Unit 3 began commercial service in September, 1982. The stack parameters are: height, 250 feet: diameter, 18 feet; exit temperature, 125 degrees F; and, actual stack gas flow rate, 1,260,536 acfm.

*{Permitting note(s): The emissions unit is regulated under Acid Rain, Phase II; Rule 62-296.405(2), F.A.C., Fossil Fuel Steam Generators with More than 250 million Btu per Hour Heat Input; and NSPS - 40 CFR 60, Subpart D, Standards of Performance for Fossil-Fuel Fired Steam Generators for Which Construction is Commenced After August 17, 1971, adopted and incorporated by reference in Rule 62-204.800(8)(b)1., F.A.C.; Rule 212.400(6), F.A.C., Prevention of Significant Deterioration (PSD); Rule 62-212.400(6), F.A.C., Best Available Control Technology (BACT) Determination; Compliance Assurance Monitoring (CAM), adopted and incorporated by reference in Rule 62-204.800, F.A.C.; and, Rule 62-296.470, F.A.C., Clean Air Interstate Rule (CAIR).}*

The affected specific condition(s) from the AC permit(s) being revised are hereby changed (the remainder of the permit remains unchanged as a result of this permitting action).

For simplified reading, the important revisions are emphasized with yellow highlight in this electronic document. ~~Strikethrough~~ is used to denote the deletion of text and <u>double-underlines</u> are used to denote the addition of text

**Specific Condition 15. established in Permit No. 1050004-026-AC.**

**Specific Condition 15. (as reflected in Specific Condition D.35. in the current valid Title V air operation permit No. 1050004-033-AV) is revised as follows:**

**EMISSIONS PERFORMANCE TESTING**

~~15. SAM Performance Tests and Sorbent Injection for SAM Emissions Control. The permittee shall conduct a series of initial performance tests to determine the SAM emissions rate under a variety of operating scenarios that documents the impact of sorbent injection on reducing SAM emissions and results in the development of correlation/curves between injection rates, operating conditions and emissions.~~

~~The permittee shall conduct stack tests to determine the uncontrolled sulfuric acid mist emission rate, the controlled sulfuric acid mist emission rate, and actual control efficiency of the installed sorbent injection system. Tests shall be conducted while firing the fuel blend with the highest sulfur content that will be fired in the unit. During each test run, the permittee shall continuously monitor and record the sorbent injection rate. The purpose of these tests is to determine actual control efficiency of the installed systems and to establish the correlation between SAM emissions and the sorbent injection rate, which will be used to calculate the actual annual emissions.~~

~~a. Within 90 days of first injecting ammonia to the SCR system, the permittee shall conduct the following initial tests:~~

~~1) The permittee shall conduct at least two, 1-hour test runs at each of the following operating scenarios to determine SAM emissions.~~

| ~~Scenario~~ | ~~Load~~ | ~~Sorbent Injection~~ |
|---|---|---|
| ~~1A~~ | ~~100% load~~ | ~~Off~~ |

| ~~Scenario~~ | ~~Load~~ | ~~Sorbent Injection~~ |
|---|---|---|
| ~~1B~~ | ~~100% load~~ | ~~ON~~ |
| ~~2A~~ | ~~88% load~~ | ~~Off~~ |
| ~~2B~~ | ~~88% load~~ | ~~ON~~ |
| ~~3A~~ | ~~69% load~~ | ~~Off~~ |
| ~~3B~~ | ~~69% load~~ | ~~ON~~ |

~~The operator shall use best efforts to obtain and maintain the approximate target unit load throughout the test run for each operating scenario.~~

~~2) All test runs shall be conducted while injecting ammonia for the control of nitrogen oxides ($NO_X$).~~

~~3) The sorbent injection rate used for each operating scenario shall be determined by the equipment vendor.~~

~~4) For each SAM test run the operator shall:~~

~~a) Record the ammonia injection rate;~~

~~b) Record the sorbent injection rate;~~

~~c) Determine the fuel firing rate and heat input rate;~~

~~d) Use the stack CEMS to determine controlled $NO_X$ and $SO_2$ emissions; and~~

~~e) Attempt to sample uncontrolled $SO_2$ emissions before the flue gas desulfurization system. If unable to gather meaningful uncontrolled $SO_2$ data for these initial tests, the permittee shall determine the uncontrolled $SO_2$ emissions by actual fuel flow and sulfur content.~~

