TECHNICAL EVALUATION
&
PRELIMINARY DETERMINATION

APPLICANT

EnviroFocus Technologies, LLC
1901 North 66th Street
Tampa, Florida 33619

PROJECT

Lead-Acid Battery Recycling Facility
Nitrogen Oxide Reallocation, Alternate Chemicals, Afterburner Rating,
Additional Building Ventilation and Other Modifications

ARMS Facility ID No. 0570057
DEP File No. 0570057-030-AC (PSD-FL-404C)

COUNTY

Hillsborough County, Florida

PERMITTING AUTHORITY

Florida Department of Environmental Protection
Division of Air Resource Management
Office of Permitting and Compliance
2600 Blair Stone Road, MS#5505
Tallahassee, Florida 32399-2400

(Addendum No. 2) June 5, 2014

1. GENERAL PROJECT INFORMATION AND BACKGROUND

In August 13, 2008, EnviroFocus Technologies, LLC (EFT) submitted a Prevention of Significant Deterioration (PSD) air construction permit application to the Florida Department of Environmental Protection (Department) for the reconstruction and expansion of their lead-acid battery recycling facility in Tampa, Florida. The Department issued a PSD Construction Permit (Air Permit No. 0570057-020-AC, PSD-FL-404) on October 22, 2009 authorizing the reconstruction and expansion project.

On August 1, 2012, EFT submitted a permit modification request (Air Permit No. 0570057-027-AC, PSD-FL-404B) to reflect the "As-Built" reconstructed and expanded facility. Specifically, EFT requested two significant changes to the original PSD permit. The first change was a reallocation of some of the permitted sulfur dioxide (SO_2) emissions from the process stack to the hygiene stack. This changed did not increase overall emissions of SO_2 from the ETF facility. The second change was the addition of new baghouse capacity consisting of a Torit cartridge collector with a secondary High-Efficiency Particulate Air (HEPA) filter to increase the ventilation of the process enclosure building. This additional air flow was needed to reduce the buildings' heat load and to ensure compliance with the enclosure ventilation requirements of 40 Code of Federal Regulations (CFR), Part 63, Subpart X - National Emission Standards for Hazardous Air Pollutants (NESHAP) from Secondary Lead Smelting. The following is a link to this subpart: NESHAP Subpart X

The reconstruction and expansion of the EFT facility that was authorized by the previous PSD air construction permits has been nearly completed and the facility is in operation and shakedown mode. All the previous construction permit packages related to the facilities' reconstruction and expansion including the Technical Evaluation and Preliminary Determination (TEPD) documents can be found at the following link:

http://www.dep.state.fl.us/air/emission/construction/hillsborough_county.htm

The original TEPD document for Air Permit No. 0570057-020-AC (PSD-FL-404) provides a much more detailed description of the facility, its processes and specifics with regard to the original reconstruction and expansion project. The TEPD document for the "As-Built" reconstructed and expanded facility (Air Permit No. 0570057-027-AC, PSD-FL-404B) is an addendum to the original TEPD document and reflects the "As-Built" configuration of the facility. This TEPD (Air Permit No. 0570057-030-AC, PSD-FL-404C) is also an addendum to the original TEPD document and the first addendum and is related to changes requested by EFT as a "Final Build-Out" project based on lessons learned and problems encountered during the reconstructed and expanded facility's initial operation and shakedown.

1.1. Facility Location

EFT operates a lead acid battery recycling facility, which is located in Hillsborough County at 1901 North 66th Street, Tampa, Florida. The UTM coordinates for the site are Zone 17, 364.0 kilometers (km) East and 3093.5 km North. The site is located 70 km south from the Chassahowitzka National Wildlife Area; the nearest Federal PSD Class I Area.

EFT is a Primary Metal industries facility with a Standard Industrial Classification (SIC) Code No. 3341, secondary smelting & refining of nonferrous metals. According to NESHAP, Subpart X - Secondary Lead Smelting, a Secondary lead smelter means any facility at which lead-bearing scraps material, primarily, but not limited to, lead-acid batteries, is recycled into elemental lead or lead alloys by smelting.

In this review, the term "lead" will be used within the context of raw and intermediate materials as well as product. When emitted, lead is a hazardous air pollutant (HAP) and its chemical symbol (Pb) will be used in the context of air pollution control and measurement.

The location of EFT in the Tampa area is shown in **Figure 1**. An aerial view of the EFT facility prior to the reconstruction and expansion project is shown in **Figure 2**. The EFT property is bounded on the south side by the CSX railroad tracks oriented northeast to southwest. A large railroad switchyard operated by CSX is located further south and is a prominent feature visible in the photograph at the top of **Figure 2**. **Figure 3** shows an aerial view of the reconstructed EFT facility which can be compared to the facility shown in **Figure 2**.

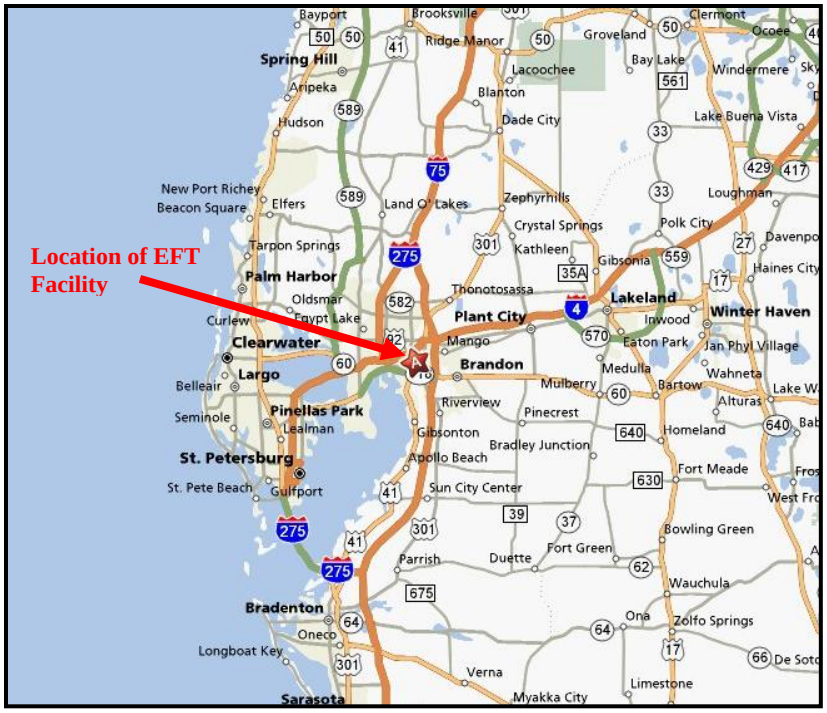

Figure 1 - EFT Facility Location in Tampa.

Figure 2 - Aerial View of EFT Facility Prior to Reconstruction.

1.2. General Process Description

The EFT facility recycles automotive and industrial lead-acid batteries, as well as other lead-acid bearing scrap materials to produce lead ingots. The process involves several key operations (or steps) including: receiving of batteries and recyclable materials; battery breaking and separation into lead, lead salts, plastic and acid electrolyte; storage and containment of recovered lead and lead waste; acid neutralization and wastewater treatment; lead smelting and refining; casting; and shipping. **Figure 4** shows a greatly simplified diagram of the lead-acid battery recycling process with particular attention to the battery breaking and separation step.

Figure 3 – Aerial View of Reconstructed EFT Facility.

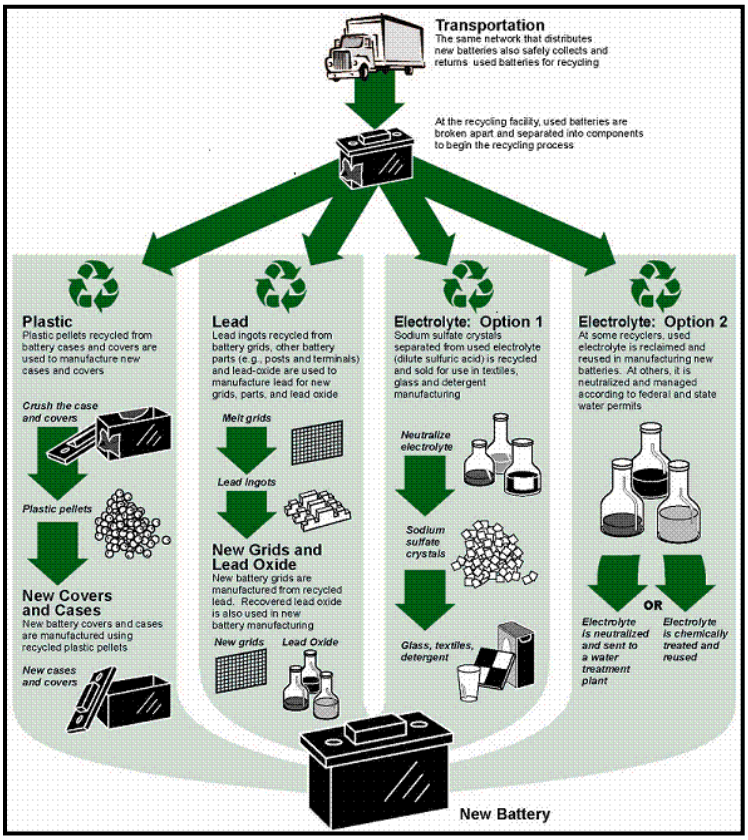

Figure 4 – Lead-Acid Battery Recycling Process.

1.3. Emissions Units (EU) at the EFT Facility

Table 1 is a list of the emissions units (EU) at EFT facility. The emission unit numbers have been changed from those that were referenced in the original reconstruction and expansion project (Air Permit No. 0570057-020-AC, PSD-FL-404). The new EU numbers along with the old EU numbers are given in **Table 1**. The EU numbers were changed to provide consistency with the Departments' Air Resource Monitoring System (ARMS) database. In addition, as a result of the "As-Built" project (Air Permit No. 0570057-027-AC, PSD-FL-404B), an additional building ventilation emission unit representing a new 160,000 actual cubic feet per minute (acfm) Torit cartridge collector with a secondary HEPA filter was added to the facility. This emission unit (EU 038) was required to meet NESHAP Subpart X requirements by increasing the negative pressure within the process enclosure building while also reducing the heat load within the building. This "Final Build-Out" project will add a new afterburner dedicated to the collocated blast furnace (EU 032) and is highlighted in the table.

TABLE 1. LIST AND DESCRIPTIONS OF EU AFTER THE AS-BUILT RECONSTRUCTION PROJECT.

New EU ID No.	Description	Old EU ID No.
026	Battery breaking area including a 50 ton per hour (TPH) hammer mill, separation equipment, plastics plant, wet impingement scrubber and a new 130 ft stack.	021
027	Plastics plant pellet silos (4) for truck and train loading. Each silo will have a bin filter and a small stack. The plastics plant is vented via the building ventilation system.	24
028	Soda ash silos. (3) with bin filters and stacks.	008
029	Propane vaporizer (1) and soda ash slurry heaters (2).	025
030	Feed dryer fueled by natural gas (propane backup) to remove moisture from lead and lead salts prior to introduction into new reverb furnace. Includes an 18,000 acfm baghouse that will be vented through the combined process (blast and reverb furnace) stack.	022
031	Collocated reverb furnace. Direct emissions controlled by common afterburner, common wet SO_2 scrubber, common process baghouse and combined 130-ft process stack.	023
032	Collocated blast furnace. Direct emissions controlled by common afterburner, common wet SO_2 scrubber, common process baghouse and combined 130-ft process stack. **New afterburner added as a result of this project (discussed below).**	001
033	Furnace tapping, charging and lead refining. Process fugitive emissions from furnace tapping and charging and 10 refining kettles. Includes a 72,000 acfm process fugitive emissions (hygiene) baghouse and 130-ft stack.	011
034	Combustion gases from (10) natural gas burners with a total capacity of 40 million British thermal units per hour (MMBtu/hr) providing heat to the refining kettles. Exhaust is vented to 10 small stacks.	013
035	Building ventilation of the totally enclosed lead recycling process to maintain the key operations at a lower than ambient pressure ensuring in-draft through any doorway opening. Includes a 195,000 acfm cartridge collector and 130 ft stack.	015
036	Facility grounds and roadways. Controlled by wet suppression, vacuum sweeping and wheel wash station.	009
037	Emergency generator rated at 500 kilowatts (kW).	026
038	Additional building ventilation a 160,000 acfm cartridge collector with secondary HEPA filter to increase the negative pressure within the building exhausting through a 90 ft stack	---

1.4. Current Project Background and Description

On April 11, 2013. EFT submitted a permit application requesting four changes to the most recent PSD permit (Air Permit No. 0570057-027-AC, PSD-FL-404B). These changes are listed below:

- Revision and reallocation of the nitrogen oxide (NO_X) emission limits for the process and hygiene stacks with a 3.77 pounds per hour (lb/hr) net increase from the process stack. This revision required additional air dispersion modeling with respect to NO_X emissions from the facility to show that the nitrogen dioxide (NO_2) 1-hour National Ambient Air Quality Standard (NAAQS) was not violated;
- Identification of alternate chemical usage in the desulfurization process and the furnace scrubber;
- Identification of the burner rating for the furnaces afterburner; and,
- Revision of the process rates and monitoring requirements.

