EXHIBIT E

EPA, Response to Comments, Draft Greenhouse Gas PSD Air Permit for the Shady Hills Generating Station, PSD-EPA-R4013 (Jan. 2014)

U.S. Environmental Protection Agency

January 2014

Responses to Public Comments

Draft Greenhouse Gas PSD Air Permit for the Shady Hills Generating Station

Table of Contents

I. Introduction

The U.S. Environmental Protection Agency, Region 4 (EPA) proposed to issue a Prevention of Significant Deterioration (PSD) permit for Greenhouse Gases (GHGs) to EFS Shady Hills LLC (Shady Hills) for the Shady Hills Generating Station (Facility) on September 24, 2013. The public comment period for the proposed permit began on September 24, 2013, and closed on October 24, 2013.

The EPA announced the public comment period through a public notice published in the Tampa Tribune (in English) on September 24, 2013, and on Region 4's website (in English) on September 24, 2013. The EPA also distributed the public notice to the necessary parties in accordance with 40 CFR Part 124, including notices sent by email on September 24, 2013. Parties notified by the EPA included agencies, organizations, and public members for whom contact information was obtained through a number of different methods, including requests made directly to the EPA through Region 4's website (or through other means) from parties seeking notification regarding permit actions in Florida, within the jurisdiction of Florida Department of Environmental Protection (FDEP), within Pasco County; and other parties known to the EPA that may have an interest in this action.

During the public comment period, the EPA received two comment letters. The Agency did not receive any request for a public hearing. Responses to the public comments received are available in the following sections of this document.

II. EPA's Responses to Public Comments

This section summarizes all public comments received by the EPA and provides our responses to those comments. The full text of all public comments and many other documents relevant to the permit can be accessed online at http://www.regulations.gov (Docket #EPA-R04-OAR-2013-0647) or on Region 4's website at http://www.epa.gov/region4/air/permits/ghgpermits/shadyhills_ghg.html.

Comments Submitted by Sierra Club

1. **Comment:** *The Draft Permit is Less Stringent than the Proposed GHG NSPS for New Electric Generating Units*

   On September 20, 2013, the EPA issued a signed notice of its Proposed Rule for *Standards of Performance for Greenhouse Gas Emissions from New Stationary Sources: Electric Utility Generating Units*, EPA-HQ-OAR-2013-0495 (GHG NSPS). The GHG NSPS will apply to any new electric generating unit that "actually supplies more than one-third of its potential electric output to the grid."[1] For those EGUs that supply more than one-third of their potential electric output to the grid, the EPA determined that the "best system of emission reduction" is natural gas combined-cycle (NGCC) technology because it is technically feasible, relatively inexpensive, its emission profile is acceptable low, and it would not adversely affect the structure of the electric power sector.[2] The proposed standard for stationary combustion turbines between 73 MW and 250 MW is 1,100 lb CO2/MWh (gross). The proposed standards for units over 250 MW is 1,000 lb CO2/MWh (gross).

   Section 111(a)(2) of the Clean Air Act defines a "new source" as any stationary source that commences construction or modification after publication of proposed new standards of performance under section 111 that will be applicable to the source. 42 U.S.C. § 7411(a)(2). Under this definition, any new fossil fuel-fired EGU greater than 25 MW that commences construction after September 20, 2013, is a "new source" and will be subject to the CO2 standard that the EPA ultimately promulgates when the source begins operating. *United States v. City of Painesville*, 644 F.2d 1186, 1191 (6th Cir. 1981) (CAA §111(a)(2) "plainly provides that new sources are those whose construction is commenced after the publication of the particular standards of performance in question."). The statute uses the date a standard is proposed to define which sources are subject to the standard. The Shady Hills Project would therefore be considered a "new source" subject to the NSPS because it has not commenced construction prior to September 20, 2013.

The Shady Hills Projects consists of two GE7FA.05 simple-cycle combustion turbines, each with an output of 218 MW while firing on natural gas. (SOB at p.3.) The Draft Permit includes an average operating limit of 3,390 hours per turbine per year on a 12-month rolling basis. (Draft Permit § IX.B.2.) Each unit may operate individually up to 5,000 hours per year. This means that the GHG NSPS, if finalized, would apply to the Shady Hills Project because 3,390 hours, not to mention 5,000, is far more than 1/3 of the unit's potential electric output (1/3 of 8,760 hours is 2,920 hours). It also means that Shady Hills as permitted would violate the NSPS because the Region's proposed BACT limit of 1,377 lb CO2/MWh (gross) is **higher** than the limit of 1,100 lb CO2/MWh in the proposed GHG NSPS. This difference fundamentally contradicts the purpose of BACT. The Clean Air Act expressly provides: "In no event shall application of "best available control technology" result in emissions of any pollutants which will exceed the emissions allowed by any applicable standard established pursuant to section [111 or 112 of the Clean Air Act]."[3] The SOB acknowledged this discrepancy in the SOB, but it dismissed the issue on the grounds that "the proposed NSPS is not a final action and the proposed standard may change." (SOB at p.8.) This logic, however, ignores the reality that the EPA headquarters has spent more than a year reviewing available data on turbine efficiencies and concluded that NGCC technology is both technically feasible and "relatively inexpensive." In contrast, the Region has simply adopted without question the Applicant's argument that a more efficient NGCC is infeasible. The Region has also adopted without any question of underlying need the operating limit of 3,390 hours per year. The findings in the proposed GHG NSPS undermine the Region's cursory and unsupported finding that the Shady Hills simple-cycle units should be allowed to pollute at such a high rate for so many hours each year.

Response: Regarding the commenter's assertion *"that Shady Hills as permitted would violate the NSPS because the Region's proposed BACT limit of 1,377 lb CO_2e/MWh (gross) is higher than the limit of 1,100 lb CO_2e/MWh"*, the Region disagrees with the commenter's interpretation of the Proposed Rule for *Standards of Performance for Greenhouse Gas Emissions from New Stationary Sources: Electric Utility Generating Units*, EPA-HQ-OAR-2013-0495 (GHG EGU NSPS). The source will not be operated in violation of any new source performance standard that is effective when the source commences construction. The EPA does not expect that the proposed GHG EGU NSPS, if finalized, would apply to the Shady Hills Project because it does not expect operation to exceed one-third of the unit's potential electric output. The proposed rule defines *electric generating units* (EGUs) as units that sell more than one-third of their potential output to the grid. Under this definition, most simple cycle *peaking* stationary combustion turbines, which sell typically less than one-third of their potential electric output to the grid, would not be subject to the NSPS. Of additional importance is the fact that, under the proposed NSPS applicability provisions, the percentage of a unit's potential electrical output that it actually delivers to a utility power distribution system for sale is to be calculated on a three-year-rolling-average basis.

Furthermore, since the actual amount of electric output generated by a unit is a function of both the hours of operation and the actual load during the operating hours, a unit's permitted operating hours alone cannot be used to predict whether it will actually generate more than one-third of its potential electrical output. Even though each of the Shady Hills combustion turbines will be capable of operating more than one-third of the total hours in a year (i.e., more than 2,920 hours), a combustion turbine would have to be operating at full load during each of those 2,920 hours for the actual power production to exceed one-third of the unit's potential electrical output. While it is true that the average load need not be as high in order to trip the one-third potential electric output criteria if the unit's actual operating time were to approach the 5,000 hour limit, as is discussed below, such circumstance seems unlikely to occur long enough for the three-year-rolling-average criteria to be triggered. Therefore, assuming the GHG EGU NSPS is finalized with this same requirement, the Shady Hills combustion turbines would have to actually operate, on average, at the high end of their allowable operating hours over a three-year period to be subject to the GHG EGU NSPS.

In the preamble to the proposed GHG EGU NSPS rule, the EPA states that *"simple cycle combustion turbines that are generally designed for operation during peak demand will usually supply less than one-third of their potential electric output to the grid."* It goes on to point out that *"there can be rare instances when they do,"* and provides an example of circumstances which may result in such operation. However, as the preamble clearly states, the inclusion of *"actual sales"* criteria combined with a *"three year rolling average"* calculation methodology are intended to prevent such *"rare instances"* from causing simple cycle combustion turbines normally used during peak demand from triggering the applicability criteria of the GHG EGU NSPS.

Indeed, in its permit application, Shady Hills indicated that the combustion turbines for this project will be used for peaking purposes. Page 13 of the preliminary determination states "[t]*his Project has the objective of expanding the Shady Hills operations by increasing the amount of peaking power generated."* The EPA also confirmed with the applicant their intention to operate as a peaking plant.

While it is highly unlikely that Shady Hills would operate the combustion turbines in a way that would trigger the GHG EGU NSPS, as proposed, EPA cannot resolve that question until the NSPS is finalized and the units are operating. In the event that the proposed GHG EGU NSPS becomes final in a form that would apply to these units, Shady Hills would be required to comply with the applicable emission limitations and standards. But the proposed NSPS is not final, and thus, the emission limit proposed in the NSPS does not establish a floor for EPA's BACT determinations.

EPA rejects the commenter's assertion that *"the Region has simply adopted without question the Applicant's argument that a more efficient NGCC is infeasible."* That comment mischaracterizes EPA's rationale for concluding that combined cycle combustion turbines (CCCTs; referred by the commenter as NGCC) are "infeasible" as BACT. As stated in the application and the preliminary determination, the applicant's purpose for this project is to operate as a peaking plant. While CCCTs are more suitable for baseload power generating plants, "*electric utilities primarily use simple-cycle combustion turbines as peaking or backup units."* [Preliminary determination at 13] Based on the short startup and shutdown periods the simple cycle combustion turbines (SCCTs) offer, along with the purpose of the Project, CCCTs were considered a redefinition of the source and; therefore, not considered in the BACT analysis. Contrary to the commenter's assertion, nothing in the proposed GHG EGU NSPS supports the commenter's contention that CCCTs would be suitable for a peaking plant like that proposed by Shady Hills. As noted above, in developing the proposed GHG EGU

NSPS, EPA assumed that simple cycle combustion turbines designed for operation during peak demand—like those proposed for use in the Shady Hills project—will not be subject to the rule. Thus, statements made by EPA in the preamble to the proposed GHG EGU NSPS regarding the feasibility of using CCCT technology by sources that would be regulated by the proposed rule have no relevance to whether such technology would be suitable for use in projects like Shady Hills.

2. **Comment:** _Hours of Operation for Peaking Unit(s) are Too High_

The Region did not question the need for the specific hours of operation included in the application. The Region based its emission calculations on unenforceable "assumptions" that the units would operate 2,890 hours per CT per year on natural gas, and the rest of the time on fuel oil. (SOB at p.10.) The Region provides no basis for the underlying operating scenario assumptions that it makes. Backup fuel oil use should only be used as a last resort because it is a much more polluting fuel source. However, the Region assumes that backup fuel oil will be used to *supplement* natural gas firing above 2,890 hours per year. This is illogical. To the extent that fuel oil is used, it should only be used when natural gas use is curtailed due to emergency supply constraints. The Applicant cannot rely on dirtier fuel oil to avoid more stringent emissions limits. The Region should make clear that fuel oil operating is only available in lieu of natural gas operation, and even then should be allowed only as needed on an emergency basis. In any case, the use of fuel oil should not allow the Applicant to increase its total operating hours. Any emergency fuel use must be considered as part of an annual hours of operation limit that corresponds to a peaking unit.

