UPDATE ON MAJOR AIR QUALITY REGULATIONS AFFECTING LANDFILLS

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ABSTRACT

Although there have been no new major air regulations directly affecting landfills in the last several years, there have been new developments with existing regulations as well as proposed regulations affecting certain landfill gas (LFG) recovery equipment. These new and updated regulatory programs have the potential to add to the already complicated mix of regulations and requirements affecting landfills.

On the positive side, some of the regulatory updates will actually clarify certain elements of these existing regulations where uncertainty has prevented a clear path toward compliance. The regulatory programs that have been recently updated or are proposed for update include the New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAPs) for landfills and the federal New Source Review (NSR) rules. New regulations include promulgated or proposed NSPS and/or NESHAPs rules for reciprocating engines and turbines, which combust LFG as a fuel source.

The enclosed paper summarizes the status and pending updates to the landfill NSPS and NESHAPs rules, the new requirements in place or proposed by the NSPS and NESHAPs for turbines and/or reciprocating internal combustion engines (RICE), and the potential application of federal NSR and Prevention of Significant Deterioration (PSD) rules to landfills.

The potential effects of these regulations on landfills, landfill-related operations, and LFG-to-energy (LFGTE) projects are also assessed along with a summary of specific issues that should be considered when seeking to achieve long-term compliance. Several case studies of enforcement actions or compliance issues for landfills related to the NSPS, NESHAPs, and NSR/PSD rules are detailed in order illustrate the serious consequences that can result when these regulatory programs are not fully understood or compliance is not achieved in a timely and complete manner.

LANDFILL NSPS AND NESHAPS

Background and History

The original NSPS for municipal solid waste (MSW) landfills was promulgated on March 12, 1996 under 40 Code of Federal Regulations (CFR) Part 60, Subpart WWW. Minor revisions to the NSPS were adopted on June 16, 1998; November 9, 1999; April 10, 2000; and October 17, 2000. On May 23, 2002, a draft amendment to the NSPS was set forth for public comment and remained in draft form for over four years. The 2002 rulemaking was intended to address issues related to the ultimate responsibility for NSPS compliance between the various owners and operators of the landfill and/or the LFG collection and control system (GCCS) as well as providing clarification of the definition of gas treatment. However, it was not acted upon for several years.

In the intervening time, the landfill NESHAPs rule was promulgated on January 16, 2003 under 40 CFR Part 63, Subpart AAAA. This rule did not create any new standards for compliance; however, it did add new recordkeeping and reporting elements to the NSPS provisions through the establishment of startup, shutdown, and malfunction (SSM) plan requirements for NSPS landfills. The NESHAPs rule also increased the annual NSPS reporting requirement to semi-annual and provided better clarification as to the nature of deviations of the minimum combustion temperature requirement for LFG control devices.

Finally on September 8, 2006, the U.S. Environmental Protection Agency (EPA) published proposed amendments to both the NSPS and NESHAPs rules. These amendments include the same issues from the 2002 rulemaking along with several new items.

Members of the Rules and Regulations Committee of the Solid Waste Associated of North America (SWANA) LFG Management Division, along with representatives of the National Solid Wastes Management Association (NSWMA), EPA Landfill Methane Outreach Program (LMOP), and the Waste Industry Air Coalition (WIAC), met with the EPA Office of Air Quality Planning and

Standards (OAQPS) on November 1, 2006, to discuss the pending NSPS rulemaking. The meeting allowed the industry representatives to discuss the concerns with the proposed rule and to solicit information that might help in drafting the MSW industry comments on the draft rulemaking. Comments on the proposed rule were due November 7, 2006 and a joint letter from SWANA and NSWMA was submitted on behalf of the industry to EPA.

As noted above, the 2006 rulemaking proposes revisions to the NSPS and NESHAP rules for landfills. Several of the proposed revisions were originally proposed in a 2002 draft rulemaking, and these have been modified based on industry comment and internal EPA deliberations. In addition, several new items are covered in the rulemaking, some of which are based on a September 23, 2004 letter from SWANA and a November 10, 2005 meeting between the SWANA, NSWMA, and EPA.

The main issues from the 2006 rulemaking include the following:

- Delineation of liability and responsibility for NSPS and NESHAPs compliance for owners and operations of the landfill as well as the GCCS, including third-part LFGTE developers.
- Further definition for "treated" LFG and specification of monitoring requirements to prove compliance.
- Changes to the one-hour control device and five-day GCCS downtime provisions.
- Clarifications to the SSM requirements of the NESHAPs rule pertaining to routine maintenance and minimum temperature requirements.
- Clarification of the definition of "household waste" and how that affects the applicability of the NSPS on construction and debris (C&D) landfills, which might accept certain types of wastes from households (e.g., green waste, C&D from residential demolition, etc.)
- Requests for additional comments from industry and other stakeholders on certain provisions for closed landfills, surface emissions monitoring requirements for cover penetrations, agency review times for GCCS Design Plans and other NSPS submittals.

Discussion of Current Regulatory Issues

A summary of the major elements of the 2006 proposed NSPS and NESHAPs revision are discussed below along with a detailed discussion and summary of the November 7, 2006 MSW industry comments from SWANA and NSWMA to EPA.

Definition of MSW Landfill Owner/Operator, Definition of MSW LFG Collection, Control or Treatment System Owner/Operator and Allowance for Offsite Control or Treatment: The current EPA rulemaking was intended to solve the problem of assigning liability for NSPS compliance without creating an obstacle to LFG beneficial use. The ability for owners and/or operators to subdivide liability with respect to compliance with the NSPS/NESHAPs rules is consistent with historical practices and is a vital step forward for a workable regulatory approach.

In SWANA's July 2002 letter to EPA regarding third party operational issues, SWANA stressed the importance of providing the greatest level of flexibility to all MSW third parties. In that light, it was recommended to EPA that third parties be given the option to certify that they would be willing to accept liability.

EPA's current proposed language in the 2006 rulemaking uses a similar approach in requiring that all parties maintain a "list" that shows very specifically with which aspects of the NSPS requirements each party is willing to comply. In the joint comment letter from November 2006, SWANA and NSWMA agreed with this concept but suggested to EPA that the requirements should not be mandatory, so as not to create additional paperwork that may be unnecessary in cases where the determination of liability is clear.

EPA's attempt to define gas collection and control system operating responsibilities through the proposed definition of *Municipal solid waste landfill gas collection, control, or treatment system owner/operator* was a good start. However, in order to further clarify the division of owner/operator compliance responsibilities, SWANA and NSWMA recommended to EPA that in 40 CFR 60.751, the proposed definition be replaced with three distinct definitions, as presented below:

"landfill gas collection system owner/operator" means an entity that owns or operates any stationary equipment for the collection of landfill gas pursuant to §60.752(b)(2)(ii).

"landfill gas treatment system owner/operator" means an entity that purchases the landfill gas

from the municipal solid waste landfill owner/operator and owns or operates any stationary equipment for the treatment of landfill gas pursuant to §60.752(b)(2)(iii)(D).

"landfill gas combustion system owner/operator" means an entity that purchases untreated landfill gas from the municipal solid waste landfill owner/operator and owns or operates any stationary equipment for the combustion of landfill gas.

The industry also expressed concern with the requirement, as outlined in §60.758 (g) and, §63.1980 (j) that *all entities involved are responsible for compliance with missing items*. It is the situation where *all* entities involved hold responsibility that the proposed amendments are trying to avoid. This leads to difficult contractual disputes and legal bickering that eventually discourages third party developers from attempting to utilize LFG in a beneficial manner. The recommendation to EPA was that in the absence of the compliance list, liability should remain with owner/operator of the affected equipment, as defined above. This provides incentive for all parties engaged in LFG collection and control activities to complete a comprehensive list of compliance responsibilities for the affected MSW landfill.