On May 13, 2013, the Department issued a request for additional information (RAI) to address information that was lacking from the application before the application could be declared complete. On July 18, 2013, EFT submitted a response to the first RAI. Subsequently, on August 7, 2013 it was discovered by the Department that EFT had not obtained approval from EPA Region 4 for the Tier 3 NO_2 air dispersion modeling approach that was provided in the permit application of April 11, 2013.

A Tier 3 modeling approach adjusts the ratio of nitrogen oxide (NO) and NO_2 leaving an exhaust stack from the standard value used in a Tier 2 modeling approach. In general terms, in a Tier 2 modeling approach it is assumed that there is a 100% conversion of NO to NO_2 in stack. However, this approach further assumes that about 80% of that resulting NO_2 stays as NO_2 in the ambient air, i.e., the actual assumed ratio is 20% NO to 80% NO_2 with respect to meeting the 1-hour NO_2 NAAQS. For a Tier 3 approach the ambient air NO/NO_2 ratio is further adjusted. For example, a ratio of 70% NO to 30% NO_2 could be used which would make meeting the 1-hour NO_2 NAAQS easier. Because of the implications that a Tier 3 analysis could have with respect to NAAQS compliance, data and analyses supporting the requested ratio has to be submitted to the EPA for approval. This was not done by EFT. Consequently, on August 9, 2014 the Department issued a second RAI indicating that before the permit application (No. 0570057-030-AC, PSD-FL-404C) could be declared complete by the Department, EFT must obtain approval from EPA Region 4 of the Tier 3 modeling approach contained in their permit application. Additional details of the Tier 3 modeling approach are provided in **Section 5**.

On March 21, 2014, the Department received a response from EFT to the second RAI. In this response, EFT provided proof that EPA Region 4 had approved their Tier 3 NO_2 modeling approach: Link to Tier 3 EPA Approval. In addition, EFT requested further changes to the pervious PSD permit (No. 0570057-0270-AC, PSD-FL-404B) reflecting lessons learned and problems encountered during operation of the rebuilt and expanded EFT lead-acid battery recycling facility. These additional requested changes are summarized below:

- Combined SO_2 limits from the process and hygiene stacks;
- Revision of the emergency generator size from 500 kW to 1000 kW;
- Identification of coke breeze as a raw material in the process description for the reverb furnace;
- Revised the process and hygiene baghouse specifications;
- Revised Appendix FDCO - Standard Operation Procedures for Fugitive Dust Control During Operational Activities, to reflect lessons learned;
- Authorize the replacement of the original process stack with a reconstructed stack of the same height and internal diameter and at the same location. The new stack will be constructed of more corrosion resistant materials; and
- Installation of a separate afterburner dedicated to the blast furnace.

Additional details describing the proposed project and the regulatory implications are presented in subsequent subsections of this TEPD.

In addition to the above requested changes to the permit from EFT, the Compliance Authority (Environmental Protection Commission (EPC) of Hillsborough County) requested another change to the permit. This changed is a clarification of the emission unit operating rate during compliance testing as it relates to the normal operation

of the emission unit at the EFT facility. The reason for the clarification will also be discussed in this TEPD document.

Finally, the permit will be modified to include the applicable NESHAP Subpart X emission standards since the compliance date of January 6, 2014 has passed for this subpart. Also the permit will be modified for clarity to indicate that by meeting the particulate matter (PM) and visible emissions (VE) standards set forth in **Section 3-B - Lead Smelting**, for the fed dryer, blast furnace and reverb furnace that the PM and VE requirements of 40 CFR Part 60, Subpart L - Standards of Performance for Secondary Lead Smelters are met.

All the changes listed above represent this the EFT "Final Build-Out" project.

1.4.1. NO_X Emission Limit Reallocation and Increase (EUs 030, 031, 032 and 033)

According to EFT, Air Permit No. 0570057-020-AC (PSD-FL-404) has a NO_X emissions limit from the process stack of 29.1 lb/hr. The process stack exhausts the air emissions from the reverb furnace (EU 031), blast furnace (EU 032), and feed dryer (EU 0030). This NO_X emissions limit was based on the implementation of a Best Available Control Technology (BACT) determination that consisted of air/oxygen/fuel burners on the reverb furnace, good furnace draft control on the blast furnace and good combustion practices (GCP) on the feed dryer. The numerical value of the limit achievable through the implementation of these control technologies was determined based on stack tests of similar equipment at other sites. In the same permit, the hygiene stack has a BACT NO_X emissions limit of 14.33 lb/hr. The hygiene stack serves the furnace tapping, furnace charging, and lead refining emissions unit (EU 033). The hygiene stack NO_X emissions limit was based on the implementation of GCP.

The above described pollution control equipment has been installed and the associated emission units have been in operation. Continuous emissions monitoring systems (CEMS) have been measuring NO_X emissions to determine achievable NO_X emission rates. Based on the CEMS data, it has been determined that the numerical values of the BACT NO_X emissions limits need to be revised. The NO_X emissions limit on the hygiene stack is much higher than necessary, while the limit on the process stack needs to be raised. The hygiene stack limit, which is currently listed as 14.33 lb/hr, can be safely reduced to 5.0 lb/hr (a reduction of 9.33 lb/hr). The limit on the process stack needs to be raised from 29.1 lb/hr, where it currently stands, to 42.2 lb/hr to accommodate the emissions achievable using the agreed-upon BACT technologies. A summary of the NO_X emission changes requested by EFT is in given in **Table 2**.

TABLE 2. REQUEST NO_X EMISSION CHANGES AT THE EFT FACILITY.

Emission Unit Currently Permitted		Proposed Emissions Limits lb/hr (g/s) [1]	Previous Emissions Limits lb/hr (g/s)
Process Stack [2]	Feed Dryer (EU 030)	2.1 (0.26)	29.1 (3.67) [2]
	Reverb Furnace (EU 031)	32.0 (4.04)	
	Blast Furnace (EU 032)	6.0 (0.76)	
	Afterburner [3]	2.1 (0.26)	
	Subtotal:	42.2 (5.32)	
Hygiene Stack (EU 033)		5.00 (0.63)	14.33 (1.81)
Combined Emission Limits		**47.2 (5.95)**	**43.43 (5.48)**
		Net Increase:	**3.77 (0.47)**

1. Units of pound per hour (lb/hr) and grams per second (g/s).
2. Includes emissions from a combined afterburner control device.
3. New afterburner control device dedicated to the blast furnace. Emission included in the process stack emissions.

Thus, as seen from **Table 2**, the overall net increase from the reallocation of NO_X emissions between the two stacks combined is **3.77 lb/hr (0.47 g/s)**. This net increase in overall NO_X emissions from the process stack, is required based on CEMS data collected by EFT to provide a margin for compliance purposes.

EFT submitted an air dispersion modeling analysis for NO_2 to show that this net increase in NO_X emissions will not cause or contribute to a violation of the 1-hour NO_2 NAAQS. This air dispersion modeling analysis is discussed in **Section** Error! Reference source not found. of this document.

1.4.2. Combined SO_2 Limits from the Process and Hygiene Stacks (EUs 030, 031, 032 and 033)

EFT is requesting a change in the format of the existing SO_2 limits on the process and hygiene stacks at the EFT facility. In Permit PSD-FL-404B (No. 0570057-027-AC) these stacks have SO_2 permitted emission limits of 163.9 lb/hr and 38.34 lb/hr, respectively. These SO_2 emission limits were imposed to restrict the potential SO_2 emissions increase from the EFT facility reconstruction and expansion project to a level below the PSD significant emission rate (SER) threshold of 40 tons per year (TPY) based on a netting analysis (892 TPY projected future actual emissions - 853 TPY pass actual emissions = 39.0 TPY increase).

EFT has indicated that the source of the SO_2 emissions is primarily from the furnaces. Also according to EFT, most of the SO_2 is ducted directly to a SO_2 scrubber which exhausts from the process stack. However, some SO_2 is emitted fugitively from various openings in the furnaces and captured by the hygiene hooding which emits from the hygiene stack. The amount of fugitive SO_2 fluctuates significantly during furnace operations causing a high degree of variability in SO_2 emissions between the two stacks. EFT can easily keep the total emissions below the PSD SER by adjusting the control efficiency of the scrubber, but it is difficult to maintain a particular split in emissions between the stacks. As a solution to this issue, EFT is requesting that the Department combine the SO_2 limits on the process and hygiene stacks into one limit of 202.24 lb/hr (163.9 lb/hr + 38.34 lb/hr). EFT will continue to demonstrate compliance using the SO_2 CEMS on both the process and hygiene stacks.

1.4.3. Alternate Chemicals

As described in the original PSD application, EFT removes much of the sulfur in its furnace feedstock by employing a desulfurization process. In this process, lead salts from the crushed batteries, primarily consisting of lead sulfate ($PbSO_4$), are "slurried" with soda ash (sodium carbonate, Na_2CO_3) resulting in the formation of sodium sulfate (Na_2SO_4). The sodium sulfate remains in solution, allowing the lead, which is still in solid form, to be separated by filtration. This prevents excess sulfur from being introduced into the furnaces, thereby reducing SO_2 emissions. The SO_2 that is formed in the furnaces is controlled by a wet scrubber that uses caustic soda (sodium hydroxide, NaOH). In combination, the desulfurization process and wet scrubber reduces SO_2 emissions from the feed dryer, blast furnace and reverb furnace.

In order to provide operational flexibility, EFT has requested that alternate reagents be allowed in the desulfurization process and furnace scrubber. In other words, caustic soda may be used instead of soda ash in the desulfurization process and vice versa in the wet scrubber. Moreover, EFT requests that the reagents be identified simply as "alkaline reagents" to allow EFT to use other chemicals. EFT states that as a result of this change, there will be no increase in SO_2 emissions from the furnaces because the SO_2 emissions are monitored by a CEMS and that the amount of reagents used will be adjust as required to meet the permitted emission limit.

1.4.4. Afterburner Rating

The exhaust gases from both furnaces (blast and reverb) at EFT are combined in an afterburner to help eliminate excess carbon monoxide (CO), volatile organic compounds (VOC) and total hydrocarbons (THC). The afterburner consists of a large chamber designed to allow mixing of the gases and provide sufficient residence time for the oxidation of the pollutants. The chamber is fitted with a natural-gas-fired burner to provide any supplemental heat needed to maintain an adequate temperature for the oxidation to occur. At the time of original application, the size of the burner had not yet been determined. However, since that time, EFT has been able to determine that the burner needs to have a maximum capacity of 10 MMBtu/hr. EFT has requested that this burner capacity be added to the permit.

1.4.5. Process Rate Monitoring

The PSD permit identifies the throughput rates of the primary lead-emitting processes at EFT in terms of tons per hour (TPH). These throughput rates are used by the Compliance Authority, to verify that the processes are being operated at or near their maximum throughput rates during compliance stack testing. EPC also requires EFT to maintain records demonstrating that these throughput rates are not being exceeded. According to EFT, this throughput monitoring requirement can present a significant challenge for several of the processes where there is no means of accurately measuring the throughput rates on an hourly basis. During stack testing, EFT intends to utilize manual measurements to get a TPH throughput reading.

As an example of the problem, EFT cites the throughput rate for the refining operations (part of EU 033). The throughput rate is listed as "approximately 20 TPH (tons per hour)" in **Specific Condition 1** on page 15 of 31 of the most recent PSD permit, while **Specific Condition 3** on page 16 of 31 states that the maximum production rate is 20 TPH. However, according to EFT the throughput rate of the refining operations cannot be determined on an hourly basis due to the batch nature of the refining process. The refining process is performed in large kettles that receive molten lead from the furnaces, refine the lead through the addition of various fluxing and alloying agents and then the refined lead is delivered to the casting process. The refining is performed on a batch basis in each kettle and different kettles may be used to prepare different alloys at any given time. Each batch takes several hours to complete. Ultimately, the throughput rate can only be determined after the fact by taking the total tonnage of lead cast over a longer period of time, e.g., 24 hours or more, and dividing the tonnage by the number of hours in the selected time period.

In order to establish a workable set of throughput rates and throughput rate monitoring requirements for stack testing and routine inspections, EFT has requested that the following adjustments be made to the PSD permit.

1.4.5.1. *Battery Breaking (EU 026)*

The throughput of Battery Breaking emissions unit is currently listed as 50 TPH in the descriptive text on page 7 of 31 of the most recent PSD permit. In **Specific Condition 3** on the following page the throughput rate is limited to 60 TPH. It appears that the 50 TPH throughput rate is an error, as the previous version of the PSD permit listed the throughput as 60 TPH, which agrees with **Specific Condition 3** and also the maximum throughput rate listed in the original permit application. According to EFT, the 60 TPH value will only be used during compliance testing. For the purposes of monitoring the throughput rate during stack testing, EFT proposes to use the manual measurement of batteries introduced to the hammer mill during the test.

