

State Registration Number
N5986

**RENEWABLE OPERATING PERMIT
STAFF REPORT**

ROP Number
MI-ROP-N5986-2023

Republic Services of Michigan I, LLC - Carleton Farms Landfill

and

Sumpter Energy Associates at the Carleton Farms Landfill

State Registration Number (SRN): N5986

Located at

28800 Clark Road, New Boston, Wayne County, Michigan 48164

Permit Number: MI-ROP-N5986-2023

Staff Report Date: September 25, 2023

This Staff Report is published in accordance with Sections 5506 and 5511 of Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451). Specifically, Rule 214(1) of the administrative rules promulgated under Act 451, requires that the Michigan Department of Environment, Great Lakes, and Energy (EGLE), Air Quality Division (AQD), prepare a report that sets forth the factual basis for the terms and conditions of the Renewable Operating Permit (ROP).

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RENEWABLE OPERATING PERMIT

SEPTEMBER 25, 2023 - STAFF REPORT

ROP Number

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Purpose

Major stationary sources of air pollutants, and some non-major sources, are required to obtain and operate in compliance with an ROP pursuant to Title V of the federal Clean Air Act; and Michigan’s Administrative Rules for Air Pollution Control promulgated under Section 5506(1) of Act 451. Sources subject to the ROP program are defined by criteria in Rule 211(1). The ROP is intended to simplify and clarify a stationary source’s applicable requirements and compliance with them by consolidating all state and federal air quality requirements into one document.

This Staff Report, as required by Rule 214(1), sets forth the applicable requirements and factual basis for the draft ROP terms and conditions including citations of the underlying applicable requirements, an explanation of any equivalent requirements included in the draft ROP pursuant to Rule 212(5), and any determination made pursuant to Rule 213(6)(a)(ii) regarding requirements that are not applicable to the stationary source.

General Information

Stationary Source Mailing Address- Section 1:	Republic Services of Michigan I, LLC- Carleton Farms Landfill 28800 Clark Road, New Boston, Michigan 48164
Stationary Source Mailing Address- Section 2:	Sumpter Energy Associates, LLC 46280 Dylan Drive, Suite 200, Novi, Michigan 48377
Source Registration Number (SRN):	N5986
North American Industry Classification System (NAICS) Code- Section 1:	562212 – Solid Waste Landfill
North American Industry Classification System (NAICS) Code- Section 2:	221119 – Other Electric Power Generation
Number of Stationary Source Sections:	2
Is Application for a Renewal or Initial Issuance?	Renewal
Application Number:	20200009
Responsible Official- Section 1:	Richard Rolf, General Manager 810-908-6220
Responsible Official- Section 2:	Tom Judge, Senior Vice President of Operations 484-788-3788
AQD Contact - District Inspector:	Jon Lamb, Senior Environmental Quality Analyst 313-348-2527
AQD Contact - ROP Writer:	Matt Karl, Environmental Quality Analyst 517-282-2126
Date Application Received:	January 22, 2020
Date Application Was Administratively Complete:	January 22, 2020
Is Application Shield in Effect?	Yes
Date Public Comment Begins:	September 25, 2023
Deadline for Public Comment:	October 25, 2023

Source Description

Carleton Farms Landfill is in an area northwest of the intersection of Clark Road and Oakville-Waltz Road in Wayne County, just north of the border with Monroe County. The nearest residence is directly east of the facility on Clark Road.

Section 1:

Carleton Farms Landfill is owned and operated by Republic Waste Services of Michigan. The property consists of 664 acres, although only 427 acres are currently permitted for waste disposal. The landfill began accepting waste in 1993. The landfill has an overall capacity of 132,342,998 cubic yards.

