



Sustainability in Action

January 24, 2025

Matt Harrison
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: December 2024 Workshop on Potential Updates to Landfill Methane Regulation (LMR)

Dear Mr. Harrison,

Republic Services appreciates the efforts put forth by the California Air Resources Board (CARB) staff relative to the December 2024 workshop on potential updates to the landfill methane regulation. The discussion was comprehensive and brought to light several subject areas that require further evaluation and discussion.

We have formatted our comments with some directional themes addressed first followed by input relative to some of the specific concepts or issues that CARB requested feedback on in their December 2024 presentation collateral. The latter items are itemized by restating the feedback request and citing the page number of the staff presentation used during the Public Workshop on December 18, 2024.

General Comments

Primary Intent and Focus of the Regulations

Minimization of landfill methane emissions is the primary focus of the LMR and any subsequent revisions should be aligned with that intent. Landfills are complex biological systems and as such rulemaking should not take a one size fits all approach. While this may make the rule making process more challenging, finding opportunities to allow for flexibility will help optimize the performance of the gas collection system thereby promoting methane emission reductions.

While the rule should include elements that provide ample compliance visibility, some of the more rigorous elements highlighted in the December workshop may not be necessary for many of the facilities in the state (both operating and closed). This is highlighted as an overall theme and will be noted in several of our topic-specific comments.

Alignment of New Technology with Application as a Compliance or Enhanced Methane Extraction Tool

Movement away from manual surface emissions monitoring (SEM) towards more automated and data driven detection and remedial measures should be a key focus of the rule change. While several promising technologies are in use (i.e., Various drones GAZOSCAN, automated wellhead monitoring/tuning), their applicability as compliance or enhanced methane extraction tools may be limited.



Sustainability in Action

The entities that have developed these tools may represent the utility of these devices could be greater than their actual capabilities (i.e., results used for comparison to compliance thresholds). We would simply ask that if an application has been made for certification of a given device, that the facility operators be given an opportunity to provide input during the review and approval process. This will allow for a balanced set of inputs to be evaluated as part of the final determination of a product's capabilities and how its output will be used.

We have employed various technologies over the past 2-3 years as a directional component of the monitoring process or as system optimization for our LFGTE facilities. Based on our experience with various emerging technologies, it is imperative to establish standards, methods and action levels prior to incorporating their use as a compliance method. We encourage the LMR to add regulatory language to allow for flexibility in using these technologies as action levels are developed.

Specific Requests for Feedback

Satellite-Detected Emission Plumes/Alternative Technologies – Slide 23

Significant work is being done by the solid waste management industry, technology providers and regulatory agencies, including U.S. EPA, on this topic. Republic Services and National Waste and Recycling Association (NW&RA) submitted comments to U.S. EPA in 2024 that we think are pertinent here. We have attached that documentation for CARB's reference and consideration.

Comments at the beginning of this response re: incorporating operator input to the application review are critical in terms of staff gaining a full understanding of the capabilities of the tools that are proposed. Additionally, use of enhanced technology and its relative advantages to the current LMR procedure are important criteria but should not be required for approval. For instance, if an operator believes that handheld PID surface scans have been effective for their facility, they should be allowed to continue the use of this method and not be mandated to utilize an approved alternative technology.

Conversely, if an operator believes that use of alternative approved technologies will enhance and streamline their ability to detect emissions then they should be able to employ that specific technology on its own and supplement it with current detection methods. Keeping in mind that the ultimate goal is identification and reduction of emissions, further dialogue between industry participants and the regulatory community relative to higher monitoring frequency is appropriate. In our view, enhanced monitoring frequency is dependent upon the practicality of use and utility of new technology that is approved for use.

The application process for new technology should be open to all and not limited to equipment vendors. Landfill operators may have simple procedures and approaches to the issues being addressed and should not be excluded from applying for use of a new technology and should be included in the review of technologies proposed by others.