~~5) Appropriate reference test methods shall be used to determine SAM and $SO_2$ emissions as necessary for the given operating conditions.~~

~~6) At a minimum, the permittee shall submit a test report within 45 days of completing the initial performance tests to include the following information for each SAM test run: the load; the heat input rate; the test method with any variations noted; the fuel blend fired and the average sulfur content; the actual sorbent injection rate; the controlled $SO_2$ emissions rate as determined by the CEMS; the uncontrolled $SO_2$ emissions rate as determined by stack test (if not available, then as determined by fuel flow and sulfur content); the ammonia injection rate for $NO_X$ control by the SCR; the controlled $NO_X$ emissions rate as determined by CEMS; the stack opacity as determined by the continuous opacity monitoring system (COMS). The report shall discuss the relative influence of operating parameters and how the sorbent injection rate will be adjusted for differing operating scenarios.~~

~~7) Until the test results are known, the permittee shall continue to operate the sorbent injection system based on the sorbent injection rate recommended by the equipment vendor. Once the tests results are known, the permittee may begin to operate the sorbent injection system based on the performance indicated by the data collected during the initial tests such that SAM emissions increases from the project will be less than 7 tons/year. The permittee shall identify and monitor the operating conditions that would result in an adjustment of the sorbent injection rate.~~

~~b. Within 60 days of conducting the initial round of performance tests, the permittee shall propose a new schedule and revised test protocol for conducting the originally proposed tests including the determination of the SAM conversion rate across the SCR catalyst. Within 120 days of submitting the test report for the initial tests, the permittee shall conduct the following additional tests:~~

DRAFT

~~1) For each set of operating conditions being evaluated, the permittee shall conduct at least a 1-hour test run to determine SAM emissions. At least nine such test runs shall be conducted to evaluate the effect on SAM emissions from such parameters as the $SO_2$ emission rate prior to the SCR catalyst (and FGD system), the unit load, the flue gas flow rate, the sorbent injection rate and the current catalyst oxidation rate.~~

~~2) Tests shall be conducted under a variety of fuel blends and load rates that are representative of the actual operating conditions. Sufficient tests shall be conducted to establish the SAM emissions rates for the following scenarios: SCR reactor in service (ammonia injection) without sorbent injection, and SCR reactor in service (ammonia injection) under varying operating conditions and levels of sorbent injection.~~

~~3) At least 15 days prior to initiating the performance tests, the permittee shall submit a test notification, preliminary test schedule and test protocol to the Bureau of Air Regulation and the Compliance Authority.~~

~~4) Within 45 days following the last test run conducted, the permittee shall provide a report summarizing the emissions tests and results. All SAM emissions test data shall be provided with this report.~~

~~5) Within 45 days following the submittal of the emissions test report and no later than 90 days following the last test run conducted, the permittee shall submit a project report summarizing the following:~~

~~a) Identify each set of operating conditions evaluated;~~

~~b) Identify each operating parameter evaluated;~~

~~c) Identify the relative influence of each operating parameter, describe how the automated control system will adjust the sorbent injection rate based on the selected parameters;~~

~~d) Identify the frequency with which operational parameters will be reevaluated and adjusted within the automated control system;~~

~~e) Provide the algorithm used for the automated control system or a series of related performance curves; and~~

~~f) Provide details for calculating and estimating the SAM emissions rate based on the level of sorbent injection and operating conditions. The test results shall be used to adjust the sorbent injection control system and estimate SAM emissions.~~

~~c. Within 45 days of firing a fuel blend with a sulfur content that is 0.20% sulfur by weight (based on a 14-operational day rolling average) higher than the maximum sulfur content previously tested, the permittee shall conduct the following additional SAM performance tests.~~

~~1) Conduct the SAM performance tests in accordance with the requirements of paragraph "b" of this condition, or~~

~~2) If the sorbent injection system is removed or is determined to be unnecessary for a given coal blend, conduct at least three, 1-hour test runs at permitted capacity to determine the SAM emissions rate.~~

~~The permittee shall use the data collected to calculate the actual SAM emissions when operating under the given conditions, including the period of time from first fire of the fuel blend until the performance test results are known.~~

~~[Rules 62-4.070(3) and 62-212.300(1)(e), F.A.C.]~~