NEW SOURCE REVIEW FOR GREENHOUSE GASES

Shady Hills Generating Station / EFS Shady Hills LLC

Pasco County, Florida

Submitted To: Mr. Gregg M. Worley

Submitted By: Golder Associates Inc.

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September 2012 **103-89556**

Report

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September 21, 2012 103-89556

Mr. Gregg M. Worley
Chief, Air Permits Section
United States Environmental Protection Agency, Region IV
Atlanta Federal Center
61 Forsyth Street
Atlanta, GA 30303-8960

RE: NEW SOURCE REVIEW FOR GREENHOUSE GASES
SHADY HILLS POWER COMPANY, LLC; FACILITY ID NO: 1010373
AIR PERMIT NO. 1010373-007-AC / PSD-FL-402

Dear Mr. Worley:

Shady Hills Power Company, LLC, a subsidiary of GE Energy Financial Services, owns and operates the Shady Hills Generating Station located at 14240 Merchant Energy Way, Shady Hills, Pasco County, Florida. This facility consists of three, dual-fuel, nominal 170 megawatt (MW) General Electric model PG7241FA (GE 7FA) simple cycle combustion turbine-electric generators, three 75-foot exhaust stacks, and one 2.8 million gallon fuel oil storage tank.

Air construction permit number PSD-FL-402, project number 1010373-007-AC, authorized the construction of two additional, nominal 170 MW simple cycle combustion turbine (CT) electric generators at the Shady Hills Power Company, LLC (Shady Hills) through December 30, 2010. In addition to the two new CTs, PSD-FL-402 authorized the construction of a 2.5 MW emergency generator, a natural gas fuel heater, and a 2.8-million gallon distillate fuel oil storage tank. Construction of these units has not been initiated. Since the issuance of the air construction permit in 2009, a new generation of General Electric (GE) CTs have been produced, GE 7FA.05. A new air construction permit application was submitted on July 12, 2010 to update the application submitted to the Florida Department of Environmental Protection (FDEP) in May 2008. The Project was issued a PSD permit from the FDEP (Permit No. 1010373-012-AC, PSD-FL-402A) on April 6, 2012.

The project will result in an increase and a net increase greater than 75,000 TPY CO_2e and an increase and a net increase in GHG emissions on a mass basis greater than zero TPY. In addition to the CTs, CO_2e emissions result from the emergency generator, gas heater, circuit breaker, and natural gas pipeline proposed as part of the Project. The project represents new emission units for the facility, and thus the maximum potential emissions are utilized for comparison with PSD review thresholds. In light of the new Tailoring Rule requirements, the GHGs emitted from the proposed project are subject to PSD review, including a BACT analysis for the GHGs.

EPA Region IV is the permitting authority for the GHG-portion of the proposed Shady Hills expansion project under a Federal Implementation Plan (FIP) that became effective on December 30, 2010. On this date, EPA established a FIP authorizing EPA to issue PSD permits in Florida for GHG-emitting sources. The FIP constitutes the EPA regulations found in 40 CFR 52.21, including the PSD applicability provisions, but applies only to GHGs.

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Tampa, FL 33609 USA
Tel: (813) 287-1717 Fax: (813) 287-1716 www.golder.com

GE Energy Financial Services looks forward to working with you on this permitting effort. If you would like to discuss any issues regarding this application, please contact Mr. Roy Belden at (203) 357-6820 or Scott Osbourn at (813) 287-1717 in Tampa.

Sincerely,

GOLDER ASSOCIATES INC.

Scott Osbourn, PE
Associate and Tampa Operations Manager

Dave Larocca
Senior Project Engineer

cc: Roy Belden, Shady Hills Power Company, LLC

Enclosure: New Source Review for Greenhouse Gases Report

REPORT

NEW SOURCE REVIEW FOR GREENHOUSE GASES

Shady Hills Generating Station / EFS Shady Hills LLC
Pasco County, Florida

Submitted To: Mr. Gregg M. Worley
Chief, Air Permits Section
United States Environmental Protection Agency, Region IV
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1.0 INTRODUCTION

1.1 Project Background

EFS Shady Hills LLC ("EFS") is proposing to construct 2 new General Electric (GE) 7FA.05 simple cycle combustion turbine-electric units with nominal ratings of 218 megawatts (MWs) each, along with associated ancillary equipment (the "Project") at the site of the existing Shady Hills Generating Station which is owned and operated by its subsidiary Shady Hills Power Company, L.L.C. Shady Hills Generating Station is located at 14240 Merchant Energy Way, Shady Hills, Pasco County, Florida. The existing facility consists of three dual-fuel, nominal 170 MW GE model PG7241FA (GE 7FA.03) simple cycle combustion turbine-electric generators, three 75-foot exhaust stacks, and one 2.8 million gallon fuel oil storage tank, and has been in operation since 2002.

The purpose of the Project, detailed herein, is to provide peaking duty service for commercial power off-take agreements while maximizing site output and minimizing costs within the existing Shady Hills Generating Station site boundary and constraints, including water availability for operational or emission control requirements. Peaking duty service refers to meeting the needs of power generation when there is a high demand. As a result of their short startup period, simple-cycle gas turbine technologies are deployed to meet the range of capacity factors typical for peaking duty service. Typically, peak demand often occurs in the afternoon, especially during the summer months when the power consumption load is high. In EPA's recently proposed "Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units," (77 Fed. Reg. 22392 (April 13, 2012)), the agency notes that peaking units "generally operate differently" than combined cycle combustion turbines. EPA points out that "simple cycle turbines are generally used much less often (and thus have lower GHG emissions) and are generally used to meet peak demand rather than base or intermediate load requirements." 77 Fed. Reg. 22392, 22398.

EFS has evaluated the market needs in Florida and the conditions that support new generation capacity at the Shady Hills Generating Station. The potential contractual arrangements that EFS has been pursuing are long term contracts with utility customers (load-serving) in order to satisfy their peak power needs. These contracts provide a great deal of flexibility to the utility off-takers to manage their system load. Similar to the existing long term agreements for the Shady Hills Generating Station, EFS expects to provide full dispatch control to its utility off-taker under the power purchase agreement.

Simple cycle combustion turbines serve a fundamentally different purpose from combined cycle combustion turbines that are installed for intermediate and baseload generation needs. This is acknowledged by EPA in the recently proposed GHG NSPS discussed above. Therefore the evaluation

of combined cycle combustion turbines represents re-definition of the source and as such is not included in this application.

1.2 Florida Department of Environmental Protection (FDEP) Permit Status

Air construction permit number PSD-FL-402, project number 1010373-007-AC, authorized the construction of two additional, GE Frame 7FA.03 nominal 170 MW simple cycle combustion turbine (CT) electric generators at the Shady Hills Generating Station through December 30, 2010. In addition to the two new CTs, PSD-FL-402 authorized the construction of a 2.5 MW emergency generator, a natural gas fuel heater, and a 2.8-million gallon distillate fuel oil storage tank. Construction of these units has not been initiated. Since the issuance of the air construction permit in 2009, a new generation of larger and more fuel efficient General Electric (GE) CTs has become available, the GE 7FA.05 with a nominal rating of 218 MWs. A new air construction permit application was submitted on July 12, 2010, to update the application submitted to the Florida Department of Environmental Protection (FDEP) in May 2008 with the following variation:

The proposed CTs will reflect the newest generation of turbines, GE's 7FA.05, as compared to the authorized turbine units GE 7FA.03. The GE 7FA.05 provides increased output, 218 gross MW per CT for natural gas firing, 59 deg. F (223 MW fuel oil firing, 59 deg. F) with a heat input of 1,923 MMBtu/hr LHV, as compared to 181.6 MW per CT with a heat input of 1,704.4 MMBtu/hr in the original application. The new CTs result in increased MW output of 20% while only increasing the heat input by 12.8% resulting in increased efficiency over its predecessor GE 7FA while maintaining the same reliability and operational flexibility during cyclic and peaking operations. Other manufacturers of CTs offer units of similar output as the proposed GE 7FA.05 and all of these other units operated within a range of 1% thermal efficiency compared to the GE 7FA.05, which itself is the most efficient. As such, the GE 7FA.05 is representative of the most efficient CTs within the F-Class of units for this analysis.

The 2010 application was further updated with a new scenario for fuel oil usage should only one unit be constructed. This supplemental information was provided to the Florida Department of Environmental Protection (FDEP) on May 24, 2011. The Project was issued a PSD permit from the FDEP (Permit No. 1010373-012-AC, PSD-FL-402A) on April 6, 2012. A copy of the final FDEP PSD permit is attached in Appendix A. The FDEP air construction permit application form addressing GHG emissions is provided in Appendix B herein.

1.3 Endangered Species Act

EFS has conducted an ecological assessment of the proposed site to determine the likely occurrence and likely abundance of species considered by the U.S. Fish and Wildlife Service (FWS) to be endangered or threatened, and/or their critical habitat, under 50 Code of Federal Regulations 17. Based on field reviews

and examination of available agency data, neither federally listed species, nor their critical habitats, were identified or observed within the Proposed Project site. However, standard protection measures for the eastern indigo snake will be enforced during construction of the Proposed Project to ensure eastern indigo snakes are not harmed. These protection measures include, but are not limited to, training contractors in the proper identification of eastern indigo snakes; and posting signs on the construction site to aid in the proper identification of indigo snakes and procedures to follow if an indigo snake is encountered. If an eastern indigo snake is encountered, work in the area will be stopped and will not recommence until the indigo snake has safely evacuated the area on its own.

On March 29, 2012, EFS' consultant, Golder Associates (Golder) discussed the following findings of the analyses with Dr. Heath Rauschenberger of FWS:

- The proposed project is located within an existing industrial site in Pasco County, Florida.
- Due to the presence of gopher tortoise burrows within the proposed project site (18 burrows total, of which 14 are potentially occupied), there is a potential for the eastern indigo snake to be present. Standard protection measures for the eastern indigo snake will be enforced during construction of the proposed project to ensure eastern indigo snakes are not harmed.
- The proposed project does not include discharge of heated water.
- No wetlands were identified within the proposed project site. In addition, no dredge or fill activities are proposed within wetlands or other surface waters.

On August 29, 2012, EFS submitted the ecological assessment, Appendix C, to the U.S. Fish and Wildlife Service (USFWS). As identified in the email response (Appendix C) from Heath Rauschenberger, PhD, dated August 29, 2012, the USFWS has determined that the project is not likely to adversely affect federally listed species.

In addition, EFS' consultant, Golder Associates, contacted Kyle Baker at the National Marine Fisheries Service (NMFS) on October 7, 2011, and March 29, 2012. Golder Associates presented to Mr. Baker a description of the Project, its location, and the site characteristics, and based on this information, he determined that no species regulated by the NMFS will be directly or indirectly affected by the proposed project. Therefore, the Project does not meet the threshold for consultation, so no consultation with NMFS is required. Correspondence with FWS and NMFS is provided in Appendix D.

1.4 Cultural Resources

Based on Florida Department of State Division of Historical Resources (FDHR) data, there are no previously recorded archaeological sites or historic structures within the Project Site. There are two resources identified within 0.3 mile north and southeast of the Project Site: Site PA00324 (MATHIS) and

Site PA00321 (Bell Pond West). Both sites are single artifact or isolated finds that are prehistoric but lack pottery. Sites PA00324 and PA00321 are ineligible for listing on the National Register of Historic Places.

Based on the characteristics of the proposed Project and previous disturbance by the existing power plant, Golder anticipates the Project will have no impacts on cultural resources. EFS has submitted to the FDHR a cultural resources desktop analysis, Appendix E, requesting FDHR's concurrence that no additional cultural resources investigation is required to demonstrate compliance with Section 106 of the National Historic Preservation Act (NHPA).

1.5 Prevention of Significant Deterioration (PSD) Applicability Introduction

On June 3, 2010, the United States Environmental Protection Agency (EPA) published a final rule that "tailors" the applicability provisions of the Prevention of Significant Deterioration (PSD) and Title V programs to enable EPA and states to phase in permitting requirements for greenhouse gases (GHGs) in a common sense manner ("Tailoring Rule"). 75 Fed. Reg. 31514.

For PSD purposes, GHGs are a single air pollutant defined as the aggregate group of the following six gases:

- Carbon dioxide (CO_2)
- Nitrous oxide (N_2O)
- Methane (CH_4)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulfur hexafluoride (SF_6)

Since January 2, 2011, under federal law these GHGs are a regulated NSR pollutant under the PSD major source permitting program when they are emitted by new sources or modifications in amounts that meet the Tailoring Rule's set of applicability thresholds.

The proposed Shady Hills expansion Project is a major modification and subject to PSD review for nitrogen oxides (NO_x), particulate matter (PM, PM_{10}), carbon monoxide (CO), and GHGs. The Project was issued a PSD permit from the FDEP (Permit No. 1010373-012-AC, PSD-FL-402A) on April 6, 2012 covering NO_x, PM, PM_{10}, and CO. As shown in Table 1, the expansion Project will result in an increase and a net increase greater than 75,000 TPY CO_2e and an increase and a net increase in GHG emissions on a mass basis greater than zero TPY. In addition to the CTs, CO_2e emissions result from the emergency generator, gas heater, circuit breaker, and natural gas pipeline proposed as part of the Project. The Project represents new emission units for the facility, and thus the maximum potential emissions are utilized for comparison with PSD review thresholds. No offsetting emissions are available

from other projects within a contemporaneous period with the Project. Therefore no netting analysis is provided and the Project triggers PSD review based on the potential emissions from the Project. In light of the new Tailoring Rule requirements, the GHGs emitted from the proposed Project are subject to PSD review, including a BACT analysis for the GHGs.

EPA Region IV is the permitting authority for the GHG-portion of the proposed Shady Hills expansion Project under a Federal Implementation Plan (FIP) that became effective on December 30, 2010. On this date, EPA established a FIP authorizing EPA to issue PSD permits in Florida for GHG-emitting sources. 75 Fed. Reg. 82246 (December 30, 2010). The FIP incorporates the EPA regulations found in 40 CFR 52.21, including the PSD applicability provisions, but applies only to GHGs. 75 Fed. Reg. 82246, 82250. The FIP will remain in effect until Florida submits a corrective State Implementation Plan (SIP) to apply its PSD program to sources of GHGs and the SIP is approved by EPA. To date, Florida has not submitted to EPA a corrective SIP. Accordingly, this application has been prepared and submitted to EPA Region IV pursuant to the FIP, and in accordance with EPA's guidance document titled "PSD and Title V Permitting Guidance for Greenhouse Gases," March 2011.[1]

[1] PSD and Title V Permitting Guidance for Greenhouse Gases," U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, EPA-457/B-11-001, March 2011.

2.0 BEST AVAILABLE CONTROL TECHNOLOGY (BACT) ANALYSIS

This section presents the proposed BACT for the GHGs. The approach to the BACT analysis is based on the regulatory definitions of BACT, as well as consideration of EPA's current policy guidelines requiring a "top-down" approach. The CAA and corresponding implementing regulations require that a BACT analysis be conducted on a case-by-case basis taking into consideration the amount of emissions reductions that each available emissions-reducing technology or technique would achieve, as well as the energy, environmental, economic and other costs associated with each technology or technique.

EPA recommends that permitting authorities continue to use the Agency's five-step "top down" BACT process to determine BACT for GHGs. In brief, the top-down process calls for all available control technologies for a given pollutant to be identified and ranked in descending order of control effectiveness. The permit applicant should first examine the highest-ranked ("top") option. The top-ranked options should be established as BACT unless the permit applicant demonstrates to the satisfaction of the permitting authority that technical considerations, or energy, environmental, or economic impacts justify a conclusion that the top ranked technology is not "achievable" in that case. If the most effective control strategy is eliminated in this fashion, then the next most effective alternative should be evaluated, and so on, until an option is selected as BACT. EPA has broken down this analytical process into the following five steps:

- Step 1: Identify all available control technologies.
- Step 2: Eliminate technically infeasible options.
- Step 3: Rank remaining control technologies.
- Step 4: Evaluate most effective controls and document results.
- Step 5: Select BACT

The Clean Air Act specifies that BACT cannot be less stringent than any applicable standard of performance under the New Source Performance Standards (NSPS). As of August, 2012, EPA has not promulgated any NSPS that contain emissions limits for GHGs applicable to simple cycle combustion turbines.

EPA believes that in BACT reviews it is important to consider options that improve the overall energy efficiency of the source or modification – through technologies, processes and practices at the emitting unit. In general, a more energy efficient technology burns less fuel than a less energy efficient technology on a per-unit-of-output basis. Thus, considering the most energy efficient technologies in the BACT analysis helps reduce the products of combustion, which include not only GHGs but other regulated NSR pollutants (e.g., NO_X, SO_2, $PM/PM_{10}/PM_{2.5}$, CO, etc.). Thus, EPA emphasizes that energy efficiency should be considered in BACT determinations for all regulated NSR pollutants (not just GHGs).

The following sections provide the required BACT analysis for each source of GHG emissions. In the BACT analysis, GHGs are considered as a single air pollutant, which is the aggregate group of the following six gases: CO_2, N_2O, CH_4, HFCs, PFCs, and SF_6. Natural gas and distillate fuel oil combustion result in GHG emissions of CO_2, N_2O, and CH_4 only. CO_2, N_2O, and CH_4 are the principal GHGs that will be emitted at the Shady Hills Generating Station. CO_2 emissions will result from the oxidation of carbon in the fuel. CH_4 emissions will result from incomplete combustion and N_2O emissions will result primarily from low temperature combustion. The Project's proposed new circuit breaker and natural gas pipeline system might result in additional minor, fugitive releases of GHGs (SF_6 and CH_4). The facility will not use any products containing HFCs or PFCs.

As described in Section 1.1, combined-cycle combustion turbine configurations do not meet the needs of peaking duty service due to their longer duration startup period, resulting in an inability to respond in a timeframe sufficient to meet market needs. Although, "fast-start" combined-cycle combustion turbines are being marketed, no units have been constructed and operated. In addition the fast start units are typically designed with an auxiliary boiler to keep the heat recovery steam generator (HRSG) and steam turbine seals and critical equipment at sufficient temperature to facilitate faster startup of the combustion turbine. In the "fast-start" unit, the auxiliary boiler would operate when the combustion turbine is down, during periods when no electricity is being produced. As such, for peaking duty operation, GHG emissions would be potentially generated from the auxiliary boiler a significant portion of the year with no electricity generated from the CTs generating units during this period. Furthermore, combined-cycle combustion turbine projects also have a high fixed cost profile that is incompatible with the expected low utilization of a peaking facility (as defined by the limit on annual operating hours). For the above reasons and those described in Section 1.1, consideration of combined-cycle combustion turbine configurations is considered "redefining the source," and therefore not considered in this New Source Review evaluation.

2.1 Simple Cycle CTs

This section contains the BACT analysis for the GHG emissions from the proposed simple cycle CTs.

2.1.1 Step 1 – Identify All Available Control Technologies

The first step in the top-down BACT process is to identify all "available" control options. Available control options are those air pollution control technologies or techniques (including lower-emitting processes and practices) that have the potential for practical application to the emissions unit and the regulated pollutant under evaluation.

EPA has placed potentially applicable control alternatives identified and evaluated in the BACT analysis into the following three categories:

- Inherently Lower-Emitting Processes/Practices/Designs,
- Add-on Controls, and
- Combinations of Inherently Lower Emitting Processes/Practices/Designs and Add-on Controls.

EPA recommends that the BACT analysis should consider potentially applicable control techniques from all of the above three categories, and permit applicants and permitting authorities identify all "available" GHG control options that have the potential for practical application to the source under consideration. Control technologies considered (and discussed below) include clean fuel, energy efficiency, and carbon capture and storage (CCS).

2.1.1.1 Clean Fuel

The definition of BACT in 40 CFR 52.21(b)(12) includes use of clean fuels as a pollution control technique. The PSD and the Title V Permitting Guidance for GHGs states that clean fuels which would reduce GHG emissions should be considered while recognizing at the same time that the BACT analysis does not need to include a clean fuel option that would fundamentally redefine the source.[2] The proposed CTs at the Shady Hills Generating Station will be fired primarily with natural gas. Ultra low sulfur diesel fuel oil (ULSDO) will be limited to a maximum of 750 hrs/yr per CT if one CT is constructed and an aggregate of 1,000 hours if both CTs are constructed. The combustion of natural gas emits about 30 percent less CO_2 than oil, and just under 45 percent less CO_2 than coal (40 CFR 75 Appendix G, and 40 CFR 98 Tables C-1 and C-2). Therefore, the proposed CTs will be fired with "clean fuels" as included in the definition for BACT in the CAA Section 169(3).

2.1.1.2 Energy Efficiency

In the PSD and Title V Permitting Guidance for GHGs, EPA emphasizes two mitigation approaches for CO_2 – energy efficiency and carbon capture and storage (CCS).[3] The first of these, energy efficiency, falls under the general category of lower-polluting processes/practices. Applying technologies, measures and options that are energy efficient translates not only to the reduction of emissions of the particular regulated NSR air pollutant undergoing BACT review, but it also may achieve collateral reductions of emissions of other pollutants. There are two different categories of energy efficient improvements:

- Technologies or processes that maximize the efficiency of the individual emissions unit.
- Options that could reduce emissions from a new green field facility by improving the utilization of thermal energy and electricity that is generated and used on site.

[2] PSD and Title V Permitting Guidance for Greenhouse Gases," U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, EPA-457/B-11-001, March 2011.
3 Id.

When the efficiency of the power generation process is increased, less fuel is burned to produce the same amount of electricity. This provides the benefits of lower fuel costs and reduced air pollutant emissions (including CO_2 on a lb/MWhr basis). Efficient power generation as a method of minimizing GHG emissions is considered to be an available technology for the proposed CTs at the Shady Hills Generating Station.

2.1.1.3 Carbon Capture and Storage (CCS)

CCS falls under the category of add-on controls, which are air pollution control technologies that remove pollutants from a facility's emissions stream. As identified in EPA's, "PSD and Title V Permitting Guidance for Greenhouse Gases," March 2011, EPA classifies CCS as an add-on pollution control technology that is "available" for large CO_2-emitting facilities including fossil fuel-fired power plants and industrial facilities with high-purity CO_2 streams. As a result, EPA requires that CCS be considered in Step 1 of the BACT analysis.

CCS is composed of three main components: CO_2 capture and/or compression, transport, and long-term, perpetual storage.

Carbon Capture - Before CO_2 gas can feasibly be stored, it must be captured as a relatively pure gas. Most power plants and other large point sources use air-fired combustors, a process that exhausts CO_2 diluted with nitrogen. According to the US Department of Energy, flue gas from the combustion of fossil fuels contains approximately 5 – 15 percent CO2.[4] For effective carbon sequestration, the CO_2 in these exhaust gases must be separated and concentrated.

According to the Department of Energy's National Energy Technology Laboratory (NETL), technologies for capturing CO_2 from relatively dilute streams such as those produced by power generation facilities are less common. These technologies currently include amine and chilled ammonia solvent systems, which have been used with coal-based power plant applications.[5]

The Carbon Sequestration Leadership Forum (CSLF), a ministerial-level international climate change initiative comprised of 24 member nations representing over 60% of the world's population, states:

"Evolutionary improvements in existing CO_2 capture systems and revolutionary new capture and sequestration concepts will be needed to bring carbon capture costs down. The most likely options currently identifiable for CO_2 separation and capture include the following:

- Absorption (chemical and physical)
- Adsorption (physical and chemical)
- Low-temperature distillation

- Gas separation membranes
- Mineralization and bio-mineralization. " [5]

Carbon Transport – After the CO_2 is captured, it must be transported to a carbon sequestration site. Pipelines are the most common method for transporting large quantities of CO_2 over long distances. Shipping CO_2 via pipeline involves compressing gaseous CO_2 to a pressure above 1,160 pounds per square inch (psi), to increase CO_2 density and make it easier and less expensive to ship. A CO_2 pipeline would be similar to a high pressure natural gas pipeline and is available. CO_2 also can be transported as a liquid in seagoing vessels or via tankers on roads or railways. In these instances, the CO_2 is held in insulated tanks at low temperatures and relatively low pressures.

Carbon Storage – In a CCS system, CO_2 is captured, it is transported, if necessary, and then stored. Geologic formations such as depleted oil and gas reservoirs, unmineable coal seams, and underground saline formations are potential options for long-term storage. Pressurized CO_2 is injected into the deep geologic formations through drilled wells. Under high pressure, CO_2 turns to liquid and can move through a formation as a fluid. Once injected, the liquid CO_2 tends to be buoyant and will flow upward until it encounters a barrier of non-porous rock, which can trap the CO_2 and prevent further upward migration. When CO_2 is injected into a coal seam, it is adsorbed onto the coal surfaces, and methane gas is potentially released and produced in adjacent wells. This technology is available. There are other mechanisms for CO_2 trapping as well: CO_2 molecules can dissolve in brine, react with minerals to form solid carbonates, or adsorb in the pores of porous rock.

Deep saline formations, which are layers of porous rock saturated with brine present an enormous potential for geologic storage of CO_2. There is ongoing research focused on storage in organic rich shale, which is a thin horizontal layer of sedimentary rock with low vertical permeability and in basalt formations, which are geologic formations of solidified lava. Other possible options include liquid storage in the ocean.

2.1.2 Step 2 – Identification of Technically Feasible Control Alternatives

Under the second step of the top-down BACT analysis, all available control techniques listed in Step 1 may be eliminated from further consideration if they are not technically feasible for the specific source and unit under review. EPA considers a technology to be technically feasible if it has been demonstrated and operated successfully on the same type of source under review, or it is available and applicable to the source type under review. Step 2 takes into consideration technical difficulties that would preclude successful use of the control option on the emissions unit under review taking into account source-specific and unit-specific factors (considering physical, chemical, and engineering principles).

2.1.2.1 Clean Fuels

The proposed CTs at the Shady Hills Generating Station will be fired primarily with natural gas. ULSDO will be limited to a maximum of 750 hrs/yr if one CT is constructed and an aggregate of 1,000 hours if both CTs are constructed. Therefore, the proposed CTs will be fired with "clean fuels" as included in the definition for BACT in the CAA Section 169(3).

The need for fuel oil as a backup fuel is driven by fuel supply reliability considerations. The Project will negotiate a tolling agreement(s) with utility offtaker(s) whereby the offtaker(s) will provide all the fuel for the units. The offtaker(s) will also control when and for how long the units are dispatched and what fuel will be used to generate power in order to meet the electricity demands of its customers. It is the Project owner's understanding that for a peaking plant, the offtaker(s) will not dedicate firm natural gas transportation to the Project, and instead, will operate the units on natural gas when interruptible natural gas transportation service is available. In the event that interruptible natural gas transportation is not available and customer load demand is high, the offtaker(s) would likely dispatch the units on fuel oil. Therefore, the Project needs the flexibility to use ULSDO as directed by the offtakers.

2.1.2.2 Energy Efficiency

Efficient power generation is considered to be technically feasible for the proposed CTs at the Shady Hills Generating Station. The proposed GE 7FA.05 CT is the latest version of 7FA CT and the output per unit of fuel combusted is higher than the 7FA.03 or the 7FA.04. Therefore, the proposed CTs provide the highest level of energy efficiency available for GE Frame 7 simple cycle CT operation. The GE Frame 7 turbine was analyzed as a surrogate for the performance of similar F class turbines as discussed in Section 1.1. Attachment H, Table 5-3, of Puget Sound Energy's PSD Permit Application for Fredonia Generating Station Expansion Project, Mount Vernon, Washington, February 2011, provides a comparison of other vendor "F-class" CTs and demonstrates that efficiencies are essentially the same as the Proposed GE 7FA.05 units (within one percent).[4]

The Project is proposed to operate in response to peaking duty requirements of the Florida market. Multiple simple cycle technologies are available to meet this basic purpose, including both heavy duty industrial and aeroderivative designs. For the Project, GE evaluated the 7FA.05, LM6000, and LMS100 simple cycle gas turbine technologies. Smaller F-class simple-cycle turbines than the 7FA.05, such as the GE Frame 6FA rated at 77 MWs, are available, but are not as economic as the 7FA.05 based on installed capital costs and lower efficiency, and would not yield as much output on the site as the 7FA.05.

[4] Attachment H of the PSD permit application for the Puget Sound Energy Fredonia Generating Station Expansion Project near Mount Vernon, Washington, can be found at the State of Washington's Department of Ecology website: http://www.ecy.wa.gov/programs/air/psd/psd_permits_recd.htm (last visited Sept. 13, 2012).

Smaller sized aeroderivative class turbines are available, but do not meet the objective to maximize site output at lowest overall cost.

The LMS100 is representative of the class of the 100 MW aeroderivative CTs for the Project's evaluation. The purpose of the Project is to provide peaking duty service with dual fuel capability, and a water source will be required for NO_x emission control on the LMS100 even during primary fuel operation on natural gas. Additionally, the LMS100 requires inter-cooling which can be achieved through water or air cooling. Water for cooling and emissions control results in additional environmental impacts associated with water withdrawal and discharge. Currently, there are no arrangements in place for additional water supplies to meet operational or emission control requirements for the LMS100 CT units at the Shady Hills Generating Station. The two new proposed GE Frame 7FA.05 simple cycle units will require the use of up to approximately 35,000 gallons per day (GPD) of water when operating on natural gas primary fuel, and approximately 165,000 GPD of water on an annual average daily basis (both natural gas primary fuel operation and back-up fuel operations). In comparison, four GE LMS100's (400 MW) would require approx. 325,000 GPD of water when operating on natural gas primary fuel, and approximately 330,000 GPD on water on an annual average daily basis (including both natural gas primary fuel operation and back-up fuel operations). Reclaimed water and surface water are not expected to be available to supply this water need. Therefore, this need would very likely have to be met by using new quantities of groundwater. A portion of these water requirements may be able to be supplied through the existing water use permit for the Shady Hills site on an as-available basis (i.e., existing project would maintain priority rights). A new water use permit for any incremental increase in water usage may be required. If a new water use permit is required, EFS will need to demonstrate that the increased water withdrawal does not create new groundwater impacts.

The Shady Hills site is located in Pasco, County Florida. Pasco County lies within the territory of the Southwest Florida Water Management District (SWFWMD) which regulates the use of water. See sections 373.069 and Part II, Chapter 373, F.S. The SWFWMD requires that a water use permit be obtained for a new groundwater withdrawal if the proposed groundwater withdrawal will be greater than 100,000 GPD on an average daily basis. Rule 40D-2.041(1)(b), F.A.C. The SWFWMD has adopted permitting criteria that must be met to obtain a WUP. Rule 40D-2.301, F.A.C. These criteria include a showing that it is not technically, environmentally, or economically feasible to use an alternative water supply which includes the reuse of reclaimed water. (See section 3.0, Basis of Review for Water Use Permits). In addition, the user must demonstrate that the proposed groundwater use will not cause environmental harm to wetlands and other surface water bodies. (See generally section 4.0, Basis of Review for Water Use Permits).

Pasco County also lies within the Northern Tampa Bay Water Use Caution Area designated by SWFWMD. Rule 40D-2.801(3)(a)1., F.A.C. Within the Northern Tampa Bay Water Use Caution Area, the SWFWMD has adopted additional rules establishing minimum water levels or minimum flows for certain surface water bodies. Chapter 40D-8, F.A.C. If a waterbody is at or above its established minimum flow or level, then the rules provide that the proposed groundwater use cannot cause the waterbody to drop below that establish minimum flow or level. Section 4.3.A., Basis of Review for Water Use Permit Applications adopted by reference in Rule 40D-2.091, F.A.C.. The rules require the proposed groundwater user to propose prevention measures, such as an environmental management plan or hydration, to ensure that the long-term aquifer level does not drop further. Section 4.3.1.A1., Basis of Review for Water Use Permit Applications, adopted by reference in Rule 40D-2.091, F.A.C. If a waterbody is below a minimum flow or level and a new groundwater withdrawal will impact that waterbody, the rules provide that the SWFWMD will generally not approve the new groundwater withdrawal. Section 4.3.1.A.(1) b., Basis of Review for Water Use Permit Applications, adopted by reference in Rule 40D-2.091, F.A.C.

While specific hydrologic or engineering analysis would be needed to evaluate any new groundwater use proposal for its impacts on water bodies, in general a large new groundwater use in Pasco County is likely to impact a water body that is below the established minimum flow and level making it much more likely that SWFWMD would issue a water use permit for the 7FA.05 given its relatively small incremental water requirement as compared to the needs of the LMS100.

As stated previously, the heavy duty industrial 7FA.05 CT units maximize output for peaking duty service within the existing Shady Hills Generating Station site boundary and constraints. To achieve the equivalent generation capacity with aeroderivative CTs like LMS100 units would require additional water resources. Nonetheless, we have included the LMS100 aeroderivative gas turbines as available technology in the cost-effectiveness evaluation even though the units are not considered technically feasible.

2.1.2.3 Carbon Capture and Storage (CCS)

In the preamble to EPA's recently proposed "Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units," (77 Fed. Reg. 22,392, 22,414 (April 13, 2012)), EPA states that "CCS is a feasible technology option for new coal-fired power plants because CCS is technically feasible and sufficiently available in light of the limited amount of new coal-fired construction expected in the foreseeable future." This Federal Register notice did not state that CCS was a feasible technology for simple cycle combustion turbines, however. Also, EPA stated in the PSD and Title V permitting guidance for GHGs that it does not believe CCS will be a technically feasible BACT

option in certain cases at this time.[5] To establish that an option is technically feasible, the permitting record should show either that an available control option has been demonstrated in practice or is available and applicable, with the term "applicable" generally meaning a technology can reasonably be installed and operated on the source type under consideration. EPA recognizes the significant logistical hurdles that the installation and operation of a CCS system presents and that sets it apart from other add-on controls that are typically used to reduce emissions of other regulated pollutants and already have an existing reasonably accessible infrastructure in place to address waste disposal and other offsite needs. It should also be noted that while CCS may be available as identified in EPA's PSD and Title V Permitting Guidance for Greenhouse Gases, March, 2011[6], there are no CCS systems commercially demonstrated and available for full-scale power plants in the United States, for either coal-fired boilers or gas-fired combustion turbines.

