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Update on Federal Air and GHG Regulations Affecting Landfills

EPA's recent regulatory changes are expected to alter the way landfills are regulated for the foreseeable future with a potential to add additional compliance costs for the industry.

■ By Patrick Sullivan, Amy Banister, Niki Wuestenberg and Frank Caponi

The air quality and greenhouse gas (GHG) regulatory framework at the federal level is currently in a state of flux with respect to landfills. The landfill industry awaits the issuance of a revised version of the municipal solid waste (MSW) landfill New Source Performance Standards (NSPS) under 40 Code of Federal Regulations (CFR), Part 60, Subpart WWW. At the same time, the industry is bracing for a final legal decision on whether biogenic emissions must be counted under the Tailoring Rule for Prevention of Significant Deterioration (PSD) and Title V permitting programs. Recently, the U.S. Environmental Protection Agency (EPA) issued changes to the GHG mandatory reporting rule (MRR) promulgated under 40 CFR Part 98, which directly affect MSW landfills and take effect for 2014. Collectively, these regulatory changes are expected to alter the way landfills are regulated for the foreseeable future with a potential to add additional compliance costs for the industry.

Recent MRR Changes

On November 29, 2013, the EPA published the final version of revisions (Technical Corrections) to the federal MRR. The revisions became effective on January 1, 2014, and changes must be incorporated into the reporting of calendar year 2013 GHG emissions (due March 31, 2014).

Background

MSW landfills are categorically required to report annual GHG emissions under 40 CFR Part 98, Subpart HH of the MRR if they meet the definition of the source category under Subpart HH and their methane generation exceeds 25,000 metric tons of carbon dioxide equivalent (MtCO₂e). Landfills required to report under the MRR must also meet general reporting requirements (Subpart A), report all stationary combustion, excluding flares (Subpart C), and report other applicable sectors, if present.

The MRR requires that landfill operators monitor information used to calculate GHG emissions, including landfill gas (LFG) flow and methane content when an active LFG collection and control system (GCCS) are present. Prior to the promulgation of the Technical Corrections, landfill operators must collect LFG flow and methane content measurements at least weekly, but this requirement was modified in the Technical Corrections as detailed below.

Major Changes

Major changes in the Technical Corrections that will impact MSW landfills include:

- Changing the global warming potential (GWP) of methane from 21 to 25
- Adding LFG as a fuel type separate from biogas
- Adding an oxygen correction to the first-order methane generation equation
- Reducing the methane monitoring requirement frequency from weekly to monthly
- Allowing variable methane oxidation values based on methane flux through landfill cover
- Refining the emission calculation equations to explicitly allow multiple LFG destruction devices

Detailed Summary and Impact of Changes

Methane GWP

The increase in the methane GWP effectively increases the methane emissions from MSW landfills by 19 percent. While this may initially appear to result in more sites being required to report, the definition of the source category under Subpart HH has also been modified to exclude closed sites that had not already reported GHG emissions under the MRR, so closed sites that had not previously reported will not be subject to the MRR solely due to the GWP changes.

The increase in the methane GWP is retroactive to previous reporting years and will result in an increase in the emissions from reporting years 2010 to 2012. In the preamble to the Technical Corrections, EPA has stated that while re-submittal of previous reports will not be required, a separate version of the GHG emissions estimates will be published by the EPA.

This will have the net effect of increasing landfill GHG emissions by 19 percent, while not allowing re-reporting to take advantage of other Technical Corrections, such as methane oxidation, which might lower GHG emissions, for reporting years 2010 to 2012. Also, this sets a precedent that EPA will retroactively update GHG reports every time the methane GWP is modified.

Landfill Gas Fuel Type

Prior to the Technical Corrections, sites reporting combustion of LFG in stationary combustion devices such as engines or turbines using the Tier 1 (default) emission factors were required to use the biogas fuel type. The biogas fuel type was developed for use with wastewater digesters and similar processes with significantly higher heating values than LFG, which resulted in corresponding higher reported emissions from stationary combustion devices than the combustion of LFG.

The addition of LFG to the available fuel types with an appropriate heating value will result in significantly lower emissions from sites with LFG-fired stationary combustion in engines and turbines. The addition of the fuel type also reduces the incentive to use measured heating value (Tier 2) in reporting emissions for LFG to energy (LFGTE) facilities.

