

# Performance Standard Supplemental Description

## GREENHOUSE GAS EMISSIONS REDUCTION METHODOLOGY FOR LANDFILL GAS DESTRUCTION AND BENEFICIAL USE PROJECTS

VERSION 2.0

2023-10-03

### Introduction

ACR's Methodology for the Quantification, Monitoring, Reporting, and Verification of Greenhouse Gas Emissions Reductions and Removal from Landfill Gas Destruction and Beneficial Use Projects, v2.0 (LFG methodology) enables the issuance of carbon credits to projects in the United States and U.S. territories that collect landfill gas (LFG) that would have otherwise been vented to the atmosphere and combust or beneficially utilize the gas via an eligible project activity.<sup>1</sup> The climate benefits of projects developed under this methodology are additional to what would have occurred under a business-as-usual scenario, current laws and regulations, and current industry practices, and without carbon market incentives. To demonstrate that the activities eligible under the LFG methodology are not common practice, ACR established a performance standard by evaluating penetration levels for LFG project activities in the U.S.

This supplemental description of the performance standard aligns with and complements the LFG methodology. It is intended to supply additional details to interested parties about the sources consulted and analysis performed during methodology development to support the performance standard established therein. ACR was inspired to publish this document to provide even more transparency on a core component of the methodology and principle of the ACR Program. Project Proponents and Validation and Verification Bodies do not need to consult this supplemental when performing the work of developing and validating/verifying projects under the methodology.

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<sup>1</sup> See the eligible LFG activities listed in Table 1 of the LFG methodology.

## LFG Methodology Performance Standard

The LFG methodology establishes performance standards for the following eligible activities.

- The installation and operation of a gas collection and control system (GCCS) through:
  - ◆ The destruction of landfill gas in an open or enclosed flare;
  - ◆ The conversion of landfill gas in a turbine, boiler, or generator to energy;
  - ◆ The enhancement of landfill gas for injection into a natural gas pipeline; and/or,
  - ◆ The enhancement of landfill gas for use in fleet vehicles, trucks, and cars.
- The installation of an automated collection system (ACS) that increases landfill gas collection efficiency above that obtained with standard collection methods with methane destruction, conversion, or enhancement occurring in any of the above “project activities.”

For these activities to qualify as additional under the LFG methodology, projects must either exceed the performance standard defined in the methodology and pass a regulatory additionality test or pass ACR’s three-prong additionality test (which, as a first step, includes a regulatory surplus test). The LFG methodology establishes practice-based performance standards developed by evaluating the penetration rates of these LFG project activities and concludes that, based on low penetration rates, any LFG project that employs these activities and meets the eligibility and other requirements of the methodology is additional.<sup>2</sup>

## Penetration Rates for Practice-Based Performance Standard for GCCS Projects

While past landfill gas carbon offset protocols have been predicated upon a low penetration rate for LFG GCCS nationally, the number of voluntary landfill gas projects has steadily increased to the point where a national, practice-based performance standard is no longer applicable. However, based on analysis of the U.S. EPA Landfill Methane Outreach Program (LMOP) database<sup>3</sup> along with assistance from several state or local permitting authorities, ACR examined landfill characteristics and identified the following criteria to be associated with low penetration rates for non-ACS LFG projects.

- Landfills that were currently open or had closed within the last five (5) years.<sup>4</sup>
- Landfills that either:

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<sup>2</sup> See the eligible activities and general eligibility requirements listed in Section 1.1 and Section 1.2 of the LFG methodology, respectively.

<sup>3</sup> U.S. EPA. LMOP Database. <https://www.epa.gov/lmop/lmop-landfill-and-project-database>.

<sup>4</sup> It should be noted that recently closed landfills may generate enough landfill gas to facilitate a project which is why candidate landfills closed in the last 5 years were included.

- ◆ Are located in non-arid counties (defined as counties with more than 25 inches of precipitation historically)<sup>5</sup> with equal to or less than 500,000 tons of waste in place (WIP); or,
- ◆ Are located in arid counties (defined as counties with less than 25 inches of precipitation historically)<sup>6</sup> with equal to or less than 1,500,000 tons of WIP.
- Landfills that are not subject to U.S. EPA New Source Performance Standard (NSPS) or Emission Guidelines (EG) or other state/local requirements to install and operate a GCCS.