Carleton Farms Landfill is classified as a Type II or Municipal Solid Waste (MSW) landfill. In Michigan, the Materials Management Division (MMD) establishes standards for Solid Waste Management. Rule 299.4104(d) defines MSW or Type II landfill as:

“A landfill which receives household waste or municipal waste incinerator ash, and which is not a land application unit, surface impoundment, injection well, or waste pile. A municipal solid waste landfill may also receive other types of solid waste, such as any of the following: construction and demolition waste, sewage sludge, commercial waste, nonhazardous sludge, hazardous waste from conditionally exempt small quantity generators, industrial waste. Such a landfill may be publicly or privately owned.”

Solid waste arrives in a variety of vehicles that potentially generate fugitive dust particulate matter (PM) emissions from interaction with the landfill's roads. After waste is transported to the landfill, it is emplaced in one of the active working areas known as cells. The deposited waste is covered with soil or other approved alternative daily cover materials (ADCM) daily. When a cell reaches its waste design capacity, it is closed, and a liner is installed, covering the waste.

Once waste is emplaced, over time, the biological processes of microbes transform waste materials and produce leachate and landfill gas (LFG). Initially, decomposition is aerobic until the oxygen supply is exhausted. During the aerobic decomposition predominately nitrogen gas and carbon dioxide (CO₂) are produced. As oxygen levels decline and become more anerobic, the decomposition process changes to produce methane (CH₄) and carbon dioxide (CO₂). Anaerobic decomposition of the buried wastes creates LFG. LFG consists mainly of methane (CH₄), carbon dioxide (CO₂), carbon monoxide (CO), hydrogen sulfide (H₂S), volatile organic compounds (VOCs) and non-methane organic compounds (NMOC). NMOC is the primary regulated air pollutant associated with LFG generation. Carleton Farms Landfill has been evaluated to generate more than 50 Mg per year (55 tons per year) of NMOC emissions.

The leachate collected from the landfill is stored in either the “east leachate tank” or the “north leachate tank”, each of which have a capacity of 500,000-gallons. The leachate stored in these tanks has a maximum true vapor pressure less than 3.5 kilopascals (kPa). The landfill has ceased using leachate recirculation in 2019 but is still approved to do so. Leachate collected is trucked off-site to Republic Industrial and Energy Solutions in Romulus for disposal via deep well injection or other approved disposal location.

The LFG is collected and controlled using an active gas collection and control system (GCCS). The GCCS has approximately 395 vertical and horizontal gas extraction wells. LFG collected from the gas extraction wells is routed via laterals to a header system. The header system sends the LFG to the Gas Treatment System for conditioning prior to being combusted as fuel for the engines described in Section 2.

The LFG Treatment System consists of two (2) identical systems, one for each phase or set of engines of the engine plant. The LFG treatment system is included under Section 1 and is owned by Carleton Farms Landfill (Republic Services of Michigan I, LLC) but is operated on a day-to-day basis by Section 2 Sumpter Energy (Nextera Energy Resources). LFG is treated by first running it through a condensate/liquid knockout sump to remove moisture from the gas. Primary filters remove larger diameter particulate matter

(PM). The LFG is then compressed using a blower system. Compressing the gas raises the temperature of the LFG, so it is passed through an air to gas cooler to lower the temperature. Lowering the temperature causes more moisture to condense, so the gas is run through a polishing and pall filter to remove residual liquid and particulate matter down to 0.3 microns in diameter (PM0.3). This treated gas is suitable to be combusted as fuel in the Section 2 engines.

The landfill also has an enclosed flare and an open flare that act as backup control devices to combust the LFG if the Section 2 engines are not in operation.

Section 2:

The Sumpter Energy LFG engines are housed in two (2) adjacent buildings known as Phase 1 and Phase 2. Phase 1 contains eight (8) engines and is permitted as FGICENGINES1-8, and Phase 2 contains six (6) engines and is permitted as FGICENGINES9-14. Both engine groups normally run concurrently, and each phase has a flow meter to monitor the flow of LFG combusted in each phase. All fourteen (14) engines are identical models: Caterpillar G3516, which is a 1138 horsepower or 800-kilowatt spark-ignited, 4-stroke lean-burn reciprocating internal combustion engine. The engines are used to turn generators that produce electricity which is sold to the DTE Energy’s electrical power grid.