Methane Monitoring Frequency

The Technical Corrections also included a modification of methane monitoring frequency from weekly to monthly. While this modification will not directly impact 2013 MRR reporting, it will reduce monitoring requirements from 2014 forward. The monthly monitoring frequency is consistent with the methane monitoring frequency in the MSW landfill NSPS to which most sites with a GCCS are already subject. In addition, a change in methane monitoring requirements may result in a need to update your facility's GHG Monitoring Plan.

Methane Oxidation

The Technical Corrections provide an option for MSW landfill owners to determine a site-specific landfill surface methane oxidation value other than the current default value of 10 percent. The new oxidation values range from 10 percent for sites with high flux to 35 percent for sites with low flux. While flux is calculated based on landfill surface area data that is already reported under the MRR, it is important to note that EPA has added several caveats to the flux calculations, which include use of alternate oxidation values if there is a soil cover of at least 24 inches over a majority of the landfill and/or geomembrane cover with at least 12 inches of cover soil. These caveats will likely make it more difficult for landfills to take advantage of the site-specific oxidation factor options.

Equations Revisions

The Technical Corrections update all equations, which were based on LFG recovery measurements, to explicitly allow multiple destruction devices. Previously, reporters with more than one destruction device or monitoring point were required to average or combine flows from multiple devices into single values for reporting under the MRR. Under the revised equations, the method for handling multiple devices has been standardized and made explicit.

Tailoring Rule in Limbo

On May 13, 2010, EPA finalized the "Tailoring Rule," which added GHG emissions to the pollutants regulated under the federal Clean Air Act (CAA) permitting programs. The Tailoring Rule has been phased in with Step 1 starting January 2, 2011 and Step 2 starting July 1, 2011. Under the Tailoring Rule, carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride are regulated GHG emissions, and collectively as carbon dioxide equivalents, may trigger permitting requirements under Title V and PSD.

Tailoring Rule Summary

Under Step 2 of the Tailoring Rule requirements, new facilities or modifications of existing minor facilities emitting at least 100,000 (tpy) of carbon dioxide equivalent are covered by PSD requirements, and modifications of existing major sources

greater than 75,000 tpy of carbon dioxide equivalent will be subject to PSD permitting requirements, provided GHGs become "subject to regulation" for the facility. Step 2 facilities are required to obtain a Title V permit if they emit at least 100,000 tpy carbon dioxide equivalents, even if other pollutants do not exceed Title V permitting thresholds. Under Step 2, GHG alone can trigger PSD or Title V permitting requirements.

Biogenic Deferral

Upon promulgation, the Tailoring Rule did not distinguish between biogenic

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and anthropogenic carbon dioxide. On July 1, 2011, EPA issued a rule (40 CFR Parts 51, 52, 70 and 71, Federal Register Volume 76, No. 139, pages 43490 to 43508) to defer the inclusion of biogenic carbon dioxide from PSD and Title V programs under the Tailoring Rule. As such, biogenic carbon dioxide has not been regulated under the Tailoring Rule since its inception.

Under the deferral, biogenic carbon dioxide will not be included in the PSD or Title V permitting requirements for three years (through July 1, 2014) while the EPA evaluates the impacts of biogenic carbon dioxide on global climate change. If the EPA takes no additional action on biogenic carbon dioxide during the three-year window, biogenic carbon dioxide will be included in the permitting requirements after July 1, 2014.

The Deferral Rule defines biogenic carbon dioxide emissions as emissions of carbon dioxide from the combustion or decomposition of biologically-based materials other than fossil fuels and mineral sources of carbon from a stationary source. Biogenic carbon dioxide includes both the carbon dioxide in surface emissions of LFG and the carbon dioxide from the combustion of the methane in LFG.

