

DEPARTMENT OF THE ENVIRONMENT  
AIR AND RADIATION ADMINISTRATION  
RESPONSE TO COMMENTS

for the  
PUBLIC HEARING held on February 1, 2023  
in BALTIMORE, MD  
related to

the repeal of existing COMAR 26.11.19.20 – *Control of Landfill Gas Emissions from Municipal Solid Waste Landfills*, and adopt new requirements and standards to reduce methane emissions from Municipal Solid Waste (MSW) Landfills in Maryland under a new chapter COMAR 26.11.42 – *Control of Emissions from Municipal Solid Waste Landfills*. The new proposed chapter and regulations in this action also incorporate provisions from the federal rules 40 CFR 60, Subparts Cf (Emission Guidelines), 40 CFR 60, Subpart XXX (New Source Performance Standards) and 40 CFR 63, Subpart AAAA (National Emissions Standards for Hazardous Air Pollutants) for MSW landfills.

Purpose of Hearing: The purpose of the public hearing was to allow for public comment on the Maryland Department of the Environment's (the Department or MDE) proposal regarding action is to repeal existing COMAR 26.11.19.20 and adopt new requirements and standards to reduce methane gas emissions from MSW landfills in Maryland under a new chapter COMAR 26.11.42. The new proposed chapter in this action also incorporates provisions from the federal rules 40 CFR 60, Subparts Cf (Emission Guidelines) and XXX (New Source Performance Standards), and 40 CFR 63, Subpart AAAA (National Emissions Standards for Hazardous Air Pollutants) for Municipal Solid Waste (MSW) landfills.

The Department is proposing to implement regulatory requirements for owners and operators of new and existing MSW landfills, which include surface emission monitoring, detecting and repairing landfill gas leaks, recordkeeping and reporting requirements, and installing and operating emission control systems based upon the regulatory applicability.

Attendance: See List attached

Statement: The Department's statement was read by Eddie Durant, Regulatory and Compliance Engineer of the Regulations Development Division of the Air and Radiation Administration, Department of the Environment.

Comments and Responses: Comments were received from:  
Prince George's County Government - Department of the Environment;  
Frederick County Division of Solid Waste and Recycling;  
Worcester County Public Works;  
Dorchester County;  
Anne Arundel County;

A joint submittal from the Environmental Integrity Project, Chesapeake Climate Action Fund & CCAN Action Fund, Maryland Sierra Club, Clean Air Task Force, Maryland League of Conservation Voters, Environmental Justice Ministry Cedar Lane Unitarian Universalist Church, South Baltimore Community Land Trust, Clean Water Action Maryland, and ~ 400 Maryland residents;

SCS Engineers - Environmental Consultants & Contractors;

Mark Imlay - Maryland resident;

Dave Arndt - Maryland resident;

Jen Hawse - Maryland resident;

Diane D'Arrigo - Maryland resident;

Robert Lipsky - Maryland resident;

Daniel Broder - Maryland resident; and

Anne Manuel - Maryland resident.

A summary of the comments received and the Department's responses are below.

### **General Support of Regulations**

**Comment:** Multiple comments were received from stakeholders and residents of Maryland expressing general support of the Department adopting regulations that will address the reduction of methane from landfills. Joint comments were received from several organizations addressing the need for these regulations, stating the following:

"It is critical that MDE issue a strong landfill methane rule." Methane is a potent greenhouse gas that has around 80 times the climate warming effect of carbon dioxide over a 20-year period. Cutting short-lived climate pollutants like methane is an effective strategy to achieve significant greenhouse gas reductions in the near term. Municipal solid waste landfills are by far the largest source of methane emissions in Maryland. Using the most recent 2020 data, landfills account for 40% of methane emissions in the state, even more than the natural gas industry which accounts for 25%. The General Assembly has set an ambitious goal of achieving 60% reductions in greenhouse gas emissions by 2031, and Maryland cannot achieve that goal without tackling methane from landfills.

Over the past two years, the States of Oregon and Washington have passed landfill methane standards that are much stronger than the federal requirements set by the U.S. EPA. Oregon and Washington have built on an approach pioneered in California over a decade ago. It is time for Maryland to join these other states in assuming climate leadership on this important issue. And that is what Maryland is doing with this draft rule.

MDE's draft regulations are similar to those finalized in October 2021 by the State of Oregon. Oregon's rules went into effect in 2022 and are based on standards issued in 2010 in California. This regulatory approach has been demonstrated workable for landfill operators in other states. This is also a commonsense step to cut emissions of a powerful climate-warming gas beyond what would be achieved by EPA's regulations. MDE's draft rule will require a greater number of Maryland landfills to operate gas control systems and, importantly, will set more stringent

requirements for the operation of those systems as well as monitoring and reporting of emissions data and other important information. MDE estimates that the draft rule will reduce greenhouse gases from the 32 affected landfills by 25-50% when fully implemented.”

An additional commenter stated, “As an owner and operator of a municipal solid waste landfill that has invested in the best technological and operational practices for capturing and beneficially using landfill gas, we are supportive of regulations that would improve landfill gas collection and control across the State of Maryland”.

**Response:** The Department appreciates the support for the proposed regulations controlling methane from municipal waste landfills. Maryland’s ambitious and inclusive approach to climate action has grown more effective with every update to the Greenhouse Gas Emissions Plan. In 2022, with the Climate Solutions Now Act (CSNA), Maryland adopted the most ambitious greenhouse gas (GHG) reduction goals of any state in the nation. The new targets include reducing statewide GHG emissions by 60% from 2006 levels by 2031 and achieving net-zero emissions by 2045 with a positive impact on Maryland’s economy and work opportunities. Maryland’s current climate plan, the 2030 Greenhouse Gas Reduction Act (GGRA) Plan (2030 Plan), will be in effect until the new CSNA plan is finalized at the end of 2023. The 2030 Plan consists of a suite of programs and initiatives that, if implemented, would achieve reductions over the required targets. The plan advances measures with an eye to benefit overburdened and underserved communities and address long-standing environmental injustices.

The Department agrees that both California and Oregon’s methane reduction standards are top-tier in climate leadership and decreasing methane emissions. Additionally in 2022, Washington State adopted legislation that requires regulations in the state to be developed following the standards established in California and Oregon for all landfills accepting waste after 1992 and larger than 450,000 tons of waste-in-place. The Department has followed both California and Oregon’s progress in development and implementation of the landfill methane reduction rules, and believes that the proposed Maryland regulations are in-line with both states’ standards. Landfills in both California and Oregon have demonstrated that they are capable of following such regulations. The Department believes that landfills within the state of Maryland required to follow these regulations will demonstrate compliance with such rules.

The Department understands the importance and the benefits of reducing methane in the State and in response has been implementing pollution control measures. Non-energy emissions of methane (CH<sub>4</sub>) are predominantly from waste management, including municipal solid waste landfills, composting and enteric fermentation, wastewater treatment plants, natural gas transmission, storage, and distribution, as well as agricultural practices and manure management. The 2030 GGRA Plan included targeted measures and regulations to identify and mitigate emissions from the energy industry and the waste management sector. Municipal solid waste landfills have been identified as the largest source of CH<sub>4</sub> emissions in the state. Reducing CH<sub>4</sub> emissions is an important part of a comprehensive plan to address climate change and is critical to the state’s efforts to meet the requirements of the GGRA and CSNA. MDE implemented a CH<sub>4</sub> minimization plan to first address CH<sub>4</sub> from the energy section. MDE

adopted regulations for the control of the natural gas transmission and storage sector in 2020 requiring leak detection and repair measures for compressor stations and storage facilities. Six facilities in Maryland began conducting surveys for CH<sub>4</sub> leaks and reporting to MDE in 2021.

### **Regulations Could Be More Stringent**

**Comment:** A commenter recommended that MDE Regulations should go further to reduce methane emissions. “The State of Oregon’s rules establish lower and more protective thresholds for requiring the installation of a pollution-control system while Maryland’s threshold for requiring control draws from part of Oregon’s rules and part from California’s rules, but the Oregon approach alone would have been more stringent and require pollution-control systems at more landfills.”

**Response:** The Department is aware that there are certain requirements in Oregon’s landfill regulation that are more stringent than the requirements in the proposed regulation. The Department weighed several factors in developing the proposed regulation to control methane emissions from MSW landfills. Factors include landfill size, climate and weather variations, waste compositions, age of landfills, etc. These factors influence the production of landfill gas.

Oregon’s landfill regulation has a waste-in-place threshold of 200,000 tons, whereas the proposed regulation has a waste-in-place threshold of 450,000 tons. Using those factors mentioned, the Department did an analysis of what would be an appropriate waste-in-place threshold and concluded that a waste-in-place threshold of 450,000 tons which is consistent with standard in California’s Landfill Methane Regulation was appropriate. Furthermore, Oregon included additional categories of landfills, such as industrial and commercial landfills. The Department looked at the impact of including these landfills in the proposed regulation as well. After much consideration, the Department did not include industrial and commercial landfills into the proposed regulation because these landfills would not provide additional benefit since they are not a significant source of methane emissions.

The Department made no change to the proposed regulations in response to this comment.

Also see the separate comments and responses below on including waste diversion to strengthen the proposed regulations.

### **Cost Concerns**

**Comment:** Several commenters stated that these regulations require significant cost investments. Several commenters noted that the proposed regulations will have a significant impact on operating expenses for affected sources, which will need to be passed down to the public by increasing fees. One commenter stated that an annual appropriation of state funds will be needed to fund the required upgrades. Additionally, one commenter stated that the monitoring requirements will require regular grass cutting beyond what is normally performed at an additional expense for the landfill. The stated cost impacts ranged widely from approximately \$4 million investment to \$300 million investment and from \$300,000 annually to \$1 million annually.

One commenter recommended that MDE evaluate the cost-benefit of the proposed additional monitoring, stating EPA considered integrated SEM in the 2016 landfill rule updates but did not incorporate integrated SEM into the final rules for NSPS Subpart XXX or Subpart Cf because of high costs.

**Response:** The majority of MSW landfills are owned and operated by local governments. Factors that could influence costs are landfill size, age, status (i.e., open, closed, active or inactive), and the amount of waste-in-place. The proposed action could have a potential impact on local governments as affected sources may incur capital costs from installing and operating new or modified landfill gas collection and control systems (GCCS) to meet requirements. Based on similar regulations promulgated by other states to reduce methane emissions from landfills, the Department determined the capital cost associated with modifying an existing GCCS or installing a new GCCS can range from \$1-\$3 million. This is coupled with estimated operating and maintenance costs ranging from \$150,000 to \$400,000/yr. There may be additional costs associated with monitoring (average annual costs around \$60,000) and recordkeeping and reporting requirements.