Sustainability in Action

Areas Excluded from Surface Emissions Monitoring – Slide 29

We recommend a balance that builds in provisions for identification and best practices for management of emissions near active areas and construction zones, while at the same time recognizing the limitations on continuing safe and reasonably efficient operations. Of the areas that are currently exempt from monitoring (i.e., steep slopes, certain construction areas and the working face), at a minimum we propose that the working face and construction areas continue to be exempt due to safety and facility operations criteria that are specific to these elements of our operations. We believe some of the newer technologies have potential for monitoring of steep slopes and other hard to access areas of the landfill and think further discussion is needed prior to incorporating these criteria into a new rule.

The issue of monitoring areas using emerging technology of the landfill that are currently excluded from SEM is not only related to how to establish action detection limits and measurements (i.e., surface screening with PID in the working area is not safe), but also challenges related to mitigation. Some of the newer technologies (drones, GAZOSCAN, etc.) can be deployed remotely, however, if emissions are detected using these tools, it is still dangerous to implement mitigation from a safety perspective. In addition, test methods need to be developed, along with appropriate detection limits to determine when remediation is appropriate.

Surface Emission Standard – Slide 34

As identified in the staff presentation, we are concerned that setting the SEM threshold any lower than the current 500 ppm standard will present unintended consequences such as air intrusion, subsurface fires and marginalization of landfill gas quality for energy production (electricity generation and pipeline injection). Also keep in mind the existing 500 ppm threshold represents an instantaneous measurement of a single point in time on the landfill surface and does not provide an indication of the aggregate emissions occurring at a given facility. Accordingly, Republic supports maintaining the current threshold of 500 ppm.

Surface Emission Corrective Action and Re-Monitoring Timelines – Slides 35-37

SEM corrective action and timelines need to consider once again that a one size fits all approach is not appropriate for landfills. Additional opportunities (not just a single opportunity) to correct an exceedance if a one-month confirmation re-monitoring standard is implemented vs. being required to install a new or replacement well is necessary. Our experience is that the operator should be afforded reasonable latitude to propose site-specific corrective measures for an uncorrected exceedance, and not be limited to well installation.

Before moving the 120-day timeline, consideration needs to be given to the operational challenges presented with landfills being under a constant state of construction. The rule should include provisions that allow for a timeline extension for uncontrollable circumstances (i.e., weather, contractor availability, the need for regulatory approval, to name a few).



Sustainability in Action

Determining Full Extent of Surface Leaks/Component Leak Monitoring – Slide 38 - 42

From an overall perspective, additional data and cost analysis is warranted to provide meaningful comments on potential changes to the surface emissions monitoring and component leak monitoring. We respectfully note that we are not in agreement that closed landfills are significant contributors of emissions. Republic Services has over 100 closed landfills with GCCS, and rarely (if ever) do we find SEM hits at any of those sites. We are open to discussing annual SEM events rotating amongst calendar quarters in order to obtain data during different times of the year, as we anticipate this would provide further affirmation that closed sites are not significant emission sources.

We look forward to continued discussions on these topics as we better understand the data and cost associated with the suggested changes by CARB.

Wellhead Monitoring – Slide 47

We would welcome harmonizing the LMR with the federal plan requirements, as it would help streamline compliance and reporting.

We request that CARB not include additional monitoring or corrective actions for oxygen/nitrogen concentrations and gas flow rates. We understand the point that CARB is trying to explore with this question, but there can be some unintended consequences that can potentially be counterproductive, and in some cases, detrimental. This topic could cover multiple pages of text or many hours of discussion, and we welcome the opportunity to have that dialogue with CARB to better explain some of our concerns. We touch on a couple examples here.

