Golder Associates

March 15, 2011

093-87674
Via Electronic Delivery

Mr. Jeffery F. Koerner, Administrator
New Source Review Section
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399

RE: PERMIT NO. 1050216-014-AV
TITLE V AIR OPERATION PERMIT RENEWAL
RIDGE GENERATING STATION
SECOND REQUEST FOR ADDITIONAL INFORMATION

Dear Mr. Koerner:

Waste Management Inc. of Florida (WMIF) received a request for additional information (RAI) from the Florida Department of Environmental Protection (FDEP) dated December 15, 2010, regarding the landfill gas-to-energy (LFGTE) project at the Medley Landfill (FDEP project No. 0250615-012-AC/PSD-FL-414). Each of FDEP's requests is answered below, in the same order as they appear in the RAI letter.

Comment 1. **The Medley facility is an open municipal solid waste (Class I) landfill. Does the facility also include any Class III or construction and demolition landfills? Based on your current solid waste permits, please identify the landfill capacity in the following terms: acres, million megagrams (mass) and million cubic meters (volume). Please include waste in place as well as future capacity that is permitted under a solid waste permit. Based on the current design capacity specified in the solid waste permits, estimate the potential annual NMOC emissions (megagrams per year).**

Response: The Medley landfill can accept construction and demolition (C&D) waste, but there are no dedicated Class III or C&D landfills onsite.

The permitted size of the landfill, including the east expansion (undergoing permitting) and the closed north hill, is 177 acres. The facility is currently permitted for 31,925,220 tons of waste (28.95 million megagrams). Once the east expansion is permitted, an additional 4,888,000 tons will be added, bringing the total permitted size to 36,813,220 tons of waste (33.40 million megagrams).

The total permitted volume capacity (consumed and remaining), including the east expansion, is approximately 39,163,000 billion cubic yards (29.95 million cubic meters). The proposed project is not adding capacity to the existing landfill.

OK

There is currently approximately 19,437,767 tons of waste in place.

The potential annual NMOC emissions estimate for the facility was presented in Table 2-6 of the Prevention of Significant Deterioration (PSD) Application submitted in August 2010. As shown, the maximum potential annual emission is 44.3 TPY, which is equivalent to 40.2 megagrams per year.

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Comment 2. **The revised Table 2-2 (Potential Emissions from Existing 6,000 SCFM Enclosed Flare (EU 10005)) was not included in your attachments. Please submit.**

Response: The revised Table 2-2 is attached. OK

Comment 3. **Rule 62-21 0.370, F.A.C. establishes a hierarchy for emissions calculations (e.g., continuous emission monitoring system (CEMS), mass balance, stack test data and emission factors). The objective is to use the available data that best represents emissions from the project. The Department agrees that the project is subject to PSD preconstruction review for CO, NOx and PM10 emissions increases. However, since the application projects SO2 emissions increases just below the PSD significant emissions rate, please use the specific H2S emissions data available for the Medley landfill to determine base line actual SO2 emissions. For the projected actual emissions, also use H2S data specific to the Medley landfill and provide additional information to support any claim that the H2S concentration in landfill gas will increase or decrease in the future. The referenced letter (dated November 21, 2008 from the Department of Environmental Resources Management) does not supersede the requirements of Rule 62-210.370, F.A.C. Also, please explain how the 2008 PSD applicability issue addressed in this letter was resolved.**

Response: WMIF continues to believe that the historical reported AOR data are the best available data for estimating baseline emissions from the landfill. The FDEP and DERM based their previous determination that the landfill was a PSD major source on the AOR data. A previous application to install engines at the landfill was withdrawn based on this determination. WMIF does not believe that it is now appropriate to begin using a different set of emissions data for PSD applicability. In fact, there is no better data available for historical 2004 to 2009 emissions than the AOR. If the available H_2S sampling data from Medley is used to calculate baseline SO_2 emissions, as shown below, the facility would not be a PSD major source (i.e., <250 TPY SO_2).