The following table lists stationary source emission information as reported to the Michigan Air Emissions Reporting System (MAERS) for the year 2022.

TOTAL STATIONARY SOURCE EMISSIONS

Pollutant	Tons per Year
Carbon Monoxide (CO)	315.08
Nitrogen Oxides (NO _x)	117.39
PM10*	28.78
Sulfur Dioxide (SO ₂)	112.09
Volatile Organic Compounds (VOCs)	12.84

* Particulate matter (PM) that has an aerodynamic diameter less than equal to a nominal 10 micrometers.

The following table lists Hazardous Air Pollutant emissions as calculated for the year 2022 by the source:

Individual Hazardous Air Pollutants (HAPs) **	Tons per Year
NMOC (HAP Surrogate per 40 CFR Part 63 Subpart AAAA) - uncontrolled***	138.61
NMOC (HAP Surrogate per 40 CFR Part 63 Subpart AAAA) - fugitive***	34.65

**As listed pursuant to Section 112(b) of the federal Clean Air Act.

***Landgem output and fugitive emissions based on equation from the EGLE Supplemental Instructions for Municipal Solid Waste Landfills.

See Parts C and D in the ROP for summary tables of all processes at the stationary source that are subject to process-specific emission limits or standards.

Regulatory Analysis

The following is a general description and history of the source. Any determinations of regulatory non-applicability for this source are explained below in the Non-Applicable Requirement part of the Staff Report and identified in Part E of the ROP.

The stationary source is in Wayne County which is currently designated by the United States Environmental Protection Agency (USEPA) as an attainment area for carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO₂), particulate matter (PM₁₀ & PM_{2.5}), and an ozone attainment/maintenance area. A portion of Wayne County is currently designated by the USEPA as a non-attainment area with respect to the sulfur dioxide (SO₂) standard.

The stationary source is subject to Title 40 of the Code of Federal Regulations (CFR) Part 70 because the potential to emit of carbon monoxide (CO) and nitrogen oxides (NO_x) exceeds 100 tons per year. Additionally, the source was previously subject to 40 CFR Part 60, Subpart WWW, which required all landfills with a capacity greater than 2.5 million megagrams to obtain a Title V Renewable Operating Permit (ROP).

The potential to emit of any single HAP regulated by Section 112 of the federal Clean Air Act, is equal to or more than 10 tons per year and/or the potential to emit of all HAPs combined is equal to or more than 25 tons per year.

EUCENGINE1 through EUCENGINE14 at the stationary source were subject to review under the Prevention of Significant Deterioration regulations of CFR 52.21, because at the time of New Source Review permitting the potential to emit of carbon monoxide (CO) and nitrogen oxides (NO_x) were greater than 250 tons per year.

The stationary source was subject to the Standards of Performance for Municipal Solid Waste Landfills promulgated in 40 CFR Part 60, Subparts A and WWW. On June 21, 2021, the facility became subject to the Federal Plan Requirements for Municipal Solid Waste Landfills that commenced construction on or before July 17, 2014 and have not been modified or reconstructed since July 17, 2014 as specified in 40 CFR Part 62, Subpart OOO. Carleton Farms Landfill is considered a legacy landfill under the Federal Plan. Michigan is not currently the authorized representative and is implementing and enforcing this regulation through the ROP.

The stationary source is subject to the National Emission Standard for Hazardous Air Pollutants for Asbestos promulgated in 40 CFR Part 61, Subparts A and M. The landfill has previously accepted and still accepts asbestos containing materials. The requirements are contained within emission unit EUASBESTOS.