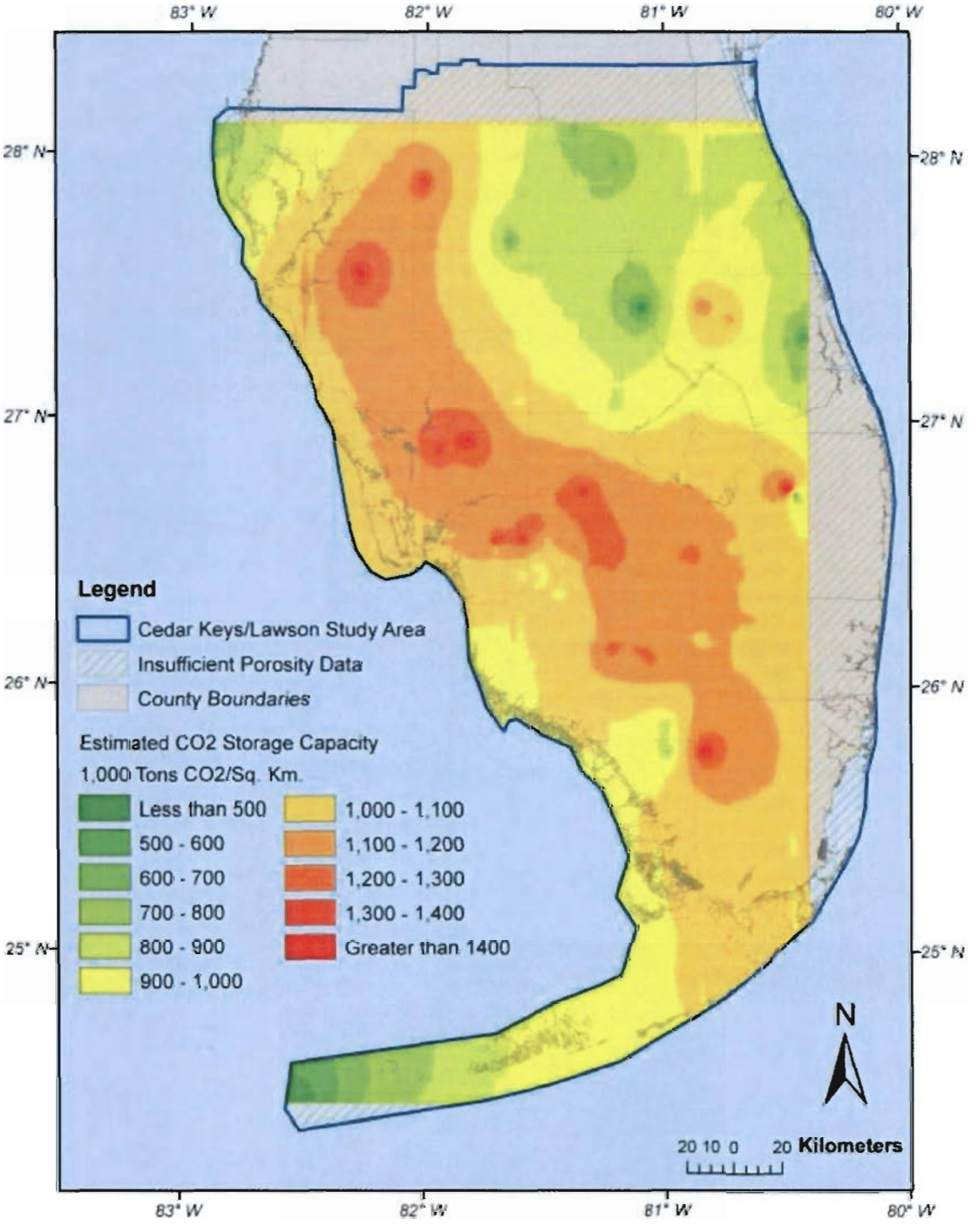
On February 3, 2010, President Obama established an Interagency Task Force on Carbon Capture and Storage, composed of 14 Executive Departments and Federal Agencies. The Task Force, co-chaired by the Department of Energy (DOE) and the EPA, was charged with proposing a comprehensive and coordinated strategy to overcome the barriers to the widespread, cost-effective deployment of CCS within ten years, with a goal of bringing five to ten commercial demonstration projects online by 2016. These projects, to be deployed with the help of federal funding, are intended to demonstrate a range of current generation CCS technologies applied to coal-fired power plants and industrial facilities. Some of these projects are underway, as noted in EPA's recent April 13, 2012, Federal Register notice for the proposed GHG emission standards for utility units, but none of these projects is in full-scale commercial operation.

The Florida Energy Systems Consortium (FESC) was created by the Florida state government to promote collaboration among the energy experts at its 11 supported universities to share energy-related expertise. The consortium assists the state in the development and implementation of an environmentally compatible, sustainable, and efficient energy strategic plan. FESC has performed a preliminary evaluation of carbon sequestration reservoirs in the state of Florida. Florida has deep saline formations near the facility location which represent a potential for CO2 geologic storage. FESC research on Florida carbon sequestration reservoirs is discussed in "*Potential for carbon dioxide sequestration in the Lower Cretaceous Sunniland Formation within the Sunniland Trend of the South Florida Basin, U.S.*" by Tina Roberts-Ashby and Mark Stewart, Department of Geology, University of South Florida, published in International Journal of Greenhouse Gas Control 6 (2012) 113 125. As discussed by Tina Roberts-Ashby and Mark Stewart:

[5] "PSD and Title V Permitting Guidance for Greenhouse Gases," U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, EPA-457/B-11-001, March 2011.
[6] Id.

"The Sunniland Trend (Trend) in south Florida is an arcuate trend about 235 kilometers long by 30 kilometers wide that has supported oil production from the Sunniland Formation for over 60 years. The individual oil fields within the Trend have average porosities that range 15–18%, and have the potential to serve as carbon dioxide (CO_2) sequestration reservoirs due to their high porosity and proven ability to trap hydrocarbons for millennia. In addition, the non-oil-bearing porous intervals of the Sunniland Formation along the Trend have relatively high porosities as well, with an average porosity range of 10–20%. All of the porous intervals in the Sunniland Formation within the extent of the Trend, including the oil-bearing intervals, have the potential to store 1.2 billion tons of CO_2, which could potentially support CO_2 sequestration for multiple large-scale power plants in the southeastern United States for their entire 40-year lifespan. The Sunniland Formation is an example of the large CO_2 storage capacities that are potentially available in depleted oil and gas basins if all porous units, including those which are non-oil bearing, are considered for storage."

The following figure is taken from FESC's 2011 Annual Report and shows the potential carbon sequestration potential in south Florida. The study area does not include the Shady Hills project site in Pasco County. However, Pasco County is the county adjacent to the northeast corner of the study area, and as such demonstrates carbon sequestration potential nearby the Project site.


83° W
82° W
81° W
80° W
28° N
27° N
26° N
25° N
Legend
Cedar Keys/Lawson Study Area
Insufficient Porosity Data
County Boundaries
Estimated CO2 Storage Capacity
1,000 Tons CO2/Sq. Km.
Less than 500
500 - 600
600 - 700
700 - 800
800 - 900
900 - 1,000
1,000 - 1,100
1,100 - 1,200
1,200 - 1,300
1,300 - 1,400
Greater than 1400
N
20 10 0 20 Kilometers

In addition to the evaluation of carbon sequestration reservoirs, FESC has been in collaboration with Tampa Electric Company, DOE and RTI International to develop a pilot project to demonstrate technology for the removal of sulfur and the capture of CO_2 from the Tampa Electric Polk Power Station's 250-megawatt integrated gasification combined cycle (IGCC) unit. The latest publically available information indicates that the project is designed to capture CO_2 from a 30 percent side stream of the coal-fired plant's syngas. The syngas, a synthetic gas generated by the gasification of coal and petroleum coke, is used as a fuel in the plant's combustion turbine to create electricity.

Although Tampa Electric has been involved with the development of a pilot scale project, which to date has not been implemented, this does not establish the technology as commercially available for the Shady Hills project. The application of CCS to simple-cycle combustion turbine power plants has not been commercially demonstrated. Although research has been completed indicating the potential for carbon sequestration in Florida nearby the project site, the suitability of these saline formations for CO_2 storage has not been demonstrated and is uncertain, and therefore the estimated storage costs are unpredictable. In addition, logistical hurdles for CCS for a particular project may also include obtaining contracts for offsite land acquisition (including the availability of land), the need for funding (including, for example, government subsidies), liability protections, timing of available transportation infrastructure, and developing a site for secure, long-term storage. The resources needed to overcome the offsite logistical barriers necessary to apply CCS technology to its operations would make this Project economically unviable and it would not be constructed.

EPA considers a technology to be technically feasible if it has been demonstrated in practice or is available and applicable. While CCS technology is available, there are no known applications to simple cycle CTs and there is uncertainty of the location of available and acceptable geologic formations for the long-term CO_2 storage. Even if the type of equipment needed to accomplish the compression, capture, and storage of CO_2 are determined to be generally available from commercial vendors, the CCS technology has not been demonstrated on simple-cycle CT projects and is not technically feasible for this project. Nevertheless, CCS will be included in the analysis and proven not to be cost-effective.

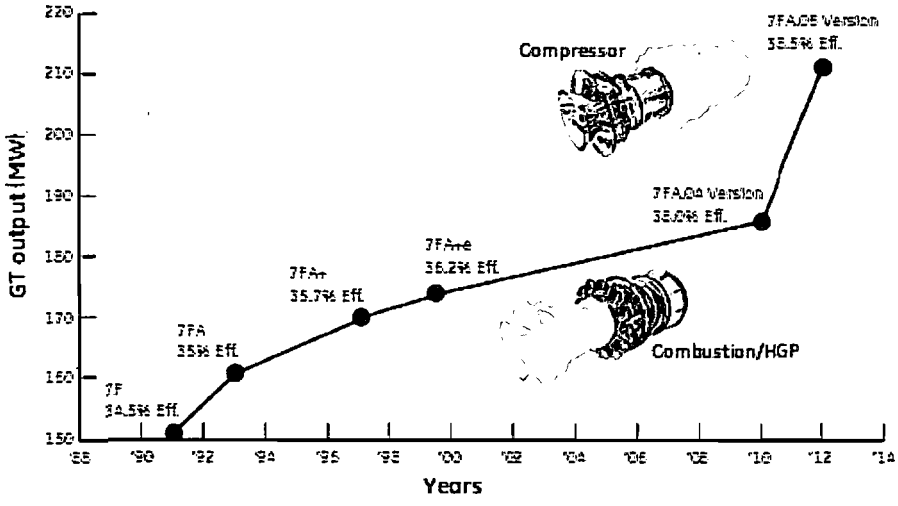
2.1.3 Step 3 – Rank Remaining Control Technologies

After the list of all available controls is narrowed down to a list of the technically feasible control technologies in Step 2, Step 3 of the top-down BACT process calls for the remaining control technologies to be listed in order of overall control effectiveness for the regulated NSR pollutant under review. The most effective control alternative (i.e., the option that achieves the lowest emissions level) should be listed at the top and the remaining technologies ranked in descending order of control effectiveness. Of the three potential control technologies, CCS, clean fuels, and energy efficiency are technically feasible technologies. Of these technically feasible technologies, CCS followed by the selection of natural gas as

the primary fuel offers the highest pollutant control effectiveness, followed by energy efficiency. Selection of the GE 7FA.05 results in a 0.5% increase in thermal efficiency compared to the GE 7FA.04, and a 2.3% increase in thermal efficiency compared to the GE 7FA.03 as shown in the following graph from GE. [7]

Product Model	7F	7FA	7FA	7FA	7FA	7FA
Revised Version	7F.01	7FA.01	7FA.02	7FA.03	7FA.04	7FA.05
Historical Version	7F	7FA	7FA+	7FA+e	-	-
Historical Designation	PG 7191	PG 7221	PG7231	PG7241	-	-

Table 2. 7FA model naming progression



[7] GE, "The 7FA Gas Turbine A Classic Reimagined," GE Gas Turbine Technology Symposium, Greenville, SC. October, 2009.

2.1.4 Step 4 - Economic, Energy, and Environmental Impacts

Under Step 4 of the top-down BACT analysis, economic, energy, and environmental impacts must be evaluated for each option remaining under consideration.

The "top" control option should be established as BACT unless the applicant demonstrates, and the permitting authority agrees, that the energy, environmental, or economic impacts justify a conclusion that the most stringent technology is not "achievable" in that case. If the most stringent technology is eliminated in this fashion, then the next most stringent alternative is considered, and so on.

Where GHG control strategies affect emissions of other regulated pollutants, EPA recommends that applicants should consider the potential trade-offs between emissions of GHGs and emissions of other regulated NSR pollutants.

2.1.4.1 CCS

Although CCS is not considered demonstrated on simple cycle CT projects nor technically feasible for the Shady Hills expansion Project, the following discussion of technology costs is provided.

Currently there are no commercial-scale power plants that employ CCS in the US; however, several demonstration projects are underway or planned. The costs associated with CCS include: separation, transportation, and injection and long-term storage. Site specific parameters impact the cost of CCS including:

- The choice of technology and design for separation, compression and injection; and
- The distance, terrain, and permitting factors involved with CO_2 transport;

The Harvard Kennedy School has prepared a study of the potential costs of CCS, "Realistic Costs of Carbon Capture," July 2009.[8] As provided in Annex C of the Harvard Kennedy School study, for natural gas combined cycle combustion turbines the range of avoided cost in $ per metric ton of CO_2 separated is from $63 to $83 equivalent to $70 to $93 short tons of CO_2 separated, based on 2 advanced F class turbines. Based on a cost of $70 per short ton of CO_2, and an estimated annual CO_2 rate of 833,796 short tons from the CTs, the annual cost for separation alone would be approximately $58,450,000. Additionally per footnote of Annex C, this cost does not include costs associated with transportation and injection and storage. The total capital cost of the Project is projected to be ~$250,000,000. The annual cost associated with capture of CO_2 is estimated to be greater than 23% of the total capital cost of the Project. Given the costs to remove the CO_2, the overall costs of CCS (which would include transportation,

[8] Al-Juaied, Mohammed and Adam Whitmore, "Realistic Costs of Carbon Capture." Discussion Paper 2009-08, Energy Technology Innovation Research Group, Belfer Center for Science and International Affairs, Harvard Kennedy School, July 2009.

injection, and permanent storage), and the costs of CCS relative to the Project costs, CCS is prohibitively expensive and not considered cost effective for the Project.

2.1.4.1 Clean Fuels

The proposed CTs at the Shady Hills Generating Station will be fired primarily with natural gas. ULSDO will be used as a secondary fuel and will be limited to a maximum of 750 hrs/yr if one CT is constructed and an aggregate of 1,000 hrs/yr if two CTs are constructed. The definition of BACT in 40 CFR 52.21(b)(12) includes use of clean fuels as a pollution control technique. The PSD and the Title V Permitting Guidance for GHGs[9] states that clean fuels which would reduce GHG emissions should be considered while recognizing at the same time that the BACT analysis does not need to include a clean fuel option that would fundamentally redefine the source. Therefore, the proposed simple cycle CTs will be fired with "clean fuels" as included in the definition for BACT in the CAA Section 169(3).

2.1.4.2 Energy Efficiency

The simple cycle CTs will reflect the newest generation of turbines, GE 7FA.05. The GE 7FA.05 provides increased output, 218 MW per CT with a heat input rate of 1,923 mmBtu/hour (LHV, natural gas firing, 100 percent load, 59F) (and 2,117 mmBtu/hour ULSDO firing, LHV, 100 percent load, 59F). The GE 7FA.05 represents the state of the art combustion turbine technology.

As discussed in Section 2.1.2.2, GE evaluated the 7FA.05, LM6000, and LMS100 simple cycle gas turbine technologies. The LMS100 technology is available but is not technically feasible for the Shady Hills Project based on the significant process water requirements and uncertainty of availability of such water resources, as more fully described in Section 2.1.2.2. Nevertheless, EFS is submitting Tables 2 and 2a which present comparison of the cost-effectiveness of GHG emissions reduction for the three types of units evaluated and demonstrates that the 7FA.05 is the most cost-effective unit for the Project. Table 2 provides a comparison to the Project CTs if 2 units are installed for a total of 425 MW from 2 7FA.05 CTs. Table 2a provides a comparison if only one unit is installed, 213 MW from one 7FA.05 CT. The operational difference of these two scenarios is that ULSDO will be limited to a maximum of 750 hrs/yr if one CT is constructed and an aggregate of 1,000 hours if both CTs are constructed. The cost-effectiveness analysis assumes maximum annual permitted operating hours, and calculates the incremental cost, including both capital and operating costs associated with achieving incremental CO_2 emission reduction from the LM6000 and LMS100 technologies in terms of $/ton of CO_2 avoided. As shown in Tables 2 and 2a, the installation of 10 LM6000 CTs and 4 LMS100 CTs needed to produce the same generation as the Project's proposed 2 7FA.05 CTs would result in a minimum of $286 and $60 per

[9] "PSD and Title V Permitting Guidance for Greenhouse Gases," U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, EPA-457/B-11-001, March 2011.

ton CO_{2e} reduced, respectively under the best operating scenario. Therefore, the LM6000 and LMS100 are not cost-effective for the Project.

Smaller aeroderivative CTs are available in units up to 100 MW per CT. However, the use of these CTs, if feasible, would result in increased uncontrolled emissions of NOx and CO compared to the proposed Project potentially resulting in selective catalytic reduction (SCR) and oxidation catalyst pollution control technology being required. The emission guarantees of NOx and CO for the aeroderivative CTs without add-on controls are higher than for the 7FA.05 CTs, as shown in the following comparison of emission concentrations per CT:

Combustion Turbine	NO_x (ppmvd @15% O_2)	CO (ppmvd @ 15% O_2)
Proposed 7FA.05 CT	9	9
Aeroderivative CTs (35 – 100 MW)	15 – 25	25

Smaller aeroderivative CTs in the range of 35 – 65 MW are available. However, these CTs have NOx emissions guarantees of 15 ppmvd @15% O_2 and CO emissions guaranteed at levels equal to 25 ppmvd @15% O_2 with the use of dry low NOx technology. To achieve the same emission levels for NOx and CO as the proposed 7FA.05 CTs, additional pollution controls to reduce NOx and CO would be needed, e.g., SCR and oxidation catalyst. For this Project, compared to the proposed Frame 7FA.05 CTs, smaller CTs in this range would result in higher operating costs associated with operation and maintenance, ammonia, catalyst replacement, and lost energy through parasitic load from the SCR (backpressure and operational electrical demand of process equipment). SCR would result in additional environmental impact as a result of emissions of NH_4 in the form of catalyst slip. Assuming typical vendor guarantees of 9 ppm NH_4 slip, and based on exhaust mass flow rates of 1,142,125 and 1,690,750 lb/hr for the LM6000 and LMS100, respectively, the estimated NH_4 emissions are 6.24 and 9.24 lb/hr, respectively per CT (ten LM6000's and four LMS100's). This would result in additional environmental impacts of 63 to 84 tons per year of NH_4 emissions and impacts that would not otherwise occur with use of the proposed GE 7FA.05 CTs.

The use of a CO oxidation catalyst would also result in higher operating costs associated with operation and maintenance, catalyst replacement, and lost energy through parasitic load, and would convert the CO emissions to CO_2, resulting in a negligible environmental benefit. Although aeroderivative CTs of this size would result in higher operating costs and add additional environmental impacts of other pollutants while resulting in no significant benefit in CO_2e reduction, the LM6000 was evaluated as a representative smaller aeroderivative CT. In fact, Attachment H, Table 5-3, of Puget Sound Energy's PSD Permit

Application for Fredonia Generating Station Expansion Project, Mount Vernon, Washington, February 2011, demonstrates that the LM6000 is the most efficient areoderivative CT that is technically feasible for the Project.[10] However, as noted above, there are significant additional environmental impacts associated with smaller CTs compared to the GE 7FA.05 CTs.

An important measure of the efficiency, for an electrical generating facility, is the unit's heat rate. Heat rate is a measurement of how efficiently a generator uses heat energy. It is expressed as the number of Btu's of heat required to produce a kilowatt-hour of energy. A heat rate of 3,412 Btu/kW-hr reflects a conversion efficiency of 100 percent from thermal energy to electrical energy. The proposed simple cycle CTs' heat rate and energy efficiency were compared to data obtained from the U.S. Energy Information Administration (US EIA). Based on data provided in the Annual Energy Review 2010, the average heat rate for fossil-fueled power plants in the U.S. in 2010 was 9,760 Btu/kW-hr [LHV] (35.0 percent efficiency).[11] The proposed CTs are estimated to be greater than 38 percent efficient. The heat rate for the proposed CTs for gas firing only is 8,826 Btu/kW-hr (LHV, 100 percent load at 59F) (38.7 percent efficiency) and 9,509 Btu/kW-hr (LHV, 100 percent load at 59F) (35.9 percent efficiency) for fuel oil firing which is limited to 750 hours per year per CT if one unit is constructed and a total of 1,000 hours per year if both CTs are constructed. The overall heat rate based on a total of 3,390 hours per year of operation with 500 of the total hours on fuel oil is equal to 8,926 Btu/kW-hr (LHV, 100 percent load at 59F) (38.2 percent efficiency, two unit average). The proposed heat rate is well below (i.e., more efficient than) the average fossil-fuel power plants based on US EIA's Annual Energy Review 2010 for the electric power industry described above.

2.1.5 Step 5 - Selection the BACT

In Step 5 of the BACT determination process, the most effective control option not eliminated in Step 4 should be selected as BACT for the pollutant and emissions unit under review and included in the permit.

The Project will utilize clean fuels and the newest generation of turbines, GE 7FA.05, with an estimated thermal energy efficiency of greater than 38%, which represents the highest level of efficiency currently available for GE Frame 7F turbines.

2.1.5.1 BACT Emission Limits

The fuel utilized determines the amount of GHG emissions per unit of energy. For example, based on 40 CFR Part 75, Appendix G emission factors, the emission factors for CO_2 are about 119 lb CO_2/MMBtu for

[10] Attachment H of the PSD permit application for the Puget Sound Energy Fredonia Generating Station Expansion Project near Mount Vernon, Washington, can be found at the State of Washington's Department of Ecology website: http://www.ecy.wa.gov/programs/air/psd/psd_permits_recd.htm (last visited June 25, 2012).

[11] "Annual Energy Review 2010," U.S. Energy Information Administration, DOE/EIA-0384 (2010), October 19, 2011, Table A6, http://www.eia.doe.gov/emeu/aer/txt/ptb1306.html.

natural gas and 163 lb CO_2/MMBtu for distillate oil. Table 3 provides CO_2e emission calculations for 100% and 50% load at ISO Conditions (59 deg. F, 60% relative humidity) for both natural gas and fuel oil firing. In addition, Table 3 presents GHG emissions in units of mass/MWh, which is a measure of GHG emissions per unit energy output. The total carbon dioxide equivalent (CO_2e) emissions take into account the global warming potential for each pollutant as prescribed under 40 CFR Part 98 and the Tailoring Rule, 40 CFR 52.21.

Due to the nature of the proposed CTs' peaking duty service described previously and associated operational variability, EFS is proposing separate CO_2e emissions BACT Limits for "normal operation" and for "startup/shutdown events" for each fuel. The proposed CO_2e emissions BACT Limits for the CTs, in units of lb/MWh, are estimated based on projected operation on natural gas and fuel oil at 100% and 50% load (ISO Conditions). As explained in more detail in Table 3, the proposed BACT CO_2e emission limits for natural gas and fuel oil "normal" operation on the CTs are as follows:

Normal Operation Limits:

- Natural Gas: average of 1,377 lb CO_2e per MWh (HHV, Gross Output, ISO Conditions) on a 12-month rolling average basis, during normal operation while firing natural gas. Gross output is proposed so that the evaluation of BACT for the CT is performed on a unit specific basis without consideration of ancillary facility equipment and parasitic load.

- Fuel Oil: average of 1,928 lb CO_2e per MWh (HHV, Gross Output, ISO Conditions) on a 12-month rolling average basis, during normal operation while firing fuel oil.

Criteria for valid hours during normal operation:

For each fuel, a new 12-month rolling average value is calculated each calendar month after the 1st year of operation based on the total fuel fired, during normal operation, during the prior 12 calendar months. Valid data shall be any fuel firing during periods of normal operation. Normal operation is achieved when the CT reaches 50% load or greater.

The proposed limits consider (a) operation across the range from 50 percent to 100 percent load, which is important for flexible, quick-starting resources under a utilities dispatch control; (b) design standards typical of construction contracts and equipment manufacturer's supply contracts, which contain commercial terms for minimum performance test acceptance criteria; (c) typical performance degradation of combustion turbines between major overhauls even with implementation of best maintenance practices; and (d) typical performance degradation over the life of the equipment. Specifically, to account for the above considerations, the proposed limits incorporate a 5.0 percent design margin and a 3.0

percent turbine performance degradation margin between major overhauls and over the life of the equipment as reflected in Table 3.

Startup and shutdown BACT emission limitations are proposed as follows:

Startup and Shutdown Limits:

- Natural Gas: 21 short tons CO_2e per Startup and Shutdown event while firing natural gas, based on an average of all startup and shutdown events occurring during natural gas firing over the past 12 consecutive calendar months.

- Fuel Oil: 28 short tons CO_2e per Startup and Shutdown event while firing fuel oil, based on an average of all startup and shutdown events occurring during fuel oil firing over the past 12 consecutive calendar months.

Criteria for valid minutes during startup and shutdown:

For each fuel, a new startup and shutdown CO_2e 12-month average is calculated each calendar month based on the summation of fuel consumption during all startup and shutdown events during the prior 12 consecutive calendar months divided by the number of startup events in the 12-month period. Fuel flow meter data shall be used to determine emissions during startup and shutdown events. Startup is defined to begin on the minute when fuel is first ignited in the CT and terminates on the minute when the CT reaches 50 percent load. Shutdown occurs on the minute when the CT load is less than 50 percent load until the minute that fuel flow to the CT stops. "Valid data during startup or shutdown operations" requires the CT to be less than 50 percent load while any fuel flow meter samples are recorded at that load.

Compliance with the CO_2e BACT emission limits for both normal operation and startup/shutdown events will be achieved through continuous monitoring of fuel consumption and gross power output to determine the CO_2e emissions based on 40 CFR Part 75 methodologies (CO_2 emissions) and 40 CFR Part 98 ,methodologies (CH_4 and N_2O emissions) as follows:

1. Normal Operation, Startup and Shutdown – Natural Gas Firing

    a. Heat input (MMBtu, HHV) will be continuously monitored, via fuel flow meters as required by 40 CFR Part 75 Appendix D. CO_2e 12-month rolling average emissions will be calculated based on measured heat input and 40 CFR Part 75 and Part 98 emission factors. From 40 CFR 75, Appendix G, Eq. G-4, an equation for CO_2 lb/MMBtu is derived as follows:

- Natural gas-firing CO_2 lb/MMBtu = 1,040 scf/MMBtu x (1/385) scf CO_2/lb-mole x 44 lb/lb-mole = 118.9 lb/MMBtu
    - CO_2 lb/12-Month Rolling Period = Heat Input MMBtu/12-Month Rolling Period x 118.9 lb CO_2/MMBtu
        - Where the Heat Input, MMBtu, is HHV and corrected to ISO conditions.
- From 40 CFR Part 98, Subpart C, Table 8a an equation for CH_4 and N_2O lb/12-Month Rolling Period is derived as follows:
    - Natural gas-firing CH_4 lb/12-Month Rolling Period = Heat Input MMBtu/12-Month Rolling Period x 2.2E-3 lb/MMBtu Natural gas-firing N_2O lb/12-Month Rolling Period = Heat Input MMBtu/12-Month Rolling Period x 2.2E-4 lb/MMBtu (Table C-2, Subpart C, 40 CFR Part 98)
        - Where emission factor in kg/MMBtu is converted to lb/MMBtu by multiplying by 2.204.
        - Where the Heat Input, MMBtu, is HHV and corrected to ISO conditions.
- CO_2e lb/12-Month Rolling Period = CO_2 lb/12Month Rolling Period + (21 x CH_4 lb/12-Month Rolling) + (310 x N_2O lb/12-Month Rolling)
- CO_2e lb/MWh = (CO_2e lb/12-Month Rolling) / (MW/12-Month Rolling) (gross)
    - Where MWh is gross output and recorded in corresponding 12-month rolling periods.

2. Normal Operation and Startup and Shutdown – Fuel Oil Firing

From 40 CFR 75, Appendix G, Eq. G-5, an equation for CO2 lb/MMBtu is derived as follows:

- Oil-firing CO_2 lb/MMBtu = 1,420 scf/MMBtu x (1/385) scf CO_2/lb-mole x 44 lb/lb-mole = 162.3 lb/MMBtu
    - CO_2 lb/12-Month Rolling Period = Heat Input MMBtu/12-Month Rolling Period x 162.3 lb CO2/MMBtu

- Where the Heat Input, MMBtu, is HHV and corrected to ISO conditions.

From 40 CFR Part 98, Subpart C, Table 8a an equation for CH_4 and N_2O lb/12-Month Rolling Period is derived as follows:

- CH_4 lb/12-Month Rolling Period = Heat Input MMBtu/12-Month Rolling Period x (3.0E-3) x 2.204 = Heat Input MMBtu/hr x 6.6E-3 lb/Mmbtu
- N_2O lb/12-Month Rolling Period = Heat Input MMBtu/12-Month Rolling x (6.0E-4) x 2.204 = Heat Input MMBtu/hr x 1.32E-3 lb/Mmbtu
    - Where emission factor in kg/MMBtu is converted to lb/MMBtu by multiplying by 2.204.
    - Where the Heat Input, MMBtu, is HHV and corrected to ISO conditions.

CO_2e lb/12-Month Rolling Period = CO_2 lb/12-Month Rolling Period + (21 x CH4 lb/12-Month Rolling Period) + (310 x N_2O lb/12-Month Rolling Period) (40 CFR 98 and 52.21)

- CO_2e lb/MWh = (CO_2e lb/12-Month Rolling Period) / (MW/12-Month Rolling Period) (gross) Where MWh is gross output and recorded in corresponding hourly averages.

During normal operation, for each fuel, a new total is calculated each month based on the total fuel fired, during normal operation, the prior 12 consecutive calendar months. Valid data shall be any fuel firing during periods of normal operation. Normal operation is achieved when the CT reaches 50% load or greater.

For each fuel, a new startup and shutdown CO_2e 12-month average is calculated each calendar month based on the summation of fuel consumption during all startup and shutdown events during the prior 12 consecutive calendar months divided by the number of startup events in the 12-month period. Fuel flow meter data shall be used to determine emissions during startup and shutdown events. Startup is defined to begin on the minute when fuel is first ignited in the CT and terminates on the minute when the CT reaches 50 percent load. Shutdown occurs on the minute when the CT load is less than 50 percent load until the minute that fuel flow to the CT stops. "Valid data during startup or shutdown operations" requires the CT to be less than 50 percent load while any fuel flow meter samples are recorded at that load.

2.2 Emergency Generator

The proposed emergency generator is diesel fired with a rating of 1,000 kW (1,342 hp) and limited to 500 hours per year of operation. Diesel emergency generators are typically exercised on a weekly or monthly basis to verify operability and to ensure availability during emergencies. Otherwise, the emergency generator is only operated for limited periods of time during plant power outages and black start conditions. Black start conditions are defined by the ability to start without an outside electrical supply.

Energy efficiency, fueling with biodiesel, fueling with natural gas, and limitations on operating hours are considered as potentially available control options for the diesel generators. Standby diesel engines used in emergency generator service and fire pump service are designed for quick startup (approximately ten seconds to provide power), whereas natural gas fueled engines provide power within 30 seconds to two minutes. Thus two engine manufacturers' representatives contacted (Cummins/Cummins Northeast and Caterpillar/Milton Cat, April 2012) stated that the respective companies do not manufacture standby engines fueled with natural gas in the size range planned for the Project. And, although natural gas is a lower carbon fuel, natural gas fueled engines of comparable size are not appreciably more efficient than diesel fueled engines.

The use of biodiesel has technical issues that represent unacceptable risk of non-operation of essential equipment during emergency events. The use of biodiesel involves maintenance of engine components and fuel management issues that impact the feasibility of using biodiesel, especially B100 (i.e., 100% biodiesel), as an alternative fuel for emergency generators.[12,13]. Because biodiesel exhibits properties of a strong solvent, frequent inspection of components such as rubber hoses and seals is required to monitor potential deterioration. In addition, fuel filters in engines converted from petroleum diesel to biodiesel require regular inspection and replacement to prevent clogging as a result of deposition of leftover sediments dissolved by biodiesel from the fuel tank and fuel lines. Shelf life is also a major concern for biodiesel fuel due to separation, congealing and degradation of the fuel. Biodiesel can degrade very quickly in the presence of oxygen, moisture and heat, increasing viscosity, acidity, and forming gums and sediments which can clog and/or damage the engine. Moisture buildup in biodiesel can also encourage microbial growth, which can clog fuel filters and injectors. The degradation of biodiesel also has a negative impact on the fuel quality, requiring greater quantities of fuel to produce the same heat output as the fuel ages. Although these issues may be controlled to some extent with the addition of fuel additives and frequent monitoring of fuel quality, storage of biodiesel is recommended for no longer than 6 months.

[12] Assessing Biodiesel in Standby Generators for the Olympic Peninsula. July 2004. Barrett Consulting Inc.
[13] Plebuch, E. *It's in the Tank: Strategies for Maintaining Standby Generators Powered by Biodiesel.* Peterson Power Systems.