LFG sampling data was provided in Attachment 2 of the RAI response letter to FDEP dated November 17, 2010. The most recent samplings for H_2S concentration were conducted in 2008 and show the following results –

Sampling date 4/24/2008 – 580 ppmv

Sampling date 9/8/2008 Sample 1 – 350 ppmv

Sampling date 9/8/2008 Sample 2 – 390 ppmv

Sampling date 9/8/2008 Sample 3 – 400 ppmv

Using the average of the 2008 H_2S sampling results above, 430 ppmv, the annual SO_2 emission rate for 2008 can be calculated as follows –

2008 LFG usage in flares = (0.336 + 1,994.0) $MMft^3/yr$ = 1,994.3 $MMft^3/yr$ (based on AOR) OK

H_2S Content = 430 ppmv

SO_2 (TPY) = H_2S (ppmv) x Volume flow ($MMft^3/yr$) x 34 (MW of H_2S) x 2116.2 lb/ft^2 (pressure) / [1545.4 (gas constant, R) x Standard Temp. (°R) (assumed)] x MW of SO_2/MW of H_2S x (lb/2,000 tons) = 71.2 TPY

The calculated SO_2 emission rate is almost exactly equal to the emission rate reported in the 2008 AOR of 69.9 TPY (presented in Table C-1).

There are no H_2S sampling results available for the period 2004 to 2007. As a result, it is not possible to refute emission rates reported in the AORS for the years 2004 to 2007. Using the 2007 AOR reported SO_2 emission rate of 242.01 TPY and the 2007 LFG flow rate from the flares of 2,182.7 $MMft^3/yr$, the 2007 H_2S concentration in the LFG is calculated to be 1,336 ppmv. Note that the reported annual SO_2 emission rates for the years 2004 to 2007 were fairly consistent, ranging from 202 to 250 TPY. The landfill had also received C&D waste up until 2004. Usually, it is 3 to 4 years after C&D waste receiving is discontinued that the H_2S content of the LFG starts declining. Therefore, it is not unexpected that the H_2S concentration was lower beginning in 2008.

The H_2S content of the LFG is expected to decrease in the future because the facility will not be receiving additional C&D waste at the landfill.

As a result of the PSD applicability determination in the letter dated November 21, 2008, WMIF withdrew the air construction permit application submitted in June 2008 for the installation of eight generators. The current project is for the installation of six CAT 3520 generator sets, and a PSD application for the project was submitted In August 2010. Again, if the newer H_2S test data are required to be used to determine baseline emissions, then FDEP should also acknowledge that the site is not currently a PSD source.

Comment 4. ***Your response states that the project is not subject to PSD review for SO2 emissions because the SO2 emissions increase will be "limited" to no more than 39 tons per year, which is less than the PSD significant emissions rate. This is based on an estimated maximum H2S concentration in landfill gas of 830 ppmv. Please explain how the H2S concentration will be maintained below a maximum level of 830 ppmv.***

Response: WMIF does not expect the H_2S content of the LFG to increase in the future. As explained above, the current 2008 actual H_2S content was in the range of 400 to 500 ppmv. WMIF proposes to perform annual testing for H_2S content in the LFG using the tedlar™ bag sampling media to verify the H_2S concentration.

OK, but quarterly

Comment 5. **Please estimate the greenhouse gas (GHG) emissions increases resulting from this project. Based on current federal regulations, it will be necessary to obtain a separate PSD permit that specifies the Best Available Control Technology for reducing GHG emissions if GHG emissions increases are greater than 75,000 tons per year.**

Response: The greenhouse gas (GHG) emissions increase due to the proposed project is estimated in the attached Tables 1 and 2. The biogenic and anthropogenic GHG emissions were calculated separately. Table 1 shows the baseline GHG emissions, which are based on maximum 2-year average actual annual LFG usage of 2,088 $MMft^3/yr$ (2-year period 2007 to 2008) and using emission factors for natural gas from Table C-1 of 40 CFR 98 Subpart C. As shown, the baseline GHG emissions are estimated to be 110,250 metric tons per year of carbon dioxide equivalents (CO_2e) (biogenic - 109,972.5, anthropogenic – 277.4).

