UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MAR 16 2012

Fadi K. Mourad, P.E.
Director, Environmental Affairs
DTE Energy Services, Inc.
414 South Main Street, Suite 600
Ann Arbor, MI 48104

Dear Mr. Mourad:

In your letter of July 21, 2011, you requested confirmation from the U.S. Environmental Protection Agency (EPA) that biosolids processed using the proposed Detroit Biosolids Project will be considered a non-waste fuel when burned for energy recovery in combustion units in accordance with the requirements of 40 CFR part 241.3(b)(4). To be designated as a non-waste fuel under that section, the regulations require that processing of the non-hazardous secondary material (NHSM) meet the definition of processing in 40 CFR 241.2. After processing, the NHSM must also meet the legitimacy criteria for fuels in 40 CFR 241.3(d)(1). Based on the information provided in your letter, and supporting materials submitted on August 16, 2011, September 9, 2011, and January 11, 2012, we believe that under the 40 CFR part 241 regulations the processed biosolids—proposed to be generated by DTE Energy Services (DTEES) through the Detroit Biosolids Project and burned in the described combustion units—would be considered a non-waste fuel.[1] The remainder of this letter provides the basis for our position. *If there is a discrepancy in the information provided to us, it could result in a different interpretation.*

Proposed Detroit Biosolids Project

The Detroit Biosolids Project is a proposed arrangement between DTEES and the Detroit Water and Sewerage Department (DWSD). DTEES operates the River Rouge Power Plant (RRPP) and other utility plants seeking to comply with Michigan's Renewable Energy Standard by 2015. DWSD operates its wastewater treatment plant in close proximity to RRPP, and it currently incinerates 800,000 tons of wet biosolids annually. Under the proposed arrangement, DTEES would further process the biosolids into a product fuel to be sold to RRPP and other utility plants that currently burn coal.

[1] Note that a non-waste determination under 40 CFR Part 241 does not preempt a state's authority to regulate a non-hazardous secondary material as a solid waste. Non-hazardous secondary materials may be regulated simultaneously as a solid waste by the state, but as a non-waste fuel under 40 CFR Part 241 for the purposes of determining the applicable emissions standards under the Clean Air Act for the combustion unit in which it is used.

Processing

Processing is defined in 40 CFR 241.2 as operations that transform discarded NHSM into a non-waste fuel or non-waste ingredient, including operations necessary to: remove or destroy contaminants; significantly improve the fuel characteristics (e.g., sizing or drying of the material, in combination with other operations); chemically improve the as-fired energy content; or improve the ingredient characteristics. Minimal operations that result only in modifying the size of the material by shredding do not constitute processing for the purposes of the definition.

In your letters, you state that DTEES will use rotary drum dryers to process the incoming biosolids—which are 20 to 25 percent solids and have a heating value between 1,000 and 2,000 Btu/pound—into a material that is 95 percent solids and has a heating value between 7,500 and 8,000 Btu/pound. Evaporated moisture, which includes some contaminants from the biosolids, will be condensed and recycled back to DWSD for further treatment. The dried biosolids will then exit the drum as discrete pellets in the exhaust stream, at which point they will be screened to a specified size and screened to remove certain materials such as coarse plastics (e.g. personal hygiene products), metals (e.g. nuts, bolts and screws) and other undesirable solids. The cooled product meeting specifications will be transported to storage silos. Reject material, consisting of the coarse plastic, metals and other undesirable solids, will be collected in a separate container for disposal (reject material is expected to total 2.5% to 4% of the incoming biosolids). Over-sized material will be crushed, combined with the fines, and mixed with incoming biosolids to begin the process again, including screening for undesirable solids.

Based on this description, we believe your operations meet the definition of processing in 40 CFR 241.2 and will transform the processed biosolids into a non-waste fuel , as further discussed below by significantly improving the fuel characteristics through a combination of sizing, drying, and contaminant removal.

Legitimacy Criteria

Under 40 CFR 241.3(d)(1), the legitimacy criteria for fuels include: 1) management of the material as a valuable commodity based on the following factors—storage prior to use must not exceed reasonable time frames, and management of the material must be in a manner consistent with an analogous fuel, or where there is no analogous fuel, adequately contained to prevent releases to the environment; 2) the material must have a meaningful heating value and be used as a fuel in a combustion unit that recovers energy; and 3) the material must contain contaminants at levels comparable to or less than those in traditional fuels which the combustion unit is designed to burn.

