

Excerpt 13

Supplemental to Application: Response to
EPA Comments to the PSD Application,
dated June, 2011, AR I.B.2.a

June 2, 2011

Mr. Steven C. Riva, Chief
USEPA Region 2
Permitting Section, Air Programs Branch
290 Broadway
New York, NY 10007-1866

Subject: Response to March 31, 2011 Letter
Arecibo Puerto Rico Renewable Energy Project
Prevention of Significant Deterioration – Air Permit Application

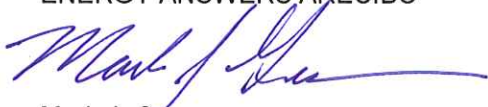
Dear Mr. Riva:

Attached for your review is our response to the permitting questions raised and additional information requested in your March 31, 2011 letter. Under separate cover we will be sending the detailed modeling and related information.

Should you require further information during your review of this material, please contact me at (347) 351-5248.

Sincerely,

ENERGY ANSWERS ARECIBO



Mark J. Green
Vice President

/Attachments

cc: John L. Hanisch – ARCADIS
Kevin R. Scott, PE – ARCADIS

EnergyAnswers
International
Resource Recovery Solutions

Arecibo Renewable Energy Project

Responses to EPA Comments to the PSD Air Permit Application

June 2011

2.3 BACT analysis discussion

EPA COMMENT:

BACT is defined as "... an emission limitation based on the maximum degree of emission reduction for each pollutant subject to regulation ... which is determined to be achievable taking into account energy, environmental and economic impacts." First, the BACT analysis must: include consideration of the most stringent available control technologies (i.e., those that provide the maximum degree of emissions reduction). Second, any decision taken by a PSD applicant to require a lesser degree of emissions reduction must be justified by an objective analysis of energy, environmental, or economic impacts.

Based on our review of your application, and as detailed below, it is EPA's opinion that EA has not adequately justified, for each pollutant included in the BACT analysis, why lower emissions limits are not achievable for the proposed MWC. For instance, while EA recognizes that the US EPA - RACT/BACT/LAER Clearinghouse has similar sources with CO, VOC, HF, SO₂, and H₂SO₄ limits lower than the EA's MWC proposed limits, the applicant has not provided the rationale why lower BACT limits should not be applied for the proposed MWC. Furthermore, recent EPA's research reveals that Palm Beach Renewable Energy Facility (MWC), Florida (Palm Beach)¹, approved on 12/23/2010, has established lower CO, VOC, Dioxin/Furans, Hydrogen chloride, Mercury(Hg)², and HF³, emissions limits than the EA's proposed limits. In conclusion, based on the issues outlined above, we recommend EA to either propose lower emission limits (i.e., similar with the lowest limits identified above) for the above listed pollutants or substantiate the BACT analysis by demonstrating that lower BACT emission limits than the limits already contained by the application are infeasible for the proposed MWC.

RESPONSE Summary:

Energy Answers is proposing a revised BACT limit for CO of 75 ppmvd@7%O₂ to be achieved at the RSCR unit by adding an oxidation catalyst to the unit. This is more stringent than other similar facilities reviewed.

¹ Available at : <http://appprod.dep.state.fl.us/air/emission/apds/listpermits.asp>

² Palm Beach was not subject to PSD review for Hg emissions. The permit establishes an annual Hg limit of 113 lb/yr (on 12-month rolling basis based on CEMS data) that is equivalent to 12 micrograms Hg/dscm @7% O₂

³ Palm Beach was not subject to PSD review for HF emissions. The Technical Evaluation document contains an emission factor of 3.5 ppmvd @7%O₂ that is equivalent to 0.002 lb HF/MBTU that was used to determine the PTE of HF.

Table 2.3 provides a comparison of BACT limits with referenced facilities.

Based on the data in the table, the proposed limits for AREP are essentially equal to or more stringent than those recently established for similar facilities

Discussion:

Enhanced CO Reduction:

Energy Answers proposes to install an additional oxidation catalyst bed as part of the RSCR. The additional catalyst will control potential emissions of CO to approximately 75 ppmvd @ 7% O₂. Therefore, with this enhancement, EA proposes a revised BACT limit on CO emissions of 75 ppmvd @ 7% O₂ on a rolling 24 hour average. This level of control exceeds that for Palm Beach and at other facilities found in the RBLC database.