In the proposed §60.750 (a) and §62.14352 (g), if the MSW landfill and the associated gas collection, control and/or treatment system are under *common control,* the entity exercising such control is responsible for specified requirements. This language is contrary to the goal of clearly specifying who has liability for compliance. *Common control* is never clearly defined as it applies to the proposed regulations and thus adds a significant level of ambiguity to the proposal. As stated above, it is the situation where *all* entities involved hold responsibility, that the proposed amendments are trying to avoid, yet the introduction of the concept of *common control,* as explained in the Preamble to the proposed regulation, does just that.

In the absence of any examples or explanations to the contrary, *common control* under this proposed wording, appears to provide EPA all the rights to take enforcement action against all entities owning or operating a source. If all landfill owners and operators are willing through a voluntary action establish a comprehensive list of compliance responsibilities, then issues of common control need not be considered. In addition, the ambiguous use of *common control* in the proposal could cause individual EPA regions to draw different interpretations on how to apply common control decisions under various federal air programs. Once again, this is contrary to the need for clarity on NSPS liability with the goal to encourage beneficial projects. Therefore, SWANA and NSWMA recommended to EPA that all references to *common control* be removed to avoid confusion. EPA always has the authority to make common control decisions in any situation, so creating another use for the term is unnecessary and confusing.

LFG Treatment Systems: In the 2006 draft rulemaking, EPA has established a new definition for *Treatment* based upon contacts with manufacturers of combustion devices who provided fuel specifications. SWANA and NSWMA recommended that the *treatment* definition be modified to read:

Treatment system means a system that compresses the landfill gas, has an absolute filtration rating of 10 microns or less and achieves a degree of de-watering consistent with specifications for good combustion supplied by the manufacturer or supplier of the combustion equipment. Any treatment system for which a site-specific EPA or NSPS-delegated state or local agency applicability determination or written, or through a written Title V permit determination by a NSPS-delegated state or local agency has been issued that the treatment system satisfies 40 CFR 60.752(b)(2)(iii)(C) is deemed to meet this definition.

SWANA and NSWMA further recommended that all existing projects that have received written applicability determinations or approvals from EPA or a delegated state/local authority be grandfathered so that the existing treatment system meets 40 CFR §60.752(b)(2)(iii)(C) requirements as of the effective date of the final rule be exempt from any further action. In these cases, EPA has already evaluated the adequacy of the project's treatment system.

For new projects, or existing projects seeking to comply with 40 CFR §60.752(b)(2)(iii)(C), SWANA and NSWMA suggested that the 20 degree dew point suppression is not practical for reasons described below. Therefore, in addition to revising the definition of treatment, SWANA and NSWMA recommended that manufacturer's/supplier's specifications for treatment be obtained by the gas treatment system owner/operator. Further, SWANA and NSWMA recommended that a site-specific preventive maintenance plan (PMP) be developed and included as part of the SSM Plan. Such PMP would be available on-site for agency inspection.

The PMP would include provisions for periodic monitoring and recording of the gas treatment system operations to demonstrate proper operation in accordance with manufacturer's/supplier's specifications/ standards. The periodic monitoring requirements for filtration should not be more stringent than weekly monitoring and recording of differential pressure to support appropriate preventive maintenance activities and to assure that a catastrophic failure of the treatment system is prevented. Compliance with the PMP would be used in lieu of any specified requirement for continuous monitoring and recording of treatment system parameters and would allow site-specific determination of the best procedure for achieving and monitoring treatment system performance as envisioned in the rule.

In support of the industry recommendations, it is important to understand that treatment system design and operation vary according to the type and size of the beneficial use project. Some engine facilities operate in cold climates where LFG can be cooled from the wellhead to temperatures in the 40-degree range simply because of ambient conditions. In cases like this it is impossible to meet the proposed definition. Also, verifying the temperature is difficult because of varying inlet and outlet conditions that can vary depending upon the pressures in the system. Accounting for these conditions could require multiple points of measure plus an algorithm to determine compliance. In addition, a dew point suppression standard does not account for water removal that may be occurring in other parts of the gas collection system, such as in header lines where condensate is continually being collected. In fact, long pipeline runs may remove significant amount of liquid, perhaps even equivalent to that removed by active dew point suppression.

Operating data exists for boiler systems that confirm such systems have operated successfully for two decades, fully meeting all NSPS requirements with only minimal gas treatment, filtration and moisture separators. There are also numerous engine facilities operating around the country, many that have received EPA exemptions that only use coalescing filters for moisture removal, compression, and air-to-air heat exchanges. Many of these facilities have source tested the combustion devices and have demonstrated compliance with the non-methane organic compounds (NMOC) destruction efficiency, requirement in the NSPS with this level of treatment. Other examples exist where gas sent offsite to an end user has only mechanical filtration and compression for moisture removal before entering a pipeline for transport to a local utility. In all these cases treatment is far less than 20-degree dew point suppression.

From a developer, or LFG combustion system owner/ operator perspective, it is important to realize that utilization of improperly treated LFG will result in potentially significant financial losses due to excessive equipment maintenance costs and downtime; this does not make business sense. Therefore, the level of treatment necessary for the efficient and long-term operation of the end use equipment should be determined on a case-by-case basis, based upon sound engineering. The real-world examples of LFG gas combustion equipment operating with treatment systems are very different than what EPA proposes, which demonstrates that a "one size fits all" approach is not practical. Not only is it impractical, but also requiring existing projects to meet the proposed definition can be financially damaging to the industry, and most importantly, may be unnecessary.

One-Hour/Five-Day Downtime of GCCSs: SWANA and NSWMA expressed support for EPA's determination that a GCCS often cannot be reasonably brought back on-line after a downtime event in less than one hour. In fact, during most downtime events it could take multiple days to return the GCCS to operating condition. Support was also expressed for EPA's decision to clearly define that the one-hour threshold should only be applied to free venting of LFG after a control device goes off-line and before the gas mover equipment can be shutdown to prevent untreated gas from passing through the control device.

However, the MSW industry is concerned with language contained within the draft Preamble, which seems to suggest that the current version of the NSPS does contain a one-hour limit on control device downtime, regardless whether free venting is occurring. It has been the MSW landfill industry's position and interpretation since the original NSPS was promulgated in 1996 that the one-hour threshold was always a free venting standard. This is particularly important since there have been several enforcement actions filed under this one-hour provision, and the draft Preamble language would seem to suggest that those actions are viable and can be enforced until this rule change takes effect. SWANA and NSWMA, therefore, requested that EPA revise the Preamble language to clarify that the one-hour standard was originally meant to be a free

venting standard and that any other interpretation is inaccurate.

Further, §60.757(f)(3) of the NSPS rule still requires sites to report all instances where the control/treatment device was not operating for more than one hour. This appears to contradict the intent of §60.755(e) which eliminates the one-hour requirement. Wording of §60.757(f)(3) should be revised to require reporting of all instances where free-venting of LFG occurred for more than one hour in duration.