Response: Regarding the commenter's assessment on the hours of operation in the preliminary determination, the EPA disagrees with the commenter's characterization. The emissions analysis from firing 2,890 hours per year of natural gas and 500 hours per year of ultra low sulfur diesel (ULSD) per CT represents the worst-case emissions operational scenario for purposes of calculating potential to emit (PTE) for applicability. The Region set output based limits for each fuel type and further limited operations to ensure the PTE calculations remain valid (see Conditions IX.B. and IX.C. in the permit). Based on the application and supplementary information, the hours of operation proposed and the choice of ULSD fuel as the backup fuel for the combustion turbines are part of the facility's basic design, which requires fuel flexibility.

Regarding the commenter's assertion that *"the Region assumes that backup fuel oil will be used to* _supplement_ (emphasis added by commenter) *natural gas firing above 2,890 hour per year,"* the EPA's intent was not to issue a permit with a condition where ULSD would be supplementing the natural gas. In the addendum titled *Fuel Oil Alternative Request* dated May 26, 2011 (see the administrative docket), the applicant further explains the decision process to operate the SCCTs firing ULSD fuel oil. It says the facility "*will operate the units on natural gas when interruptible natural gas transportation service is available. In the event interruptible natural gas transportation is not available and customer load demand is high, the offtaker/[customer] would likely dispatch the units on fuel oil."* Therefore, ULSD will be used as a backup fuel in place of natural gas, not as a supplementary fuel that could be used for operations above the overall operating limit of 2,890 hours per year. Any ULSD use is subject to the overall annual hours of operation limit. EPA revised Condition IX.B.2 to clarify this restriction.

Regarding the commenter's request that the permit restrict ULSD use to circumstances when natural gas use is curtailed due to emergency supply constraints, EPA did not make the requested change.

Under the permit, firing of the SCCTs with the ULSD fuel oil is allowed during normal operation and startup/shutdown as well as during emergencies. Refer to the response to comment #8 for further information on the use of ULSD fuel oil usage for this project.

Comment #2 continued: a) Peaking Units Operate Less than 2000 Hours Annually

The Region states that "Shady Hills is a peaking plant" and "Electric utilities primarily use simple-cycle combustion turbines as peaking or backup units." (SOB at p.13.) However, the annual operating hours for all of the proposed units are much higher than typical peaking units. The available data show that almost all simple cycle combustion turbine units have low operating hours – but they also appear to show that a few large simple cycle units have high capacity factors. The SOB assumed that the Shady Hills Project would operate 3,390 hours per year. This is far more operating hours than peaking units, and the high operating hours limits demonstrate that the Applicant is attempting to avoid using a more efficient combined-cycle unit. The histogram in Figure 1 shows that the annual operating hours in the proposed permit are too high. The "knee in the curve" for these data appears to be below 2000 hours for 2011 (the most favorable year for industry), thus showing that operation greater than 2000 hours is not consistent with the normal operation of simple cycle units.

We note that even 2000 hours of operation may represent simple cycle units that are in intermediate load rather than peaking operation, especially if such use is seasonal. We also note that there are a substantial number of combined cycle units that are designed for intermediate load applications but that may have limited hours of operation because of market conditions. Eighty-two of the 592 recently constructed combined cycle units in the EPA CAMD data set, Figure 2, operate less than 2000 hours per year; 143 of those units operated less than 2900 hours per year. These figures show that a typical simple-cycle unit almost never operates at or above 3,390 hours per year. This begs the question of why the Applicant would propose such a high operating limit unless it was claiming to be a peaking unit for the express purpose of trying to avoid a BACT limit based on a combined-cycle unit.

Figure 2 data suggest that an hour of operation assumption above 2,000 hours does not sufficiently differentiate peaking from intermediate-load units. Intermediate units may operate seasonally, but for many hours at a time once started up. Such intermediate units are seasonal or load following and are not true peaking units. In the draft permit, the Region must set the operational hours based on the characteristics of a peaking unit because it expressly rejected consideration of combined cycle units on the grounds that the Applicant needed the Shady Hills Project for peaking power generation. (SOB at p.13.) If the Applicant plans to operate the Shady Hills Project as an intermediate resource rather than a peaking resource, then the BACT analysis must fully consider combined cycle units as a feasible alternative.

Industry practice provides what appears to be the most useful definition of a peaking unit. Rather than the total hours per year of operation, General Electric defines "peaking" units in terms of an average hour of operation per startup. GE Performance defines base load as operation at 8,000 hours per year with 800 hours per start. It then defines peak load as operation at 1250 hours per year with five hours per start. The Region should set the maximum operating hours for the Shady Hills Project based on typical peaking units operating hours of 2,000 hours per year with limits on the number of hours per start, to ensure that the proposed simple cycle turbines are used as true peaking units rather than as base load or intermediate load units. If the Applicant plans to operate the Shady Hills Project for more than 2,000 hours per year, then such use should be considered intermediate or load following and the GHG BACT analysis must consider alternative technologies, such as combined cycle, that can operate more efficiently and therefore at lower GHG emission rates

Response: Regarding commenter's assertion that the EPA should limit the annual hours of operation for this facility to 2,000 hours per year based on "typical" peak operating hours for peaking units, the EPA believes that limiting the annual hours of operation to the "typical" peak operation hours of a peaking unit, will hinder the facility's ability to fulfill its purpose to operate as a peaking facility. In an email dated December 12, 2013, the applicant confirmed that *"the purpose of the Project is to provide peaking duty service."* See also the permit application at 1-2.A peaking plant may operate only a few occasions or many times in a given year, and sometimes very differently the next year due to variation in power demand caused by weather, emergencies, maintenance or other outages at the other power serving the grid, and other factors. If EPA were to restrict operation of the Shady Hills units to the "typical" number of hours that a peaking unit is used, EPA would impair Shady Hills' ability to provide reliable peaking duty service during years in which circumstances requiring peak duty service occur more frequently than usual. Simply because a peaking unit operates more frequently in a particular year than is "typical" for such a unit does not mean that the unit is no longer serving as a peaking unit. Rather, the basic distinction between a peaking and an intermediate or baseload facility is the planned operational use of the facility (quick startup to serve peak demand) and not strictly the hours of permitted operation. Regarding the commenter's request to put a limit to the number of hours per start, please refer to the response to comment #9.

Lastly, the data presented by the commenter does not indicate that a peaking facility would never need to operate more than 2,000 hours per year. To ensure that they can effectively be used as intended, the permit allows the two proposed SCCTs to operate an average 3,390 hours per year per CT on a 12-month rolling total basis. This limit is not indicative of the actual hours of operation and not an indication that it will be operated contrary to the stated purpose (peaking).

3. **Comment:** _The Region Must Consider Combined Cycle Turbine Design_

The Region failed to consider more efficient combined-cycle units as BACT for the project on the basis that "CCCT's have a longer startup and shutdown period." (SOB at p.13.) Modern combined cycle units can achieve startup and ramp rates comparable to a simple cycle, which means that combined-cycle units can operate to meet peaking needs. In this case, with such a high proposed operating limit that is far greater than a peaking facility, the Region must consider whether a combined-cycle unit is BACT. At a minimum, the Region must acknowledge that combined-cycle technology is feasible in step 2 of the BACT analysis, which would then requiring a demonstration of adverse economic impact in step 4 in order to reject the technology as BACT.

Several combined-cycle units are available that can meet short startup periods. For example, the proposed Oakley Generating Station in California is designed to be able to start up and dispatch quickly with GE's Rapid Response package.8 The Rapid Response package allows the plant to start up from warm or hot conditions in less than 30 minutes. The Rapid Response package achieves this fast performance by initially bypassing the steam turbine when the gas turbines are started up. In a conventional combined-cycle system, the gas turbine needs to be held at low load for a period of time while the HRSG is warmed up and steam is gradually fed into the steam turbine and the steam turbine is brought up to operating temperature. The steam turbine needs to be brought up to operating temperature slowly in order to minimize thermal stresses on the equipment and to maintain the necessary clearances between the rotating and stationary components of the turbine. In the past, this delay necessitated having to slowly warm up the HRSG and steam turbine and meant that the gas turbine could not increase load as rapidly as a simple-cycle gas turbine to quickly provide power to the grid. It also caused increased emissions, including CO2, because the combustion turbine needs to be held at low load – where it is not as efficient – while the HRSG and steam turbine are warmed up. Those constraints are avoidable with today's technology. The GE Rapid Response system initially bypasses the steam turbine when the combustion turbines are started, allowing them to ramp up quickly and begin providing power to the grid. The steam turbine can then be warmed up slowly without requiring the combustion turbines to be held at low load (except for a short time for cold startups), through the controlled admission of steam from the HRSGs into the steam turbine. The Rapid Response package therefore allows the facility to start up and begin providing power more quickly than a conventional system, which will enhance operational flexibility and reduce emissions associated with startups.

Other vendors similarly offer fast start of rapid response designs. The 2013 Gas Turbine World (GTW) contains several examples of combined-cycle units that perform better than comparable simple-cycle units. For example, the emissions of an LM6000PC Sprint (46,200 kW simple cycle per GTW) might be compared to the Siemens SGT 800 (47,500 kW simple cycle per GTW). Deploying the SGT 800 in combined cycle will provide 48 MW of fast starting gas turbine capability, plus an additional 19 MW of steam turbine generation ("STG") output capability. According to GTW, the efficiencies of the simple cycle LM6000PC Sprint and the SCC 800 1x1 combined cycle are 41.2% and 53.8% respectively. Thus, the efficiency and stack emissions of the plant would be improved by 30% by substituting the combined cycle alternative.

In California, there are additional examples of combined-cycle units being deployed instead of simple-cycle. Several years ago, the Marsh Landing plant (in the San Francisco Bay Area) was commissioned. NRG Marsh Landing features four 200 MW Siemens SGT6 5000F gas turbines in a simple cycle configuration. These gas turbines can ramp up to maximum power in about 12 minutes after the electronic startup command is sent to the gas turbines. More recently, NRG commissioned two of the same Siemens 5000F model of gas turbines at their El Segundo plant (near Los Angeles), but the El Segundo gas turbines were commissioned in a combined cycle configuration using Siemens FlexPlant design. Compared to Marsh Landing, the addition of the HRSG and steam turbine dramatically improved the plant efficiency and dramatically reduced the stack emissions per MWH of energy produced. Nevertheless, the El Segundo gas turbines can still startup just as fast as the Marsh Landing gas turbines.

Response: As Shady Hills explained in its permit application, even equipped with a Rapid Response package, a combined cycle combustion turbine (CCCT) would not fulfill the purpose of the Shady Hills project to provide peaking duty service during periods of high power demand.[1] First, as the commenter acknowledges, a Rapid Response package is capable of enabling startup of a CCCT within 30 minutes only if the unit already is warm or hot. To keep the heat recovery steam generator (HRSG) and the steam turbine seals and auxiliary equipment at a sufficiently high temperature to allow for quick startup of the CT, the facility would have to continuously operate an auxiliary boiler.

[1] See permit application at 7.

In other words, the auxiliary boiler would be operated even when the peaking unit is not in service, resulting in additional emissions of GHGs and other pollutants. Continuous operation of an auxiliary boiler at a peaking duty facility like Shady Hills would make no sense, given that the turbines are only sporadically called into service. If the unit is not kept warm by an auxiliary boiler, however, the time frame startup is approximately 90 minutes[2]—far too long for a facility like Shady Hills that is designed to meet peak demand during caused by circumstances such as extremely hot or cold weather, emergencies, maintenance or other outages at the other power serving the grid.

Therefore, the EPA agrees with the applicant's assessment that use of CCCT "fast start" technology would not meet the basic purpose of the project; and would, therefore, redefine the source.