Manage as a Valuable Commodity

Regarding the first legitimacy criterion, you note that the processed biosolids[2] will be sold to RRPP or other utility plants for use as a fuel at a competitive market price. You also state that

[2] As noted in the regulations, prior to final processing (drying, pelletizing, and screening), the processed sludge may be considered a solid waste and is subject to appropriate federal, state, and local regulations.

the processed biosolids will be pneumatically conveyed from the product silo at the DTEES biosolids plant to storage silos at RRPP, never being exposed to the outside atmosphere. Co-combustion with coal will then occur within four days. Coal, on the other hand, is typically stored at RRPP in a pile exposed to the atmosphere for up to one month prior to combustion.

Based on this information, we believe that the processed biosolids will be managed as a valuable commodity at both DTEES and RRPP—that is, managed in silos, with the material not being exposed to the outside atmosphere. In addition, storage would not exceed a reasonable time frame, and in fact, appears to be used in a time frame shorter than that used for fossil fuel products. If sold to utility plants other than RRPP, pneumatic conveyance to the utility may not be possible, but transport in covered trucks or railcars are examples of other acceptable transport methods you may wish to consider. However, since no information was provided as to how the processed biosolids will be managed at other utility plants, this letter does not address this aspect of the legitimacy criteria when utilized at other utility plants.

Meaningful Heating Value and Used as a Fuel to Recover Energy

Regarding the second legitimacy criterion, you note that the processed biosolids have an as-fired heating value between 7,500 and 8,000 Btu/pound. As the Agency stated in the preamble to the NHSM final rule, NHSMs with an energy value greater than 5,000 Btu/lb, as fired, are considered to have a meaningful heating value (see 76 FR 15541, March 21, 2011). Thus, we believe that the processed biosolids meet the second legitimacy criterion. You also noted that enough energy will be recovered from the use of this fuel to provide 3.5 percent of RRPP's total fuel needs displacing 91,200 tons of coal per year.

Comparability of Contaminant Levels

Regarding the third legitimacy criterion, your letter requested confirmation that the processed biosolids contain contaminants at levels comparable to or lower than levels found in coal. While we could not evaluate the actual processed biosolids—because the DTEES Biosolids Plant does not yet exist—we did evaluate oven-dried biosolids samples collected from the DWSD wastewater treatment plant as a proxy, which you indicate would be representative of the processed biosolids that will be generated by the DTEES Biosolids Plant. You submitted DWSD analytical data measuring levels of 15 elemental contaminants[3], as well as total halogens, as part of your August 16, 2011 letter and more recent data in a follow-up email on January 11, 2012.

We have prepared the enclosed table "Comparison of DTEES Dried Biosolids to Coal" to compare the analytical data you submitted for your NHSM to data for coal in our "Contaminant Concentrations in Traditional Fuels: Tables for Comparison" document. [4,5,6] For all

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[3] EPA has issued a proposed rule that amends the definition of contaminants in the final NHSM rule. The proposal revises the definition to add elemental precursors to pollutants listed in Clean Air Sections 112(b) and 129(a)(4) that form during combustion, including these 15 elemental contaminants identified in the data submittal (see 76 FR 80471).

[4] *Contaminant Concentrations in Traditional Fuels: Tables for Comparison, November 29, 2011* can be found at www.epa.gov/epawaste/nonhaz/define/index.htm.

contaminants other than nitrogen, straightforward comparisons for individual contaminants reveal NHSM levels that are lower than or comparable to those in coal. Regarding contaminant levels reported for fluorine, EPA notes that previous data submitted by DTEES in August 2011 indicated levels of 560 mg/dry kg based on analyses performed on one sample in 2009. Believing this one data point not to be representative of the levels of fluorine in your materials, you collected additional data in January 2012 and submitted this information to the Agency. New data submitted indicates fluorine levels of 195 mg/dry kg - - the highest fluorine concentration of analyses found in 3 samples taken in January 2012. Such levels of 195 mg/dry kg are comparable to the fluorine levels listed for coal (ND- 178 ppm) as indicated in the enclosed table.[7]

Regarding nitrogen, the processed biosolids have somewhat higher levels of total nitrogen than coal. However, as you argue in your September 9, 2011 letter, total nitrogen is not an appropriate way to assess this contaminant—*in your specific situation*—that will form NOx during combustion. Specifically, you note that ammonia and organic nitrogen, which will be rapidly converted into ammonia early in the combustion process, should not be considered as contaminants provided the combustion unit has a Low NOx firing system (i.e., Low NOx burners with Overfire Air). You also state that the majority of nitrogen in the processed biosolids is in fact ammonia or organic nitrogen. Due to the oxygen-deficient nature and flame temperatures characteristic of Low NOx firing systems, introducing ammonia into the combustion chamber via the processed biosolids will actually *reduce* NOx emissions. This would happen as the ammonia reacts with existing NOx—always present in some amount due to nitrogen's presence in air—to form nitrogen gas and water. As such, we agree that total nitrogen is not an appropriate contaminant to consider for your processed biosolids, but this finding only applies in situations where the combustion unit receiving the fuel is equipped with a Low NOx firing system. This is the case at RRPP.