MDE estimates approximately 32 MSW landfills (11 closed and 21 active) meet the applicability requirements in the proposed regulations based on age of accepted waste and the amount of waste-in-place (WIP). The department estimates that several of these landfills are either closed or fall below the WIP threshold of the regulations and will be subject to minimal requirements. Based on a landfill's methane generation rate and required monitoring results, a facility may be required to install and operate a GCCS. Several landfills in Maryland have voluntarily installed and operate a GCCS system already.

The Department recognizes that costs may be incurred by owners and operators of landfills through the monitoring and GCCS requirements, however revenue can be generated from the landfill gas as well. MDE is aware of 9 landfill gas-to-energy projects operating in Maryland currently. The U.S. Environmental Protection Agency's (EPA) Landfill Methane Outreach Program notes: *Landfill Gas (LFG) energy projects generate revenue from the sale of the LFG, electricity, or renewable natural gas (RNG) created from LFG. LFG use can also create jobs associated with the design, construction, and operation of energy recovery systems. LFG energy projects involve engineers, construction firms, equipment vendors and utilities or end users of the power produced. Much of the project costs are spent locally for drilling, piping, construction, and operational personnel, helping communities to realize economic benefits from increased employment and local sales. Local businesses can realize cost savings associated with using LFG as a replacement for more expensive fossil fuels. Some companies could save millions of dollars over the life of their LFG energy projects. By linking communities with innovative ways to deal with their LFG, LMOP helps communities enjoy increased environmental protection, better waste management and responsible community planning.*

Landfills that have installed and are operating a GCCS may be eligible to defray costs through the Maryland Renewable Portfolio Standard (RPS) Program, which offers incentives and grants.

The link to incentives and grants offered through the Maryland RPS Program can be found under [FAQ](#).

There are currently no grant or incentive programs available through MDE to reduce costs for affected landfills. However, the Maryland Energy Administration (MEA) occasionally receives proposals for initiatives and proposals for energy projects through its OPEN Energy Program (OPEN Energy). Information about OPEN Energy can be found on MEA's website at the following link: <https://energy.maryland.gov/Pages/OpenEnergyGrantProgram.aspx>

OPEN Energy may provide opportunities for landfills to pursue grants for energy projects that advance the agency's goals while benefiting stakeholders. One example of an energy project is Midshore I Landfill located in Easton, which is installing a biogas generator to produce energy.

Federal grant programs through the EPA may also provide opportunities for landfills. One County (Anne Arundel Millersville) noted that they have an award-winning landfill gas-to-electricity facility that was supported in part by a federal grant through the American Recovery and Reinvestment Act (ARRA).

The Department also notes that some of the estimated costs assumed by owners and operators of landfills may be based upon inflated cost projections or a misunderstanding of the requirements of the regulations. The Department's economic impact assessment has been based upon vetted research from EPA and other state agencies cost analyses, and is documented within the Department's [Technical Support Document](#) under Appendix C.

### **Stakeholder Process**

**Comment:** A commenter stated that MDE failed to include stakeholders (re: government operators of landfills) in the development of the regulations, and that a new stakeholder process should be formed to include landfill operators. A commenter was concerned that environmental justice considerations were not accounted for in the regulation development process.

**Comment:** Several commenters noted that "...this regulation is timely if not overdue. MDE first solicited feedback from the regulated industry and the public on potential new landfill methane rules at a meeting held in 2017. Since then, the agency has held two public stakeholder meetings and accepted comments on multiple occasions from landfill operators as well as advocacy groups."

**Response:** The Department disagrees with the initial comment. Since 2017, the Department has contacted and sought input from government operators of landfills, environmental engineer and consulting firms, local representatives, vested Maryland state agencies, federal agencies, other states, the University of Maryland, environmental organizations, and local community organizations. The Department maintained a stakeholder list of 175 participants during this process. Stakeholder meetings were held on March 31, 2017, September 21, 2020, and June 21, 2021. Additionally, the Department encouraged and held numerous one on one meetings

with government operators of landfills to better understand the unique operations at their facilities and attempt to address such issues in the regulation development process.

The Department provided briefings and updates to the [Air Quality Control Advisory Council](#) (AQCAC) that were open to the public and affected sources on December 10, 2018, March 16, 2020 and March 15, 2021. On September 30, 2022, the Department sought final input from stakeholders prior to the MSW landfill regulations being proposed before the AQCAC on October 24, 2022. Several comment letters were received with which the Department incorporated suggested edits to the draft regulations before proposal.

The Department's stakeholder process sought input from all Marylanders and communities directly impacted by the effects of climate change and improperly managed landfills. Therefore, the Department believes that it has followed the tenets of EJ policy that is still evolving. The Department has received broad support for this regulation from environmental organizations and the community at large.

### **Waste Diversion**

**Comment:** A commenter stated that these regulations will take funds away from efforts to divert waste, Counties will not be able to offer services or operate diversion facilities because of the massive expense of upgrades to these landfills.

**Response:** The Department fully supports efforts to divert waste and reduce methane generating materials from entering landfills. The Department encourages local jurisdictions to take action in reducing the amount of waste from entering landfills, such as recycling, composting, and food scrap programs. The state is putting forth extensive efforts in diverting waste in order to reduce emissions and achieve zero waste goals, such as the Maryland Recycling Act (MRA) and a Maryland Department of the Environment (MDE) [new regulation focusing on organics recycling and waste diversion](#).

In the calendar year 2020, a statewide waste diversion rate of 42.2% was recorded. The Department does not envision these regulations to create a significant financial burden so that municipalities will be unable to continue implementing their waste diversion programs. Programs, such as the [Extended Producer Responsibility Program](#) are becoming more widely-available for the state and if implemented would reduce the costs that counties and municipalities put towards recycling programs. MDE recognizes and is encouraged by many of the programs that are currently put in place by counties and municipalities. These waste diversion programs are highlighted in the Department's [Technical Support Document](#) under Appendix E.

**Comment:** Several commenters stated these regulations are backwards-looking, not forwards looking. The amount of methane emissions from a landfill reduces over time, so the efforts need to be put towards keeping methane producing materials out of the landfill, this would have a

much greater impact on long term methane reduction than looking backwards, and installing upgrades to parts of the landfill where the emissions are already failing.

**Response:** The Department believes that, with regards to MSW landfills, a multi-faceted approach is needed to reduce and avoid harmful methane emissions. In conjunction with many waste diversion programs enacted at the local level, Maryland state government has taken great strides to reduce the amount of methane producing materials from entering our landfills. These waste diversion programs are highlighted in the Department's [Technical Support Document](#) under Appendix E. The Department agrees that keeping such materials out of landfills would be beneficial in reducing the overall methane emission rates stemming from these facilities. However, MDE is fully committed to addressing methane at existing landfills. The Department estimates that GHG emissions will be reduced by 25-50% from landfills affected by these regulations. Methane has a global warming potential more than 25 times that of carbon dioxide, and landfills within the state of Maryland are the single largest contributor for the state's methane emissions. These emissions are approximately four times greater than what was previously estimated in Maryland's GHG Emissions Inventory. The updates to the [GHG Emissions Inventory](#) confirm that it is crucial to reduce methane emissions from landfills to meet the requirements of the GGRA.

**Comment:** A commenter suggested allowing an alternative compliance allowance or mechanism if a landfill has a waste diversion program. Instead of investing money on improving the landfill gas diversion systems in areas of the landfill already complete, investments should be spent on waste diversion and other low-cost alternatives.

**Comment:** A commenter noted programs designed to reduce food waste entering the landfill will have a much more significant impact on future emissions. The commenter also mentioned low-cost alternatives that significantly reduce emissions should be considered in place of GSSC upgrades in existing facilities.

**Comment:** A commenter stated "I would also like to strongly urge you to ensure that the new controls on methane emissions be paired with enhanced waste diversion programs such as composting of food waste and recycling. Under no circumstance should the new regulations come at the expense of existing composting or recycling programs."

**Response:** The Department provided responses to the comments above under cost concerns and waste diversion.

### **Applicability for Existing Landfills and Voluntary Adoption Concerns**

**Comment:** Some commenters noted that they have already taken steps to support climate change by installing voluntary controls for landfill gas. One commenter noted that the proposed regulations do not necessarily recognize the decade plus voluntary climate change investments that some counties have already taken to mitigate landfill gases and the anticipatory increased costs with nominal additional gains.



**Response:** The Department disagrees with the commenter. The Department believes the proposed regulations have taken into account MSW landfills that have made investments to mitigate landfill gas emissions. The use of a GCCS, even voluntary gas control systems, are an important component to mitigating methane emissions from MSW landfills. The proposed regulation also incentivizes MSW landfills that are in compliance with the regulation. For example, a MSW landfill with a GCCS that has demonstrated compliance with the monitoring requirements in Regulation .09 after four consecutive monitoring quarters may shift to annual monitoring. The Department acknowledges that the proposed regulations may result in additional costs for MSW landfills resulting from the recordkeeping, reporting, monitoring, testing and other compliance provisions. However, the Department does not believe the requirements in the proposed regulation will drive up costs significantly for MSW landfills that currently operate a voluntarily installed GCCS. The costs of operating a voluntarily installed GCCS are significantly less than the costs associated with installing and operating a new GCCS to comply with the requirements in the regulation.

**Comment:** A commenter stated that facilities that have performed voluntary landfill gas management initiatives should be exempted from the requirements of the regulation. The commenter also stated that voluntary management practices already in place will only result in a nominal return on the destruction of landfill gasses, and large costs will be required to meet the requirements for nominal return on the destruction of landfill gases.

**Response:** The Department appreciates the commenter's efforts in taking active steps to control methane emissions from the landfill. However, having voluntarily installed and operating a GCCS prior to the effective date of the proposed regulation does not necessarily exempt the owner or operator from the requirements in the regulation. Under §B of Regulation .01, MSW landfills may be exempted from the proposed regulation if the landfill meets certain criteria. The Department is proposing these regulations, partially, to meet the federal MSW landfill EG.

**Comment:** A commenter stated that open landfill regulations should apply only to areas of the landfill that begin accepting waste after January 1, 2025, and areas of a landfill that ceased accepting waste on or before January 1, 2025 should qualify as 'closed' landfills for the purpose of the regulation.

**Response:** The proposed regulations apply to MSW landfills that have accepted waste after November 8, 1987. This applicability date of November 8, 1987 in the proposed regulation is consistent with applicability date in the federal Emission Guidelines for MSW Landfills (40 CFR 60, Subpart Cf). In addition, certain landfills are exempted from the requirements of the proposed regulation under §B of Regulation .01. This includes closed or inactive MSW landfills, with less than 450,000 tons of waste-in-place, or with a design capacity of less than 2,750,000 tons (2.5 million megagrams) and 3,260,000 cubic yards (2.5 million cubic meters) that last accepted waste before December 31, 1993.