With respect to the proposed elimination of the five-day provision, SWANA and NSWMA expressed appreciation of EPA's efforts to give the landfills flexibility in determining a reasonable limit on total downtime for a GCCS through the SSM provisions of the NESHAPs rule. However, there is concern that the proposed language would give too much discretion to state or local agencies in determining a maximum downtime limit, and those agencies could select something less than five days. The MSW landfill industry has always felt that five days is a reasonable maximum limit for GCCS downtime and are willing to commit to it as a regulatory threshold. Keeping the five-day limit will ensure that there is a upper end time limit for downtime allowed under the rule, allow consistency across the country, and prevent state or local agencies from selecting shorter time frames, thereby eliminating the flexibility EPA is trying to create.

SSM Provisions: The proposed rulemaking makes several changes to the SSM provisions within the NESHAPs rule, beyond the one-hour and five-day requirements. One of these changes is the clear delineation that routine maintenance events should be included in the SSM plan. The MSW landfill industry has always believed that the SSM requirements include routine maintenance, so SWANA and NSWMA did not take issue with EPA's inclusion of this requirement in the rule. Because of this, it is unnecessary to require that a routine maintenance plan be added to each SSM plan, which has already been developed by MSW landfill owners/operators. Instead, making it clear that routine maintenance events are regulated SSM events should be sufficient for this rulemaking. Further, the industry already includes routine maintenance events in semi-annual SSM reports, so this change is unnecessary as well.

The second change to the SSM requirements is the removal of the cross-referencing table to the NESHAPs general provisions (40 CFR Part 63, Subpart A) and replacement with all specific requirements contained within 40 CFR Part 63, Subpart AAAA. SWANA and NSWMA expressed support for this change as the cross-referencing element was always unclear and hard to follow.

The third change is described as a minor change to the block averaging requirement for three-hour temperature values in the NESHAPs rule to be consistent with what is reportedly contained within the NSPS rule. This includes the removal of the allowance to exclude SSM events from the calculation of three-hour block averages for determining compliance with the minimum temperature requirement under the NSPS. SWANA and NSWMA took serious issue with this requirement. Inclusion of SSM events in three-hour block averages will lead to numerous temperature deviations due to low temperature at almost all landfills. When a control device goes off-line for SSM events, the temperature will drop to ambient levels (versus operating levels over 1400 F for flares) fairly quickly, and when this is averaged with any operating time, deviations will inevitably exist.

This would result in a temperature deviation for almost any SSM event of more than a few minutes in duration and leave us at the mercy of state and local regulators, who could take enforcement action regardless of whether our SSM plans were implemented or not.

The MSW landfill industry has always viewed the NESHAPs rule language of exclusion of SSM events from the block average calculation as a clarification of unworkable rule language within the NSPS. With this proposed rulemaking, the requirement would return to this unworkable situation for temperature calculations. As such, SWANA and NSWMA strongly requested that the proposed rule be revised to continue to allow exclusion of SSM events for the one-hour block average calculations for both the NSPS and NESHAPs rules.

Removal of GCCS Requirements for Closed Landfills: EPA requested comments on approaches for addressing removal of controls in closed landfill areas and specific criteria that could be applied to determine which areas warrant control and which may remove control. As stated succinctly in the preamble to the proposed rules, there are many situations in the landfill industry in which an old, closed portion of a landfill has been inappropriately drawn into the NSPS because of its location to an

adjacent, newer facility. This can lead to problems when gas production in the older areas has fallen off so significantly that it is difficult if not impossible for this portion of the site to comply with the NSPS operational standards.

Further, many closed landfills installed GCCSs prior to the NSPS requirements. The current rule language states that the minimum 15-year duration for gas system operations begins with the date of the initial performance test required by the NSPS or emission guideline (EG) rules. For sites subject to the NSPS, initial performance tests of the control system likely occurred during December 1998 and June 1999. However, for the sites subject to either state/local EG rules or the Federal Plan for the EG, the initial performance test dates occurred as late as October 2002 to April 2003. Typically, closed landfills are subject to the state EG or Federal Plan requirements and not the NSPS requirements. Therefore, at many closed sites the useful life of the equipment (i.e., 15 years) has already been surpassed.

There were several potential solutions to address declining gas flows and gas quality at closed landfills which were submitted to EPA for consideration including the following:

For a closed MSW landfill, not co-located with other landfill units (active or closed), the closed MSW landfill should be able to remove NSPS control requirements once the site demonstrates it emits less than 25 Mg/yr NMOC based on actual LFG flow in accordance with §60.754(b) irrespective of the age of the gas collection and control system. The 50 Mg/yr NMOC threshold should be maintained where sites can demonstrate 15-years of gas system operations in accordance with existing rule requirements. SWANA and NSWMA recommended that the NSPS (also applies to appropriate sections in the EG rules) rule language under 40 CFR 60.752(b) be revised as follows:

> *The collection and control system may be capped or removed provided that the conditions of paragraphs (b)(2)(v)(A), and either (B) or (C) are met:*
>
> *(A) The landfill shall be a closed landfill as defined in § 60.751 of this subpart. A closure report shall be submitted to the Administrator as provided in § 60.757(d); and*
>
> *(B) The collection and control system shall have been in operations a minimum of 15 years and following the procedures specified in § 60.754(b) of this subpart, the calculated NMOC gas produced by the landfill shall be less than 50 megagrams per year on three successive test dates. The test dates shall be no less than 90 days apart, and no more than 180 days apart; or*
>
> *(C) For a closed landfill not co-located with other landfill units, follow the procedures specified in § 60.754(b) of this subpart, the calculated NMOC gas produced by the landfill shall be less than 25 megagrams per year on three successive test dates. The test dates shall be no less than 90 days apart, and no more than 180 days apart.*

As for closed landfill units or areas co-located with active landfill units, several options were recommended to EPA within the confines of the existing rules. These include:

- For a closed landfill unit or area co-located with active landfill units, the site should be able to remove NSPS control requirements based on 15 years from the initial well installation date for the affected landfill or area, not the date of NSPS or EG performance test. This is similar to the language found in Ohio's EG program (OAC 3745-76-07(B)(2)(e)). The EPA approved Ohio EPA's EG program on October 6, 1998.Include a provision for a 10% NMOC threshold for non-producing areas in order to address declining flows from closed landfill units or areas of an MSW landfill. The 10% NMOC threshold may be determined in accordance with 40 CFR §60.754(b) as gas collection is installed in these areas.

The non-producing area(s) would not be subject to monthly wellhead monitoring requirements or obligation to meet pressure, temperature and oxygen standards for wells located in the closed area(s). This proposed provision is ***in addition to the existing 1% NMOC threshold*** already provided for in 40 CFR §60.759(a)(3)(2) for non-producing areas without a gas collection system.

To demonstrate that the 10% threshold is still protective of the environment, the site would continue to conduct monthly cover integrity inspections and quarterly surface emissions

monitoring. If readings above 500 parts per million by volume (ppmv) surface emissions standard are not discovered for non-producing area(s) after three consecutive quarters, then the site could defer to annual surface emissions monitoring as allowed in 40 CFR §60.756(f). If exceedance(s) are detected (above 500 ppmv above background), then corrective actions would be applied in accordance with 40 CFR §60.755(c)(4). The site would re-initiate quarterly monitoring until three consecutive quarterly events demonstrate no exceedances of 500 ppmv standard. The site would then defer to annual monitoring as allowed in 40 CFR 60.756(f). Monthly cover integrity inspections and surface emissions monitoring would cease once the landfill met the following condition:

> *When a 1% NMOC threshold is achieved for non-producing area(s) as determined in accordance with 40 CFR 60.754(b).*

Definition of Household Waste: The definition of household waste in the draft rulemaking needs to be expanded to not only exclude yard waste but also non-putrescible C&D materials. There is a concern, for example, that roof shingles from a residential home could be deemed to make a C&D landfill into an MSW landfill for NSPS purposes and impose unnecessary and unduly expensive Title V permitting obligations on these facilities and/or result in enforcement action for non-compliance to date. Title V permitting for such facilities would potentially be required even though such facilities would not require gas collection and control systems (because there is no degradable waste to produce LFG), based solely on the size of the C&D landfill and the acceptance of a single roof shingle. If C&D materials from houses after a hurricane or other disaster are deemed to be "municipal waste", then C&D landfills would have a disincentive to accept such material because they would be unnecessarily subject to Title V permitting as a result of landfill NSPS applicability. Given the public policy implications, the definition of household waste should specifically exclude non-putrescible C&D materials.