- Oxygen/nitrogen – Adding limits and additional compliance steps related to oxygen concentration would be counterproductive to the changes U.S. EPA finalized in the federal rules. U.S. EPA recognized that there can be a number of reasons oxygen is detected in a wellhead reading. For example, a gas collector (e.g., well) could be under influential vacuum from a nearby collector; the reading could be the result of faulty sample ports or above or near-grade damage to the well or boot; a well could be intentionally operated in an aggressive way to mitigate odors, which can result in some oxygen being pulled into the well; or the waste mass in the zone of influence of a collector could be reaching the end of its methane-producing cycle. We request that CARB not include additional monitoring requirements or compliance actions related to oxygen and/or nitrogen concentrations in the GCCS.
- Flow rate or gas composition – As with the other items listed above, we request that CARB not add compliance requirements related to wellhead flow rate or gas composition changes. There can be numerous reasons for changes in flow rate and composition. Landfills are large, complex, and ever changing. Flow that is present at a well one day, could migrate to other gas collectors on another day as the internal landfill pressures change and other wellfield conditions change. The same can be said of gas composition, which can be related to flow rate. We encourage CARB to limit the focus to

the objective of controlling the emission of methane, and not add prescriptive individual wellhead requirements on top of the federal requirements.

Gas Collection System Downtime – Slide 52

Our view of the approach to this item is that a one-size fits all may not be the appropriate answer. All of the mitigation measures noted on this slide are effective under certain circumstances depending upon the type of construction that is occurring or the cause of the event.

The number of wells to be disconnected should not be a set amount for all facilities as some of the larger facilities will undertake projects requiring broader scopes and impact a greater percentage of the system. Additionally, the concept of having the number of wells that can be disconnected at any one time tied to waste intake may not be the best approach. We believe that leaving the number of wells that can be disconnected at any one time variable as long as appropriate mitigation measures are undertaken is a more feasible approach. Depending upon the size and scope of the project, reconnection of some of the wells to the system could be an option. However, if a complete well replacement or refurbishment is being undertaken this may not be feasible.

Lastly, our view is that emissions from the working face and GCCS downtime are not necessarily related. Much of the downtime of given components of the system is due to construction. Impacting daily operations by limiting the working face size may not yield the intended benefit and will have other unintended effects on safety, traffic flow at the facility and the facility's ability to manage the community's waste.

Gas Collection System Operating Parameters – Slide 55

The questions posed on this particular slide and the level of data capture and monitoring envisioned may divert attention away from the focus of overall methane capture. We recommend not going to this level of granularity in terms of specifying explicit operating parameters for a GCCS. Adding a header pressure requirement into the regulation is not necessary and could result in unintended consequences in terms of pursuing variations beyond established action and reporting criteria. Once again, landfills and associated GCCS are highly variable. A one size fits all attempt at bracketing acceptable operating parameters for GCCS at all facilities may cause pursuit of operating criteria that are neither attainable, necessary, nor beneficial in terms of methane removal.

Additional Analysis at Sites with Persistent Exceedances – Slide 57

Conceptually, the idea of requiring additional monitoring at landfills with persistent exceedances is aligned with our view that added oversight should be reserved for facilities with elevated and more frequent methane releases. However, increased monitoring should be a follow-on to the mitigation and remedial work that is in response to detected surface emissions. Some of the re-monitoring protocols are included in the LMR today and we have provided input on some of the suggested concepts provided in the workshop.



Sustainability in Action

High level, increased monitoring frequencies for the entire facility may not be prudent if emissions are persistent in only a portion of the landfill area. The added burden of increased monitoring frequency may once again detract from efforts to cure an isolated or recurring issue at a specific segment of the facility.

From a guidance standpoint, we believe the persistent emissions standard should be applied to the grid where the exceedance was initially detected and not a smaller subdivision. Additionally, the 10 instantaneous or 5 aggregate exceedances in a 3-year period seems excessive and we propose removing the instantaneous element. If this type of concept is pursued, the timeframe should be much shorter, and the enhanced monitoring protocol should be required only after the implementation of mitigation or remediation of the root cause following re-monitoring verifying that the emissions from that grid have been abated.

The last three bullets on this slide refer to cover integrity and collection system analysis. The elements of these analysis that are listed are generally reasonable and specific items that we would review in attempting to identify the root cause of surface emissions exceedances. Establishment of metrics for these points of evaluation (as suggested in the last bullet on this slide) could lead down the path of one size fits all once again. Our suggestion would be to not include metrics for cover integrity and collection system analysis, as what may be suitable for a given facility in a certain climate and operational setting may not be relevant in another.