**Comment:** A commenter requested the Department include a closed landfill exclusion under COMAR 26.11.42.01B(3) which would exclude landfills that ceased accepting waste on or before December 31, 2000 and have a GCCS in place.

**Response:** The Department disagrees with the commenter. The inclusion of an exemption for landfills that have installed and operated a GCCS and ceased accepting waste on or before December 31, 2000 would conflict the applicability requirement for MSW landfills in §A of Regulation .01. This applicability date would be less stringent than the applicability of November 8, 1987 in the federal Emission Guidelines for MSW Landfills (40 CFR 60, Subpart Cf). The Department made no change to the proposed regulations in response to these comments.

## **Flares**

**Comment:** Commenters requested that MDE allow open flares, or that the date of ‘no operation of open flares after 1/1/2025’ should be revised to 1/1/2030. Commenters also requested that MDE should provide additional flexibility for landfills to provide site-specific documentation that would support the continued use of open flares.

**Comment:** Several commenters stated that open flares can operate at different conditions than enclosed flares, they can accommodate changes in flow rates and low volume flow rates. Landfill gas open flares are proven and demonstrated control technologies that consistently achieve compliance with control efficiency requirements. Flares typically require a minimum methane content (%) to sustain combustion and meet emission performance requirements such as destruction efficiency. Enclosed flares typically require a higher minimum methane content than utility flares to sustain continuous operation. In our experience, enclosed flares typically require a minimum methane content of about 30 percent, and utility flares can typically operate at an LFG methane content of 20 percent (and often lower). Consequently, utility flares generally have a greater capacity for accommodating flow and LFG composition typical at closed and smaller landfills likely to trigger the rule requirements. In particular, utility flares can operate at lower LFG methane content than enclosed flares. Therefore, utility flares can often be a more suitable control device than enclosed flares and can result in increased GCCS operation and thus, lower fugitive emissions.

**Response:** The Department believes that the proposed regulation allows owners and operators sufficient flexibility to operate open flares. §B(3) in Regulation .05 allows the operation of open flares after January 1, 2025 if the owner or operator meets conditions and receives written approval from the Department. The alternative compliance standards in Regulation .08, allows owners and operators to request alternatives to the compliance standards and requirements in Regulation .05, which would extend to the operation of open flares. The commenter should note that any alternative compliance option must be approved by both the Department and EPA and must effectively control the off-site migration of landfill gas and provide an equivalent level of methane emission control. The Department made no change to the proposed regulations in response to this comment.

**COMMENT:** One commenter requested any gas collected to be destroyed using an open flare with no methane tonnage limit through the life of the landfill without special written approval from MDE. The commenter noted that as it is written now, approval to use an open flare after January 1, 2025 requires special approval and methane generation must be less than 732 tons per year.

**Response:** The Department disagrees with the commenter. Under the proposed regulation, the Department would allow the use of an open flare only under limited conditions, which include during the repair or maintenance of the gas control and collection system, awaiting the installation of an enclosed flare, or if necessary to remedy a situation where there is gas migrating offsite. An owner or operator seeking to use an open flare must also receive written approval from the Department. The Department made no change to the proposed regulations in response to this comment.

#### **Additional comments and responses on flares on page 21-23 and 27.**

**COMMENT:** Several commenters requested to add specific language to allow owners or operators to use an open flare if landfill gas is sent to a separately permitted landfill gas-to-electricity facility or beneficial use projects.

**COMMENT:** Several commenters suggested that open flares can be an important component of landfill gas treatment systems such as landfill gas-to-energy (LFGTE) facilities or other beneficial use projects. These beneficial use projects are typically designed with an open flare to release the landfill gas not used in the production of electricity and may be at low or variable flow rates. The commenters mentioned, open flares are typically more capable than enclosed flares at controlling a wider range of gas quality and landfill gas flow rates.

**Response:** The Department would like to clarify for the commenter that any MSW landfill subject to the requirements of the proposed regulation, any gas control device located and operated on-site would also be subject to the requirements of the proposed regulation. Also, the Department is aware there are certain conditions which may necessitate the use of an open flare. §B(3)(e) of Regulation .05 prohibits the operation of open flares after January 1, 2025, unless the owner or operator of the MSW landfill demonstrates there is at least one condition that requires the use of an open flare and has received prior written approval from the Department. This may include MSW landfills with on-site landfill gas-to-energy facilities and those that use landfill gas for beneficial use, unless the landfill gas-to-energy facility is permitted separately under an MDE permit to operate.

#### **Enclosed Flare Destruction Efficiency**

**COMMENT:** A commenter suggested that the proposed 99 percent destruction rate [for enclosed flares] is estimated at a cost to approximately \$1M yet only achieves 1% more destruction with no accounting for the years of gases destroyed voluntarily by the County (to meet the federal requirement of 98 percent destruction rate).

**Response:** The 99 percent destruction efficiency for enclosed flares in the proposed regulation is consistent with the requirements for enclosed flares in both the California Landfill Methane Regulation and Oregon Landfill Regulation. The Department has reviewed staff reports (notably the Initial Statement of Reason, 2009) from the California Air Resources Board (CARB) as a part of the rulemaking for the Landfill Methane Regulation. CARB noted in the staff report that enclosed flares can meet a destruction efficiency for methane of 99 percent or greater. The Department

has also reviewed additional information from the solid waste industry which suggests that enclosed flares are able to achieve a destruction efficiency of at least 99 percent, and that 98 percent may be outdated. Based on this information, the Department declines to revise or amend this requirement at this time.

One white paper of note is titled “*Current MSW Industry Position and State of the Practice on LFG Destruction Efficiency in Flares, Turbines, and Engines*,” presented to Solid Waste Industry for Climate Solutions (SWICS)” July 2007 by SCS Engineers Sacramento CA.

<https://www.scsengineers.com/scs-white-papers/current-msw-industry-position-and-and-state-of-the-practice-on-lfg-destruction-efficiency-in-flares-turbines-and-engines-presented-to-solid-waste-industry-for-climate-solutions-swics/>

### **Stack Testing**

**COMMENT:** Several commenters suggested that stack testing should occur every five years, not annually, which aligns with federal rules.

**Response:** The proposed regulations require that the owner or operator of a MSW landfill that operates a GCCS conduct performance tests on an annual basis. The proposed regulations include a stipulation that would allow performance testing to be conducted every three years if the control device has demonstrated compliance with requirements in §B(7) of Regulation .05 after three consecutive tests. Also, it should be noted that performance testing is not required for boilers and process heaters with design heat input capacities of 44 megawatts per hour (150 MMBtu/hr) or greater that burn landfill gas in accordance with the requirements in §B(4). The performance testing timetables in the proposed regulation are consistent with the requirements in Oregon’s landfill regulation and are to ensure the control device(s) are in compliance and operating in accordance with manufacturer’s specification. The Department declines to revise or amend this requirement at this time.

### **Low Methane Volume Concerns**

**COMMENT:** Several commenters stated that it can be very challenging, and in some cases infeasible, to continuously operate an active gas collection and control system, particularly enclosed flares, at older landfills with lower methane generation rates. Commenters stated that in some cases this could require a site to utilize supplemental fossil fuel such as natural gas to sustain operation.

**COMMENT:** Several commenters stated that the infrastructure upgrades/remediation needed may exceed \$1M. Commenters emphasized this infrastructure would be difficult to install and operate properly (in accordance with the proposed regulations) due in part to the low and diminishing methane volumes that some landfills have. Commenters also mentioned these projects are reasonably anticipated to disrupt ongoing solid waste management activities and will lead to (temporary) nuisance conditions to the communities surrounding the county’s solid waste management facilities.

**Response:** The proposed regulations have exemptions for landfills based on age and size of the landfills. Many medium size landfills already have voluntary GCCS to eliminate odors, address climate change and produce revenue through beneficial use projects. The tiers in Regulation .04 are set up to minimize the requirements for closed landfills that are capped and not leaking methane.

Design plans will have to address continuous operation and supplemental fuel use if necessary. Also, Regulation .05B(3)(e) allows open flares with certain conditions with the Departments approval.

Active landfills will follow Regulation .04 to determine the GCCS and SEMs requirements. The GCCS design plan under Regulation .05 will address whether sufficient methane generation is available to sustain the proper GCCS.

Closed landfills with existing GCCS systems will follow Regulations .05 - .11 as applicable, perform SEMs and continue to operate that system until the GCCS removal requirements of Regulation .06 are met. Modification to the design plan as the landfill ages will be considered, such as Regulation .10 C(9) allows an amended design plan.

Closed landfills with no GCCS that meet the methane generation thresholds will be required to perform 4 quarterly SEMs. If the landfill is properly capped and maintained, then it is anticipated that no SEMs exceedances will be found and the landfill is no longer subject to the regulation. If a closed landfill with no GCCS failed the 4 quarterly SEMs tests and remediation, then the landfill will have to develop a GCCS design plan under Regulation .05 considering the methane generation and leaks.

Closed landfills that have a design capacity of less than 2,750,000 tons (2.5 million megagrams) and 3,260,000 cubic yards (2.5 million cubic meters) that last accepted waste before December 31, 1993 are exempt from the regulations.

See additional comments and responses on page 25 - 26.

### **Gas System Phase Out**

**COMMENT:** One commenter requested that the regulations for the Gas System Phase Out or GCCS removal should be permitted at the current federal levels for closed landfills.

**Response:** The proposed regulation allows for the permanent shutdown and removal of a GCCS installed at a closed MSW landfill or closed area of a MSW landfill, provided certain requirements are met.

The requirements for permanent shutdown and removal of a GCCS include: the system must have been in operation at least 15 years, unless the owner or operator can demonstrate to the Department that due to declining methane rates the MSW landfill will be unable to operate the GCCS for a 15-year period; the calculated or measured methane generation rate (using the test methods in Regulation .11D) at the MSW landfill is less than 732 tons/yr based on three

successive test dates (no less than 90 days apart but no more than 180 days apart); surface methane concentration measurements do not exceed 200 ppmv; the concentrations of methane gas at the MSW landfill do not exceed 25 percent of the lower explosive limit in facility structures (excluding gas collection and control system components) or the lower explosive limit at the property boundary; and, ultimately the owner or operator submits an equipment removal report to the Department.

The requirements in the proposed regulation for the permanent shutdown and removal of a GCCS are consistent with those found in other state's regulations. While certain requirements in the proposed regulation are more stringent than those found in the federal regulations (732 tons/yr methane generation rate as opposed to the 50 Mg/yr NMOC rate in the federal regulations), the Department believes the GCCS requirements as proposed will ensure that excess methane emissions are not produced in an effort to support the States' commitment to climate action.