Design Plan Approvals: It has been an ongoing problem with EPA as well as state and local agencies that regulated NSPS facilities cannot get timely approval of plans, reports, and/or requests for exemption or alternatives. This is particularly an issue for GCCS Design Plan submittals, which contain the basis for NSPS compliance for the GCCS and the requests for exemptions and alternatives from the rule. The review and approval of the NSPS Design Plans has not been consistent from state to state, or even within the same state, from district to district. Some states have never approved Design Plans, even though we are now on the 10 year anniversary of the NSPS promulgation. In the draft rulemaking, EPA attempted to address the issue of Design Plan approvals through the solicitation of comments.

EPA's suggestion to allow landfills to have a "de facto" approval of their Design Plan after a certain time period has elapsed is an excellent option, and SWANA and NSWMA supported this strongly.

With respect to the time frame for agency review of an initial Design Plan, the EPA's February 1999 document "Municipal Solid Waste Landfills, Volume 1: Summary of the Requirements for the New Source Performance Standards and Emission Guidelines for Municipal Solid Waste Landfills" stated the following (on page 2-38):

> *"The implementing agency must approve the design of a gas collection and control system prior to installation. The review and comment interval for approving a design plan is expected to take approximately 6 months from the date the plan is submitted, leaving approximately 12 months for installing the alternative gas collection and control system."*

This six-month timeframe for review and approval of the initial Design Plans is very reasonable since it leaves at least one year for the landfill to prepare construction level drawings and specifications for the first phase of the approved design, as well as solicit bids, and ultimately install the system. Therefore, since the Design Plan has to be professionally designed and certified by a Professional Engineer along with ultimately achieving compliance through quarterly surface emissions monitoring and monthly testing and monitoring, SWANA and NSWMA strongly supported the de facto approval of Design Plans if approval is not provided by the Administrator after six months of submittal.

With respect to time frames for updates or revisions to Design Plans, a four-month time frame should be more than adequate, as the proposed revisions to an existing plan should require a less extensive review than a brand new plan prepared from scratch.

A related issue is the absence of consistent regulatory review and approval of higher operating value

(HOV) demonstrations, alternative timeline requests and well decommissioning requests. Some state agencies have established internal procedures to review and approve these requests on a timely basis, while other state agencies have no internal programs. The lack of response by an agency leaves a site in an awkward compliance position.

If an alternative timeline as allowed in 40 CFR §60.755(a) and (c) is requested and no written response provided by the Agency, is the facility operating in or out of compliance with the NSPS? Because facilities have only two options for addressing wellhead and surface emission exceedances (e.g., expand the system within 120 days of the initial exceedance or seek approval for an alternative remedy/timeline), the facility could be considered out of compliance if the approval is never granted and the system is not expanded within the 120-day timeframe. Since expanding the system is not always the best way to correct an exceedance, and a facility may not be able to determine the appropriate course of action within 15 days of an initial well exceedance, SWANA and NMSWMA proposed to EPA two different options to address these situations. One is to replace the 15-day timeframe with 60 days to address the initial exceedance prior to having to submit an alternative timeline request or decommission a well. Secondly, if the well or area still exhibits an exceedance of the operating criteria, which will occur for more than 60 days, the EPA Administrator should have a much shorter timeframe to review the requests before a "de facto" approval would be allowed; i.e. 30 days. If the approval is not granted within an expeditious timeframe, it would leave little time to perform the expansion activity.

Cover Penetrations: EPA also asked for comment on issues regarding surface monitoring locations and the interpretation of cover penetrations. The EPA has taken the draft position that the quarterly monitoring path should include the monitoring of every cover penetration, since "cover penetrations can be observed visually and are clearly a place where gas would be escaping from the cover, so monitoring of them would be required by the regulatory language." SWANA and NSWMA disagreed with this interpretation.

To assume that all cover penetrations, including gas extraction wells, are a place where gas is escaping is unwarranted since the gas system is under vacuum. Also, it has been our experience that most cover penetrations do not leak, and therefore, there should not be a default assumption that they represent places where surface emissions are likely occurring. In addition, there are several facilities which are closed and are capped with a flexible membrane liner. This type of cover is very effective in not allowing gas to escape.

Further, if visual or other observations (e.g., breach in seal around penetration, desiccation of the cover material at the interface of penetration and the cover material, LFG odor in immediate vicinity, etc.) indicate possible elevated concentrations of LFG around cover penetrations in the solid waste area where the collection system is required, those areas are currently being monitored as a part of the quarterly surface emissions testing.

The proposed requirement would be very difficult to perform at many landfills especially since there are landfills which have over 1,000 cover penetrations with only a small fraction of them potentially causing surface emissions. Therefore, SWANA and NSWMA recommended the following rule changes as described below.

It was requested that EPA clarify that any obligation to perform surface monitoring in the vicinity of a penetration of the landfill cap is limited to the area within the perimeter of the municipal waste disposal area. Second, any requirement to perform surface monitoring in the vicinity of a penetration in the cap should apply only where such penetration extends fully through the cap, rather than constitutes a surficial breach or inconsistency. This limitation would eliminate the need to automatically perform surface monitoring around survey poles, gas line or leachate line markers and other commonplace items that are intentionally placed within the cap but only within the top several inches of the surface. Third, the obligation to perform surface monitoring in the vicinity of a landfill cap penetration should not apply to gas collection wells or other components maintained under vacuum unless there are visible signs of a crack or breach in the seal around the penetration as noted above. Finally, it was stressed that the regulation for monitoring surface penetrations needs to be clear that monitoring is to be performed at the landfill surface (i.e. at a point within 5 to 10 cm of the surface) not into the space between the penetration and the landfill cover.

Previous Request for Rule Clarification: A letter from SWANA dated October 14, 2004 detailed 22 issues within the NSPS rule where SWANA sought clarification. These issues were discussed with EPA

staff in a meeting on November 10, 2005, which was summarized in meeting notes dated, January 24, 2006. Several of these issues are covered in the draft rulemaking; however, others are not.

For the issues not addressed in the rulemaking, SWANA and NSWMA requested that EPA either specifically cover those issues in the draft rulemaking or clarify in the Preamble that certain issues will be handled in another manner, such as through applicability determinations or revisions to one of the guidance documents associated with the NSPS rule. This is what had been agreed to with EPA at the November 10, 2005 meeting.