Table 2 shows the future potential GHG emissions, which is based on the design LFG flow rate of 7,317 scfm and 8,760 hr/yr annual operation. As shown, the future potential GHG emissions are estimated to be 203,011.3 metric tons per year of CO_2e (biogenic – 202,500.5, anthropogenic – 510.8). Please note that on March 11, 2011, EPA proposed to defer for a period of three (3) years the application of the PSD and Title V permitting requirements to biogenic CO_2e emissions from bioenergy and other biogenic stationary sources, which includes solid waste landfills. Therefore, the anthropogenic GHG emissions increase due to the proposed project is 233.4 metric tons per year of CO_2e.

Please note that there is no increase in the LFG flow rate as a result of the project. The project will re-route the same LFG to the CAT engines that otherwise would have been combusted in the flares. Therefore, the project will not generate new GHGs. The 233.4 metric tons per year of CO_2e is just the difference between the baseline and current potential anthropogenic GHG emissions.

Comment 6. Please provide the additional information requested regarding the air quality analysis.

Response: Additional information requested regarding the air quality analysis was provided in the *revised modeling analysis submitted to FDEP in late December 2010.*

Clear Modified OK

Thank you for your consideration of this information. If you have any questions, please do not hesitate to call me at (352) 336-5600.

Sincerely,

GOLDER ASSOCIATES INC.

David A. Buff, P.E.
Principal Engineer

Salahuddin K. Mohammad
Senior Project Engineer

cc: T. Thorley, WMI

Enclosures

SKM/nav

TABLE 1 - ESTIMATION OF BASELINE EMISSIONS OF GHG

General Information

Unit Type	Unit Rated Throughput (scfm)	Actual Annual Throughput [a] (mmscf)	Annual Potential Methane Generation (mmscf)	Annual Potential CO2 Generation (mmscf)
EU 001 - Open Flare (3000 scfm)	3000	0.56	0.28	0.28
EU 005 - Enclosed Flare (6000 scfm)	6000	2088.0	1044.00	1044.00
6 CAT 3520 Engines	0	0	0.00	0.00
Insert your device here	0	0.00	0.00	0.00

[a] Based on maximum 2-year average actual annual LFG usage for the period 2007 to 2008. Based on AOR data, LFG combusted in EU 005 in 2007 and 2008 are 2,182 $MMft^3/yr$ and 1.994 $MMft^3/yr$, respectively. LFG combusted in EU 001 in the same period are 0.78 and 0.336 $MMft^3/yr$, respectively.

Potential Biogenic Generation

Unit Type	Actual Annual Heat Rate (MMBTU/Yr)	Combustion CO2 (metric tons)	Combustion CO2 (short tons)	Passthrough CO2 (metric tons)	Passthrough CO2 (short tons)	**Total Biogenic CO2 (metric tons)**	**Total Biogenic CO2 (short tons)**
EU 001 - Open Flare (3000 scfm)	283.4	14.75	16.26	14.73	16.24	**29.49**	**32.50**
EU 005 - Enclosed Flare (6000 scfm)	1056528.0	55,013.41	60,641.29	54,929.72	60,549.04	**109,943.14**	**121,190.32**
6 CAT 3520 Engines	0.000	0.00	0.00	0.00	0.00	**0.00**	**0.00**
Insert your device here	0.000	0.00	0.00	0.00	0.00	**0.00**	**0.00**

Potential Anthropogenic Generation

Unit Type	N2O (metric tons)	N2O (short tons)	CH4 (metric tons)	CH4 (short tons)	N2O (metric tons CO2 eq.)	N2O (short tons CO2 eq.)	CH4 (metric tons CO2 eq.)	CH4 (short tons CO2 eq.)	**Total Anthropogenic (metric tons CO2 eq.)**	**Total Anthropogenic (short tons CO2 eq.)**
EU 001 - Open Flare (3000 scfm)	0.00	0.00	0.00	0.00	0.06	0.06	0.02	0.02	**0.07**	**0.08**
EU 005 - Enclosed Flare (6000 scfm)	0.67	0.73	3.38	3.73	206.34	227.45	71.00	78.26	**277.34**	**305.71**
6 CAT 3520 Engines	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.00**
Insert your device here	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.00**

Combined Biogenic and Anthropogenic Totals

Unit Type	**Total CO2 eq. metric tons**	**Total CO2 eq. short tons**
EU 001 - Open Flare (3000 scfm)	**29.56**	**32.59**
EU 005 - Enclosed Flare (6000 scfm)	**110,220.48**	**121,496.03**
6 CAT 3520 Engines	**0.00**	**0.00**
Insert your device here	**0.00**	**0.00**

Source: WMIF GHG Calculator.