In addition to the operational issues discussed above, based on discussions with representatives of standby diesel engine suppliers, there are limited, if any, emissions data available for biodiesel-fired standby generators.[14] This is a result of limited experience and use of biodiesel for standby power generation, the corresponding low demand for biodiesel emissions data and the potential wide variation in fuel composition. These variations in fuel composition stand in contrast to No. 2 diesel oil which has fairly standard compositions and therefore, standard combustion properties and consistent levels of emissions. Biodiesel may be produced from a variety of different feedstock materials (e.g., rapeseed oil, soybean oil, used vegetable oil, animal fats) and the composition of the fuel will depend on the availability and costs of the source materials (which may fluctuate over time) and possibly the capabilities and preferences of the producer. Firing of these different types of biodiesel in standby generators may produce different power outputs and varying levels of emissions. Although levels of emissions for most pollutants from combustion of biodiesel are generally much lower than diesel, data are only available for tailpipe emissions for heavy and medium duty engines. Declines in biodiesel fuel quality as a result of storage can add additional uncertainty to emissions levels.

Based on the technical limitations and lack of availability of generator systems of sufficient size to meet the demands of the Project, the use of natural gas fuel as BACT was eliminated. Based on the limited use of biodiesel for standby power generation and uncertainties associated with emissions data for standby power generation, biodiesel fuel was also eliminated as BACT. Thus, limitation of operating hours and the associated TPY of CO_2 is the only technically feasible and cost effective BACT measure for the diesel engines.

2.2.1 BACT Emission Rate

The generator will meet the requirements of 40 CFR Part 60, Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. Greater fuel efficiency is inherently a result of the more stringent limitations imposed by Subpart IIII for PM, NOx and hydrocarbon emissions. The CO_{2e} emissions resulting from the combustion of diesel fuel in the generator will be limited based on energy efficiency requirements inherent in compliance with Subpart IIII and be representative of BACT. Based on 40 CFR 52.21 and Part 98 methodologies (Table C-2, Subpart C, kg/MMBtu factors converted to lb/mmBtu by multiplying by 2.204), CO_2e emissions from diesel firing of the emergency generator are estimated to be 398 short TPY based on 500 hours of operation, see Table 4. BACT is proposed based on a calendar year annual average. Compliance demonstration is proposed based on the following 40 CFR Part 98 methodologies:

[14] Telephone conversations between Gavin Hoch of Golder Associates, Inc. and Chad Taurman and Ron Romanelli of Ring Power Corporation on July 9, 2012.

- CO2 Short TPY = 73.96 kg CO2/MMBtu x Annual Heat Input (MMBtu) x 2.204 / 2204 x 2000 (40 CFR Part 98 Table C-1)
- CH_4 Short TPY = (3.0E-3) x 2.204 x Heat Input MMBtu/hr / 2204 x 2000
- N_2O Short TPY = (6.0E-4) x 2.204 x Heat Input MMBtu/hr / 2204 x 2000
- CO_2e Short TPY = CO_2 TPY + (21 x CH4 TPY) + (310 x N_2O TPY)

All fuel consumption during the calendar year is included in the averaging period. A new average is calculated at the end of each calendar year based on total fuel consumption including startup and shutdown events.

2.3 Fuel Gas Heater

The proposed natural gas-fired fuel heater will be used to preheat natural gas to keep the gas above the dew point temperature. The proposed gas-fired fuel heater is standard equipment used in power plants to preheat natural gas and such equipment is used successfully in hundreds of utility, processing, and upstream oil and gas industry applications.

The heater will be an indirect-fired type where the fire tube is surrounded by a chamber full of natural gas and heat transfer will occur between the fire tube and the thermal reservoir that transfers heat to the natural gas. Although the specific unit has not been selected for the Project, indirect-fired fuel heaters have thermal efficiencies of up to 70% (amount of heat transferred to the natural gas per amount of heat input into heater). Please note that fuel heaters are similar to a boiler used for hot water or space heating and cannot be compared to commercial boilers. The fuel heater is expected to use indirect heat transfer where a heat transfer fluid (e.g., water and ethylene glycol mixture) maintains the required temperature of the natural gas.

BACT for the natural gas fired fuel gas heater is achieved through exclusive natural gas combustion and operation of a high thermal efficiency. Although the specific gas heater unit has not been specified, new units are capable of greater than 75% thermal efficiency as demonstrated by Weatherford's GRIT™ Natural-Gas-Line-Heater.[15] Based on 40 CFR Part 98 methodologies, CO_2e emissions from the fuel gas heater are estimated to be 5,123 short TPY based on 8,760 hours per year, see Table 4. BACT is proposed based on a calendar year annual average. Compliance demonstration is proposed based on the following 40 CFR Part 98 methodologies:

[15] (http://www.weatherford.com/weatherford/groups/web/documents/weatherfordcorp/WFT075697.pdf)

- CO_2 Short TPY = 53.02 kg CO_2/MMBtu x Annual Heat Input (MMBtu) x 2.204 / 2204 x 2000 (40 CFR Part 98 Table C-1)
- CH_4 Short TPY = (1.0E-3) x 2.204 x Heat Input MMBtu/hr / 2204 x 2000
- N_2O Short TPY = (1.0E-4) x 2.204 x Heat Input MMBtu/hr / 2204 x 2000
- CO_2e Short TPY = CO_2 TPY + (21 x CH_4 TPY) + (310 x N_2O TPY)

All fuel consumption during the calendar year is included in the averaging period. A new average is calculated at the end of each calendar year based on total fuel consumption including startup and shutdown events.

2.4 Fuel Oil Storage Tank

The proposed fuel oil storage tank is estimated to emit 2.02 tons per year of VOC. GHG emissions for the fuel oil storage tank were evaluated by reviewing EPA guidance regarding greenhouse gas emissions reporting for the petroleum and natural gas industry, including the final rule for *Mandatory Reporting for Greenhouse Gases: Petroleum and Natural Gas Systems* (dated November 30, 2010, accessed at http://www.gpo.gov/fdsys/pkg/FR-2010-11-30/pdf/2010-28655.pdf). This rule was based on technical considerations discussed and evaluated in the background Technical Support Document (EPA-HQ-OAR-2009-0923, accessed at http://www.epa.gov/climatechange/emissions/downloads10/Subpart-W_TSD.pdf). The technical support document compiled and summarized information from a number of supporting references, including an American Petroleum Institute (API) study which specifically addresses potential GHG emissions resulting from standing and working losses from liquid petroleum storage tanks. This study, titled *Compendium of GHG Emissions Estimation Methodologies for the Oil and Gas Industry* (dated August 2009, accessed at http://www.api.org/ehs/climate/new/upload/2009_ghg_compendium.pdf, pages 5-55 to 5-56) indicates that "Unless site-specific data indicate otherwise, "weathered" crude and other refined petroleum products are assumed to contain no CH_4 or CO_2. Therefore, it is also assumed that there are no CH_4 or CO_2 emissions from the working and breathing losses of tanks containing "weathered" crude or other petroleum products." Similarly, EPA's study entitled *Available and Emerging Technologies for Reducing Greenhouse Gas Emissions from the Petroleum Refining Industry* (dated October 2010, accessed at http://www.epa.gov/nsr/ghgdocs/refineries.pdf, page 10) also concluded that petroleum liquid storage tanks will generally have negligible GHG emissions. Thus, GHG emissions for the fuel oil storage tank were considered negligible.

2.5 Electrical Breaker – SF_6

The Project includes one new electrical breaker that is expected to contain SF_6. Industrial circuit breakers typically contain sulfur hexafluoride (SF_6) for the purpose of electrical insulation and interruption of electrical current. SF_6 has been, and continues to be, broadly used in the U.S. due to its dielectric strength and arc-quenching characteristics. Flammable insulating oils have been largely replaced with SF_6. SF_6 is a GHG.

BACT will be good operational practices to help ensure the breaker does not break or leak. The BACT analysis for the GHG emissions from the circuit breakers follows the EPA's suggested 5 step "top down" process:

2.5.1 Step 1 – Identify All Available Control Technologies

The available control options include alternative (non-SF6) dielectric fluids and minimization of fugitive emissions of SF_6. Historically, dielectric fluids such as dielectric oils have been used in high voltage service for electrical insulation purposes. Other dielectric fluids have been replaced with SF_6 for use in circuit breakers because SF_6 is not flammable and has exceptional dielectric strength and arc-quenching characteristics.

The SF6 Emission Reduction Partnership is one of EPA's voluntary industry programs aimed at reducing greenhouse gas emissions. The Partnership's primary objective is to reduce SF6 emissions via cost-effective technologies and practices. Through improvements in the leak rate of new equipment, refurbishing of older equipment, and the use of more efficient operation and maintenance techniques, utilities often find economical solutions to reduce SF6 emissions.

Modern SF_6 circuit breakers are designed as totally enclosed pressure systems with minimal potential for fugitive SF_6 emissions. The Proposed SF_6 circuit breakers will have a pressure gage with internal set points for operation limitations. The breaker gage will be continuously monitored with alarm sounding for operators when a leak is detected. Corrective action will be taken to repair the leak should one occur or replace the leaking circuit breaker. In addition, O&M procedures include routine safety inspections of the circuit breaker equipment to ensure proper operation.

2.5.2 *Steps 2 & 3 – Identification and Ranking of Technically Feasible Control Alternatives*

EPA's SF_6 Partnership has recognized that there is no clear alternative to using SF_6 in combination with fugitive SF_6 emissions detection, repair, and replacement strategies.[16] Thus, the only technically feasible option is use of sealed SF_6 circuit breakers with leak detection (i.e., alarm), repair, and replacement strategies. Since only one technically feasible option is available, no ranking of options is required and the remaining option is the "top" control option.

2.5.3 *Step 4 – Economic, Energy, and Environmental Impacts*

The "top" control option is use of SF_6 circuit breakers in conjunction with use of modern totally enclosed equipment, equipped with leak detection equipment (density alarms), and implementation of maintenance programs and period safety inspections. SF_6 is chemically inert, non-toxic, non-flammable, and thermally stable. This system of equipment and procedures offers low economic, energy, and environmental impacts.

2.5.4 *Step 5 – Select the BACT*

Based on the top down analysis, the "top" technically feasible control option has been selected for the Project as the following:

- Three new totally enclosed circuit breakers
- Pressure gage with internal set points for operation limitations Repair of leaks or replacement of equipment
- Continuous monitoring of circuit breaker pressure gage and inspection and maintenance

2.6 On-Site Pipeline and Natural Gas Supply

The scope of this BACT analysis is limited to the Project site and new natural gas pipelines to be installed as part of the expansion Project. Within the existing Shady Hills Generating Station site, new natural gas supply lines to the new CTs and heater will be installed. Natural gas leaks from the new on-site natural gas supply lines represent a potential source of fugitive GHG emissions in the form of methane contained in the natural gas. Leakage of natural gas will be actively monitored and repaired if found at the site since natural gas leaks are flammable and pose a safety risk. Thus methane emissions from the on-site pipeline and natural gas supply lines will be minimized at the site. Such minimization using monitoring

[16] "SF_6 Emission Reduction Partnership for Electric Power Systems," 2010 Annual Report, U.S. Environmental Protection Agency, December 2011 (http://www.epa.gov/electricpower-sf6/resources/index.html).

and repair is considered BACT. EFS will continuously monitor pipeline system pressure against alarm set points, to be determined upon system design and implementation, to identify leaks as they occur. In addition the natural gas is treated with mercaptan so that the odor from leaks can be detected by personnel.

TABLES

TABLE 1. GHG Emissions for the Proposed Shady Hills Expansion Project Compared to PSD Review Threshod

Unit (7FA.05)	Heat Input (MMBtu/hr) LHV	Heat Input (MMBtu/hr) HHV	Gross Power Output (MW)	CO_2 Emissions (a) Emission Factor (lb/MMBtu)	CO_2 Emissions (a) Emission Rate (lb/hr)	CO_2 Emissions (a) Emission Rate (tons/hr)	N_2O Emissions (b) Emission Factor (lb/MMBtu)	N_2O Emissions (b) Emission Rate (lb/hr)	N_2O Emissions (b) Emission Rate (tons/hr)	CH_4 Emissions (b) Emission Factor (lb/MMBtu)	CH_4 Emissions (b) Emission Rate (lb/hr)	CH_4 Emissions (b) Emission Rate (tons/hr)	CO2e Emissions (c) Emission Rate (lb/hr)	CO2e Emissions (c) Emission Rate (tons/hr)	Per Unit Output (lb/MWh)
100% Load, 59 F, 60% Relative Humidity (ISO), Natural Gas-Firing, CT Only															
CT1	1,923	2,135	218	118.9	228,645	114.3	2.20E-04	0.4	0.0002	2.2E-03	4.2	0.0021	254,040	127	
CT2	1,923	2,135	218	118.9	228,645	114.3	2.20E-04	0.4	0.0002	2.2E-03	4.2	0.0021	254,040	127	
	3,846	4,269	435.8		457,289	228.6		1	0.0004		8	0.004	508,081	254	1,166
														Design Margin 5%	
														Performance Degradation Margin 3%	
														Adjusted lb/MWh for Margin(d)	1,261
100 % Load, ISO, Oil-Firing, CT Only															
CT1	2,117	2,265	223	162.3	343,589	171.8	1.32E-03	2.8	0.0014	6.6E-03	14.0	0.0070	368,883	184	
CT2	2,117	2,265	223	162.3	343,589	171.8	1.32E-03	2.8	0.0014	6.6E-03	14.0	0.0070	368,883	184	
	4,234	4,530	445.3		687,178	343.6		6	0.0028		28	0.014	737,767	369	1,657
														Design Margin 5%	
														Performance Degradation Margin 3%	
														Adjusted lb/MWh for Margin(d)	1,792

Annual Operating Scenario No. 1

Annual Average Case Baseload, 59 F, 3390 Hours per Year of Natural Gas Firing and Zero Hours per Year of Oil Firing.

		(Short TPY)	(lb/MWh)
CT1		430,598	1,261
CT2		430,598	1,261
	Total (2 CTs)	861,196	

Annual Operating Scenario No. 2

Annual Average Case Baseload, 59 F, 2890 Hours per Year of Natural Gas Firing and 500 Hours per Year of Oil Firing.

		(Short TPY)	(lb/MWh)
CT1		459,309	1,339
CT2		459,309	1,339
	Total (2 CTs)	918,618	

Annual Operating Scenario No. 3

Annual Average Case Baseload, 59 F, 1640 Hours per Year of Natural Gas Firing and 750 Hours per Year of Oil Firing.

		(Short TPY)	(lb/MWh)
CT1	Total (1 CT)	346,644	1,434

CT Maximum Annual Emissions (Scenario No. 2)	**918,618**	**Short TPY**
Emergency Generator	**398**	**Short TPY**
Fuel Gas Heater	**5,123**	**Short TPY**
Total Annual CO2e Emissions (Incudes Startup and Shutdown Emissions)(e)	**924,139**	**Short TPY**
PSD Review Threshold	**75,000**	**Short TPY**

(a) Appendix G - Determination of CO_2 Emissions, 40 CFR Part 75. Natural gas-firing CO_2 lb/MMBtu = 1040 scf/MMBtu(HHV) x (1/385) scf CO_2/lb-mole x 44 lb/lb-mole = 118.9 lb/MMBtu.
Appendix G - Determination of CO_2 Emissions, 40 CFR Part 75. Oil-firing CO_2 lb/MMBtu = 1420 scf/MMBtu(HHV) x (1/385) scf CO_2/lb-mole x 44 lb/lb-mole = 162.3 lb/MMBtu.

(b) Table C-2, Subpart C, 40 CFR Part 98. Emission factors in kg/MMBtu were converted to lb/MMBtu by multiplying by 2.204.

(c) CO2e = CO2 + (21 x CH4) + (310 x N2O)

(d) Assumes 5% margin for design basis and 3% margin for degradation between major overhauls and the life of unit.

(e) TPY CO2e conservatively based on 100 % utilization at maximum load at en annual average operating case based on ISO conditions, 100% load @ 59 deg. F, 60 % relative humidity.

Source: Golder, 2012.

Table 2. Shady Hills Expansion: Cost Effectiveness Analysis for Alternative Simple Cycle Generation Technologies
Base scenario - Both units installed

			2 x 7FA.05	10 x LM6000	4 x LMS100
Plant					
Plant Total Output		(MW)	425	425	425
Number of Turbines		(Unit)	2	10	4
Capacity Factor		(%)	38.7%	38.7%	38.7%
Fuel Operating Hours		(Hours)	3,390	3,390	3,390
Number of Starts		(Starts/Unit)	250	250	250
Percentage of operation by fuel	– NG	(%)	85%	85%	85%
	– FO	(%)	15%	15%	15%
Annual operating hours	– NG	(Hours/year)	2,890	2,890	2,890
	– FO	(Hours/year)	500	500	500
Net Plant Heat Rate (LHV)	– NG	(Btu/kWh)	8,928	8,312	7,971
	– FO	(Btu/kWh)	9,708	8,489	8,061
HHV/LHV Conversion	– NG		1.11	1.11	1.11
	– FO		1.07	1.07	1.07
Net Plant Heat Rate (HHV)	– NG	(Btu/kWh)	9,910	9,226	8,848
	– FO	(Btu/kWh)	10,388	9,083	8,625
Total Plant Heat Input per Start/Shutdown (HHV)		(MMBtu)	255	44	90
Fuel Price	– NG	($/MMBtu)	5	5	5
	– FO	($/MMBtu)	20	20	20
CO2e (fuel HHV basis, incl CO2, N2O and CH4)	– NG	(lb/MMBtu)	119	119	119
	– FO	(lb/MMBtu)	163	163	163
Costs					
Capital Cost		($/kW)	617	1129	979
Fixed Charge Rate		(%)	11.0%	11.0%	11.0%
Fixed Operation & Maintenance costs (Fixed O&M)		($/kW-yr)	18.2	28.8	25.8
Variable Operation & Maintenance costs (Variable O&M)		($/MWh)	7.44	7.11	5.78
Operations					
Energy Produced	**Total**	(MWh/yr)	**1,440,801**	**1,440,801**	**1,440,801**
	– NG		1,228,301	1,228,301	1,228,301
	– FO		212,500	212,500	212,500
Fuel Consumption	**Total**	(MMBtu/yr)	**14,379,913**	**13,262,443**	**12,700,820**
	– NG		12,172,463	11,332,305	10,868,007
	– FO		2,207,450	1,930,138	1,832,813
CO2e Emission	**Total**	(Short Tons/yr)	**904,094**	**831,519**	**795,965**
	– NG		724,353	674,357	646,728
	– FO		179,742	157,161	149,237
Emission Difference to 7FA.05		(Short Tons/yr)	**0**	**-72,576**	**-108,130**

Cost of Electricity				
Capital Recovery	$/kW-yr	$ 67.7	$ 123.9	$ 107.5
Fixed O&M	$/kW-yr	$ 18.2	$ 28.8	$ 25.8
Total fixed revenue req't	**$/kW-yr**	**$ 85.9**	**$ 152.7**	**$ 133.2**
Fuel - NG	$/MWh	$ 49.6	$ 46.1	$ 44.2
Fuel - FO	$/MWh	$ 198.2	$ 184.5	$ 177.0
Fuel - Weighted	$/MWh	$ 71.5	$ 66.5	$ 63.8
Fuel - Startup	$/MWh	$ 0.4	$ 0.4	$ 0.3
Variable O&M	$/MWh	$ 7.4	$ 7.1	$ 5.8
Total variable revenue req't	**$/MWh**	**$ 79.4**	**$ 74.0**	**$ 69.9**
Capital Recovery	$MM/yr	$ 28.8	$ 52.7	$ 45.7
Fixed O&M	$MM/yr	$ 7.7	$ 12.2	$ 11.0
Fuel	$MM/yr	$ 103.6	$ 96.4	$ 92.4
Variable O&M	$MM.yr	$ 10.7	$ 10.2	$ 8.3
Total	**$MM/yr**	**$ 150.8**	**$ 171.6**	**$ 157.3**
All-in cost of electricity	**$/MWh**	**$ 104.7**	**$ 119.1**	**$ 109.2**
Differences v. 7FA.05 Option	$MM/yr		$ 20.7	$ 6.5
	$/Short Ton CO2e		$ 285.6	$ 60.2

* NG = natural gas; FO = ultra low sulfur fuel oil; LHV = lower heating value; HHV = higher heating value
* CO2e - includes CO2, N2O, and CH4 and is based on 40 CFR Part 75 and Part 98 factors.
* Sigma Energy estimate is based on 2011 overnight dollars. Escalated to 2015 dollars using 2% Annual Inflation Rate
* 10% Contingency built into the capital cost estimate provided by Sigma for Simple Cycle units
* FOM and VOM costs are escalate at 2% annual rate. Inputs in this table is a levelized rate over 20 years horizon.
* Output and heat rate values above are net of plant auxiliary loads and incorporate a degradation allowance over the 20 year horizon.
* Fixed charge rate used above for evaluation consistent with long-term investment considerations

Source: EFS 2012, Sigma 2012.

Table 2a. Shady Hills Expansion: Cost Effectiveness Analysis for Alternative Simple Cycle Generation Technologies
Alternate scenario - Only 1 unit installed

			1 x 7FA.05	5 x LM6000	2 x LMS100
Plant					
Plant Total Output		(MW)	213	213	213
Number of Turbines		(Unit)	1	5	2
Capacity Factor		(%)	27.3%	27.3%	27.3%
Fuel Operating Hours		(Hours)	2,390	2,390	2,390
Number of Starts		(Starts/Unit)	176	176	176
Percentage of operation by fuel	– NG	(%)	69%	69%	69%
	– FO	(%)	31%	31%	31%
Annual operating hours	– NG	(Hours/year)	1,640	1,640	1,640
	– FO	(Hours/year)	750	750	750
Net Plant Heat Rate (LHV)	– NG	(Btu/kWh)	8,928	8,312	7,971
	– FO	(Btu/kWh)	9,708	8,489	8,061
HHV/LHV Conversion	– NG		1.11	1.11	1.11
	– FO		1.07	1.07	1.07
Net Plant Heat Rate (HHV)	– NG	(Btu/kWh)	9,910	9,226	8,848
	– FO	(Btu/kWh)	10,388	9,083	8,625
Total Plant Heat Input per Start/Shutdown (HHV)		(MMBtu)	257	44	90
Fuel Price	– NG	($/MMBtu)	5	5	5
	– FO	($/MMBtu)	20	20	20
CO2e (fuel HHV basis, incl CO2, N2O and CH4)	– NG	(lb/MMBtu)	119	119	119
	– FO	(lb/MMBtu)	163	163	163
Costs					
Capital Cost		($/kW)	617	1129	979
Fixed Charge Rate		(%)	11.0%	11.0%	11.0%
Fixed Operation & Maintenance costs (Fixed O&M)		($/kW-yr)	18.2	28.8	25.8
Variable Operation & Maintenance costs (Variable O&M)		($/MWh)	7.44	7.11	5.78
Operations					
Energy Produced	**Total**	(MWh/yr)	**507,875**	**507,875**	**507,875**
	– NG		348,500	348,500	348,500
	– FO		159,375	159,375	159,375
Fuel Consumption	**Total**	(MMBtu/yr)	**5,109,223**	**4,662,864**	**4,458,137**
	– NG		3,453,635	3,215,261	3,083,528
	– FO		1,655,588	1,447,603	1,374,609
CO2e Emission	**Total**	(Short Tons/yr)	**340,322**	**309,202**	**295,420**
	– NG		205,517	191,332	183,493
	– FO		134,805	117,870	111,927
Emission Difference to 7FA.05		(Short Tons/yr)	**0**	**-31,120**	**-44,903**

Cost of Electricity				
Capital Recovery	$/kW-yr	$ 67.7	$ 123.9	$ 107.5
Fixed O&M	$/kW-yr	$ 18.2	$ 28.8	$ 25.8
Total fixed revenue req't	**$/kW-yr**	**$ 85.9**	**$ 152.7**	**$ 133.2**
Fuel - NG	$/MWh	$ 49.6	$ 46.1	$ 44.2
Fuel - FO	$/MWh	$ 198.2	$ 184.5	$ 177.0
Fuel - Weighted	$/MWh	$ 96.2	$ 89.6	$ 85.9
Fuel - Startup	$/MWh	$ 0.4	$ 0.4	$ 0.3
Variable O&M	$/MWh	$ 7.4	$ 7.1	$ 5.8
Total variable revenue req't	**$/MWh**	**$ 104.1**	**$ 97.0**	**$ 92.0**
Capital Recovery	$MM/yr	$ 14.4	$ 26.3	$ 22.8
Fixed O&M	$MM/yr	$ 3.9	$ 6.1	$ 5.5
Fuel	$MM/yr	$ 49.1	$ 45.7	$ 43.8
Variable O&M	$MM.yr	$ 3.8	$ 3.6	$ 2.9
Total	**$MM/yr**	**$ 71.1**	**$ 81.7**	**$ 75.0**
All-in cost of electricity	**$/MWh**	**$ 140.0**	**$ 160.9**	**$ 147.7**
Differences v. 7FA.05 Option	$MM/yr		$ 10.6	$ 3.9
	$/Short Ton CO2e		$ 341.5	$ 87.2

* NG = natural gas; FO = ultra low sulfur fuel oil; LHV = lower heating value; HHV = higher heating value
* CO2e - includes CO2, N2O, and CH4 and is based on 40 CFR Part 75 and Part 98 factors.
* Sigma Energy estimate is based on 2011 overnight dollars. Escalated to 2015 dollars using 2% Annual Inflation Rate
* 10% Contingency built into the capital cost estimate provided by Sigma for Simple Cycle units
* FOM and VOM costs are escalate at 2% annual rate. Inputs in this table is a levelized rate over 20 years horizon.
* Output and heat rate values above are net of plant auxiliary loads and incorporate a degradation allowance over the 20 year horizon.
* Fixed charge rate used above for evaluation consistent with long-term investment considerations

Source: EFS 2012, Sigma 2012.

TABLE 3. Shady Hills Expansion: Proposed CO_2e emission limits - per Turbine

Gas-fired operations							CO_2e Emissions			
Unit load	Output, MW (gross)	Heat Rate, Btu/kWh (LHV, gross)	Heat Rate, Btu/kWh (HHV, gross)	operating hours %	Annual operating hours	Generation, MWh/yr	lb/mmBtu (HHV basis)	lb/hr	lb/yr	lb/MWh
100%	218	8,826	9,797	50%	1,445	314,835	119	254,040	367,088,173	1,166
50%	109	11,265	12,504	50%	1,445	157,417	119	162,120	234,264,066	1,488
Totals						472,252			601,352,239	1,273
Design margin										5.0%
Performance degradation margin										3.0%

Proposed GHG limit on NG				
	Normal Operations	12-Month Rolling Average	**lb/MWh at ISO**	**1,377**
	Start-up and Shut-down	12-Month Rolling Average	**Short tons per SU-SD event**	**21**

Oil-fired operations							CO_2e Emissions			
Unit load	Output, MW (gross)	Heat Rate, Btu/kWh (LHV, gross)	Heat Rate, Btu/kWh (HHV, gross)	operating hours %	Annual operating hours	Generation, MWh/yr	lb/mmBtu (HHV basis)	lb/hr	lb/yr	lb/MWh
100%	223	9,509	10,175	50%	250	55,658	163	368,883	92,220,787	1,657
50%	111	11,670	12,487	50%	250	27,829	163	226,358	56,589,621	2,033
Totals						83,487			148,810,408	1,782
Design margin										5.0%
Performance degradation margin										3.0%

Proposed GHG limit on ULSD n)				
	Normal Operations	12-Month Rolling Average	**lb/MWh at ISO**	**1,928**
	Start-up and Shut-down	12-Month Rolling Average	**Short tons per SU-SD event**	**28**

Notes:

1 The above GHG limits take into consideration a number of operating, design and maintenance factors typical of combustion turbine generating facilities. The limits consider (a) operation across the range from minimum load to full load output, which is important for flexible, quick-starting resources under a utility's dispatch control; (b) design standards typical of construction contracts and equipment manufacturer's supply contracts, which contain commercial terms for minimum performance test acceptance criteria; and (c) typical performance degradation of combustion turbines between major overhauls and the life of the equipment even with implementation of best maintenance practices.

2 CO2e - includes CO2, N2O, and CH4 and is based on 40 CFR Part 75 and Part 98 factors.

3 ISO = 59 deg. F., 60% relative humidity

4 Assumes 5% margin for design basis and 3% margin for degradation between major overhauls and the life of unit.

5 CO2e lb/MMBtu Emission Factors based on Table 1. CO2e = CO2 + (21 x CH4) + (310 x N2O)

6 Startup Shutdown Emission based on CO2e Emission Factor and Estimated Fuel Consumption fer event: 338 MMBtu/event, and 339 MMBtu/event, for Natural Gas and ULSD, respectively, and 119 lb CO2e/MMBtu and 163 lb CO2e/MMBtu, respectively for natural gas ans ULSD, respectively.

Source: EFS, 2012

TABLE 4. Shady Hills Expansion: GHG Emissions for the Proposed Emergency Generator and Fuel Gas Heater

Unit	Heat Input (MMBtu/hr)	Operation (Hr/yr)	Annual Heat Input (MMBtu/yr)	CO_2 Emissions (a)		N_2O Emissions (a)		CH_4 Emissions (a)		CO_2e Emissions (b)
				Emission Factor (lb/MMBtu)	Annual Emissions (Short tons/yr)	Emission Factor (lb/MMBtu)	Annual Emissions (Short tons/yr)	Emission Factor (lb/MMBtu)	Annual Emissions (Short tons/yr)	Emission Rate (Short tons/yr)
Emergency Generator	9.73	500	4,864	163.0	396	1.32E-03	3.22E-03	6.6E-03	1.61E-02	398
Fuel Gas Heater	10	8760	87,600	116.9	5118	2.20E-04	9.65E-03	2.2E-03	9.65E-02	5123

(a) Table C-2, Subpart C, 40 CFR Part 98. Emission factors in kg/MMBtu were converted to lb/MMBtu by multiplying by 2.204.
(b) CO2e = CO2 + (21 x CH4) + (310 x N2O)
Source: Golder, 2012

APPENDIX A
AIR PERMIT NO. 1010373-012-AC (PSD-FL-402A)

Florida Department of Environmental Protection

Bob Martinez Center
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Rick Scott
Governor

Jennifer Carroll
Lt. Governor

Herschel T. Vinyard Jr.
Secretary

PERMITTEE

EFS Shady Hills, LLC.
14240 Merchant Energy Way
Spring Hill, Florida 06927

Authorized Representative:
Roy S. Belden, Vice President

Air Permit No. 1010373-012-AC (PSD-FL-402A)
Shady Hills Generating Station
Site Expansion Project
Modified and Reissued Permit
Expires: July 31, 2015

FACILITY AND LOCATION

This is the final air construction permit, which authorizes the construction of two nominal 223 megawatt (MW) simple cycle combustion turbine electric generators, and associated support equipment. This permit modifies and replaces Air Permit No. 1010373-007-AC (PSD-FL-402) issued on January 12, 2009. The proposed work will be conducted at the Shady Hills Generating Station, which is an electric utilities plant categorized under Standard Industrial Classification No. 4911. The existing facility is located in Pasco County at 14240 Merchant Energy Way in Spring Hill, Florida. The UTM coordinates are Zone 17, 347.0 kilometers (km) East, and 3139.0 km North.

This final permit is organized into the following sections: Section 1 (General Information); Section 2 (Administrative Requirements); Section 3 (Emissions Unit Specific Conditions); Section 4 (Appendices). Because of the technical nature of the project, the permit contains numerous acronyms and abbreviations, which are defined in Appendix A 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.) and Title 40, Parts 60 and 63 of the Code of Federal Regulations (CFR). The permittee is authorized to conduct the proposed work in accordance with the conditions of this permit. This project is subject to the general preconstruction review requirements in Rule 62-212.300, F.A.C. and 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.

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
Division of Air Resource Management
Office of Permitting and Compliance
(Electronic Signature)

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.

Roy S. Belden, Shady Hills Power Company, LLC: roy.belden@ge.com
Scott Osbourn, P.E., Golder Associates, Inc.: sosbourn@golder.com
Robert Wong, DEP SWD: robert.wong@dep.state.fl.us
Heather Ceron, EPA Region 4: ceron.heather@epa.gov
Catherine Collins, U.S. Fish and Wildlife Service: catherine_collins@fws.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.
(Electronic Signature)

FACILITY DESCRIPTION

This facility consists of: three, dual-fuel, nominal 170 MW General Electric (GE) Model PG7241FA simple cycle combustion turbine-electrical generators, three exhaust stacks that are 18 feet in diameter and 75 feet tall, and one nominal 2.8-million gallon distillate fuel oil storage tank. The combustion turbine units can operate in simple-cycle mode and intermittent duty mode. The units are equipped with dry low-nitrogen oxides (NO_X) combustors and water injection capability. The three combustion turbines are regulated under Phase II of the Federal Acid Rain Program. This facility operates during peak hours of electrical use.

PROPOSED PROJECT

The proposed site expansion project is to install two, dual-fuel nominal 223 MW GE 7FA.05 simple cycle combustion turbine-electrical generators, two 75-feet exhaust stacks, an emergency generator, a natural gas heater and a nominal 2.8-million gallon distillate fuel oil storage tank.

The new emission units will be assigned the following emissions unit identification number (E.U. ID No.) within the Department's Air Resource Management System (ARMS):

Facility ID No. 1010373

ID No.	Description
005	223 MW General Electric Model 7FA.05 simple cycle combustion turbine-electrical generator
006	223 MW General Electric Model 7FA.05 simple cycle combustion turbine-electrical generator
007	2,500 kW Emergency Generator
008	10 million British thermal units per hour (MMBtu/hr) Natural Gas Heater
009	2.8 million gallon distillate fuel oil storage tank

REGULATORY CLASSIFICATION

The facility is not a major source of hazardous air pollutants (HAP).