Finally, the EPA disagrees with the commenter that CCCTs should be considered in the BACT analysis for this project. Page 8 of the Preliminary Determination describes the rationale for not considering CCCTs as part of the BACT analysis. The main argument is the intrinsic design and purpose of the Shady Hills facility, which is intended to operate as a peaking facility.

4. **Comment:** *<u>The Region Must Consider Energy Storage in Lieu of Natural Gas Peakers</u>*

The Region must consider modern energy storage units in step 1 of the BACT analysis. If, as the Applicant states, the purpose of the project is to provide peaking capacity, then zero-emission energy storage units may provide that service with far lower emissions. The California Energy Storage Alliance (CESA) has issued an analysis showing the numerous capabilities and advantages that energy storage has compared to simple-cycle units such as the LMS 100. The technology could feasibly meet the business purpose of the Applicant to provide peaking capacity with almost no emissions of GHGs. Energy storage is commercially available, as demonstrated in part by a recent California Public Utilities Commission decision directing public utilities to acquire 1,325 MW of energy storage by 2020. Energy storage would also alleviate the natural gas supply reliability issues that the Applicant uses to justify reliance on fuel oil backup.

The Region must include energy storage as an identified technology for providing peak capacity energy services for purposes of its BACT analysis.

Response: EPA disagrees with the commenter's assertion that *"[energy storage] technology could feasibly meet the business purpose of the Applicant to provide peaking capacity with almost no emissions of GHGs."* From information found in CESA's website[3], some advanced energy storage technologies are advanced batteries, thermal energy storage, and flywheels. However, the EPA believes that application of these developing technologies, especially energy storage, is a site-specific decision.

We note the following information regarding energy storage provided by the applicant on December 12, 2013:

> "*Energy storage fails to meet the needs of the project purpose on the ability to provide an equivalent MW output and the ability to deliver the peak power on a frequency and*

[2] Oakley Generating Station Preliminary Determination of Compliance, Oct 2010, http://www.baaqmd.gov/~/media/Files/Engineering/Public%20Notices/2010/20798/PDOC/OakleyPDOCoct2010.ashx?la=en
[3] http://www.storagealliance.org/node/4

duration that may be needed during summer months or on cold days when the power consumption load is high. The limited duration of energy availability from energy storage to meet demand would be insufficient to replace the functionality and utility of a gas/oil peaking generation facility."

While energy storage is available in the form of pumped water, compressed air, and battery storage, it first requires generation and the transfer of the energy to storage, and would also need to be frequently recharged. Fossil fuel generation would most likely be used to recharge a storage facility in Florida. Florida's flat terrain is not conducive to the development of pumped storage where two water reservoirs at different elevations are required. Nor is there sufficient additional land or surplus water available for a pumped water storage system at or near the Shady Hills Generating Station site. Traditional compressed air systems require geological formations for air storage, and to our knowledge, there are no such geological formations present near the project site. The largest battery storage systems, including the 64-megawatt Laurel Mountain Wind Farm (W. Virginia) and the 36-megawatt Notrees Wind Farm and Battery Facility (Texas) are an order of magnitude less than the proposed project. As such, considering energy storage as an alternative would result in redefining the project.

EPA concurs with these statements from the applicant regarding energy storage, and its viability for the Shady Hills project. Thus, EPA disagrees with the commenter that zero-emission energy storage should be considered as part of the BACT analysis for the Shady Hills project because it does not fulfill the purpose of the source and would therefore constitute a redefinition of the source.

5. **Comment:** <u>*The Record Indicates that the Project Can Meet a Better GHG BACT Limit*</u>

Table 6-1 of the SOB indicates that GE 7FA.05 can meet a much better heat rate than permitted. The table indicates a heat rate of 8,848 Btu/kWh (HHV). Assuming an emission factor for GHG of 53.02 kg CO2e/MMBtu (40 CFR Part 98, Table C-1 and C-2), this equates to a CO2e rate of 1,034 lb/MWh. However, the permit inexplicably increases this rate by 33% to a permitted rate of 1,377 lb/MWh. The SOB includes a statement that the Applicant included a 3% percent margin for the difference between vendor heat rates and actual heat rates, plus another 5% margin for degradation over time. (SOB at p.19.) This 8% marginal increase does not come close to explaining the huge 33% increase in emission limit over the heat rate data provided in Table 6-1 of the SOB.

Response: The EPA set the GHG BACT limit of 1,377 lb CO_2e/MWh on a gross output basis under normal operating conditions (approximately 75% load) when firing natural gas. This limit provides an 8% margin of compliance, not the 33% suggested by the commenter. See Table 3 of the application.

The commenter's misconception regarding the margin of compliance is based on (1) a typographical error in the preliminary determination and (2) an incorrect comparison of underlying heat rate values. The typo appears on page 17 of the preliminary determination in Table 6-1 *Efficiency from Available Turbines Options*. The table erroneously reported that the 7FA.05 heat rate was 8,848 Btu/kWh, whereas the correct heat rate is 9,910 Btu/kWh (see Table 2 and 2a in the application). Regardless, the information in Table 6-1 is not the basis of the BACT emission limit. The heat rate information in Table 6-1 is at full load (100%) and on a net generation basis. The BACT limit, on the other hand, was set on a gross generation basis under normal operating conditions (approximately 75% load). See preliminary determination on page 18 and the application at Tables 2 and 3.

6. Comment: *The Region Improperly Considered Adverse Economic and Environmental Impacts*

The Region asserts that more efficient turbine designs should be eliminated as BACT based on higher costs, increased water usage, and higher NO_x emissions. (SOB at p.18.) However, the NSR Manual makes clear that the Region's rationale for establishing BACT based on more efficient units for the Shady Hills Project is not valid.

a) Economic Impact
The Region's analysis concluded that installing more efficient LMS6000 units would be $286.8 per ton of CO2e removed, and installing the LMS100 would cost $61.9 per short ton of CO2e removed. (SOB at p. 18) Cost considerations in determining BACT should be expressed in terms of average cost effectiveness. *NSR Manual* at B.36; *see, also, Inter-Power of New York, Inc.*, 5 E.A.D. 130 at 136 (1994). However, the Region makes no attempt to compare the costs of CO2 removed to other comparable units. The Region must consider the average cost effectiveness of more energy efficient units compared to the costs borne by other similar facilities. The Region cannot recite the cost per ton of CO2 removed and reject that added costs without further consideration or analysis. The NSR Manual expressly rejects this approach:

BACT is required by law. Its costs are integral to the overall cost of doing business and are not to be considered an afterthought. Consequently, for control alternatives that have been effectively employed in the same source category, the economic impact of such alternatives on the particular source under review should be not nearly as pertinent to the BACT decision making process as the average and, where appropriate, incremental cost effectiveness of the control alternative.12

The Region must base its BACT decision on the average cost effectiveness of energy efficient units, expressed in terms of $/ton of CO2 removed or avoided. Although the Region included this information in the SOB, the Region did not attempt to evaluate whether the cost effectiveness of installing more efficient units was atypical compared to the costs borne by other sources of the same type. The Region merely concluded without discussion that the costs were too high. This rationale does not meet BACT requirements to reject a technology for adverse economic impacts.

The EPA guidance makes clear that energy efficiency must be considered in the BACT analysis. The NSR Manual provides: "The reviewing authority…specifies an emissions limitation for the source that reflects the **maximum degree** of reduction achievable…" (NSR Manual, p.B.2 (emphasis added)). Without a showing that the most efficient design is either technically infeasible or that it should be eliminated due to disproportionate site-specific energy, economic or environmental impacts, the Region must set the GHG BACT emission rate limit based on the most efficient turbine design.

When determining if the most effective pollution control option has sufficiently adverse economic impacts to justify rejecting that option and establishing BACT as a less effective option, a permitting agency must determine that the cost-per-ton of emissions reduced is beyond "the cost borne by other sources of the same type in applying that control alternative." *NSR Manual* at B.44; *see also Steel*

Dynamics, Inc., 9 E.A.D. 165 at 202 (2000)*; Inter-Power*, 5 E.A.D. at 135 ("In essence, *if the cost of reducing emissions with the top control alternative, expressed in dollars per ton, is on the same order as the cost previously borne by other sources of the same type in applying that control alternative, the alternative should initially be considered economically achievable, and, therefore, acceptable as BACT*." (quoting *NSR Manual* at B.44) (emphasis original)). This high standard for eliminating a feasible BACT technology exists because the collateral impacts analysis in BACT step 4 is intended only as a safety valve for when impacts unique to the facility make application of a technology inapplicable to that specific facility. To reject the more efficient turbines, BACT requires a demonstration that the costs of pollutant removal are disproportionately high for the specific facility compared to the cost of control at other facilities. No such comparison was made here.

The average cost effectiveness calculated by the Applicant does not necessarily constitute an adverse economic impact unless it is disproportionate to the cost-per-ton of CO2 avoided at other facilities. At a minimum, to reject more efficient turbines at the Shady Hills Project when other facilities will be using the same technology, the applicant must demonstrate—with actual data—that the cost per ton at the Shady Hills Project is disproportionate to other facilities.

b) Environmental Impact

Similarly, there are no identified adverse environmental impacts from the Shady Hills Project's installation that warrant rejection of more efficient turbines based on adverse environmental impacts. The SOB asserts that the Applicant would need to install additional NOx and CO controls if it selected more efficient technologies (SOB at p.18). However, there is nothing to suggest that the Applicant would be unable to install those controls, and therefore no valid basis for rejecting more efficient turbines based on those emissions. A potential increase in criteria pollutants is not a valid basis for rejecting a feasible control technology due to adverse environmental impacts. As the NSR Manual expressly states, the "environmental impacts analysis is not to be confused with the air quality impacts (i.e. ambient concentrations)…" In this case, whether more efficient turbines would increase some criteria pollutants does not constitute an adverse environmental impact because Applicant can control those emissions with other technologies.

In addition, the Region cites to the increased water requirements of the LMS100 and LMS6000 as a basis for rejecting more efficient turbines. As a preliminary matter, the Region should have considered other turbine manufacturers and designs that use more efficient air cooled systems. Even the LMS100 unit considered by the Region is capable of air-cooling. The vendor, GE, states no efficiency impact from air cooling if the air cooling system equipped with a misting system (swamp cooler). The swamp cooler allows the air cooled system to match wet tower performance at high ambient temperatures while using almost no water relative to a wet tower. The air cooler can match wet tower performance at moderate temperatures without misting. The air cooler fans can be shut off at ambient temperatures of 40 F or less according to the LMS100 manufacturer (GE). This is a significant GHG advantage for the air-cooled system, as the wet tower would need to continue to operate both the water circulation pumps and the large diameter fans in each cooling tower cell. This is especially significant for projects that have been permitted to operate a high number of hours, for example 5,000 hr/yr in the Shady Hills draft permit, because a substantial portion of those hours in most parts of the country will occur at ambient temperatures in the range of 40 F or less. Finally, past analyses of air-cooled systems have shown that they are actually less expensive than traditional wet-cooled systems.