VOC BACT:

The heat input-based limit listed in Table 5-2 of the application for the Miami-Dade County Resource Recovery Facility appears in the RBLC database but is not the enforceable limit in the facility's air permit. The enforceable VOC limit at this facility that appears in both the EPA RBLC and the operating air permit is a concentration limit of 25 ppmv as follows:

Volatile Organic Compounds (VOC)

B.41. VOC (hydrocarbons) emissions, per emissions unit, shall not exceed 25 ppmv, corrected to 7 percent O₂, dry basis; and, 19.1 tons/yr. The permittee must furnish to the Department evidence (i.e., test results) that this facility emits less than 100 tons per year of hydrocarbons, or must obtain legally enforceable limits for the hydrocarbon emissions from this facility.
[PSD-FL-006(D)]

Mr. John Koerner of the Florida Department of Environmental Protection (FDEP) in Tallahassee clarified that the 25 ppmv remains as the enforceable limit and that FDEP has never implemented the 0.0145 lb/MMBTU limit described in the RBLC database. And, based on the discussions with FDEP, the heat input based limit has never been demonstrated via source stack testing as achievable in practice. Furthermore, a review of the origin of this heat input based VOC limit at Miami Dade shows that the value given represents VOC quantified in terms of methane, a convention which can potentially mis-estimate actual emissions.

2.14 Bottom and Fly Ash handling, storage and processing, and Lime and Carbon SilosEPA Comment:

Please address the following:

- *Submit your proposed calculation methodology of determining the above-mentioned emitting sources' compliance with the short-term and annual emissions limits.*
- *While the application's Project Summary mentions that EA's project include a carbon storage silo, the Emissions Summary and the BACT Section do not address the carbon storage silo's emissions. Therefore, please clarify whether a carbon storage silo is proposed, and also provide the silo's volume.*
- *Provide a discussion clarifying whether the particulate emissions expected from the above mentioned activities (and carbon silo) comprise of all of the following: PM, PM10 and PM2.5.*

In addition, please address BACT analysis separately for PM, PM10, and PM2.5.

Response Summary:

Energy Answers proposes to install high efficiency filters that are guaranteed to control particulate emissions to the limits proposed in the application for each of these sources. The short-term and annual mass emission rates can be calculated as follows:

Daily Emissions – 24-hour daily average:

$$\frac{(\text{hours of operation per day}) \times (\text{design flow rate}) \times (\text{guaranteed max outlet concentration})}{24 \text{ hours}}$$

Annual Emissions – 12 month rolling average:

$$\frac{(\text{hours of operation per 12 month period}) \times (\text{design flow rate}) \times (\text{guaranteed max outlet concentration})}{(8760 \text{ hours- or } 8784 \text{ hours if leap year})}$$

The emissions from the powdered activated carbon (PAC) silo will be controlled using the same fabric filter technology as the lime silo and ash handling operations. Therefore, the BACT level of control proposed for those units is also applicable to the PAC. The PAC silo is shown in the PSD Application as item number 12, vent number

P-9 on Figure 5-1 of the original PSD Application. Table 6-1 in the original PSD Application shows vent number P-9 (Silo1 for the modeling) and its stack height (13.1 meters), diameter (0.18 meters), exit velocity (18.59 m/s), temperature (310.93K) and PM_{10} / $PM_{2.5}$ emission (8.04E-06 g/s). Please note on Table 6-1 of the original PSD Application that Silo4 is also listed as vent number P-9. This is the flyash silo, and should have the designation P-8 in Table 6-1 in the original PSD Application.

Under normal operating conditions, these high efficiency filters are expected to perform such that the quantifiable emissions are in terms of $PM_{2.5}$. Therefore, the proposed BACT at these sources is for $PM_{2.5}$ emissions, concurrently achieving what can also be considered BACT for PM and PM_{10} classifications, so no further BACT evaluation is necessary.

2.15 Supplemental fuel (SF) handling and storage activities

EPA Comment:

Please clarify whether the SF storage area is located outdoors. If so, please describe the measures that EA proposes to adopt to minimize the fugitive emissions.

Response Summary:

Supplemental fuels will be stored indoors in the MSW Storage Area. Section 2.2.4 states, "From the weigh station, incoming trucks will be directed to the enclosed MSW Tipping and Storage Area, and positioned to unload onto the tipping floor. The MSW Storage Area will be designed to store approximately 2,100 tons of MSW." Supplementary fuels will be received separately at a dedicated unloading station in the indoor storage area, stored in a designated area, and then blended directly into the PRF stream in the PRF Storage Area prior to combustion." The dedicated unloading station and storage area are part of the enclosed MSW Storage Area. Air from the MSW Storage Area will be vented through the roof and ducted to the boiler house for makeup air feed to the boilers as an active measure for minimizing the potential for fugitive emissions. Additionally, best management practices, such as routine housekeeping steps and keeping the doors closed, will be implemented to minimize potential for fugitive emissions.