The most recent development in the NESHAPs area came with the promulgation of a draft revision to the NESHAPs General Provisions on January 3, 2007. This draft rule would allow sources that are non-major (also termed minor or area) with less than 10 tons per year (tpy) of a single hazardous air pollutant (HAP) and 25 tpy of total HAPs to avoid having to comply with the maximum achievable control technology (MACT) standard. On face value, this could be extremely helpful to landfill since many NSPS and EG landfills, which are therefore subject to the landfill NESHAPs, are minor sources for HAP emissions. As such, it is possible that these landfills could be relieved from MACT requirements, such as the SSM provisions. However, because the landfill NESHAPs so clearly defines that all NSPS and EG landfills exceeding 50 Mg/year of NMOCs must comply with the MACT requirements, that may trump any exemption this draft rule provides. Also, many of these sites are already subject to and have been complying with the landfill NESHAPS; therefore, it is unlikely that the draft rule would allow them to stop compliance activities at this point in time. Comments on the draft rule are due March 5, 2007.

FEDERAL NSR AND PSD

Background and History

Federal NSR and PSD are long-standing federal air programs dating back to the 1980's. The cornerstone of these programs is compliance with the National Ambient Air Quality Standards (NAAQS) for criteria air pollutants. NSR and PSD are pre-construction air permitting programs that affect major sources of criteria air pollutants, including new major sources, modifications to minor sources making them major, and major modifications to existing major sources.

Applicability for NSR is based on emissions exceeding trigger levels for major sources at 100 tpy or less of nitrogen oxides (NOx), volatile organic compounds (VOCs), carbon monoxide (CO), sulfur oxides (SOx), and/or particulate matter less than 10 microns (PM10) or on exceedance of the more stringent "significance levels" for major modifications based on the non-attainment status of the jurisdiction. Particulate matter less than 2.5 microns (PM2.5) was recently added as a regulated pollutant and will fully become subject to all of the NSR provisions in the near future.

Applicability for PSD is based on emissions exceeding trigger levels for major sources at 250 tpy of NOx, VOCs, CO, SOx, and/or PM10 or on exceedance of the more stringent "significance levels" for major modifications. In addition, the NSPS rule for landfills created a new regulated pollutant under PSD, NMOCs, with a major source level of 250 tpy and a significance level of 50 tpy for major modifications. Of special note is that federal NSR and PSD do not count fugitive emissions of these pollutants toward the applicability thresholds.

NSR applies in non-attainment areas and carries requirements for achieving the lowest achievable emission rate (LAER) in terms of control technology, offsetting emission increases with contemporaneous reductions or emission reduction credits (ERCs), and air dispersion modeling to demonstrate compliance with the NAAQS. PSD applies in attainment areas and includes requirements for achieving best available control technology (BACT), completion of ambient air monitoring, and extensive air dispersion modeling to demonstrate compliance with the NAAQS, PSD increments, and visibility standards.

Although these programs have not consistently been implemented for landfills, arguably NSR and PSD should have applied to stationary sources at landfills (e.g., flares, engines, turbines, etc.) if they exceeded major source thresholds and had non-fugitive emissions. However, there has always been uncertainty regarding the application of NSR and PSD to LFG emissions from the refuse mass. In a policy dated, October 6, 1987, EPA had indicated that LFG emissions were fugitive, and therefore, not regulated by federal NSR or PSD for applicability purposes.

However, in an October 21, 1994 policy, EPA essentially reversed itself and declared that LFG emissions were not fugitive since they could be "reasonably collected" such that they could be emitted through a "vent, stack, or chimney." Although it went mostly unnoticed, this single policy change has had a major impact on the application of NSR and PSD to landfills. With the NSPS rule in March 1996, EPA further clarified that NSR and PSD could be

applied to LFG emissions, which provided an increased focus on this issue.

In a July 1, 1994 guidance memorandum, EPA set forth its policy of excluding certain types of pollution control projects (PCP) from the NSR requirements on a case-by-case basis. The exclusion allows states or local agencies to exempt a PCP from major NSR or PSD if the PCP is "environmentally beneficial." The guidance memorandum states that "unless information regarding a specific case indicates otherwise," projects such as the addition of combustion devices to comply with this rule, "can be assumed, by their nature, to be environmentally beneficial." It should be noted that this exemption was established as a case-by-case determination; the deciding authority for such an exemption is the state or local agency.

One of the examples in the guidance was of a LFG flare, which gave clear direction that EPA intended to exempt LFG control devices from NSR and PSD as PCPs. The exemption was intended to include allowances for not meeting LAER or BACT and not requiring modeling; however, states were left with discretion whether to require modeling to prove environmental benefit. Under the PCP guidance, emission offsets were still to be required under NSR but at a one-to-one offset ratio, rather than larger ratios required under NSR.

On December 31, 2002, EPA published the final version of a major reform to the NSR and PSD regulations at the federal level with strong support from the Bush Administration. These regulations were intended to increase the flexibility for compliance and were strongly supported by the major industries. This 2002 rulemaking was followed by the final routine equipment replacement rule, which was promulgated on October 27, 2003, with an objective of allowing certain routine maintenance, repair, and replacement (MRR) activities to occur without being considered NSR or PSD modifications. Over the last several years, these NSR/PSD reform regulations have been hotly debated in the courts and political arena as further detailed below.

Discussion of Current Regulatory Issues

In the 2002 and 2003 rulemakings, EPA made a number of regulatory improvements in the way the NSR/PSD programs work for existing facilities. These improvements would not have changed the programs as they apply to new facilities and would not change which facilities are subject to the NSR rules. Instead, these improvements were intended to:

- Remove needless regulatory barriers to pollution control and prevention projects;
- Encourage modernization of plants and provide operating flexibility by establishing emission caps known as "Plantwide Applicability Limits" (PALs);
- Create incentives for facilities to install state-of-the-art pollution controls by providing operational flexibility for facilities that install "clean units,"
- Codify the PCP exemption that was formerly contained only in policy;
- Allow calculation of actual emissions increases and establish actual emissions baselines versus the current actual to future potential requirement for estimating emission increases from modifications;
- Establish an annual routine MRR allowance, so that activities undertaken to promote the safe, reliable and efficient operation of a plant whose costs fall within the allowance would automatically constitute routine maintenance not be subject to NSR/PSD; and
- Establish an equipment replacement approach, whereby most replacements of existing equipment with functionally equivalent new equipment to allow plants to run more safely, efficiently and reliably, again without triggering NSR/PSD.

For landfills, this reform package could have had some very positive effects. Codification of the PCP exemption could have strengthened its use for LFG control devices. The MRR provisions could have been very beneficial for the upgrade and replacement of major LFG recovery equipment like engines and turbines by allowing such actions to occur without concern for NSR or PSD. The actual-to-actual (versus actual-to-potential) test for estimating emissions increases for modifications and the use of PALs could have allowed much greater flexibility in showing that emissions changes from facility modifications should not trigger NSR or PSD.

The NSR reform package immediately came under intense scrutiny by environmentalist groups and by states with liberal state governments and/or existing stringent state air regulations. They considered these new provisions a role-back of federal NSR and PSD, which would allow many substantial modifications to move forward without triggering NSR or PSD and ultimately result in unregulated emissions increases. Many considered it a gift from the Bush Administration to its industrial supporters, such as the oil and gas and utility industries. Lawsuits were filed by various states and organizations, which forced the reform regulations to be decided by the courts.

On June 24, 2005, the District of Columbia (DC) Court of Appeals ruled on several elements of the 2002/2003

regulations that had been challenged in court. First, they upheld the provisions regarding the actual-to-actual test for modifications and use of PALs. However, substantial discretion is left to the state or local agencies with delegated NSR or PSD authority, which may mean that these provisions will not be adopted uniformly across the country. The court rejected the "Clean Unit" and PCP exemptions as not being supported by the Clean Air Act (CAA). The PCP decision is a strong blow to landfills since under the original policy, LFG control devices were clearly covered by the exemption, but the court decision renders the old policy moot.