For on-going compliance demonstrations, EFT proposes to record the total weight of batteries introduced into the hammer mill on a daily basis which will not exceed a limit of 1,440 tons per day (TPD). On an average hourly basis, the 1,440 TPD limit equals 60 TPH. Accordingly, EFT has requested that the limit of 60 TPH throughput limit be changed to 1,440 TPD in the PSD permit.

1.4.5.2. *Feed Dryer, Reverb Furnace, and Blast Furnace (EUs 030, 031 and 032)*

The currently listed throughputs of these emission units are 40 TPH, 40 TPH, and 7.5 TPH for the Feed Dryer (EU 030), Reverb Furnace (EU 031) and Blast Furnace (EU 032), respectively. For the purposes of monitoring throughput rates and burner firing rates during stack testing, EFT has requested that it be allowed to manually monitor the throughputs during stack testing to demonstrate compliance.

For ongoing compliance, EFT has proposed to record the inputs of the dryer and furnaces on a daily basis for comparison with the daily process limits of 960 TPD for the Feed Dryer, 960 TPD for the Reverb Furnace and 180 TPD for the Blast Furnace. Accordingly, EFT has requested that the hourly throughput limits be replaced with these daily limits in the PSD permit. Additionally, EFT has proposed that the 24-hour period used for compliance monitoring purposes start and end a noon each day.

1.4.5.3. *Furnace Tapping, Charging, and Lead Refining (EU 033)*

As described in **subsection 1.4.5** above, the hourly throughput rate of refining operations cannot be measured on an hourly basis due to the batch nature of the process. Therefore, EFT has requested that the throughput rate at which the refined lead is cast be monitor as a means to represent the loading of the refining process during compliance stack testing. The casting can occur at a rate has high as 66 TPH. Therefore EFT has requested that the permit language be modified to replace the 20 TPH process rate on refining with the 66 TPH casting rate and to identify that the casting rate will be used to monitor the throughput rate, i.e., load, on the refining kettles during compliance stack testing. To ensure that there is a representative load on furnace tapping and charging during stack tests, EFT has proposed to manually measure the casting rate to ensure it does not exceed the 66 TPH limit.

For the purposes of on-going compliance, EFT has requested that the total lead cast throughput rate be used to represent the throughput of the refining process and that it be limited of 1,584 TPD. This is equivalent to an average of 66 TPH during a consecutive 24 hour period. EFT also has requested that the hourly throughput limit of 20 TPH be replaced with this daily throughput limit of 1,584 TPD in **Specific Condition 3** on page 16 of 31 in the most recent PSD permit. EFT indicates that the facility will still continue to be limited to 150,000 TPY of lead production in any consecutive twelve month period as stated in **Specific Condition 5** on page 16 of 31 in the PSD permit.

1.4.6. Increased Emergency Generator Rating (EU 037)

The original PSD permit (PSD-FL-404) application called for the installation of a 500 kW diesel-fired emergency generator. The current PSD permit (PSD-FL-404B) identifies the unit as EU ID No. 037. EFT has determined that the generator needs to be larger to accommodate all of the processes that will need to be operated during a power outage. The new design specification is for a 1000 kW diesel-fired generator. The appropriately revised application forms were included in the permit application. EFT included the revised NO_X emissions rate associated with the larger emergency generator in their revised NO_X modeling (see **Section 5Error! Reference source not found.**).

1.4.7. Coke Breeze Identification (EU 031)

An independent audit, performed at EFT's request, has suggested that the permitted "process description for the reverb (furnace) should include coke breeze as a reductant, consistent with industry practice, so the storage, handling and use of this material is transparent to regulators." For this reason, EFT has requested the addition of coke breeze usage in the description of the reverb furnace operation.

1.4.8. Revised Baghouse Specifications (EUs 030, 031 and 032)

EFT is upgrading the process baghouse that serves the dryer and furnaces due to higher than anticipated corrosion rates. The baghouse fans and the process stack will not be altered, so there will be no change in the air flow or an impact on air emissions. Rather the baghouse modules themselves will be replaced and will contain a different size and quantity of bags. The new information for the baghouses has been provided in permit application forms on pages 17, 40, and 64.

1.4.9. Revised Appendix FDCO

EFT is requesting that Appendix FDCO - Standard Operation Procedures for Fugitive Dust Control During Operational Activities be revised to reflect the lessons learned during the operation of the reconstructed and expanded facility.

1.4.10. Process Stack Replacement

EFT is requesting that authorization be given to replacement the original process stack with a reconstructed stack of the same height and internal diameter and at the same location. The new process stack is required

because the existing stack has encountered extensive corrosion problems during operation of the reconstructed and expanded EFT facility. The new stack will be constructed of more corrosion resistant materials.

1.4.11. New Dedicated Afterburner (EU 032)

As described in **subsection 1.4.4**, the gases from both furnaces at EFT facility are combined in an afterburner chamber to help eliminate excess CO, VOC and THC emissions. The afterburner consists of a large chamber that allows mixing of the high temperature gases from the reverb furnace with the lower temperature gases from the blast furnace, so that the CO, VOC and THC from the blast and reverb furnaces will be destroyed. EFT is proposing to construct an additional afterburner chamber dedicated to the blast furnace that can be operated when the reverb furnace is not in operation.

Like the main afterburner, the dedicated afterburner will be equipped with a natural gas burner. The burner capacity will be a maximum of 20 MMBtu/hr. The burner rating is higher than that of the dedicated afterburner because there are no ”hot” reverb burner exhaust gases mixing with the blast furnace gases to contribute the heat content within the new afterburner chamber. Preliminary drawings and specifications for the new afterburner are included in Appendix C of the permit application.

The new afterburner has been designed such that the emissions from the process stack will not exceed the permitted emission limits. Like the main afterburner, the new dedicated afterburner will employ a continuous temperature monitoring system that will provide evidence that the afterburner is operating in a manner consistent with the operation during the most recent compliance test for THC.

2. RULE APPLICABILITY

2.1. State Regulations

This project is subject to the applicable environmental laws specified in Section 403 of the Florida Statutes (F.S.). The Florida Statutes authorize the Department of Environmental Protection to establish rules and regulations regarding air quality as part of the F.A.C. These state regulations are summarized below in **Table 3**.

TABLE 3 - KEY APPLICABLE STATE REGULATIONS.

Chapter	Description
62-4	Permits
62-204	Air Pollution Control – General Provisions
62-210	Stationary Sources of Air Pollution – General Requirements
62-212	Stationary Sources – Preconstruction Review
62-213	Operation Permits for Major Sources (Title V) of Air Pollution
62-214	Requirements for Sources Subject to the Federal (Title IV) Acid Rain Program
62-296	Stationary Sources – Emission Standards
62-297	Stationary Sources – Emissions Monitoring

2.2. Federal Regulations

The U.S. Environmental Protection Agency (EPA) establishes air quality regulations in Title 40 of the CFR. Part 60 identifies NSPS for a variety of industrial activities. Part 61 specifies NESHAP based on specific pollutants. Part 63 specifies NESHAP provisions based on the Maximum Achievable Control Technology (MACT) for given source categories. Federal regulations are adopted in Rule 62-204.800, F.A.C. These federal regulations are summarized below in **Table 4**.

TABLE 4 - KEY APPLICABLE FEDERAL REGULATIONS.

Title 40	Description
Part 60	Standards of Performance for New Stationary Sources (NSPS)
Part 61	National Emission Standards for Hazardous Air Pollutants (NESHAP)
Part 63	National Emission Standards for Hazardous Air Pollutants for Source Categories (a.k.a. Maximum Achievable Control Technology (MACT))

3. PSD APPLICABILITY REVIEW

3.1. General PSD Applicability

The Department regulates major stationary sources in accordance with Florida's PSD program pursuant to Rule 62-212.400, F.A.C. PSD preconstruction review is required in areas that are currently in attainment with the state and federal Ambient Air Quality Standards (AAQS) or areas designated as "unclassifiable" for these regulated pollutants. As defined in Rule 62-210.200, F.A.C., a facility is considered a "major stationary source" if it emits or has the potential to emit 5 tons per year (TPY) of lead, 250 TPY or more of any PSD pollutant, or 100 TPY or more of any PSD pollutant and the facility belongs to one of the 28 listed PSD major facility categories.

PSD pollutants include: CO; NO_X; SO_2; particulate matter (PM); PM with a mean diameter of 10 microns or less (PM_{10}); PM with a mean diameter of 2.5 microns or less ($PM_{2.5}$); VOC; Pb; Fluorides (F); sulfuric acid mist (SAM); hydrogen sulfide (H_2S); total reduced sulfur (TRS), including H_2S; reduced sulfur compounds, including H_2S; municipal waste combustor organics measured as total tetra- through octa-chlorinated dibenzo-p-dioxins and dibenzofurans; municipal waste combustor metals measured as particulate matter; municipal waste combustor acid gases measured as SO_2 and hydrogen chloride (HCl); municipal solid waste landfills emissions measured as nonmethane organic compounds (NMOC); and mercury (Hg).

As defined in Rule 62-210.200(189)(a)1, F.A.C., a "major stationary source" (major PSD source) is any of 28 listed stationary sources of air pollutants which emits, or has the potential to emit, 100 tons per year (TPY) or more of any PSD pollutant. Link to Rule 62-210, F.A.C. The major stationary source threshold for source categories not on the cited list is 250 TPY or more of any PSD pollutant. The EFT facility is one of the 28 listed PSD major facility categories, i.e., a secondary metal production plant (Code 22).

For major stationary sources, PSD applicability is based on emissions thresholds known as the significant emission rates (SER) as defined in Rule 62-210.200 (Definitions), F.A.C. Emissions of PSD pollutants from the project exceeding these SER are considered "significant" and BACT must be employed to minimize emissions of each PSD pollutant and an air quality impact analysis must be conducted for the PSD pollutants for which AAQS are defined. SER also means any emissions rate or any net emissions increase of a PSD pollutant associated with a major stationary source or major modification which would construct within 10 kilometers of a Class I area and have an impact on such area equal to or greater than 1 gram per cubic meter, 24-hour average.

Although a facility may be "major" for only one PSD pollutant, a project must include BACT controls for any PSD pollutant that exceeds the corresponding SER given in **Table 5**.

TABLE 5 - LIST OF SER BY PSD-POLLUTANT [1, 2]

Pollutant	SER (TPY)	Pollutant	SER (TPY)
CO	100	NO_X	40
$PM/PM_{10}/PM_{2.5}$	25/15/10	Ozone (VOC)	40
$PM_{2.5}$ (NO_X)	40	$PM_{2.5}$ (SO_2)	40
Ozone (NO_X)	40	SAM	7
SO_2	40	Pb	0.6
H_2S	10	F	3
Hg	0.1	GHG (CO_2e)	75,000 [2]

1. Ozone (O_3) is regulated by its precursors (VOC and NO_X). PSD for $PM_{2.5}$ can be triggered by its precursors (NO_X and SO_2).
2. Greenhouse Gases (GHG) in terms of CO_2 equivalents (CO_2e) are subject to regulation for projects at this stationary source that will result in an

Pollutant	SER (TPY)	Pollutant	SER (TPY)
emissions increase 75,000 TPY of GHG as CO_2e or more.			

In addition, applicants must provide an Air Quality Analysis that evaluates the predicted air quality impacts resulting from the project for each PSD pollutant.

3.2. Applicants' PSD Determination and Air Dispersion Modeling

In the original reconstruction project, PSD was triggered for NO_X and $PM/PM_{10}/PM_{2.5}$. Since EFT has requested a combined net increase in NO_X emissions from the process and hygiene stacks of 3.77 lb/hr (16.5 tons per year, TPY) the BACT determination for the emission units affect by this increase must be reassessed. According to EFT, none of the other requested changes to the most recent PSD permit will result in any emissions increases of a PSD pollutant. Consequently, PSD is not triggered for any other pollutant as a result of the permit modification. Because NO_X emissions will increase from the EFT facility, EFT did conduct an air dispersion modeling analysis to show that the increase in NO_X emissions does not adversely affect air quality. The air dispersion modeling is discussed **Section 5** of this document.

A GHG emissions increase was not addressed by EFT but will be dealt with in the Department review of the project (see **Section 4**)

4. DEPARTMENTS REVIEW

Beside than 3.77 lb/hr NO_X emissions increase from the process stack, the Department believes that there could be small increase of other regulated pollutants, including GHG due to the addition of the dedicated blast furnace afterburner. The Department addresses the NO_X emissions increase and the re-evaluation of the BACT for the reverb furnace (EU 023), blast furnace (EU 001) and feed dryer (EU 022) exhausts via the process stack in **subsection 4.1** below. The remaining modifications request by EFT will be addressed in subsequent subsections from a compliance enforcement perspective. Possible other emission increase will be addressed in **subsection 4.11** where the new afterburner is discussed.

4.1. NO_X Emissions Increase from Process Stack

BACT and NO_X emissions from the emission units venting to the process stack are listed in **Table 6** along with the causes of the NO_X emissions along with pollution control strategies. As seen from the table, EFT is requesting a net increase in NO_X emissions of 16.52 TPY.

TABLE 6 – BACT AND NO_X EMISSIONS – PROCESS STACK.