2.16 Fugitive emissions

EPA Comment:

EA belongs to one of the 28 named PSD source categories, and therefore it is subject to the requirement that quantifiable fugitive emissions be included in determining the PTE. While, your application identifies some of the proposed project potential sources of fugitive dust emissions and discusses the measures that EA proposes to adopt to minimize these emissions, it is unclear whether the project's PTE includes the fugitive emissions. Consequently, please address the following:

- Quantify the short term and annual fugitive emissions, from the following sources associated with the proposed project, as appropriate: 1) road dust due to traffic within the project boundaries; 2) outdoors receiving and storage areas of the MSW and SF; 3) building ventilation (i.e., MSW, PRF, and Ash Processing buildings); and 4) ammonia storage tank, and fuel oil storage tanks. Please indicate the source of the emission factors, and provide the calculations.
- Provide a discussion regarding the type of contaminants comprising the project's fugitive emissions.

Response Summary:

Fugitive emissions generally consist of windblown dust from outside streets, particulate and dust from loader activities inside the buildings, and dust from MSW processing. All of these fugitive dust emissions are controlled by design or operating features of the facility. If necessary, roads will be manually and mechanically swept and sprayed to minimize potential for fugitive dust. Emission calculations of the potential fugitive dust. The total emissions from roadway fugitive dust are provided below in **Table 16.1**.

Table 16.1: Roadway Fugitive Dust Emissions

Roadway Fugitive Dust Emissions						
Pollutant	PM		PM10		PM2.5	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Total	1.79	7.06	0.36	1.41	0.09	0.35

The backup for calculations of the potential fugitive dust emissions are given in **Appendix B**.

All receiving and storing of MSW, PRF, and supplemental fuels is done indoors. Fugitive emissions will be controlled in the MSW Storage Area by keeping the doors closed during periods when MSW is not being delivered. Also, combustion air for the boilers is drawn from the MSW Storage Area (among other areas). This creates a negative pressure in the area, and draws potential emissions and odors into the boilers where they are combusted. The negative pressure in the building causes air to flow into the building through the doors and louvers, preventing emissions and odors from escaping. This design virtually eliminates the potential for fugitive emissions from storage activities.

Air from the ash processing building is vented through fabric filter baghouses that in turn vent to the atmosphere. Emissions from these units are included in the application as point sources.

Fugitive emissions from the ammonia storage tank and fuel oil storage tank are estimated at 0.674 tons per year. Backup documentation is provided in **Appendix B**.

Discussion:

Fugitive emissions will consist of particulate matter from road dust and also the products of combustion from off-road vehicles for plant maintenance operations (e.g. fork trucks).

With regard to potential fugitive emissions associated with fly ash, both on site and at its ultimate disposal location, we are providing additional details on the Fly Ash Stabilization Methods that Energy Answers plans to utilize. As indicated in PSD application, all fly ash will be stored in a single storage silo. Ash discharged from the silo will be stabilized with water, which will be mixed into the fly ash in conditioning mills located below the storage silo. These mills perform essentially as mortar mixing pugmills. The physical consistency of the finished product is similar to moist soil, or zero slump concrete; it does not flow. The stabilized, non-hazardous ash will be delivered in covered dump trailers to a permitted landfill where conventional landfill equipment will immediately compact the material. Within several days the material hardens to a concrete like mass.

Fly ash from the SEMASS project in Rochester, Massachusetts has been stabilized in this manner and landfilled in a single ash monofill for over twenty years. (Fly ash from SEMASS is discharged from baghouse filters after acid gas neutralization in spray dryer absorbers, so its characteristics are similar to those projected for AREP fly ash.) Hydrogen sulfide generation has never been a problem at the ash monofill serving the SEMASS project.

The Massachusetts Department of Environmental Protection is well aware of the hydrogen problems associated with Construction and Demolition landfills that accept gypsum board, and issued a policy on the *Control of Odorous Gas at Massachusetts Landfills* in 2007. However, the same department indicates there is no evidence of hydrogen sulfide emissions from the SEMASS ash monofill or, for that matter, from any waste-to-energy ash landfill in the state. (Contact Dan Hall of the department at 413-755-2212 or Daniel.Hall@state.ma.us).

2.17 Discussion on the PSD Applicability for the GHG emissions

EPA Comment:

Since EA's emissions of non-GHG pollutants exceed the statutory threshold of 100 TPY, the proposed source would be a new major stationary source that is subject to PSD regulations for any pollutant emitted at or above its significant level. Furthermore, since it has a potential to emit (PTE) of 293,443 TPY C02e, which is greater than the applicable threshold of 75,000 TPY C02e, it is considered an "anyway source" and consequently PSD also applies to its GHG emissions. However, while EA agrees that non-GHG pollutants may be subject to PSD review for this project, EA has determined that their project is not subject to PSD review for GHG. EA's rationale for non-applicability is that the proposed source's GHG PTE would be less than a landfill GHG PTE, assuming EA were to instead send the waste off site to a hypothetical uncontrolled landfill. Thus, EA asserts that there is a net reduction in GHG emissions.