Sadly, the court decisions have rendered most of the major provisions of the NSR reform powerless, and the unwillingness of state and local agencies to adopt the surviving provisions may limit the ultimate value that can be gained from the NSR reform.

EPA still intends to push for these reforms, but is being forced to take a piece-meal approach to the broad package that was originally passed in 2002 and 2003. On September 8, 2006, EPA re-proposes several elements of their NSR reform package. Public hearings were held in November 2006, and final rulemakings are due in the summer of 2007. Expect these rulemaking to be controversial as well.

As the MSW industry watches this NSR reform process unfold, it still has to be mindful of the existing elements of NSR and PSD that can affect landfills. Triggering either one of these federal permitting programs for a landfill project can have the effect of adding substantial cost and/or significant time to the permitting of the proposed project. Current NSR and PSD issues for landfills are further detailed below.

It should be well recognized now that landfills and landfill projects can be subject to NSR or PSD. With several recent enforcement actions by EPA, as detailed below under the Case Studies, landfill owners and operators should not be caught unaware regarding the possible applicability of these regulations. Further, with the increased scrutiny on landfills as air emissions sources due to the NSPS and Title V permitting programs, non-compliance is unlikely to escape detection for very long.

The types of landfill projects that could potentially trigger NSR or PSD include any new landfills or any modifications to exiting landfills (e.g., expansions) or individual sources at the landfill, which could cause an increase in emissions (as measured by the applicable NSR/PSD rules). Examples include the following:

- Landfill expansions which result increases in NMOC (PSD) and VOC (NSR) emissions from LFG. Landfills with high concentrations of NMOCs (VOCs) in the LFG are at greater risk.
- Installation of LFG control devices or recovery equipment, which are part of the same source as the landfill, which cause combustion emissions. Engines and turbines can have much higher emissions than flares in this regard.
- Projects at landfills located in serious, severe, or extreme non-attainment areas with stringent triggering thresholds.
- LFG combustion equipment at sites with very high levels of sulfur compounds in the LFG, resulting in high SOx emissions.
- Installation or expansion of ancillary equipment at landfills, which can have high emissions (e.g., composting operations, large diesel engines, aggregate or green waste processing, etc.).

Of special note is the fact that EPA, based on the 1994 policy, now deems LFG emissions to be non-fugitive and thus potentially subject to NSR and PSD. As such, any landfill projects which occurred after the policy change could have unknowing triggered NSR or PSD. This is the basis of the enforcement cases detailed below under the Case Studies. EPA, and the courts have upheld, believes that NSR and PSD liability is retroactive; therefore, it is not only new projects that must be considered for possible applicability.

TURBINE NSPS

Background and History

The NSPS rule for stationary gas turbines was originally promulgated in 1979 under 40 CFR Part 60, Subpart GG. Amendments to the rule were promulgated on April 14, 2003, July 8, 2004 and February 24, 2006. The final rule in its current status was set forth on July 6, 2006 under 40 CFR Part 60, Subpart KKKK.

The rule affects turbines that commenced construction, reconstruction, or modification after February 18, 2005. The rule establishes performance-based limits on NOx and SOx. The emissions standards under the turbine NSPS would affect LFG-fired turbines with a size of over 10 MM BTU/hour, which would include all such LFG-fired turbines with the exception of small microturbines. Monitoring, testing, reporting, and recordkeeping requirements are also specified in the rule.

For NOx, the emission limits are 96 parts per million by volume dry (ppmvd) for turbines less than or equal to 50 MM BTU/hour and 74 ppmvd for turbines greater than 50 but less than or equal to 850 MM BTU/hour a 15%

oxygen. Testing for NOx includes an initial and annual source test with an option to reduce to testing every two years if emissions can be shown to be 75% of the limit. As an alternative, compliance can be shown using a continuous emissions monitoring system (CEMS) or parametric monitoring system. More stringent limits apply if the gas burned is greater than 50% natural gas.

For SOx, the emission limits are either 0.9 lb/MW-hour gross output or 0.06 lb/MM BTU heat input (about 20 grains per 100 standard cubic feet). Testing for SOx includes an initial and annual source test or fuel testing.

Reporting under the turbine NSPS includes downtime and excess emission reports as well as submittal of source test reports.

Discussion of Current Regulatory Issues

In general, the turbine NSPS contains emission standards for NOx that are less stringent than what would be imposed as LAER, BACT, or reasonably available control technology (RACT), which generally include levels around 25 to 40 ppmvd depending on heat efficiency. However, these limits would be enforceable projects that do not trigger LAER. BACT, or RACT.

The SOx standard could be potentially limiting for sites with high sulfur levels in LFG, as there does not appear to be any exemptions for gases with variable sulfur levels. This limit is the equivalent of about 170 ppmv of total reduced sulfur (TRS) compounds in LFG of approximately 50 % methane.

ENGINE NSPS AND NESHAPS

Background and History

The original RICE NESHAPs was promulgated on June 15, 2004 under 40 CFR Part 63, Subpart ZZZZ. A proposed amendment to the rule was set forth on June 12, 2006. Along with the proposed amendment to the RICE NESHAPs, a draft RICE NSPS rule was promulgated at the same time under 40 CFR Part 60, Subpart JJJJ. These rules are further discussed below.

> **RICE NESHAPs:** The NESHAPs rule applies to RICE at major or area (minor) sources with HAP emissions. It limits air toxics emission from new, existing, and modified stationary RICE > 500 HP that are located at major sources of HAPs, stationary RICE $\leq$ 500 HP that are located at a major source of HAPs, and stationary RICE of any size at minor HAP sources.

The definitions of existing or new depend on the commence construction date and whether the unit is greater than or less than 500 HP.

- A stationary RICE > 500 HP is "existing" if construction or reconstruction was completed before December 19, 2002.
- A stationary RICE $\leq$ 500 HP is "existing" if construction or reconstruction was completed before June 12, 2006.
- A stationary RICE > 500 is "new" if construction or reconstruction ended on or after December 19, 2002.
- A stationary RICE $\leq$ 500 HP is "new" if construction or reconstruction ended on or after June 12, 2006

A key element of the rule is that it carries substantial exemptions for RICE that burn gaseous fuels with LFG $\geq$ 10% on BTU basis. New or modified RICE meeting these criteria must only comply with notification, monitoring, and recordkeeping, and reporting requirements that demonstrate that the exemption criteria are met. Existing RICE meeting these criteria have no requirements under the rule.

As such, the rule only affects LFG-fired RICE where LFG is less than 10% on BTU basis, which is a very small percentage of the projects in operation or being considered. These engines would be treated just like any other engines under the rule with specific requirements depending on size of engine, whether it is considered existing or new, and the engine type. Note that LFG-fired engines are typically 4-stroke, spark ignition, lean-burn (SI 4SLB) engines that are greater than 500 HP, but located at area or minor sources of HAPs. However, engines at industrial facilities using LFG to supplement their natural gas use could be of varying sizes.

The requirements for the SI 4SLB engines include the following:

- Reduction of CO emissions by greater than or equal to 93% or reduction of formaldehyde exhaust concentrations to less than or equal to 14 ppmvd at 15% oxygen.
- Non-methane hydrocarbon (NMHC) limit of 1.0 g/HP-hour.
- Catalytic reduction if necessary to achieve the above levels.
- Periodic stack testing.

- Emissions monitoring, including CEMS or parametric monitoring.
- O&M requirements.
- Recordkeeping.
- Reporting.