Emission Unit	Past Permitted Total Emissions (TPY)	Requested Permitted Total Emissions (TPY)	Comments Cause of NO_X, Exhaust Stack	Control
Feed dryer	**190.1**	**206.6** [1]	Natural gas combustion, filtered then vented via process stack	Good combustion
Reverb furnace			Natural gas combustion, afterburner, filtered, scrubbed, then vented via process stack	Air/oxy/fuel burners (LNB) and furnace draft control
Blast furnace			Coke combustion, GCP, afterburner, filtered, scrubbed, then vented via process stack	Furnace draft
Net Increase:	**16.52 (3.77 lb/hr)**			

1. Includes emission from new afterburner.

Based on the technical discussion in the original PSD permit application, the reverb furnace accounted for approximately 83% of the NO_X emissions from the three emission units list in **Table 6** which all vent via the process stack. Consequently, the previous BACT analysis for NO_X emissions from the process stack concentrated on this reverb furnace.

For the reverb furnace, EFT stated the two most effective options are low NO_X burners (LNB such as

air/oxygen/fuel burners and furnace draft control (FDC). LNB are configured to minimize the formation of thermal NO_X by using flame patterns that eliminate hot spots and/or by substituting oxygen for air to minimize the nitrogen available for thermal NO_X formation. FDC refers to minimizing air infiltration through the various openings, such as tap and slag holes, so that there is less air available for conversion to NO_X, as furnace draft control. Additionally, FDC has the added benefit of reducing the amount of fuel combustion needed to melt the feed stock, thereby minimizing the emission of all products of combustion, e.g., CO, VOC, etc., .

EFT also claimed in the original application that alternative technologies such as selective catalytic reduction (SCR) and selective non-catalytic reduction (SNCR) that rely on ammonia (NH_3) injection have not been used to control NO_X from secondary smelting and that they are technically infeasible.

According to EFT, SCR catalysts are especially susceptible to poisoning by the types of metals present in smelting furnace emissions. The claim is certainly plausible given the presence of HAP metals such as Pb, Arsenic (As), cadmium (Cd) and (Antimony) Sb. Also according to EFT, the use of SNCR on a lead smelting furnace would require the use of excessive NH_3 or urea (CH_4N_2O) in order to accommodate the fluctuating furnace conditions while achieving any reasonable control efficiency. These conditions would inevitably lead to considerable "slip" of the reagent into the gases emitted to the atmosphere and the resulting control efficiency would be lower than what is achieved in boilers as a consequence. The reagent would also interfere with the operation of the downstream SO_2 scrubber."

EFT provided the following additional reasons to support the case that SNCR and SCR were not feasible NO_X control options:

- Affinity of metals for NH_3 causing injection of greater than stoichiometric amounts of NH_3 and causing additional slip and salts formation;
- Salt formation in the wet scrubber;
- Introduction of significant amounts of NH_3 into the wastewater system;
- Ammonium ions interfere with the removal of Pb and other metals in the wastewater treatment system;
- The wastewater pretreatment standards for secondary lead smelters (40 CFR 421, Subpart M) allow <u>no</u> NH_3 discharge from any of the activities at such smelters;
- SCR would have to be installed downstream of the baghouse to avoid premature catalyst fouling, where gases have cooled below the temperature required for catalyst operation, necessitating the reheating of the gas stream;
- These concerns are the reasons SNCR and SCR have never been employed at secondary lead smelters in the U.S.; and
- The small amount of NO_X potentially prevented is not worth interference with these facilities' primary function – to prevent Pb reaching the environment from spent lead-acid batteries.

As previously concluded, even with an increase of 16.52 TPY, the Department believes that SCR and SNCR are not appropriate for the reduction of the levels of NO_X from reverb furnace at the EFT operation. In addition, the contribution from the other emission units venting to the process stack is marginal making application of another BACT control technology unjustified. Consequently, the Department reaffirms the original BACT determinations for the reverb furnace (EU 031), blast furnace (EU 032), and feed dryer (EU 030) that are stated in **Table 6** above.

An analysis of the ambient air effects of the 16.52 TPY NO_X emissions increase is provided in **Section 5**Error! Reference source not found..

4.2. Alternate Chemicals for SO_2 Control

As previously described, in order to provide operational flexibility, EFT is proposing the use of alternate reagents in the desulfurization process and furnace scrubber. In other words, caustic soda may be used instead of soda ash in the desulfurization process and vice versa. Moreover, EFT requests that the reagents be identified simply as "alkaline reagents" to allow EFT to use other chemicals. There will be no increase in SO_2 emissions from the furnaces as a result of this change, because the SO_2 emissions are monitored by CEMS and EFT will adjust the amount of reagents used to meet the targeted emission limit.

The Compliance Authority commented on this request as provided below:

"The use of sodium hydroxide in the desulfurization process results in the formation of lead oxide (PbO) instead of lead carbonate (PbCO3). According to Chapter 15 of Valve-Regulated Lead-Acid Batteries © 2004 by Rand, Moseley, Garche, and Parker, each of the [desulfurization] processes offers some advantages over the other, in terms of sulfate conversion, solubility of additives, or formation of unwanted insoluble salts. EFT should provide data on the sulfate conversion for each of the alkaline reagents being proposed for use in the process. In addition, based on these conversions, EFT should quantify the effect of the different reagents on the SO_2 emissions from the furnaces. Furthermore, based on the information provided in the Application, it was unclear what the effects would be on production and emissions of other pollutants due to the processing of lead oxide instead of lead carbonate and subsequent processing by the blast and reverberatory furnaces. In the desulfurization process, additional water is formed in the reaction from the use of sodium hydroxide which must be removed prior to further processing which could result in processing changes in the feed dryer and furnaces. Any physical changes and/or process rate changes from the chemistry difference as well as any emissions changes should be addressed accompanied by the relevant calculations. Also, if any of the emissions from the desulfurization process are directed to emissions control devices, the effects on the emissions from the reagent changes should be addressed."

EFT responded as follows:

"Although there are differences in the reactions when using different reagents in the desulfurization process and in the furnace scrubber, EFT has the operational capability and the continuous monitoring necessary to maintain compliance with the sulfur dioxide limit at the process stack, regardless of what reagent is used. In other words, any reduction in desulfurization effectiveness can be countered by the use of additional reagent at the scrubber to maintain the same sulfur dioxide emission rate. The process stack is equipped with a continuous SO_2 emissions monitor that EFT will use to ensure that the limit is maintained. EFT is not requesting the use of any reagents that would prohibit compliance with the limit."

"The differences in the emissions of other pollutants from the furnaces resulting from the introduction of paste that has been converted to lead oxide rather than lead carbonate is negligible. Also, the additional formation of water when using caustic soda instead of soda ash in the desulfurization process has no bearing on the resulting water content of the desulfurized paste, because the process is performed in a slurry that already has a high water content. After the desulfurizing reactions have taken place, the paste is separated from the water by a filter. Therefore, the dryer's operation is unaffected by the use of different desulfurizing chemicals."

The Department believes that EFT is correct in stating that an SO_2 CEMS should provide reasonable assurance that the SO_2 limit is not exceeded regardless of the reagent used. However, the Department will put language into the permit stipulating that the SO_2 CEMS must be used to control the reagent injection rate to ensure that the SO_2 permitted emissions limit is not exceed. This new permit language will be stress further in **subsection 4.5** when the new combined SO_2 emission limit requested by EFT is discussed. With regard to the dyer operation, the Department agrees with EFT explanation that excessive water in the desulfurized paste is not an issue of concern.

In summary, the permittee has indicated that if the desired flexibility is provided by the Department with regard to the chemicals used in the desulfurization process and the wet scrubber (sodium carbonate, caustic soda, etc.), all permitted SO_2 emissions limits will be met with compliance shown by CEMS. The Department agrees to provide the requested flexibility to the permittee. The term "alkaline reagents" will be added to the language of the permit with all references to the actual chemical names removed. In addition, language will be added to the permit specifying that based on SO_2 CEMS data, the amount of reagents used in the desulfurization process and the wet scrubber shall be adjust as required to meet the permitted emission limits. Further records shall be keep indicating the amount and type of reagent used and the corresponding SO_2 emissions rates. These records shall be kept on site for a period of 5 years and open to inspection by the Compliance Authority.

4.3. Afterburner Heat Rate

At the time of the original PSD application, the size of the afterburner had not yet been determined. However, since that time, EFT has been able to determine that the afterburner needs to have a maximum capacity of 10 MMBtu/hr.

The Compliance Authority EPC commented on this request as provided below:

"EFT is identifying the heat input capacity of the new furnace process afterburner, which is 10 MMBtu/hr. EFT should provide engineering design calculations for the afterburner which show how the furnace afterburner heat input rate was determined."

EFT responded as follows:

The exact heat input capacity needed to meet the emission limit cannot be determined due to the complexity of the system and the variables involved. For example, mixing and temperature uniformity in the afterburner play an important part in the oxidation process, but are difficult to determine accurately on paper. EFT feels confident based on our knowledge of the process and the experience gained at the facility's sister plant in Eagan, Minnesota that the heat needed will not exceed 10 MMBtu/hr. The burner will only be operated at the firing rate needed to maintain compliance with emission limit.

The Department believes that meeting the permitted emissions limits of VOC, THC and CO from the process and hygiene stacks provides reasonable assurance that the afterburner heat rate is adequate. The Department will define the burner capacity of the afterburner as 10 MMBtu/hr in the PSD permit. The capacity will be on a nominal basis precluding any compliance issues. No emissions increases will be caused by this change.

4.4. Process Rate Monitoring

The process rate monitoring requirement requests by EFT are discussed below.

4.4.1. Battery Breaking (EU 026)

For on-going compliance demonstrations, EFT is proposing to record the total weight of batteries introduced into the hammer mill on a daily basis with a limit of 1,440 tons per day, which is equal to the maximum hourly limit of 60 TPH times 24 hours. Accordingly, EFT requested that the limit of 60 TPH be changed to 1,440 tons per day in the PSD permit.

The Compliance Authority EPC commented on this request as provided below:

"EFT is proposing to monitor the batteries per day input rate to the battery breaking process in order to demonstrate continuous compliance with the maximum 60 TPH process rate in the AC Permit. The proposed limit is 1440 TPD which is derived by multiplying 60 TPH x 24 hours/day. However, the annual battery input rate is limited to 438,000 tons per 12-consecutive month period (annual average of 50 TPH). EPC staff recommends that the 12-consecutive month limit remain in the permit if the proposed maximum daily rate is established in the revised AC permit. In addition, a 30-day rolling average of the battery input rate should be kept by the facility in order to ensure that the 438,000 TPY limit is not exceeded, pursuant to Rule 62-4.070(1), F.A.C. Furthermore, in regards to the stack testing of the battery breaking operation, EFT should explain the procedures for the proposed manual monitoring to determine the battery input rate."

EFT responded as follows:

"The proposed limits of 60 ton/hr, 1,440 ton/day, and 438,000 ton/yr represent maximum battery breaking process rates. As stated in the comment, the value of 50 ton/hr is the average process rate that is equivalent to the annual limit of 438,000 ton/yr. In other words, the annual process rate limit of 438,000 divided by the number of hours in a year (8,760) yields an annual average rate of 50 ton/hr. There may be periods when the 50 ton/yr average is exceeded, but EFT will not process more than the specified limit of 1,440 tons on any given day. This daily limit is equivalent to 60 ton/hr times 24 hr/day."

"EFT plans to monitor the battery input rate to the battery breaking process during tests manually with an employee standing at the pallet dumper at the apron feeder. Ongoing production monitoring will be accomplished on a daily basis by manually counting pallets per day to estimate the amount of batteries broken"

"However, ……., EFT requests that this monitoring method not be incorporated into the permit, so as not to preclude improved monitoring methods from being used should they become available."

The Department will modify the PSD permit to reflect the change from 60 TPH to 1,440 TPD process rate while emphasizing that the TPY limit of 438,000 is still enforce by inclusion of a 12-month rolled monthly average

recordkeeping requirement for a period of 5 years. The method proposed by EFT to measure the battery breaking process rate during compliance stack testing will also be incorporated into the permit. However, a permitting note will be added to indicate that other methods may be used with prior approval of the Compliance Authority so as not to preclude the use of improved measuring methods should they become available.

4.4.2. Furnace Tapping, Charging, and Lead Refining (EU 033)

For the purposes of on-going compliance, EFT is proposing that the total lead cast will be used to represent the throughput of the refining process and will be compared with a limit of 1,584 tons per day (TPD). This is equivalent to 66 TPH for 24 hours. EFT requests that the hourly production limit of 20 TPH be replaced with this daily production limit in **Specific Condition 3** on page 16 of 31. The facility will continue to be limited to 150,000 tons per year as stated in **Specific Condition 5** on page 16 of 31 in the PSD Permit.

The Compliance Authority commented on this request as provided below:

"Based on EPC staff review, Table 15.1 - Typical Composition of Components in Battery Paste from Valve-Regulated Lead-Acid Batteries © 2004 by Rand, Moseley, Garche, and Parker, the typical average battery paste composition by weight is 57.5% lead sulfate, 32.5% lead dioxide, 2.5% metallic lead, and 7.5% other. Therefore, the overall percentage of elemental lead in battery paste is approximately 70% by weight. Performing a material balance on the smelting processes shows that the annual smelting capacity at 8,760 hours per year is about 312,491 TPY of elemental lead based on the 40 TPH process rate for the reverberatory furnace and the 7.5 TPH process rate for the blast furnace. The hard and soft lead produced in the smelting processes is sent to the refining kettles for further purification and alloying."

