

**Comments for the U.S. Treasury and Internal Revenue Service’s (IRS) proposed regulations related to the 45V Credit for Production of Clean Hydrogen; Section 48(a)(15) Election To Treat Clean Hydrogen Production Facilities as Energy Property
Docket REG-117631-23**

**Submitted by:
Industrious Labs**

I. Current federal regulations do not adequately protect the public or the climate, and the 45V credit could exacerbate current issues

Poorly controlled landfills present an urgent threat to our climate and communities. As organic waste decomposes in landfills, it emits methane – a super potent greenhouse gas with about 80 times the warming power of CO₂ on a 20-year time horizon. Landfills are the third largest source of human-driven methane emissions in the United States, emitting 3.7 million metric tons of methane annually (or about 295 million metric tons CO₂e), per inventories.¹ Worse, recent aerial surveys have revealed super-emitting methane plumes at landfills across the country, with substantial under-reporting at some landfills.²

As the below evidence from the U.S. EPA itself demonstrates, MSW landfills with biomethane infrastructure have significant fugitive methane emissions. Incentivizing hydrogen production at these sites is simply not the same as actually mitigating methane emissions. It is not a substitute for the myriad of rigorous design, technology and operational methane mitigation practices that must be vigilantly executed for decades. In fact, the U.S. EPA itself acknowledges that “fugitive emissions of methane, depending upon their magnitude, can negate the climate and environmental benefits of biomethane projects.”³ Worse, the EPA LMOP program has identified “best practices” to reduce methane emissions from biomethane systems, but there are no federal regulations in place that include any of these best practices.⁴ Moreover, as proposed, the 45V credit provides a financial incentive to continue landfilling organic waste that puts more sustainable and low carbon waste management pathways, such as waste prevention and composting, at a relative disadvantage

Landfills settle, shift and leak. The intricate set of pipes and cover associated with landfills are subject to changing weather conditions, water accumulation, age, impacts of unique composition of waste, settling, and earthquakes, among other issues. That conditions are always changing means constant attention is required to manage and limit emissions. Within

¹ *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2021*. U.S. Environmental Protection Agency, 2023, <https://www.epa.gov/ghgemissions/draft-inventory-us-greenhouse-gas-emissions-and-sinks-1990-2021>; using GWP20 of 80

² “Carbon Mapper Data Portal,” *Carbon Mapper*, May 2023, <https://data.carbonmapper.org/>; Eburn Ayandele et al., *Key Strategies for Mitigating Methane Emissions from Municipal Solid Waste*, RMI, 2022, <https://rmi.org/insight/mitigating-methane-emissions-from-municipal-solid-waste/>.

³ *Renewable Natural Gas: Facility Operation Best Practices to Create a More Climate-Friendly Project*, U.S. ENV’T PROT. AGENCY (2022)., https://www.epa.gov/system/files/documents/2022-11/RNG_Operations_Guide.pdf

⁴ *Renewable Natural Gas: Facility Operation Best Practices to Create a More Climate-Friendly Project*, U.S. ENV’T PROT. AGENCY (2022)., https://www.epa.gov/system/files/documents/2022-11/RNG_Operations_Guide.pdf

the current inadequate federal regulatory framework, the 45V credits risks exacerbating methane emissions. Operators of landfills with energy devices may change operational practices in order to maximize the energy production value of the landfill gas - which increases methane emissions. They would attempt to "rehydrate" (i.e., increase the moisture content of) the accumulated waste and to reduce oxygen infiltration. Adding moisture and controlling oxygen infiltration tend to optimize methane production, as does delaying installation of the cover to let more rainfall infiltrate the wastes. That makes the operation of the engines used to produce energy more efficient and more profitable, but it also increases the amount of methane that escapes from the landfill. As it stands, the 45V program provides no guardrails to minimize methane leakage at the landfill, which in turn perpetuates the release of highly potent, planet-warming emissions. Therefore, we encourage the U.S. Treasury and IRS to adopt the landfill methane recommendations contained in the comments filed by RMI. In addition, the U.S. EPA should swiftly open a rulemaking to update federal Clean Air Act regulations, the New Source Performance Standards and Emission Guidelines, for municipal solid waste landfills.