On July 12, 2013, the U.S. Court of Appeals for the District of Columbia Circuit (D.C. Circuit) vacated the Deferral Rule that had suspended regulation of "biogenic" GHG emissions under the CAA. However, this recent legal finding vacating the deferral of biogenic GHG emissions has not yet taken effect while time is allowed for appeals to be filed. On November 14, 2013, the D.C. Circuit granted a delay of the final deadline for submitting appeals until the Supreme Court rules on a related GHG case in 2014. As such, biogenic emissions are presently still deferred under the Tailoring Rule for PSD or Title V purposes. Therefore, the issue of biogenic emissions is in limbo while the MSW industry waits on a Supreme Court decision on "Whether EPA permissibly determined that its regulation of greenhouse gas emissions from new motor vehicles triggered permitting requirements under the Clean Air Act for stationary sources that emit greenhouse gases." If the Supreme Court's decision is permitting requirements were not triggered, then GHGs (including biogenic emissions) would not be subject to permitting. It is unclear at this time whether EPA will proceed with rulemaking prior to the July 1, 2014 three-year deferral period deadline. This legal development is especially disappointing since EPA's Science Advisory Board's Biogenic Carbon Emissions Panel recommended to EPA that biogenic carbon dioxide from "anyway" emissions such as landfills should be considered neutral and therefore permanently excluded from regulation under the CAA.

Fugitive Emissions

On December 12, 2013, EPA issued a clarification as to how fugitive GHG emissions would be handled under the Tailoring Rule. Essentially, they have said that fugitive GHGs will be regulated in the same way as other regulated pollutants under the CAA. This means that under federal PSD, fugitive GHG emissions are not counted for applicability purposes for minor sources or modifications to existing minor sources unless the facility is in one of the specific industry categories that EPA has defined (MSW landfills are not). Also, they would not be counted for any modifications to existing major sources (major modifications) to determine PSD applicability if the threshold is exceeded solely due to fugitive GHGs. However,

fugitive GHGs could be counted if a project is major for another regulated pollutant. The EPA clarification avoids further confusion regarding fugitive GHGs. The hope is that EPA will eventually address fugitive emissions as it intended several years ago and exclude them from regulation for the "non-listed source categories" in all circumstances.

GWP Change

The GWP change under the MRR will also affect permitting under the Tailoring Rule since the Tailoring Rule references 40 CFR 98 for emission estimation methods GHGs. This means that methane emission from landfills will result in higher carbon dioxide equivalents that can be regulated under the Tailoring Rule. However, to counter the GWP change, which will increase emissions of GHG, the MSW industry is hopeful that it can also take advantage of other calculation methods changes from the MRR, such as the ability to use a higher oxidation factor for methane.

Awaiting NSPS Amendments

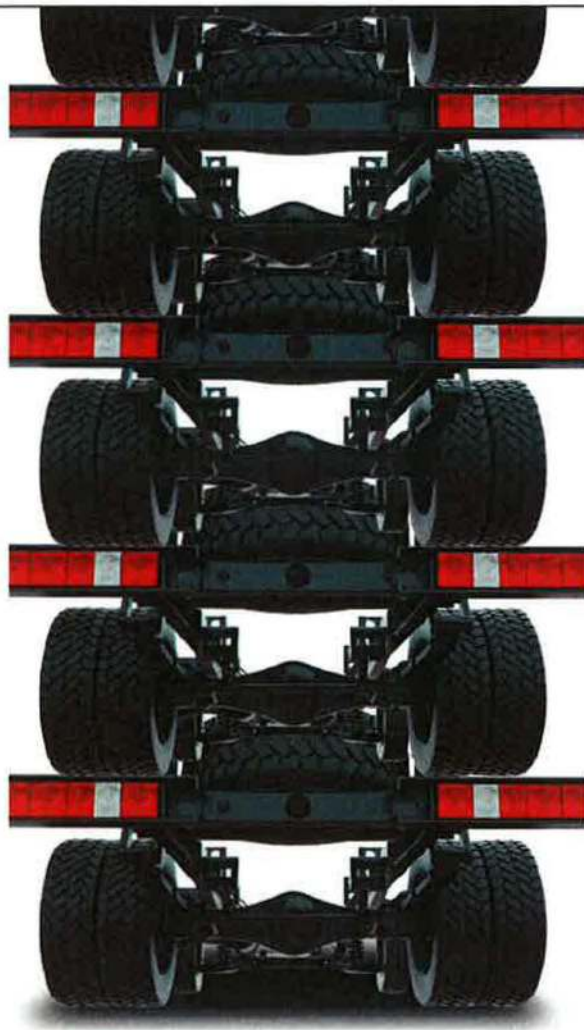
EPA is proposing possible changes for NSPS and Emission Guidelines (EG) for MSW landfills. Although EPA is required to review NSPS rules every eight years, their review and proposed changes are a result of lawsuit settlement filed against them by the Environmental Defense Fund (EDF). Currently, out of the 2,000 active landfills in the United States, 729 are currently subject to either NSPS or EG.