The stationary source is subject to the National Emissions Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills as promulgated in 40 CFR Part 63, Subparts A and AAAA. The landfill has estimated NMOC emissions greater than 50 Mg per year and is required to install and operate an active landfill gas collection and control system. This subpart did require such landfills to meet the startup, shutdown, and malfunction (SSM) requirements of 40 CFR Part 63, Subpart A, General Provisions but now the standard applies at all times. After September 28, 2021, the permittee must comply with all applicable provisions per 40 CFR 63.1930(b). The permittee has opted to comply with the provisions for the operational standards in 40 CFR 63.1958 (as well as the provisions in 40 CFR 63.1960 and 40 CFR 63.1961) for a Municipal Solid Waste Landfill with a gas collection and control system used to comply with the provisions of 40 CFR 62.16714(b) and (c).

EUCENGINE_1, EUCENGINE_2, EUCENGINE_3, EUCENGINE_4, EUCENGINE_5, EUCENGINE_6, EUCENGINE_7, EUCENGINE_8, EUCENGINE_9, EUCENGINE_10, EUCENGINE_11, EUCENGINE_12, EUCENGINE_13 and EUCENGINE_14 at the stationary source are subject to the National Emission Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines promulgated in 40 CFR Part 63, Subparts A and ZZZZ.

The monitoring conditions contained in the ROP are necessary to demonstrate compliance with all applicable requirements and are consistent with the "Procedure for Evaluating Periodic Monitoring Submittals."

No emission units have emission limitations or standards that are subject to the federal Compliance Assurance Monitoring rule pursuant to 40 CFR Part 64, because the emission limitations or standards for municipal solid waste landfills are covered by 40 CFR Part 62, Subpart OOO and 40 CFR Part 63, Subpart AAAA. The landfill gas fired engines do not have control devices.

Please refer to Parts B, C and D in the draft ROP for detailed regulatory citations for the stationary source. Part A contains regulatory citations for general conditions.

Source-Wide Permit to Install (PTI)

Rule 214a requires the issuance of a Source-Wide PTI within the ROP for conditions established pursuant to Rule 201. All terms and conditions that were initially established in a PTI are identified with a footnote designation in the integrated ROP/PTI document.

The following table lists all individual PTIs that were incorporated into previous ROPs. PTIs issued after the effective date of ROP No. MI-ROP-N5986-2015 are identified in Appendix 6 of the ROP.

PTI Number			
C-10937 through C-10941	372-06	241-10	62-01
C-11553 through C-11555	62-01A	62-01B	

Streamlined/Subsumed Requirements

This ROP does not include any streamlined/subsumed requirements pursuant to Rules 213(2) and 213(6).

Non-applicable Requirements

Part E of the ROP lists requirements that are not applicable to this source as determined by the AQD, if any were proposed in the ROP Application. These determinations are incorporated into the permit shield provision set forth in Part A (General Conditions 26 through 29) of the ROP pursuant to Rule 213(6)(a)(ii).

Processes in Application Not Identified in Draft ROP

The following table lists processes that were included in the ROP Application as exempt devices under Rule 212(4). These processes are not subject to any process-specific emission limits or standards in any applicable requirement.

Section 1:

PTI Exempt Emission Unit ID	Description of PTI Exempt Emission Unit	Rule 212(4) Citation	PTI Exemption Rule Citation
DVDIESEL1	10,000-gallon aboveground storage tank	R 336.1212(4)(d)	R 336.284(2)(g)(i)
DVDIESEL2	8,000-gallon diesel aboveground storage tank	R 336.1212(4)(d)	R 336.284(2)(g)(i)
DVDIESEL3&4	Two (2) portable 250-gallon storage tanks.	R 336.1212(4)(d)	R 336.284(2)(g)(i)
DVGASOLINE	550-gallon gasoline aboveground storage tank	R 336.1212(4)(d)	R 336.1284(2)(g)(i)