II. U.S. EPA inspections uncover significant methane exceedances and multiple issues associated with adequate capture of gas at MSW landfills with biomethane infrastructure

As table I below outlines, U.S. EPA Clean Air Act inspection reports of municipal solid waste landfills with "biomethane infrastructure show hundreds of exceedances of the 500 ppm federal regulatory methane threshold. Worse, some cases demonstrate a significant disparity between the number of exceedances EPA inspectors found compared with surveys conducted by the landfill operator. It is important to note that the U.S. EPA is able to independently inspect a fraction of the country's MSW landfills, and therefore cannot provide the full extent of issues. Inspection reports are usually only available to the public through a public records request. These comments provide examples of obtained U.S. EPA inspection reports, but the U.S. Treasury and EPA could more easily access the EPA enforcement division's inspection reports to conduct a comprehensive review of issues found at MSW landfills with "biomethane" infrastructure. While the specific landfills discussed below would not be eligible for the 45V credit as currently designed, as it would not be the "first productive use," these examples illustrate the significant unchecked methane emissions that could arise from 45V if additional landfills are used for biomethane (or "RNG") production without strong guardrails - and regulations - in place to minimize leakage.

Table I: Summary of U.S. EPA Clean Air Act Inspections of MSW Landfills with Biomethane Infrastructure				
Landfill	Location	Landfill biomethane system description from EPA Inspection Report	EPA inspection date	Number of 500 ppm limit exceedances found by EPA

Waste Connections Seabreeze Environmental Landfill⁵	Angelton, Texas	“Gas collection is primarily through vertical wells, though horizontals are sometimes utilized when building out an area. Wells are typically installed within a year or two of waste deposition. Gas is primarily routed to a separately permitted high BTU renewable natural gas plant, owned and operated by DTE.”	March 16, 2023	61
LRI 304th Street landfill⁶	Graham, Washington	“The gas collection and control system (GCCS) routes gas to two flares and to a gas to energy plant, all on the north end of the site. Both flares are enclosed, one with a 3,000 standard cubic feet per minute (scfm) capacity, and one with a 1,500 scfm capacity. The adjacent gas-to-energy plant is run by a separate company and has three Caterpillar 3520 engines with no pre-treatment and a capacity for roughly 1650 scfm in total. Recent total collected flows from the Landfill have been in the 4,200 to 4,300 scfm range.”	June 28, 2022	38
McCommas Bluff Landfill⁷	Dallas, Texas	“The site currently contains over 500 active wells. In addition to the wells, 4 of the 11 leachate risers are incorporated into the GCCS from collection piping originating at the respective leachate riser cleanouts. LFG captured by the GCCS is routed offsite to Dallas Clean Energy McCommas Bluff (“Gas Treatment Plant”), a gas treatment plant that is owned and operated in a public-private partnership with	September 23- 24, 2021	15 (Note: Notice of Violation, September 2023)

⁵ CLEAN AIR ACT INSPECTION REPORT, Waste Connections Seabreeze Environmental Landfill, U.S. ENV'T PROT. AGENCY (2023).

https://drive.google.com/file/d/1EpXh0B4xnoC6HUhAeACIPeesSoYRDnTm/view?usp=drive_link

⁶ CLEAN AIR ACT INSPECTION REPORT, LRI 304th Street Landfill, U.S. ENV'T PROT. AGENCY (2022).

https://drive.google.com/file/d/1x2IEO9IKC7VoUHyoWp-uS5HW6gmlnFbE/view?usp=drive_link

⁷ CLEAN AIR ACT INSPECTION REPORT McCommas Bluff Landfill, U.S. ENV'T PROT. AGENCY (2021).

https://drive.google.com/file/d/1ThZJ-ULC35IQHY4b3zgfBnU3bPUemGFW/view?usp=drive_link and NOTICE OF VIOLATION, McCommas Bluff Landfill, U.S. ENV'T PROT. AGENCY (2023).

https://drive.google.com/file/d/1IYZbxm9_aulOuTJpBZatHrEiwR5bji2K/view?usp=drive_link

		Energy Power Partners, LLC (“EPP”). Treated gas is then supplied for sale through a pipeline interconnect into the local gas utility distribution network.”		
Waste Management Atascocita Landfill⁸	Humble, Texas	“The gas collection and control system presently contains approximately 415 gas collection Points. The Landfill has typically been collecting approximately 5,500 to 6,500 scfm of gas over the past few years. Gas is routed either to on-site flares or to a renewable natural gas (RNG) plant owned/operated by Montauk Energy.”	March 15, 2023	75
Republic Services McCarty Road Landfill⁹	Houston, Texas	“The gas collection and control system (GCCS) contains approximately 500 wells. All collected gas goes to a common header, and all gas collection is active. Typical collection is in the range of approximately 9000 to 9500 standard cubic feet per minute (scfm) normalized to 50% methane. Collected gas goes to a blower/flare system. Connections from the blower can discharge to two separate renewable natural gas (RNG) plants, and gas volumes beyond what the plants accept is flared off.”	March 14, 2023	55
Roosevelt Landfill¹⁰	Roosevelt, Washington	“The gas collection and control system (GCCS) contains 260 landfill gas (LFG) collection points, of which approximately 60% are vertical, 20% are horizontal, and 20% are	June 28, 2022	16