Pursuant to the PSD regulations and guidance: "Netting must take place at the same stationary source; emission reductions cannot be traded between stationary sources."⁴ Thus, the EA's proposed project is not allowed to use emissions reductions from a landfill, unless the proposed project and landfill were shown to belong to the same stationary source. In this case, the landfill does not exist, and no such "single source" demonstration has been made. Consequently, it is EPA's determination that the proposed project is subject to PSD requirements for GHG emissions. Therefore, please address the following:

Response Summary:

- The GHG emissions summary in the application was not intended as a netting analysis. MSW is an unavoidable reality that must be addressed by each

⁴ EPA's 1990 "Draft New Source Review Workshop Manual" at A.35: <http://www.epa.gov/nsr/gen/wkshpman.pdf>



Appendix D

Agency Support Letters



United States Department of the Interior



FISH AND WILDLIFE SERVICE

Boqueron Field Office
Carr. 301, KM 5.1, Bo. Corozo
P.O. Box 491
Boqueron, PR 00622

Lillian Mateo Santos
Ferraiuoli LLC
221 Ponce de Leon Ave, Suite 403
Hato Rey, Puerto Rico 00917

MAY 04 2011

Re: Renewable Energy Cambalache,
Arecibo

Dear Ms.Mateo,

Thank you for the letter of March 28, 2011, received in our office on March 31, 2011, requesting comments regarding the above referenced project. Our comments are issued in accordance with the Fish and Wildlife Coordination Act (FWCA, 48 Stat. 401, as amended; 16 U.S.C. 661 et. seq.), the Endangered Species Act (ESA, 87 Stat. 884, as amended; 16 U.S.C. 1531 et. seq.), and the Migratory Bird treaty act of 1918 (16 U.S.C. 703 et seq.). Please refer to Project Identification Number **FWS-72013-026** in any future correspondence regarding this project.

The proposed project consists of the construction of a renewable energy and resource recovery plant to create electricity from the incineration of solid waste. The plant will be placed in Cambalache Ward in the municipality of Arecibo.

Based on a review of the information provided, the nature of the project, and the site characteristics, suitable habitat for federally listed species is not present within the project site. Thus, adverse effects are not anticipated for species under our jurisdiction. Nevertheless, the project is proposed to be constructed on a floodplain. The Executive Order 11988 requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. The Service has concerns about the growing practice of constructing on floodplains for urban and commercial developments. Floodplains are important in providing habitat and serve as a corridor for wildlife. We do not recommend construction on flood plains to maintain the function and value of these natural land features.

The National Wetland Inventory Map shows that part of the proposed project appears to be on or near a wetland area. We recommend that the project plan be overlaid on a wetland jurisdictional determination to ensure that the construction does not result in direct or indirect effects to the wetland area. The development of the wetland


MAY 5 2011

jurisdictional determination should be closely coordinated with the US Army Corps of Engineers' Regulatory Section, using the Caribbean supplement. Please be advised that impacts to wetlands or aquatic resources may need a federal permit from the US Army Corps of Engineers.

Furthermore, the project will result in dirt and vegetation removal, and soil exposure to weather events. Due to the proximity of the project to the Rio Grande de Arecibo, and the possibility of soil movement, we believe that a General Storm Water Construction Permit from the Environmental Protection Agency (EPA) is needed. The NPDES storm water program requires operators of construction sites one acre or larger to obtain authorization to discharge storm water under an NPDES construction storm water permit. Stormwater runoff from construction activities can have a significant impact on water quality. As stormwater flows over a construction site, it picks up pollutants like sediment, debris, and chemicals. Polluted stormwater runoff can harm or kill fish and other wildlife. Sedimentation can destroy aquatic habitat and high volumes of runoff can cause stream bank erosion. Therefore, we recommend that stringent erosion control plan be implemented using best management practices during the project development. The applicant should contact EPA for issue a NPDES permit.

Thank you for the opportunity to comment on this project. It is our mission to work with others, to conserve, protect and enhance fish, wildlife and plants and their habitats for the continuing benefit of our people. If you have any additional question regarding this issue, please do not hesitate to contact Rafael González at 787-851-7297 extension 214. You may also visit our website <http://www.fws.gov/caribbean> for additional information on threatened and endangered species under jurisdiction and the programs to conserve them.

Sincerely yours,


Edwin E. Muñiz
Field Supervisor
Caribbean Field Office

rg

cc:

USACOE, SJ
EPA, SJ
FEMA, SJ