"Pursuant to Rule 62-4.070(1), F.A.C., in order to properly limit the lead production rate from the refining operations, EFT should provide the minimum residence time for the refining kettles (on a ton basis) for soft lead, hard lead, and lead alloys, in order to determine the maximum hourly process rate for this operation. In regards to the furnace operation, EFT should explain the procedures for the proposed manual monitoring to determine the furnace and feed dryer process rates."

EFT responded as follows:

"The smelting capacity of the plant cannot be determined based solely on the lead composition of the paste and the maximum short-term input rates to the furnaces. The feedstocks to the furnaces contain other materials, such as solid lead battery components, coke for use as fuel or reductant, and, in the case of the blast furnace, lead-bearing slag from the reverb furnace, cast iron, and fluxes. Also, the furnaces throughput rates will vary depending on several variables. They cannot be operated continuously at their maximum short-term rates nor can they be operated uninterrupted throughout the year. They are shutdown at scheduled intervals for routine maintenance and occasional malfunctions of the furnaces or the equipment upstream or downstream of the furnaces."

"Based on the overall design of the plant and the constraints under which the equipment can be operated we estimate that the plant will be capable of making approximately 150,000 tons of lead per year. Regarding residence time in the kettles, it is important to understand the nature of the operation before discussing the correlation between minimum residence time in a kettle and the overall process rate of the refining operations. The refining process consists of 10 kettles, two of which have a capacity of 150 tons each, while the remaining eight have a capacity of 100 tons each. The two larger kettles are used to receive molten lead from the furnaces and distribute the lead to the eight smaller kettles as needed. The refining and alloying takes place in the smaller kettles. The residence time in any one of these kettles depends on the composition of the molten lead being charged to the kettle and specifications of the desired product. It could be anywhere from 8 to 15 hours. The lead in each of the kettles is refined independently from the others and the lead in any given kettle may be held for a period of time awaiting casting. Although a theoretical maximum process rate could be determined using the minimum residence times, it would not correlate well with an actual maximum process rate in practice due to the nature of the operation. Further, because the residence time is so long, it would be very difficult to monitor the process rate during a three-hour stack test. For this reason, EFT has suggested in its permit application that the process output rate, casting rate, which is more easily measured, be used to characterize the process rate of refining during stack testing. A maximum casting rate of 66 ton/hr was provided for this purpose."

"EFT's current plan for monitoring the process rates for the furnaces and feed dryer is to manually read and record meter readings and monitor the system with employees out(sic) at each unit. Please note that EFT requests that specific process monitoring procedures not be specified in the permit in the event that a better

solution for monitoring the process rates presents itself."

The Department will modify the PSD permit to reflect the 66 TPH casting rate as a surrogate for the refining rate with the 66 TPH casting rate to be used during compliance stack testing. In addition, the Department will add a limit for the daily total lead cast of 1,584 TPD into the permit. The method proposed by EFT to measure the casting rate during compliance stack testing will also be incorporated into the permit. However, a permitting note will be added to indicate that other methods may be used with prior approval of the Compliance Authority so as not to preclude the use of improved measuring methods should they become available.

4.4.3. Feed Dryer, Reverb Furnace, and Blast Furnace (EUs 030, 031 and 032)

The original PSD permit lists the capacities of the Feed Dryer, the Reverb Furnace and the Blast Furnace as 40 TPH, 40 TPH and 7.5 TPH, respectively. For the purposes of monitoring the process rates and burner firing rates during compliance stack testing, EFT proposes to manually monitor these capacities. For ongoing compliance, EFT proposes to record the inputs of the dryer and furnaces on a daily basis for comparison with daily process limits of 960 ton/day for the Feed Dryer, 960 ton/day for the Reverb Furnace and 180 ton/day for the Blast Furnace. Accordingly, EFT requests that the hourly limits be replaced with these daily limits in the PSD permit. Additionally, EFT proposes that the 24-hour period used for compliance monitoring purposes end and begin at noon each day.

The Compliance Authority EPC commented on this request as provided below:

"On Page 90 of the Application, the maximum annual rate for lead refining is listed as 175,000 TPY of lead refined, while the PSD permits (PSD-FL-404A and 404B) and the Application narrative specify a maximum of 150,000 TPY lead refined. Also, on the same page, the maximum hourly process rate for refining is listed as 20 TPH, but Page 88 lists the maximum hourly process rate as 25 TPH. Based on the review of the original PSD permit application and original PSD permit, the potential emission calculations for lead refining were based on a long-term process rate of 16.67 TPH which is equivalent to approximately 146,000 TPY lead refined. Pursuant to Rule 62-4.070(1), F.A.C., EFT should explain the discrepancies in the maximum annual and hourly production rates, and how any changes to the original design have affected or will affect the actual emissions and PTE for the facility, and submit revised application pages, as necessary."

EFT responded as follows:

"The value of 175,000 ton/yr on page 90 is simply the annual equivalent of 20 ton/hr at 8,760 hr/yr. EFT does not intend to exceed the allowable 150,000 ton/yr limit in the permit. A revised copy of page 90 showing an anticipated maximum production rate of 150,000 ton/yr is included in Attachment A. The hourly process rate of 20 ton/hr is the estimated hourly process rate of the refining operations. As described in the response to Comment No. 1 above, it is difficult to determine an hourly rate due to the nature of the refining operation. For the sake of consistency, EFT is including a revised version of page 88 showing a process rate of 20 ton/hr in Attachment A. Please note that none of the emission rates presented in this application or in previous applications are based on the process rate of refining. The particulate matter and lead emissions are based on the air flow of the Hygiene Baghouse and the maximum outlet concentrations of the pollutants from the Hygiene Baghouse. The NOx and SO_2 are based on the anticipated maximum usages of refining materials containing nitrogen and sulfur."

The Department will modify the PSD permit to reflect the request change from hourly to daily process rates for the Feed Dryer, Reverb Furnace, and Blast Furnace. However, to ensure that there is no confusion with regard to compliance issues, the 24-hour period used for process rate compliance and CEMS compliance will continue be defined as running from midnight to midnight each day. It will also be noted in the permit that the process rates and burner firing rates during compliance stack testing will be manually monitored. EFT has sufficiently explained the discrepancies in the maximum annual and hourly production rates, and how any changes to the original design have affected or will affect the actual emissions and PTE for the facility. EFT has also submitted the necessary revised application pages.

4.5. Combined SO_2 Limits from the Process and Hygiene Stacks (EUs 030, 031, 032 and 033)

EFT is requesting a change in the format of the existing SO_2 emissions limits on the process and hygiene stacks. These stacks are currently limited by the permit to 163.9 lb/hr and 38.34 lb/hr of SO_2 emissions, respectively.

The underlying regulatory purpose of these limits is to restrict the potential SO_2 emissions increase resulting from the plant reconstruction and expansion to a level below the PSD major modification threshold. EFT has requested that these two limits be combined into a single limit of 202.24 TPY.

According to EFT, the amount of fugitive SO_2 fluctuates significantly during furnace operations causing a high degree of variability in SO_2 between the two stacks. The SO_2 emission are controlled by wet scrubbing with compliance shown by a SO_2 CEMS on both the process and hygiene stacks. The Department believes that the scrubbing and CEMS provide reasonable assurance that the PSD SER threshold of 40 TPY will not be exceed by combining the SO_2 emissions limits. The PSD permit will be modified accordingly. Since PSD will not be trigger, no SO_2 air dispersion modeling is required due to this change.

Finally as previously indicated in **subsection 4.2**, language will be added to the permit specifying that based on SO_2 CEMS data, the amount of reagents used in the desulfurization process and the wet scrubber shall be adjust as required to meet the permitted SO_2 emission limits. A plan to ensure that this is done shall be submitted to the Compliance Authority for approval within 30 days of this permit going final.

4.6. Increased Emergency Generator Rating (EU 037)

EFT has requested that the size of the emergency generator be increased from 500 kW to 1,000 kW. EFT states that this change is required because it has been determined that the generator needs to be larger to accommodate all of the processes that will need to be operated during a power outage. The EFT NO_X air dispersion modeling included in the permit application took into account the emissions increase from the large generator. However, according to EPA guidance, intermit air pollution sources such as emergency generators do not need to be include in air modeling. The PSD permit will be changed to reflect the new generator size. In addition, the allowable operational hours of the generator will be reduced from 500 hours to 100 hours to meet the new definition of an emergency generator in the NSPS 40 CFR 60, Subpart IIII.

The Department will also change the units for emissions from the generator from the original units of grams per horsepower hour (g/hp-hr) to grams per kilowatt hour. For a 1,000 kW emergency generator, the non-methane hydrocarbon (NMHC) plus NO_X emission limit in the PSD permit should be 3.8 grams g/kW-hr. Also, due to an oversight in the previous permits, a CO limit was not included for the emergency generator. To correct this oversight, the actual CO emit of 3.5 g/kW-hr will be added to the permit.

4.7. Coke Breeze Identification (EU 031)

EFT states that an independent audit suggested that the permitted process description for the reverb furnace should include coke breeze as a reductant, consistent with industry practice, so the storage, handling and use of this material is transparent to regulators. The PSD permit will be changes accordingly.

4.8. Revised Baghouse Specifications (EUs 030, 031 and 032)

EFT is going to upgrade the process baghouse that serves the dryer and furnaces due to higher than anticipated corrosion rates. However, the baghouse fans and the process stack will not be altered. Consequently, there will be no change in the air flow or an impact on air emissions. The baghouse modules themselves will be replaced and will contain a different size and quantity of bags. The new information for the baghouses was include in the permit application forms. The PSD permit will be modified to authorize this baghouse upgrade and description (if necessary).

4.9. Revised Appendix FDCO

EFT is proposing to revise Appendix FDCO - Standard Operation Procedures for Fugitive Dust Control During Operational Activities, to reflect lessons learned during the operation of the reconstructed and expanded EFT facility. The Department will replace the existing Appendix FDCO in the permit with the revised Appendix FDCO provided by EFT.

4.10. Process Stack Replacement

EFT has requested the authorization to replacement the original process stack due to the stack encountering extensive corrosion problems during the initial operation of the EFT reconstructed and expanded facility. The reconstructed stack will have same height and internal diameter of the original stack and will be at the same

location. The new stack will be constructed of more corrosion resistant materials. The Department will authorize replacement of the process stack with a new stack at the same location which will be the same height and internal diameter of the original stack.

4.11. New Dedicated Afterburner (EU 032)

EFT is proposing to construct an additional afterburner chamber dedicated to the blast furnace that can be operated when the reverb furnace is down. Like the main afterburner, the dedicated afterburner will be equipped with a natural gas burner. The burner capacity will be a maximum of 20 MMBtu/hr. The burner rating is higher on the dedicated afterburner than the common afterburner (10 MMBtu/hr), as there are no "hot" reverb burner gases to contribute to heat content with the dedicated afterburner's chamber. Like the common afterburner, the new dedicated afterburner will employ a continuous temperature monitoring system that provide evidence that the afterburner is operating in a manner consistent with the operation during the most recent compliance test for THC

Based on AP-42 Chapter 1.4, the increase in emissions from the combustion of an additional 20 MMBtu/hr of natural gas is 8.5 TPY NO_X, 7.2 TPY CO, 0.65 TPY PM, 0.47 TPY VOC, and 0.05 TPY SO_2. These emission rates must be checked against the facility-wide PSD avoidance levels originally established in the PSD permit, for the pollutants that did not trigger PSD, specifically, CO, VOC, and SO_2. The estimated emission from the original PSD application (Link to Application page 12 of 38) and Technical Evaluation (Link to Technical page 15 of 37) are given in **Table 7** below.

TABLE 7 – ORIGINAL PSD PERMIT EMISSIONS ESTIMATES FOR PSD APPLICABILITY.

Pollutants	Baseline Actual Emissions	Future Potential Emissions	Net Emissions Increase	PSD Significant Emission Rate	PSD Triggered? Yes/No
CO	813	912	99	100	No
NO_X	35	204	169	40	Yes
$PM/PM_{10}/PM_{2.5}$	24	65	41	25/15/10	Yes
SAM	4.4	6.5	2.1	7	No
Pb	0.97	0.96	-0.01	0.6	No
SO_2	853	892	39.0	40	No
VOC	60	16	-44.0	40	No
Mercury (Hg)*	0.012	0.018	0.006	0.1	No

As seen from this **Table 7**, the only pollutant of concern is CO which had an increase due the facility reconstruction project of 99 TPY which is 1 TPY less the PSD SER of 100 TPY. The estimated CO emissions increase from the new dedicated afterburner is 7.2 TPY which would put the reconstructed facility over the CO SER triggering a PSD review. However, **Specific Condition 14** of **Section III-B - Lead Smelting** of the original PSD states:

14. CO Emission Standard: CO emissions from the feed dryer and blast furnace and reverb furnace shall not exceed 204.7 lb/hr as demonstrated by a combined 30-day rolling CEMS average on the process stack. [Application No. 0570057-020-AC; Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]

Consequently, CO emission from feed dryer and blast furnace and reverb furnace are monitored by CEMS to provided reasonable assurance the PSD SER for CO is not exceed. Further assurance is also provided by the fact that even through the emergency generator is doubling in size as a result of this permitting action its operational hours under nonemergency conditions are reduced by 80%. With the NSPS Subpart IIIII CO certified emission rate for emergency generator engines in the 500 kW to 1000 kW range of 3.5 grams per kW-hour (g/kW-hr) the change in CO emissions are:

The change in the generator size when coupled with the reduction in operational hours results in a net CO emission decrease of 0.96 – 0.38 = 0.58 TPY.