⁸ CLEAN AIR ACT INSPECTION REPORT, Atascocita Landfill, U.S. ENV’T PROT. AGENCY (2023).

https://drive.google.com/file/d/1SBvo8wtoD1HXfWg2wNGzWKS9dIFQ4NcN/view?usp=drive_link

⁹CLEAN AIR ACT INSPECTION REPORT, McCarty Road Landfill, U.S. ENV’T PROT. AGENCY (2023).

<https://drive.google.com/file/d/1x2IEO9IKC7VoUHyoWp-uS5HW6gmlnFbE/view?usp=sharing>

¹⁰CLEAN AIR ACT INSPECTION REPORT, Roosevelt Regional Landfill, U.S. ENV’T PROT. AGENCY (2022).

https://drive.google.com/file/d/1DFIUaDEzk1MINDJ6fKHjITmnrRBVbkMm/view?usp=drive_link

		dual collectors in the leachate system. Collected LFG is routed to the HW Hill Renewable Natural Gas (RNG) Plant owned and operated by Klickitat County Public Utility District #1. Over 95% of collected LFG is routed to the RNG Plant, with LFG routed to the Landfill's flares”		
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The 2023 U.S. EPA inspection of the Waste Management Atascocita Landfill in Humble, Texas revealed 75 exceedances of the federal 500 ppm methane limit. As the report details, multiple issues were found:

“The EPA inspectors flagged 75 points above 500 ppm methane. 44 exceedances were at penetrations, 31 exceedances were not in association with penetrations. All but two of the exceedances had confirmation measurements and included measurements within 5 to 10 centimeters of the landfill surface. The two remaining locations were points of intermittent venting of landfill gas from the tops of wells: in one case a sump missing a cover cap, and the other from the pneumatic dewatering pump. The bulk of the exceedances were found at wellheads, areas of erosion, exposed waste, or leachate risers. Multiple exceedances were in bubbling ponded liquids. Some of the leachate risers appeared to be the source of relatively large amounts of leaking landfill gas, with significant odors and high readings measured at multiple feet away from the risers. The exceedances at the risers were all measured within 5-10 cm of the surface in addition to from the risers directly. EPA observed erosion gulleys, leachate breakouts, and exposed waste on the North Hill.”¹¹

The 2023 EPA Clean Air Act inspection of the Waste Connections Seabreeze Environmental Landfill in Angelton, Texas included a surface emissions monitoring survey of only part of the facility, and monitoring ended early due to the arrival of rain. Yet even a partial monitoring revealed 61 exceedances of the surface methane standard, all of which were confirmed by the SCS technicians, contracted by the landfill operator. The EPA’s inspection report stated the following concerns:

“Concerns:

- “EPA observed erosion and exposed waste over much of the survey area
- “EPA found a significantly higher rate of surface exceedances in the survey area than had been documented in recent SEM surveys
- “EPA expressed concern that because high grass is something that could be readily resolved by the Facility in preparation for surface monitoring that it should

¹¹ CLEAN AIR ACT INSPECTION REPORT, *Atascocita Landfill*, U.S. ENV’T PROT. AGENCY (2023). Page 4. https://drive.google.com/file/d/1SBvo8wtoD1HXfWg2wNGzWKS9dIFQ4NcN/view?usp=drive_link

not be cited as a dangerous area exempt from monitoring, and that it has not seen that practice at other landfills in similar climates.”¹²

The EPA Clean Air Act inspection at the LRI 304th Street Landfill near Tacoma Washington detected explosive concentrations of methane, despite the landfill’s failure to detect the same.¹³ Concerns outlined in the inspection report include the following:¹⁴

“Concerns:

- “EPA, again, detected significantly more exceedances of the surface methane standard than past reported SEM surveys on site, even with minimal surveying of Cell 6, no surveying of Cell 3, and the restoration of gas collection in areas that had none during the September inspection.
- “The northeast corner (Cell 1) is an area lacking gas collection devices, with repeated points of exceedance.
- “The tarped area around the meeting of Cells 2B, 3A, 5, and 6 appeared to be visibly inflated with landfill gas, with explosive levels of gas being measured coming out of it, indicating both an environmental concern and a safety hazard.
- “It was not clear how Waste Connections is ensuring sufficient density / adequate coverage in its gas collection system.”