The facility operates units subject to the acid rain provisions of the Clean Air Act (CAA).

The facility is a Title V major source of air pollution in accordance with Chapter 62-213, F.A.C.

The facility is a major stationary source in accordance with Rule 62-212.400(PSD), F.A.C.

The facility operates units subject to the New Source Performance Standards (NSPS) of 40 CFR 60

The facility operates units subject to the National Emissions Standards for Hazardous Air Pollutants (NESHAP) of 40 CFR 63.

RELEVANT DOCUMENTS:

The permit request and additional information received to make it complete are not a part of this permit; however, the information is listed in the technical evaluation which is issued concurrently with this permit.

SECTION 2. ADMINISTRATIVE REQUIREMENTS

1. Permitting Authority: The Permitting Authority for this project is the Office of Permitting and Compliance (OPC) in the Division of Air Resource Management of the Department. The mailing address for the OPC is 2600 Blair Stone Road, MS #5505, Tallahassee, Florida 32399-2400. All documents related to applications for permits to operate an emissions unit shall be submitted to the OPC Section.
2. Compliance Authority: All documents related to compliance activities such as reports, tests and notifications shall be submitted to the Southwest District Office. The mailing address and phone number of the Southwest District Office is: 13051 N. Telecom Parkway, Temple Terrace, FL 33637-0926, 813/632-7600.
3. Appendices: The following Appendices are attached as part of this permit:
   a. Appendix A. Citation Formats and Glossary of Common Terms;
   b. Appendix B. General Conditions;
   c. Appendix C. Common Conditions;
   d. Appendix D. Common Testing Requirements;
   e. Appendix E. Summary of Best Available Control Technology Determinations;
   f. Appendix F. NSPS, Subpart A, General Provisions and NESHAP, Subpart A, General Provisions;
   g. Appendix G. NSPS, Subpart KKKK, Requirements for Stationary Combustion Turbines;
   h. Appendix H. NSPS, Subpart IIII and NESHAP, Subpart ZZZZ; and
   i. Appendix I. NSPS, Subpart Dc, Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units.
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. Authorization to construct shall expire if construction is not commenced within 18 months after receipt of the permit, if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable time. This provision does not apply to the time period between construction of the approved phases of a phased construction project except that each phase must commence construction within 18 months of the commencement date established by the Department in the permit.
   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 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.

c. 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. Application for Title IV Permit: At least 24 months before the date on which the new unit begins serving an electrical generator greater than 25 MW, the permittee shall submit an application for a Title IV Acid Rain Permit to the Department's Office of Permitting and Compliance Section in Tallahassee and a copy to the Region 4 office of the U.S. Environmental Protection Agency (EPA) in Atlanta, Georgia. [40 CFR 72]

9. 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 with copies to each Compliance Authority.
[Rules 62-4.030, 62-4.050, 62-4.220, and Chapter 62-213, F.A.C.]

A. Simple Cycle Combustion Turbines (EU-005 and 006)

This section of the permit addresses the following emissions units.

ID No.	Emission Unit Description
005	General Electric Model 7FA.05 combustion turbine-electric generator (nominal 223 MW)
006	General Electric Model 7FA.05 combustion turbine-electric generator (nominal 223 MW)
Design Heat Input Rating: The design heat input rating of each combustion turbine is 1,923 MMBtu/hr when firing natural gas and 2,117 MMBtu/hr when firing fuel oil (based on a compressor inlet air temperature of 59° Fahrenheit (F), 60 percent (%) relative humidity, 14.7 pounds per square inch (psi) pressure, the lower heating value (LHV) of each fuel and 100% load). Actual heat input rate will vary depending upon gas turbine characteristics, ambient conditions and evaporative cooling.	

APPLICABLE STANDARDS AND REGULATIONS

1. BACT Determinations: Determinations of the Best Available Control Technology (BACT) were conducted for nitrogen oxides (NO_X), initial carbon monoxide (CO) and particulate matter ($PM/PM_{10}/PM_{2.5}$). [Rule 62-210.200 (BACT), F.A.C.]

2. NSPS Requirements: These units shall comply with the applicable NSPS in 40 CFR 60, including: Subpart A (General Provisions) and Subpart KKKK (Standards of Performance for Stationary Gas Turbines). See Appendices F and G of this permit. The BACT emissions standards for NO_X and the fuel sulfur specifications are as stringent as, or more stringent than the NO_X and sulfur dioxide (SO_2) limits imposed by the applicable NSPS provisions. Some separate reporting and monitoring may be required by the individual subparts. [Rule 62-204.800(7)(b), F.A.C.; 40 CFR 60, Subparts A and KKKK]

EQUIPMENT DESCRIPTION

3. Combustion Turbines: The permittee is authorized to install, tune, operate, and maintain two GE Model 7FA.05 combustion turbine-electrical generator sets and an inlet air filtration system with evaporative coolers. The combustion turbines will be designed for operation in simple cycle mode and will have dual-fuel capability. [Application 1010373-012-AC; Design]

CONTROL TECHNOLOGY

4. Combustion Technology: The permittee shall install, operate and maintain the GE dry-low NO_X (DLN 2.6) combustion system with the GE Start-up NO_X technology feature to control NO_X emissions from the combustion turbines when firing natural gas. Prior to the initial emissions performance tests required for the gas turbines, the DLN combustors and automated gas turbine control system shall be tuned to achieve the permitted levels for NO_X. Thereafter, the system shall be maintained and tuned in accordance with the manufacturer's recommendations or determined best practices.
[Design; Rule 62-212.400(10)(BACT), F.A.C.]

5. Wet Injection: The permittee shall install, operate, and maintain a water injection system to reduce NO_X emissions from the combustion turbines when firing distillate fuel oil. Prior to the initial emissions performance tests, the water injection system shall be tuned to achieve sufficiently low NO_X values to meet the NO_X limits of this permit. Thereafter, the system shall be maintained and tuned in accordance with the manufacturer's recommendations or determined best practices.
[Applicant request; Rule 62-212.400(10)(BACT), F.A.C.]

PERFORMANCE REQUIREMENTS

6. Authorized Fuels: The combustion turbines shall fire natural gas as the primary fuel, which shall contain no more than 1.5 grains of sulfur per 100 standard cubic feet (gr. sulfur/100 SCF) of natural gas. As a restricted alternate fuel, the combustion turbines may fire ultra low sulfur distillate (ULSD) fuel oil containing no more than 0.0015% sulfur by weight.
[Rules 62-210.200 (Potential to emit) and 62-212.400, F.A.C.; BACT for $PM/PM_{10}/PM_{2.5}$]

7. Hours of Operation:
   a. *Natural Gas Operation:*
      1. The two combustion turbines may operate an average of no more than 3,390 hours per year per turbine with no single unit operating more than 5,000 hours per year.
      2. If only one combustion turbine is installed, then it may operate no more than 3,390 hours per year.
   b. *ULSD Fuel Oil Operation:*
      1. The two combustion turbines combined may operate up to 1,000 hours on ULSD fuel oil per calendar year.
      2. If only one combustion turbine is installed, then it may operate up to 500 hours on ULSD fuel oil per calendar year. The single combustion turbine may fire an additional 250 hours of ULSD fuel oil, provided that for every hour of ULSD fuel fired beyond 500 hours, the combustion turbine must reduce its capability to fire natural gas by five hours (i.e. 5:1 natural gas to ULSD fuel oil ratio).

         {E.g., if the single combustion turbine operates on ULSD fuel oil for 750 hours in a calendar year, then it may only operate for only 1,640 hours on natural gas during the same calendar year [(3,390 – 500) – 5(750-500)]}

   [Rules 62-210.200(PTE, and BACT) and 62-212.400 (PSD), F.A.C.]

8. Manufacturer's Performance Curves: The permittee shall provide manufacturer's performance curves (or equations) that correct combustion turbine design heat input rating and operation for site conditions to the Permitting and Compliance Authorities within 45 days of completing the initial compliance testing. Operating data may be adjusted for the appropriate site conditions in accordance with the performance curves and/or equations on file with the Department. [Rule 62-210.200(PTE), F.A.C.]

9. Simple Cycle, Intermittent Operation: The turbines shall operate only in simple cycle mode not to exceed the permitted hours of operation allowed by this permit. This restriction is based on the permittee's request, which formed the basis of the PSD applicability and BACT determination and resulted in the emission standards specified in this permit. For any request to convert this unit to combined cycle operation by installing/connecting to heat recovery steam generators, including changes to the fuel quality or quantity related to combined cycle conversion which may cause an increase in short or long-term emissions, the permittee may be required to submit a full PSD permit application complete with a new proposal of the BACT as if the unit had never been built. [Rules 62-212.400(12) and 62-212.400(BACT), F.A.C.]

EMISSIONS AND TESTING REQUIREMENTS

10. Emission Standards: Emissions from the combustion turbines shall not exceed the following standards.

Pollutant		Emission Standard [a,b]	Basis	Compliance Method [c]	Averaging Time
NO_X	Gas	15.0 ppmvd @15% O_2	NSPS KKKK	CEMS	4-hr rolling avg.
		9.0 ppmvd @15% O_2	BACT		24-hr block avg.
		69.5 lb/hour [d]			One 24-hr block[d]
	Oil	42.0 ppmvd @15% O_2	NSPS KKKK, BACT		4-hr rolling avg.
		370.9 lb/hour [d]	BACT		One 24-hr block[d]
CO	Gas	9.0 ppmvd [e]	Initial BACT [e]	Initial and Annual Stack Tests	three 1-hr runs
		33.5 lb/hour [e]			
	Oil	20.0 ppmvd [e]			
		73.2 lb/hour [e]			
$PM/PM_{10}/PM_{2.5}$ [f]		1.5 gr. sulfur/100 SCF gas 0.0015% sulfur fuel oil [f]	**BACT**	Fuel Record Keeping	N/A
		10 percent opacity		Visible Emissions Annual Test [g]	6-minute block

a. Nitrogen oxides (NO_X) concentration emission standards are expressed in parts per million by volume, dry, corrected to 15 percent oxygen, abbreviated as ppmvd @15% O_2. Carbon monoxide (CO) concentration emissions standards in ppmvd are not corrected to 15% O_2.
b. The mass emission rate standards in pounds per hour (lb/hour) are based on a turbine inlet condition of 59°F and using the higher heating value (HHV) of the fuel. Mass emission rate shall be adjusted to actual test conditions in accordance with the performance curves and/or equations provided to the Department pursuant to Condition 8 above.
c. CEMS means continuous emissions monitoring system.
d. One time initial compliance demonstration by CEMS. Subject to the notification requirements in 62-297.310(7)(a)9., F.A.C. The demonstration period shall include all valid hours within the designated 24-hour block and not less than three valid hours during the block. Pound/hour NO_X values reported as NO_2 equivalent of nitrous oxide (NO) plus nitrogen dioxide (NO_2).
e. The stated CO emission standards represent initial BACT limits. Final BACT limits will be determined and incorporated into a future permit modification as described in Condition 35 below.
f. The fuel sulfur specifications combined with the efficient combustion design and operation of the combustion turbines represent BACT for PM/PM_{10}/$PM_{2.5}$ emissions and effectively limit the potential SO_2 project emissions to values less than 40 tons/year. Compliance with the fuel specifications, carbon monoxide (CO) standards, and visible emissions (opacity) limit shall serve as indicators of good combustion.
g. Compliance with the 10% opacity standard shall be demonstrated by conducting 30-minute tests in accordance with EPA Method 9 - Visual Determination of Opacity.

[Rules 62-4.070(3), 62-210.200, 62-212.400, 62-297and 40 CFR 60, Subpart KKKK]

11. Unconfined Particulate Emissions: During the construction period, unconfined PM emissions shall be minimized by dust suppressing techniques such as covering, confining, or applying water or chemicals to the affected areas, as necessary. [Rule 62-296.320(4)(c), F.A.C.]

12. Test Methods: Required initial and annual compliance stack tests shall be performed in accordance with the following reference methods.

Method	Description of Method and Comments
7E	Determination of NO_X Emissions - Instrumental
9	Visual Determination of Opacity
10	Determination of Carbon Monoxide Emissions from Stationary Sources
20	Determination of NO_X, Sulfur Dioxide, and Diluent Emissions from Stationary Gas Turbines

The methods are described in 40 CFR 60, Appendix A, and adopted by reference in Rule 62-204.800, F.A.C. No other methods may be used for compliance testing unless prior written approval is received from the administrator of the Department's Emissions Monitoring Section in accordance with an alternate sampling procedure pursuant to 62-297.620, F.A.C. [Rules 62-204.800, F.A.C.; 40 CFR 60, Appendix A]

13. Testing Requirements: Initial and annual tests shall be conducted at 90% or greater of the design heat input ratings provided in emissions unit description above and corrected as described therein. If it is impracticable to test within the described range, the combustion turbine may be tested at less the described range. In such case, the reported mass emission rates (corrected as described in Condition 10 above) shall be further corrected by dividing the result by the percent of the design heat rating at which the test was conducted and multiplying by 100%. [Rule 62-297.310, F.A.C.; and 40 CFR 60.8]

14. Initial Compliance Demonstration: Initial compliance stack tests while *firing natural gas* shall be conducted within 60 days after achieving the maximum production rate, but not later than 180 days after the initial startup. Initial testing *on fuel oil* shall be conducted within 60 days of any fuel oil firing in the CT. In accordance with the test methods specified in this permit, the combustion turbines shall be tested to demonstrate initial compliance with the mass emission rate standards for NO_X, CO and with the visible emissions standard. [Rules 62-4.070, 62-297.310(7)(a), F.A.C. and 40 CFR 60.8]

15. Subsequent Compliance Testing: Annual compliance tests for CO and visible emissions shall be conducted during each federal fiscal year (October 1st to September 30th) while firing natural gas. CO and visible emissions tests shall also be performed while firing fuel oil, on each combustion turbine that is fired with fuel oil, for more than 400 hours during the federal fiscal year.
[Rules 62-4.070, 62-210.200(BACT), and 62-297.310(7)(a)4, F.A.C.]

16. Continuous Compliance: Continuous compliance with the permit standard for emissions of NO_X shall be demonstrated with data collected from the required CEMS.
[Rules 62-4.070, and 62-210.200(BACT), F.A.C.]

17. Special Compliance Tests: When the Department, after investigation, has good reason (such as complaints, increased visible emissions or questionable maintenance of control equipment) to believe that any applicable emission standard contained in a Department rule or in a permit issued pursuant to those rules is being violated, it shall require the owner or operator of the emissions unit to conduct compliance tests which identify the nature and quantity of pollutant emissions from the emissions unit and to provide a report on the results of said tests to the Department. [Rule 62-297.310(7)(b), F.A.C.]

EXCESS EMISSIONS

{Permitting Note: The following conditions apply only to the State Implementation Plan (SIP)-based emissions standards specified in Condition No. 10 of this subsection. Rule 62-210.700, F.A.C. (Excess Emissions) cannot vary or supersede any federal provision of the NSPS, NESHAP, or Acid Rain programs.}

18. Definitions:
    a. *Startup* is defined as the commencement of operation of any emissions unit which has shut down or ceased operation for a period of time sufficient to cause temperature, pressure, chemical or pollution control device imbalances, which result in excess emissions.
    b. *Shutdown* is the cessation of the operation of an emissions unit for any purpose.
    c. *Malfunction* is defined as any unavoidable mechanical and/or electrical failure of air pollution control equipment or process equipment or of a process resulting in operation in an abnormal or unusual manner.

    [Rule 62-210.200(165, 242, and 258), F.A.C.]

19. Excess Emissions Prohibited: Excess emissions caused entirely or in part by poor maintenance, poor operation or any other equipment or process failure that may reasonably be prevented during startup, shutdown or malfunction shall be prohibited. All such preventable emissions shall be included in any compliance determinations based on CEMS data. [Rule 62-210.700(4), F.A.C.]

20. Data Exclusion Procedures for SIP Compliance: As per the procedures in this condition, limited amounts of CEMS emissions data, as specified in Condition 21, may be excluded from the corresponding SIP-based compliance demonstration, provided that best operational practices to minimize emissions are adhered to, the duration of data excluded is minimized, and the procedures for data exclusion listed below are followed. As provided by the Department's authority in Rule 62-210.700(5), F.A.C., the following provisions and those given in Condition 21 are adjustments to maximum and minimum factors in Rule 62-210.700(1), F.A.C.
    a. Limiting Data Exclusion. If the compliance calculation using all valid CEMS emission data indicates that the emission unit is in compliance, then no CEMS data shall be excluded from the compliance demonstration.
    b. Event Driven Exclusion. There must be an underlying event (startup, shutdown, malfunction, or fuel switching) in order to exclude data. If there is no underlying event, then no data may be excluded.
    c. Continuous Exclusion. Data shall be excluded on a continuous basis. Data from discontinuous periods shall not be excluded for the same underlying event.

    [Rule 62-210.700, F.A.C.]

21. Allowable Data Exclusions: The following data may be excluded from the corresponding SIP-based compliance demonstration for each of the events listed below in accordance with the Data Exclusion Procedures of Condition 200:
    a. *Startup and Shutdown:* Up to 60 minutes of CEMS data may be excluded for each combustion turbine startup and shutdown cycle. For startups and shutdowns of less than 60 minutes in duration, only those minutes attributable to startup and shutdown may be excluded.

b. *Malfunction*: Up to 120 minutes (in any operating day) of CEMS data may be excluded due to a documented malfunction. A "documented malfunction" means a malfunction that is documented within one working day of detection by contacting the Compliance Authority by telephone, facsimile transmittal, or electronic email.

c. *DLN Tuning*: CEMS data collected during initial or other DLN tuning sessions may be excluded from the compliance demonstrations provided the tuning session is performed in accordance with the manufacturer's specifications or determined best practices. Prior to performing any tuning session, the permittee shall provide the Compliance Authority with an advance notice that details the activity and proposed tuning schedule. The notice may be by telephone, facsimile transmittal, or electronic mail. [Design; Rule 62-4.070(3), F.A.C.]

d. *Fuel Switching*: Up to 60 minutes of CEMS data may be excluded for each fuel switch. For fuel switches of less than 60 minutes in duration, only those minutes attributable to fuel switching may be excluded.

All valid emissions data (including data collected during startup, shutdown, malfunction, DLN tuning, and fuel switching) shall be used to report emissions for the Annual Operating Report.

[Rules 62-210.200(BACT), 62-210.370, and 62-210.700, F.A.C.]

22. Notification Requirements: The owner or operator shall notify the Compliance Authority within one working day of discovering any emissions that demonstrate non-compliance for a given averaging period. [Rule 62-4.070, F.A.C.]

CONTINUOUS MONITORING REQUIREMENTS

23. CEMS: Subject to the following, the permittee shall install, calibrate, operate, and maintain a CEMS to measure and record the emissions of NO_X from the combustion turbines in terms of the applicable standards. The monitoring system shall be installed, and functioning within the required performance specifications by the time of the initial compliance demonstration.

    a. *NO_X Monitor:* Each NO_X monitor shall be certified pursuant to the specifications of 40 CFR 75. Quality assurance procedures shall conform to the requirements of 40 CFR 75. The annual and required RATA tests required for the NO_X monitor shall be performed using EPA Method 20 or 7E in Appendix A of 40 CFR 60.

    b. *Diluent Monitor:* The oxygen (O_2) or carbon dioxide (CO_2) content of the flue gas shall be monitored at the location where NO_X is monitored to correct the measured emissions rates to 15% O_2. If a CO_2 monitor is installed, the O_2 content of the flue gas shall be calculated using F-factors that are appropriate for the fuel fired. Each monitor shall comply with the performance and quality assurance requirements of 40 CFR 75.

    [Rules 62-4.070(3), 62-210.200(BACT), F.A.C., and 40 CFR 60, Subpart 75]

24. Moisture Correction: If necessary, the owner or operator shall determine the moisture content of the exhaust gas and develop an algorithm to enable correction of the monitoring results to a dry basis (0% moisture). [Rules 62-4.070(3), 62-210.200(BACT), F.A.C]

25. CEMS Data Requirements for BACT Standards:

    {Permitting Note: The following conditions apply only to the SIP-based NO_X emissions standards specified in Condition No. 10 of this section. These requirements cannot vary or supersede any federal provision of the NSPS, or Acid Rain programs. Additional reporting and monitoring may be required by the individual subparts.}

    a. *Data Collection*: Except for continuous monitoring system breakdowns, repairs, calibration checks, and zero and span adjustments, emissions shall be monitored and recorded during all operation including startup, shutdown, and malfunction.

b. *Operating Hours and Operating Days*: An hour is the 60-minute period beginning at the top of each hour. Any hour during which an emissions unit is in operation for more than 15 minutes is an operating hour for that emission unit. A day is the 24-hour period from midnight to midnight. Any day with at least one operating hour for an emissions unit is an operating day for that emission unit.

c. *Valid Hour*: Each CEMS shall be designed and operated to sample, analyze, and record data evenly spaced over the hour at a minimum of one measurement per minute. All valid measurements collected during an hour shall be used to calculate a 1-hour block average that begins at the top of each hour.

(1) Hours that are **not operating** hours are **not valid** hours.

(2) For each operating hour, the 1-hour block average shall be computed from at least two data points separated by a minimum of 15 minutes. If less than two such data points are available, there is insufficient data and the 1-hour block average is not valid.

(3) During fuel switching an hour in which fuel oil is fired is attributed towards compliance with the permit standards for oil firing.

d. *24-hour Block Averages*: A 24-hour block shall begin at midnight of each operating day and shall be calculated from 24 consecutive valid hourly average concentration values. If a unit operates less than 24 hours during the block, or there are less than 24 valid hourly averages available, the 24-hour block average shall be the average of all available valid hourly average concentration values for the 24-hour block. *{Permitting Note: For purposes of determining compliance with the 24-hour CEMS standards, the missing data substitution methodology of 40 CFR Part 75, Subpart D, shall not be utilized. Instead, the 24-hour block average shall be determined using the remaining hourly data in the 24-hour block and periods of missing CEMS data are to be reported as monitor downtime in the excess emissions and monitoring performance reports. For example, the "24-hr block average" may consist of only 6 valid operating hours for the day.}*

e. *4-hour Rolling Averages:* A 4-hour rolling average is the arithmetic average of the average emission concentration measured by the CEMS for a given hour and the three unit operating hour average concentrations immediately preceding that unit operating hour.

f. *Data Exclusion:* Each CEMS shall monitor and record emissions during all operations including episodes of startup, shutdown, malfunction, DLN tuning, and fuel switches. Some of the CEMS emissions data recorded during these episodes may be excluded from the corresponding CEMS compliance demonstration subject to the provisions of Conditions 20 and 211 of this subsection.

g. *Availability*: The quarterly excess emissions report shall identify monitor availability for each quarter in which the unit operated.

[Rules 62-4.070(3) and 62-210.200(BACT), F.A.C.]

CEMS REQUIREMENTS FOR ANNUAL EMISSIONS

26. CEMS Annual Emissions Requirement: The owner or operator shall use data from the NO_X CEMS when calculating annual emissions for purposes of computing actual emissions, baseline actual emissions, and net emissions increase, as defined at Rule 62-210.200, F.A.C., and for purposes of computing emissions pursuant to the reporting requirements of Rule 62-210.370(3), F.A.C. In computing the emissions of a pollutant, the owner or operator shall account for the emissions during periods of startup and shutdown of the emissions unit. [Rules 62-210.200, and 62-210.370(3), F.A.C.]

REPORTING AND RECORD KEEPING REQUIREMENTS

27. Monitoring of Operations: The permittee shall monitor and record the operating rate of the combustion turbines on a daily average basis, considering the number of hours of operation during each day (including the times of startup, shutdown, malfunction, DLN tuning, and fuel switching). Such monitoring shall be made by monitoring daily rates of consumption and heat content of each allowable fuel in accordance with the provisions of 40 CFR 75 Appendix D. [Rules 62-4.070(3) and 62-210.200(BACT), F.A.C.]

28. Monthly Operations Summary: By the 15th calendar day of each month, the permittee shall record the following for each fuel in a written or electronic log for the combustion turbines for the previous month of operation: fuel consumption, hours of operation on each fuel, and the updated calendar year totals for each. Information recorded and stored as an electronic file shall be available for inspection and printing within at least three days of a request by the Department. The fuel consumption shall be monitored in accordance with the provisions of 40 CFR 75 Appendix D. [Rules 62-4.070(3) and 62-210.200(BACT), F.A.C.]

29. Fuel Sulfur Records: The permittee shall demonstrate compliance with the fuel sulfur limits specified in this permit by maintaining the following records of the sulfur contents.

    a. *Natural Gas Sulfur Limit*: Compliance with the fuel sulfur limit for natural gas shall be demonstrated by keeping reports obtained from the vendor indicating the average sulfur content of the natural gas being supplied from the pipeline for each month of operation. Methods for determining the sulfur content of the natural gas shall be ASTM methods D4084-82, D4468-85, D5504-01, D6228-98 and D6667-01, D3246-81 or more recent versions.

    b. *Distillate Fuel Oil Sulfur Limit*: Compliance with the distillate fuel oil sulfur limit shall be demonstrated by taking a sample, analyzing the sample for fuel sulfur, and reporting the results to each Compliance Authority before initial startup. Sampling the fuel oil sulfur content shall be conducted in accordance with ASTM D4057-88, Standard Practice for Manual Sampling of Petroleum and Petroleum Products, and one of the following test methods for sulfur in petroleum products: ASTM methods D5453-00, D129-91, D1552-90, D2622-94, or D4294-90. More recent versions of these methods may be used. For each subsequent fuel delivery, the permittee shall maintain a permanent file of the certified fuel sulfur analysis from the fuel vendor. At the request of the Compliance Authority, the permittee shall perform additional sampling and analysis for the fuel sulfur content.

    The above methods shall be used to determine the fuel sulfur content in conjunction with the provisions of 40 CFR 75 Appendix D. [Rules 62-4.070(3) and 62-4.160(15), F.A.C.]

30. Emissions Performance Test Reports: A report indicating the results of any required emissions performance test shall be submitted to the Compliance Authority no later than 45 days after completion of the last test run. The test report shall provide sufficient detail on the tested emission unit and the procedures used to allow the Department to determine if the test was properly conducted and if the test results were properly computed. At a minimum, the test report shall provide the applicable information listed in Rule 62-297.310(8)(c), F.A.C. and in Appendix D of this permit. [Rule 62-297.310(8), F.A.C.].

31. Excess Emissions Reporting:

    a. *Malfunction Notification:* If emissions in excess of a standard (subject to the specified averaging period) occur due to malfunction, the permittee shall notify the Compliance Authority within (1) working day of: the nature, extent, and duration of the excess emissions; the cause of the excess emissions; and the actions taken to correct the problem. In addition, the Department may request a written summary report of the incident.

    b. *SIP Quarterly Report*: Within 30 days following the end of each calendar-quarter, the permittee shall submit a report to the Compliance Authority summarizing periods of NO_X emissions in excess of the BACT permit standard following the NSPS format in 40 CFR 60.7(c), Subpart A. A summary of data excluded from SIP compliance calculations should also be provided. In addition, the report shall summarize the NO_X CEMS system monitor availability for the previous quarter.

    [Rules 62-4.130, 62-204.800, 62-210.700(6) and 62-212.400(BACT), F.A.C., and 40 CFR 60.7 and 60.4375]

32. Annual Operating Report: The permittee shall submit an annual report that summarizes the actual operating hours and emissions from this facility in accordance with Rule 62-210.370. Annual operating reports shall be submitted to the Compliance Authority by April 1st of each year. [Rule 62-210.370(2), F.A.C.]

33. Single Combustion Turbine Option – Fuel Oil Use Notification: If only one combustion turbine is constructed, the permittee shall submit a notification to the Compliance Authority no later than 15 days after the combustion turbine has operated for more than 500 hours ULSD fuel oil in a calendar year. Thereafter, the permittee shall, upon request, promptly provide the Department with year-to-date records of hours of operation on ULSD fuel oil and natural gas for that calendar year. [Rule 62-4.070, F.A.C.]

FINAL BACT DETERMINATION FOR CARBON MONOXIDE

34. Temporary CO Continuous Emission Monitoring System (CO-CEMS): Within 270 days after the initial startup of the first combustion turbine authorized by this permit, the permittee shall install and certify a temporary CO-CEMS using the methodology described in 40 CFR 60, Appendix B, Performance Specification 4 or 4A. If two combustion turbines are constructed, the permittee may select to install a temporary CO-CEMs on only one unit and the emission data shall be used to establish a limit for both combustion turbine units. The permittee shall for a period of 365 consecutive calendar days collect and preserve the collected data and shall code the data for inclusion and identification of data obtained during startups, shutdowns, malfunctions, low load conditions and normal operations. [Rules 62-070(3), 62-210.200 (BACT Definition), and 62-212.400, F.A.C.]

{Permitting note: The Department requires ultimate submittal of all data because they may be considered in determining a final CO BACT determination that may define low load, startup, shutdown and malfunction excess emissions. The temporary CO-CEMS data do not have to be submitted until the due date of the technical report described in Condition 35. The demonstration CO-CEMS data will not be subject to the excess emission reporting requirements given in Condition 31 above.}

35. Final CO Emission Standard: Within 820 days of initial startup of the first combustion turbine, the permittee shall submit an application with a final CO emission standard proposal and compliance method consistent with the procedures for determining BACT or with procedures that demonstrate that the project is and will continue to be a minor stationary source of CO. The application shall include a technical report summarizing the data collected using the temporary CO-CEMS installed pursuant to Condition 34 above. [Rules 62-070(3), 62-210.200 (BACT Definition), and 62-212.400, F.A.C.]

B. 2500 kW Emergency Generator (EU-007)

This section of the permit addresses the following emissions unit.

ID No.	Emission Unit Description
007	One 2,500 kilowatts Emergency Generator (model year 2011 or later)

APPLICABLE STANDARDS AND REGULATIONS

1. NSPS, Subpart IIII Applicability: This emergency generator is a Stationary Compression Ignition Internal Combustion Engine (Stationary ICE) and is subject to 40 CFR 60, Subpart IIII. The applicant shall comply with 40 CFR 60, Subpart IIII only to the extent that the regulations apply to the emission unit and its operations (e.g. non-road, emergency, displacement, capacity and model year selected).

   [40 CFR 60, Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines and Rule 62-204.800(8)(b)79., F.A.C.]

2. NESHAP, Subpart ZZZZ Applicability: This emergency generator is a Stationary Reciprocating Internal Combustion engine located at an area source of hazardous air pollutants emissions and is subject to 40 CFR 63, Subpart ZZZZ. Because this emergency generator is subject to regulation under 40 CFR 60, Subpart IIII, the Subpart ZZZZ only requires that the emergency generator meet the requirements of 40 CFR 60, Subpart IIII. No further requirements of Subpart ZZZZ apply to this emergency generator.

   [40 CFR 63, subpart ZZZZ - National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines, section 63.6590(c) and Rule 62-204.800(11)(b)82., F.A.C.]

EQUIPMENT SPECIFICATIONS

3. Equipment: The permittee is authorized to install, operate, and maintain one fuel oil-fired emergency generator. [Applicant Request; Rule 62-210.200(PTE), F.A.C.]

EMISSIONS AND PERFORMANCE REQUIREMENTS

4. Hours of Operation and Fuel Specifications: The hours of operation shall not exceed 500 hours per year. The generator shall burn distillate fuel oil with a sulfur content of 15 parts per million (ppm) or less. [Applicant Request; Rule 62-210.200(PTE), F.A.C.]

5. Fuel: Total fuel consumption of the emergency generator and four ancillary generators shall be no more than 77,750 gallons of distillate fuel oil per year. [Application]

6. Emergency Generator Emission Limits:

Emergency Generator (> 560 kilowatts)	CO (g/kW-hr)[1]	PM (g/kW-hr)	NMHC[2]+NO_X (g/kW-hr)	Diesel Fuel[3] (sulfur)
2011 and later	3.5	0.20	6.4	15 ppm

1. g/kW-hr means grams per kilowatt-hour.
2. NMHC means Non-Methane Hydrocarbons.
3. Nonroad diesel specification of 15 ppm is from 40 CFR part 80, subpart I – Motor Vehicle Diesel Fuel; Nonroad, Locomotive, and Marine Diesel Fuel; and ECA Marine Fuel.

   [Applicant Request; 62-212.400(BACT), F.A.C.; NSPS Subpart IIII]

7. Emergency Generator Testing Requirements: This unit shall be stack tested to demonstrate initial compliance with the emission standards for CO and NO_X. The tests shall be conducted within 60 days after achieving the maximum production rate at which the unit will be operated, but not later than 180 days after the initial startup of this unit. As an alternative, an EPA certification of emissions characteristics of the purchased model that are at least as stringent as the BACT (NSPS Subpart IIII) values and the use of ultralow sulfur distillate fuel oil or nonroad diesel fuel with a sulfur content of 15 ppm or less can be used to fulfill this requirement. [Rule 62-297.310(7)(a)1, F.A.C.; 40 CFR 60.8 and 40 CFR 60.4211]

8. Test Methods: Any required tests shall be performed in accordance with the following reference methods.

Method	Description of Method and Comments
7E	Determination of Nitrogen Oxides Emissions from Stationary Sources
10	Determination of Carbon Monoxide Emissions from Stationary Sources

NOTIFICATION, REPORTING AND RECORDS

9. Notifications: Initial notifications are required pursuant to 40 CFR 60.7, 40 CFR 63.9, and 40 CFR 63.6590 (b) (i) for the 2500 kW emergency generator.

10. Reporting: The permittee shall maintain records of the amount of liquid fuel used. These records shall be submitted to the Compliance Authority on an annual basis or upon request. [Rule 62-4.070(3), F.A.C.]

