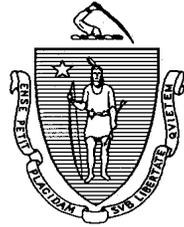


Regional Greenhouse Gas Initiative
CO₂ Budget Trading Program



Massachusetts
Department of Environmental Protection

Massachusetts CO₂ Budget Trading Program

Offset Project Consistency Application
Instruction Packet

Landfill Methane Capture and Destruction

Version 1.0

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1. Overview

To demonstrate that a landfill methane capture and destruction project qualifies for the award of carbon dioxide (CO₂) offset allowances, a Project Sponsor must submit to the Massachusetts Department of Environmental Protection (MassDEP) in accordance with these instructions, a fully completed *Massachusetts Offset Project Consistency Application – Landfill Methane Capture and Destruction Version 1.0 (Consistency Application)*, including the coversheet and all forms and related attachments. An incomplete *Consistency Application* will not be reviewed to determine consistency. Following these instructions will ensure that the *Consistency Application* contains all necessary information and is submitted properly.

Each Project Sponsor should review the Massachusetts CO₂ Budget Trading Program regulations, 310 CMR 7.70(10), for information regarding offset projects located in Massachusetts and the award of CO₂ offset allowances. All Massachusetts offset application materials and other documents are available at <http://www.rggi.org/offsets>.

Before the *Consistency Application* can be completed, the Project Sponsor must establish a general account and obtain an offset project ID code through the Regional Greenhouse Gas Initiative (RGGI) CO₂ Allowance Tracking System (COATS). The Project Sponsor identified in the *Consistency Application* must be the same as the Authorized Account Representative for the RGGI COATS general account identified in the Massachusetts *Consistency Application*. For information about establishing a RGGI COATS general account and offset project ID code, consult the RGGI COATS User's Guide, available at <http://www.rggi-coats.org>.

Key eligibility dates and application submittal requirements for offset projects are as follows:

- For offset projects commenced between December 20, 2005 and December 31, 2008, the *Consistency Application* must be submitted by June 30, 2009.
- For offset projects commenced on or after January 1, 2009, the *Consistency Application* must be submitted within six (6) months after the project is commenced.
- For an offset project located solely in one (1) participating state, the *Consistency Application* must be filed with the appropriate regulatory agency in that state.
- For an offset project located in more than one (1) participating state, the *Consistency Application* must be filed in the participating state where the majority of the CO₂-equivalent (CO₂e) emissions reduction or carbon sequestration due to the offset project is expected to occur.

2. Submission Instructions

The Project Sponsor should submit the completed *Consistency Application*, and all attachments, via RGGI COATS at <http://www.rggi-coats.org> as described above. For information about submitting a *Consistency Application* via RGGI COATS, consult the RGGI COATS User's Guide, available at <http://www.rggi-coats.org>.

The *Consistency Application* has three (3) parts, as described below. Each part comprises specified forms and required documentation. The *Consistency Application* has been created as a Microsoft Word document with editable fields. Enter information directly into the fields provided or submit information or documentation as an attachment, as directed. Include headers on all attachments indicating the form to which each is attached, the offset project name, and offset project ID code. If attachments are being submitted as separate electronic documents, please include the form numbers in the file names of the documents.

When submitting documents electronically via RGGI COATS, it is not necessary to submit a scanned or paper hardcopy of the application forms. The Project Sponsor must retain the completed original copy of the *Consistency Application* with the original signed documents. MassDEP reserves the right to request the original signed application documents at any time.

A completed hardcopy and/or CD of the *Consistency Application* may also be mailed to: Climate Strategies Group, Massachusetts Department of Environmental Protection, Bureau of Waste Prevention, 6th Floor, One Winter Street, Boston, MA 02108-4747.

Questions about this form and how to submit it should be directed to climate.strategies@state.ma.us or 617-574-6815.