Even if the only available efficient turbines did require more water use, which is not the case, the Region does not provide any indication that increased water usage would constitute a significant impediment to the project. There is nothing in the record suggesting that water is limited for the Shady Hills Project, and there are no other identified significant or unusual impacts from the use of more efficient turbines. Therefore, there is no basis to reject more efficient turbines due to adverse environmental impacts

Response: The EPA agrees that where a control technology has been successfully applied to similar sources in a source category, a finding that such technology is not cost-effective for a particular source typically should be based on the permitting agency's determination that the cost-per-ton of emissions reduced is beyond "the cost borne by other sources of the same type in applying that control alternative." The EPA draft NSR Manual at page B.44. However, the EPA's March 2011 *PSD and Title V Permitting Guidance for Greenhouse Gases* recognizes the lack of reliable GHG cost-effectiveness data because of the limited history of BACT analysis for GHG and concludes that "it may be appropriate in some cases to assess the cost-effectiveness of a control option in a less detailed quantitative (or even a qualitative) manner. Guidance at 42. Moreover, the NSR Workshop Manual is not a binding regulation that dictates how the economic impacts analysis must be conducted in all cases. See draft NSR Workshop Manual, at 1 (October 1990) (first paragraph of Preface); *In re: City of Palmdale (Palmdale Hybrid Power Project)*, PSD Appeal No. 11-07, Slip. Op. 54 n. 39 (EAB Sept. 17, 2012).

<u>*Economic Impacts*</u>
As the commenter's notes, the Region did consider the cost per ton of removing CO_2 from more energy efficient and smaller turbines such as the LM6000 and the LMS100 SCCTs. The applicant calculated the average cost effectiveness (above the baseline GE7FA turbine model) of avoiding CO_2 emissions from the LM6000 and the LMS100 turbine models as $286.8/ton and $61.9/ton, respectively. As discussed below in the environmental impacts section, the additional generation of NO_x and CO from the operation of the LM6000 and LMS100 turbines was also a factor when considering the feasibility of these particular SCCT models. In addition to the costs included in the calculation of the average cost effectiveness values provided by the applicant, EPA believes it is appropriate to consider the additional cost of controlling the excess NO_x and CO emissions associated with the use of the smaller, more efficient turbines as part of the economic analysis. In this case, the likely options for controlling NO_x and CO emissions would be use of Selective Catalytic Reduction (SCR) and Catalytic Oxidation systems, respectively. According to the application (page 21), these additional costs include such items as higher maintenance and operation costs and the periodic cost of catalyst replacement. The EPA also believes the additional capital costs associated with the control systems as well as the cost of a large amount of additional water usage (165,000 gallons per day) associated with the use of the LMS100 can be considered in the economic analysis.

Given the cost effectiveness value of $286.8/ton as well as the other identified costs associated with the use of the LM6000, EPA did not consider this option to be economically feasible. Additionally, the EPA did not consider the LMS100 to represent BACT after considering both the cost of removing CO_2e and the adverse environmental impact resulting from the excess water usage (330,000 gallons per day, almost twice as much as the proposed 7FA.05). As stated in the preliminary determination, the EPA selected GE's 7FA.05 CT as the most effective control technology after *"considering the higher costs for removing GHG emissions, the increased water* *usage, and the higher NO_X emissions."* See the BACT analysis in the Preliminary Determination & Fact Sheet, pp 12-19, and the applicant discussion in their BACT analysis pp. 6-22.

Environmental Impacts

Regarding the environmental impacts, the Region disagrees with the commenter's position that "*a potential increase in criteria pollutants is not a valid basis for rejecting a feasible control technology."* In the PSD and Title V Permitting Guidance for Greenhouse Gases[4], page 39, the EPA said *"EPA has recognized that consideration of a wide variety of environmental impacts is appropriate in BACT Step 4, such as solid or hazardous waste generation, discharges of polluted water from a control device, visibility impacts, demand on local water resources, and emissions of **other pollutants subject to NSR** or pollutants not regulated under NSR such as air toxics."* (emphasis added). Consistent with this guidance, EPA believes it is appropriate for the Shady Hills BACT analysis to consider the environmental impacts of a potential increase in other pollutants subject to NSR (*i.e.*, criteria pollutants).

The Region disagrees with the commenter's suggestion that EPA consider an air cooling system equipped with a misting system (or swamp cooler) as an alternate technology for less water consumption. The purpose of the water needed to operate the LMS100 turbine, as described in the application and the preliminary determination, is for both NO_x emission control as well as inter-cooling. While a swamp cooler will be able to promote inter-cooling of the unit, its purpose does not include NO_x emission control. Furthermore, the greatest advantages of the evaporative cooling from a misting system are obtained in hot, dry climates.[5] The Shady Hills facility is located in Florida, characterized by its hot (average annual temperature in Tampa is 73.4 deg F[6]) and humid climate (average relative humidity in Tampa is 58%[7]). The commenter does not demonstrate that such a system would work in Florida, which is hot, but humid. Additionally, the commenter noted that a *"significant GHG advantage of the air-cooled system"* is that its *"air cooler fans can be shut off at ambient temperatures of 40 F or less according to the LMS100 manufacturer."* This advantage would not apply to the Tampa area, where sustained temperatures below 40 F are rare.. Furthermore, this discussion by the commenter seems to be referring to use of a *"cooling tower,"* which is generally installed at the end of an exhaust gas stream and is not the same as an in-line evaporate cooling system. A cooling tower is not proposed as part of the Shady Hills project.

The commenter argued that the Region did not provide any indication that increased water usage would constitute a "*significant impediment to the project"* [emphasis added]. A *significant impediment* is not the standard for rejecting a control technology in Step 4. The permit application indicates that the water requirement to run the four LMS100s is estimated to be around 330,000 gallons per day, which the EPA considers a high demand on local water resources resulting in adverse environmental impact.[3] The applicant furthers explains that *"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"* and that *"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*."[Permit application at 12] The Region agrees with the applicant

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[4] PSD and Title V Permitting Guidance for Greenhouse Gases, March 2011, p. 39, http://www.epa.gov/nsr/ghgdocs/ghgpermittingguidance.pdf

[5] GE Oil & Gas Evaporative Cooler, http://site.ge-energy.com/businesses/ge_oilandgas/en/literature/en/downloads/evaporativecooler.pdf

[6] NOAA website, http://www.srh.noaa.gov/images/tbw/climate/tpaannnorm.pdf

[7] The Southeast Regional Climate Center, http://www.sercc.com/climateinfo/historical/avgrh.html

that these additional environmental impacts are valid and should be considered in Step 4 of the BACT analysis for the Shady Hills project.

Finally, the EPA disagrees with the commenter's main assertion that the Region improperly considered adverse economic and environmental impacts. The Region properly and extensively supported the selection of the GE 7FA.05 as the most effective of the SCCT options considered in the application after taking into account economic and environmental impacts

7. **Comment:** _The Region Improperly Rejected CCS as a Technologically Infeasible Alternative_

The Region rejected carbon capture and sequestration (CCS) on the basis of an analysis conducted on an entirely different simple-cycle unit in California, the proposed Pio Pico plant. (SOB at p.15.) There is no site-specific engineering analysis to support the Region's conclusion that "post-combustion capture is infeasible due to the variable operation of simple cycle combustion turbines and flue gas cooling and heat integration issues." (SOB at p.15.) The Region must revise its analysis to consider BACT based on CCS. Even though the Applicant provided cost data on CCS, the Region did not perform any economic analysis because it rejected CCS in step 2 of the BACT analysis. The Region must redo its BACT analysis to consider the economic cost effectiveness of CCS, and it must allow the public an opportunity to comment on the CCS cost analysis.

Response: As explained in the preliminary determination, CCS was deemed technically infeasible by EPA based on the three different elements of the CCS process (*i.e.*, carbon capture, carbon transportation, and carbon storage). The preliminary determination (on page 16) concludes that *"based on the technical barriers to capture CO_2, as identified and discussed in Pio Pico permit documents, as well as the potential concerns raised by the applicant regarding CO_2 transportation in Florida and the* [storage] *capabilities of the nearest geologic storage (Sunniland Trend), the EPA has determined that CCS is technically infeasible."* The preliminary determination identified other concerns with feasibility, noting (on page 15) that *"all current CCS projects for power plants are either in the demonstration stage or newly permitted and there have been no CCS demonstrations on simple cycle combustion turbines."* Lastly, logistical hurdles for implementing CCS were also described in the preliminary determination at 15.

Furthermore, the preamble to the Proposed GHG NSPS for EGUs, 79 FR 1430 (January 8, 2014), states that CCS technology has primarily been applied to gas streams that have a relatively high to very high concentration of CO_2 (such as that from a coal combustion or coal gasification unit). The concentration of CO_2 in the flue gas stream of a coal combustion unit is normally about four times higher than the concentration of CO_2 in a natural gas-fired unit. Natural gas-fired stationary combustion turbines also operate differently from coal-fired boilers and IGCC units of similar size. The preamble observes that the NGCC units (Shady Hills will operate simple cycle combustion turbines not combined cycle) are more easily cycled (*i.e.*, ramped up and down as power demands increase and decrease). Moreover, adding CCS to a NGCC unit may limit the operating flexibility, in particular during the frequent startups/shut-downs and in the rapid load changes required for such units. This cyclical operation, combined with the already low concentration of CO_2 in the flue gas stream, means that we cannot assume that the technology can be easily transferred to NGCC without larger scale demonstration projects on units operating more like a typical NGCC. The technical hurdles for applying CCS to NGCCs confirm that CCS is also technically infeasible for natural gas-fired simple cycle combustion turbines.

Since CCS was eliminated in Step 2 of the BACT analysis, a cost analysis is not needed. However, the applicant submitted a cost analysis for CCS as part of the application, and that analysis was included in the administrative record that was available for public comment.

8. **Comment:** *The BACT Requirement to Consider Cleaner Fuels Precludes the Use of Fuel Oil Absent Stringent Restrictions*

Draft permit Condition IX.B(3) would allow the Shady Hills project to operate using fuel oil for up to 1000 hours on a 12-month rolling total. There are no restrictions on what conditions must be present for Applicant to operate the facility on fuel oil, and there is no definition in the draft permit for what constitutes an "emergency" that would require the use of backup fuel oil. This permit condition therefore substantially increases the potential GHG emissions at the facility.

The SOB includes a brief discussion of the costs associated with 100% non-interruptible natural gas supply. However, the Region does not include any analysis of the need for 1,000 hours of backup fuel, nor does it establish the conditions necessary for operation of the units on fuel oil. The draft permit would allow the Applicant to operate the Shady Hills facility on fuel oil whenever it is cheaper to do so. This proposed operation of the facility does not comply with the Clean Air Act's requirement that facilities operate with the best available control technologies. The draft permit clearly acknowledges that the use of natural gas as a fuel source is an inherently lower emitting practice than the use of fuel oil because it sets different GHG emission rates. The draft permit's GHG limit is 40% higher for fuel oil than for natural gas, and the fuel oil limit of 1,928 lb CO2e/MWh does not even come close to meeting the proposed new source performance standard of 1,100 lb/MWh for small stationary natural gas fired units. In short, fuel oil is an outdated and dirty technology that does not meet the requirements that the facility comply with BACT limits.

Despite the obviously higher pollution from fuel oil use, the Region does not provide any restrictions on the use of fuel oil, other than an arbitrary cap of 1000 hours on a 12-month rolling average. This means that the facility can operate on fuel oil up to 1000 hours annually regardless of whether there is any emergency, any limit to natural gas supply, or any risk of electric system reliability. The Applicant can simply switch to fuel oil whenever it decides that fuel oil is cheaper. The top-down BACT analysis does not allow this condition. The Region must set limits based on the technologies that are feasible. In this case, the use of natural gas fuel is clearly feasible because it is the primary purpose of the plant. The Region rejects "100% use" of natural gas based on the determination that such a requirement would be economically infeasible (SOB p.17) However, the draft permit's conditions are not narrowly tailored to alleviate the concerns of reliability and natural gas supply disruption. Even if it were reasonable to allow the use of fuel oil in an emergency, such as a pipeline disruption caused by a hurricane, the draft permit's allowance of up to 1000 hours every year is completely arbitrary and would allow Applicant to operate on fuel oil even absent any reliability and risk concerns.