C. Natural Gas Heater (EU-008)

This section of the permit addresses the following emissions unit.

ID No.	Emission Unit Description
008	10 MMBtu/hour Natural Gas Heater

EQUIPMENT

1. Natural Gas Heater: The permittee is authorized to install, operate, and maintain one natural gas heater for the purpose of heating the natural gas supply to the combustion turbines. [Application]

PERFORMANCE RESTRICTIONS

2. Authorized Fuel: The natural gas heater shall fire only natural gas with a maximum fuel sulfur content of 1.5 grains/100 scf. [Application; Rules 62-210.200(PTE) and 62-296.406(BACT) F.A.C.]

3. Hours of Operation: The natural gas heater is allowed to operate 3,390 hours/year/installed CTG. [Applicant Request and Rule 62-210.200(PTE), F.A.C.]

REGULATORY APPLICABILITY

4. Small Boiler BACT: The natural gas heater is subject to the requirements of Rule 62-296.406, F.A.C., which includes a determination of the Best Available Control Technology (BACT) for PM and SO_2 emissions. For this project, BACT for PM and SO_2 emissions is determine to be the firing of natural gas with a maximum fuel sulfur content of 1.5 grains/100 scf as the only authorized fuel. [Rule 62-296.406, F.A.C.]

5. NSPS Subpart Dc and Subpart A Applicability: The natural gas heater is subject to all applicable requirements of 40 CFR 60, Subpart Dc which applies to Small Industrial, Commercial or Institutional Boilers and Subpart A, General Provisions. Specifically, this emission unit shall comply with 40 CFR 60.48c Reporting and Recordkeeping Requirements. The applicable conditions are given in Appendices A and Dc of this permit.
[Rule 62-204.800(7)(b) and 40 CFR 60, NSPS-Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units, attached as Appendix J].

EMISSIONS STANDARDS

6. BACT Determination: The determination of BACT for this emissions unit is the requirement that the heater only fire of natural gas with a maximum fuel sulfur content of 1.5 grains/100 scf. [Rules 62-296.406; 62-4.070(3) and 62-210.200(BACT), F.A.C.]

NOTIFICATIONS, RECORDS AND REPORTS

7. Notification: Initial notification is required for the natural gas heater. [40 CFR 60.7]

8. Reporting: The permittee shall maintain records of the amount of natural gas used in the heater. These records shall be submitted to the Compliance Authority on an annual basis or upon request. [Rule 62-4.070(3] F.A.C.]

D. 2.8 Million Gallon Distillate Fuel Oil Tank (EU-009)

ID No.	Emission Unit Description
009	2.8 Million Gallon Ultralow Sulfur Distillate Fuel Oil Storage Tank

NSPS APPLICABILITY

1. NSPS, Subpart Kb Applicability: Based on the true vapor pressure of ultralow sulfur distillate fuel (< 3.5 kilopascals), the storage tank **is not** subject to 40 CFR 60, Subpart Kb - Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984. [Application; 40 CFR 60.110b(b)]

EQUIPMENT SPECIFICATIONS

2. Equipment: The permittee is authorized to operate, and maintain one nominal 2.8 million gallon distillate fuel oil storage tank to provide fuel oil to Units 005 and 006 or to other units on the site. [Application]

EMISSIONS AND PERFORMANCE REQUIREMENTS

3. Hours of Operation: The hours of operation are not restricted (8,760 hours per year). [Application]

NOTIFICATION, REPORTING AND RECORDS

4. Ultralow Sulfur Distillate Fuel Oil Records: The permittee shall keep readily accessible records showing the maximum true vapor pressure of the stored liquid. Compliance with this condition may be demonstrated by using the information from the respective manufacturers safety data sheets (MSDS) for the fuel oil stored in the tanks. [Rule 62-4.070(3) F.A.C.; avoidance of 40 CFR 60, Subpart Kb]

APPENDIX B
FDEP AIR APPLICATION FORMS

RECEIVED
SEP 24 2012
DIVISION OF AIR RESOURCE MANAGEMENT

Department of Environmental Protection

Division of Air Resource Management

APPLICATION FOR AIR PERMIT - LONG FORM

I. APPLICATION INFORMATION

Air Construction Permit – Use this form to apply for an air construction permit:

- For any required purpose at a facility operating under a federally enforceable state air operation permit (FESOP) or Title V air operation permit;
- For a proposed project subject to prevention of significant deterioration (PSD) review, nonattainment new source review, or maximum achievable control technology (MACT);
- To assume a restriction on the potential emissions of one or more pollutants to escape a requirement such as PSD review, nonattainment new source review, MACT, or Title V; or
- To establish, revise, or renew a plantwide applicability limit (PAL).

Air Operation Permit – Use this form to apply for:

- An initial federally enforceable state air operation permit (FESOP); or
- An initial, revised, or renewal Title V air operation permit.

To ensure accuracy, please see form instructions.

Identification of Facility

1. Facility Owner/Company Name: **Shady Hills Power Company, LLC**	
2. Site Name: **Shady Hills Generating Station**	
3. Facility Identification Number: **1010373**	
4. Facility Location... Street Address or Other Locator: **14240 Merchant Energy Way** City: **Spring Hill** County: **Pasco** Zip Code: **34610**	
5. Relocatable Facility? ☐ Yes ☒ No	6. Existing Title V Permitted Facility? ☒ Yes ☐ No

Application Contact

1. Application Contact Name: **Roy S. Belden**
2. Application Contact Mailing Address... Organization/Firm: **Shady Hills Power Company, LLC** Street Address: **800 Long Ridge Rd.** City: **Stamford** State: **CT** Zip Code: **06927**
3. Application Contact Telephone Numbers... Telephone: **(203) 357-6820** ext. Fax: Fax: **(203) 967-5116**
4. Application Contact E-mail Address: **Roy.Belden@GE.com**

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	3. PSD Number (if applicable):
2. Project Number(s):	4. Siting Number (if applicable):

APPLICATION INFORMATION

Purpose of Application

This application for air permit is being submitted to obtain: (Check one)

Air Construction Permit

☒ Air construction permit.

☐ Air construction permit to establish, revise, or renew a plantwide applicability limit (PAL).

☐ Air construction permit to establish, revise, or renew a plantwide applicability limit (PAL), and separate air construction permit to authorize construction or modification of one or more emissions units covered by the PAL.

Air Operation Permit

☐ Initial Title V air operation permit.

☐ Title V air operation permit revision.

☐ Title V air operation permit renewal.

☐ Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is required.

☐ Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is not required.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit (Concurrent Processing)

☐ Air construction permit and Title V permit revision, incorporating the proposed project.

☐ Air construction permit and Title V permit renewal, incorporating the proposed project.

Note: By checking one of the above two boxes, you, the applicant, are requesting concurrent processing pursuant to Rule 62-213.405, F.A.C. In such case, you must also check the following box:

☐ I hereby request that the department waive the processing time requirements of the air construction permit to accommodate the processing time frames of the Title V air operation permit.

Application Comment

This application is a supplemental air construction permit application to the July, 2010, Air Permit Application and Prevention of Significant Deterioration Analysis, and Final FDEP Permit No. 1010373-012-AC, PSD-FL-402A, for the Shady Hills Generation Station. This application provides PSD review analyses of GHG emissions from the project. The project will consist of two General Electric Frame 7FA.05 CTs (GE 7FA.05) and associated facilities. The GE 7FA.05 units will each be equipped with evaporative cooling. The annual maximum capacity factor of the plant will be 39 percent per CT, which is equivalent to operating 6,554,565 MMBtu/CT/year (3,390 hours/year) at full load per CT). Natural gas will be used as the primary fuel, and fuel oil will be used as a backup fuel. The project will require an additional gas heater, emergency generator and fuel oil storage tank for the two new CTs.

APPLICATION INFORMATION

Scope of Application

Emissions Unit ID Number	Description of Emissions Unit	Air Permit Type	Air Permit Processing Fee
005	223 Megawatt Simple-Cycle Combustion Turbine	AC1A	
006	223 Megawatt Simple-Cycle Combustion Turbine	AC1A	
007	Emergency Generator	AC1E	
008	Natural Gas Heater	AC1F	
009	Distillate Fuel Oil Storage Tank	AC1F	

Application Processing Fee

Check one: ☐ Attached - Amount: _____ ☒ Not Applicable

APPLICATION INFORMATION

Owner/Authorized Representative Statement

Complete if applying for an air construction permit or an initial FESOP.

1. Owner/Authorized Representative Name :
   Roy S. Belden, Vice President
2. Owner/Authorized Representative Mailing Address...
   Organization/Firm: **EFS Shady Hills LLC**
   Street Address: **800 Long Ridge Rd.**
   City: **Stamford** State: **CT** Zip Code: **06927**
3. Owner/Authorized Representative Telephone Numbers...
   Telephone: **(203) 357-6820** ext. Fax: **(203) 967-5116**
4. Owner/Authorized Representative E-mail Address: **Roy.Belden@GE.com**
5. Owner/Authorized Representative Statement:

   I, the undersigned, am the owner or authorized representative of the corporation, partnership, or other legal entity submitting this air permit application. To the best of my knowledge, the statements made in this application are true, accurate and complete, and any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department.

   Roy S. Belden — Signature

   9/14/12 — Date

APPLICATION INFORMATION

Application Responsible Official Certification

Complete if applying for an initial, revised, or renewal Title V air operation permit or concurrent processing of an air construction permit and revised or renewal Title V air operation permit. If there are multiple responsible officials, the "application responsible official" need not be the "primary responsible official."

1. Application Responsible Official Name:

2. Application Responsible Official Qualification (Check one or more of the following options, as applicable):

- ☐ For a corporation, the president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit under Chapter 62-213, F.A.C.
- ☐ For a partnership or sole proprietorship, a general partner or the proprietor, respectively.
- ☐ For a municipality, county, state, federal, or other public agency, either a principal executive officer or ranking elected official.
- ☐ The designated representative at an Acid Rain source or CAIR source.

3. Application Responsible Official Mailing Address...
Organization/Firm:
Street Address:
City: State: Zip Code:

4. Application Responsible Official Telephone Numbers...
Telephone: ( ) - ext. Fax: ( ) -

5. Application Responsible Official E-mail Address:

6. Application Responsible Official Certification:

I, the undersigned, am a responsible official of the Title V source addressed in this air permit application. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof and all other applicable requirements identified in this application to which the Title V source is subject. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department, and I will promptly notify the department upon sale or legal transfer of the facility or any permitted emissions unit. Finally, I certify that the facility and each emissions unit are in compliance with all applicable requirements to which they are subject, except as identified in compliance plan(s) submitted with this application.

Signature Date

APPLICATION INFORMATION

Professional Engineer Certification

1. Professional Engineer Name: **Scott H. Osbourn**
   Registration Number: **57557**
2. Professional Engineer Mailing Address...
   Organization/Firm: **Golder Associates Inc.****
   Street Address: **5100 West Lemon St., Suite 208**
   City: **Tampa** State: **FL** Zip Code: **33609**
3. Professional Engineer Telephone Numbers...
   Telephone: **(813) 287-1717** ext. **53304** Fax: **(813) 287-1716**
4. Professional Engineer E-mail Address: **sosbourn@golder.com**
5. Professional Engineer Statement:

I, the undersigned, hereby certify, except as particularly noted herein, that:*

(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this application for air permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.

(3) If the purpose of this application is to obtain a Title V air operation permit (check here ☐, if so), I further certify that each emissions unit described in this application for air permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance plan and schedule is submitted with this application.

(4) If the purpose of this application is to obtain an air construction permit (check here ☒, if so) or concurrently process and obtain an air construction permit and a Title V air operation permit revision or renewal for one or more proposed new or modified emissions units (check here ☐, if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

(5) If the purpose of this application is to obtain an initial air operation permit or operation permit revision or renewal for one or more newly constructed or modified emissions units (check here ☐, if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.

Signature Date 9/21/12

(seal)

SCOTT H. OSBOURN LICENSE No. 57557 STATE OF FLORIDA PROFESSIONAL ENGINEER

* Attach any exception to certification statement. ** Board of Professional Engineers Certificate of Authorization # 00001670

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates... Zone **17** East (km) **347.0** North (km) **3,139.0**		2. Facility Latitude/Longitude... Latitude (DD/MM/SS) **28/22/00** Longitude (DD/MM/SS) **82/33/30**	
3. Governmental Facility Code: **0**	4. Facility Status Code: **A**	5. Facility Major Group SIC Code: **49**	6. Facility SIC(s): **4911**
7. Facility Comment :			

Facility Contact

1. Facility Contact Name: **Roy S. Belden, Vice President**
2. Facility Contact Mailing Address... Organization/Firm: **Shady Hills Power Company, LLC** Street Address: **800 Long Ridge Rd.** City: **Stamford** State: **CT** Zip Code: **06927**
3. Facility Contact Telephone Numbers: Telephone: **(203) 357-6820** ext. Fax: **(203) 967-5116**
4. Facility Contact E-mail Address: **Roy.Belden@GE.com**

Facility Primary Responsible Official

Complete if an "application responsible official" is identified in Section I that is not the facility "primary responsible official."

1. Facility Primary Responsible Official Name:
2. Facility Primary Responsible Official Mailing Address... Organization/Firm: Street Address: City: State: Zip Code:
3. Facility Primary Responsible Official Telephone Numbers... Telephone: ( ) - ext. Fax: ( ) -
4. Facility Primary Responsible Official E-mail Address:

Facility Regulatory Classifications

Check all that would apply *following* completion of all projects and implementation of all other changes proposed in this application for air permit. Refer to instructions to distinguish between a "major source" and a "synthetic minor source."

1. ☐ Small Business Stationary Source	☐ Unknown
2. ☐ Synthetic Non-Title V Source	
3. ☒ Title V Source	
4. ☒ Major Source of Air Pollutants, Other than Hazardous Air Pollutants (HAPs)	
5. ☐ Synthetic Minor Source of Air Pollutants, Other than HAPs	
6. ☐ Major Source of Hazardous Air Pollutants (HAPs)	
7. ☐ Synthetic Minor Source of HAPs	
8. ☒ One or More Emissions Units Subject to NSPS (40 CFR Part 60)	
9. ☐ One or More Emissions Units Subject to Emission Guidelines (40 CFR Part 60)	
10. ☐ One or More Emissions Units Subject to NESHAP (40 CFR Part 61 or Part 63)	
11. ☐ Title V Source Solely by EPA Designation (40 CFR 70.3(a)(5))	

12. Facility Regulatory Classifications Comment:

Emissions units 005, and 006 are subject to NSPS Subpart KKKK - Standards of Performance for Stationary Gas Turbines.

Emergency Generator, emission unit 007:

- **NSPS Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.**
- **NESHAP Subpart ZZZZ.**

Emission unit 009, the proposed 2.8 million gallon fuel oil storage tank, is subject to NSPS Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984.

List of Pollutants Emitted by Facility

1. Pollutant Emitted	2. Pollutant Classification	3. Emissions Cap [Y or N]?
$PM/PM_{10}/PM_{2.5}$	**A**	**N**
CO	**A**	**N**
VOC	**A**	**N**
SO_2	**A**	**N**
NO_x	**A**	**N**
CO_2e	**A**	**N**

B. EMISSIONS CAPS

Facility-Wide or Multi-Unit Emissions Caps

1. Pollutant Subject to Emissions Cap	2. Facility-Wide Cap [Y or N]? (all units)	3. Emissions Unit ID's Under Cap (if not all units)	4. Hourly Cap (lb/hr)	5. Annual Cap (ton/yr)	6. Basis for Emissions Cap

7. Facility-Wide or Multi-Unit Emissions Cap Comment:

C. FACILITY ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1.	Facility Plot Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) ☒ Attached, Document ID: See Note ☐ Previously Submitted, Date:_____
2.	Process Flow Diagram(s): (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) ☒ Attached, Document ID: See Note ☐ Previously Submitted, Date:_____
3.	Precautions to Prevent Emissions of Unconfined Particulate Matter: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) ☐ Attached, Document ID: NA ☐ Previously Submitted, Date:_____

Additional Requirements for Air Construction Permit Applications

1.	Area Map Showing Facility Location: ☒ Attached, Document ID: See Note ☐ Not Applicable (existing permitted facility)
2.	Description of Proposed Construction, Modification, or Plantwide Applicability Limit (PAL): ☐ Attached, Document ID: NA
3.	Rule Applicability Analysis: ☒ Attached, Document ID: See Report for GHG Rule Applicability Analysis
4.	List of Exempt Emissions Units: ☐ Attached, Document ID:_____ ☒ Not Applicable (no exempt units at facility)
5.	Fugitive Emissions Identification: ☐ Attached, Document ID:_____ ☒ Not Applicable
6.	Air Quality Analysis (Rule 62-212.400(7), F.A.C.): ☒ Attached, Document ID: See Note ☐ Not Applicable
7.	Source Impact Analysis (Rule 62-212.400(5), F.A.C.): ☒ Attached, Document ID: See Note ☐ Not Applicable
8.	Air Quality Impact since 1977 (Rule 62-212.400(4)(e), F.A.C.): ☒ Attached, Document ID: See Note ☐ Not Applicable
9.	Additional Impact Analyses (Rules 62-212.400(8) and 62-212.500(4)(e), F.A.C.): ☒ Attached, Document ID: See Note ☐ Not Applicable
10.	Alternative Analysis Requirement (Rule 62-212.500(4)(g), F.A.C.): ☐ Attached, Document ID:_____ ☒ Not Applicable

Note: See Air Permit Application and Prevention of Significant Deterioration Analysis for the Shady Hills Generation Station, July, 2010.

C. FACILITY ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for FESOP Applications

1. List of Exempt Emissions Units:
   ☐ Attached, Document ID:_____ ☒ Not Applicable (no exempt units at facility)

Additional Requirements for Title V Air Operation Permit Applications NA

1. List of Insignificant Activities: (Required for initial/renewal applications only)
   ☐ Attached, Document ID:_____ ☐ Not Applicable (revision application)

2. Identification of Applicable Requirements: (Required for initial/renewal applications, and for revision applications if this information would be changed as a result of the revision being sought)
   ☐ Attached, Document ID:_____
   ☐ Not Applicable (revision application with no change in applicable requirements)

3. Compliance Report and Plan: (Required for all initial/revision/renewal applications)
   ☐ Attached, Document ID:_____
   Note: A compliance plan must be submitted for each emissions unit that is not in compliance with all applicable requirements at the time of application and/or at any time during application processing. The department must be notified of any changes in compliance status during application processing.

4. List of Equipment/Activities Regulated under Title VI: (If applicable, required for initial/renewal applications only)
   ☐ Attached, Document ID:_____
   ☐ Equipment/Activities Onsite but Not Required to be Individually Listed
   ☐ Not Applicable

5. Verification of Risk Management Plan Submission to EPA: (If applicable, required for initial/renewal applications only)
   ☐ Attached, Document ID:_____ ☐ Not Applicable

6. Requested Changes to Current Title V Air Operation Permit:
   ☐ Attached, Document ID:_____ ☐ Not Applicable

C. FACILITY ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Facilities Subject to Acid Rain, CAIR, or Hg Budget Program

1. Acid Rain Program Forms:

   Acid Rain Part Application (DEP Form No. 62-210.900(1)(a)):
   ☒ Attached, Document ID: **See Note** ☐ Previously Submitted, Date:_____
   ☐ Not Applicable (not an Acid Rain source)

   Phase II NO_X Averaging Plan (DEP Form No. 62-210.900(1)(a)1.):
   ☐ Attached, Document ID:_____ ☐ Previously Submitted, Date:_____
   ☐ Not Applicable

   New Unit Exemption (DEP Form No. 62-210.900(1)(a)2.):
   ☐ Attached, Document ID:_____ ☐ Previously Submitted, Date:_____
   ☐ Not Applicable

2. CAIR Part (DEP Form No. 62-210.900(1)(b)):
   ☒ Attached, Document ID: **See Note** ☐ Previously Submitted, Date:_____
   ☐ Not Applicable (not a CAIR source)

Note: See Air Permit Application and Prevention of Significant Deterioration Analysis for the Shady Hills Generation Station, July, 2010.

Additional Requirements Comment

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for an initial, revised or renewal Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for an air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised or renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes, and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

☒ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

☐ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

☒ This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

☐ This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

☐ This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:

Two simple-cycle combustion turbines.[a]

3. Emissions Unit Identification Number: **005 and 006**

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C			**49**

8. Federal Program Applicability: (Check all that apply)

☒ Acid Rain Unit

☒ CAIR Unit

9. Package Unit:
Manufacturer: **GE** Model Number: **7FA.05**

10. Generator Nameplate Rating: **223 MW/CT[b]**

11. Emissions Unit Comment:

[a]. Two simple cycle General Electric Model 7FA.05 (GE 7FA.05) combustion turbines.
[b] Parameter of distillate oil at 59°F and 100% base load.

Emissions Unit Control Equipment/Method: Control 1 of 1

1. Control Equipment/Method Description: **Water injection for NO_x control (distillate oil firing).** **Dry Low NO_x burner for NO_x control (natural gas burning).**
2. Control Device or Method Code: **028, 025**

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

B. EMISSIONS UNIT CAPACITY INFORMATION
(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate:	
2. Maximum Production Rate:	
3. Maximum Heat Input Rate: **2,106.9** million Btu/hr[a]	
4. Maximum Incineration Rate: pounds/hr tons/day	
5. Requested Maximum Operating Schedule: **24** hours/day **52** weeks/year	**7** days/week **(See Below)**hours/year

6. Operating Capacity/Schedule Comment:

[a] **Parameter of distillate oil at 59°F and 100% base load.**

Maximum heat input rates: Natural gas firing - 1,923 MMBtu/hr
Distillate fuel oil firing - 2,117 MMBtu/hr

Maximum heat input rates are based on lower heating value of each fuel at ambient conditions of 59 degree F, 60 percent RH, 100 percent load, and 14.7 psi pressure.

Three proposed operating scenarios:

1. **2 CTs operating 3,390 hours per CT including 1,000 hours of total oil firing;**
2. **2 CTs operating 3,390 hours per CT, 100% natural gas firing;**
3. **1 CT, operating 1,640 hours of natural gas firing and 750 hours of oil firing.**

C. EMISSION POINT (STACK/VENT) INFORMATION

(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: **005 and 006**	2. Emission Point Type Code:	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking:		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code: **V**	6. Stack Height: **75** feet	7. Exit Diameter: **18** feet
8. Exit Temperature: **1,099°F**[a]	9. Actual Volumetric Flow Rate: **2,780,256** acfm[a]	10. Water Vapor: **12.11 %**[a]
11. Maximum Dry Standard Flow Rate: dscfm	12. Nonstack Emission Point Height: feet	
13. Emission Point UTM Coordinates... Zone: **17** East (km): **347.0** North (km): **3,139.0**	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) **28/22/00** Longitude (DD/MM/SS) **82/33/30**	
15. Emission Point Comment: [a] **Parameter of distillate oil at 59°F and 100% base load.**		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type): **Internal Combustion Engines; Electric Generation; Natural-Gas Firing**		
2. Source Classification Code (SCC): **2-01-002-01**	3. SCC Units: **Million cubic feet natural gas burned**	
4. Maximum Hourly Rate: **2.06**	5. Maximum Annual Rate: **6,983 Per CT**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **933**
10. Segment Comment: **Based on natural gas lower heating value (LHV) of 933 Btu/ft^3.** **Maximum hourly rate = 1923 MMBtu/hr /933 MMBtu/MM ft3 = 2.06 MM ft3/hr** **Maximum annual rate = 2.06 MM ft3/hr x 3,390 hr/yr = 6,983 MM ft3/yr. (Scenario 2.)**		

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type): **Internal Combustion Engines; Electric Generation; Distillate Oil Firing**		
2. Source Classification Code (SCC): **2-01-001-01**	3. SCC Units: **1000 Gallons burned**	
4. Maximum Hourly Rate: **16.04 Per CT**	5. Maximum Annual Rate: **16,040 Total 2 CTs**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **0.0015**	8. Maximum % Ash:	9. Million Btu per SCC Unit: **132**
10. Segment Comment: **Based on distillate oil LHV of 132 MMBtu/1,000 gal** **Maximum hourly rate = 2,117 MMBtu/hr /132 MMBtu/1,000 gallon = 16.04 1,000 gallons/hr.** **Maximum annual rate = 16,040 gallons/hr x 1,000 hr/yr = 16,040 1,000 gallons/yr. (Scenario 1)**		

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
CO2e			**EL**

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **CO2e**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **(See Table 1)** lb/hour **(See Table 1)** tons/year	4. Synthetically Limited? ☒Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **Multi-Component, See Table 1** Reference: **Appendix G, 40 CFR Part 75 and 40 CFR Part 98**	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:

Table 1 provides lb/hr emission rates for 100 % load and 59F, for both natural gas firing and fuel oil firing.

Annual emission provided in Table 1 for three operating scenarios:

1. **2 CTs operating 3,390 hours per CT including 1,000 hours of total oil firing;**
2. **2 CTs operating 3,390 hours per CT, 100% natural gas firing;**
3. **1 CT, operating 1,640 hours of natural gas firing and 750 hours of oil firing.**

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **BACT**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **See Table 3**	4. Equivalent Allowable Emissions: lb/hour **833,796** tons/year
5. Method of Compliance: **40 CFR Part 75, Appendix G and 40 CFR Part 98 Emission Factors.**	
6. Allowable Emissions Comment (Description of Operating Method): **See Table 3.**	

Allowable Emissions Allowable Emissions of

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions of

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: See Note ☐ Previously Submitted, Date _____

2. Fuel Analysis or Specification: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: See Note ☐ Previously Submitted, Date _____

3. Detailed Description of Control Equipment: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: See Note ☐ Previously Submitted, Date _____

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: See Note ☐ Previously Submitted, Date _____
   ☐ Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: See Note ☐ Previously Submitted, Date _____
   ☐ Not Applicable

6. Compliance Demonstration Reports/Records:
   ☐ Attached, Document ID: _____
   Test Date(s)/Pollutant(s) Tested: _____
   ☐ Previously Submitted, Date: _____
   Test Date(s)/Pollutant(s) Tested: _____
   ☐ To be Submitted, Date (if known): _____
   Test Date(s)/Pollutant(s) Tested: _____
   ☒ Not Applicable
   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute:
   ☐ Attached, Document ID: _____ ☒ Not Applicable

Note: See Air Permit Application and Prevention of Significant Deterioration Analysis for the Shady Hills Generation Station, July, 2010.

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1.	Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)): ☐ Attached, Document ID: _____ ☒ Not Applicable
2.	Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): ☐ Attached, Document ID: _____ ☒ Not Applicable
3.	Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: _____ ☒ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications - NA

1.	Identification of Applicable Requirements: ☐ Attached, Document ID: _____
2.	Compliance Assurance Monitoring: ☐ Attached, Document ID: _____ ☐ Not Applicable
3.	Alternative Methods of Operation: ☐ Attached, Document ID: _____ ☐ Not Applicable
4.	Alternative Modes of Operation (Emissions Trading): ☐ Attached, Document ID: _____ ☐ Not Applicable

Additional Requirements Comment

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for an initial, revised or renewal Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for an air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised or renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes, and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

☒ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

☐ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

☒ This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

☐ This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

☐ This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:

Emergency generator.

3. Emissions Unit Identification Number: **007**

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C			**49**

8. Federal Program Applicability: (Check all that apply)

☐ Acid Rain Unit

☐ CAIR Unit

9. Package Unit:
Manufacturer: Model Number:

10. Generator Nameplate Rating: **1 MW**

11. Emissions Unit Comment:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate:	
2. Maximum Production Rate:	
3. Maximum Heat Input Rate: **9.73 million Btu/hr (HHV)**	
4. Maximum Incineration Rate: pounds/hr tons/day	
5. Requested Maximum Operating Schedule:	
24 hours/day	**7** days/week
52 weeks/year	**500** hours/year
6. Operating Capacity/Schedule Comment:	

C. EMISSION POINT (STACK/VENT) INFORMATION

(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: **007**	2. Emission Point Type Code:	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking:		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code:	6. Stack Height: feet	7. Exit Diameter: feet
8. Exit Temperature: °F	9. Actual Volumetric Flow Rate: **acfm**	10. Water Vapor: %
11. Maximum Dry Standard Flow Rate: dscfm	12. Nonstack Emission Point Height: feet	
13. Emission Point UTM Coordinates... Zone: **17** East (km): **347.0** North (km): **3,139.0**	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) **28/22/00** Longitude (DD/MM/SS) **82/30/00**	
15. Emission Point Comment:		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): **Diesel**		
2. Source Classification Code (SCC): **2-01-001-02**	3. SCC Units: **1000 gallons of Distillate Oil (Diesel) Burned**	
4. Maximum Hourly Rate: **70.5**	5. Maximum Annual Rate: **35,253**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **138**
10. Segment Comment: **Maximum hourly rate = 9.73 MMBtu/hr / (138 MMBtu / 1000 gal) = 70.5 gal/hr** **Maximum annual rate = 70.5 gal/hr x 500 hr/yr = 35,253 gal/hr**		

Segment Description and Rate: Segment __ of __

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment:		

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
CO2e			**EL**

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **CO2e**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **1,592** lb/hour **398** tons/year	4. Synthetically Limited? ☒Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **Various, 40 CFR Part 98, See Table 4.** Reference: **40 CFR Part 98**	7. Emissions Method Code: **3**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table 4.**	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions of

1. Basis for Allowable Emissions Code: **BACT**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **398 TPY**	4. Equivalent Allowable Emissions: **1,592** lb/hour **398** tons/year
5. Method of Compliance: **Fuel monitoring and 40 CFR Part 98 Emission Factors.**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of __

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

EMISSIONS UNIT INFORMATION
Section [2] of [4]
Emergency Generator

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: See Note ☐ Previously Submitted, Date _____

2. Fuel Analysis or Specification: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: See Note ☐ Previously Submitted, Date _____

3. Detailed Description of Control Equipment: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: See Note ☐ Previously Submitted, Date _____

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: See Note ☐ Previously Submitted, Date _____
   ☐ Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: See Note ☐ Previously Submitted, Date _____
   ☐ Not Applicable

6. Compliance Demonstration Reports/Records:
   ☐ Attached, Document ID: _____
   Test Date(s)/Pollutant(s) Tested: _____
   ☐ Previously Submitted, Date: _____
   Test Date(s)/Pollutant(s) Tested: _____
   ☐ To be Submitted, Date (if known): _____
   Test Date(s)/Pollutant(s) Tested: _____
   ☒ Not Applicable
   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute:
   ☐ Attached, Document ID: _____ ☒ Not Applicable

Note: See Air Permit Application and Prevention of Significant Deterioration Analysis for the Shady Hills Generating Station, July, 2010.

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)): ☒ Attached, Document ID: **See PSD Report** ☐ Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): ☒ Attached, Document ID: **See Note** ☐ Not Applicable
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) ☒ Attached, Document ID: **See Note** ☐ Not Applicable

Note: See Air Permit Application and Prevention of Significant Deterioration Analysis for the Shady Hills Generating Station, July, 2010.

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements: ☐ Attached, Document ID: _____
2. Compliance Assurance Monitoring: ☐ Attached, Document ID: _____ ☐ Not Applicable
3. Alternative Methods of Operation: ☐ Attached, Document ID: _____ ☐ Not Applicable
4. Alternative Modes of Operation (Emissions Trading): ☐ Attached, Document ID: _____ ☐ Not Applicable

Additional Requirements Comment

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for an initial, revised or renewal Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for an air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised or renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes, and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

   ☒ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

   ☐ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

   ☒ This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:

   Natural Gas Heater.

3. Emissions Unit Identification Number: **008**

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C			**49**

8. Federal Program Applicability: (Check all that apply)

   ☐ Acid Rain Unit

   ☐ CAIR Unit

9. Package Unit:
   Manufacturer: Model Number:

10. Generator Nameplate Rating:

11. Emissions Unit Comment:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

B. EMISSIONS UNIT CAPACITY INFORMATION
(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate:	
2. Maximum Production Rate:	
3. Maximum Heat Input Rate: **10** million Btu/hr (HHV)	
4. Maximum Incineration Rate: pounds/hr tons/day	
5. Requested Maximum Operating Schedule: **24** hours/day **52** weeks/year	**7** days/week **3,390** hours/year
6. Operating Capacity/Schedule Comment:	

C. EMISSION POINT (STACK/VENT) INFORMATION

(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: **008**	2. Emission Point Type Code:	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking:		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code: **V**	6. Stack Height: **30** feet	7. Exit Diameter: feet
8. Exit Temperature: **500**°F	9. Actual Volumetric Flow Rate: **4,950 acfm**	10. Water Vapor: %
11. Maximum Dry Standard Flow Rate: dscfm	12. Nonstack Emission Point Height: feet	
13. Emission Point UTM Coordinates... Zone: **17** East (km): **347.0** North (km): **3,139.0**	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) **28/22/00** Longitude (DD/MM/SS) **82/33/30**	
15. Emission Point Comment:		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): **Natural gas**		
2. Source Classification Code (SCC):	3. SCC Units: **1,000,000 SCF**	
4. Maximum Hourly Rate: **0.011**	5. Maximum Annual Rate: **96.4**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: **933**
10. Segment Comment: **Maximum hourly rate = 10 MMBtu/hr / 933 MMBtu/MMscf = 0.011 MMscf/hr** **Maximum annual rate = 0.011 MMscf/hr x 8,760 hr/yr = 96.4 MMscf/yr**		

Segment Description and Rate: Segment __ of __

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC):	3. SCC Units:	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment:		

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
CO2e			EL

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **CO2e**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **1,170** lb/hour **5123** tons/year	4. Synthetically Limited? ☒Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **Various, 40 CFR Part 98, See Table 4.** Reference: **40 CFR Part 98**	7. Emissions Method Code: **3**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **See Table 4.**	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions of

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of ___

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions __ of ___

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

EMISSIONS UNIT INFORMATION
Section [3] of [4]
Natural Gas Heater

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: See Note ☐ Previously Submitted, Date _____

2. Fuel Analysis or Specification: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: See Note ☐ Previously Submitted, Date _____

3. Detailed Description of Control Equipment: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: See Note ☐ Previously Submitted, Date _____

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: See Note ☐ Previously Submitted, Date _____
   ☐ Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: See Note ☐ Previously Submitted, Date _____
   ☐ Not Applicable

6. Compliance Demonstration Reports/Records:
   ☐ Attached, Document ID: _____
   Test Date(s)/Pollutant(s) Tested: _____
   ☐ Previously Submitted, Date: _____
   Test Date(s)/Pollutant(s) Tested: _____
   ☐ To be Submitted, Date (if known): _____
   Test Date(s)/Pollutant(s) Tested: _____
   ☒ Not Applicable
   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute:
   ☐ Attached, Document ID: _____ ☒ Not Applicable

Note: See Air Permit Application and Prevention of Significant Deterioration Analysis for the Shady Hills Generating Station, July, 2010.

