INTRODUCTION AND SUMMARY

TABLE OF CONTENTS

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1.0 INTRODUCTION

The Tampa Electric Company (Tampa Electric) Polk Power Station (PPS) located in southwest Polk County, approximately 13 miles southwest of the city of Bartow, currently operates under Title V Air Operation Permit No. 1050233-039-AV with an effective date of January 1, 2015, and an expiration date of December 31, 2019. This Title V air operation permit authorizes operation of one nominal 260-megawatt (MW), combined-cycle gas turbine (Emissions Unit [EU] 001) and four simple-cycle combustion turbines (CTs). Tampa Electric is in the process of modifying the four simple-cycle CTs to a four-on-one, combined-cycle configuration with the installation of four new heat recovery steam generators (HRSGs), one steam electric generator, a mechanical draft cooling tower, and other ancillary equipment. Modification of these simple-cycle CTs to combined-cycle operation is authorized under air construction permit No. 1050233-034-AC.

PPS Unit 1 (EU 001) is an integrated gasification combined-cycle (IGCC) unit authorized to combust syngas only, syngas with natural gas augmentation, and pipeline-quality natural gas only. The current Title V air operation permit authorizes EU 001 to operate continuously, i.e. 8,760 hours per year (hr/yr) while combusting syngas or while combusting syngas with natural gas augmentation. EU 001 is also authorized to operate up to 10-percent annual capacity factor (876 hr/yr) while combusting natural gas only.

Tampa Electric wishes to increase the maximum annual hours of operation for EU 001 while combusting natural gas only from 876 hr/yr to 3,000 hr/yr. This will provide PPS with greater operational flexibility. This increase in maximum hours of natural gas-fired operation will result in an increase in annual nitrogen oxides (NO_x) emissions since the hourly NO_x emissions rate is slightly higher when combusting natural gas as opposed to combusting syngas. The hourly emissions rate for all other pollutants is the same whether combusting syngas or natural gas; therefore, there will be no increase in annual emissions of any other pollutant. The increase in annual NO_x emissions will be greater than the NO_x Prevention of Significant Deterioration (PSD) significant emissions rate (SER) and thus will be considered a major modification under PSD regulations.

An air construction permit is required prior to incorporating a major modification, per Rule 62-212.300(1)(a), Florida Administrative Code (F.A.C.). This submittal, including the required permit application forms and supporting documentation included in the appendices, constitutes Tampa Electric's application for authorization to increase maximum hours of operation while combusting natural gas only for PPSS Unit 1 in accordance with the Florida Department of Environmental Protection (FDEP) permitting rules contained in Chapter 62-212, *et. seq*., F.A.C. Since the proposed modification will not require the physical construction of any new emissions unit or equipment or physical modification of any existing emissions unit, this permit application is being submitted as a concurrent air construction permit application/Title V air operation permit revision application.

This report is organized as follows:

- Section 2.0 describes the existing facility.
- Section 3.0 describes new source review (NSR) requirements and discusses applicability of these requirements to the proposed project.
- Section 4.0 describes applicable state and federal emissions standards.
- Section 5.0 provides an analysis of best available control technology (BACT).
- Section 6.0 describes the air dispersion modeling methodology.
- Section 7.0 provides ambient air quality impacts (dispersion modeling results).
- Section 8.0 discusses current ambient air quality in the vicinity of the project and preconstruction ambient air quality monitoring.
- Section 9.0 addresses other potential air quality impact analyses.
- Section 10.0 provides an assessment of impacts on Class I areas located within 300 kilometers (km) of the project site.

Appendices A and B provide the FDEP Application for Air Permit—Long Form and emissions rate calculations, respectively. Appendix C contains dispersion modeling input and output files for the ambient impact analyses.

2.0 SUMMARY

The analyses required for preparation of this permit application have resulted in the following conclusions.

- The proposed increase in maximum hours of operation for PPS Unit 1 while combusting natural gas only will result in an increase of annual NO_x emissions only. All other pollutants have the same allowable hourly emissions rate regardless of whether the unit is combusting syngas only, syngas with natural gas augmentation, or natural gas only.
- The increase in annual NO_x emissions will be greater than the PSD SER using the baseline actual to projected actual PSD applicability test. Therefore, PPS Unit 1 will be subject to PSD requirements, including a BACT analysis and ambient air impact analysis.
- The increase in annual greenhouse gas (GHG) emissions will be less than the PSD SER using the baseline actual to projected actual PSD applicability test. Therefore, PPS Unit 1 will not be subject to GHG PSD review.
- The results of the BACT analysis for NO_x concluded the installation and operation of a selective catalytic reduction (SCR) system is not economically feasible.
- An ambient air impact analysis was conducted to determine the impacts of increased annual NO_x emissions from PPS Unit 1 only. Air dispersion modeling using the U.S. Environmental Protection Agency's (EPA's) American Meteorological Society (AMS)/EPA regulatory model (AERMOD) was performed, and the results of the annual averaging period demonstrated all impacts due to the increase in hours of operation while combusting natural gas only were below the NO_x annual significant impact level (SIL). Also, hourly potential NO_x emissions from PPS Unit 1 and other PPS sources were modeled. Since some significant impacts were modeled, cumulative modeling was performed. No violations of the 1-hour NO_2 national ambient air quality standards (NAAQS) were predicted.
- Class I areas located within 300 km of PPS include the Chassahowitzka National Wilderness Area (NWA) and Everglades National Park (NP) in Florida. Application of the Federal Land Manager (FLM) initial screening criteria for

air quality-related value (AQRV) review indicates the project will be well below the screening criteria threshold for Everglades NP. Accordingly, Class I AQRV analyses would only be required for the Chassahowitzka NWA in accordance with FLM guidance. The results of previous modeling were used to show the AQVRs for soils, vegetation, and visibility would not be adversely affected by the increased NO_x emissions from PPS Unit 1. Assessments of PSD Class I increments for both Chassahowitzka NWA and Everglades NP were shown to not be necessary, because the modification would not result in significant impacts at those locations.

- The ambient impact analysis demonstrated that project impacts will be below the EPA proposed PSD Class I SILs for Chassahowitzka NWA and Everglades NP. Accordingly, a multisource cumulative assessment of PSD Class I increment consumption was not required.
- Based on refined dispersion modeling, the project will not cause or contribute to an exceedance of NAAQS or PSD increment for Class I or II areas.