



January 24, 2025

California Air Resources Board
P.O. Box 2815
Sacramento, CA 95812

RE: Landfill Methane Regulation

(Comment submitted electronically)

Dear California Air Resources Board,

LoCI Controls, Inc. ("LoCI") appreciates the opportunity to provide comments regarding potential updates to the California Air Resources Board's ("CARB") Landfill Methane Regulation ("LMR"). As a respected innovator in real-time data and control systems for landfills, LoCI leverages patented technology to reduce emissions and increase methane capture at landfills. This comment addresses topics raised during the Public Workshop held on December 18, 2024, and emphasizes the critical role of advanced gas collection and control systems ("Advanced GCCS") in achieving CARB's methane reduction goals. LoCI recognizes CARB's groundbreaking and exemplary work in quantifying fugitive methane emissions from landfills and implementing strategies to maximize emissions reductions. LoCI appreciates the opportunity to provide this comment and would welcome any questions or follow-up regarding the points discussed herein.

LoCI Technology & Impact

LoCI specializes in advanced real-time landfill gas collection systems that optimize gas recovery, reduce emissions, and provide significant operational improvements at a relatively low cost. LoCI's patented real-time data and control system ("LoCI System") uses continuous data monitoring and automated tuning to:

- Identify and address issues such as air leaks, watered-out wells, and vacuum loss.
- Deliver an average 17% increase in landfill gas collection efficiency.¹

¹ Calculated based on ACR (formerly American Carbon Registry) "Methodology for the Quantification Monitoring, Reporting and Verification of Greenhouse Gas Emissions Reductions and Removals from Landfill Gas Destruction and Beneficial Use Projects, version 2.0," https://americancarbonregistry.org/carbon-accounting/standards-methodologies/landfill-gas-destruction-andbeneficial-use-projects/lfg-methodology-v2-f_2021-05-05.pdf.

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Key Recommendations

- 1. Require Continuous Vacuum Reporting and Stability.** LoCI supports CARB's proposal to require continuous reporting of available vacuum and require that a stable vacuum be maintained within a range of landfill specified set points. Available vacuum is a first-order control for methane collection, directly influencing the effectiveness of gas capture systems. Ensuring consistent vacuum stability, as well as providing data on overall gas collection system uptime, will support improved methane recovery rates and reduce emissions.
- 2. Use an Advanced GCCS.** To further reduce methane emissions, LoCI is supportive of CARB's recommendation to require the use of an Advanced GCCS at landfills failing to meet regulatory requirements and at landfills with a gas collection system performing below a state-defined minimum efficiency standard. Advanced real-time data and automated gas collection control systems provide real-time monitoring, data, and automated controls that improve landfill gas ("LFG") collection efficiency. Leveraging an Advanced GCCS allows gas collection system operators to more quickly identify problems and take corrective action which can significantly enhance methane recovery while addressing leaks, watered-out wells, and vacuum loss in near real time.
- 3. Incorporate Direct Methane Emissions Measurement Technologies.** CARB should encourage and allow the use of drone, satellite, and other direct measurement methods to scan for methane emissions. These emerging technologies provide additional data points that include active landfill areas and slopes — areas often missed by traditional surface emission monitoring methods. Such direct measurement methods complement existing approaches and provide a fuller, more accurate emissions profile.
- 4. Shorten the Timeline for a GCCS Expansion.** Under the current LMR, a GCCS must be installed within 18 to 30 months of approval of a GCCS design plan. CARB should consider revising this timeline to ensure that a GCCS is installed more quickly, particularly for expansions to new active areas of landfills. Accelerating GCCS deployment will significantly reduce early-stage methane emissions. An Advanced GCCS can support gas collection operations to maintain gas composition thresholds and limit air intrusion into the waste mass in new active areas. This improves safety in the active filling area for landfill personnel and operations by increasing landfill gas capture, and reducing emissions that would otherwise result intrinsically.

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Potential Emissions Reductions in California

Starting in 1996, LFG collection became a requirement for large U.S. landfills. The largest landfills are mandated reporters to the EPA Greenhouse Gas Reporting Program and database, therefore there is a long history of landfill methane collection system efficiency based on meeting regulatory requirements. Such public data provides a reliable benchmark for gas collection operations using industry standard manual wellfield tuning. Using a representative estimate of the average performance improvement from implementing the LoCI System (15%), California landfills could achieve the following decrease in methane emissions.

Year	Percent of CA Landfills Advanced GCCS Adoption (Methane Inventory Basis)	Emissions Reduction Annually from CA Landfills with Advanced GCCS (Metric Tons/Year CO ₂ e)	Percent Reduction of Estimated CA Landfill Emissions Relative to 2019 Estimated Baseline
2025	6%	245,000	3%
2026	9%	409,000	5%
2027	12%	572,000	7%
2028	15%	654,000	8%
2029	18%	817,000	10%
2030	21%	899,000	11%
2031	25%	1,144,000	14%
2032	30%	1,307,000	16%
2033	35%	1,552,000	19%
2034	40%	1,797,000	22%
2035	45%	2,043,000	25%

Economic and Environmental Benefits of Advanced GCCS

While Advanced GCCS adoption may require upfront capital as well as annual operating expenses for maintenance and repair and system operation, an Advanced GCCS yields measurable environmental and financial benefits to help offset the initial investment:

1. **Landfill Beneficial Use Projects:** Implementation of an Advanced GCCS supports and improves operations at a landfill's beneficial use project, including renewable natural gas (RNG), LFG to electricity, or other products derived from LFG. An Advanced GCCS

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increases visibility and control over gas quality to maximize methane recovery and further increase revenue opportunities.

2. **Support State Initiatives:** The use of Advanced GCCS at California landfills will further support statewide initiatives including SB 1440 by reducing short-lived climate pollutants and CARB's 2022 Scoping Plan for Achieving Carbon Neutrality.
3. **Voluntary Carbon Credits (VCCs):** The American Carbon Registry Methodology allows landfills to quantify emissions reductions incremental to baseline regulatory compliance creating a direct financial incentive to landfill owners and operators who utilize an Advanced GCCS to increase landfill gas collection system efficiency, increase methane capture and reduce emissions.

Conclusion

LoCI commends CARB's continued leadership in reducing landfill methane emissions and appreciates the opportunity to contribute to this vital initiative. Requiring an Advanced GCCS for underperforming sites, integrating direct methane measurement methods, and accelerating timelines for GCCS deployment will support California's goal of reducing methane emissions by 40% by 2030.

LoCI is available to provide additional input regarding the LMR and the potential impact of the considerations identified in this comment letter. We look forward to continuing to support California's goals to reduce methane and greenhouse gas emissions.

Respectfully,



Peter Quigley
CEO/Chairman

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