3. Consistency Application Forms

The *Consistency Application* includes nine (9) forms divided into three (3) parts, as follows:

Part 1. General Information Forms

- Form 1.1 – Coversheet
- Form 1.2 – General Information
- Form 1.3 – Attestations
- Form 1.4 – Project Sponsor Agreement
- Form 1.5 – Disclosure of Greenhouse Gas Emissions Data Reporting

Part 2. Category-Specific Information and Documentation Forms

- Form 2.1 – Project Description
- Form 2.2 – Demonstration of Eligibility
- Form 2.3 – Monitoring and Verification Plan

Part 3. Independent Verification Form

- Form 3.1 – Independent Verifier Certification Statement and Report

The following instructions address each of the forms in numerical order. Note that the forms themselves include many embedded instructions.

Part 1. General Information Forms

The five (5) forms in Part 1 of the *Consistency Application* address general requirements applicable to landfill methane capture and destruction offset projects. Instructions for the Part 1 forms are provided below.

Form 1.1 Coversheet

Enter the requested information in the editable text fields in the form.

Check the boxes to indicate which forms are being submitted. For information about entering the Project Sponsor (RGGI COATS Authorized Account Representative), offset project name and offset project ID code, and RGGI COATS account name and number, see instructions below for Form 1.2, General Information.

Submit all forms including the Coversheet. If a required form is not submitted, the *Consistency Application* will not be considered complete for commencement of review by MassDEP.

Form 1.2 General Information

Enter the requested information in the editable text fields in the form. If a text field is not applicable or is unanswerable, enter "NA." Note the following:

Offset Project ID Code: Enter the offset project ID code. The offset project ID code is the alphanumeric code generated when the Project Sponsor creates a record of the offset project in RGGI COATS. See the RGGI COATS User's Guide for more information about creating an offset project record in RGGI COATS, available at <http://www.rggi-coats.org>.

Project Information: Enter project information. The name of the offset project should be the same name entered by the Project Sponsor when creating a project record in RGGI COATS. The project location entered should be the primary location of the project if the project consists of actions at multiple locations. The summary narrative of the project should indicate all locations where project actions occur or will occur.

Project Sponsor: Identify the Project Sponsor and provide his or her contact information. The Project Sponsor is the natural person who is the Authorized Account Representative for the RGGI COATS general account identified in the *Consistency Application*.

Project Sponsor Organization: Provide the full legal name of the organization the Project Sponsor represents, including any alternative names under which the organization also may be doing business (e.g., John Doe Enterprises, Inc., d/b/a JDE). If the Project Sponsor is representing himself or herself as an individual, enter "NA".

RGGI COATS General Account Name and Number: Enter the RGGI COATS general account name and number. The RGGI COATS general account identified in the *Consistency Application* is the RGGI COATS account into which any awarded CO₂ offset allowances related to the offset project will be transferred.

Form 1.3 Attestations

Sign and date the form. Submit the form via RGGI COATS as directed in the submittal instructions above. Note that the Project Sponsor must retain the completed original copy of the *Consistency Application* and attachments with all original signed documents. MassDEP reserves the right to request the original signed application documents at any time.

If the offset project includes an electric generation component, any and all attribute credits generated by the offset project that may be used for compliance with a renewable portfolio standard (RPS) or other regulatory requirement (other than awarded CO₂ offset allowances), must be transferred to MassDEP. If applicable, attach a copy of the Attribute Credit Transfer Agreement to this form. The attached agreement must include a header that indicates the transfer agreement is attachment to Form 1.3 and includes the offset project name and offset project ID code. If attachments are being submitted as separate electronic documents, please include the form number in the file name of the document.

Form 1.4 Project Sponsor Agreement

Sign and date the form. Submit the form via RGGI COATS as directed in the submittal instructions above. Note that the Project Sponsor must retain the completed original copy of the *Consistency Application* and attachments with all original signed documents. MassDEP reserves the right to request the original signed application documents at any time.

Form 1.5 Disclosure of Greenhouse Gas Emissions Data Reporting

Check the appropriate box in the form to indicate whether greenhouse gas emissions data related to the offset project have been or will be reported to any voluntary or mandatory programs, other than the Massachusetts CO₂ Budget Trading Program. For each program for which data have been or will be reported, provide the program name, the program type (voluntary or mandatory), program contact information (website or street address), the categories of emissions data reported, the frequency of reporting, when the reporting began or will begin, and reporting status (prior, current, future). The Project Sponsor must disclose future reporting related to current commitments made to voluntary programs as well as future reporting mandated by current statutes, regulations, or judicial or administrative orders.