### **Applicability of the Proposed Regulations to Landfill Gas to Energy Projects (or Landfill Gas Treatment System)**

**COMMENT:** Some commenters requested language to clarify that the energy recovery device regulations do not apply if located at a separately permitted facility. Some existing landfills have a beneficial use project or treatment system that uses the landfill gas to produce electricity. The separate permit to operate the landfill gas-to-energy has its own federal regulatory requirements along with regular testing.

**Response:** The Department made no change to the proposed regulations in response to this comment. The proposed regulation applies to MSW landfills that meet the applicability requirements in §A of Regulation .01. A landfill gas-to-energy facility that is separate from the MSW landfill and operates with a unique operating permit would not be considered part of the MSW landfill, and thus would not be subject to the requirements of the proposed regulation. However landfill-gas-to-energy facilities may be subject to separate federal and state regulations as applicable.

### **Surface Emissions Monitoring (SEM)**

**COMMENT:** One commenter recommended removing the meteorological condition thresholds for both instantaneous and integrated SEM. Landfills are often the highest point in an area and lack woody vegetation to slow or block wind making compliance with a wind speed requirement operationally challenging. Additionally, they state that the EPA did not incorporate thresholds into the final rule for NSPS Subpart XXX.

**Response:** The Department made no change to the proposed regulations in response to this comment. The Department has incorporated the requirement from the other state and federal regulations (NSPS) that allows the use of a wind barrier when wind speeds exceed 4 miles per hour or gusts exceed 10 miles per hour. MSW landfills that consistently have winds in excess of

the limits specified in the proposed regulation may request alternative wind speed requirements under the Alternative Compliance Standards in §A(2) of Regulation .08.

**COMMENT:** Several commenters requested revising the SEMs requirements for MSW landfills from a quarterly to annual basis.

**COMMENT:** One commenter noted the methane generation rates at closed cells rarely change over the course of a few months. Annual testing will be just as effective for determining the methane generation rate.

**Response:** Methane from landfills in Maryland accounts for 44% of inventory, and many studies contend that this is underestimated. While landfills have taken efforts to control methane, emissions remain significant. The Department believes the surface emission monitoring (SEM) requirements in the proposed regulation will detect areas of a landfill with leaking methane that can be reduced with remediation and/or GCCS improvements. The quarterly SEMs testing requirements in the proposed regulation are consistent with the requirements in both California and Oregon's regulations. If SEMs there are no exceedances after four consecutive quarterly instantaneous surface monitoring periods, the proposed regulation allows owners and operators to shift to annual testing.

To clarify for the commenter, MSW landfills that are subject to the requirements in §B under Regulation .04 are required to calculate the methane generation rate on an annual, not quarterly basis. The Department made no change to the proposed regulations in response to this comment.

**COMMENT:** Some commenters suggested increasing the distance between the walking pattern methane meter readings from one every 25 feet to one every 100 feet and increased to 200 feet if after the first year no reading is higher than 200 ppmv and eliminated entirely if no reading is higher than 200 ppmv after the third year. Noting, the amount of methane generated by a closed cell is not going to dramatically differ over a 25-foot spacing. Increasing the distance between collection points will provide the same level of information and reduce sample collection costs significantly. In addition, the gradual elimination of sampling recognizes that methane production decreases over time and continual monitoring isn't warranted.

**Response:** The 25-foot spacing, followed by 100-foot spacing after demonstrating four consecutive, quarterly non-exceedances or three years prior to the effective date of the proposed regulation through annual or quarterly monitoring is consistent with the requirements in other state regulations.

The proposed regulation includes a provision under §F(1)(d)(iii) of Regulation .11 which an owner or operator can demonstrate that three years prior to the effective date of the proposed regulation excluding any non-repeatable, momentary readings, there were no exceedances of the methane concentration limit of 500 ppmv in §A(1) of Regulation .07 through quarterly or annual monitoring, then the walking pattern can increase to 100-foot spacing. This is not only consistent with the requirements in other state's regulations, but this allows existing MSW

landfills to utilize 100-foot spacing if they can provide documentation of compliance under §F(1)(d)(iii) of Regulation .11. The Department made no change to the proposed regulations in response to this comment.

**COMMENT:** One commenter suggested that as an alternative to the continuous FID detection method, the Department should allow the use of aerial drones equipped with FLIR cameras to identify the locations of any active methane plumes, with follow up FID detection as opposed to 25-foot walking patterns.

**Response:** The Department is familiar with the use of aerial drones and other unmanned aerial technologies to identify methane emissions. However, the Department is not aware of EPA or any State approving this method to measure and quantify methane emissions from landfills. The Department will review new measurement methods as they are reviewed and approved by EPA and will incorporate such measures into future amendments to the regulation as needed. Additionally, an alternate compliance plan can be submitted to the Department for consideration per Regulation .08. The Department made no change to the proposed regulations in response to this comment.

### **Nuclear and Hazardous Waste Concerns**

**Comment:** A commenter stated “there’s a regulatory workaround that could potentially be precedent-setting that is allowing nuclear power waste from a reactor in Texas to go into solid waste landfills in Texas. And we do have reactors in Maryland, nuclear power reactors, and so I wanted to raise a caution to those who are tracking solid waste regulations to watch out for this kind of radioactive waste getting into our landfills.”

**Response:** Thank you for bringing this issue to our attention. We will notify the MDE LMA that regulates solid waste activities at landfills and the materials that are acceptable.

### **Timelines for the Installation of Gas Collection and Control Systems at MSW Landfills**

**Comment:** One commenter recommended including installation timeframes for expansion of gas collection systems in the new regulation and that the federal NSPS Subpart XXX currently requires expansion within 5 years after initial waste placement, for example.

**Comment:** One commenter requests waste age and installation timelines for gas control requirements. “Unlike the EPA Landfill Rules (NSPS/NESHAP), which require gas collection in landfill areas in which the initial solid waste has been placed for a period of 5 years or more if active; or 2 years or more if closed or at final grade, the proposed rule does not provide for these or similar timelines. As a result, the proposed rule would require gas wells to be installed and operating very soon or immediately after initial waste disposal. This raises several potential issues: Requiring gas collection from areas soon or immediately after initial waste disposal would likely result in introducing ambient air (oxygen/nitrogen) into the system potentially leading to safety concerns and increased unplanned system shutdowns. This could also negatively impact a landfill’s ability to process the gas for subsequent sale or reuse, as most



beneficial use projects (e.g., electricity production, high btu, etc.) require a minimum methane content and low levels of oxygen.”

**Comment:** A commenter recommends for safety consideration that MDE consider incorporating some minimum waste-age thresholds associated with the GCCS installation and compliance standards, or provide for this to be addressed on a site-specific basis in the design plan.

**Response:** The Department understands the concerns for safety and a properly designed and operated GCCS. These concerns should be addressed in the design plan, as required under Regulation .05. Like the similar California and Oregon regulations that go beyond the federal requirements, MDE is not establishing a waste age threshold, but rather a full design plan that will estimate any future expansion and design requirements. We agree that the proposed regulations are more stringent than the federal (§ 63.1958 Operational standards for collection and control systems and § 63.1959 NMOC calculation procedures (b)(2); or equivalent 40 CFR 62 Subpart OOO). During the regulation development process MDE has been in contact with California and Oregon. Neither California nor Oregon noted any changes that should have been incorporated into the requirements. Moreover, California did not indicate issues with landfills to comply with the requirements of regulations that have been effective for over 10 years.

#### **Comments on Specific Regulations and Requirements in COMAR 26.11.42 – Control of Emissions from Municipal Solid Waste Landfills.**

**Comment:** A commenter had a question on the applicability for a GCCS. The draft rule requires landfills with calculated methane generation rate greater than 8,548 tons per year (tpy) and greater than 732 tpy (and which experience a 200 ppmv SEM exceedance, if electing to follow this demonstration) to install and operate a GCCS in accordance with the rule. The commenter suggests that mathematical models provide estimates of gas generation and often overestimate methane generation and can thus be very inaccurate. The methane content may differ from model assumptions and the waste characteristics may not be known from older landfills.

**Response:** Regulation .04B(3) applies to landfills with a calculated methane generation rate greater than or equal to 732 tons per year but less than 8,548 tons per year. There are two paths the landfill can follow (a) install a GCCS or (b) perform SEM testing to determine the surface does not exceed 200 ppmv, with other requirements under Reg .04B(4) & (5).

Any landfill with an existing GCCS, whether installed per federal requirements or installed voluntarily, will be required to follow (a). By the nature of the GCCS existing, a landfill cannot choose (b).

Therefore, the questions pertaining to calculated methane generation rate versus actual may not apply as noted by the commenter. If a GCCS exists a landfill shall follow the requirements under Reg .05A Design Plan and Installation and Reg .05B Standards and Requirements for Gas Collection and Control Systems. Those landfills with a voluntary system will be required to follow Reg .05A and (2)(h) stating *“Design the gas collection and control system to handle the expected gas generation flow rate from the entire area of the landfill ...”*

If a landfill has an existing GCCS, it is likely the calculated methane generation rate is over 732 tpy and therefore, the design plan requirements as stated above under Reg .05 would apply. Also Reg .11D(1)(b) notes that “the Department may request additional information as may be necessary to verify the methane generation rate from the landfill and site-specific data may be substituted when available”, which means a facility with an existing GCCS may want to demonstrate the difference between the modeled methane generation rate per §98.343(a)(1) or the actual methane generation rate per §98.343(b)(1) or (2).

Under Regulation .04B(3) a methane generation rate based on the mathematical model is requested, using Regulation .11D. If a landfill is closed and does not have a GCCS the calculated methane generation rate is the default and starting point. For closed landfills, the Department will work with each landfill individually and utilize the existing waste records on file with MDE ARA or MDE LMA.

The Department does agree that mathematical modeling can sometimes overestimate the methane generation. However, very few of the landfills subject to this proposed regulation should be close to the 732 tpy threshold. MDE’s data indicates that only two landfills subject to the proposed regulations would come within 100 tpy of the 732 tpy calculated methane generation rate threshold, all the other landfills are above or below).

See additional comments and responses on page 19, 24 and 29.

**Comment:** The commenter asks that the Department clarify the definition of “commenced installation of solar panels or arrays on or before January 1, 2024” under Regulation .01B(4). The commenter notes that the process to contract, design, permit, and develop a solar project is very time consuming. A landfill may have initiated a solar project before the effective date of the rule, but due to the long process associated with project development inherent with these projects it is possible that physical installation of actual solar panels may not occur prior to 1/1/2024. The commenter requests that the regulation be revised to address this scenario or to provide allowance for landfills to request approval of an alternate schedule if they can demonstrate they have commenced project development.

**Response:** The proposed exception is intended to mean shovel in the ground. Any landfill can still install solar panels. If the construction is started after January 1, 2024 then an alternative compliance plan to address surface emissions monitoring should be created.