The Region must revise the permit condition allowing the use of fuel oil to state that fuel oil may only be used during times of natural gas supply disruption due to emergency, and in no case may the use of fuel oil exceed 100 hours annually. The Region should also include a definition of "emergency" conditions that warrant use of backup fuel oil, and that definition should specify that high natural gas prices are not by themselves an emergency. Fuel oil should only be used in cases of true emergency that disrupts the ability to deliver natural gas to the Shady Hills facility. BACT requires the best available technology, and in this case the facility must operate on natural gas fuel unless it is infeasible to do so.

Response: The commenter is correct in noting that the permit does not restrict the use of ULSD to only emergency situations. Consequently, EPA did not define the term "emergency" for the purpose of using ULSD in the turbines. Rather, the combined 1,000-hour annual limit for both turbines is based on site specific operational and contractual constraints as described in additional information submitted by the applicant in response to EPA's incompleteness determination and request for additional information. See the response letter dated November 30, 2012 to EPA's incompleteness letter and the response to additional information dated March 27, 2013 in the administrative record. In the response letter dated November 30, 2012, the applicant included an addendum to the BACT analysis exploring 100% non-interruptible (also referred to as *firm transportation*) natural gas operation as a potential control option. As described, the applicant's intent for having ULSD fuel oil as the back-up fuel is to enhance *"the reliability of the plant to generate electricity when needed to meet demand in the event of [natural gas] unavailability"* as well as to provide flexibility when natural gas is not available. The response, then, discussed the economic and practical implications of procuring 100% non-interruptible natural gas, such as additional costs (2.5 times higher than interruptible transportation) and the impracticality of having 100% non-interruptible natural gas in a peaking facility which operates only part of the year. The response letter dated March 27, 2013 confirms that the addendum titled *Fuel Oil Alternative Request* dated May 2011 and originally submitted to Florida Department of Environmental Protection as part of the construction permit application is also considered as part of the GHG PSD permit application submitted to the EPA. In this addendum, the applicant further explains the decision process to use ULSD fuel oil to fire the SCCTs, and states that the offtakers/customers "*will operate the units on natural gas when interruptible natural gas transportation service is available. In the event interruptible natural gas transportation is not available and customer load demand is high, the offtaker would likely dispatch the units on fuel oil."*

In other words, because cost and practical considerations require that the facility rely on *interruptible* natural gas, there will be times other than during emergencies that natural gas will be unavailable to the facility. According to the applicant, an allowance to operate up to a combined 1,000 hours per year (for both turbines) using ULSD fuel oil is necessary to ensure that the facility will be available to provide peak duty service even when interruptible natural gas is unavailable. [Refer to Addendum *Fuel Oil Alternative Request* dated May 2011]

The commenter has not provided any support for their suggested limit of 100 hours of ULSD per year per CT nor any documentation for why this limit is more appropriate for this project than that proposed by the applicant. Based on EPA experience with power plants in the state of Florida, the proposed use of the combined 1,000 hours of ULSD fuel oil on a 12-month rolling total for both turbines, is justified to accommodate circumstances when natural gas in unavailable

Finally, the commenter states that the proposed BACT limit does not meet the recently proposed NSPS for new electric generating units (signed September 20, 2013). Please refer to the response to Comment #1 regarding potential applicability of this Rule to this facility.

9. Comment: <u>*Startup and Shutdown Periods Are Not Specified*</u>

The draft permit Condition IX.C allows 21 tons CO2e per event. However, there is no limit on the number of events permissible, and the draft permit does not specify whether Startup and Shutdown contributes to total annual operating hours and at what point those hours begin. The Region should clarify in the draft permit that all hours of startup and shutdown apply to the total annual operating hours for the plant. The assumption in the SOB that startup and shutdown will last 15 minutes on average and that an estimated 250-300 startup-shutdown events are expected is not an enforceable condition in the permit. (SOB at 19)

Response: Based on information provided by the applicant in their response letter dated November 30, 2012 to the EPA's incompleteness determination, the approximate time for starting up and shutting down is 15 minutes per event. To calculate PTE during startup and shutdown events, the applicant used a range of 250-300 startup/shutdown cycles annually. Due to the nature of this facility and its purpose, limiting the number of events may hinder the facility from operating as it is intended, as a peaking plant. Furthermore, since the BACT limit for startup/shutdown is a TPY limit per event, it is unnecessary to limit the time (*e.g.,* 15 minutes) for each event as it will not affect the overall emissions associated with each event. The EPA revised the final permit to include a statement clarifying that the hours the plant operates during startup and shutdown count toward the overall limit on total annual operating hours for EU 005 and 006. Condition IX.D.3. was added to the permit:

> *Total time (hours) during startup and shutdown shall be included in the total hours of operations as determined in Condition IX.B.2. When ULSD oil is used during startup or shutdown, the total time (in hours) of such use shall be included in the limit on hours of operation firing ULSD oil in Condition IX.B.3.*

In addition, as requested by the commenter, EPA revised the definitions of *startup* and *shutdown* in the permit to provide more specificity regarding the point at which these periods begin (and end). Conditions IX.C.1 and 2. now read:

1. *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% load.*

2. *Shutdown occurs on the minute when the CT load is less than 50% load until the minute that fuel flow to the CT stops.*

Comments Submitted by EFS Shady Hills LLC on the Draft Permit

10. Comment:

Page 1, first paragraph, the applicant should be corrected as follows:

> ***"~~Shady Hills Power Company, LLC~~ EFS Shady Hills LLC***
> ***800 Long Ridge Road***
> ***Stamford, Connecticut, 06927***

Response: The EPA agrees with the applicant on the change requested. The applicant name in the draft permit was changed from Shady Hills Power Company, LLC to EFS Shady Hills LLC.

11. Comment:

Page 1, first paragraph; Page 2, Project Location, and Page 2, Project Description, 2nd paragraph, the facility is located outside of the City limits of City of Spring Hill and therefore the applicant requests the following correction:

> ***"…to construct and operate Greenhouse Gas (GHG) air emissions units as a modification to the existing Shady Hills Generating Station located at 14240 Merchant Energy Way ~~within~~ near the City of Spring, in Pasco County, Florida."***

Response: The EPA agrees with the applicant on the change requested. The Project Location and Project Description were changed to incorporate the revision above.

12. Comment:

Page 2, under heading "Authority", the applicant should be corrected as follows:

> ***"…This permit is based upon application materials submitted to the EPA by "~~Shady Hills Power Company, LLC~~ EFS Shady Hills LLC (Shady Hills),…"***

Response: The EPA agrees with the applicant on the change requested. The applicant name in the draft permit was changed from Shady Hills Power Company, LLC to EFS Shady Hills LLC.

13. Comment:

Page 2, under heading "Authority", the applicant should be corrected as follows:

> ***"~~Shady Hills Power Company, LLC~~ EFS Shady Hills LLC***
> ***800 Long Ridge Road***
> ***Stamford, Connecticut, 06927***

Response: The EPA agrees with the applicant on the change requested. The applicant name in the draft permit was changed from Shady Hills Power Company, LLC to EFS Shady Hills LLC.

14. Comment:

Page 2, second paragraph under heading "Project Location" The facility is located outside of the City limits of the City of Spring Hill and therefore the applicant requests the following correction"

> ***"~~Shady Hills's project~~ The existing facility and the project ~~will be~~ are located at ~~the existing Shady Hills Generating Station located at~~ 14240 Merchant Energy Way ~~within~~ near the City of Spring Hill, in Pasco County, Florida."***

Response: The EPA agrees with the applicant on the change requested. The Project Location description was changed as shown below.

> ***The existing Shady Hills's facility and the project ~~will be~~ are located ~~the existing Shady Hills Generating Station located~~ at 14240 Merchant Energy Way near the City of Spring Hill, in Pasco County, Florida.***

15. Comment:

Page 2, first paragraph of "Project Description." The applicant requests that the ISO conditions be added to heat input referenced as follows:

> ***"2,135 million British thermal units per hour (MMBtu/hour), high heating value (HHV) at 59 deg. F, 60% relative humidity (ISO conditions)"***

Response: The EPA agrees with the applicant on the change requested. The Project Description was changed as requested above.

16. Comment:

Page 2, first paragraph of "Project Description." The applicant request the indication of the number of circuit breakers be corrected as follows:

> ***"…an SF6 circuit breakers (EU10),…"***

Response: The EPA agrees with the applicant on the change requested. The Project Description was changed as requested above.

17. Comment:

Page 2, last sentence of "Project Description." The applicant requests clarification of the operation of the existing facility with the following correction:

> ***"…The facility has been in operation since 2002 and operates usually during peak hours of electrical use."***

Response: The EPA agrees with the applicant on the requested change regarding the operation of the existing facility. The Project Description was changed as shown below:

> ***The existing facility has been in operation since 2002 and operates usually during peak hours of electrical use.***

18. Comment:

Page 4, Condition III.A. Facility Operation. The facility does not operate air pollution control devices for GHG emissions and as such requests that "including associated air pollution control equipment," be removed as follows:

> ***"A. At all times, including periods of startup, shutdown, shakedown, and malfunction, Permittee shall, to the extent practicable, maintain and operate the facility~~, including associated air pollution control equipment,~~ in a manner consistent with good air pollution control practices for minimizing emissions…"***

Response: The EPA agrees with the applicant on the change requested. Shady Hills does not operate and is not planning on installing any air pollution control equipment for GHGs. The Project Description was changed as requested above.

19. Comment:

Page 4, Condition III.C. Facility Operation. The applicant is not requesting any change to the condition language, but offers the following understanding of the requirement. The required facility operation and maintenance plan will be developed and implemented based on manufacturer's specifications and will be maintained on site.

Response: The EPA has the same understanding of this condition. No changes were made to Condition III.C.

20. Comment:

Page 4, Condition IV.A. Malfunction Reporting. The facility does not operate air pollution control devices for GHG emissions and as such requests that the "failure of air pollution control" criteria be removed from the reporting requirement as follows:

> ***A. "Permittee shall notify the EPA Region 4 via the contact information provided in Condition X: AGENCY NOTIFICATIONS within two (2) calendar days following the discovery of any failure of ~~air pollution control equipment or~~ process equipment, or failure of a process to operate in a normal manner, which results in an increase in emissions above the allowable emission limits stated in Condition IX: SPECIAL CONDITIONS of this permit."***

Response: The EPA agrees with the applicant on the change requested. Shady Hills does not operate and is not planning on installing any air pollution control equipment for GHGs. The Project Description was changed as requested above.

21. Comment:

Page 4, Condition IV.C. The applicant requests the inclusion of "agency discretion" in evaluating circumstances involving a malfunction as follows:

> ***"C. Compliance with this malfunction notification provision shall not excuse or otherwise constitute a defense to any violation of this permit or any law or regulation such malfunction may cause. The Agency may exercise its enforcement discretion in evaluating the circumstances involving a malfunction."***

Response: The EPA does not agree with the applicant on the requested change. The purpose of Condition IV.C. is to clarify that compliance with the permit's malfunction reporting requirements does not absolve the permittee from liability regarding any violations that may have resulted from the malfunction. The Clean Air Act contemplates continuous compliance with all conditions contained within a PSD permit. In turn, the EPA expects all violations to be addressed, as appropriate, considering the specific circumstances of any violation. Therefore, it is not appropriate for the permit to include a blanket statement regarding potential enforcement discretion.