In addition to the increase of CO emissions, the addition of the dedicated afterburner will result in an increase of GHG emissions. The increase in GHG emissions from the increase in the emergency generator size will be more than offset by the reduction in operational hours.

Utilizing EPA GHG emissions factors (http://www.epa.gov/climateleadership/documents/emission-factors.pdf) the increase in GHG emissions from the afterburner equals:

The 10,230 TPY of CO_2 is well below the GHG PSD triggering threshold for a PSD anyway source of 75,000 TPY of CO_2e. It should be noted, that while only the CO_2 from the natural gas combusted in the dedicate afterburner was calculated, the overwhelming amount of CO_2e generated by combusting natural gas is CO_2.

Finally, the NO_X emissions from the NO_X increase from the process stack of 16.52 TPY when combined with the potential NO_X increase from the dedicated afterburner of 7.2 TPY is still well below the PSD SER for NO_X of 40 TPY.

The PSD permit will be modified to authorize the installation and operation of the dedicate blast furnace afterburner with a nominal burner capacity of 20 MMBtu/hr. Language will be included in the permit limiting the operation of the dedicated blast furnace afterburner to times when the reverb furnace is not in operation. Finally, the permit will be modified to include a 10 year monitoring, recordkeeping and reporting requirements for CO emission from the process stack to ensure PSD is not triggered for CO.

4.12. Operating Rate During Compliance Testing

Rule 62-297.310(2), F.A.C., which is include in Appendix CTR of the previous PSD permits, states:

Operating Rate During Testing: Testing of emissions shall be conducted with the emissions unit operating at permitted capacity. If it is impractical to test at permitted capacity, an emissions unit may be tested at less than the maximum permitted capacity; in this case, subsequent emissions unit operation is limited to 110 percent of the test rate until a new test is conducted. Once the unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purpose of additional compliance testing to regain the authority to operate at the permitted capacity. Permitted capacity is defined as 90 to 100 percent of the maximum operation rate allowed by the permit.

Consequently, an emission unit capacity is limited to a maximum of 110% of the lowest capacity at which the most recent compliance test was conducted for any pollutant. In other words, if an emission unit was tested at 70% capacity during compliance testing for Pb and 80% capacity when compliance testing for NO_X, during normal operation of the emission unit its capacity is limited to 77% (70% x 1.1) not 88% (80% x 1.1) until such time that a new compliance test is conducted for Pb at a higher capacity. Upon testing for Pb (or any other pollutant), the same capacity analysis would be performed again to determine the unit capacity limiting pollutant (if any). At the request of EPC, language will be added to the PSD permit clarifying this fact to avoid future misunderstandings with EFT on this issue.

4.13. NESHAP Subpart X Emission Standards

The EFT facility is an affected source that commenced construction or reconstruction on or before May 19, 2011. Consequently the EFT facility must demonstrate compliance with the requirements of NESHAP 40 CFR 63, Subpart X - National Emission Standards for Hazardous Air Pollutants From Secondary Lead Smelting no later than January 6, 2014. Since the time has passed for the EFT facility to come into compliance with Subpart X requirements, the PSD permit will be modified to include the applicable emission limits from the subpart. Some of these emissions limits are given in **Table 8** below.

TABLE 8 – NESHAP SUBPART X BLAST AND REVERB FURNACE EMISSIONS LIMITS.

FOR VENTS FROM THESE PROCESSES	YOU MUST MEET THE FOLLOWING EMISSIONS LIMITS [a]	
	TOTAL HYDROCARBON PARTS PER MILLION BY VOLUME EXPRESSED AS PROPANE CORRECTED TO 4% CO_2 (ppmv)	DIOXIN AND FURAN (D/F) NANOGRAMS/DSCM EXPRESSED AS TEQ CORRECTED TO 7% O_2 (ng/dscm TEQ)
Collocated blast and reverberatory furnaces (new and existing)	20	0.50
Collocated blast and reverberatory furnaces when the reverberatory furnace is not operating for units that comments construction or reconstruction before June 9, 1994	360	170
[a] There are no standards for dioxins and furans during periods of startup and shutdown.		

Other Subpart X emissions limits applicable to the EFT facility are:

- Lead Emissions: Existing sources must maintain the concentration of lead compounds in any process vent gas at or below 1.0 milligrams of lead per dry standard cubic meter (mg/dscm). Existing sources must maintain a flow-weighted average concentration of lead compounds in vent gases from a secondary lead smelting facility at or below 0.20 mg/dscm of lead.
- THC Emissions, Hygiene Stack: If you do not combine the furnace charging process fugitive emissions with the furnace process emissions, and discharge such emissions to the atmosphere through separate emissions points, you must maintain the total hydrocarbons concentration in the exhaust gas at or below 20 ppmv, expressed as propane.

4.14. NSPS Subpart L Emissions Standards

The EFT facility is an affected source and is subject to the requirements of NSPS 40 CFR 60, Subpart L - Standards of Performance for Secondary Lead Smelters. This subpart has emission limits for PM and VE which are given below:

- Contain particulate matter in excess of 50 mg/dscm (0.022 gr/dscf); and
- Exhibit 20 percent opacity or greater.

The PM and VE standards set forth in **Section 3-B - Lead Smelting**, for the fed dryer, blast furnace and reverb furnace of 0.005 gr/dscf (PM) and 3% opacity (VE) ensure that that the PM and VE requirements of 40 CFR Part 60, Subpart L are met.

5. AIR QUALITY IMPACT ANALYSIS

5.1. Introduction

The initial ambient air impact was conducted and approved in 2009, and can be found on pages 23 to 37 of the original Technical Evaluation located at the link given in **Section 1** of this document.

Subsequently as part of the "As-Built" project (Permit No. 0570057-027-AC, PSD-FL-404B), this modeling analysis was revised for lead and PM_{10} to include a new baghouse and emission point (stack). For these pollutants EFT provided a demonstration using approved air quality models that project emissions would not cause or contribute to a violation of an NAAQS or PSD increment for the pollutants where they applied. This additional ambient air impact was conducted and approved in 2012, and can be found on pages 10 to 14 of the Addendum No. 1 to the original Technical Evaluation located at the link given in **Section 1** of this document..

The EnviroFocus (EFT) project is located approximately eight kilometers (km) northeast of downtown Tampa. The surrounding industrialized area contains several major stationary sources of air pollutants that are important components of the multi-source modeling analyses that were performed. The general location of the existing site is shown in **Figure 5**, while **Figure 6** shows a 3-D rendering of the reconstructed EFT facility with its emission points (stack identified).

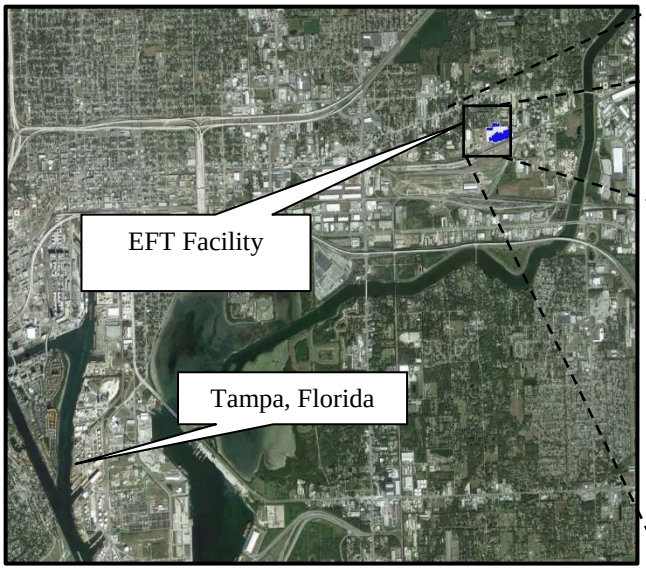

Figure 5. Location of EFT Facility.

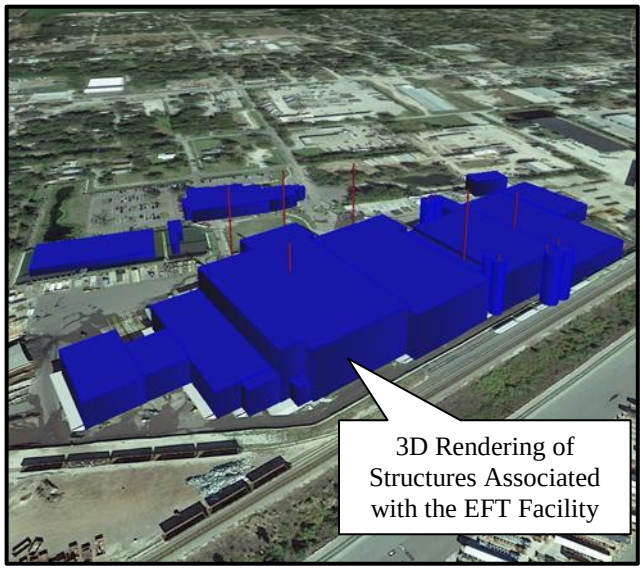

Figure 6. EFT 3D Rendering of EFT Facility.

5.1. Major Stationary Sources near the EFT Facility

To provide some perspective on the relative scale of the EFT "Final Build-Out" project with respect to NO_X emissions, **Table 9** is provide below. This table lists the largest stationary sources of actual NO_X emission around the EFT facility. The maximum potential future NO_X emissions rounded to the nearest Ton from the EFT "Final Build-Out" project is highlighted in the table.

TABLE 9 - LARGEST SOURCES OF NO_X (2012) NEAR THE EFT FACILITY.

Owner/Company Name	Site Name	County	Emissions (tpy)
Tampa Electric Company	Big Bend Station	Hillsborough	47,779.8
Lakeland Energy	C.D. Mcintosh Jr. Power Plant	Polk	1,823.1
Hillsborough County	Resource Recovery Center	Hillsborough	926.1
FP&L	Manatee Power Station	Manatee	877.8
Tampa Electric Company	H.L. Culbreath Bayside Power	Hillsborough	541.2
City of Tampa	McKay Bay Refuse to Energy	Hillsborough	330.4
Mosaic Fertilizer	Riverview Facilities	Hillsborough	158.6
Trademark Nitrogen Corp	Trademark Nitrogen Corp	Hillsborough	59.9
EnviroFocus	**EnviroFocus**	**Hillsborough**	**17.0**

All nearby facilities that were included in the cumulative modeling for the one hour NO_2 NAAQS and increment analyses (see **subsection 5.4**) are shown in **Figure 7**.

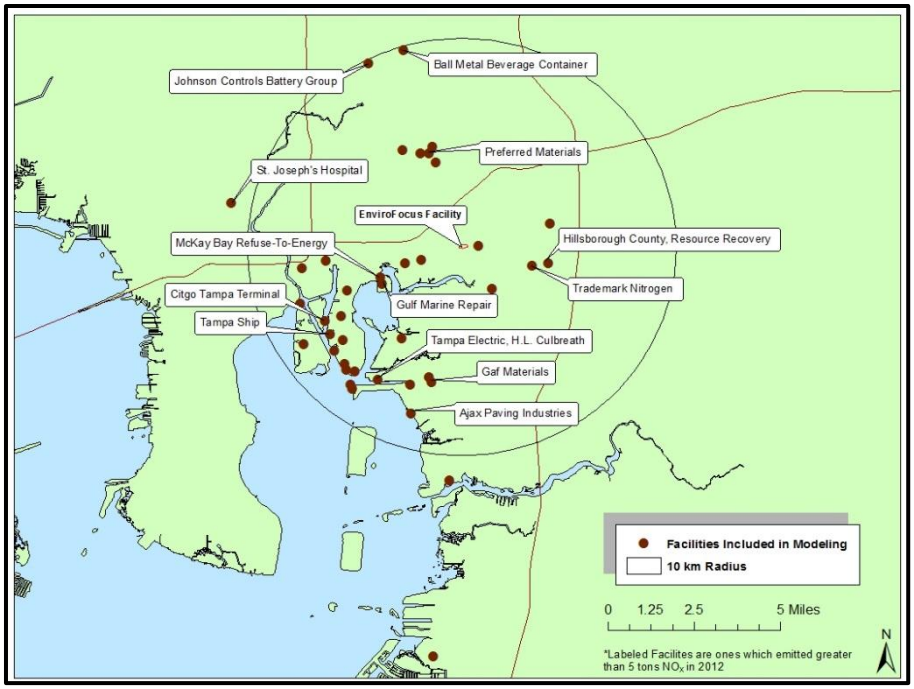

Figure 7 Background Emission Sources near the EFT Facility.