There are MSW landfills in Maryland that have installed, or are preparing to install, solar panels to provide renewable energy. The Department recognizes the investments made by the MSW landfills in Maryland and supports renewable energy projects.

The proposed MSW landfill regulations allow for exemptions or alternative compliance options to address MSW landfills that have invested in solar panels. The proposed regulations provide an exemption for some closed landfills with less than 2.75 million tons of waste-in-place that have commenced installation of solar panels by January 1, 2024. This allows Maryland to address small and medium size landfills separate from larger landfills that are required to meet

the federal state plan requirements under the Clean Air Act. Through this proposed action, the Department does not intend that existing solar panel installations need to be removed or reinstalled to satisfy regulation requirements.

The Solid Waste Management Program, which is part of the Land and Materials Administration (LMA) at MDE reviews and approves solar panel installations at all MSW landfills in Maryland. Also, landfills considering solar panel projects may be required to file a Notice of Intent for construction activities with the Water and Science Administration (WSA) at MDE.

**Comment:** The commenter states that it is unclear in Regulation .04B(3)(b) whether a landfill that currently operates a gas system voluntarily is permitted to operate the voluntary system if it chooses to follow the <200 ppmv SEM demonstration option.

**Response:** If a landfill has a voluntary GCCS under the federal requirements, it is considered a GCCS system under the proposed regulations, therefore all regulations requirements for GCCS design and operation must be followed.

**Comment:** The commenter believes under Regulation .04B(5)(a), a landfill would have to comply with the requirements of Regulations .04 -.11 of this chapter beginning with the “next quarterly report submission”. The commenter requests clarification on the intended quarterly report submission referenced under the cited regulation.

**Response:** The requirement to begin a GCCS design if there is a SEM exceedance of the 200 ppmv after corrective action, starts at the next quarter when a report would be due.

**Comment:** The commenter believes under Regulation .04B(5)(c)(iv), the reference should point to Reg .10C(11) not B(11).

**Response:** The Department agrees that the reference for instantaneous surface emissions monitoring reports should be Regulation .10C(11). The Department shall make a nonsubstantive change in the Notice of Final Action. Regulation .04B(5)(c)(iv) to read (iv) *“Submitted all instantaneous surface emissions monitoring reports to the Department in accordance with requirements of Regulation[CAJ1] .10[[B]]C(11) of this chapter.”*

**Comment:** The commenter asks the Department to confirm that under Regulation .04B(5)(c)(i), a site must have capped and removed its GCCS to meet this eligibility criteria and may not continue to operate a GCCS voluntarily.

**Response:** If a landfill has a voluntary GCCS under the federal requirements, it is considered a GCCS system under the proposed regulations, therefore all regulations requirements for GCCS must be followed. The owner or operator seeking to remove the GCCS must follow the procedures in Regulation .06.

**Comment:** The commenter notes that in order to meet the eligibility criteria in Regulation .04B(5)(c)(ii), a site must have submitted a “final waste-in-place report” per the rule. The

commenter noted that in many cases the landfill may have closed years ago before the reporting requirements of the rule were applicable.

**Comment:** The commenter notes that in order to meet the eligibility criteria in Regulation .04B(5)(c)(iii), a site must have submitted a closure notification in accordance with the rule. However in many cases the landfill may have closed years ago before this notification requirement was applicable.

**Response:** The Department will work with each landfill individually and utilize the existing records on file with Air & Radiation (ARA) and Land & Materials (LMA) Administrations at MDE.

**Comment:** The commenter requests that the GCCS Design Plan schedule start date be the date of the triggering methane generation report of Regulation .04(B)(3)(a) or (6) and not the effective date in Regulation .05A(1).

**Response:** The Department requires the GCCS design plan to start after the effective date of the regulation.

**Comment:** The commenter requested a reference change under Regulation .05A(2)(h) for clarity.

**Response:** The Department agrees that the component leak standards are under Regulation .09B(7), not B(3). The Department shall make a nonsubstantive change in the Notice of Final Action. Reg .05A(2)(h) to read: *“Design the gas collection and control system to handle the expected gas generation flow rate from the entire area of the landfill and to collect gas at an extraction rate to comply with the surface methane concentration standards in Regulation .07A of this chapter, component leak standards in Regulation .09B[[3]] (7) of this chapter, and which is sufficient to meet all operational and performance standards in this chapter;”*

**Comment:** The commenter requested clarification on the list in Regulation .05B(4)(c)(ii) to confirm “either” or “or”.

**Response:** The Department shall make a nonsubstantive change in the Notice of Final Action to correct the reference list to be **one of four separate options under §B(1), §B(2), §B(3), or §B(4)**, removes the “and”, and adds “applicable” for clarity.

**Comment:** The commenter asks that the Department clarify the GCCS operational requirements in Regulation .05B(1)(a). This condition suggests the GCCS must operate continuously except as provided in §§D and F which address well raising and scheduled or unplanned shutdowns provided that certain notifications are met. Regulation .05B(1)(e)-(f) provides criteria for device shutdowns (valves closed within 1 hour) and to restore operation as quickly as possible. The commenter also asks if MDE intends to require landfills to submit a notification within 10 days of every shutdown event, regardless of duration as active gas systems regularly experience temporary and short-term shutdowns for a variety of reasons, sometimes several per day.

**Response:** The Department intends to require 10-day notification to the Department for unplanned shutdowns that are an emergency, catastrophic event or landfill fire.

All other unplanned shutdowns shall be reported to the Department, regardless of the duration, as part of the semi-annual and annual reporting. Through the Compliance Program (ARA) at MDE, the Department will work with owners and operators to address any concerns or issues regarding the submission of notifications. The Department will consider clarifying this reporting under future amendments.

**Comment:** The commenter requests that this inspection language in Regulation .05B(3)(d) be clarified to apply only in the event that a flare is equipped with a bypass line. Most flares do not include a line to bypass the flare.

**Response:** Regulation .05(B)(3)(d) requires that a visual inspection be conducted only in the event that an open flare is equipped with a bypass line. The Department will continue to review the MSW landfill regulations in their entirety and may make clarifying amendments as needed.

**Comment:** The commenter suggests the schedule in Regulation .05B(3)(e) & (f) indicates that a landfill subject to the requirements of this regulation may not use an existing open flare after 1/1/2025 unless written approval is obtained. The commenter suggests the schedule does not seem to be consistent with the overall implementation schedule which involves: rule finalization/effective date, initial methane rate calculations (or SEM), 1-year to prepare design plan, MDE review and approval of design plan, and 30-months to construct the GCCS following MDE approval. The commenter requests that the rule be modified to, at minimum account for this schedule such that landfills can complete a proper design, obtain MDE approval, and then construct a new control device, if needed.

**Response:** The Department believes the time between the effective date of the regulation and the phase-out date for the use of open flares (unless granted approval by the Department) of January 1, 2025 will allow affected sources to comply with the requirements in §B(3)(e)-(f) of Regulation .05. The Department believes the retrofit or replacement of the open flare can be implemented within that time. If the landfill believes that a new or revised GCCS design plan will ultimately remove the open flare, then a written request for alternative compliance can be submitted stating that use of the open flare is necessary until a design plan is approved and constructed. In addition, through the Compliance Program (ARA) at MDE, the Department will work with owners and operators to address any concerns or issues regarding the approval process for the use of open flares. The Department declines to revise or amend this requirement at this time.

**Comment:** The commenter notes that one of the conditions necessary for approval of an open flare is demonstration that the methane generation rate controlled by the open flare is less than 732 tons per year. The commenter requested that this criteria in Regulation .05B(3)(f) & (g) be removed because the remaining criteria provide sufficient minimum requirements needed for an MDE demonstration. The commenter suggests if the methane generation rate is less than 732 tons per year, it would appear that the landfill would not be subject to the rule.

**Response:** To clarify for the commenter, §B of Regulation .01 lists the types and conditions under which certain landfills are exempt from the requirements of the proposed regulation. A methane generation rate of less than 732 tons/yr does not automatically exempt a MSW landfill from the requirements of the proposed regulation.

Regulation .05B(3)(e)-(f) addresses the use of open flares. The Department understands that there are certain conditions which may necessitate the use of an open flare. §B(3)(e) of Regulation .05 prohibits the operation of open flares after January 1, 2025, unless the owner or operator of the MSW landfill demonstrates there is at least one condition that requires the use of an open flare and has received prior written approval from the Department. Conditions include one or more of the following: the MSW landfill has demonstrated the methane generation rate is less than 732 tons per year using the test methods in Regulation .11D and the rate of landfill gas generated is insufficient to support the continuous operation of an enclosed flare or other gas control device; temporary operation during repair or maintenance of the gas control system, or while awaiting the installation of an enclosed flare, or to address off-site gas migration issues; landfill gas emissions that cannot be controlled using enclosed flare gas control devices in the gas control system; or, the owner or operator otherwise has received written approval from the Department to operate an open flare under the alternative compliance standards in Regulation .08. The Department believes this criterion is reasonable and sufficient for owners and operators to demonstrate the need to operate an open flare. The Department declines to revise or amend this requirement at this time.

**Comment:** The commenter believes Regulation .05B(5) requires that a treatment system monitoring plan be submitted with the GCCS design plan. The commenter states that in many cases, a beneficial use project may be developed well after a GCCS design plan is submitted. For example, once LFG generation rates reach a level that makes a beneficial use project feasible. Based on this, the commenter requested that this requirement be modified to account for this situation.

**Response:** The Department believes such an example would be covered under the requirements for amended design plans under §C(9) of Regulation .10. Events such as the expansion of operations not covered under a previously approved design plan or installing, repairing, or expanding a GCCS in a manner that was not previously covered under a design plan previously approved by the Department would require the owner or operator of a MSW landfill to submit an amended design plan. All amended design plans should be submitted to the Department at least 90 days in advance of any of the following conditions. The Department believes there is no need for amendments to the requirements in §C(9) of Regulation .10 at this time.

**Comment:** The commenter believes the language in Regulation .05B(6) is confusing and may include a typo. The commenter also asks if MDE intends that a flow meter recording flow to the treatment system be calibrated, maintained, and operated according to the manufacturer's specifications.

**Response:** The Department believes the language in §B(6) of Regulation .05 is consistent with the federal requirements for MSW landfills. The language requires that the owner or operator that uses a landfill gas treatment system calibrate, maintain, and operate according to the manufacturer's specifications a device (such as a flow meter) that records flow to the treatment system and bypass of the treatment system.

**Comment:** The commenter asks the Department for clarification on Regulation .05B(6)(ii) and if MDE intends that only LFG from lined landfill areas can be used when a beneficial use project is developed.