PTI Exempt Emission Unit ID	Description of PTI Exempt Emission Unit	Rule 212(4) Citation	PTI Exemption Rule Citation
DVLEACHATE1 (North)	500,000-gallon leachate aboveground storage tank	R 336.1212(3)(f)	R 336.1285(2)(aa)
DVLEACHATE2 (East)	500,000-gallon leachate aboveground storage tank	R 336.1212(3)(f)	R 336.1285(2)(aa)
DVUSED OIL1	550-gallon used oil aboveground storage tank	R 336.1212(3)(e)	R 336.1284(2)(c)
DVUSED OIL2	1,000-gallon used oil aboveground storage tank	R 336.1212(3)(e)	R 336.1284(2)(c)
DVMOTOR OIL1	1,000-gallon motor oil aboveground storage tank	R 336.1212(3)(e)	R 336.1284(2)(c)
DVMOTOR OIL2	500-gallon motor oil aboveground storage tank	R 336.1212(3)(e)	R 336.1284(2)(c)
DVHYDRAULIC	500-gallon hydraulic oil aboveground storage tank	R 336.1212(3)(e)	R 336.1284(2)(c)
FGCOLD CLEANERS	Washing tanks that use Safety Kleen as the cleaning solution (no VOC or HAPs) and no halogenated compounds.	R 336.1212(3)(b)	R 336.1281(2)(e)

Section 2:

PTI Exempt Emission Unit ID	Description of PTI Exempt Emission Unit	Rule 212(4) Citation	PTI Exemption Rule Citation
NEWOILTANK	One (1) 4,400-gallon aboveground tank of new lubricating oil.	R 336.1212(3)(e)	R 336.1284(2)(c)
USED OILTANK	One (1) 2,600-gallon aboveground tank of used lubricating oil.	R 336.1212(3)(e)	R 336.1284(2)(c)

Draft ROP Terms/Conditions Not Agreed to by Applicant

This draft ROP does not contain any terms and/or conditions that the AQD and the applicant did not agree upon pursuant to Rule 214(2).

Compliance Status

The AQD finds that the stationary source is expected to be in compliance with all applicable requirements as of the effective date of this ROP.

Action taken by EGLE, AQD

The AQD proposes to approve this ROP. A final decision on the ROP will not be made until the public and affected states have had an opportunity to comment on the AQD's proposed action and draft permit. In addition, the USEPA is allowed up to 45 days to review the draft ROP and related material. The AQD is not required to accept recommendations that are not based on applicable requirements. The delegated decision maker for the AQD is Brad Myott, Field Operations Supervisor. The final determination for ROP approval/disapproval will be based on the contents of the ROP Application, a judgment that the stationary source will be able to comply with applicable emission limits and other terms and conditions, and resolution of any objections by the USEPA.

State Registration Number
N5986

RENEWABLE OPERATING PERMIT
NOVEMBER 3, 2023 - STAFF REPORT ADDENDUM

ROP Number
MI-ROP-N5986-2023

Purpose

A Staff Report dated September 25, 2023, was developed to set forth the applicable requirements and factual basis for the draft Renewable Operating Permit (ROP) terms and conditions as required by Rule 214(1) of the administrative rules promulgated under Act 451. The purpose of this Staff Report Addendum is to summarize any significant comments received on the draft ROP during the 30-day public comment period as described in Rule 214(3). In addition, this addendum describes any changes to the draft ROP resulting from these pertinent comments.

General Information

Responsible Official- Section 1:	Richard Rolf, General Manager 810-908-6220
Responsible Official- Section 2:	Tom Judge, Senior Vice President of Operations 484-788-3788
AQD Contact - District Inspector:	Jon Lamb, Senior Environmental Quality Analyst 313-348-2527
AQD Contact - ROP Writer:	Matt Karl, Environmental Quality Analyst 517-282-2126

Summary of Pertinent Comments

No pertinent comments were received during the 30-day public comment period.

Changes to the September 25, 2023 Draft ROP

No changes were made to the draft ROP.