5.2. Ambient Air Monitoring Surrounding the EFT Facility

Pre-construction ambient air monitoring is required for those pollutants subject to PSD review or, for ozone, if the potential emissions of NO_X or VOC exceed 100 tpy; however, if there are representative regulatory monitors already in place, this data can satisfy the pre-construction monitoring requirement.

For the initial EnviroFocus project application, submitted in 2009, the maximum potential emissions of $PM_{2.5}$, PM_{10}, and NO_X exceeded the SIL; thus, the submittal of monitoring data for these pollutants and ozone were required. In the subsequent modeling analysis conducted in 2012, the maximum potential emissions of Pb and PM_{10}, exceeded the SIL. Consequently, a cumulative modeling of additional sources in the region is required to show that the proposed project modification will not cause or contribute a violation of the NAAQS. However, since this revision only affects NO_X emissions, monitoring data for this pollutant and ozone are required.

The State of Florida ambient air monitoring network operated by the Department and its partners (local air pollution control programs) includes monitors in many Florida counties. There are eleven active monitors operated by the EPC, the local program nearest the facility. Some of these monitors are within a few kilometers of the EFT facility. The monitors which measure ozone or NO_X around the EFT facility are shown in **Figure 8**. These monitors are considered to be conservatively representative of the project site and are used to estimate the existing air quality in the area and to satisfy pre-construction monitoring requirements.

The ambient air measurement for the chosen monitors are listed in **Table 10**. These values do not contain 'exceptional events'. An 'exceptional event' is defined by EPA in accordance with 40 CFR 50.14 as an event that affects air quality, is not reasonably controlled or preventable, and is an event caused by human activity that is unlikely to recur at a particular location or natural event.

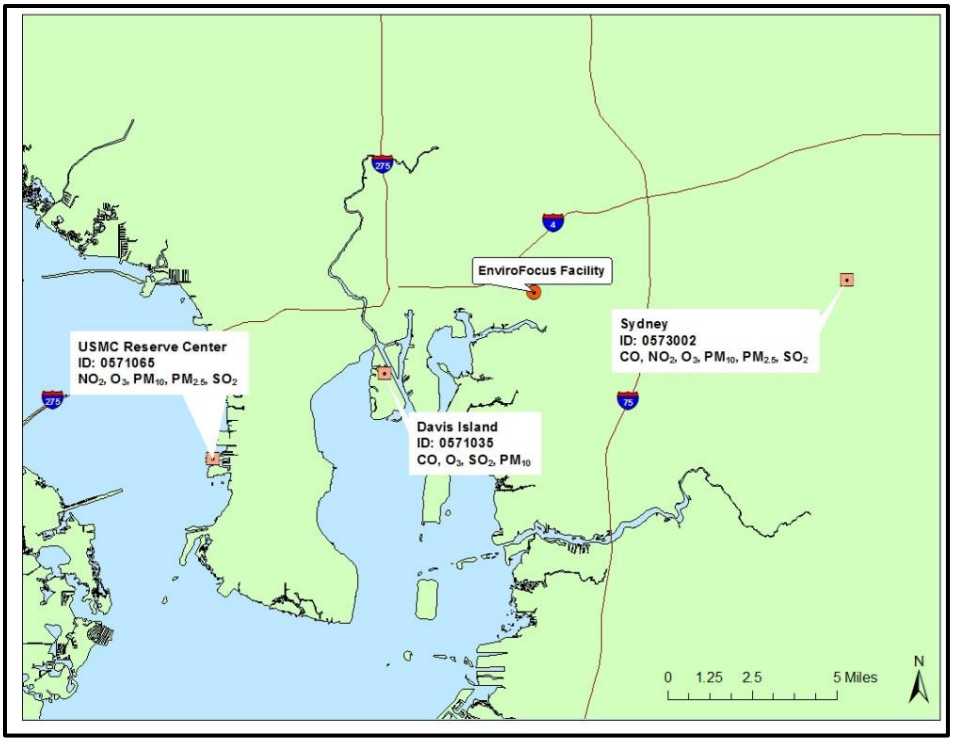

Figure 8 Ambient Air Monitors near the EFT Facility.

TABLE 10 - AMBIENT AIR QUALITY MEASUREMENTS NEAREST TO THE EFT FACILITY (2010-2012).

Pollutant	Location (Site Number)	Averaging Period	Ambient Concentration			
			Compliance Period	Value	Standard	Units
NO_2	USMC Reserve Center (057-1065)	Annual [a]	2012	4.7	53	ppb
		1-hour [b]	2010-2012	35	100	ppb
Ozone	Davis Island (057-1035)	8-hour [c]	2010-2012	69	75	ppb

a. 2012 annual arithmetic mean.
b. Three year average (2010-2012) of the annual 98th percentile daily maximum 1-hour average.
c. Three year average (2010-2012) of the annual 99th percentile daily maximum 8-hour average

5.3. Existing Ambient Air Quality near the EFT Facility

5.3.1. Ozone and NO_2

Ozone is a key indicator of the overall state of regional air quality. It is not emitted directly from combustion processes; rather it is formed from VOC and NO_x emitted primarily from regional industrial and transportation sources. VOC is also emitted naturally from vegetation. These two precursors participate in photochemical reactions that occur on an area-wide basis and are highly dependent on meteorological factors.

The ozone and NO_2 measurements are summarized in **Table 10**. The reported NO_2 annual compliance value (4.7 ppb) shown in **Table 10** was calculated by averaging all the one hour values during the year 2012. The reported NO_2 1-hour design value (35 ppb) was calculated by taking the three year average (2010-2012) of the annual 98th percentile daily maximum 1-hour average.as shown in **Table 10**. The reported ozone 8-hour design value (69 ppb) was calculated by taking the three year average (2010-2012) of the annual 99th percentile daily maximum 8-hour average and is reported in **Table 10**. Note: EFT utilize a value of 5.1 ppb for the annual NO_2 their air dispersion modeling analysis due to a different approach in calculating the value. This makes the EFT air dispersion modeling analysis for annual NO_2 inherently conservative in nature.

5.4. Air Quality Impact Modeling

5.4.1. Models, Emissions Data, and Meteorological Data

The EPA-approved AERMOD modeling system was used to evaluate the pollutant emissions from the project in the surrounding Class II areas. AERMOD is a Gaussian steady-state plume dispersion modeling system that simulates pollutant dispersion methods based on planetary boundary layer turbulence structure and scaling concepts, including the treatment of both surface and elevated sources, and both simple and complex terrain. AERMOD contains two input data processors: the AERMET meteorological processor and the AERMAP terrain processor.

The applicant used a series of specific model features recommended by the EPA that are referred to as the regulatory options. Direction specific building downwash parameters for each stack were calculated for all proposed structures at the EFT project site using the BPIPPRM program. Emissions data used in the modeling analysis were obtained from the DEP ARMS database, DEP permit files, and recent PSD permit reviews.

The AERMET meteorological data used with the AERMOD model consisted of a concurrent 5-year period of hourly surface weather observations from the National Weather Service (NWS) Automated Surface Observing System (ASOS) station and upper air sounding data collected at Tampa International Airport (TPA). This data was compiled by the DEP for the period 2006 through 2010 with the inclusion of a land cover and use analysis input from AERSURFACE and detailed wind data from AERMINUTE. The ASOS station at TPA is located approximately 15 km west of the EFT project site and is the closest primary weather station considered to have representative meteorological data. As the TPA ASOS station is only 15 km from the project site, both sites are approximately the same distance from the coastline, and the terrain between the two sites is mostly flat, the wind direction and wind speed frequencies measured at the ASOS location are considered to be very similar to those experienced at the project site.

5.4.2. Significant Impact Analysis (SIL)

The general modeling approach for the significant impact analysis for the "Final Build-Out" EFT project followed the EPA and the DEP modeling guidelines for determining compliance with NAAQS and PSD increments. For all criteria pollutants that will be emitted in excess of the PSD SER due to a proposed project, a significant impact analysis is performed to determine whether the emission and/or stack configuration changes due to the project alone will result in predicted impacts that are in excess of the EPA SIL for Class I (designated areas such as National Parks) and Class II areas (everywhere else). For the proposed revision, emissions increases for NO_X are expected. As NAAQS and/or PSD increments exist for this pollutant, a significant impact analysis was completed to determine if the project has the potential to cause an increase in ground-level concentration greater than the respective SIL.

If the modeling for a particular pollutant shows ground-level increases less than it's SIL, the applicant need not conduct any further modeling. If the modeled concentrations from the project exceed the SIL then additional refined modeling, including emissions from nearby facilities and/or projects (multi-source modeling), is required to determine the proposed project's impacts compared to the NAAQS and PSD increments for those pollutants.

5.4.2.1. *Class II SIL*

For the Class II analysis, a combination of fence line, near-field and far-field receptors were chosen for predicting maximum concentrations in the vicinity of the project. Receptor locations used in the modeling analysis were based on Universal Transverse Mercator (UTM) coordinates from Zone 17, North American Datum 1983 (NAD83). The air modeling domain for the one hour NAAQS analysis was set as a 29 km by 26 km grid centered at the facility's location. A discrete Cartesian grid was located at the following intervals and distances:

- 50 m spacing along the property boundary and fence line;
- 100 m spacing from the fence line to approximately 500 m;
- 200 m spacing from approximately 500 m to 2,400 m from the fence line;
- 500 m spacing from approximately 2,400 m to 4,200 m and 6,200 m from the fence line.

For the annual NAAQS analysis a discrete Cartesian grid was located at the following intervals and distances:

- 100 m spacing from the fence line to approximately 1,400 m;
- 200 m spacing from approximately 1,400 m to 2,900 m from the fence line;
- 500 m spacing from approximately 2,900 m to 13,400 m from the fence line.

In addition to the existing grids, the applicant included a uniform Cartesian grid spaced every 100 m where the overall model impact exceeded the standard or came within 90% of it.

The modeling results in **Table 11** show the maximum radii where concentrations exceeded the SIL for both the annual and 1-hour standard. As a result, additional modeling analyses for these pollutants must consider other nearby sources and background concentrations to determine the cumulative impact of these sources for comparison to the NAAQS and PSD increments.

TABLE 11 - MAX PREDICTED AIR QUALITY IMPACTS OF THE EFT PROJECT COMPARED TO CLASS II SIL.

Pollutant	Averaging Time	Max Distance to SIL Exceedance (km)	SIL (μg/m^3)	Significant Impact?
NO_2	Annual	2.78	1	**Yes**
	1-Hour	13.4	7.6	**Yes**

5.4.2.2. *Class I Area Impacts- Air Quality Related Values (AQRV)*

The nearest Class I area to the facility is the Chassahowitzka National Wildlife Refuge and Wilderness Area, which is located 70 km to the north of the facility. According to the U.S. Department of the Interior, an AQRV is defined as "all those values possessed by an area except those that are not affected by changes in air quality and include all those assets of an area whose vitality, significance, or integrity is dependent in some way upon the air environment." An analysis of a project's impacts on AQRV in Class I areas is required as part of an application for an air construction permit.

In October 2010, the Federal Land Managers (FLMs), consisting of the National Park Service, U.S. Forest Service, and U.S. Fish and Wildlife Service, issued the Federal Land Managers' Air Quality Related Values Work Group (FLAG), Phase I Report- Revised (2010). Based on the report, the FLM recommended initial screening criteria that would exempt a source from AQRV impact review based on a source's annual emissions and distance from a Class I area.

The FLM will consider a source located greater than 50 km from a Class I area (the EnviroFocus facility is 70 km away) to have negligible impacts with respect to Class I AQRV if its total SO_2, NO_x, PM_{10}, and sulfuric acid mist (SAM) annual emissions in TPY (based on 24-hour maximum allowable emissions), divided by the distance (km) from the Class I area (Q/D) is 10 or less. The FLM would not request any further Class I AQRV impact analyses from such sources. As shown in **Table 12**, the Q/D value for the ENP is less than the screening criterion; therefore, an AQVR analysis is not required.

TABLE 12 - MAX PREDICTED AIR QUALITY IMPACTS OF THE EFT PROJECT COMPARED TO CLASS I SIL.

Pollutant	SO_2	NO_x	SAM	PM_{10}	Total
Potential Emissions (Q) (TPY)	38	177	0	35	280
Class I area	Chassahowitzka National Wildlife Refuge and Wilderness Area				
Minimum Distance (D) (km)	70				
FLAG screening ratio (Q/D) (TPY/km)	4.0				
Greater than FLAG guidance (10)?	**No**				

5.4.3. NAAQS Analyses

The NAAQS analyses are cumulative source analyses that evaluate whether the air quality impacts from all nearby sources, and the source under review, will comply with the NAAQS for each pollutant and averaging time. The analyses consider the modeled impacts from revised sources at the EnviroFocus site, emissions from other nearby sources, and a non-modeled background concentration.