**Response:** The Department is not restricting the beneficial use projects, instead it is clarifying the design requirements. The requirements in §B(6)(b)(ii) of Regulation .05 are consistent with federal requirements for MSW landfills with passive collection systems. In order to get clarification, Oregon discussed aspects of this requirement with EPA. According to the EPA, the liner is meant to make sure landfill gas flows in one direction when using a passive system. EPA noted that active collection systems would be a better choice for MSW landfills without liners, since federal requirements require the design of gas collection and control systems to minimize the off-site mitigation of landfill gas as opposed to the use of liners. The proposed regulations require a GCCS to be designed as an active collection system when practical when the site methane generation rate is over 732 tons per year and surface testing reveals levels above 200 ppmv.

Being consistent with the federal and Oregon's regulation, the proposed regulation includes language under §B(1)(g) that requires MSW landfills with a design capacity of 2,750,000 tons and 3,260,000 cubic yards that use a passive collection system to install liners on the bottom and sides and as required under 40 CFR §258.40 (RCRA design criteria, with new being after Oct 1991).

The Department is not making a change to the regulation but will assess if a future revision may be needed to provide clarity.

**Comment:** The commenter notes that Regulation .05B(7)(a) includes an annual testing requirement for open flares and asks the Department for clarification of the associated standard and test method for this test program.

**Response:** Regulation .05B(7)(a) requires annual testing for all gas control devices. Furthermore, owners and operators of open flares are subject to the requirements under 40 CFR §60.18 as specified in Regulation .11E. In the case of open flares, there is not a specific annual test. However, the conditions of 40 CFR §60.18 (f) must be met and reported as specified in Regulations .10B(1)(m), B(2)(f) and C(4)(c). Under 40 CFR §60.18, owners and operators of open flares are required to minimize visible emissions, monitor the pilot flame, and monitor the heating value of the gas and exit velocity.

Regulation .11C - *Determination of Control Device Destruction Efficiency*, list test methods for determining the efficiency of the control device in controlling methane emissions.

**Comment:** The commenter notes that Regulation .05B(7)(d) requires that testing of existing control devices must be completed within 180 days of the effective date of this regulation. The commenter believes this schedule does not appear to be consistent with the overall implementation schedule which involves: rule finalization/effective date, initial methane rate calculations (or SEM), 1-year to prepare design plan, MDE review and approval of design plan, and 30-months to construct the GCCS following MDE approval and requests that the testing schedule be modified to account for this schedule.

**Response:** Testing of existing controls applies to existing GCCS and can start with the effective date of the regulations. A new GCCS requires testing after the startup of the GCCS under Regulation .05B(7)(b).

**Comment:** The commenter states that Regulation .06A(2)(a)-(b) defines the emission requirements for capping the GCCS and references both measured or calculated methane generation rates. The commenter believes these conditions do not reference required procedures for measuring methane generation rates; the procedures for calculating methane generation rates Regulation .11D include procedures for landfills with carbon adsorption systems and passive venting systems but not with active collection and flaring systems and requests clarification.

**Response:** The methods and procedures for determining the methane generation rate are listed under Regulation .11D - *Determination of Methane Generation Rate*. Reg .11D(1)(a) specifies that MSW landfills without carbon adsorption or passive venting systems shall calculate the methane generation rate using the procedures specified in 40 CFR §98.343(a)(1). This would include MSW landfills without a GCCS and MSW landfills with active GCCS. Furthermore, additional methods for measuring the methane generation rate are listed under Regulation .11D for MSW landfills with carbon adsorption and passive venting systems.

Reg .11D(1)(b) notes that “the Department may request additional information as may be necessary to verify the methane generation rate from the landfill and site-specific data may be substituted when available”, which means a facility with an existing GCCS may want to demonstrate the difference between the modeled methane generation rate per §98.343(a)(1) or the actual methane generation rate per §98.343(b)(1) or (2).

Additionally, under the alternative compliance provisions in Regulation .08 - *Alternative Compliance Provisions*, MSW landfill owners and operators have the option of submitting alternative methods and procedures to determine the methane generation rate to the Department. Please note that any alternative method or procedure is subject to review and approval by both the Department and EPA.

**Comment:** The commenter states that Regulation .06A(5) requires that a landfill must have submitted an equipment removal report in accordance with the rule requirements (which include a closure notification within 30 days of ceasing waste acceptance). The commenter adds that in many cases the landfill may have closed years ago before the reporting requirements of the rule were applicable.



**Response:** The purpose of the equipment removal report (which includes a closure notification report) is to ensure no waste is being placed at the MSW landfill before allowing the permanent shutdown and removal of the gas collection and control system. Closed and inactive landfills that have submitted information to the Department demonstrating cessation of waste acceptance prior to the effective date of the proposed regulation will not be required to submit an additional report.

The Department will work with each landfill individually and utilize existing records on file with ARA and LMA here at MDE to determine compliance.

**Comment:** The commenter asks for clarification of Regulation .06B and if MDE intends that a landfill must cap or remove its GCCS in order to conduct the either (8) quarterly SEM events outlined herein in order to be eligible to permanently remove the GCCS. The commenter notes, should an SEM reading of 200 ppmv be noted during this testing (per §B(3)), it is required to resume control in accordance with the rule. It will be challenging for a landfill to resume LFG control if it has previously capped or removed its GCCS. The commenter states this requirement also appears to prevent a landfill from continuing to operate all or a portion of its GCCS voluntarily, should it wish to do so, upon demonstrating that it is no longer subject to the rule.

**Response:** Regulation.06B specifically applies to the owner or operator of a closed MSW landfill or closed area of a MSW landfill that has capped or removed a gas collection and control system in accordance with the requirements in §A of the regulation. The owner and operator must conduct surface methane concentration measurements over the portion of the landfill with the capped or removed gas collection and control system in accordance with the procedures in Regulation .11F - *Surface Emissions Monitoring* for at least eight consecutive calendar quarters after the gas collection and control system is capped or removed. The owner and operator must conduct surface methane concentration measurements in accordance with Regulation .06B(1)-(3) and Regulation .11F. Regulation .06B(2) stipulates that the owner or operator shall submit a final gas collection and control system closure notification (in accordance with Regulation .10C(1)) to the Department if no measured concentration of methane of 200 ppmv or greater from the landfill surface occurred during any of these measurement events. However, Regulation .06B(3) states the owner or operator shall comply with the provisions in Regulations .04 — .11 if there is any measured concentration of methane of 200 ppmv or greater in any of these measurement events, other than “nonrepeatable, momentary readings, as determined by instantaneous surface emissions monitoring”.

Based on Regulation .06B(3), the Department does agree that this situation can appear circular. However, we note that one of the conditions for the permanent removal of a gas collection and control system is that the closed or inactive landfill must demonstrate a measured or calculated methane generation less than 732 tons/yr for three successive tests, as required under Regulation .06A(2). Since Regulation .04B requires a methane generation rate from the closed or inactive landfill to be greater than or equal to 732 tons/yr (if there is a measured concentration of methane equal to or greater than 200 ppmv) the owner or operator will not be required to reinstall and operate a gas collection and control system.

The Department will continue to review the MSW landfill regulations in their entirety and may make clarifying amendments as needed.

**Comment:** The commenter states that under Regulation .08B, proposed compliance alternatives are to be submitted to and approved by EPA, but under Regulation.08A and the GCCS design plan this information is to be submitted to MDE only.

**Response:** The owner or operator of a MSW landfill may submit alternatives to compliance methods, monitoring requirements, or test methods and procedures in Regulations .05, .09 and .11 to the Department for approval. However, any alternative compliance option is subject to approval by both the Department and EPA. Any compliance option must show that it effectively controls the off-site migration of landfill gas and provides an equivalent level of methane emission control.

**Comment:** Regulation .09A(1) addresses SEM monitoring requirements, re-checks, and remedial actions required in response to specific SEM exceedance triggers in response to SEM conducted for: initial SEM exemption demonstration (Regulation .04), rule exit testing following capping or removal of GCCS (Regulation .06) and regular GCCS operational standards (Regulation .07). The commenter states this section provides requirements for specific recheck schedules (10-day and monthly) and remedial actions (e.g., new or replacement well or collection device) that do not appear to be applicable for sites conducting SEM per Regulation .04 and Regulation .06 of the rule.

**Response:** The Department believes the schedules and corrective actions are applicable to MSW landfills that are subject to the requirements in Regulations .04B(3)(b) or .06B(3). The purpose of those requirements is to document and take corrective actions for any areas that exceed the methane concentration limit of 500 ppmv in Regulation .07A(1), or 200 ppmv for compliance with Regulations .04B(3)(b) or .06B(3).

Regulation .09A(1) allows for other remedial actions such as cover maintenance for landfills that have removed their GCCS. However, .09A(1)(c) does say if a third exceedance, (ii) and (v) remedial actions (e.g., new or replacement well or collection device) or (vi) requires an install of GCCS. A MSW landfill subject to the requirements of Regulation .04 that has not installed a GCCS may either be required to perform cover remediation or to install a GCCS. Regarding Reg .06B(3), see the comment and response on page 25-26. The Department will consider a future amendment to clarify the remedial actions required under Regulation .06 after a GCCS has been removed.

**Comment:** The commenter requested that Regulation .09A(1)(e) require a "...return to quarterly instantaneous surface monitoring of the closed or inactive MSW landfill or the closed or inactive area of an active MSW landfill where the exceedance was recorded." The commenter states this would be consistent with Regulation .09A(1)(d).

**Comment:** The commenter requested that Regulation .09A(2)(e) require a "...return to quarterly integrated surface monitoring of the closed or inactive MSW landfill or the closed or inactive area of an active MSW landfill where the exceedance was recorded."

**Response:** The Department believes there is no need for change or clarification. The monitoring schedule in Regulation .09A(1)(d) applies to closed and inactive landfills, or any closed or inactive areas on an active MSW landfill. These landfills may shift to annual instantaneous surface monitoring if after four consecutive quarterly instantaneous surface monitoring periods there is no exceedance of the 500 ppmv methane concentration limit in Regulation .07A(1). However, Regulation .09A(1)(e) notes that any exceedances of the 500 ppmv methane concentration limit as detected during any compliance inspections or annual instantaneous surface monitoring that cannot be remediated within 10 calendar days will result in a return to quarterly instantaneous surface monitoring of all areas of the MSW landfill that were previously monitored on an annual basis. This would apply to any closed or inactive landfill or closed or inactive areas on active MSW landfills that have shifted to annual instantaneous monitoring but have exceeded the 500 ppmv methane concentration limit.

**Comment:** The commenter believes that Regulation .09B(3) should read "For a gas control device other than an enclosed flare or an open flare....".