Part 2. Category-Specific Information and Documentation Forms

The three (3) forms in Part 2 of the *Consistency Application* address category-specific requirements and documentation for landfill methane capture and destruction offset projects. Instructions for the Part 2 forms are provided below.

Form 2.1 Project Description

Attach a detailed narrative of the actions to be taken as part of the offset project. The attached narrative must include a header that indicates it as an attachment to Form 2.1 and identifies the offset project name and offset project ID code. If attachments are being submitted as separate electronic documents, please include the form number in the file name of the document. The narrative must include the following information:

1. Type of Project. Indicate the type of project:
 - a. Flaring offset project – Landfill employs an active gas collection system. The flaring system can utilize either an open or enclosed flare.
 - b. Electricity generation offset project – Landfill gas is used as a fuel for internal combustion engines, gas turbines, or boilers to produce electricity.
 - c. Direct-use offset project – Landfill installs a system that enables an end user to utilize collected landfill gas for direct use as a valuable fuel source.
2. Project Owner and Operator Information. Provide organization legal name(s), point(s) of contact information, and physical address for the offset project owner and offset project operator. Provide organization legal name, point(s) of contact information, and physical address for the parent company if the owner or operator is a subsidiary.
3. Landfill Location and Specifications. Provide the following information and include as an appendix to the narrative a copy of the Massachusetts and local (if applicable) operating permit or certificate for the landfill where the offset project and landfill gas collection system are located:
 - a. Landfill location (city, state, zip code) and site I.D. number from the Massachusetts and local (if applicable) operating permit or certificate ;
 - b. Types of waste accepted (municipal solid waste, non-hazardous sludge, industrial waste, construction and demolition debris, medical waste, or specify other) as stated in the Massachusetts and local (if applicable) operating permit or certificate
 - c. Opening year from Massachusetts and local (if applicable) operating permit or certificate;
 - d. Closing year (if applicable) or estimated date of closure from Massachusetts and local (if applicable) operating permit or certificate or approved closure plan;
 - e. Total design waste capacity (specify cubic feet or tons) from Massachusetts and local (if applicable) operating permit or certificate;

- f. Current area (specify hectares or acres) devoted to landfilling from Massachusetts and local (if applicable) operating permit or certificate , or if not available, from contour maps and filling plans;
 - g. Average waste depth (in feet) from Massachusetts and local (if applicable) operating permit or certificate, or if not available, from contour maps and filling plans;
 - h. Total waste in place from weigh scale records, most recent Massachusetts and local (if applicable) operating permit or certificate, or other documented source;
 - i. Waste characteristics (food waste, wood, plastics, metal, paper, and specify other) represented as either percent of total mass or volume currently accepted, from weigh scale records of waste characterization and site-specific density records;
 - j. Annual quantity of accepted waste (specify cubic feet or tons) for most recent year from weigh scale records, most recent Massachusetts and local (if applicable) operating permit or certificate, or other documented source; and
 - k. Average annual rainfall for location of landfill from the National Oceanic and Atmospheric Administration's (NOAA's) National Climatic Data Center (NCDC).
4. Landfill Owner and Operator Information. Provide organization legal name(s), point(s) of contact information, and physical address for the landfill owner and landfill operator. Include organization legal name, point(s) of contact information, and physical address for the parent company if the owner or operator is a subsidiary.
5. Equipment Specifications and Technical Schematic. Provide the following offset project equipment specifications:
- a. Landfill gas collection equipment and landfill gas flow and composition monitoring equipment specifications including:
 - i. Type(s) of equipment and manufacturer(s);
 - ii. Dates of installation;
 - iii. Dates of initial calibration;
 - iv. Design landfill gas flow capacity in standard cubic feet per minute (scf/min);
 - v. Installed landfill gas flow meter accuracy; and
 - vi. Methane concentration instrument thresholds (percent by volume) and methane concentration instrument precision and accuracy levels as specified by the manufacturer.
 - b. For on-site flare projects:
 - i. Type of flare(s) (open, enclosed, or specify other) and manufacturer(s); and
 - ii. Design capacity of flare flow rate in standard cubic feet per minute (scf/min) as specified by the manufacturer.
 - c. For on-site or off-site electricity generation projects:
 - i. Type of electricity generation technology (reciprocating engine, gas turbine, cogeneration, microturbine, steam turbine, combined cycle, organic Rankine cycle, or specify other);