The background concentration is based on monitoring data and is designed to take into account any existing natural or anthropogenic sources of each pollutant in the area that are not explicitly modeled. The concentration for NO_x was derived from local monitoring data as shown in **Table 10**. Pollutant sources within 50 km of the EFT site were considered for inclusion in the analyses. The background sources that were explicitly modeled for the 1-hr NO_2 standard are shown in **Figure 7**. Since no attempt was made to remove the impact each of these sources had on the established monitored background levels, which are added to the modeling results, there is likely a certain level of 'double-counting' occurring and thus this method is considered to be a conservative approach.

5.4.3.1. *1-hour NO_2 NAAQS*

The 1-hour NO_2 NAAQS analysis is a complex analysis. This is mainly due to the fact that the emitted pollutant, NO_x, is not the controlled pollutant, NO_2. NO_X is the sum of the nitrogen-oxide species NO and NO_2. In general, a large portion of the NO_x emitted from sources is NO. Once the plume leaves the stack, oxidation reactions between NO and ozone in the ambient air converts a certain amount of the NO to NO_2. EPA guidance recommends a three tiered approach to determining the ratio of NO_2 to NO_x both in-stack and in the ambient air:

- Tier 1: 100% conversion of NO to NO_2.
- Tier 2: 80% ambient conversion of NO to NO2 on an hourly basis.

Tier 3: Default in-stack ratios of 50% conversion (or lower if defensible) with up to 90% ambient conversion utilizing either the ozone limiting method (OLM) or plume volume molar ratio method (PVMRM) algorithms. For this analysis, the Tier 3 method, approved by EPA Region 4, was utilized with the PVMRM algorithm and the in-stack ratios shown in **Table 13**.

TABLE 13 - TIER 3 IN-STACK RATIOS.

Source	NO_2/NO_x Ratio
Woodruff & Sons EU	0.32
All Other emission sources	0.5

The modeling procedure followed established departmental and federal guidelines for the new 1-hour NO_2 standard. This included an hourly ozone concentration file compiled by the DEP for the Davis Island Monitor (ID: 057-1035) for the years 2006-2010 that was utilized by the PVMRM algorithm for calculating ambient NO_2 concentrations. Missing data within the file was replaced by the applicant using an established protocol involving linear interpolation and substitution. The monitored background NO_2 level was included in the model as the design value from the USMC Reserve Center (ID: 057-1065) monitor as shown in **Table 10** - Ambient Air Quality Measurements nearest to the EFT facility (2010-2012).. The MAXDCONT keyword was used to output a file that shows the contribution of each source to any modeled violation of the NAAQS in order to determine significant contributions.

Two modeling runs were performed by the applicant for the 1-hour NO_2 NAAQS analysis using two different receptor grids. The initial grid included every receptor where EFT exceeded the SIL in the Class II SIL analysis. The maximum concentration predicted from this run was 731.89 $\mu g/m^3$, above the NAAQS of 188 $\mu g/m^3$. Using the MAXDCONT function, EFT was found to not significantly contribute to a violation. However, upon closer inspection, the area of highest concentrations was found to be in an area of large receptor spacing. A second run was then performed using a grid where additional receptors were added and spaced every 100 m around areas that exceeded the NAAQs or came within 90% of violating it. Additionally the Department added receptors with 100 m spacing in other areas which challenged the standard, but did not have sufficient receptors.

While there were modeled violations of the 1-hour NO_2 NAAQS, EFT's maximum contribution to any of these was less than the SIL. In addition, after examining monitoring data in and around Hillsborough County which showed no volitions of the 1-hour NO_2 NAAQS, and accounting for the fact that a vast amount of double-counting may be occurring in the model due to the background concentration used in modeling already accounting for some of the other modeled emission sources, the DEP is confident that there is no actual violation of the NAAQS occurring. This conclusion is supported by the fact that the AERMOD model is very conservative, and examines worst case meteorology and emissions. Therefore, concentration levels predicted may be exaggerated compared to what is actual happening. The results shown in **Table 14** indicate that DEP has reasonable assurances that the proposed EFT project is not expected to significantly contribute to or cause any violation of the NAAQS.

Due to the extent of the significant impact area for the 1-hour NO_2 standard, cumulative modeling for the annual NO_2 NAAQS must be performed using a receptor grid at least equal in size to the one used in the 1-hour analysis. Using this grid, there were apparent violations of the annual NO_2 NAAQS within the modeling domain. The maximum concentration predicted in this analysis was 675 µg/m^3, well above the 100 µg/m^3 standard. However, the area where this and other NAAQS violations occurred are not located within the significant impact area for the annual standard. Therefore, as shown in **Table 14**, DEP has reasonable assurances that the proposed EFT project is not expected to significantly contribute to or cause any violation of the NAAQS.

TABLE 14 - CUMULATIVE NAAQS 1-HR ANALYSIS MODELING RESULTS.

Pollutant	Averaging Time	Max EFT Contribution to Modeled Violation (µg/m^3)	Monitored Background (µg/m^3)	Max Modeled Sources Contribution (µg/m^3)	Max Modeled Concentration (µg/m^3)	NAAQS (µg/m^3)	EFT Significant to a Modeled Violation?
NO_2	1-hour	5.75	35 [a]	2604.5	2639.5	188	No
a. Three year average (2010-2012) of the annual 98th percentile daily maximum 1-hour average.							

5.4.3.2. PSD Increment and Annual NO_2 Analyses

A PSD increment analysis is required of each pollutant and averaging time that exceeds the applicable SIL; however, PSD increments do not currently exist for the 1-hour NO_2.

The PSD increment represents the level that new sources may increase the local ambient ground level concentrations of a pollutant above a baseline concentration. PSD increment modeling is similar to NAAQS modeling in that it is a cumulative analysis that takes into account the impact from nearby increment consuming sources that are applicable. The highest second-high predicted short-term average concentration for each year 2006-2010 was calculated and is compared to the applicable PSD increments in **Table 15**. The results show that the EFT facility is not expected to cause or contribute to any violation of a PSD increment in the vicinity.

TABLE 15 - CUMULATIVE PSD INCREMENT ANALYSIS MODELING RESULTS.

Pollutant	Averaging Time	Max Modeled Impact (µg/m^3)	PSD Increment (µg/m^3)	Exceeds Increment?
NO_2	Annual	9.1	25	No

5.4.4. Ozone Analysis

Projects with VOC or NO_x emissions greater than 100 tpy are required to perform an ambient air impact analysis for ozone including the gathering of pre-construction ambient air quality data. The applicant originally estimated in their 2009 application that annual potential NO_x emissions from the project will be greater than 100 tpy, and this current revision has the potential to increase emissions further. Therefore an ambient air impact analysis for ozone is required.

Ozone site-specific modeling is not typically completed for single source permitting because of its complexity. Ozone is a secondarily formed pollutant that is known to be caused by the regional emissions of VOC and NO_x in combination with meteorological parameters (temperature, rainfall, solar insolation, etc.). Ambient ozone levels in Hillsborough County is within attainment of the NAAQS. Despite significant increases in population and motor vehicle activity, ambient ozone air quality in Florida has improved over the last 5 years due to improvements in motor vehicle emissions rates. Continued reductions in average motor fleet emissions would be expected to further improve ozone air quality. In addition, as seen in **Figure 9**, implementation of CAIR has resulted in significant actual reductions in existing power plant NO_x emissions throughout Hillsborough County.

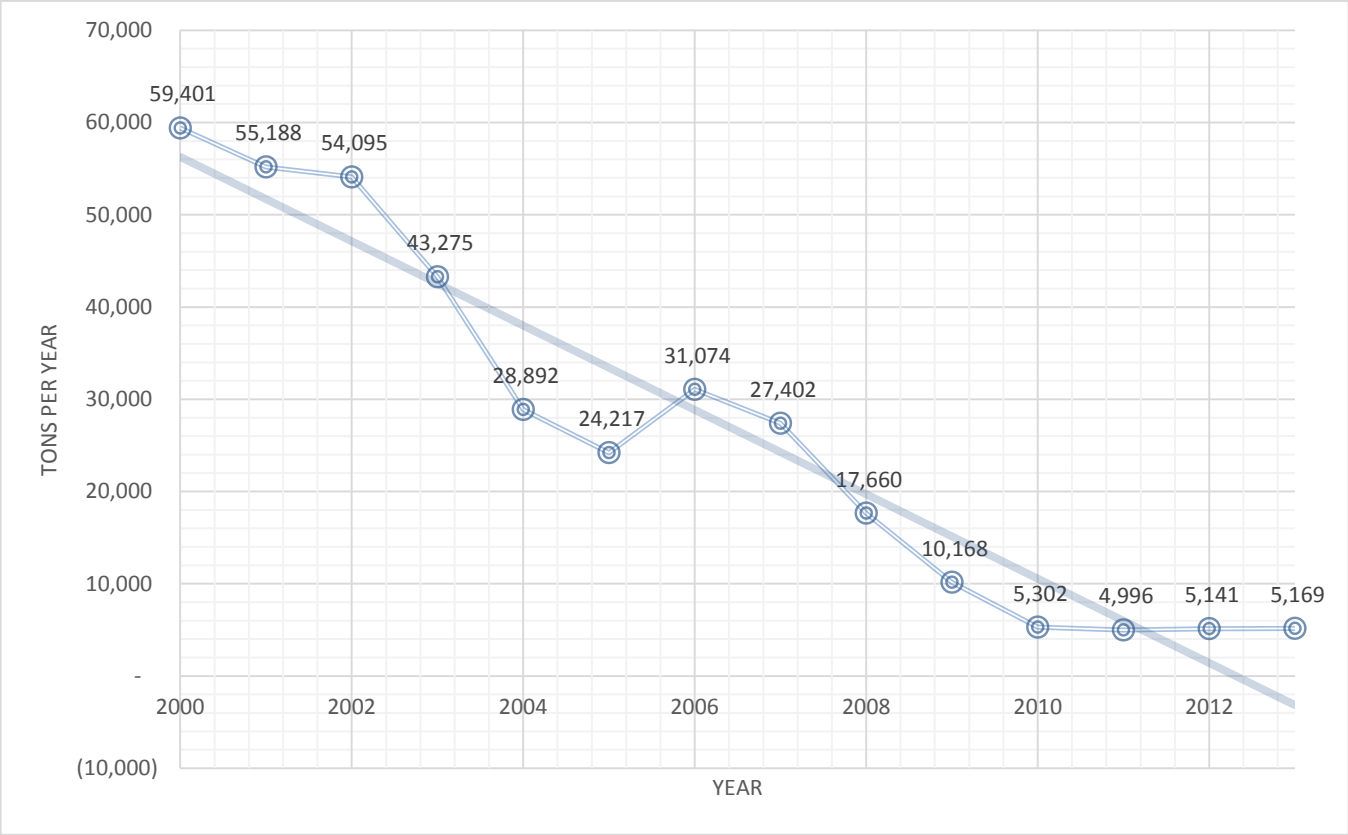

Figure 9. Hillsborough County NO_x Emissions from Acid Rain Units 2000-2013.

5.5. Additional Impacts Analysis

5.5.1. Growth-Related Impacts Due to the Proposed Project

According to the applicant, growth impacts associated with the EFT project will be minor. The impacts associated with the temporary increase in vehicular traffic are expected to be negligible, and the workforce will come from the existing regional populations. Although increases in NO_x emissions will occur from the additional trucks, the department expects monitored concentration to stay well below the NAAQS.

5.5.2. Impact on Soils, Vegetation, and Wildlife

Emissions of pollutants have the potential to negatively affect soils, vegetation and wildlife near the project site. The concentrations of pollutants emitted will be low and dispersed over a wide area. As previously mentioned, this will result in the project's maximum potential air quality impacts remaining below the NAAQS and PSD increments for all pollutants and thus the project's impacts on soils and vegetation in the vicinity are expected to be negligible.

Impacts to wildlife in the vicinity of the project are expected to be negligible as well. Conservative estimates of the project's pollutant emissions are expected to be below the applicable NAAQS and PSD increments. Combined with the mobility of wildlife, these low concentrations are not expected to directly or indirectly contribute to any adverse effects on wildlife in the area.

5.6. Air Dispersion Modeling Summary

Based on the results presented in the air quality analysis, the DEP has reasonable assurance that the increased NO_X emissions associated with this project will not cause or significantly contribute to any violation of a NAAQS or PSD increment. In addition, the DEP finds that there will be no adverse impact on ozone, soils, vegetation, wildlife, or, in Class I areas, any AQRV.

6. CONCLUSION

The Department makes a preliminary determination that the proposed project will comply with all applicable state and federal air pollution control regulations as conditioned by the Draft Permit. This determination is based on a technical review of the application, the reasonable assurances provided by the applicant, and the conditions specified in the Draft permit. Mr. David Read, P.E. is the project engineer responsible for reviewing the application, preparing the draft permit and writing the technical document. Details of the analyses may be obtained by contacting Mr. Read by email at david.read@dep.state.fl.us or by phone at 850-717-9075. Mr. Justin Rivard is the meteorologist responsible for air dispersion modeling submitted by the applicant. Details of the air dispersion modeling analysis may be obtained by contacting Mr. Rivard by email at justin.rivard@dep.state.fl.us or by phone at 850-717-9011.