Table 3 of the LFG methodology shows the number of candidate landfills meeting these criteria and the landfills with a voluntary GCCS. The same table is presented below.

**Table 1: Penetration Rate of Candidate Landfills**

|   | NON-ARID       | ARID             |
|---|----------------|------------------|
| <b>WIP Limit</b>                                  | <b>500,000</b> | <b>1,500,000</b> |
| <b>Candidate Landfills</b>                        | 90             | 92               |
| <b>Candidates Landfills with a Voluntary GCCS</b> | 13             | 12               |
| <b>Percent Adoption</b>                           | 14.44%         | 13.04%           |

The low penetration rates demonstrate that the installation and operation of a GCCS is not common practice at landfills in the U.S. that meet the above criteria. As a result of the analysis and findings described above, the LFG methodology concludes that, based on low penetration rates, any non-ACS LFG project at such a landfill that meets the eligibility and other requirements of the methodology is additional.

### **Penetration Rates for Practice-Based Performance Standard for ACS Projects**

For landfills subject to a U.S. EPA NSPS (e.g., 40 CFR 60, Subpart XXX) or EG (e.g., 40 CFR 62, Subpart 000) that have reached or exceeded a non-methane organic compounds (NMOC) emission threshold or subject to another federal, state, or local rule or regulation, no carbon credits may be claimed once the landfill is required to install a GCCS. However, these landfills can participate in a voluntary carbon credit program if an ACS is voluntarily used which increases gas collection system efficiency above the baseline scenario.

<sup>5</sup> U.S. EPA. AP 42, Fifth Edition, Volume I, Chapter 2: Solid Waste Disposal (1998). Precipitation zones defined in Section 2.4.4.1. <https://www3.epa.gov/ttnchie1/ap42/ch02/>.

<sup>6</sup> Ibid.

According to the EPA LMOP database,<sup>7</sup> there were approximately 500 large landfills in the country as of the spring of 2020, where most are NSPS- or EG-regulated and where most couple their GCCS with beneficial use projects. Table 4 of the LFG methodology shows the number of these beneficial use projects and the landfills with an ACS. The same table is presented below.

**Table 4: Penetration Rate of Automated Collection Systems**

|                       | LANDFILL GAS TO PIPELINE PROJECTS | LANDFILL GAS TO ELECTRICITY PROJECTS |
|-----------------------|-----------------------------------|--------------------------------------|
| CURRENT PROJECTS      | 65                                | 400                                  |
| LANDFILLS WITH AN ACS | 9                                 | 0                                    |
| PERCENT ADOPTION      | 13.84%                            | 0%                                   |

The low penetration rates demonstrate that the installation and operation of an ACS is not common practice at landfills in the U.S. Adoption rates are expected to remain low in the near future due to the cost of the new ACS versus the value of the electricity being generated in landfill gas to electricity markets.<sup>8</sup>

As a result of the analysis and findings described above, the LFG methodology concludes that, based on low penetration rates, any LFG ACS project that meets the eligibility and other requirements of the methodology is additional.

### Eligible LFG Project Activities Excluded from the Performance Standard

For non-ACS LFG projects that are located at landfills above the applicable WIP threshold for their geographic region and, therefore, do not automatically qualify under the practice-based performance standard, the LFG methodology allows the additionality of such project activities to be assessed on a case-by-case basis. For these activities to qualify as additional under the LFG methodology v2.0, projects must pass a three-pronged test to demonstrate that they exceed currently effective and enforced laws and regulations, exceed common practice in the relevant industry sector and geographic region, and face a financial implementation barrier. This three-pronged approach is further detailed in Section 3.2.2 of the LFG methodology and the ACR Standard.

<sup>7</sup> U.S. EPA. LMOP Database. <https://www.epa.gov/lmop/lmop-landfill-and-project-database>.

<sup>8</sup> Dataset is specific to only Loci Controls' projects because they were the only company with commercial ACS at the time.