Image A reproduces one of many photographs included in the LRI 304th Street Landfill inspection report, showing both the gas inflation of the tarp and the location of an impressively large methane exceedance.

Image A: LRI 304th Street Landfill: Tarp edge by culvert, sections showing inflation at top: 9,000 methane ppm reading found (reading taken at 1' in air), strong odor¹⁵

¹² *CLEAN AIR ACT INSPECTION REPORT, Waste Connections Seabreeze Environmental Landfill, U.S. ENV'T PROT. AGENCY (2023).*

https://drive.google.com/file/d/1EpXh0B4xnoC6HUhAeACIPeesSoYRDnTm/view?usp=drive_link

¹³ *CLEAN AIR ACT INSPECTION REPORT Waste Connections LRI-304th St Landfill, Graham, WA, U.S. ENV'T PROT. AGENCY (2022).*

¹⁴ *Id.* at 7.

¹⁵ *CLEAN AIR ACT INSPECTION REPORT Waste Connections LRI-304th St Landfill, Graham, WA, U.S. ENV'T PROT. AGENCY (2022), attachment 20220502_112327.*



The Roosevelt Landfill in Washington reported no methane exceedances, while the EPA reported sixteen, many significantly higher than the exceedance limit.¹⁶ As the EPA inspection report states, “despite Republic having never found any SEM exceedances in its past 5 years of quarterly monitoring, including a full year of checking all penetration points, EPA identified sixteen points in exceedance of 500 ppm, including five points above 10,000 ppm, indicating potential concerns with Republic’s SEM/Method 21 procedures.¹⁷ Image B reproduces one of the EPA Inspection photographs, showing the landfill gas inflating a tarped area.

Image B: Roosevelt Landfill: Tarped area visibly inflated with landfill gas¹⁸

¹⁶ CLEAN AIR ACT INSPECTION REPORT REPUBLIC SERVICES ROOSEVELT REGIONAL LANDFILL, ROOSEVELT, WA, U.S. ENV’T PROT. AGENCY 6 (July 11, 2022).

¹⁷ *Id.* at 6.

¹⁸ CLEAN AIR ACT INSPECTION REPORT REPUBLIC SERVICES ROOSEVELT REGIONAL LANDFILL, ROOSEVELT, WA, U.S. ENV’T PROT. AGENCY 6 (July 11, 2022)., attachment 20220502_142517.pdf



The final example is the McCommas Bluff Landfill in Dallas, Texas, which is owned by the city of Dallas. The EPA inspected McCommas Bluff Landfill on September 23 and 24, 2021, and after further investigation, sent a Notice of Violation to the Landfill in September 2023, that included 12 counts, such as, “There may be extended periods of time where LFG generated by the Landfill is not collected and controlled by the GCCS”; “There are uncollected emissions of LFG at the perimeter of the landfill due to subsurface gas migration;” “There are inconsistencies between the landfill’s recorded gas flow rate and the maximum capacity of the Gas Treatment Plant according to the GCCS design plan.”¹⁹

As these U.S. EPA inspections show, biomethane production from landfills is not a substitute for the myriad operational design, practices and technology deployment that is needed for decades to actually reduce methane emissions from landfills.

III. Imperative to do no harm and achieve

As you know, methane also contributes to ozone and particulate matter pollution, harming respiratory, reproductive, and cardiovascular health. Accordingly, methane from landfills poses a sinister threat to communities—particularly the most vulnerable members—and the global climate. We encourage the U.S. Treasury and IRS to adopt the landfill methane recommendations contained in the comments filed by RMI. In addition, the U.S. EPA should swiftly open a rulemaking to update federal Clean Air Act regulations, the New Source Performance Standards and Emission Guidelines, for municipal solid waste landfills. With unchecked methane emissions getting worse every day, we urge the U.S. Treasury and IRS to design a 45V Tax Credit that does not make the problem worse. Thank you for taking the time to review these comments.

¹⁹ NOTICE OF VIOLATION, *McCommas Bluff Landfill*, U.S. ENV’T PROT. AGENCY (2023). https://drive.google.com/file/d/1IYZbxm9_aulOuTJpBZatHrEiwR5bji2K/view?usp=drive_link