Additional Monitoring at Sites with Persistent Gas Collection System Issues – Slide 59

Republic has been utilizing the LOCI wellhead monitoring equipment at our Sonoma Central Landfill since late 2023. Since its installation we have not seen an appreciable reduction in landfill gas capture. We are willing to share data with CARB staff to illustrate this result.

As noted at the beginning of our transmittal, the vendors advocating for this technology may believe that it will be an essential add-on for every landfill to increase landfill gas capture and regulate flow. We haven't necessarily seen that result after nearly 18 months of operation and believe this is an expensive add to the GCCS that has not yielded a corresponding gain in terms of landfill gas capture.

In response to some of the questions noted on this slide, the frequency of exceedances and time periods for follow-on monitoring noted in the previous item seems generally reasonable for the requirement of additional monitoring. We correspondingly believe this should only be required if the persistent exceedances occur on a given component after mitigation and remediation occur. Focus on remediation of the issue at hand versus requiring enhanced monitoring while mitigation is in progress seems to align with the goal of addressing the causal issues first and performing verification monitoring as a follow-on for a period of time thereafter.

In terms of wellhead parameters to be measured, we would once again default to the parameters in the federal rule versus mandatory inclusion of oxygen and especially nitrogen. While oxygen content of the gas could be of use to determine if the system is overdrawing, we use a holistic view of all parameters to assess the effectiveness of that given component. This keeps the focus on landfill gas capture and system



Sustainability in Action

performance, as opposed to increased data gathering and tracking that may not be accretive to achieving the goal of the LMR.

Declining Gas Generation – Slide 64

This slide presents a number of issues and solicits feedback on thresholds for minimum MMBtu/hr, criteria for well decommissioning, temporary shutdown requests and other concepts. As noted in other segments of our response, each facility is different and setting specific criteria could lead to the exclusion of other more pertinent requests for a system or component decommissioning. Our view is that the current approach of the operator submitting a comprehensive plan for assessment of the system and proposal for decommissioning all or a portion of the system could prove to be limiting and may cause delays to addressing declining flows. We appreciate CARB's recommendations on streamlining the process to address declining gas flow and caution against setting a universal standard that may impact an operator's ability to demonstrate an alternative approach.

Advanced Monitoring and Automated Wellhead Tuning – Slide 69

Please see our response to the feedback requested on Slide 59 related to automated wellhead tuning. As noted in that response, our data does not support the claims of sustained improved gas capture as a result of installing this equipment on a large segment of the wellfield at the Sonoma Central Landfill. If a facility operator desires to employ the equipment, they should be able to propose its use as part of an overall plan that they believe will enhance the function of their system in a given operating environment.

While our organization never wants to balance cost and expense versus compliance, we seek to employ our resources in the most efficient and results oriented manner available. In our experience, advanced monitoring and automated wellhead tuning has not consistently resulted in increased methane capture or improved system operation.

Reporting and Record Keeping Parameters – Slide 71

At this time, we would not suggest additional reporting and recordkeeping. However, some standardization of the format could assist operators as well as the regulatory community in assessing data in a common format as well as limit confusion for an entity that owns multiple facilities and is managing varied reporting formats. As the LMR update process unfolds this may be a topic requiring further discussion.



Sustainability in Action

Republic has a shared interest with CARB in achieving emission reductions through a program that is reasonable, cost-effective, and flexible. Republic prioritizes responsible operations, compliance and collaboration and appreciate the opportunity to participate in the review of the Landfill Methane Regulation. We look forward to continuing to work with you on the development of revisions to the LMR and discussing our comments in greater detail when your schedule allows.

Thank you

Very Best Regards,

A handwritten signature in blue ink that reads "Michael Caprio".

Michael Caprio
Director of Government Affairs – CA
500 Capital Mall, Suite 2350
Sacramento, CA 95814

Attachment: Republic Services and National Waste & Recycling Association (NW&RA) comments on U.S. EPA Request for Information on the Use of Advanced and Emerging Technologies dated November 27, 2024