**Response:** The Department disagrees with the commenter and believes there is no need for change or clarification. §B(2) under Regulation .09 lists specific monitoring procedures for owners or operators who use open flares. §B(3) applies to gas control devices other than enclosed flares that are not specified in the regulation.

**Comment:** The commenter requested that language in Regulation .09(B)(9)(b)(iii) be moved to the end of §B(9)(b)(ii) to clarify that the inspection is related to the bypass line, if one exists.

**Response:** The Department has drafted the language to apply to a treatment system or a bypass line if applicable. The Department will continue to review the MSW landfill regulations in their entirety and may make clarifying amendments as needed.

**Comment:** The commenter states that Regulation .09(C)(1)(b) & (c) references reporting requirements of Regulation .10B but Regulation .10B appears to reference recordkeeping requirements only.

**Response:** §B under Regulation .10 stipulates that the owner or operator of a MSW landfill is required to maintain certain records for a minimum of 5 years. This includes records of all positive wellhead gauge pressure measurements, and any corrective action taken and root cause analysis as required under §C(1)(b) & (c) of Regulation .09. The Department believes there is no need for clarification at this time.

**Comment:** The commenter requested that Regulation .09C(3) be amended so that it references correcting a wellhead temperature to below 145 deg F or an approved HOV. The commenter further states that §C(3)(b) references reporting requirements of Regulation .10B where Regulation .10B appears to reference recordkeeping requirements only.

**Response:** The Department disagrees with the commenter. The language in §C(3) of Regulation .09 is equivalent to the language found under the National Emission Standards for Hazardous Air Pollutants (NESHAP) for MSW Landfills, specifically 40 CFR 63.1960 - *Compliance provisions*. The proposed regulation must be at least equivalent to the requirements found in the federal regulations.

Under the requirements in Reg .09C(3), the owner or operator of a MSW landfill shall not cause exceedances of other operational or performance standards from any attempted corrective measure(s) and must take corrective actions as soon as practicable but no more than 120 days following the measurement of landfill gas temperature greater than 62.8°C (145°F). Also, the owner or operator is required to submit all records of any corrective actions in accordance with the reporting requirements in Regulation .10B and .10C(10) (corrective actions) and semi-annual reporting requirements in Regulation .10C(3).

For this reason, the Department believes there is no need for changes or clarification at this time.

**Comment:** The commenter requested that the requirements in Regulation .09C(6) reference nitrogen levels at or above 20 percent or oxygen levels at or above 5 percent. The commenter notes that standard industry meters used for similar landfill gas monitoring (e.g., LandTec GEM 5000, Envision Gas Analyzer) do not measure nitrogen. Rather these meters measure methane, carbon dioxide, and oxygen, and calculate the difference as “balance gas” (which is typically assumed to be primarily nitrogen).

**Response:** The Department disagrees with the commenter and notes that the language in §C(6) of Regulation .09 is equivalent to the language found under the National Emission Standards for Hazardous Air Pollutants (NESHAP) for MSW Landfills, specifically in 40 CFR 63.1983. The language in the proposed regulation must be at least equivalent to the requirements found in the federal regulations. For this reason, the Department believes there is no need for changes or clarification at this time.

**Comment:** The commenter is unclear [under Regulation .10B(1)(g)] what is required for waste characterization and asks MDE how it intends for landfills to conduct regular field characterization of its waste.

**Response:** Landfills in Maryland are currently required to document the composition of the waste (e.g., paper, plastics, food scraps, metals, etc.) accepted in their annual reports to the Department. These annual reports are submitted to the Resource Management Program (Land and Materials Administration) at MDE, which uses them to help track waste flow for the Department's annual report. The composition of waste can be documented as a weighted amount (tons), or a percentage of amount accepted for landfill.

Owners and operators of active MSW landfills with less than 450,000 tons of waste-in-place would be required to submit to the Department an annual tonnage report (which includes documentation of waste composition) pursuant to the landfill's Refuse Disposal Permit issued

under COMAR 26.04.07. Owners and operators of certain MSW landfills subject to the requirements in the proposed regulation (those with 450,000 tons or more of waste-in-place) would also have to include this information in the Waste-in-Place Report, which is to be submitted annually to the Department. The Department believes this requirement provides important information about landfill gas production in addition to measuring the effectiveness of waste diversion programs in the State - where waste is recycled and diverted from entering the waste stream through source reduction activities.

**Comment:** The commenter suggests the requirements in §B(2)(g) redundant with the requirements in §B(2)(j) of Regulation .10.

**Response:** The Department disagrees with the commenter. The requirements in §B(2)(g) are distinct from the requirements in §B(2)(j). The requirements in §B(2)(j) asks owners and operators to keep for the life of each gas control device a ready accessible plot map showing all existing and planned collectors in the system along with a unique identification location label for each collector, whereas §B(2)(g) simply asks for most recent map showing each existing and planned gas collector in the system. The Department believes there is no need for changes or clarification at this time.

**Comment:** The commenter states that Regulation .10C(1)(a) requires that a landfill submit a closure notification within 30 days of ceasing waste acceptance. The commenter notes that in many cases a landfill may have closed years ago before the reporting requirements of the rule were applicable and thus cannot comply with this timeline.

**Response:** Closed and inactive landfills that have submitted information to the Department demonstrating cessation of waste acceptance prior to the effective date of the proposed regulation will not be required to submit an additional report. Furthermore, the Department will work with closed facilities and use existing records with the Department that can satisfy this requirement.

**Comment:** The commenter asked if the equipment removal report as required under Regulation .10C(2) must also contain the methane generation rate demonstration of Regulation .06A(2).

**Response:** The Equipment Removal Report should include dated copies of three successive reports demonstrating that the calculated or measured methane generation rate at the MSW landfill is less than 732 tons per year. For MSW landfills opting to measure the methane generation rate, the test dates should be no less than 90 days apart, and no more than 180 days apart. For MSW landfills opting to calculate the methane generation rate should do so in accordance with the provisions of Regulation .11D - *Determination of Methane Generation Rate*.

**Comment:** The commenter suggests that under Regulation .10C(3), a landfill is required to submit a semi-annual report only for the period covering January through June. The commenter believes that these schedule requirements are confusing as it suggests a report is required for this period in 2024 and appears to be inconsistent with the overall implementation schedule which involves: rule finalization/effective date, initial methane rate calculations (or SEM), 1-year

to prepare design plan, MDE review and approval of design plan, and 30-months to construct the GCCS following MDE approval.

**Response:** The semi-annual reporting requirements in the proposed regulation are consistent with the semi-annual reporting requirements in the NESHAP for MSW landfills. The Department believes the time between the effective and implementation dates will allow sufficient time for affected sources to comply with the semi-reporting requirements and is consistent with the overall implementation schedule.

**Comment:** The commenter states Regulation .10C(3)(a) requires reporting of all instantaneous SEM readings of 100 ppmv or greater. The commenter believes this threshold applies only to those landfills following the SEM demonstration of Regulation .04B(3)(b) – see also the next comment. It appears that this reporting requirement should instead be all instantaneous SEM readings of 250 ppmv or greater (see also Regulation .11F(2)(c)).

**Response:** The Department included the 100 ppmv recordkeeping requirement in the proposed regulation, which is modeled after reporting requirements in Oregon’s landfill regulation. Oregon included this requirement in its regulation so that MSW landfills could record surface emissions that are close to, but have not yet exceeded the 200 ppmv requirement. The Department agrees with this rationale and believes this requirement could benefit MDE’s Climate Change Program with greenhouse gas emissions modeling. As specified under Regulation .11F(2)(c), an instantaneous SEM reading that is over 250 ppmv would trigger the requirement for additional 5-foot SEM measurements to be performed.

The Department does not agree that a change is needed for this requirement.

**Comment:** The semi-annual reporting requirements in Regulation .10C(3)(b) references landfills that are following the SEM demonstration of Regulation .04B(3)(b). The commenter states these landfills will not have triggered the GCCS requirements yet and per the requirements of Regulation .04B(5)(b) these landfills are subject to an annual instantaneous SEM report per Regulation .10C(11) so it appears requiring these landfills to submit the semi-annual report and all the requirement elements is not appropriate. The commenter asks if it is MDE’s intent for these landfills to be subject to this semi-annual reporting requirement.

**Response:** To clarify for the commenter, MSW landfills that have not triggered the GCCS requirements with a measured concentration of methane of 200 ppmv or greater from the surface of an active MSW landfill after four consecutive quarterly instantaneous surface emissions monitoring periods will not be required to submit a semi-annual report. Per §B(5)(b) of Regulation .04, the owner and operator of a MSW landfills that have not triggered the GCCS requirements and are required to conduct quarterly instantaneous surface emissions monitoring are required to prepare and submit an annual instantaneous surface emissions monitoring report to the Department in accordance with Regulation .10C(11). Owners and operators must submit these reports to the Department within “30 days after the fourth consecutive quarter of monitoring if no exceedances are detected, or 30 days after a measured concentration of

methane of 200 ppmv or greater, whichever is first". Therefore, if an exceedance is recorded a report may be required to be submitted to the Department before the annual report.

However, MSW landfills with GCCS will be required to document all readings and any exceedances of the measured methane concentrations limits in §B(3)(b) as part of the Semi-Annual Report.

**Comment:** The commenter believes the information listed under Regulation .10C(4)(c)(x) is already included in the semi-annual reporting requirements. The commenter adds the information appears to be redundant and only §C(4)(g), (j) and (k) are additional and should be listed there.

**Response:** The owners and operators of MSW landfills are required to keep and maintain certain information under the recordkeeping requirements in §B of Regulation .10. As part of the requirements of §C(4)(c)(x), the Department is asking that landfills include and submit this information as part of the annual report. Relevant information under the same recordkeeping requirements may also be required in the semi-annual report.

**Comment:** The commenter states that Regulation .10C(6)(d) requires landfills with methane emissions <732 tons per year to include in the annual report the results of a visual inspection of the landfill cover and actions done to fix leaks. The commenter believes landfills with this emission rate are not subject to instantaneous SEM requirements, so it appears this reporting requirement may be in error.

**Response:** The Department would like to clarify for the commenter that the requirements in Regulation .10C(6)(d) stipulates that owners and operators of MSW landfills that are greater than or equal to 450,000 tons of waste are required to include the methane generation calculation, along with any relevant parameters in the Methane Generation Report that is to be submitted to the Department. Even though no SEMs are required, MSW landfills required to submit a Methane Generation Report are also required under §C(6)(e) to include the results of a visual inspection of the landfill cover and document any actions to fix leaks and minimize methane releases.

**Comment:** The commenter believes the requirement in Regulation .10C(7)(b) to submit subsequent performance test reports 30 days after completion of testing is unnecessarily short and may be difficult to comply with. The commenter requested that this requirement be changed to within 60 days, which is typical within the industry and more reasonable.