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)):
☒ Attached, Document ID: **See PSD Report** ☐ Not Applicable

2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.):
☒ Attached, Document ID: **See Note** ☐ Not Applicable

3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only)
☒ Attached, Document ID: **See Note** ☐ Not Applicable

Note: See Air Permit Application and Prevention of Significant Deterioration Analysis for the Shady Hills Generating Station, July, 2010.

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements:
☐ Attached, Document ID: _____

2. Compliance Assurance Monitoring:
☐ Attached, Document ID: _____ ☐ Not Applicable

3. Alternative Methods of Operation:
☐ Attached, Document ID: _____ ☐ Not Applicable

4. Alternative Modes of Operation (Emissions Trading):
☐ Attached, Document ID: _____ ☐ Not Applicable

Additional Requirements Comment

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for an initial, revised or renewal Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for an air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised or renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes, and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

☐ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

☒ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

☒ This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

☐ This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

☐ This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:

Distillate Fuel Oil Storage Tank.

3. Emissions Unit Identification Number: **007**

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:
C			**49**

8. Federal Program Applicability: (Check all that apply)

☐ Acid Rain Unit

☐ CAIR Unit

9. Package Unit:
Manufacturer: Model Number:

10. Generator Nameplate Rating:

11. Emissions Unit Comment:

EMISSIONS UNIT INFORMATION
Section [4] of [4]
Distillate Fuel Oil Storage Tank

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

Emissions Unit Control Equipment/Method: Control ___ of ___

1. Control Equipment/Method Description:
2. Control Device or Method Code:

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate: **16,939,770 gal/year**	
2. Maximum Production Rate:	
3. Maximum Heat Input Rate:	
4. Maximum Incineration Rate: pounds/hr tons/day	
5. Requested Maximum Operating Schedule:	
24 hours/day	**7** days/week
52 weeks/year	**8,760** hours/year
6. Operating Capacity/Schedule Comment:	

C. EMISSION POINT (STACK/VENT) INFORMATION

(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: **007**	2. Emission Point Type Code:	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking:		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code:	6. Stack Height: feet	7. Exit Diameter: feet
8. Exit Temperature: °F	9. Actual Volumetric Flow Rate:	10. Water Vapor: %
11. Maximum Dry Standard Flow Rate: dscfm	12. Nonstack Emission Point Height: feet	
13. Emission Point UTM Coordinates... Zone: **17** East (km): **347.0** North (km): **3,139.0**	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) **28/22/00** Longitude (DD/MM/SS) **82/33/30**	
15. Emission Point Comment:		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): **Diesel**		
2. Source Classification Code (SCC): **3-90-900-03**	3. SCC Units: **1000 gal/yr distillate oil (No.2) Storage capacity (breathing losses)**	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **0.0015**	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment: **See Air Permit Application and Prevention of Significant Deterioration Analysis for the Shady Hills Generating Station, July, 2010.**		

Segment Description and Rate: Segment __ of __

1. Segment Description (Process/Fuel Type):		
2. Source Classification Code (SCC): **3-90-900-04**	3. SCC Units: **1000 gal/yr distillate oil (No.2) throughput (working losses)**	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: **0.0015**	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment: **See Air Permit Application and Prevention of Significant Deterioration Analysis for the Shady Hills Generating Station, July, 2010.**		

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
CO2e			NS

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **CO2e**	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour **negligible** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code: **5**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions:	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions ____ of ____

1. Basis for Allowable Emissions Code:	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance:	
6. Allowable Emissions Comment (Description of Operating Method):	

EMISSIONS UNIT INFORMATION
Section [4] of [4]
Distillate Fuel Oil Storage Tank

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: See Note ☐ Previously Submitted, Date _____

2. Fuel Analysis or Specification: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: See Note ☐ Previously Submitted, Date _____

3. Detailed Description of Control Equipment: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: See Note ☐ Previously Submitted, Date _____

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: _ ☐ Previously Submitted, Date _____
   ☒ Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: _☐ Previously Submitted, Date _
   ☒ Not Applicable

6. Compliance Demonstration Reports/Records:
   ☐ Attached, Document ID: _____
   Test Date(s)/Pollutant(s) Tested: _____
   ☐ Previously Submitted, Date: _____
   Test Date(s)/Pollutant(s) Tested: _____
   ☐ To be Submitted, Date (if known):_____
   Test Date(s)/Pollutant(s) Tested: _____
   ☒ Not Applicable
   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute:
   ☐ Attached, Document ID: _____ ☒ Not Applicable

Note: See Air Permit Application and Prevention of Significant Deterioration Analysis for the Shady Hills Generating Station, July, 2010.

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)): ☒ Attached, Document ID: **See PSD Report** ☐ Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): ☐ Attached, Document ID: _____ ☒ Not Applicable
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: _____ ☒ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements: ☐ Attached, Document ID: _____
2. Compliance Assurance Monitoring: ☐ Attached, Document ID: _____ ☐ Not Applicable
3. Alternative Methods of Operation: ☐ Attached, Document ID: _____ ☐ Not Applicable
4. Alternative Modes of Operation (Emissions Trading): ☐ Attached, Document ID: _____ ☐ Not Applicable

Additional Requirements Comment

APPENDIX C
USFWS CONSULTATION

Larocca, David

From: Heath_Rauschenberger@fws.gov
Sent: Wednesday, August 29, 2012 4:41 PM
To: Ahrens, Heather
Cc: Larocca, David; jaxregs@fws.gov; Belden, Roy S (GE Capital) (roy.belden@ge.com); Osbourn, Scott
Subject: Re: Shady Hills Generating Station ESA Consultation

Hi Heather,
After reviewing your information, we have determined that the project is not likely to adversely affect federally listed species.

Sincerely,
Heath

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
Heath Rauschenberger, PhD
Project Consultation Chief
U.S. Fish and Wildlife Service
7915 Baymeadows Way, Suite 200
Jacksonville, Florida 32256-7517
(o) 904.731.3203
(c) 904.228.2217
(f) 904.731.3045
E-mail:heath_rauschenberger@fws.gov
http:/www.fws.gov/northflorida

"Your life is an occasion. Rise to it."
- Edward Magorium

"Ahrens, Heather" <Heather_Ahrens@golder.com>

08/29/2012 04:34 PM

To "jaxregs@fws.gov" <jaxregs@fws.gov>, "Heath_Rauschenberger@fws.gov" <Heath_Rauschenberger@fws.gov>

cc "Belden, Roy S (GE Capital) (roy.belden@ge.com)" <roy.belden@ge.com>, "Larocca, David" <DLaRocca@golder.com>, "Osbourn, Scott" <Scott_Osbourn@golder.com>

Subject Shady Hills Generating Station ESA Consultation

Dr. Rauschenberger,

Per our previous telephone and email correspondence, the ecological due diligence report for the referenced project is attached for your review.

Please do not hesitate to contact me if you have any questions or comments.

Regards,

Heather Todd Ahrens | Senior Ecologist | **Golder Associates Inc.**
5100 West Lemon Street, Suite 208, Tampa, Florida, USA 33609
T: +1 (813) 287-1717 | **D:** +1 (813) 769-5307 | **F:** +1 (813) 287-1716 | **C:** +1 (813) 407-8846 | **E:**

Golder Associates

August 17, 2012 103-89556A

Dr. Heath Rauschenberger
Chief, Regulatory Compliance
US Fish and Wildlife Service
North Florida Ecological Services Office
7915 Baymeadows Way, Suite 200
Jacksonville, FL 32256-7517

RE: ENDANGERED SPECIES ACT CONSULTATION
EFS SHADY HILLS LLC GENERATING STATION (PSD-FL-402A),
PASCO COUNTY, FLORIDA

Dear Dr. Rauschenberger:

On August 18, 2011, Golder Associates Inc. conducted an ecological assessment of the above-referenced proposed site to satisfy a request for information from the US Environmental Protection Agency (USEPA) regarding the likely occurrence and likely abundance of species considered by the US Fish and Wildlife Service to be endangered or threatened, and/or their critical habitat, under 50 Code of Federal Regulations 17.

No federally listed species were documented on-site; however, two federally listed species, the eastern indigo snake (threatened) and the wood stork (endangered) were identified by the Florida Natural Areas Inventory and/or the Southwest Florida Water Management District as having a potential to occur within the vicinity of the site. Impacts to federally listed species are not anticipated due to the proposed construction or operation of this project.

Golder contacted Kyle Baker at the National Marine Fisheries Service (NMFS) on October 7, 2011 and March 29, 2012, and described the project, its location, and the site characteristics. Based on this information, he determined that no species regulated by the NMFS will be directly or indirectly affected by the proposed project, and therefore, consultation with NMFS is not required.

In addition, Golder contacted the North Florida Ecological Services Office of the USFWS on October 7, 2011 and March 29, 2012 to discuss the proposed project with you. During our conversations, you indicated that the USFWS would like to review the ecological assessment report before making a final determination on whether the proposed project will affect listed species. The ecological report is enclosed for your review.

Please do not hesitate to contact Heather Ahrens at (813) 287-1717 if you have any questions regarding the ecological assessment conducted within the generating station site.

Sincerely,

GOLDER ASSOCIATES INC.

Heather T. Ahrens
Senior Ecologist

David T. Larocca
Senior Engineer

Enclosure: Shady Hills Generating Station Ecological Assessment Report

HTA/DTL/lcr

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Golder Associates Inc.
5100 W. Lemon Street, Suite 208
Tampa, FL 33609 USA
Tel: (813) 287-1717 Fax: (813) 287-1716 www.golder.com

Golder Associates

August 17, 2012 103-89556A

Mr. Roy Belden
Vice President
EFS Shady Hills LLC
c/o GE Energy Financial Services
800 Long Ridge Road
Stamford, CT 06927

RE: EFS SHADY HILLS LLC GENERATING STATION, ECOLOGICAL ASSESSMENT, PASCO COUNTY, FLORIDA

Dear Mr. Belden:

On August 18, 2011, Golder Associates Inc. conducted an ecological assessment of the above-referenced proposed site to satisfy a request for information from the US Environmental Protection Agency (USEPA) regarding the likely occurrence and likely abundance of species considered by the US Fish and Wildlife Service (USFWS) to be endangered or threatened, and/or their critical habitat, under 50 Code of Federal Regulations (CFR) 17. Although the USEPA did not specifically request it, Golder has also identified species considered by the Florida Fish and Wildlife Conservation Commission (FFWCC) to be endangered, threatened, or of special concern under Chapter 39-27.002-004, Florida Administrative Code (FAC), to assist GE Energy Financial Services with identifying any potentially significant ecological constraints or project encumbrances. In addition, Golder reviewed the site to identify approximate boundaries of wetlands that will likely be claimed by the US Army Corps of Engineers (USACE) under the 1987 Federal Wetland Delineation Methodology (Interim Regional Supplement 2008), and the Florida Department of Environmental Protection (FDEP) using the statewide unified Wetland Delineation Methodology found in Chapter 62-340, FAC.

Please recognize that this assessment is designed to assist in your preliminary site planning and due diligence efforts and is not intended to represent final agency action with regard to any listed species permitting or wetland delineation.

PROJECT LOCATION AND DESCRIPTION

EFS Shady Hills LLC, an affiliate of the Shady Hills Power Company, LLC and subsidiary of GE Energy Financial Services, owns and operates the Shady Hills Generating Station located at 14240 Merchant Energy Way, in Section 25, Township 24 South, Range 17 East, Pasco County, Florida. This facility consists of three, dual-fuel, nominal 170-megawatt (MW) General Electric model PG7241FA (GE 7FA) simple cycle combustion turbine-electric generators, three 75-foot exhaust stacks, and one 2.8 million gallon fuel oil storage tank. EFS Shady Hills LLC (Shady Hills) proposes to license, construct, and operate two additional new simple-cycle units at the Shady Hills Generating Station (the Proposed Project) (Figure 1). The Proposed Project consists of the addition of two simple cycle GE 7FA combustion turbines (CTs) that will use dry low-nitrogen oxide combustion technology. The primary fuel of the CTs will be natural gas with distillate fuel oil used as backup fuel. The Proposed Project will require an additional gas heater for the two new CTs. The present heater at the facility is only sized for the existing three GE 7FA CTs. In addition, since the present generator is marginally rated, the emergency diesel/generator will need to be larger to accommodate the additional CTs.

Land cover and land use within the Proposed Project site were classified using the Florida Land Use, Cover and Forms Classification System (FLUCFCS) (Florida Department of Transportation 1999) (Figure 2). The Proposed Project site and immediate vicinity include the following land uses: low density residential (FLUCFCS 110), industrial (FLUCFCS 150), open land (FLUCFCS 190), cropland and pastureland

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(FLUCFCS 210), hardwood-coniferous mixed forest (FLUCFCS 434), coniferous (pine) plantations (FLUCFCS 441), reservoirs, less than 10 acres (FLUCFCS 534), freshwater marshes (FLUCFCS 641), emergent aquatic vegetation (FLUCFCS 644), disturbed land (FLUCFCS 740), and electric power facilities (FLUCFCS 831). The sections below describe land use and cover/habitat classifications within and immediately adjacent to the generating station site that may be utilized by listed wildlife species.

Uplands

Golder's analysis of the Southwest Florida Water Management District (SWFWMD) land use maps (SWFWMD 2009) and the field review data revealed three upland land cover/habitat types within the Proposed Project site that may be utilized by listed wildlife species: coniferous (pine) plantations (FLUCFCS 441), disturbed land (FLUCFCS 740), and electric power facilities (FLUCFCS 831). These upland land cover types are described in more detail in the table below.

Table 1: Upland Habitat Classifications within the Proposed Project Site

FLUCFCS Code	Description		Acreage within Proposed Project Site
441	Coniferous (pine) Plantations	This upland habitat consists of rows of planted slash pines (*Pinus elliottii*), sparsely interspersed with ruderal understory species such as dog fennel (*Eupatorium capillifolium*), cogon grass (*Imperata cylindrica*), and common ragweed (*Ambrosia artemisiifolia*).	1.62
740	Disturbed Land	This upland habitat was previously used as a construction laydown/staging area and consequently includes gravel perimeter roads throughout. Vegetated areas are dominated by ruderal species, including bahiagrass (*Paspalum notatum*), Spanish needles (*Bidens alba*), dog fennel, cogon grass, sedges (*Cyperus* spp.), Mexican clover (*Richardia brasiliensis*), crowfoot grass (*Dactyloctenium aegyptium*), common ragweed, and Japanese climbing fern (*Lygodium japonicum*). Additional species observed, although in smaller quantities, include prickly pear cactus (*Opuntia humifusa*), sky-blue lupine (*Lupinus diffusus*), and goldenaster (*Pityopsis graminifolia*).	10.71
831	Electric Power Facilities	This land use consists of the existing generating station and associated facilities, including buildings and parking lots. Any vegetated areas consist of small grassy patches composed of bahia or other grasses.	15.56
		TOTAL	**27.89**

Wetlands and Other Surface Waters

Based on analysis of the SWFWMD land use maps and Golder's site reconnaissance effort, one surface water (FLUCFCS 534, reservoir/stormwater pond) was identified in the northern portion of the Proposed Project site, just west of the proposed new fuel oil storage tank. No wetlands were identified within the site. Wetland and surface water land cover/habitat types adjacent to the Proposed Project site include: reservoirs, less than 10 acres (FLUCFCS 534), freshwater marshes (FLUCFCS 641), and emergent aquatic vegetation (FLUCFCS 644).

Table 2: Wetland and/or Other Surface Water Habitat Classifications within the Proposed Project Site

FLUCFCS Code	Description		Acreage within Proposed Project Site
534	Reservoirs, less than 10 acres	This surface water/stormwater pond is located in the northern portion of the Proposed Project site, just west of the proposed new fuel oil storage tank.	2.19
		TOTAL	**2.19**

Based on Golder's analysis of the Federal Emergency Management Agency (FEMA) floodplain database, the Proposed Project site is not located within the 100-year floodplain (Figure 3). In addition, Golder's review of the National Wetlands Inventory database confirmed that no wetlands are, or were historically, located within or immediately adjacent to the Proposed Project site (Figure 4).

Soils

According to the U.S. Department of Agriculture Natural Resources Conservation Service, there are two soil types within the Proposed Project site: Candler Fine sand, 0 to 5 percent slopes (±29.72 acres) and Tavares sand, 0 to 5 percent slopes (±0.36 acres) (Figure 5).

The dominant soil type, Candler Fine sand, 0 to 5 percent slopes, consists of excessively drained soils with a depth to water table below 80 inches that typically occur in sandhill communities. Tavares sand, 0 to 5 percent slopes consists of moderately well-drained soils that typically occur within low ridges. This soil type typically has a depth to water table of 40 to 60 inches for 6 to 12 months of the year and below 60 inches during periods of drought.

Listed Species

On August 18, 2011 via vehicular and pedestrian transects, Golder personnel assessed land cover/habitats for the presence of species that are considered threatened, endangered, and/or species of special concern. Listed plant species are those plants that are listed by the USFWS or the Florida Department of Agriculture and Consumer Services (FDACS) as endangered, threatened, of special concern, or commercially exploited. Listed animal species are those animals that are listed as endangered, threatened, or of special concern federally by the USFWS or within the state of Florida by the FFWCC.

To allow it to focus site reconnaissance efforts on potentially occurring species, Golder obtained a list of federally listed plant and wildlife species for Pasco County, Florida from the USFWS (USFWS 2010a) (Attachment 1). Additionally, Golder obtained state and federally listed species occurrence data for an area within a 1-mile radius of the Proposed Project site from the Florida Natural Areas Inventory (FNAI), which maintains a database of known occurrences of listed species throughout Florida (FNAI Biodiversity Matrix Unit 23978, Attachment 2 and Figure 6). The FFWCC Bald Eagle Nest Locator database (FFWCC 2010) and breeding bird atlas (FFWCC 2003) were also used to identify the location and status of any bald eagle nests or breeding bird colonies in the vicinity of the Proposed Project site (Figure 6). The USFWS Wood Stork Colony and Core Foraging Area database (USFWS 2010b) was used to identify wood stork colonies and core foraging areas in the vicinity of the Proposed Project site (Figure 7).

All observations of listed and non-listed wildlife species within and adjacent to the Proposed Project site were documented. These observations included direct sightings of species or signs of their presence, including tracks, scat, nests, carcasses, and, typically with avifauna and amphibians, calls.

FNAI database species occurrences and listed species identified during the site visit are described below.

Flora

Initiated in 1984, the Preservation of Native Flora of Florida Act (Sections 581.011 and 581.185(2), Florida Statutes, and Chapter 5B-40.001, FAC, defines plant species in Florida that are protected because of danger of extinction or rapid decline, or that are commercially exploited, thus averting damage to native plant populations. Agency permits as well as permission from the landowner are required to harvest or disturb plants listed in this act, and a permit is required to sell commercially exploited plants. The FNAI list of threatened and endangered plants was used to determine which threatened and endangered plants occur within Pasco County, since the FNAI list incorporates both the FDACS (state)- and USFWS (federal)-listed status (FNAI 2010).

According to the FNAI, no listed plant species have been documented within 1 square mile of the Proposed Project site. However, FNAI's Biodiversity Matrix Report identified 15 listed plant species with a potential to occur in the vicinity of the Proposed Project site in Pasco County, Florida (Attachment 2). Of the 15 listed plant species, only one, Carter's warea (*Warea carteri*), is federally listed as endangered, while the state lists 11 of the 15 plant species as endangered and the remaining 4 as threatened. FNAI's closest recorded occurrence of a listed plant species, pondspice (*Litsea aestivalis*), which is listed by the FDACS as endangered, is located in a residential area just south of State Road 52 (approximately 4.5 miles southwest of the Proposed Project site) (FNAI 2007).

Because of its industrial nature, it is unlikely that listed or endemic plant species occur within the Proposed Project site, nor were any of these listed or endemic plant species observed at the time of the site reconnaissance.

Fauna

The presence and potential for occurrence of important faunal species in the Proposed Project site were determined from evaluation of the presence or absence of habitat types, literature review (including FNAI and FFWCC Bald Eagle Nest Locator database queries), aerial photo interpretation, and preliminary site reconnaissance.

Natural habitats within the Proposed Project site have been historically altered primarily for industrial purposes, and planted pines are of moderately lower value to wildlife.

According to the FNAI (FNAI 2010), no listed species have been documented within 1 square mile of the Proposed Project site in Pasco County, Florida (Attachment 2). However, the FNAI identified six listed wildlife species likely to occur and eight with a potential to occur within 1 square mile of the Proposed Project site. Out of the 14 FFWCC (state)-listed species identified by the FNAI as occurring or having a potential to occur, only 2 are federally listed (by the USFWS). All 14 species are discussed in greater detail below.

Federally Listed Species

Reptiles

Eastern Indigo Snake (*Drymarchon couperi*)

The eastern indigo snake as is listed as federally threatened. This snake can occur within a broad range of suitable habitats, from scrub and sandhill to wet prairies. In its northern range, it is often commensal with the gopher tortoise, using their burrows for shelter during the winter (FNAI 2001). Due to the presence of gopher tortoises within the Proposed Project site, there is a potential for the eastern indigo snake to be present.

Birds

Wood Stork (*Mycteria americana*)

The wood stork as is listed as federally endangered. Wood storks prefer nesting in cypress swamps and mixed forested wetlands, and they forage mainly in shallow water in freshwater marshes, swamps, lagoons, ponds, tidal creeks, flooded pastures, and ditches (FNAI 2001). SWFWMD staff previously identified several wood storks foraging within freshwater marshes approximately 1,000 ft south of the Proposed Project site (SWFWMD RAI 2010). Because of the lack of preferred nesting habitat, it is unlikely that this species nests nearby; however, it may occasionally forage in the vicinity of the Proposed Project site.

The closest documented wood stork colony (Embassy, USFWS 2010) is located approximately 10.2 miles southwest of the Proposed Project site, and the site falls within five colonies' 15-mile core foraging area radii (Figure 7). No impacts to wood storks or their habitats are anticipated due to construction/operation of the Proposed Project.

State-listed Species

Amphibians

Gopher Frog *(Rana capito)*

The gopher frog is currently listed by the FFWCC as a species of special concern. It is typically found in sandhill and scrub habitat in the vicinity of isolated wetlands or large ponds, and is considered to be a commensal species to the gopher tortoise, using their burrows for shelter (FNAI 2001). It is unlikely that the gopher frog is present due to the lack of its preferred habitat within the immediate vicinity of the Proposed Project site.

This species is currently listed as a species of special concern by the FFWCC; however, the gopher frog underwent a biological status review in June 2011 and was approved for removal from the state-designated protected species list (FFWCC 2011). Management plans are currently being prepared for all state-listed species that do not have recent management plans completed. FFWCC will continue to maintain a separate Species of Special Concern category until all the species have been reviewed and those species are either designated as State-designated Threatened, or given a management plan and removed from the list.

Reptiles

Gopher Tortoise (*Gopherus polyphemus*)

The FFWCC currently lists the gopher tortoise as threatened. Gopher tortoises are commonly found in dry upland habitats, such as sandhills, scrub, xeric oak hammock, and dry pine flatwoods. They are also found in pastures and old fields (FNAI 2001). Eighteen gopher tortoise burrows, of which 14 were potentially occupied, were identified within the Proposed Project site (Figure 8).

If gopher tortoise burrows can be avoided by a buffer that is greater than or equal to 25 feet (ft) in radius, no permit is required. If impacts to burrows cannot be avoided, a relocation permit will be required from the FFWCC, and gopher tortoises will need to be relocated to either on- or off-site areas pursuant to FFWCC guidelines.

Florida Pine Snake (*Pituophis melanoleucus mugitus*)

The Florida pine snake often coexists with gopher tortoises and southeastern pocket gophers (*Geomys pinetis*) in sandhills, old fields and pastures, sand pine scrub, and scrubby flatwoods (FNAI 2001). This species is currently listed as a species of special concern by the FFWCC; however, the Florida pine snake underwent a biological status review in June 2011 and was approved for protection status as a threatened species (FFWCC 2011). Management plans are currently being prepared for all state-listed

species that do not have recent management plans completed. FFWCC will continue to maintain a separate Species of Special Concern category until all the species have been reviewed and those species are either designated as State-designated Threatened, or given a management plan and removed from the list.

The Florida pine snake was observed within the disturbed land habitat in the northeastern portion of the Proposed Project site. The observation was made in the vicinity of both gopher tortoise and southeastern pocket gopher burrows. Gopher tortoise burrows within the Proposed Project site will most likely need to be excavated and commensal species relocated. If pine snakes are encountered during gopher tortoise relocation activities, they will be relocated to an approved recipient site, along with gopher tortoises and other commensal species, in accordance with regulatory permit guidelines.

Birds

Florida Burrowing Owl (*Athene cunicularia floridana*)

The Florida burrowing owl is listed as a species of special concern by the FFWCC. It lives in burrows in sandy soils associated with cattle pastures, prairies, and sandhills (FNAI 2001). No burrowing owls, nor their burrows, were observed within the Proposed Project site during the site reconnaissance effort. No adverse impacts to burrowing owls are anticipated due to the Proposed Project.

This species is currently listed as a species of special concern by the FFWCC; however, the Florida burrowing owl underwent a biological status review in June 2011 and was approved for protection status as a threatened species (FFWCC 2011). Management plans are currently being prepared for all state-listed species that do not have recent management plans completed. FFWCC will continue to maintain a separate Species of Special Concern category until all the species have been reviewed and those species are either designated as State-designated Threatened, or given a management plan and removed from the list.

Little Blue Heron (*Egretta caerulea*)

The little blue heron is listed as a species of special concern by the FFWCC. They prefer freshwater lakes, marshes, swamps, and streams for foraging, and cypress trees for roosting (FNAI 2001). This species was identified by FNAI within wetland systems approximately 1.0 mile southeast and 1.1 miles southwest of the Proposed Project site. Although this species likely forages within freshwater marshes and wet prairies in the vicinity of the site, it is not likely that the little blue heron nests in the area, because the closest documented breeding bird colony (Atlas Number 2674) is located approximately 1.5 miles southeast of the Proposed Project site. No adverse impacts to little blue herons are anticipated due to the Proposed Project.

This species is currently listed as a species of special concern by the FFWCC; however, the little blue heron underwent a biological status review in June 2011 and was approved for protection status as a threatened species (FFWCC 2011). Management plans are currently being prepared for all state-listed species that do not have recent management plans completed. FFWCC will continue to maintain a separate Species of Special Concern category until all the species have been reviewed and those species are either designated as State-designated Threatened, or given a management plan and removed from the list.

Snowy Egret (*Egretta thula*)

The snowy egret is listed as a species of special concern by the FFWCC. It is widely distributed in Florida in both fresh- and saltwater systems (FNAI 2001). This species was identified by FNAI within wetland systems approximately 1.0 mile southeast of the Proposed Project site. Although this species likely forages within freshwater marshes and wet prairies in the vicinity of the site, it is not likely that the snowy egret nests in the area, because the closest documented breeding bird colony (Atlas Number 2674) is located approximately 1.5 miles southeast of the Proposed Project site. No adverse impacts to snowy egrets are anticipated due to the Proposed Project.

This species is currently listed as a species of special concern by the FFWCC; however, the snowy egret underwent a biological status review in June 2011 and was approved for removal from the state-designated protected species list (FFWCC 2011). Management plans are currently being prepared for all state-listed species that do not have recent management plans completed. FFWCC will continue to maintain a separate Species of Special Concern category until all the species have been reviewed and those species are either designated as State-designated Threatened, or given a management plan and removed from the list.

White Ibis (*Eudocimus albus*)

The white ibis is listed as a species of special concern by the FFWCC. It inhabits a variety of wetland habitats, including freshwater and brackish marshes, salt flats, forested wetlands, wet prairies, swales, and man-made ditches (FNAI 2001). This species was identified by FNAI within wetland systems approximately 1.1 miles southwest of the Proposed Project site. Although this species likely forages within freshwater marshes and wet prairies in the vicinity of the site, it is not likely that the white ibis nests in the area because the closest documented breeding bird colony (Atlas Number 2674) is located approximately 1.5 miles southeast of the Proposed Project site. No adverse impacts to the white ibis are anticipated due to the Proposed Project.

This species is currently listed as a species of special concern by the FFWCC; however, the white ibis underwent a biological status review in June 2011 and was approved for removal from the state-designated protected species list (FFWCC 2011). Management plans are currently being prepared for all state-listed species that do not have recent management plans completed. FFWCC will continue to maintain a separate Species of Special Concern category until all the species have been reviewed and those species are either designated as State-designated Threatened, or given a management plan and removed from the list.

Southeastern American Kestrel (*Falco sparverius paulus*)

The southeastern American kestrel is found throughout Florida year-round, but seasonal occurrence is complicated by the arrival of northern migrants in winter (FNAI 2001). The subspecies that breeds in Florida is classified by the FFWCC as threatened, while northern migrants typically arriving in September and departing by March are not listed. Kestrels seen in Florida during May through June are the resident southeastern American kestrels. Neither the American kestrel nor the southeastern subspecies are listed federally by the USFWS. The southeastern American kestrel commonly inhabits open areas, such as open pine habitats, woodland edges, prairies, and pastures (FNAI 2001).

A southeastern American kestrel was identified by FNAI within the transmission line right-of-way approximately 0.6 mile to the west of the Proposed Project site. Southeastern American kestrels nest between mid-March and early June. Current recommended management guidelines state that a 492-ft-radius buffer zone should be maintained around any active nest sites and disturbance inside the nest-site buffer should be minimized during the courtship, breeding, and nesting period (i.e., January to August) (Lane and Fischer 1997). Adverse impacts to the southeastern American kestrel are not anticipated due to the Proposed Project.

Florida Sandhill Crane (*Grus canadensis pratensis*)

The FFWCC lists the Florida sandhill crane as threatened. It is found year-round in prairies, freshwater marshes, and pastures throughout Florida, while the non-listed migrant greater sandhill crane (*G. canadensis tabida*) generally arrives in October and departs by March (FNAI 2001).

SWFWMD staff previously identified a nesting pair of sandhill cranes within freshwater marshes approximately 1,000 ft south of the Proposed Project site (SWFWMD Request for Additional Information [RAI] 2010). The FFWCC recommends a 400-ft protective buffer around active crane nests. The crane nesting season is February to May, and the guidelines do not mention any protective measures for cranes outside the nesting season. If nesting cranes were identified within or adjacent to the site, it is likely that the FFWCC would require some protective measures.

Mammals

Florida Mouse (*Podomys floridanus*)

The Florida mouse is listed as a species of special concern by the FFWCC. They prefer xeric upland habitats with sandy soils, such as scrub, sandhill, and ruderal sites, and they often inhabit burrows of the gopher tortoise (FNAI 2001). Due to the presence of gopher tortoises and their burrows within the Proposed Project site, it is moderately likely that the Florida mouse is present as well.

This species is currently listed as a species of special concern by the FFWCC; however, the Florida mouse underwent a biological status review in June 2011 and was approved for removal from the state-designated protected species list (FFWCC 2011). Management plans are currently being prepared for all state-listed species that do not have recent management plans completed. FFWCC will continue to maintain a separate Species of Special Concern category until all the species have been reviewed and those species are either designated as State-designated Threatened, or given a management plan and removed from the list.

Sherman's Fox Squirrel (*Sciurus niger shermani*)

The Sherman's fox squirrel is listed as a species of special concern by the FFWCC. They commonly inhabit sandhills, pine flatwoods, pastures, and other open, ruderal habitats with scattered pines and oaks (FNAI 2001). Because of the presence of pasture and other open, ruderal habitats with scattered pines and oaks to the east of the Proposed Project site, it is moderately likely that the Sherman's fox squirrel is present adjacent to the Proposed Project site.

If the Sherman's fox squirrel were encountered on the Proposed Project site, the FFWCC would most likely require some protective measures for fox squirrels. In Golder's experience, the FFWCC will permit development within 125 ft of active fox squirrel nests as long as the nest and young are not disturbed. The fox squirrel nesting season typically occurs twice a year, between January and February, and between June and August (NatureServe Explorer 2008).

Florida Black Bear (*Ursus americanus floridanus*)

The FFWCC lists the Florida black bear as threatened. They prefer large upland forests and large swamps (FNAI 2001). It is unlikely that the Florida black bear is present within the immediate proximity of the Proposed Project site due to the lack of large, contiguous tracts of forested wetlands and mixed hardwood-conifer forests. Adverse impacts to the Florida black bear are not anticipated from the construction of the Proposed Project.

This species is currently listed as a species of special concern by the FFWCC; however, the Florida black bear underwent a biological status review in June 2011 and was approved for removal from the state-designated protected species list (FFWCC 2011). Management plans are currently being prepared for all state-listed species that do not have recent management plans completed. FFWCC will continue to maintain a separate Species of Special Concern category until all the species have been reviewed and those species are either designated as State-designated Threatened, or given a management plan and removed from the list.