RICE NSPS: The RICE NSPS applies to manufactures **and** owners/operators of engines, including LFG-fired units. The emission standards include: (1) 2.0 or 3.0 g/HP-hour NOx, (2) 5.0 g/HP-hour CO, and (3) 1.0 g/HP-hour NMHC. These standards must be achieved by January 1, 2008 or January 1, 2011 for all new, reconstructed, or modified engines greater than 25 HP, depending on certain triggering events.

Compliance must be achieved during "useful life" of the engine as defined by 40 CFR 90 or 1048, 10 years, or 8,000 hours if engine is certified under this NSPS. Compliance can be demonstrated through source testing and/or by purchasing a certified unit. Additional monitoring, recordkeeping, and reporting requirements also apply.

Discussion of Current Regulatory Issues

In general, the RICE NSPS contains emission standards for NOx, CO, and NMHC that are less stringent than what would be imposed as LAER, BACT, or RACT, which generally include achievable levels around 0.6 to 0.8, 2.1 to 3.0, and 0.4 to 0.8 g/HP-hour, respectively. These standards would affect and be applicable to new, modified, or reconstructed engines in locations where LAER, BACT. or RACT do not apply.

However, the reductions required by the RICE NESHAPs could be burdensome, and with the proposed revision to the NESHAPs, these standards would apply to RICE at minor sources, which would have a clear effect on LFG projects where LFG is less than 10%.

CASE STUDIES

Central Landfill Rhode Island

The EPA and the Department of Justice (DOJ) settled an enforcement case with the Rhode Island Resource Recovery Corp. (RIRRC), the owner/operator of the Central Landfill in Johnston, RI, regarding various NSPS, Title V, and NSR violations. The settlement required RIRRC to pay a $321,000 penalty and install over $5 million in additional pollution control systems at the 190-acre landfill, which handles most of the state's household and commercial waste. The LFG system improvements were required to meet both NSPS requirements as well as EPA's determination of LAER for LFG systems.

The settlement also required improvements at numerous areas of the Central Landfill, which consists of four landfill phases. Phase I of the Central Landfill opened in 1955 under previous ownership and was closed in 1993. (This area is being cleaned up under EPA's Superfund Program.) Phases II and III began accepting waste in the 1990s and Phase IV began accepting waste in September 2000. Among the specific improvements required under the settlement:

- Installation of 14 horizontal LFG collection trenches in the upper layers of Phases II and III;
- Continuation of the ongoing installation of an extensive LFG collection trench system in all layers of Phase IV;
- Installation of cover and capping materials on Phases II and III to trap escaping LFG, limit water infiltration into the waste, and increase the efficiency of already existing collection and control systems.
- Installation of an ultra-low emissions flare which will burn LFG substantially cleaner than most flares currently on the market.

Ultimately, the non-compliance at the Central Landfill affected several other parties, including the owners and operators of the LFG collection and energy recovery systems. These other parties also entered into enforcement settlement agreements with EPA with fines ranging from $25,000 to $100,000. It also set dangerous precedents regarding the application of NSR to landfills and the assignment of NSPS liability potentially to all owner and operators of the landfill and GCCSs.

NSR Application in EPA Region 1

Emboldened by their success with the Central Landfill case, EPA Region 1 has brought enforcement actions against several other landfills for failure to comply with NSR for landfill expansions with alleged VOC emissions above the NSR threshold. Key to EPA's case is their position on several legal and regulatory issues:

- LFG generation modeling for VOC emission estimates must use the most stringent (highest) "k" and Lo" values available for the same or similar sites, and such values will be deemed "site-specific." Values specified in EPA's own AP-42 guidance are not acceptable for CAA purposes such as NSR regardless of what the NSPS rule and guidance directs.
- When using site-specific NMOC data, actual testing of non-VOCs must occur in order to subtract these values from the NMOC total.

Default VOC in NMOC content values in AP-42 (e.g., 39% for MSW landfills) cannot be used for this purpose.

- All generated LFG is considered non-fugitive and emitted even if only a fraction of that amount is actually reasonably collectable as defined by the 1994 policy. The 75% default value (or 60-85% range) in AP-42 cannot be used for CAA purposes.
- Existing controls not installed for NSPS purposes are not considered federally enforceable for limiting potential to emit (PTE) unless they are specified in an enforceable permit, which clearly spells out the levels of control that must be achieved.
- LAER includes installation and operation of LFG controls at the earliest possible date after waste placement, and cost cannot be a consideration. Improved cover practices may also be required to meet LAER as well as the use of ultra low-NOx flares. The NSPS level of controls does not meet LAER.

While EPA is well within their rights to look backward at landfill expansion projects that occurred after the 1994 policy change on fugitive LFG emissions, the MSW industry is generally in disagreement with every other element of EPA's enforcement case, as detailed above. Clearly, they are putting forth a position that will maximize VOC emissions and cause more landfill projects to trigger NSR. Further, historical retroactive NSR cases for non-landfills have brought them major penalties by alleging both large environmental impacts due to the lack of emission offsets and economic benefits gained from non-compliance. For landfills, the economic benefit is due to the fact that LAER levels of controls were not installed, which allowed a large economic benefit for non-compliance, and excess emissions occurred because of lower levels of collection efficiencies.

These cases, if settled or decided in EPA's favor, would set several horrible precedents against the MSW industry. It is likely that other EPA regions will begin to look at landfills in this same manner, so it behooves landfill owner/operators to proactively assess their potential liability under this retroactive NSR applicability.

NSPS Site Examples

Landfill A is located in a mountain region of the Western United States and has one older, closed area and one active area, which are physically separated on the landfill property. The overall site is subject to the NSPS and has a GCCS in place. Because the older area is such a large distance from the main active area and because of the poor quality of LFG from this area, the older area has its own separate GCCS with an activated carbon unit for a control device.

The older area can only generate approximately 30-35 standard cubic feet per minute (scfm) of LFG on a continuous basis with a methane content of 29-32 % on average (about 20 scfm at 50% methane). None of the wells in the older area can meet NSPS wellhead standards without a HOV allowance, and surface emissions have not been detected in this area, even before the GCCS was installed.

For the above reasons, it was felt that this older area of the site would be a good candidate for an exemption from having to operate a GCCS in compliance with the NSPS. However, the only option available under the rule was to demonstrate that the area's NMOC emissions were less than 1% of the total NMOC emissions for the site. When this analysis was completed using NSPS protocols, it was discovered that the older areas was still purportedly generating over 10% of the site-wide total for NMOCs and would not drop to 1% until the year 2050.

However, when the actual LFG flow data from this area is used to complete an NMOC emissions analysis, the percentage drops to 0.81 % in 2006. Clearly, with all of the above information, this area of the site should not be required to have a GCCS under the NSPS rule but the 1% threshold and the requirement to operate the GCCS for a minimum of 15 years prevents this exemption from being granted.

Landfill B is located in a desert region of the Southwestern United States and has one recently closed area and one active area, which are physically separated on the landfill property. The overall site is subject to the NSPS and has a GCCS in place for the recently closed area; the active area is not required to have control under the NSPS at this time.

The site was originally required to install a GCCS under the NSPS because of projected NMOC emissions of greater than 50 Mg/year using NSPS protocols. This was primarily due an extremely high NMOC concentration that was detected during a Tier 2 study. Since the GCCS has been installed, the site is only able to produce approximately 217 scfm of LFG on a continuous basis with a methane content of 29 % on average (about 126 scfm at 50% methane). Most of the wells at the site cannot meet NSPS wellhead standards without an HOV allowance, and no surface emissions have been detected, even before the GCCS was installed. Also, the amount of LFG at the site is not enough to continuously operate the LFG flare, so the GCCS is on a timer system with two hours of operation per day.