As discussed in the previous two paragraphs and the attached table, the processed biosolids meet the contaminants legitimacy criterion when compared to coal. This conclusion presumes that additional contaminants for which the biosolids were not tested are present at levels comparable to or lower than those in the appropriate traditional fuel, based on your knowledge of the material.

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[5] EPA notes that the contaminant values listed in the *Contaminant Concentrations in Traditional Fuels: Tables for Comparison* document for coal may be revised in the future based on the availability of new or additional data. Any future revisions to the values will not impact the conclusions made in this letter; the values are based upon the data that is available at the time EPA responds to a request.

[6] You may use other data on the contaminant levels in traditional fuels in determining whether the levels are comparable to those in DTEES' processed biosolids. That is, other data on the level of contaminants in traditional fuels that your company has or may become aware of may also be considered in determining whether the level of contaminants in DTEES' dried and pelletized biosolids are comparable to those in the traditional fuel that the combustion unit is designed to burn.

[7] As discussed in the final NHSM rule, the comparable to or lower than standard means any contaminants present in the NHSM that are within a small acceptable range, or lower than the contaminant in the traditional fuel. An example of a small acceptable range is given as an NHSM containing 500 ppm lead, while the traditional fuel burned in the unit contains 475 ppm lead. (76 FR 15523). As indicated in the enclosed table, reported fluorine and lead levels in the processed biosolids compared to coal within a small acceptable range.

Conclusion

Overall, based on the information provided, we believe that the processed biosolids that DTEES will generate through the Detroit Biosolids Project, as described in your letters, meet both the processing definition and the legitimacy criteria outlined above. Accordingly, we would consider this NHSM a non-waste fuel under the 40 Part 241 regulations.

If you have any other questions, please contact Kenneth Dixon of my staff at 703-308-1848.

Sincerely,

James R. Berlow, Director
Program Implementation and Information Division

Enclosure

Enclosure

Comparison of DTEES Dried Biosolids to Coal

Contaminant	Units[1]	Dried Biosolids[2]	Coal[3]	Result of Comparison
Antimony (Sb)	ppm	4.3 - 5.6	ND - 10	Lower than coal
Arsenic (As)	ppm	0.8 - 10.1	ND - 174	Lower than coal
Beryllium (Be)	ppm	0 - 1.8	ND - 206	Lower than coal
Cadmium (Cd)	ppm	6.1 - 17.0	ND - 19	Lower than coal
Chromium (Cr)	ppm	74.7 - 140.0	ND - 168	Lower than coal
Cobalt (Co)	ppm	5.4 - 22.5	ND - 25.2	Lower than coal
Lead (Pb)	ppm	31.2 - 153.3	ND - 148	Comparable to coal
Manganese (Mn)	ppm	87.9 - 136	ND - 512	Lower than coal
Mercury (Hg)	ppm	0.4 - 1.1	ND - 3.1	Lower than coal
Nickel (Ni)	ppm	27.7 - 122.0	ND - 730	Lower than coal
Selenium (Se)	ppm	3.0 - 29.4	ND - 74.3	Lower than coal
Sulfur (S)	ppm	5100 - 6200	740 - 61,300	Lower than coal
Chlorine (Cl)	ppm	1,047	ND - 9,080	Lower than coal
Fluorine (F)	ppm	195	ND - 178	Comparable to coal
Total Halogens	ppm	1,670	at least 9,080	Lower than coal
Total Nitrogen (N)	ppm	50,300 - 60,700	13,600 - 54,000	See "Comparability of Contaminant Levels" section of text for explanation.

Notes:

1. All contaminant analyses—biosolids and coal—are on a dry weight basis.
2. DWSD BIOSOLIDS RANGE Data is from Detroit Water and Sewerage Department's (DWSD) monthly sampling, per DWSD Residual Management Program. The samples were obtained from three separate sources (24 sample analyses, sampling Period May 2008 through January 2009). Results were obtained by Test Method EPA SW 846-6010A. Chlorine and Fluorine data was obtained from 3 individual sample analyses performed in January 2012; Data for Cobalt, Manganese and Antimony was obtained from DWSD's quarterly duplicate sampling (8 samples for four quarters of year 2003).
3. Coal data taken from EPA document *Contaminant Concentrations in Traditional Fuels: Tables for Comparison, November 29, 2011,* available at www.epa.gov/epawaste/nonhaz/define/index.htm.