Non-listed Species

Although the bald eagle (*Haliaeetus leucocephalus*) is not currently classified by the USFWS or the FFWCC as threatened or endangered, it is protected under the federal Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act, as well as Florida's Bald Eagle Management Plan. Bald eagles typically inhabit areas close to coastal areas, bays, rivers, lakes, or other bodies of water that provide concentrations of food sources (FNAI 2001). Impacts to bald eagles may be avoided through adherence to the national bald eagle management guidelines (USFWS, 2007) of a construction setback of 330 to 660 ft from any active nests. According to the FFWCC Bald Eagle Nest Locator database, the closest

bald eagle nest (Nest ID PS008) is located approximately 2.8 miles northeast of the Proposed Project site. The Proposed Project is not anticipated to have adverse impacts on nesting bald eagles.

Non-listed species observed on the site include mourning doves (*Zenaida macroura*), wild turkey (*Meleagris gallopavo*), holes/burrows of nine-banded armadillo (*Dasypus novemcinctus*) and southeastern pocket gopher, and the skull of a gray fox (*Urocyon cinereoargenteus*).

CONCLUSIONS AND RECOMMENDATIONS

Based on Golder's field reviews and examination of available agency data, no federally listed species were observed within the Proposed Project site. Adverse impacts from the Proposed Project to federally listed flora or fauna are not anticipated.

Two state-designated species, the gopher tortoise (threatened) and the Florida pine snake (species of special concern), were observed within the Proposed Project site during the site reconnaissance effort. Pursuant to FFWCC's gopher tortoise permitting guidelines, a gopher tortoise survey should be conducted within 90 days of the anticipated construction commencement date and the survey results submitted to FFWCC with supporting permit application documents. Construction activities may not begin until the gopher tortoise relocation permit has been approved by the FFWCC and gopher tortoises have been relocated to an FFWCC-approved recipient site. Typically, up to one Florida pine snake encountered during gopher tortoise excavation activities may be relocated to the approved recipient site; however, encounters with and/or relocation of additional pine snakes will require further consultation with the FFWCC.

USFWS' standard protection measures for the eastern indigo snake will be enforced during construction of the Proposed Project to ensure eastern indigo snakes, if present, are not harmed. These protection measures include, but are not limited to, training contractors in the proper identification of eastern indigo snakes (and Florida pine snakes); and posting signs on the construction site to aid in the proper identification of indigo snakes and the procedures to follow if an indigo snake is encountered. If an eastern indigo snake is encountered, work in the area will be stopped and will not recommence until the indigo snake has safely evacuated the area on its own.

Please do not hesitate to contact Heather Ahrens at (813) 287-1717 if you have any questions regarding the ecological assessment conducted within the generating station site.

Sincerely,

GOLDER ASSOCIATES INC.

Heather T. Ahrens
Senior Ecologist

David T. Larocca
Senior Engineer

Attachments: Figure 1, Site Location
Figure 2, Land Use/Land Cover
Figure 3, FEMA Flood Zones
Figure 4, National Wetlands Inventory
Figure 5, Soils
Figure 6, Bald Eagle Nests and FNAI Listed Species Occurrences
Figure 7, Wood Stork Core Nesting Colonies and Foraging Areas
Figure 8, Gopher Tortoise Burrow Locations
Attachment 1, Federally Listed Plant and Wildlife Species for Pasco County, Florida
Attachment 2, FNAI Biodiversity Matrix Report and Associated Tables

HTA/DTL/lcr

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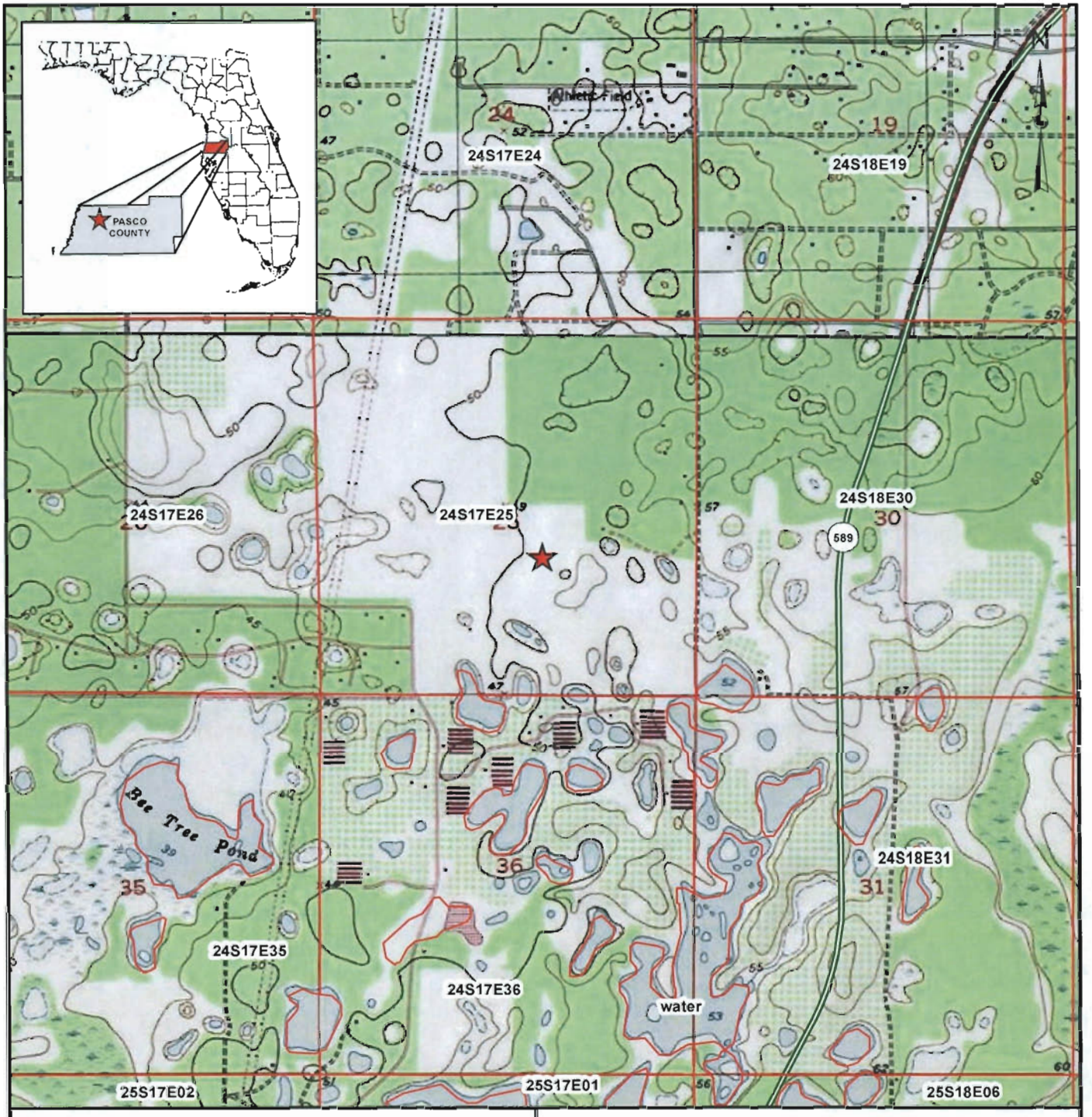
USFWS. 2010b. Wood Stork Colony and Core Foraging Areas. Online: http://www.fws.gov/northflorida/WoodStorks/wood-storks.htm (retrieved 2010).

FIGURES



LEGEND

- APPROXIMATE PROJECT LOCATION
- TOLL ROAD
- US ROAD
- STATE ROAD
- COUNTY ROAD
- TOWNSHIP-RANGE -SECTION
- COUNTY BOUNDARY

REFERENCES

1. APPROXIMATE PROJECT LOCATION: GOLDER ASSOCIATES INC., 2011
2. ROADS: FLORIDA DEPARTMENT OF TRANSPORTATION, 2012
3. TOWNSHIP-RANGE-SECTION: FLORIDA RESOURCES & ENVIRONMENTAL ANALYSIS CENTER, 2008
4. COUNTY BOUNDARIES: FLORIDA GEOGRAPHIC DATA LIBRARY, 2008
5. USGS TOPOGRAPHIC MAP: NATIONAL GEOGRAPHIC SOCIETY, 2010

2,000 0 2,000
Feet

REV.	DATE	DES	REVISION DESCRIPTION	GIS	CHK	RVW

PROJECT

SHADY HILLS

TITLE:

SITE LOCATION

Golder Associates
Tampa, Florida

PROJECT No. 103-89556			FILE No. 103-89556B001
DESIGN	JG	06/13/2011	SCALE: AS SHOWN REV 0
DR.	JG	06/13/2011	
CHECK	SO	07/25/2011	FIGURE 1
REVIEW	HTA	08/17/2012	

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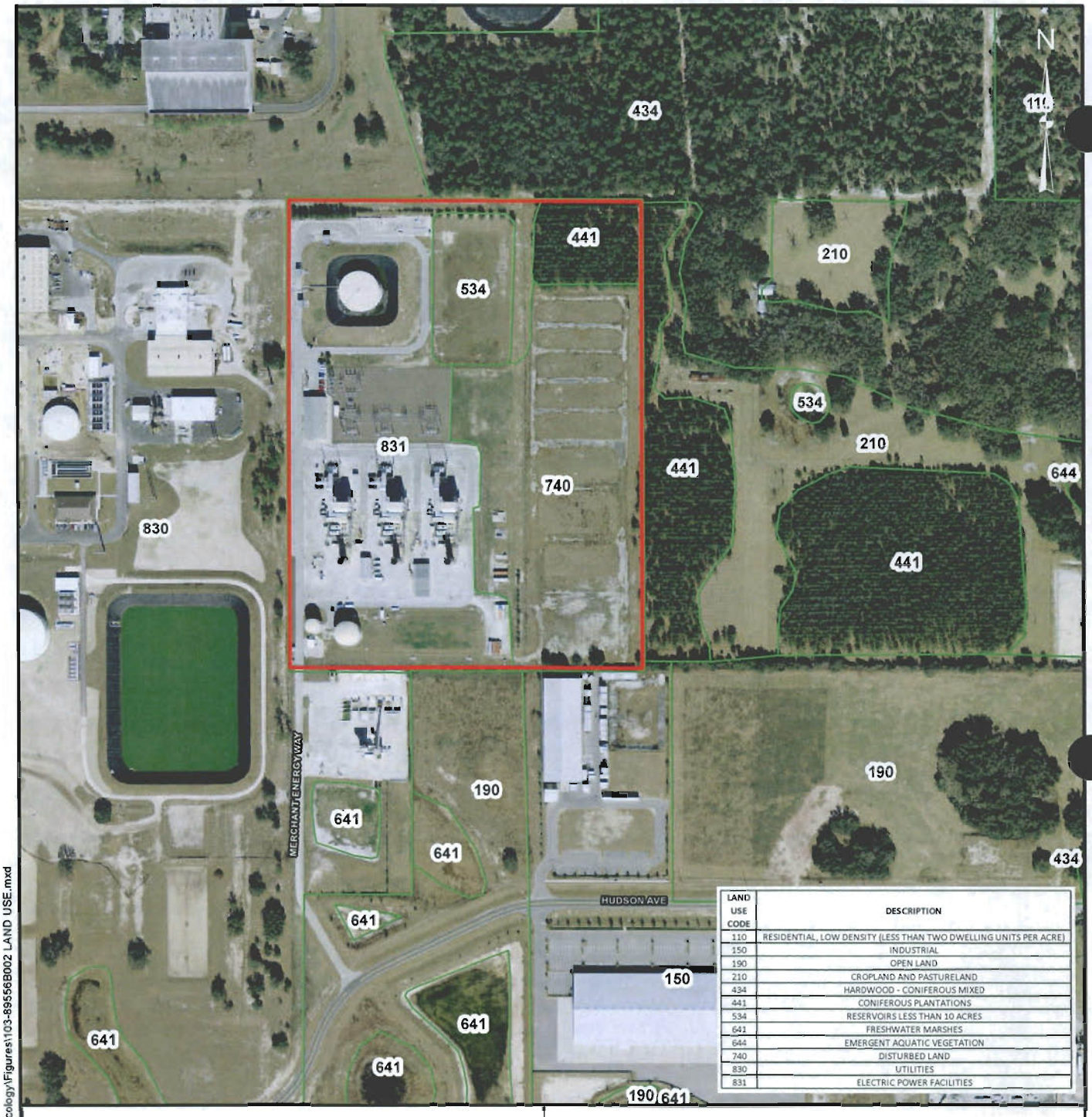

LAND USE CODE	DESCRIPTION
110	RESIDENTIAL, LOW DENSITY (LESS THAN TWO DWELLING UNITS PER ACRE)
150	INDUSTRIAL
190	OPEN LAND
210	CROPLAND AND PASTURELAND
434	HARDWOOD - CONIFEROUS MIXED
441	CONIFEROUS PLANTATIONS
534	RESERVOIRS LESS THAN 10 ACRES
641	FRESHWATER MARSHES
644	EMERGENT AQUATIC VEGETATION
740	DISTURBED LAND
830	UTILITIES
831	ELECTRIC POWER FACILITIES

LEGEND

APPROXIMATE PROJECT BOUNDARY

LAND USE/LAND COVER BOUNDARY

400 0 400 Feet

REV.	DATE	DES	REVISION DESCRIPTION	GIS	CHK	RVW

PROJECT

SHADY HILLS

TITLE

LAND USE/LAND COVER

REFERENCES

1. APPROXIMATE PROJECT BOUNDARY: GOLDER ASSOCIATES INC., 2011
2. LAND USE/LAND COVER: SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT (SWFWMD), 2009
3. 2010 AERIAL: SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT AND WOLLPERT, INC., 2010

Golder Associates Tampa, Florida

PROJECT No. 103-89556			FILE No. 103-89556B002	
DESIGN	JG	08/16/2011	SCALE: AS SHOWN	REV. 0
GIS	JG	08/16/2011		
CHECK	HA	08/16/2011	FIGURE 2	
REVIEW	DL	08/17/2012		

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LEGEND

APPROXIMATE PROJECT BOUNDARY

FLOOD ZONES

A - AN AREA INUNDATED BY 100-YEAR FLOODING, FOR WHICH NO BASE FLOOD ELEVATIONS HAVE BEEN DETERMINED.

AE - AN AREA INUNDATED BY 100-YEAR FLOODING, FOR WHICH BASE FLOOD ELEVATIONS HAVE BEEN DETERMINED.

NOTE

ALL UNSHADED AREAS ARE ZONE X AND DO NOT FALL WITHIN A FLOOD ZONE.

REFERENCES

1. APPROXIMATE PROJECT BOUNDARY: GOLDER ASSOCIATES INC., 2011
2. FLOOD ZONES: FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA), 1996
3. 2009 AERIAL: I-CUBED, 2010

1,000 0 1,000 Feet

REV.	DATE	DES	REVISION DESCRIPTION	GIS	CHK	RVW

PROJECT

SHADY HILLS

TITLE:

FEMA FLOOD ZONES

Golder Associates Tampa, Florida

PROJECT No. 103-89556			FILE No. 103-89556B006	
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GIS	JG	08/16/2011	FIGURE 3	
CHECK	SO	08/16/2011		
REVIEW	HA	08/17/2012		

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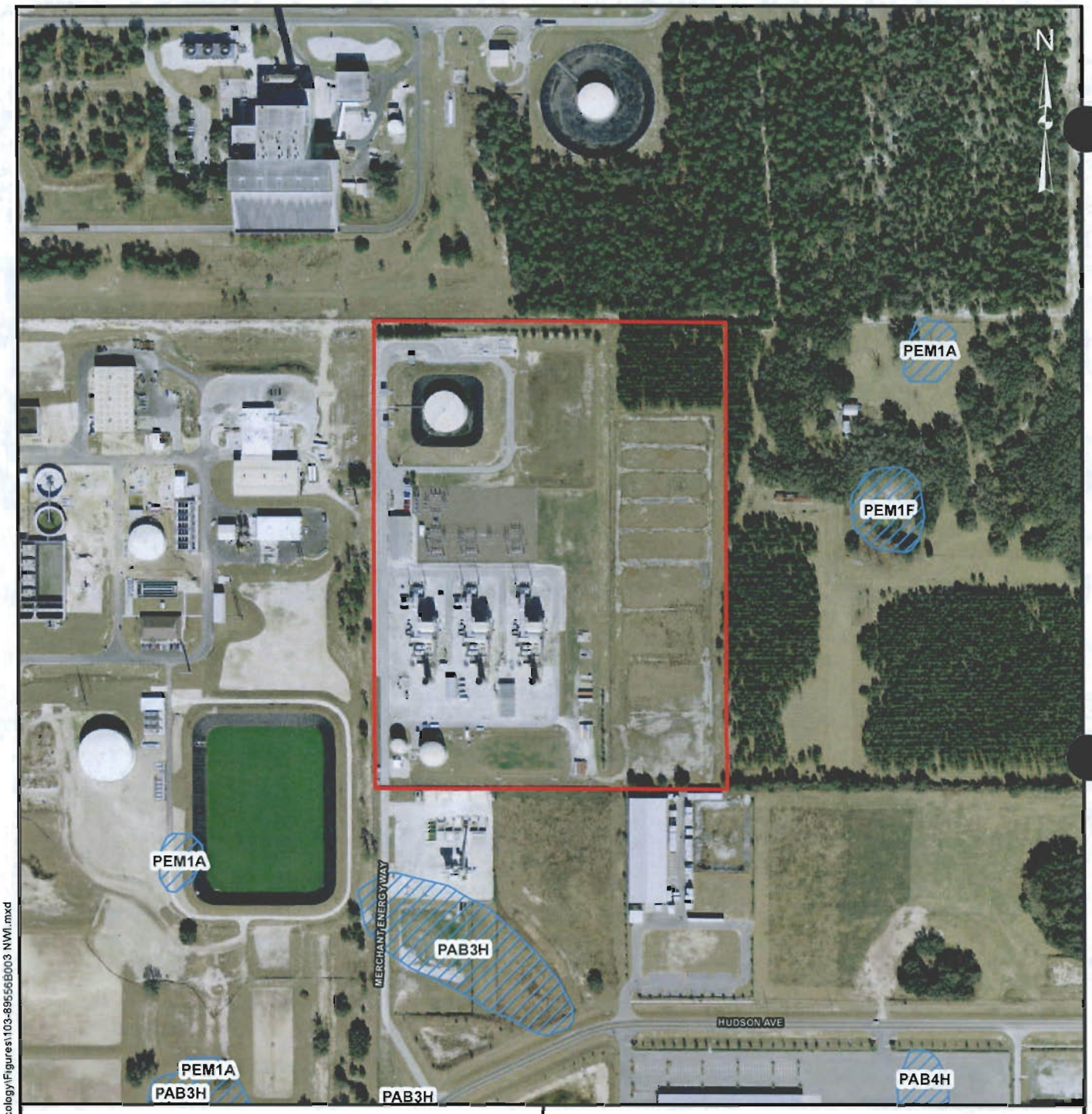

LEGEND

APPROXIMATE PROJECT BOUNDARY

NATIONAL WETLANDS INVENTORY WETLAND

PEM1A = PALUSTRINE; EMERGENT; PERSISTENT; TEMPORARILY FLOODED
PAB3H = PALUSTRINE; AQUATIC BED; ROOTED VASCULAR; PERMANENTLY FLOODED
PAB4H = PALUSTRINE; AQUATIC BED; FLOATING VASCULAR; PERMANENTLY FLOODED
PEM1F = PALUSTRINE; EMERGENT; PERSISTENT; SEMIPERMANENTLY FLOODED

REFERENCES

1. APPROXIMATE PROJECT BOUNDARY: GOLDER ASSOCIATES INC., 2011
2. NATIONAL WETLANDS INVENTORY (NWI): U.S. FISH AND WILDLIFE SERVICE, DIVISION OF HABITAT AND RESOURCE CONSERVATION, 2008
3. 2010 AERIAL: SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT AND WOLLPERT, INC., 2010

400 0 400
Feet

REV.	DATE	DES	REVISION DESCRIPTION	GIS	CHK	RVW

PROJECT

SHADY HILLS

TITLE

NATIONAL WETLANDS INVENTORY

Golder Associates
Tampa, Florida

PROJECT No. 103-89556			FILE No. 103-89556B003	
DESIGN	JG	08/16/2011	SCALE: AS SHOWN	REV. 0
GIS	JG	08/16/2011		
CHECK	HA	08/16/2011	FIGURE 4	
REVIEW	DL	08/17/2012		

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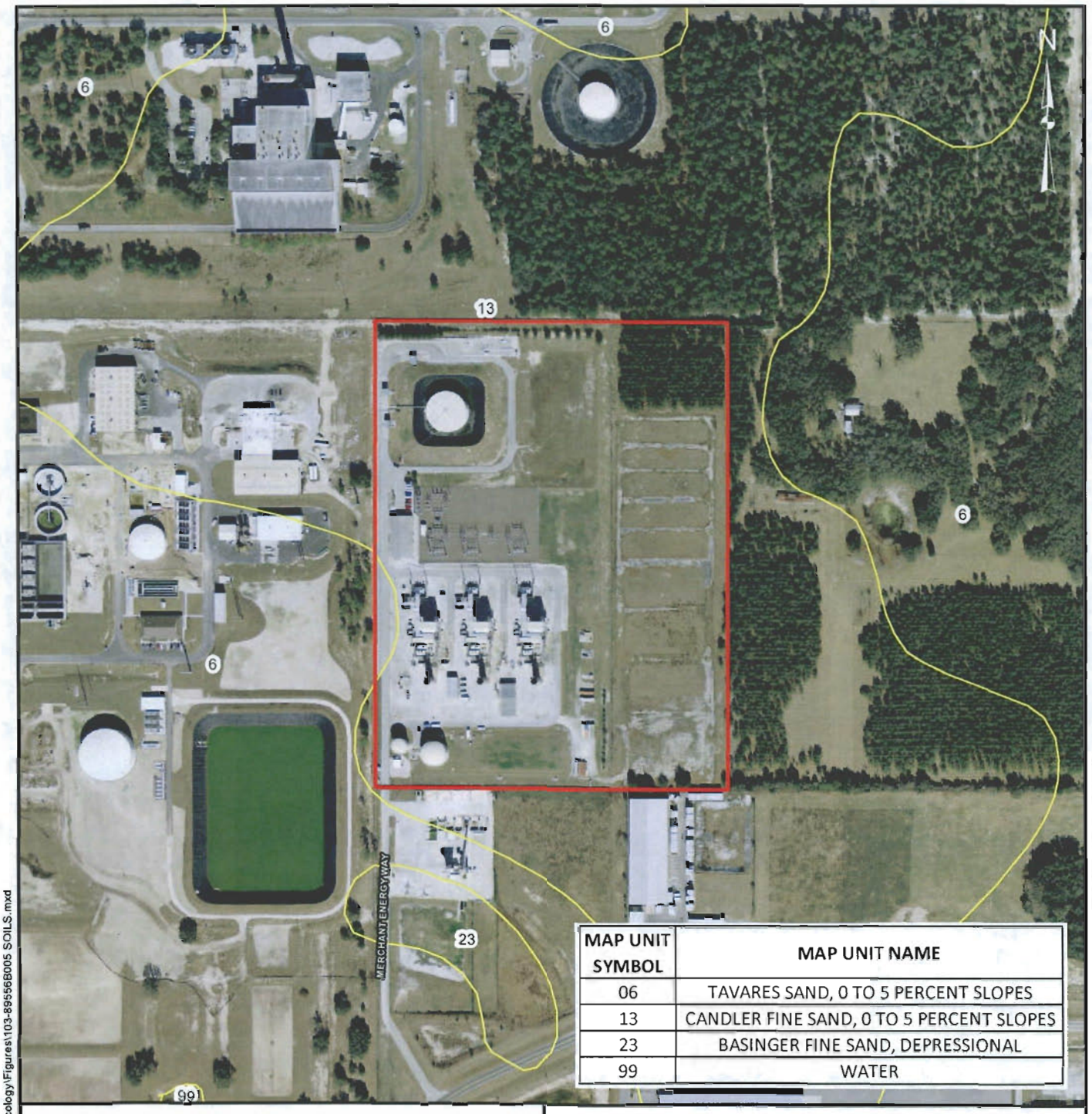

MAP UNIT SYMBOL	MAP UNIT NAME
06	TAVARES SAND, 0 TO 5 PERCENT SLOPES
13	CANDLER FINE SAND, 0 TO 5 PERCENT SLOPES
23	BASINGER FINE SAND, DEPRESSIONAL
99	WATER

LEGEND

APPROXIMATE PROJECT BOUNDARY

SOIL BOUNDARY

400 0 400 Feet

REV.	DATE	DES	REVISION DESCRIPTION	GIS	CHK	RVW

PROJECT

SHADY HILLS

TITLE

SOILS

REFERENCES

1. APPROXIMATE PROJECT BOUNDARY: GOLDER ASSOCIATES INC., 2011
2. SOILS: U.S. DEPARTMENT OF AGRICULTURE, NATURAL RESOURCES CONSERVATION SERVICE, 2010
3. 2010 AERIAL: SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT AND WOLLPERT, INC., 2010

Golder Associates Tampa, Florida

PROJECT No. 103-89556			FILE No. 103-89556B005
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GIS	JG	08/16/2011	
CHECK	HA	08/16/2011	FIGURE 5
REVIEW	DL	08/17/2012	

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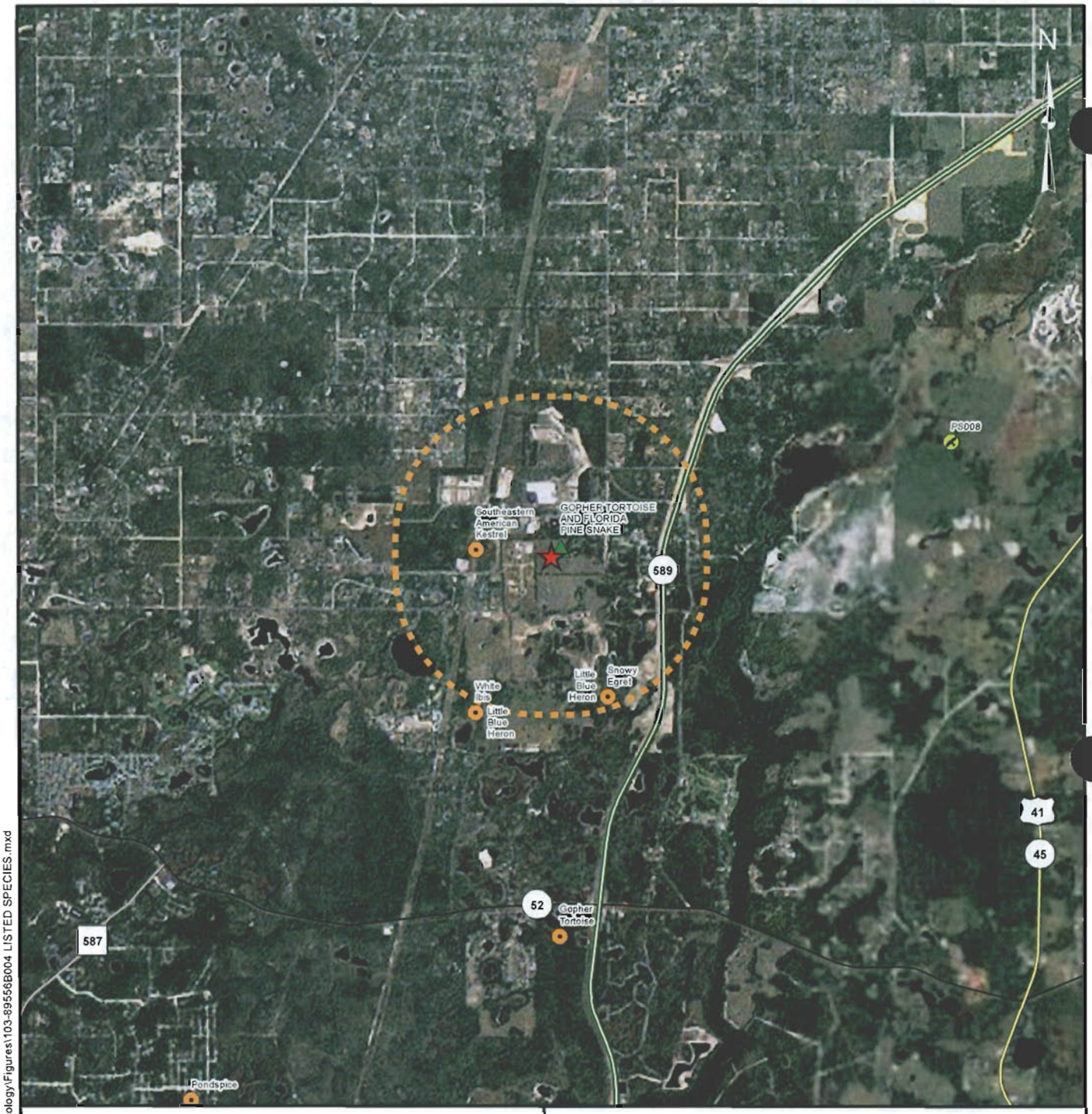

LEGEND

- APPROXIMATE PROJECT LOCATION
- LISTED SPECIES OBSERVED BY GOLDER
- FNAI LISTED SPECIES/ELEMENT OCCURRENCE
- BALD EAGLE NEST
- 1 MILE RADIUS
- TOLL ROAD
- US ROAD
- STATE ROAD
- COUNTY ROAD

REFERENCES

1. APPROXIMATE PROJECT LOCATION AND LISTED SPECIES OBSERVED BY GOLDER: GOLDER ASSOCIATES INC., 2011
2. ELEMENT OCCURRENCE: FLORIDA NATURAL AREAS INVENTORY, 2006
3. BALD EAGLE NEST LOCATIONS: FLORIDA FISH AND WILDLIFE CONSERVATION COMISSION, 2010
4. ROADS: FLORIDA DEPARTMENT OF TRANSPORTATION, 2011
5. 2009 AERIAL: I-CUBED, 2010

1 0 1 Miles

REV.	DATE	DES	REVISION DESCRIPTION	GIS	CHK	RVW

PROJECT

SHADY HILLS

TITLE

BALD EAGLE NESTS
AND FNAI LISTED SPECIES OCCURRENCES

Golder Associates
Tampa, Florida

PROJECT No. 103-89556			FILE No. 103-89556B004	
DESIGN	JG	06/16/2011	SCALE: AS SHOWN	REV. 0
GIS	JG	08/16/2011		
CHECK	HA	08/16/2011	FIGURE 6	
REVIEW	DL	08/17/2012		

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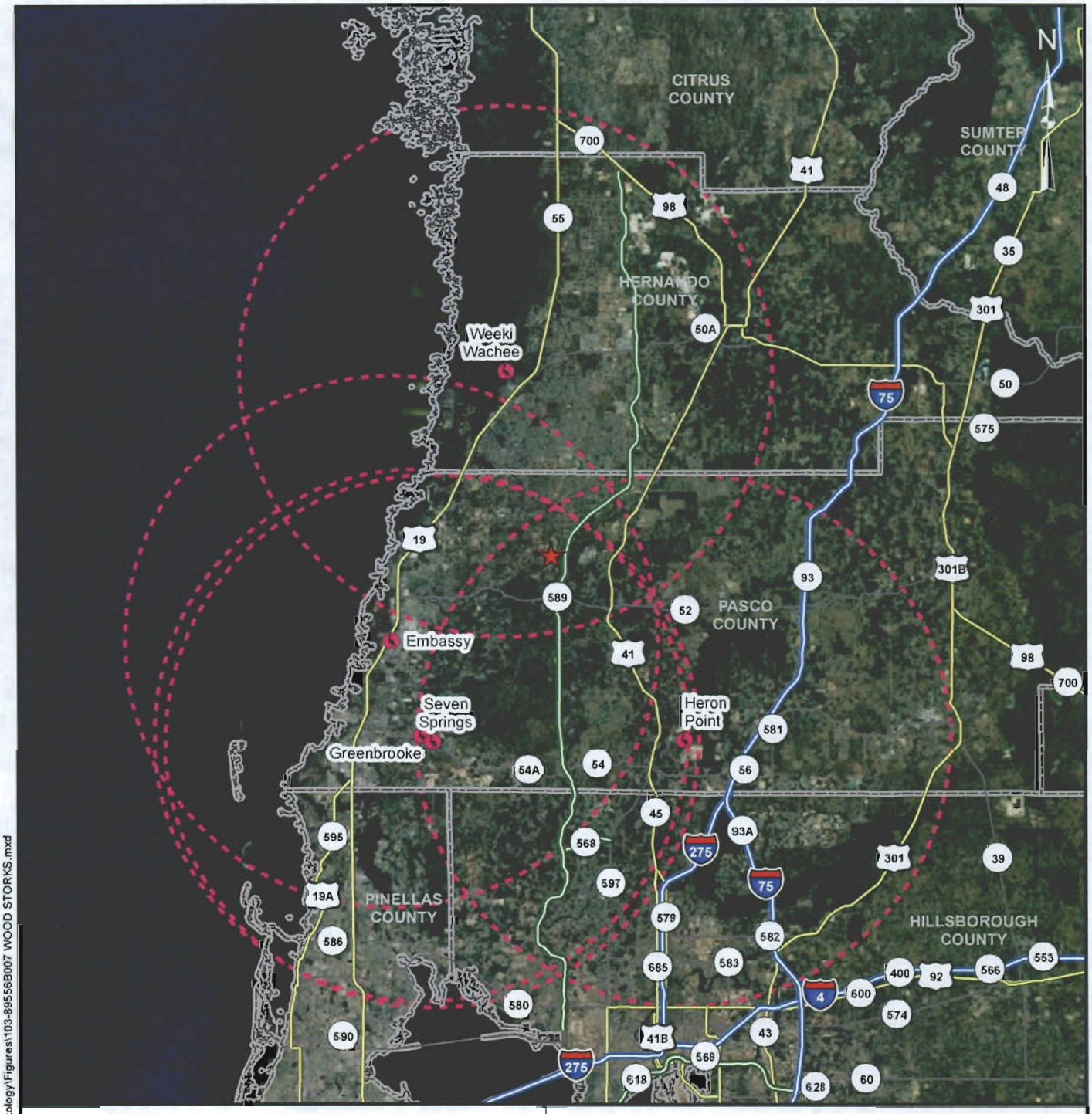