22. Comment:

Page 6, IX.A. Special Conditions. Air pollution Control Equipment and Operation. The facility does not operate air pollution control equipment for GHG emissions and as such the applicant requests that the title of this condition be renamed as follows:

> ***"IX. Special Conditions, A. ~~Air pollution Control Equipment and~~ Operation"***

Response: The EPA partially agrees with the applicant on the requested change regarding the title for Condition IX.A. It was changed as shown below:

> ***"IX. Special Conditions, A.Air Pollution Control and Equipment Operation***

23. Comment:

Page 6, IX.B.1. Special Conditions. Combustion Turbine (EU 005 and 006) Emission Limits. EFS Shady Hills LLC requests that the "shakedown period," as defined in Permit Condition IX.1., be included in Conditions IX.B.1. as follows:

> ***"Except as noted below under Condition IX.C, on and after the date of initial startup and the successful completion of the shakedown period, Permittee shall not discharge or cause the discharge of emissions from the SCCT Units into the atmosphere in excess of the following:***

Response: The EPA partially agrees with the applicant on the requested change regarding the inclusion of "shakedown period" into Condition IX.B.1. Refer to Condition IX.I for the definition of "shakedown period". The Condition was changed as shown below:

> ***1. Except as noted below under Condition IX.C. and Condition IX.I., on and after the date of initial startup and completion of the shakedown period, Permittee shall not discharge or cause the discharge of emissions from the SCCT Units into the atmosphere in excess of the following:***

24. Comment:

Page 6, IX.B.1. Combustion Turbines (EU 005 & 006) Emission Limits. The applicant requests that a footnote be added to the table to identify that the limits of 1,377 lb CO2e/MWh gross output and 1,928 lb CO2e/MWh gross output are based on ISO conditions.

Response: The EPA agrees with the applicant on the requested change on the footnote of the table in Condition IX.B.1. The EPA revised the table as follows:

~~Normal Operation~~* ***GHG Emission Limit per CT on gross output basis and corrected to ISO conditions****	***~~Emission Limit (per CT)~~*** ***~~(N~~natural gas firing~~)~~*****	***~~Emission Limit (per CT)~~*** ***~~(~~ULSD oil burning~~)~~*****
	1,377 pounds (lb) of carbon dioxide equivalent (CO_2e) per megawatt-hour (MWh) ~~gross output~~ *(12-month rolling average)*	*1,928 lb CO_2e/MWh ~~gross output~~* *(12-month rolling average)*