TABLE 2 - ESTIMATION OF POTENTIAL ANNUAL EMISSIONS OF GHG

General Information

Unit Type	Unit Rated Throughput (scfm)	Annual Potential Throughput (mmscf)	Annual Potential Methane Generation (mmscf)	Annual Potential CO2 Generation (mmscf)
Open Flare (3000 scfm)	0	0.00	0.00	0.00
Enclosed Flare (6000 scfm)	0	0.00	0.00	0.00
6 CAT 3520 Engines	7317	3845.82	1922.91	1922.91
Insert your device here	0	0.00	0.00	0.00

Potential Biogenic Generation

Unit Type	Heat Rate (MMBTU/Hr)	Combustion CO2 (metric tons)	Combustion CO2 (short tons)	Passthrough CO2 (metric tons)	Passthrough CO2 (short tons)	**Total Biogenic CO2 (metric tons)**	**Total Biogenic CO2 (short tons)**
Open Flare (3000 scfm)	0.000	0.00	0.00	0.00	0.00	**0.00**	**0.00**
Enclosed Flare (6000 scfm)	0.000	0.00	0.00	0.00	0.00	**0.00**	**0.00**
6 CAT 3520 Engines	222.144	101,327.31	111,693.09	101,173.17	111,523.18	**202,500.47**	**223,216.27**
Insert your device here	0.000	0.00	0.00	0.00	0.00	**0.00**	**0.00**

Potential Anthropogenic Generation

Unit Type	N2O (metric tons)	N2O (short tons)	CH4 (metric tons)	CH4 (short tons)	N2O (metric tons CO2 eq.)	N2O (short tons CO2 eq.)	CH4 (metric tons CO2 eq.)	CH4 (short tons CO2 eq.)	**Total Anthropogenic (metric tons CO2 eq.)**	**Total Anthropogenic (short tons CO2 eq.)**
Open Flare (3000 scfm)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.00**
Enclosed Flare (6000 scfm)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.00**
6 CAT 3520 Engines	1.23	1.35	6.23	6.86	380.05	418.93	130.77	144.15	**510.82**	**563.08**
Insert your device here	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**	**0.00**

Combined Biogenic and Anthropogenic Totals

Unit Type	**Total CO2 eq. metric tons**	**Total CO2 eq. short tons**
Open Flare (3000 scfm)	**0.00**	**0.00**
Enclosed Flare (6000 scfm)	**0.00**	**0.00**
6 CAT 3520 Engines	**203,011.29**	**223,779.35**
Insert your device here	**0.00**	**0.00**

Source: WMIF GHG Calculator.

TABLE 2-2
POTENTIAL & PROJECTED EMISSIONS FROM EXISTING 6,000 SCFM ENCLOSED FLARE (EU ID 005)
MEDLEY LANDFILL, INC., MEDLEY, FLORIDA