LEGEND

- APPROXIMATE PROJECT LOCATION
- FLORIDA WOOD STORK NESTING COLONY
- 15-MILE FLORIDA WOOD STORK CORE FORAGING AREA RADIUS
- COUNTY BOUNDARY
- INTERSTATE
- TOLL ROAD
- US ROAD
- STATE ROAD

8 0 8 Miles

REV.	DATE	DES	REVISION DESCRIPTION	GIS	CHK	RVW

PROJECT

SHADY HILLS

TITLE

WOOD STORK NESTING COLONIES AND CORE FORAGING AREAS

REFERENCES

1. APPROXIMATE PROJECT LOCATION: GOLDER ASSOCIATES INC., 2011
2. FLORIDA WOOD STORK NESTING COLONIES AND CORE FORAGING AREAS: US FISH AND WILDLIFE SERVICE, 2010
3. ROADS: FLORIDA DEPARTMENT OF TRANSPORTATION, 2011
4. COUNTY BOUNDARIES: FLORIDA GEOGRAPHIC DATA LIBRARY, 2008

Golder Associates Tampa, Florida

PROJECT No. 103-89556			FILE No. 103-89556B007	
DESIGN	JG	08/16/2011	SCALE: AS SHOWN	REV. 0
GIS	JG	08/16/2011		
CHECK	HA	08/16/2011		
REVIEW	DL	08/17/2012		

FIGURE 7

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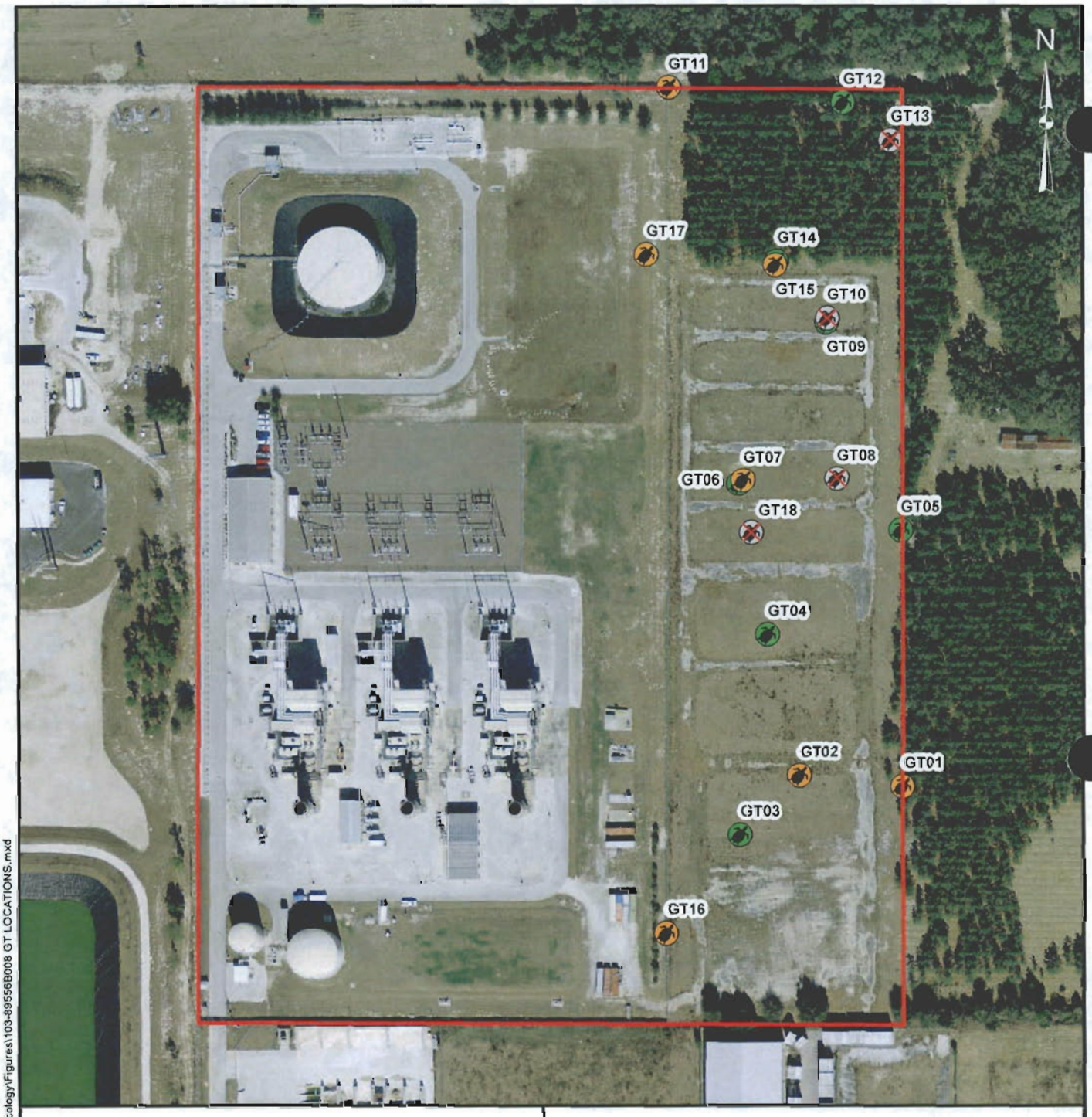


LEGEND

- APPROXIMATE PROJECT BOUNDARY
- ACTIVE GOPHER TORTOISE BURROW
- INACTIVE GOPHER TORTOISE BURROW
- ABANDONED GOPHER TORTOISE BURROW

200 0 200
Feet

REV.	DATE	DES	REVISION DESCRIPTION	GIS	CHK	RVW

PROJECT

SHADY HILLS

TITLE

GOPHER TORTOISE BURROW LOCATIONS

REFERENCES

1. APPROXIMATE PROJECT BOUNDARY: GOLDER ASSOCIATES INC., 2011
2. GOPHER TORTOISE BURROW LOCATIONS: GOLDER ASSOCIATES INC., 08/2011
3. 2010 AERIAL: SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT AND WOLLPERT, INC., 2010

Golder Associates
Tampa, Florida

PROJECT No. 103-89556			FILE No. 103-89556B008
DESIGN	JG	08/16/2011	SCALE: AS SHOWN REV. 0
GIS	JG	08/18/2011	
CHECK	HA	08/18/2011	FIGURE 8
REVIEW	DL	08/17/2012	

F:\PROJECTS\2010 PROJ\103-89556 GE Shady Hills Revision\5 - Ecology\Figures\103-89556B008 GT LOCATIONS.mxd

ATTACHMENT 1

FEDERALLY LISTED PLANT AND WILDLIFE SPECIES FOR PASCO COUNTY, FLORIDA

Welcome
Our Strategic Plan
Area of Responsibility
Our Office Location
Contact Us
Current News Releases
News Archives
Landowner Tools
Programs and Resources
Partners for Fish and Wildlife
Coastal Program
Habitat Conservation Plans
Federally-listed Species in Florida
Students & Teachers
Related Sites of Interest

Key North Florida Species

Bald Eagle
Florida Manatee
Eastern Indigo Snake
Florida Scrub-Jay
Sea Turtles
Whooping Crane
Wood Stork

General Information

Hunting-Fishing Licenses & Permits
Injured/Nuisance Wildlife
Wildlife Law Violations

Other USFWS Resources

Service Office Finder
Office Directory
Southeast Region Contacts
Federal Register Notices
Regional Five-Year Reviews

Federally Listed Species in Pasco County, Florida

This information is provided as a guide to project planning, and is not a substitute for site-specific surveys. Such surveys may be needed to assess species' presence or absence, as well as the extent of project effects on listed species and/or designated critical habitat.

The following table lists those federally-listed species known to be present in the county.
Code Key: E = Endangered, T = Threatened, CH = Critical Habitat Designated

Category	Species Common Name	Species Scientific Name	Code
Mammals	West Indian (Florida) Manatee	*Trichechus manatus latirostris*	E/CH
Birds	Piping Plover	*Charadrius melodus*	T
	Florida Scrub-jay	*Aphelocoma coeruluscens*	T
	Wood Stork	*Mycteria americana*	E
	Red-cockaded Woodpecker	*Picoides borealis*	E
Fish	Gulf Sturgeon	*Acipenser oxyrhynchus desotoi*	T
Reptiles	Eastern Indigo Snake	*Dymarchon corais couperi*	T
	Green Sea Turtle	*Chelonia mydas*	E
	Kemp's Ridley Sea Turtle	*Lepidochelys kempii*	E
	Leatherback Sea Turtle	*Dermochelys coriacea*	E
	Loggerhead Sea Turtle	*Caretta caretta*	T
Amphibians	None		
Mollusks	None		
Crustaceans	None		
Plants	None		

▶ Home ▶ Species: North Florida County ▶ Species: South Florida County ▶ Species: Panhandle County

For a list of State species by county use the Florida Natural Areas Inventory's Tracking Lists at http://www.fnai.org/trackinglist.cfm

For State listed species details, please go to http://myfwc.com/imperiledspecies//

NOTE: Bald eagles were removed from the endangered species list in June 2007 because their populations recovered sufficiently. However, the protections under the Bald and Golden Eagle Act (Eagle Act) continue to apply. Please see the eagle information on our Landowner Tools page or our national website at http://www.fws.gov/migratorybirds/baldeagle.htm for information regarding new permit requirements under the Eagle Act.

[redacted]

SHARE

Send comments on our web site or general questions to North Florida office.
If you need special assistance please contact the Public Affairs Officer.

Last updated: November 12, 2010

[redacted]

ATTACHMENT 2

FLORIDA NATURAL AREAS INVENTORY
BIODIVERSITY MATRIX REPORT AND ASSOCIATED TABLES

1018 Thomasville Road
Suite 200-C
Tallahassee, FL 32303
850-224-8207
850-681-9364 fax
www.fnai.org

Florida Natural Areas Inventory

Biodiversity Matrix Query Results

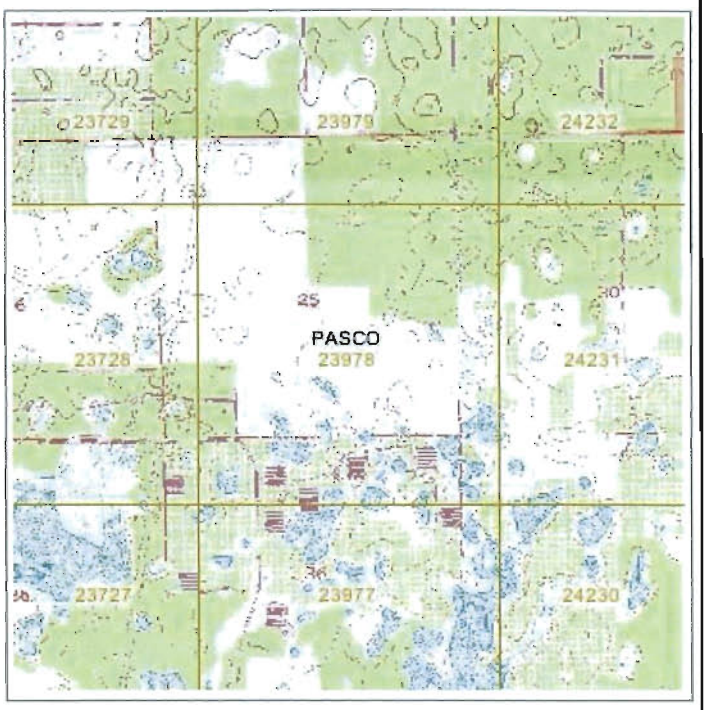
UNOFFICIAL REPORT

Created 9/9/2011

(Contact the FNAI Data Services Coordinator at 850.224.8207 for information on an official Standard Data Report)

NOTE: The Biodiversity Matrix includes only rare species and natural communities tracked by FNAI.

Report for 1 Matrix Unit: 23978



Descriptions

DOCUMENTED - There is a documented occurrence in the FNAI database of the species or community within this Matrix Unit.

DOCUMENTED-HISTORIC - There is a documented occurrence in the FNAI database of the species or community within this Matrix Unit; however the occurrence has not been observed/reported within the last twenty years.

LIKELY - The species or community is *known* to occur in this vicinity, and is considered likely within this Matrix Unit because:

1. documented occurrence overlaps this and adjacent Matrix Units, but the documentation isn't precise enough to indicate which of those Units the species or community is actually located in; *or*
2. there is a documented occurrence in the vicinity and there is suitable habitat for that species or community within this Matrix Unit.

POTENTIAL - This Matrix Unit lies within the known or predicted range of the species or community based on expert knowledge and environmental variables such as climate, soils, topography, and landcover.

Matrix Unit ID: 23978

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

9 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Ardea alba Great Egret	G5	S4	N	N
Egretta caerulea	G5	S4	N	SSC

Little Blue Heron				
Egretta thula Snowy Egret	G5	S3	N	SSC
Eudocimus albus White Ibis	G5	S4	N	SSC
Falco sparverius paulus Southeastern American Kestrel	G5T4	S3	N	ST
Grus canadensis pratensis Florida Sandhill Crane	G5T2T3	S2S3	N	ST
Mesic flatwoods	G4	S4	N	N
Mycteria americana Wood Stork	G4	S2	LE	FE
Sandhill	G3	S2	N	N

Matrix Unit ID: 23978

30 **Potential** Elements for Matrix Unit 23978

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Aimophila aestivalis Bachman's Sparrow	G3	S3	N	N
Athene cunicularia floridana Florida Burrowing Owl	G4T3	S3	N	SSC
Calopogon multiflorus Many-flowered Grass-pink	G2G3	S2S3	N	LE
Centrosema arenicola Sand Butterfly Pea	G2Q	S2	N	LE
Coelorachis tuberculosa Piedmont Jointgrass	G3	S3	N	LT
Digitaria floridana Florida Crabgrass	G1	S1	N	N
Drymarchon couperi Eastern Indigo Snake	G3	S3	LT	FT
Gopherus polyphemus Gopher Tortoise	G3	S3	N	ST
Gymnopogon chapmanianus Chapman's Skeletongrass	G3	S3	N	N
Heterodon simus Southern Hognose Snake	G2	S2	N	N
Lechea cernua Nodding Pinweed	G3	S3	N	LT
Litsea aestivalis Pondspice	G3	S2	N	LE
Matelea floridana Florida Spiny-pod	G2	S2	N	LE
Monotropsis reynoldsiae Pygmy Pipes	G1Q	S1	N	LE
Mustela frenata peninsulae Florida Long-tailed Weasel	G5T3	S3	N	N
Nemastylis floridana Celestial Lily	G2	S2	N	LE
Neofiber alleni Round-tailed Muskrat	G3	S3	N	N
Nolina atopocarpa Florida Beargrass	G3	S3	N	LT
Notophthalmus perstriatus Striped Newt	G2G3	S2S3	N	N
Panicum abscissum Cutthroat Grass	G3	S3	N	LE

Pituophis melanoleucus mugitus Florida Pine Snake	G4T3	S3	N	SSC
Platanthera integra Yellow Fringeless Orchid	G3G4	S3	N	LE
Podomys floridanus Florida Mouse	G3	S3	N	SSC
Pteroglossaspis ecristata Giant Orchid	G2G3	S2	N	LT
Rana capito Gopher Frog	G3	S3	N	SSC
Salix floridana Florida Willow	G2	S2	N	LE
Sciurus niger shermani Sherman's Fox Squirrel	G5T3	S3	N	SSC
Triphora craigheadii Craighead's Nodding-caps	G1	S1	N	LE
Ursus americanus floridanus Florida Black Bear	G5T2	S2	N	ST*
Warea carteri Carter's Warea	G3	S3	LE	LE

Unofficial Report

These results are considered unofficial. FNAI offers a Standard Data Request option for those needing certifiable data.

APPENDIX D
USFWS AND NMMS CORRESPONDENCE

Larocca, David

From: Ahrens, Heather
Sent: Thursday, March 29, 2012 10:42 AM
To: Kyle.Baker@noaa.gov
Cc: Osbourn, Scott; Larocca, David
Subject: Shady Hills Generating Station ESA Consultation

Kyle,

Thank you for taking time out of your busy schedule to discuss the referenced project with me today as well as during our original conversation on October 7, 2011. My understanding from our conversations is that the NMFS would make a no effect determination because the site is located inland in Pasco County, Florida, and therefore, species regulated by NMFS for this area (i.e., gulf sturgeon and sea turtles) would not be present on site. It is also my understanding that the NMFS does not send no effect determination correspondence.

Please do not hesitate to contact me if you have any questions or concerns regarding this matter.

Regards,

Heather Todd Ahrens | Senior Ecologist | **Golder Associates Inc.**
5100 West Lemon Street, Suite 208, Tampa, Florida, USA 33609
T: +1 (813) 287-1717 | **D:** +1 (813) 769-5307 | **F:** +1 (813) 287-1716 | **C:** +1 (813) 407-8846 | **E:** Heather_Ahrens@golder.com | **www.golder.com**

Larocca, David

From: Ahrens, Heather
Sent: Wednesday, April 04, 2012 2:38 PM
To: Heath_Rauschenberger@fws.gov
Cc: Osbourn, Scott; Larocca, David
Subject: Shady Hills Generating Station ESA Consultation

Dr. Rauschenberger,

Thank you for taking time out of your busy schedule to discuss the referenced project with me on March 29 as well as during our original conversation on October 7, 2011. As we discussed:

1. The proposed project is located within an existing industrial site in Pasco County, Florida.
2. Due to the presence of gopher tortoise burrows within the proposed project site(18 burrows total, of which 14 are potentially occupied), there is a potential for the eastern indigo snake to be present. Standard protection measures for the eastern indigo snake will be enforced during construction of the proposed project to ensure eastern indigo snakes are not harmed.
3. The proposed project does not include discharge of heated water.
4. No wetlands were identified within the proposed project site. In addition, no dredge or fill activities are proposed within wetlands or other surface waters.

My understanding from our conversations is that the USFWS would like to review the ecological due diligence report before making a determination on whether the project will affect listed species. It is also my understanding that we may submit the ecological due diligence report directly to USFWS for review, or we can wait until the USEPA forwards the information to the USFWS as part of the Section 7 Consultation process.

Please do not hesitate to contact me if you have any questions or concerns regarding this matter.

Regards,

Heather Todd Ahrens | Senior Ecologist | **Golder Associates Inc.**
5100 West Lemon Street, Suite 208, Tampa, Florida, USA 33609
T: +1 (813) 287-1717 | **D:** +1 (813) 769-5307 | **F:** +1 (813) 287-1716 | **C:** +1 (813) 407-8846 | **E:** Heather_Ahrens@golder.com | **www.golder.com**

APPENDIX E
CULTURAL RESOURCE ANALYSIS

Golder Associates

August 17, 2012 103-89556

Ms. Laura Kammerer
Deputy State Historic Preservation Officer for Review and Compliance
Florida Division of Historical Resources
R.A. Gray Building
500 South Bronough Street
Tallahassee, FL 32399-0250

RE: CULTURAL RESOURCES DESKTOP ANALYSIS FOR SHADY HILLS EPA PSD PERMIT

Dear Ms. Kammerer:

On behalf of EFS Shady Hills, LLC (Shady Hills) Golder Associates Inc (Golder) is submitting to the Florida Division of Historical Resources (FDHR) the following cultural resources desktop analysis. Golder respectively requests FDHR's concurrence that no additional cultural resources investigation is required to demonstrate compliance with Section 106 of the National Historic Preservation Act (NHPA).

INTRODUCTION

A subsidiary of Shady Hills, the Shady Hills Power Company, LLC, owns and operates the Shady Hills Generating Station located at 14240 Merchant Energy Way, Shady Hills, Pasco County, Florida. Shady Hills is proposing to expand the Shady Hills Generating Station with the addition of two nominal 218-megawatt (MW) simple cycle combustion turbine-electric generators and associated ancillary equipment (Project.) The proposed expansion is a major modification to the existing facility and subject to Prevention of Significant Deterioration (PSD) for specific air emissions. The Florida Department of Environmental Protection has issued a final air construction permit (Air Permit No. 1010373-012-AC PSD-FL-402A) for the project for all applicable air pollutants except greenhouse gas (GHG).

EPA Region IV is the permitting authority for the GHG-portion of the expansion project under a Federal Implementation Plan (FIP) that became effective on December 30, 2010. Federal law requires that a federal agency's actions be in compliance with Section 106 of the NHPA. On behalf of Shady Hills, Golder conducted a desktop analysis to demonstrate compliance with Section 106, NHPA. This analysis includes identification and review of any previously recorded cultural resources within and adjacent to the project site.

PROJECT LOCATION

The Shady Hills Generating Station and Project are located in unincorporated Pasco County, Florida within Section 25, Township 24S, and Range 17E (Figures 1 and 2). The Shady Hills property is approximately 30 acres. The Project will be located adjacent to the east side of the existing generators, and the associated switchyard will be located adjacent to the east side of the existing switchyard. The area where the additional generators and switchyard will be located was previously used as a construction laydown area during the construction of the existing Shady Hills Generating Station facilities.

PREVIOUSLY CONDUCTED SURVEYS AND PREVIOUSLY RECORDED CULTURAL RESOURCES WITHIN THE PROJECT SITE AND PROJECT AREA

Golder requested from the Florida Department of State Division of Historical Resources a search of the Florida Master Site File (FMSF) to identify known cultural resources locations within the Project location and surrounding area. This information is based on the most current FMSF data. Golder acknowledges

Golder Associates Inc.
5100 W. Lemon Street, Suite 208
Tampa, FL 33609 USA
Tel: (813) 287-1717 Fax: (813) 287-1716 www.golder.com

that the FMSF is not a comprehensive inventory of cultural resources and their significance, and therefore may not reflect existing conditions.

According to the FMSF, there were no previously recorded archaeological sites or historic structures within the Project Site. There were two resources identified within 0.3 mile north and southeast of the Project Site: Site PA00324 (MATHIS) and Site PA00321 (Bell Pond West). Both sites are single artifact or isolated finds that are prehistoric but lack pottery. Sites PA00324 and PA00321 are ineligible for listing on the National Register of Historic Places.

Based on the characteristics of the proposed Project and previous disturbance by the existing power plant, Golder anticipates the Project will have no impacts on cultural resources, and therefore recommends that the FDHR confirms in writing that no further investigation of cultural resources is required for the proposed Project.

If you have any questions, please feel free to contact the undersigned at (813) 287-1717.

Sincerely,

GOLDER ASSOCIATES INC.

Kelly L. Hartman
Environmental and Land Use Planner

Scott Osbourn
Senior Consultant and Associate

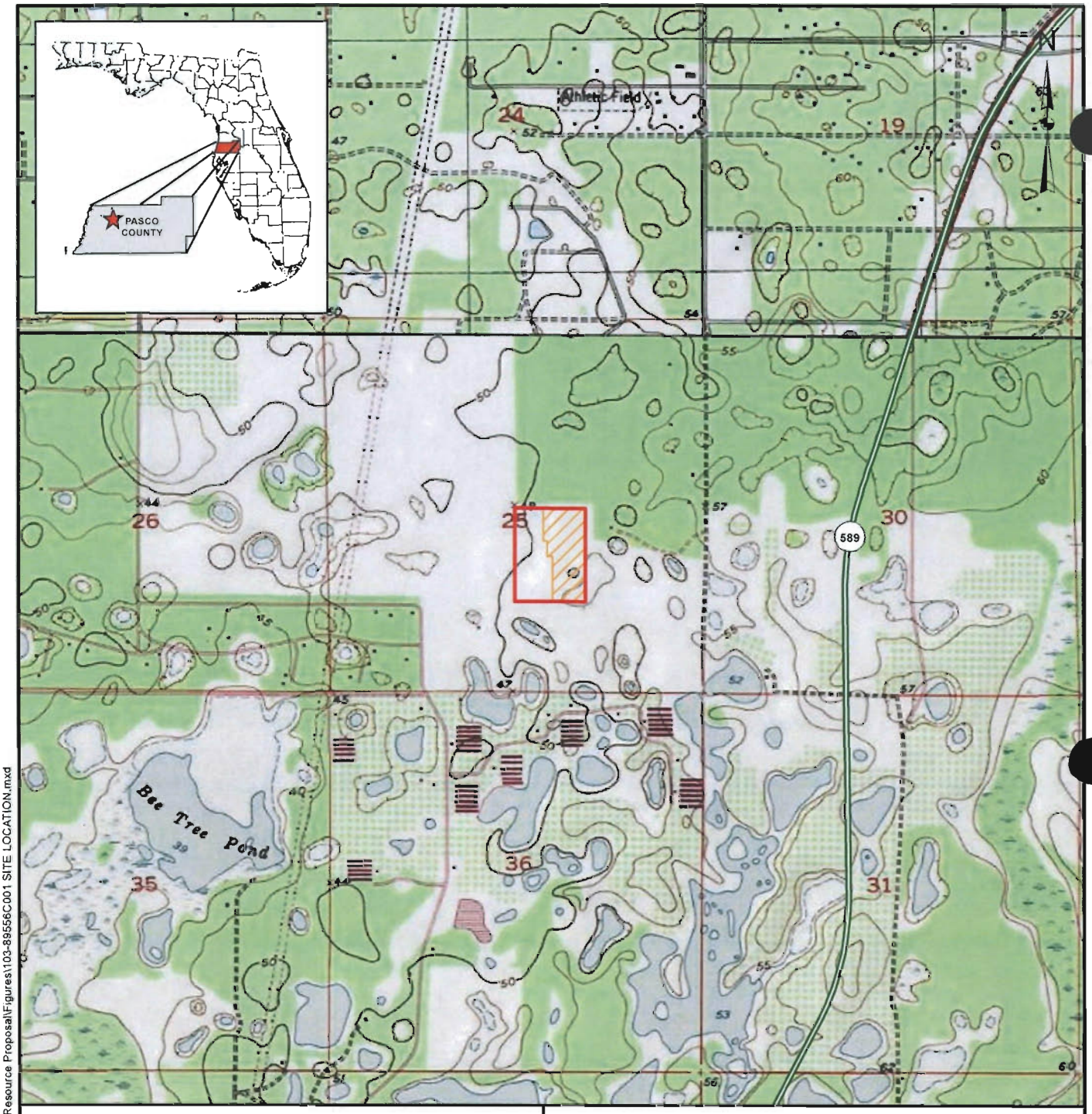
David Larocca
Senior Engineer

Attachments: Figure 1, Site Location—Topographic
Figure 2, Site Location—Aerial

cc: Roy Belden – GE Energy Financial Services, EFS Shady Hills, LLC

KLH/SO/DL/lcr

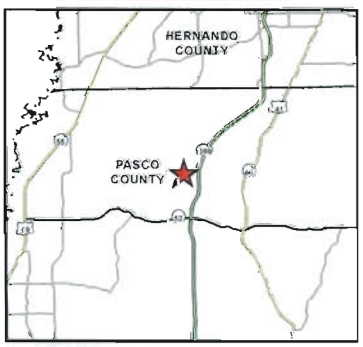
FIGURES



LEGEND

- APPROXIMATE SITE BOUNDARY
- APPROXIMATE EXPANSION PROJECT AREA
- TOLL ROAD
- US ROAD
- STATE ROAD
- COUNTY ROAD
- COUNTY BOUNDARY

REGIONAL MAP



REFERENCES

1. APPROXIMATE PROJECT BOUNDARY: GOLDER ASSOCIATES INC., 2011
2. ROADS: FLORIDA DEPARTMENT OF TRANSPORTATION, 2011
3. COUNTY BOUNDARIES: FLORIDA GEOGRAPHIC DATA LIBRARY, 2008
4. USGS TOPOGRAPHIC MAP: NATIONAL GEOGRAPHIC SOCIETY, 2010

2,000 0 2,000
Feet

REV.	DATE	DES.	REVISION DESCRIPTION	GIS	CHK	RVW

PROJECT

SHADY HILLS GENERATING STATION

TITLE

SITE LOCATION - TOPOGRAPHIC

Golder Associates
Tampa, Florida

PROJECT No. 103-89556			FILE No. 103-89556C001
DESIGN	JDG	04/10/2012	SCALE: AS SHOWN / REV. 0
GIS	JDG	04/13/2012	
CHECK	KLH	04/13/2012	FIGURE 1
REVIEW	DL	04/13/2012	

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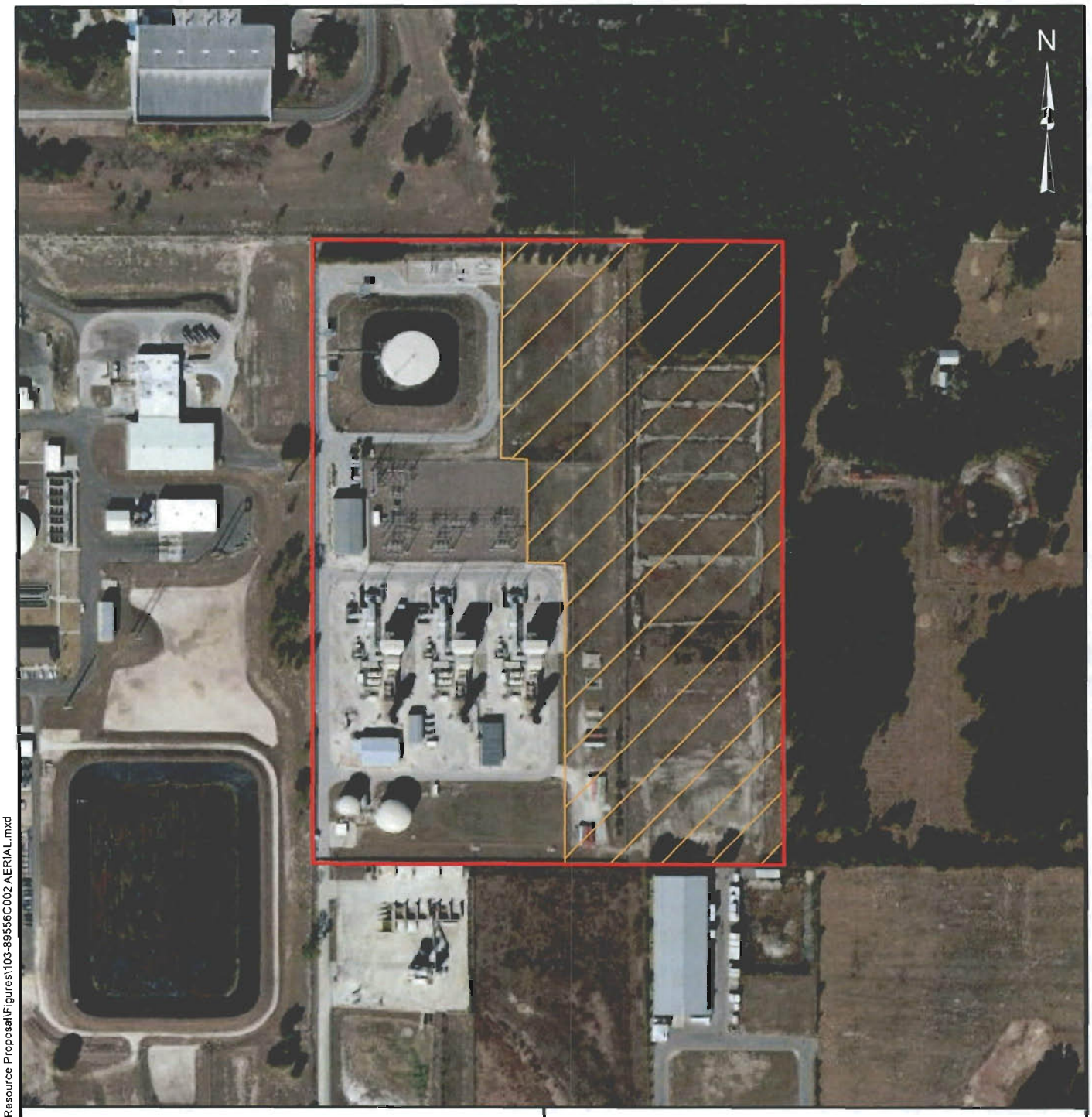

LEGEND

APPROXIMATE SITE BOUNDARY

APPROXIMATE EXPANSION PROJECT AREA

300 0 300 Feet

REV.	DATE	DES	REVISION DESCRIPTION	GIS	CHK	RVW

PROJECT

SHADY HILLS GENERATING STATION

TITLE

SITE LOCATION - AERIAL

REFERENCES

1. APPROXIMATE PROJECT LOCATION: GOLDER ASSOCIATES INC., 2011
2. AERIAL: ARC GIS ONLINE - BING MAPS AERIAL; MICROSOFT CORPORATION AND ITS DATA SUPPLIERS, 2010

Golder Associates Tampa, Florida

PROJECT No. 103-89556			FILE No. 103-89556C002	
DESIGN	JDG	04/10/2012	SCALE AS SHOWN	REV. 0
GIS	JDG	04/13/2012	FIGURE 2	
CHECK	KLH	04/13/2012		
REVIEW	DL	04/13/2012		

F:\PROJECTS\2010\103-89556 GE Shady Hills Revision\C - Cultural Resource Proposal\Figures\103-89556C002 AERIAL.mxd