~~ Normal operation is achieved when a CT reaches 50% load or greater.~~*

~~~~*Compliance with the above limits shall be demonstrated in accordance with **Condition IX.E.8.~~9.~~***

25. Comment:

Page 6, IX.B.2. Combustion Turbines (EU 005 & 006) Emission Limits. The hours of operation are currently limited based on a calendar year in the FDEP Permit PSD-FL-402A/1010373-012-AC and as such the applicant requests that the hourly limitations, of Condition IX.B.2, be revised from a rolling 12-month total basis to a calendar year 12-month basis. In addition, the applicant requests the following revision:

2. ***"EU 005 and 006 shall not operate an average of more than 3,390 hours per year per CT on a ~~12-month rolling total~~ calendar year basis. No single unit shall operate more than 5,000 hours per year on a ~~12-month rolling total~~ calendar year basis, when firing natural gas.***
   If only one combustion turbines is installed, it shall operate no more than 3,390 hours per year on a ~~12-month rolling total~~ calendar year basis, when firing natural gas.

   Permittee shall monitor and record the number of hours each CT operates monthly ~~and totalled every month for the previous 12 months~~.

3. ***EU 005 and 006 shall not operate firing ULSD fuel oil more than 1,000 combined hours per year on a ~~12-month rolling~~ calendar year total. The Permittee shall monitor and record the number of hours each CT operates on ULSD monthly ~~and totalled every month for the previous 12 months~~.***

   If only one SCCT is installed, the CT may operate up to 500 hours firing ULSD oil per year on a 12-month rolling total. The single combustion turbine may fire additional 250 hours of ULSD oil, provided that for every hour of ULSD oil fired beyond the 500 hours, the CT must reduce its capability to fire natural gas by five hours (i.e., 5:1 natural gas to ULSD fuel oil ratio)."

Response: The EPA does not agree with the applicant on the requested changes**.** Emission limits which require compliance on a calendar year basis are not practically enforceable or consistent with the PSD program. For long-term emission limitations to be practically enforceable, compliance must be determined, at a minimum, on a 12-month rolling sum basis. This means that each month the emissions of the current month plus (+) the 11 previous months are summed. The EPA did not change Conditions IX.B.2. and 3., as requested by the applicant. However, these conditions were modified as follow for clarification purposes.

2. ***If both, EU 005 and 006 are constructed, they shall not operate an average of more than 3,390 hours per year per CT on a 12-month rolling total basis. No single unit shall operate more than 5,000 hours per year on a 12-month rolling total basis~~, when firing natural gas~~.***

   If only one combustion turbines is installed, it shall operate no more than 3,390 hours per year on a 12-month rolling total basis~~, when firing natural gas~~.

   Permittee shall monitor and record the number of hours each CT operates monthly and totalled every month for the previous 12 months.

3. ***If both, EU 005 and 006 are constructed, they shall not ~~operate firing~~ fire ULSD fuel oil more than 1,000 combined hours per year on a 12-month rolling total. The Permittee shall monitor and record the number of hours each CT operates on ULSD monthly and totalled every month for the previous 12 months.***

If only one SCCT is installed, the CT may operate up to 500 hours firing ULSD oil per year on a 12-month rolling total. The single combustion turbine may fire additional 250 hours of ULSD oil, provided that for every hour of ULSD oil fired beyond the 500 hours, the CT must reduce its capability to fire natural gas by five hours (i.e., 5:1 natural gas to ULSD fuel oil ratio).
{Example: if the single combustion turbine operates on ULSD fuel oil for 750 hours per year on a 12-month rolling total, then it may only operate for only 1,640 hours on natural gas during the same period [(3,390-500)-5(750-500)]}

26. Comment:

Page 7, first full paragraph, appears to have a typographical error – "mist" should be "must" in the last sentence of that paragraph.

Response: The EPA agrees with the applicant on the requested correction. The last sentence of Condition IX.C.3. was corrected as shown below:

The single combustion turbine may fire additional 250 hours of ULSD oil, provided that for every hour of ULSD oil fired beyond the 500 hours, the CT ~~mist~~ must reduce its capability to fire natural gas by five hours (i.e., 5:1 natural gas to ULSD fuel oil ratio).

27. Comment:

Page 7, Condition IX.C.I. Startup is defines as periods when there are excess emissions above the limits in Condition IX.C.3. However, combustion turbine startup is not defined by the presence of excess emissions since emissions limitations for startup are defines in Condition IX.C.3. It is defined by the load of the CT after commencement of operation from a shutdown. The applicant request that the condition of excess emissions be removed from the definition of startup as follows. This language is consistent with the application.

3. ***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 above the limits in Condition IX.C.3~~."***

Response: In the draft permit, the EPA's intent was to define combustion turbine startup consistent with the definition of startup contained within the PSD permit for other regulated pollutants issued by the Florida Department of Environmental Protection. However, the EPA concludes that it is more appropriate to revise the definition of startup and shutdown to reflect what was stated in the original application. Therefore, the EPA did not accept the applicant's recommended language. Condition IX.C.1. and IX.C.2. were revised as follows.

1. ***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 above the limits in Condition IX.C.3.~~ to begin on the minute when fuel is first ignited in the CT and terminates on the minute when the CT reaches 50% load.***

2. ***Shutdown occurs on the minute when the CT load is less than 50% load until the***

minute that fuel flow to the CT stops~~is the cessation of the operation of an emissions unit for any purpose~~.

28. Comment:

Page 7, Condition IX.C.3. Combustion Turbines (EU 005 & 006) Emission Limits. The applicant requests that a footnote be added to the table to identify that the limits of 21 tons CO_2e per event (12-month rolling average) and 28 tons CO_2e per event (12-month rolling average) are based on ISO conditions.

Response: The EPA agrees with the applicant on the requested change on the footnote of the table in Condition IX.C.3. The EPA revised the table as follows:

~~Startup and Shutdown~~ GHG Emission Limit per CT on gross output basis and corrected to ISO conditions*	***~~Emission Limit (per CT)~~ ~~(N~~natural gas firing~~)~~****	***~~Emission Limit (per CT)~~ ~~(~~ULSD oil burning~~)~~****
	21 tons CO_2e per event (12-month rolling average)	28 tons CO_2e per event (12-month rolling average)

* Compliance with the above limits shall be demonstrated in accordance with **Condition IX.E.** ***8.~~9.~~***

29. Comment:

Page 8, Condition IX.D.3., limits operation of EU 007 Emergency Generator to "maintenance and testing purposes, except during an emergency." The Condition further limits annual hours of operation for maintenance and testing to 100 hours per 12-month rolling total. In addition to authorizing operation for maintenance and testing purposes and during emergencies, 40 CFR 63 Subpart ZZZZ also authorizes emergency stationary reciprocating internal combustion engines to operate for emergency demand response (40 CFR § 63.6640(f)(2)), and for up to 50 hours per year in non-emergency situations (40 CFR § 63.6640(f)(4)). In its September 21, 2012, New Source Review for Greenhouse Gasses, EFS Shady Hills LLC discussed its intent to use the emergency generator in certain non-emergency situations, as authorized by 40 CFR 63 Subpart ZZZZ. EFS Shady Hills LLC requests that in addition to allowing EU 007 to operate for maintenance and testing purposes and during emergencies, the Condition also allow EU 007 to operate to the extent permitted by 40 CFR 63 Subpart ZZZZ. EFA Shady Hills LLC proposes the following language to replace the current Condition:

> ***"~~The EU 007 Emergency Generator shall be limited to operation of the engine for maintenance and testing purposes, except during an emergency.~~ Annual hours of operation for ~~emergency stationary reciprocating internal combustion engine(as defined in 40 CFR 63 Subpart ZZZZ)~~*** *EU 007 Emergency Generator* ***for ~~maintenance and testing,~~*** *non-emergency purposes* ***shall not exceed 100 hours per 12-month rolling total.*** *Operation during emergencies is not limited*. ***Permittee shall monitor and record the number of hours the emergency generator operates monthly and totalled every month for the previous 12 months."***

Response: The EPA partially agrees with the applicant on the requested changes. Based on 40 CFR 63.6640(f)(4) use of an emergency stationary RICE for non-emergency purposes is allowed for up to a total of 50 hours per calendar year for area sources of HAPs. These 50 hours of non-emergency use are accounted as part of the 100 hours per calendar year for maintenance and testing and emergency demand response provided in 40 CFR 63.6640(f)(2). Condition IX.D.3. was changed as shown below:

> ***3.*** ***~~The EU 007 Emergency Generator shall be limited to operation of the engine for maintenance and testing purposes, except during an emergency.~~*** ***The EU 007 Emergency Generator may be operated for emergency and non-emergency situations. Combined, the total ~~A~~annual hours of operation ~~for~~ of EU 007 Emergency Generator ~~emergency stationary reciprocating internal combustion engine~~ (as defined in 40 CFR 63 Subpart ZZZZ) for maintenance and testing, emergency demand response, voltage deviation, and non-emergency situations shall not exceed 100 hours per 12-month rolling total, as limited by 40 CFR 63.6640(f)(2) and (4).***
>
> ***EU 007 may be operated for up to 50 hours per 12-month rolling total in non-emergency situations, which will be included in the maximum total annual hours of operation of 100 hours per 12-month rolling total.***
>
> ***Permittee shall monitor and record the number of hours the emergency generator operates as well as the purpose of the operation. Permittee shall calculate the total hours of operation other than for emergency situations monthly and totalled every month for the previous 12 months.***

30. Comment:

Page 8, Condition IX.D.4., requires that the natural gas heater operate at an efficiency of 75% or higher. EFS Shady Hills LLC requests that the condition be based on thermal efficiency consistent with the application and be based on manufacturer's specifications. The following changes to the condition are requested:

> ***"EU 008 Natural Gas Heater shall operate exclusively on natural gas and operate on a thermal efficiency of 75% or higher based on manufacturer's specifications for a new unit."***

Response: The EPA agrees with the applicant on the change requested. Condition IX.D.4. was changed as follows:

> ***EU 008 Natural Gas Heater shall operate exclusively on natural gas and in accordance with manufacturer's specifications, in order to maintain a minimum thermal efficiency of 75% ~~or higher~~.***

31. Comment:

Page 8, Condition IX.D.6. The facility receives gas containing mercaptan. No on site injection of mercaptan is required. As such the applicant requests that the following sentence be removed from the condition:

> ***"…~~Personnel shall treat the natural gas with mercaptan for leak detection by odor.~~"***

Response: The EPA partly agrees with the applicant on the change requested. For clarification purposes, the EPA also added a new language into the condition regarding detected leaks. Condition IX.D.6. was changed as follows:

The on-site pipeline and natural gas supply system pressure shall be monitored and recorded continuously against alarm set points to be determined upon system design and implementation to identify any leaks. Permitte~~sonnel~~ shall use natural gas treated with mercaptan for leak detection by odor. Any detected leaks must be repaired immediately. Records of inspection, detected leaks, and repairs (including action taken and duration) shall be kept in accordance with Condition IX.G.

32. Comment:

Page 8, Condition IX.E.1. The applicant requests further specification of the compliance monitoring system indicating that the CO2e emissions will be estimated based on fuel flow data monitored through 40 CFR Part 75 methodologies. The applicant requests the following revisions:

"Permittee shall install and certify fuel flow monitoring systems ~~required for quantifying CO_2 emissions from~~ on each CT in accordance with the applicable requirements of 40 CFR Part 75, Appendix D, which shall constitute the "compliance monitoring system" for this permit…"

Response: The applicant identified fuel flow continuous monitoring as their compliance monitoring system. The EPA agrees with the applicant on this matter. 40 CFR Part 75, Appendix D. Section 2.1. of Appendix D specifies fuel flowmeter measurements (See Section 2.1.2.) ConditionIX.E.1. was revised as follows.

"Permittee shall install, ~~and~~ certify, operate, and maintain fuel flow monitoring systems ~~required for quantifying CO_2 emissions from~~ on each CT in accordance with the applicable requirements of 40 CFR Part 75, Appendix D, which shall constitute the "compliance monitoring system" for this permit."

33. Comment:

Page 8, Condition E.2 and Page 9, Conditions E.3, E.4, and E.5. The applicant requests that these conditions be revised to reflect the use of fuel flow monitors and calculations of emissions based on equations and emission factors, as follows:

2. ***Following initial certification, the ~~CO_2~~ fuel flow continuous monitoring system shall be quality assured in accordance with the applicable requirements of 40 CFR Part 75.***

3. ***Data from the ~~CO_2~~ continuous monitoring system and the procedure provided in 40 CFR 71.10(a)(3)(ii) (calculation of CO2 emissions using the Equation G4 from 40 CFR 75 Appendix G and calculation of the other GHG emissions (CH4 and N2O) based on the Global Warming Potential (GWP) factors provided in Condition J below shall be capable of producing hourly determinations of CO_{2e} ~~mass~~ emissions in tons per hour (tons/hr).***

4. ***In accordance with §75.62, an initial monitoring plan shall be submitted identifying the methodology for which ~~CO_2 mass emissions~~ fuel flow will be continuously monitored. The initial monitoring plan shall be submitted no later than 21 days prior to the initial certification tests.***

5. ***Permittee shall provide notifications as specified in §75.61 for any event related to the continuous measurement of the fuel flow ~~CO_2~~.***

Response: Based on the revision of Condition IX.E.1., the EPA agrees with the applicant on their request to modify Conditions IX.E.2. through E.5. to replace CO_2 continuous monitoring with fuel flow continuous monitoring. The modified conditions read as follows:

2. ***Following initial certification, the ~~CO_2~~ fuel flow continuous monitoring system shall be quality assured in accordance with the applicable requirements of 40 CFR Part 75.***

3. ***Data from the ~~CO_2~~ fuel flow continuous monitoring system and the procedure provided in 40 CFR 75.10(a)(3)(ii) along with the Global Warming Potential (GWP) factors provided in Condition J below shall be ~~capable of producing~~ used to produce hourly determinations of CO_{2e} ~~mass~~ emissions in tons per hour (tons/hr). The permitte shall calculate CO_2 emissions using the Equation G-4 from 40 CFR 75 Appendix G and CH_4 and N_2O emissions using Equation C-8 from 40 CFR 98 Subpart C.***

4. ***In accordance with §75.62, an initial monitoring plan shall be submitted identifying the methodology for which ~~CO_2 mass emissions~~ fuel flow will be continuously monitored. The initial monitoring plan shall be submitted no later than 21 days prior to the initial certification tests.***

5. ***Permittee shall provide notifications as specified in §75.61 for any event related to the continuous measurement of the fuel flow ~~CO_2~~.***

34. Comment:

Page 9, Condition IX.E.6.b. Since the facility will not operate a CO2e mass emission monitor, and because the issue is addressed in the revisions above, the applicant requests this condition be removed.

Response: The EPA agrees with the applicant. Former Condition IX.E.6.b. was deleted as requested.

~~b. CO_2 mass emission rate (lbs CO_2/hr);~~

35. Comment:

Page 9, Condition IX.E.6.e. Since the facility will use natural gas, the language used in this application should also specify scf as a unit of the amount of fuel burned. The applicant requests the following revision:

"The type (natural gas or ULSD) and amount of fuel (scf or gals) burned."

Response: The EPA agrees with the applicant on the change requested. Condition IX.D.6.e. was changed as requested above.

36. Comment:

Page 9, Condition IX.E.6. Since the ISO corrections will require data regarding ambient conditions, the applicant request the following language be added to the Condition:

"e. Ambient conditions (temperature, humidity, and pressure)."

Response: The EPA agrees with the applicant on the change requested. Condition IX.D.6.f. was added to Condition IX.E.6. as requested above.

37. Comment:

Page 9, Conditions IX.E.7.a. and b. These conditions require that monthly averages of CO2 mass emissions and heat rate be determined and then averaged to come up with a 12-month average. This methodology is not consistent with the application. The application states the following:

> ***"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."***

Response: The EPA deleted former Condition IX.7.a. and b. requiring the calculation of monthly averages of CO_2 mass emissions and heat rate. New Condition IX.E.7.a. and b. (Former Condition IX.E.8.a. and b.) requires the calculation and recording of the 12-month rolling average CO_2e emissions rate and 12-month rolling gross output for each CT.

38. Comment:

The applicant requests Condition IX.E.8.a. and b. be revised to be consistent with the permit application as follows:

> ***"8. Permittee shall calculate and record, for each CT, the following on ~~an annual~~ a 12-month rolling average basis, in each case corrected to ISO conditions:***
>
> ***a. The 12-month rolling average CO2e ~~mass~~ emission rate (lbs CO2e/12-month rolling total ~~MWh~~) (for each fuel combusted in the previous 12 months) shall be calculated ~~as the sum of each monthly average value times the monthly energy output (MWh) divided by the sum of the energy output (MWh) generated during the 12 month period~~ 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.***
>
> ***b. The 12-month rolling ~~average heat rate~~ gross output (~~Btu/kWh~~ MWh) (for each fuel combusted in the previous 12 months) shall be calculated ~~as the sum of each monthly average heat rate value times the monthly energy output (kWh) divided by the sum of the energy output (kWh) generated during the 12 month period~~ based on the total gross output recorded during normal operation, during the prior 12 calendar months. Valid data shall be any fuel firing during periods of normal operation.***

Response: The EPA partially agrees with the applicant on the change requested. EPA added language regarding the applicability of these conditions "at all times other than startup and shutdown" instead of "during normal operation" only. Additionally, the reference to data only being valid for periods of normal operations was not accepted. Conditions IX.E.8.a. and b. (New Conditions IX.7.a. and b.) were modified as shown below:

7. ***Permittee shall calculate and record, for each CT, the following on ~~an annual~~ a 12-month rolling average* basis*, in each case corrected to ISO conditions*:***

   a. ***The 12-month rolling average CO_2e ~~mass~~ emission rate (lbs CO_2e/12-month rolling total) (for each fuel combusted in the previous 12 months) shall be calculated ~~as the sum of each monthly average value times the monthly energy output (MWh) divided by the sum of the energy output (MWh) generated during the 12 months period~~ based on the total fuel fired, at all times other than startup and shutdown, during the prior 12 calendar months using the global warming potential (GWP) factors in Condition J: GLOBAL WARMING POTENTIAL (GWP).***
   b. ***The 12-month rolling ~~average heat rate~~ gross output (~~Btu/kWh~~MWh) (for each fuel combusted in the previous 12 months) shall be calculated ~~as the sum of each monthly average value times the monthly energy output (MWh) divided by the sum of the energyoutput (MWh) generated during the 12 months period~~ based on the total fuel fired, at all times other than startup and shutdown, during the prior 12 calendar months using the global warming potential (GWP) factors in Condition J.***

39. Comment:

The applicant requests Condition IX.E.8.c. and d, be added to describe the 12-month rolling average methodology during startup and shutdown:

   c. ***The 12-month rolling total CO2e emission rate shall be divided by the 12-month rolling gross output rate to determine the lb/MWhr rolling average.***
   d. ***For each fuel, a new startup and shutdown CO2e 12-month rolling average (tons CO2e/event) 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 event in the 12-month period. Permittee shall monitor and record the time, date, fuel type, and duration of each startup and shutdown event. These records must be kept for five years following the date of such event.***

Response: The EPA partially agrees with the applicant on the change requested. Former Condition IX.E.8. (New Condition IX.E.7.) was modified to contain the new added Condition IX.E.7.c. However, the suggested Condition IX.E.8.d was actually added to Condition IX.F as Condition IX.F.1. The last two sentences of the suggested Condition IX.E.8.d were already in the permit under Condition IX.F.1. The numbering of this existing condition is now Condition IX.F.2.

Condition IX.E.7.

   c. ***The 12-month rolling total CO_2e emission rate shall be divided by the 12-month rolling gross output rate to determine the lb/MWh rolling average.***

Condition IX.F.

1. ***For each fuel, a new startup and shutdown CO_2e 12-month rolling average (tons CO_2e/event) 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 and shutdown events in the 12-month period.***

2. ***Permittee shall monitor and record the time, date, fuel type, and duration of each startup and shutdown event. These records must be kept for five years following the date of such events.***

40. Comment:

Page 10, Condition IX.E.9., requires that Permittee shall use the procedures set forth in 40 CFR parts 75 and 98 to determine resulting GHG emissions (as CO2e) based on the combination of measured CO2 emissions and calculated CO2e of other GHG pollutants. Permittee requests that this condition be removed as it has been addressed in the Conditions above, as revised.

Response: The EPA does not agree with the applicant regarding deleting Condition IX.E.9. The intent of this condition is for the applicant to be aware of using the global warming potential (GWP) factors as specified in Condition J. Condition IX.E.9. was modified as follows:

8. ***For demonstrating compliance with the limits specified in Condition IX.B.1, Permittee shall use the procedures set forth in 40 CFR parts 75 and 98 to determine resulting GHG emissions (as CO_2e) ~~based on the combination of measured CO_2 emissions and calculated CO_2e of other GHG pollutants (~~using the GWP as specified in Condition J~~: GLOBAL WARMING POTENTIAL (GWP))~~. Permittee shall keep adequate records of these GHG emission calculations according to requirements in Condition IX.H.1.***

41. Comment:

Page 10, Condition IX.G.3., requires that the permittee calculate and record the operating efficiency of the 10 MMBtu/hr gas heater on a daily basis. Thermal efficiency is not readily monitored continuously on fuel gas heaters. Given the requirement of Condition IX.D.4. to install a gas heater with equal to or greater than 75% thermal efficiency based on manufacturer's specifications combined with Permit Condition D.1, limiting the annual CO2e to 3,965 TPY, operation within the BACT determination shall be assured. The applicant requests that the requirement to calculate and record the operating efficiency on a daily basis be removed from Condition IX.G.3. In addition, the applicants request that tune-ups be required ***"in accordance with manufacturer's specifications."***

Response: The BACT limit for EU 008 was based on 6,780 hours per 12-month rolling period; therefore, the EPA revised Condition IX.G.3. as follows:

3. ***Permittee shall calculate and record the operating efficiency of the 10.0 MMBtu/hr natural gas heater (EU 008) on a ~~daily~~ monthly basis.***

   To maintain the EU 008 operating at a high efficiency, the Permittee shall perform annual tune-ups and meet the associated requirements as follows (if the unit is not operating on the required date for a tune-up, the tune-up must be conducted within one week of startup) in accordance with manufacturer's specifications:

42. Comment:

Page 11, Condition IX.H.1.a. Requires the plant to maintain for five years copies of "all records or reports" related to "adjustments and/or maintenance performed on any system or device at the facility." This requirement should only apply to units and activities subject to the requirements of the permit. As such, the applicant requests the following revision:

a. ***all records or reports pertaining to adjustments and/or maintenance performed on any system or device at the facility that are part of the emission units and activities regulated by this permit;***

Response: The EPA agrees with the applicant on the change requested. Condition IX.H.1.a. was modified as requested above.

43. Comment:
Page 12, Condition IX.H.5. EFS Shady Hills LLC requests "applicable averaging time," be added as follows:

> ***"Excess emissions shall be defined as any period in which the facility emissions exceed the maximum emission limits based on the applicable averaging period as set forth in this permit.***

Response: The EPA agrees with the applicant on the change requested. Condition IX.H.5. was modified as requested above.

44. Comment:

Page 12, Condition IX.H.7. The applicant requests that "source testing" be removed from the condition as it is not applicable.

> ***7. Excess emissions indicated by compliance monitoring and applicable averaging period ~~continuous monitoring system source testing, or compliance monitoring~~ shall be considered violations of the applicable emission limit for the purpose of this permit.***

Response: Since the intent of the condition is to identify the basis for compliance, the EPA revised Condition IX.H.7. as follows:

> ***Excess emissions indicated by ~~continuous monitoring system source testing, or compliance monitoring~~ Section IX.E.* Monitoring and Compliance with GHG Emission Limits for CTs (EU005 and 006) *and Section IX.F* Monitoring and Compliance with GHG Emission Limits for CTs (EU005 and 006) During Startup and Shutdown *shall be considered violations of the applicable emission limit for the purpose of this permit.***

45. Comment:

Page 13, Condition IX.I. Shakedown Periods. The applicant requests the condition include "successful completion" of the initial performance test.

Response: Per 40 CFR 52.21(b)(3)(vii) a reasonable shakedown period is no longer than 180 days. The EPA revised Condition IX.I as follows:

> ***The combustion turbine and auxiliary equipment emission limits and requirements in Conditions IX.B, IX.C, and IX.D shall not apply during combustion shakedown periods. Shakedown is defined as the period beginning with initial startup and ending no later than the successful completion of initial performance testing, during which the Permittee conducts operational and contractual testing and tuning to ensure the safe, efficient and reliable operation of the plant. The shakedown period shall not exceed 180 days. The requirements of Section III of this permit shall apply at all times.***

Comments Submitted by EFS Shady Hills LLC on the Preliminary Determination and Statement of Basis and the Public Notice

The following comments were submitted by EFS Shady Hills LLC regarding the Preliminary Determination and Statement of Basis and the Public Notice.

46. Comment:

Cover Page, Page 3, Section 1.0 and Page 4, Section 2.1 and 2.2. The applicant requests that the "Applicant" be referenced as EFS Shady Hills LLC.

47. Comment:

Page 4,, and globally through the report, the facility is located outside of the City limits of the City of Spring Hill and therefore the applicant requests any location description be changed from "within the City of Spring Hill" to "near the City of Spring Hill."

48. Comment:

Page 5, second paragraph. The project will result in a net emissions increase greater than PSD thresholds limits for the pollutants identified and CO emissions as identified in FDEP Air Permit No. 1010373-012-AC (PSD-FL-402**A**). The applicant requests that CO be added to the PSD review pollutants listed in the second paragraph of page 5.

49. Comment:

Page 6, first paragraph. EFS Shady Hills LLC requests the paragraph be revised to be consistent with the application as follows:

> ***"The second (alternate) scenario consists of the installation and operation of only one SCCT for a maximum of 3,390 hours per year of which up to ~~750~~ 500 hr/yr would be using ULSD fuel oil as a back-up. ~~After reaching the first 500 hours of firing ULSD fuel oil, the remaining 250 hr/yr will be under an operating hour trade off mechanism consisting of 390 hour of natural gas only, or 78 hours of ULSD fuel oil only, or a combination following a 5:1 trade-off ratio. In this situation, the worst-case emissions scenario is where the CT operates using ULSD fuel oil for the maximum amount of 750 hours per year and the CT would be able to run with natural gas for a maximum 1,640 hrs/yr~~ However, an additional 250 hours per year of operation on fuel oil would be allowed by applying a trade-off mechanism whereby potential natural gas operation would be reduced by a ratio of 5:1 for each additional hour of fuel oil operation. In this situation, the worst-case emission scenario is where the CT operates using ULSD fuel oil for the maximum amount of 750 hours per year and the CT would be able to run with natural gas for a maximum of 1,640 hours per year.***

50. Comment:

Page 9, Table 5, Per FDEP Air Permit No. 1010373-012-AC (PSD-FL402A), the CO emissions in Table 5-1 should be updated as follows:

EU ID No.	Potential to Emit CO Estimates (TPY)
005 & 006	~~88.4~~ 131.4
007	~~6.17~~ 1.93
008	1.35
009	0.0
010	0.0
Fugitives	0.0
Total Project	***~~95.9~~ 135***

51. Comment:

Page 10, Table 5, Per FDEP Air Permit No. 1010373-012-AC (PSD-FL402A), the CO emissions in Table 5-2 should be updated as follows:

Pollutant	PTE (TPY)	Significant Emission Rate (TPY)	PSD Review Required
CO	~~96~~ 135	100	No

52. Comment:

Page 10, last paragraph, EFS Shady Hills LLC requests the following revisions:

> ***"The alternate scenario proposes the construction of only one CT. ~~It is assumed that it will operate for a maximum 3,390 hours per year. Of the 3,390 operating hours, an average of 1,640 hr/CT/yr are assumed to be natural gas firing only. The other 750 operating hours, the applicant proposed to run a maximum of 500 hours on ULSD fuel oil and apply a trade-off mechanism for the rest of the 250 operating hours. The trade-off consists of natural gas versus ULSD fuel oil at 5:1 ratio~~ which is assumed to operate for a maximum of 3,390 hours per year, of which 500 hours per year would be using ULSD fuel oil as a back-up. However, an additional 250 hours per year of operation on fuel oil would be allowed by applying a trade-off mechanism whereby potential natural gas operation would be reduced by a ratio of 5:1 for each additional hour of fuel oil operation. In this situation, the worst-case emission scenario is where the CT operated using ULSD fuel oil for the maximum amount of 750 hours per year and the CT would be able to run with natural gas for a maximum of 1,640 hours per year."***

53. Comment:

Page 11, Section 5.2, Compliance Methodology, identifies that monitored data will include CO2 mass emission rate, inferring a CO2 CEMS will be utilized. However, as indicated in the application, 40 CFR Part 75 will be utilized to calculate CO2 emissions based on monitored fuel heat input consistent with the basis for the CO2e emissions limitations. As such, EFS Shady Hills LLC requests that Section 5.2 be revised as follows:

> ***"The monitored data (including gross energy output rate, ~~CO_2 mass emission rate,~~ and heat input rate) will be used to determine CO_2e emissions based on 40 CFR Part 75 for CO_2 emissions.***

54. Comment:

Page 12, 1st paragraph, The project will result in a net emissions increase greater than PSD thresholds limits for the pollutant identified and CO emissions as identified in FDEP Air Permit No. 1010373-012-AC (PSD-FL-402**A**). The applicant requests that CO be added to the list of pollutants identified as permitted by FDEP.

55. Comment:

Page 12, 2nd paragraph, The applicant requests that that the word "plant" be replaced by "tank" as follows:

> ***"In addition, the application includes an emergency generator, a natural gas heater, a ULSD fuel oil storage ~~plant~~ tank,…"***

56. Comment:
Page 15, Second full paragraph, EFS Shady Hills LLC requests the following revisions:

> ***…more efficient turbine models of similar size to the GE 7FA.05, and for use in simple cycle operation, has become available since October 2011***

57. Comment:
Page 17, Table 6-1" The information within the table is not consistent with the application, the corrections are provided as follows:

7FA.05	LM6000	LMS100
GE	GE	GE
~~Aero~~ Frame	Aero	~~Frame~~ Aero
~~8,848~~ 9,910	9,226	~~9,910~~ 8,848
~~8,625~~ 10,388	9,083	~~10,388~~ 8,625
904,094	831,519	795,965
~~1~~ 3	2	~~3~~ 1

58. Comment:
Page 18, 1st paragraph of Step 5, The applicant request discussion of "normal" operation to indicate consideration of full load and partial load operations as follows:

> ***"Shady Hills proposed gross output-based GHG BACT limits for "normal (full and partial load)" operation…"***

59. Comment:
Page 19, 1st paragraph, the 3% and 5% should be switched; add "potential" ahead of difference in 3rd line, and add "expected" ahead of degradation in 4th line. The requested corrections should read as follows:

> ***"… a ~~3~~5 percent margin for the potential difference between guaranteed heat rates and actual heat rates, and a ~~5~~3 percent margin for expected degradation over time.***

60. Comment:
Page 1, EFS Shady Hills LLC requests the applicant be corrected to "EFS Shady Hills LLC" [in the Public Notice].

Response to Comments 46-60: The EPA acknowledges receipt of the above comments related to the Preliminary Determination and Statement of Basis and the Public Notice. However, any resulting changes will be appropriately reflected in the redline/strikeout version of the permit (and summarized in the final determination) rather than a redline/strikeout version of the Preliminary Determination and Statement of Basis and the Public Notice.