Pollutants	Emission Factor	Ref.	Activity Factor[a]					Potential Emissions	
			LFG Flow (scfm)	LFG Heating Value (Btu/scf)	LFG Methane Content (%)	Heat Input (MMBtu/hr)	Operating Hours	(lb/hr)	(lb/scf)
Carbon Monoxide (CO)	0.20 lb/MMBtu	b	6,000	500	50	180.0	8,760	36.0	1.00E-04
Nitrogen Oxides (NOx)	0.06 lb/MMBtu	b	6,000	500	50	180.0	8,760	10.80	3.00E-05
Particulate Matter (PM)	0.000017 lb/scf CH_4	c	6,000	500	50	180.0	8,760	3.06	8.50E-06
Particulate Matter (PM_{10})	0.000017 lb/scf CH_4	c	6,000	500	50	180.0	8,760	3.06	8.50E-06
Particulate Matter ($PM_{2.5}$)	0.000017 lb/scf CH_4	c	6,000	500	50	180.0	8,760	3.06	8.50E-06
Non-Methane Organic Compounds (NMOC)	20 ppmvd @ 3% O_2	d	6,000	500	50	180.0	8,760	8.38	2.33E-05
Volatile Organic Compounds (VOC)	100 % of NMOC	e	6,000	500	50	180.0	8,760	8.38	2.33E-05
Sulfur Dioxide (SO_2)	830 ppmv, H_2S	f	6,000	500	50	180.0	8,760	49.6	1.38E-04
PROJECTED ACTUAL EMISSIONS:									
NMOC	0.48 ppmvd @ 3% O_2	d	5,470	500	50	180.0	8,760	0.18	5.59E-07
VOC	100 % of NMOC	e	5,470	500	50	180.0	8,760	0.18	5.59E-07

[a] Activity factors are based on LFG flow of 6,000 scfm to the flare and LFG heating value of 450 Btu/scf, HHV.

[b] Based on manufacturer emissions guarantee.

[c] Based on AP-42, Chapter 2.4, Table 2.4-5. PM and $PM_{2.5}$ emissions are assumed to be equal to estimated PM_{10} emissions.

[d] NMOC emission rate is based on compliance with NSPS Subpart WWW, which requires NMOC outlet concentration to be less than 20 ppmvd as hexane, at 3% oxygen.
NMOC emissions calculated as following:

LFG gas flow into flare = 5,470 scfm, based on test on 3/24/08 (maximum value from test data from last 5 years).
Exhaust flow rate = 284,286 acfm, based on test on 3/24/08 (maximum value from test data from last 5 years).
Potential exhaust flow rate = 311,831 acfm, prorated for 6,000 scfm LFG flow.
Exhaust temperature = 1,830 °F, based on test on 3/24/08.
Exhaust air moisture content = 7.7 °F, based on test on 3/24/08.
Oxygen content of dry air (O_2, dry) = 12.5 %, dry, based on test on 3/24/08.
Max. Potential NMOC concentration = 20.0 ppmvd @ 3% O_2 as hexane [based on 40 CFR 60, Subpart WWW].
8.69 ppmv, actual [ppmvd @ 3% O_2 x (20.9-O_2, dry)/(20.9-3) x (1-moisture content(%)/100)]
Molecular weight of NMOC as hexane = 86.18 lb/lb-mol (AP-42 table 2.4-1)
Potential NMOC emissions = 8.38 lb/hr. NMOC (ppmv actual) x Volume flow (acfm) x 86.18 (MW of NMOC) x 2116.2 lb/ft2 (pressure) / [1545.4 (gas constant, R) x Actual Temp. (°R)] x 60 min/hr
Projected actual NMOC concentration = 0.48 ppmvd @ 3% O_2 as hexane, based on test on 4/01/10 (maximum value from test data from last 5 years).
0.21 ppmv, actual [ppmvd @ 3% O_2 x (20.9-O_2, dry)/(20.9-3) x (1-moisture content(%)/100)]
Projected actual NMOC emissions = 0.18 lb/hr, based on max. actual flow and max. NMOC concentration from test data from last 5 years.

[e] 100% of NMOC assumed as VOC.

[f] SO_2 emission rate is based on H_2S concentration in LFG and design LFG flow rate to the flare.

LFG H_2S concentration = 830 ppmv, based on OLI data.
LFG gas flow into flare = 6,000 scfm, design LFG flow.
Standard Temperature = 68 °F
Molecular weight of H_2S = 34 lb/lb-mol (AP-42, Table 2.4-1)
SO_2 emissions = 49.6 lb/hr: H_2S (ppmv actual) x Volume flow (scfm) x 34 (MW of H_2S) x 2116.2 lb/ft^2 (pressure) / [1545.4 (gas constant, R) x Standard Temp. (°R)] x 60 min/hr x MW of SO_2/MW of H_2S