- ii. Make (or model), manufacturer, and date of installation of combustion unit;
 - iii. Design electricity generation capacity in units of megawatt electrical (MWe), as specified by the manufacturer;
 - iv. Heat rate of combustion in British thermal units per kilowatt hour (Btu/kWh), as specified by the manufacturer; and
 - v. Name, address, and point(s) of contact for each off-site purchaser of landfill gas.
- d. For on-site or off-site direct-use projects:
- i. Type of direct-use project (boiler, direct thermal, leachate evaporation, high-Btu quality fuel, medium-Btu quality fuel, methanol synthesis, or specify other);
 - ii. Make (or model), manufacturer, and date of installation of combustion unit;
 - iii. Pipeline length, diameter, and material type as documented by the Massachusetts and local (if applicable) operating permit or certificate; and
 - iv. Name, address, and point(s) of contact for each off-site purchaser of landfill gas.
- e. A technical schematic outlining the overall landfill gas capture and destruction system for the type of offset project (flare, electricity generation, or on-site or off-site direct use). The schematic must trace the landfill methane from source to destruction by combustion.

Form 2.2 Demonstration of Eligibility

Attach documentation, with state and federal identification numbers, as applicable, that indicates that the landfill or landfill units from which the offset project will draw landfill gas is/are not subject to federal New Source Performance Standards (NSPS) for municipal solid waste landfills, 40 CFR Part 60, Subpart Cc and Subpart WWW. The documentation should include the initial design capacity report, the current annual non-methane organic compound (NMOC) emission rate report and, if applicable, the amended design capacity report as described in the reporting requirements at 40 CFR Part 60.

Attach the results of calculations of estimated NMOC emissions in megagrams per year (Mg/yr) for the most recent year available, including supporting data and calculations performed in accordance with the test methods and procedures specified at 40 CFR Part 60, Subpart WWW 60.754.

Each attachment must include a header that indicates it is an attachment to Form 2.2 and includes the offset project name and offset project ID code. If attachments are being submitted as separate electronic documents, please include the form numbers in the file names of the documents.

In the editable text fields in the form, enter the estimated date that the landfill will exceed the NSPS NMOC threshold, and the Tier type (i.e., Tier 1, Tier 2, or Tier 3) of emission rate estimates performed in accordance with the test methods and procedures specified at 40 CFR Part 60, Subpart WWW 60.754.

Form 2.3 Monitoring and Verification (M&V) Plan

Provide the Monitoring and Verification Plan (M&V Plan) as an attachment to Form 2.3. The M&V Plan must include a header that indicates it is an attachment to Form 2.3 and includes the offset project name and offset project ID code. If attachments are being submitted as separate electronic documents, please include the form numbers in the file names of the documents. Check the boxes to indicate that the attached M&V Plan includes required components.

The M&V Plan must include the following:

1. Procedures for Quantifying Annual CO₂-equivalent (CO₂e) Emissions Reductions. Specify the data source(s) and the calculations to be used to determine emission reductions.
2. Procedures for Quantifying Annual Volume of Methane Collected. Specify the data sources and calculations to be used for quantifying, in standard cubic feet (scf), annual volume of methane collected.
3. Procedures for Quantifying Mass of Methane per Cubic Foot of Methane. Specify whether the default value of 0.04246 pounds per standard cubic feet (lbs/scf) at 1 atmosphere and 20 degrees Celcius (°C) will be used, or specify the procedures that will be used to monitor temperature and pressure, derive an alternate representative temperature, and the data sources and value for the appropriate mass of methane (CH₄) in pounds per standard cubic feet (lbs/scf).
4. Quality Assurance/Quality Control (QA/QC) Program for Measuring Equipment. Document the QA/QC program, including the following:
 - a. Procedures for recording names and contact information for: personnel responsible for recording measurements and data entry, QA/QC managers, and third party analytical laboratory;
 - b. Procedures for designated personnel to keep landfill gas sales records (in million British thermal units (MMBtu) or standard cubic feet (scf)), electricity sales records, records of measured heat rate of combustion device if applicable, and records of newly installed equipment and retired equipment;
 - c. Procedures for annual comparison of collected methane measured by monitoring equipment with calculated methane in landfill gas used to generate electricity or sold for direct use, noting any discrepancies;
 - d. Calculation procedures for standardizing landfill gas flow that correct for documented site-specific temperature and pressure measurements. (This procedure is not necessary when using flow meters that automatically measure temperature and pressure and express landfill gas flow in standard cubic feet (scf); and
 - e. Description of the contents of an annual quality control report describing the procedures for QA/QC of landfill gas collection and monitoring equipment during the reporting period and a schedule for the annual completion of such report. The report should identify findings of quarterly reviews, issues encountered, and remedial actions taken.

5. Maintenance, Operation, and Calibration of Measuring and Monitoring Equipment. Document the protocol for maintenance, operation, and calibration of measuring and monitoring equipment, including the following:
- a. Maintenance of Measuring and Monitoring Equipment. Document the protocol that will be used to ensure that the following required actions are performed and documented:
 - i. Records are kept of landfill gas flow rate performance tests at least monthly to ensure:
 - (A) flow readings are recorded at least every 15 minutes;
 - (B) the accuracy of landfill gas flow meter readings is within +/- 5 percent of manufacturer specifications; and
 - (C) methane concentration instrument manufacturer specifications for precision and accuracy are met; and
 - ii. Maintenance schedules for landfill gas flow meter and methane concentration instrument (for permanent and/or portable equipment) are performed in accordance with manufacturer recommendations and specifications.
 - b. Operation of Measuring and Monitoring Equipment. Document the protocol that will be used to ensure that the following required actions are performed and documented:
 - i. Records are kept at least daily of collected landfill gas flow rates and methane concentration;
 - ii. Records are kept on a monthly basis of the number of hours that the landfill gas collection system was not in operation;
 - iii. Records are kept on a monthly basis of the number of hours that the combustion device (e.g., flare, boiler, electricity generation unit) was not in operation;
 - iv. Records are kept on a monthly basis of the calculation of landfill gas flow rate standardization, in standard cubic feet per day (scf/day) to correct for site-specific pressure and temperature measurements. (This procedure is not necessary when using flow meters that automatically measure temperature and pressure and express landfill gas flow in standard cubic feet (scf);
 - v. Records are kept on an annual basis of the measured heat rate of combustion of the electric generation unit(s), in British thermal units per kilowatt hour (in Btu/kWh), in accordance with manufacturer specifications for landfill gas, if applicable to the offset project; and
 - vi. Records are kept on a monthly basis of the amount of landfill gas combusted in standard cubic feet (scf) in the combustion device.
 - c. Calibration of Measuring and Monitoring Equipment. Document the protocol that will be used to ensure that the following required actions are performed and documented:
 - i. Records are kept of calibration procedures for landfill gas flow monitoring equipment as specified by the manufacturer;