EPA has been working with the MSW industry, environmentalists and other stakeholders in development of the amended rule. Because the rule is expected to have a compliance cost of \$25 million or more in one year nationally, EPA has been required to convene and consult with a small business advocacy review (SBAR) panel under Executive Order 13132. Small entity representatives (SERs) have met with EPA on several occasions to address the possible impacts of the proposed rule changes on small businesses and small municipalities that own and/or operate affected landfills. EPA is also required to consult with local and state governments under Executive Order 13132 to address Federalism implications as part of the rulemaking.

Pursuant to Federalism and SBAR discussions, EPA is considering six different scenarios for new and existing landfills to reduce emissions for both NSPS and EG. Options include reducing emission thresholds for non-methane organic compounds (NMOCs), reducing allotted time for installation and expansion of GCCSs, reducing the design size threshold for applicability, or some combination. In addition, EPA is considering enhanced surface emissions monitoring (SEM) and other changes to the way compliance monitoring is conducted.

The rule changes are also intended to resolve draft rulemaking proposals from 2002 and 2006 Federal Register publications, which were issued as draft but never promulgated as final. Also included in these draft rulemakings were proposals to change the definition of "treatment", which will impact facilities that currently, or will qualify for the exemption from destruction efficiency (or outlet NMOC concentration) standard, and address compliance responsibilities under "third party" operating scenarios.

EPA plans to issue draft NSPS amendments by February 4, 2014 with the final rule due on December 17, 2014. The MSW industry will continue to work with EPA in an effort to



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develop the most reasonable rule changes possible, including providing formal comments through the Solid Waste Association of North America (SWANA) and the National Waste and Recycling Association (NWRA). |

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Amy Banister is the Senior Director for Air Programs for Waste Management, Inc. (Houston, TX). She has more than 20 years of experience in air quality consulting, project management, regulation development and planning, as well as corporate environmental program implementation. She is currently responsible for directing air program activities at Waste Management, which includes developing corporate policies and standards and training programs for application at Waste Management North American facilities. Amy also supervises corporate climate change initiatives and supports regulatory advocacy for air issues pertaining to Waste Management and the solid waste industry. She is Past Director of SWANA LFG Technical Division and has served as Vice Chair of the LFG Division's Rules and Regulations Committee. Amy can be reached at abaniste@wm.com.

Niki Wuostenberg is the Corporate Air Compliance Manager for Republic

Services, Inc. (Phoenix, AZ). She has more than 20 years of experience in the solid waste industry, including air quality program management, project management, compliance training, environmental auditing, oversight of landfill gas collection system operations and maintenance, and coordinating climate change initiatives. For Republic, Niki has a broad range of air compliance responsibilities including review of regulations, air compliance evaluations, PSD/NSR guidance and compliance support, as well as oversight of state and federal Title V permit programs and NSPS/NESHAPS. As climate change has become increasingly more demanding, she has also focused on GHG initiatives and assisting with coordinating regulatory advocacy involving the solid waste industry. Niki was appointed Vice-Chair of SWANA's Rules and Regulations Committee for the LFG Technical Division, represents Republic on the Solid Waste Industry for Climate Solutions coalition, is an Advisor to the Climate Registry and is a member of NWRA's Climate Task Force. Niki can be reached at nwuostenberg@republicservices.com.

Frank Caponi is the Division Engineer of the Air Quality Engineering Section for Los Angeles County Sanitation Districts (Whittier, CA). Frank is a professional environmental engineer with more than 32 years of experience in the solid waste and wastewater management field. For the Districts, Frank is responsible for air quality programs and compliance at the District's operating landfills and POTWs. He serves as one of the District's primary liaisons with federal, state and local air quality agencies, as well as sitting on several agency committees. Frank is active in many professional societies, has published several papers and has prepared and presented numerous talks on a wide range of air quality and waste management related topics. He can be reached at fcaponi@lacsad.org.

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