For the above reasons, it was felt that the NSPS applicability for this site should be re-evaluated, and a Tier 2 study was recently conduct using samples collected from the main header to the LFG system. These data are much more representative of the average NMOC concentration for the site (because the GCCS draws from the entire refuse volume) as compared to the previous Tier 2 study completed with the probe method where only the newer, uppermost waste could be sampled.

Using the new Tier 2 value, the site's NMOC emissions are projected to be less than 50 Mg/year for the landfill's entire life with the highest value being 21 Mg/year. In 2006, the NMOC emissions would be 14.1 Mg/year using NSPS protocols but only 0.36 Mg/year using actual LFG flow data from the site.

This site is another example of a landfill that should not be required to have a GCCS under the NSPS but the requirement to operate the GCCS for a minimum of 15 years prevents this from changing. The NSPS never established any provisions to allow a site that was incorrectly classified as requiring a GCCS to subsequently demonstrate that the emissions are less than 50 Mg/year and avoid the requirement without first operating for 15 years.

Landfill C received a small expansion in volume prior to its closure in 1993, and has been subject to the NSPS since promulgation of the regulations in 1996. The active gas collection system at the landfill was installed during closure activities in the 1990's. Collected gas is sent to a five engine plant. An open flare is available to provide backup control. Three gas compressors at the plant are the "gas mover" equipment. A utility flare is available as backup.

A site-specific NMOC sample was collected several years ago from this facility and based on existing gas flow rates and this concentration, the facility's NMOC emissions are well below the 50 Mg/year threshold. However, the EPA denied a request to establish the "start date" for the gas system operations as when the first well was installed, vs. the date of the initial NSPS performance test, since the facility could not demonstrate that it had conducted all required NSPS monitoring and recordkeeping from the date the gas system was installed (which was prior to the promulgation of the NSPS regulations). NSPS compliance at this facility has cost over $1,000,000 to date.

These examples show several cases where the NSPS rule simply is not working as written for particular sites. Many more examples of site-wide or individual compliance and enforcement issues exist and are being dealt with on a daily basis.

PSD for LFGTE Project

In Northern California, a large LFG engine project exceeded 250 tpy of CO emissions and therefore triggered PSD. The PSD permitting process has had a major effect on the cost and timeline for the project, increasing project costs by approximately $200,000 and schedule by over 9 months. Because of EPA's direct involvement in the PSD project, Endangered Species Act issues have also been brought to light, which have also affected project cost and timeline. While it has not been difficult to meet the PSD requirements, the cost and schedule impacts highlight the major pitfalls of federal PSD permitting. These must be factored into any project budget or schedule where PSD may be triggered.

NSR for Flares and Engines

In the South Coast Air Quality Management District (SCAQMD), federal NSR is triggered at 10 tpy of NOx or VOCs and 50 tpy of CO because of non-attainment status. As such, LAER is applied to most LFG projects for flares, engines, and turbines. Unlike BACT, LAER does not consider the cost of control in selecting the required control technology. As such, the SCAQMD has deemed the ultra low-NOx flares and gas treatment with catalytic reduction to be LAER for flares and engines, respectively.

This has had a significant effect on the costs for these installations, rendering most LFG engine projects non-viable. Gas treatment and catalytic reduction systems could add capital costs of over $1 million and annual operating costs of several hundreds of thousands of dollar. LAER flares can be as much as three times as expensive as conventional flares of the same type. These LAER decisions may also have a long-term effect on raising the bar for the levels of control that are achievable in practice, thereby increasing the likelihood that these may be defined as BACT or RACT in the future.

Note that so far gas treatment and catalytic reduction have not been required for gas turbines as LAER; however, such a determination could occur in the future.

CONCLUSIONS

Landfill NSPS and NESHAPs

NSPS and NESHAPs compliance for landfills is an ongoing and evolving process. The 2006 rulemaking should be finalized this year and will make some major changes to these two regulations. The MSW industry must be prepared to immediately adopt and implement these new or revised provisions. However, the efforts to work for flexible implementation and enforcement of these requirements should not end there. The industry must continue to work with EPA, as well as state and local

agencies with delegation of these programs, to achieve reasonable interpretations of the rule and fight against the establishment of bad precedents that hurt the whole industry.

Federal NSR and PSD

To comply with NSR and PSD, they must become part of the planning for permitting for any new projects at landfills. They are pre-construction permitting programs so the permits must be obtained prior to even constructing the new source or modification. As such, the time and cost of these programs should be evaluating right along side other landfill permits such as land use, solid waste facility, or water quality permits. The cost and availability of ERCs for emissions offsets could be a major obstacle to project development in certain locations. Also, the cost of employing BACT or LAER can also be expensive, and it has been difficult to obtain manufacturer's guarantees for these emission levels due to the variability of LFG as a fuel source. Consideration should be given to reducing emissions ahead of triggering NSR and PSD through enforceable state or local permits so as to avoid applicability in the first place.

NSR (and to a lesser degree PSD) are permitting programs that are generally implemented and enforced at the state and local level. In many cases, these state or local agencies increase the stringency of the requirements beyond federal NSR. Common state/local modifications to these federal programs include counting of fugitive emissions toward applicability thresholds; lower triggering levels for emissions; providing offset or modeling exemptions for certain source types (e.g., control devices or essential public services); cumulating emissions from some baseline date rather than looking at each modification separately, etc. Because of this, a landfill owner or operator not only must become knowledgeable on federal NSR/PSD, they must know the state and local program in their jurisdiction as well. Further, with the major NSR reform efforts still in process, regulated sources must keep abreast of current and future developments in these areas.

Finally, it must be remembered that NSR and PSD have retroactive liability so even past projects, particularly new or expanded landfills after the EPA policy change on fugitive emissions in 1994, are fair game for enforcement action. EPA is already doing this in Region 1 with a high likelihood that this will spread to other regions. Further, NSR enforcement cases have been shown to have major penalties due to economic benefit and excess emissions issues.

Turbine NSPS

The turbine NSPS is unlikely to have a major impact on NOx emissions from LFG-fired turbines unless the gas is mixed with greater than 50% natural gas. The rule would not affect existing turbines unless they undergo a reconstruction or modification as defined in the CAA. The major turbine manufacturers producing units for LFG service can generally meet the 94 or 76 ppmvd limits.

The rule does require testing and reporting, which may not normally be required in all jurisdictions. However, it is still an applicable requirement for certain turbines projects, and compliance must be achieved even if the stringency of the limits is superseded by other more stringent requirements.

Many sites can meet the SOx limits based on exiting levels of TRS in the LFG. However, it is possible that a site with high TRS concentrations could be required to conduct sulfur removal to meet the sulfur limit in the turbine NSPS for new, reconstructed, or modified turbine projects.

Engine NSPS and NESHAPs

Where it applies, the RICE NSPS is unlikely to have a major impact on NOx, CO, and NMHC emissions from LFG-fired engines since the major engine manufacturers producing units for LFG service can generally meet the rule limits. However, the rule could add testing, monitoring, recordkeeping, and reporting provisions, which may not normally be required in all jurisdictions. Also, it is still an applicable requirement for certain engine projects, and compliance must be achieved even if the stringency of the limits is superseded by other more stringent requirements.

The RICE NESHAPs will likely only affect a very small numbers of direct use projects where LFG is a minor fuel source.