- ii. Records are kept of calibration procedures for permanent methane concentration measurement equipment as specified by the manufacturer; and
 - iii. Calibration schedules for landfill gas flow meter and methane concentration instrument (for permanent and/or portable equipment) are maintained in accordance with manufacturer recommendations and specifications.
6. Records Retention. Document the recordkeeping protocol that will be used to maintain record keeping throughout the duration of the offset project, including maintenance of an electronic index of all material to be collected, and storage procedures to ensure maintenance of collected information in electronic and/or hardcopy form for the following required information:
- a. QA/QC Program for Measuring Equipment.
 - i. Names and contact information for the following:
 - (A) personnel responsible for recording measurements;
 - (B) personnel responsible for data entry;
 - (C) QA/QC managers; and
 - (D) third-party analytical laboratory; and
 - ii. Annual QA/QC reports and the associated findings and remedial actions taken; and
 - iii. Annual comparison of collected methane as measured by monitoring equipment with calculated methane used to generate electricity or landfill gas sold, if applicable to the offset project.
 - b. Maintenance of Measuring and Monitoring Equipment.
 - i. Records of all installed equipment and retired equipment related to landfill gas collection system and landfill gas combustion;
 - ii. Landfill gas flow meter performance tests for each month;
 - iii. Methane concentration instrument performance tests for each month; and
 - iv. Maintenance schedules for landfill gas flow meter and methane concentration instrument.
 - c. Operation of Measuring and Monitoring Equipment.
 - i. Landfill gas sales records (in million British thermal units (MMBtu) or standard cubic feet (scf) of methane) or electricity sales records in kilowatt hour (kWh) for each month, if applicable to the offset project;
 - ii. Landfill gas flow meter readings in at least 15 minute intervals;
 - iii. Methane concentration instrument readings in at least daily intervals;
 - iv. Landfill gas collection system operating hours for each month;
 - v. Combustion device operating hours for each month;
 - vi. Landfill gas flow meter pressure and temperature measurements for each month;

- vii. Heat rate of combustion of electric generation unit(s) for reporting year, if applicable to the offset project; and
 - viii. Methane combustion data for combustion device in at least 15 minute intervals.
- d. Calibration of Measuring and Monitoring Equipment.
- i. Calibration procedures and schedules for landfill gas flow meter and methane concentration instrument (for permanent and/or portable equipment).

Independent Verification of Landfill Gas Methane Composition. Document the process that will be used to perform annual third-party analysis of sampled landfill gas methane composition. Provide as an appendix to the M&V Plan a copy of the contract (with financial information redacted) for annual third-party laboratory analysis of sampled landfill gas using U.S. EPA-approved laboratory testing methods (e.g., see U.S. EPA Method 3C available at: <http://www.epa.gov/ttn/emc/promgate.html>). Document the protocol that will be used to ensure that the landfill gas samples will be taken at the same location as the landfill gas flow meter.

Part 3. Independent Verification Form

The form in Part 3 of the *Consistency Application* addresses the requirements and documentation related to the independent verifier certification statement and report. Instructions for the form in Part 3 are provided below.

Form 3.1 Independent Verifier Certification Statement and Report

An accredited independent verifier must sign and date the form. Attach the accredited independent verifier report. The attached verifier report must include a header that indicates it is an attachment to Form 3.1 and includes the offset project name and offset project ID code. If attachments are being submitted as separate electronic documents, please include the form numbers in the file names of the documents. Note that the Project Sponsor must retain the completed original copy of the *Consistency Application* and attachments, including the verifier's original signed documents. MassDEP reserves the right to request the original signed documents at any time. The verifier report must document the following:

1. The verifier has reviewed the entire *Consistency Application* and evaluated the contents of the application in relation to the applicable requirements of 310 CMR 7.70(10).
2. The verifier has evaluated the adequacy and validity of information supplied by the Project Sponsor to demonstrate that the offset project meets the applicable eligibility requirements of 310 CMR 7.70(10)(c) and (e).
3. The verifier has evaluated the adequacy of the M&V Plan submitted pursuant to 310 CMR 7.70(10)(e).

The verifier report must include the following contents, in the order listed below:

- Cover page with report title and date
- Table of contents
- List of acronyms and abbreviations
- Executive summary
- Description of objective of report
- Identification of the client, including name, address, and other contact information
- Identification of the offset project
- Description of evaluation criteria (applicable regulatory provisions and documentation requirements specified in *Consistency Application*)
- Description of the review and evaluation process, including any site visits and interviews
- Identification of individuals performing the verification work, including the verification team leader and key personnel, and contact information for the team leader
- Description of the materials provided to the verifier by the Project Sponsor
- Evaluation conclusions and findings, including level of assurance provided