**Response:** The commenter is correct that under the federal requirements, the timeline for owners and operators of MSW landfills to submit subsequent performance tests is within 60 days of completing each test. Oregon's landfill methane regulation, which is consistent with requirements in the proposed regulation, includes a timeline of no later than 30 days after completing a performance test for submittal. Oregon has not reported any problems or issues with sources meeting this compliance timeline since its regulation became effective in October of 2021. Based upon feedback from Oregon, the Department does not believe the 30-day

timetable for submission of performance tests will cause an undue burden upon the industry. Through the Compliance Program (ARA) at MDE, the Department will work with owners and operators to address any concerns or issues regarding submittal dates for performance tests. The Department made no change to the proposed regulations in response to this comment.

**Comment:** The commenter requested that Regulation .10C(7)(c) be revised to reflect “The initial performance test report shall include...”. The commenter believes this language is consistent with the Federal requirements.

**Response:** The Department discussed this issue brought up by the commenter with the Oregon Department of Environmental Quality (DEQ), as the proposed regulation is consistent with their state regulation. Based on the conversation, the requirements in §C(7) of Regulation .10 discuss both the initial and ongoing performance tests. Therefore, it was appropriate to not to include the word “initial” when discussing the performance test reports as this may refer to the initial performance test report or additional performance test reports. The Department made no change to the proposed regulations in response to this comment.

**Comment:** The commenter believes the submittal schedule under Regulation .10C(9)(a)-(b) is confusing (i.e., “within 90 days” and “prior to installing, repairing, or expanding...”). The commenter requested that the phrase “within 90 days” be moved to (a) to read: “At least 90 days before expanding operations to an area not covered by the previously approved design plan”.

**Response:** The Department disagrees with the commenter. The requirements in §C(9)(a)-(b) would require an owner or operator to submit an amended design plan to the Department at least 90 days in advance of expanding operations to an area not covered by the previously approved design plan or installing, repairing, or expanding the gas collection system in a way that is not consistent with a previously approved design plan. The Department made no change to the proposed regulations in response to this comment.

**Comment:** Regulation .10(C)(10)(a) should reference the wellhead temperature compliance standard established in .07 of 62.8 deg C (145 deg F).

**Comment:** The reporting requirement in Regulation .10C(14) appears to be redundant with §C(10). Also this should reference the wellhead temperature compliance standard established in Regulation .07 of 62.8 deg C (145 deg F).

**Response:** The requirements in §C(14) of Regulation currently follow the corrective actions for MSW landfills in both the NSPS and EG. However, the Department recognizes the federal requirements have been revised under the NESHAP and will address this in a possible future action so that it is consistent with both the NESHAP and the wellhead compliance standard in Regulation .07.

**Comment:** The commenter asks, does MDE intend to require landfills to submit a notification within 10 days of every unplanned shutdown event as required under Regulation .10C(13)(b), regardless of duration.



**Response:** The Department intends to require 10-day notification to the Department for unplanned shutdowns that are an emergency, catastrophic event or landfill fire.

All other unplanned shutdowns shall be reported to the Department, regardless of the duration, as part of the semi-annual and annual reporting. Through the Compliance Program (ARA) at MDE, the Department will work with owners and operators to address any concerns or issues regarding the submission of notifications. The Department will consider clarifying this reporting under future amendments.

**Comment:** It appears Regulation .10C(16)(a) contains an incorrect reference as Regulation .05C refers to the wellhead gauge pressure requirements.

**Response:** The Department will continue to review the MSW landfill regulations in their entirety and may make clarifying amendments as needed. At this time the requirements to submit a liquids addition report apply if a GCCS and wellheads are operating with a leachate recirculation or added liquids system.

**Comment:** The initial reporting schedule under Regulation .10C(16)(c) is triggered by the “commenced construction, modification, or reconstruction” which appears to be a reference to EPA NSPS XXX and which may not apply to landfills that have not met these criteria.

**Response:** The initial reporting schedule is consistent with the requirements in 40 CFR 60, subpart XXX (NSPS) and would apply to MSW landfills that are subject to the requirements in Regulation .04C.

**Comment:** The commenter states that Regulation.11D includes provisions for measuring the actual methane rate for landfills with carbon adsorption systems or passive venting systems, but not for landfills with existing voluntary GCCS. The commenter asks the Department for clarification if a landfill with an existing GCCS can measure the actual methane rate using an existing GCCS; this would likely be more accurate than determining the methane generation rate using a gas model.

**Response:** The methods and procedures for determining the methane generation rate are listed under Regulation .11D - *Determination of Methane Generation Rate. Reg .11D(1)(a)* The regulation specifies that MSW landfills without carbon adsorption or passive venting systems shall calculate the methane generation rate using the procedures specified in 40 CFR §98.343(a)(1). This would include MSW landfills without a GCCS and MSW landfills with active collection systems. Furthermore, additional methods for measuring the methane generation rate are listed under Regulation .11D for MSW landfills with carbon adsorption and passive venting systems.

Reg .11D(1)(b) notes that “the Department may request additional information as may be necessary to verify the methane generation rate from the landfill and site-specific data may be substituted when available”, which means a facility with an existing GCCS may want to demonstrate the difference between the modeled methane generation rate per §98.343(a)(1) or the actual methane generation rate per §98.343(b)(1) or (2).

Additionally, under the alternative compliance provisions in Regulation .08 - *Alternative Compliance Provisions*, MSW landfill owners and operators have the option of submitting alternative methods and procedures to determine the methane generation rate to the Department. Please note that any alternative method or procedure is subject to review and approval by both the Department and EPA.

**Comment:** Regulation .11D(2) requires the use of a meter meeting the requirements of .11A for measuring the concentration of methane (percent by volume) in raw LFG. The commenter believes that Regulation .11A refers to a methane detector that would be used for leak monitoring, which would not be appropriate to use for measuring methane in higher levels expected to be present in raw LFG.

**Response:** §D(2) of Regulation .11 lists specific requirements for determining the methane generation rate for MSW landfills using carbon adsorption. The owner or operator is required to measure the actual total landfill gas flow rate using a flow meter (or other measuring device) and the methane concentration (percent by volume) using a hydrocarbon detector meeting the requirements of Regulation .11A. These requirements are consistent with the Requirements found in both Oregon and CARB's regulations. Neither state has reported any issues. The Department will work with owners and operators of MSW landfill to address any concerns or issues.

**Comment:** The commenter requests clarification on Regulation .11F(2)(e) as to what is considered a cover penetration. The commenter asks, would this include penetrations of the landfill bottom liner (e.g., leachate cleanout pipes or similar features)?

**Response:** The Department believes the definition for "cover penetration" which is used in the NESHAP for MSW Landfills (40 CFR § 63.1990) provides the necessary clarification for the commenter. A "cover penetration" is defined as a "wellhead, a part of a landfill gas collection or operations system, and/or any other object that completely passes through the landfill cover." The definition adds that "the landfill cover includes that portion which covers the waste, as well as the portion which borders the waste extended to the point where it is sealed with the landfill liner or the surrounding land mass."

In an effort to be consistent with the definition found in the NESHAP, the Department would not consider "survey stakes, fencing including litter fences, flags, signs, utility posts, and trees so long as these items do not pass through the landfill cover" as cover penetrations. In addition, features such as leachate cleanout pipes that while penetrating the landfill bottom liner but do not pass through the landfill cover would not fall under the definition of a "cover penetration".

**Comment:** The commenter believes Regulation .11F(2)(f) is unnecessary since it appears to address landfills that are not required to conduct SEM per this rule but otherwise are subject to SEM per a Federal Rule (note that NSPS Subpart WWW is no longer effective). The commenter further states that if landfill is not subject to quarterly SEM of the Maryland Rule, then it would seem this requirement would not apply anyway, and any applicable SEM requirements of the referenced Federal Rule would take precedent.

**Response:** The Department disagrees with the commenter. Based on conversations the Department had with Oregon, which rule is consistent with Maryland's proposed regulation. The intended purpose of this requirement is to incorporate the federal requirements for the largest MSW landfills (which are subject to NSPS and/or NESHAP) while allowing some flexibility for MSW landfills that would not be subject to the federal requirements.

**Comment:** The requirements cited in Regulation .11I(4) should reference the downwell temperature monitoring requirements of §I(10) rather than Regulation .09C.

**Response:** To address the issue raised by the commenter and add clarity, the requirements in Regulation .11I(4) will keep the reference to the requirements in Regulation .09C for wellhead monitoring but also include a reference to the downwell temperature monitoring requirements in §I(10) of Regulation .11. The Department shall make a nonsubstantive change in the Notice of Final action to add the additional reference. Reg .11(I)(4) to read "*Monitor temperature of the landfill gas every 10 vertical feet of the well as provided in Regulation .09C and §I(10) of this chapter;*"

**COMMENT: AELR reviewed the proposed regulations and provided some drafting style changes, as well as three reference edits.**

**Response:** The Department is proposing the following nonsubstantive changes based on the AELR review and match comments noted above.

Reg .04B(5)(c)(iv) - change the reference from Reg .10B(11) to Reg .10C(11)

Reg .05A(2)(h) - change the reference from Reg .09B(3) to Reg .09B(7)

Reg .05B(4)(c)(ii) - change the applicable requirements list from §B(1), §B(2) or §B(3) and §B(4) to §B(2), §B(3), §B(4)(a) or §B(4)(b) of this regulation.

**Public Hearing Feb. 1, 2023 Attendance List**

Carolyn Jones, MDE	Meena Viswanath
Eddie Durant, MDE	Mehal Trivedi
Kelsey Sisko, MDE	Michael Kuku
Randy Mosier, MDE	Natallia Reid
Abdulrahman Mohammed, MDE	Orlando Powell
Alan Cohen	Robert Erdman
Aman Azhar	Robert Lipsky
Andrea Crooms	Ruth White
Andrew Milstead	Tim Wheeler
Anna Marshall	Timothy B. Richards
Anne Manuel	William Knott
Bolaji Edwin	Xinrong Ren
Bruce M. O'Dell	3 Callers not Identified
Bryan Allen	
Carla Adduci	
Carly Cushing	
Charles Ingram	
Charles Peng	
Comms Director	
Craig Marker	
Diane D'Arrigo	
Dave Arndt	
Dru Schmidt-Perkins	
Eric Jackson	
Frances Sherman	
Gary Lasako	
J.T. Schoenberger	
Jacob Shepherd	
Jen Hawse	
Joel Dreessen, MDE	
John Agnoli	
Josh Roth	
Kathleen Wehnes, MDE	
Keith Roumfort	
Kevin Serrona	
Kim Drake, MDE	
Leah Kelly	
Marc Imlay	
Marilyn Naumann	
Mario Cora Hernandez, MDE	
Mark Huncik	
Mark Morris	