AIR EMISSION TEST REPORT
FOR THE
VERIFICATION OF AIR POLLUTANT EMISSIONS
FROM AN ENCLOSED FLARE AND
AN OPEN FLARE

Prepared for:

Republic Services of Michigan I, LLC – Carleton Farms Landfill
SRN N5986

Test Date: May 22, 2024

ICT Project No.: 2400123
June 18, 2024

IMPACT COMPLIANCE & TESTING

Report Certification

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Republic Services of Michigan I, LLC – Carleton Farms Landfill
New Boston, MI

Report Certification

The material and data in this document were prepared under the supervision and direction of the undersigned.

Impact Compliance & Testing, Inc.

Tyler J. Wilson
Senior Project Manager

Table of Contents

List of Tables

List of Appendices

1.0 Introduction

Republic Services of Michigan I, LLC – Carleton Farms Landfill (Republic-CFL) operates a landfill gas (LFG) enclosed flare identified as emission unit EUENCLOSEDFLARE and a LFG open flare identified as emission unit EUOPENFLARE, in New Boston, Wayne County, Michigan. The flares are fueled by LFG that is recovered from the Carleton Farms Landfill.

The State of Michigan Department of Environment, Great Lakes, and Energy – Air Quality Division (EGLE-AQD) has issued to Republic-CFL a Renewable Operating Permit (MI-ROP-N5986-2023) for operation of the facility, which consists of:

- One (1) enclosed flare identified as emission unit EUENCLOSEDFLARE; and
- One (1) open flare identified as emission unit EUOPENFLARE.

Air emission compliance testing was performed pursuant to MI-ROP-N5986-2023. Conditions of MI-ROP-N5986-2023 for EUENCLOSEDFLARE and EUOPENFLARE state:

1. *The permittee must verify the NMOC reduction efficiency or ppmv from EUENCLOSEDFLARE, by testing at owner's expense, in accordance with Department requirements…*
2. *The permittee must verify visible emissions from EUOPENFLARE, by testing at owner's expense, in accordance with Department requirements…*

The compliance testing presented in this report was performed by Impact Compliance & Testing, Inc. (ICT), a Michigan-based environmental consulting and testing company. ICT representatives Tyler Wilson and Clay Gaffey performed the field sampling and measurements on May 22, 2024.

The enclosed flare performance tests consisted of triplicate, one-hour sampling periods for non-methane organic compounds (NMOC, as non-methane hydrocarbons (NMHC)). Exhaust gas moisture and oxygen (O_2) content were determined for each test period to calculate NMOC concentrations, corrected to parts per million by volume, dry basis (ppmvd) as hexane @ 3% O_2, for comparison to the permit limit.

The open flare demonstration consisted of one (1) 30-minute observation (visible emissions) and sampling period (inlet gas sampling).

The exhaust gas sampling and analysis was performed using procedures specified in the Stack Test Protocol dated April 17, 2024, that was reviewed and approved by EGLE-AQD. Mr. Jonathan Lamb of EGLE-AQD observed portions of the compliance testing.

Questions regarding this air emission test report should be directed to:

Tyler J. Wilson
Senior Project Manager
Impact Compliance & Testing, Inc.
37660 Hills Tech Drive
Farmington Hills, MI 48331
(734) 357-8046
Tyler.Wilson@impactCandT.com

Mr. Cole Chambers
Environmental Manager
Republic Services
28800 Clark Rd.
New Boston, MI 48164
(734) 271-6147
Cchambers2@republicservices.com

2.0 Summary of Test Results and Operating Conditions

2.1 Purpose and Objective of the Tests

Conditions of MI-ROP-N5986-2023, the federal Standards of Performance 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 (40 CFR Part 62, Subpart OOO), and the federal National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills (40 CFR Part 63, Subpart AAAA) require Republic-CFL to test the enclosed flare (EUENCLOSEDFLARE) for NMOC concentration and perform an open flare demonstration for the open flare (EUOPENFLARE). EUENCLOSEDFLARE and EUOPENFLARE were tested during this compliance test event.

2.2 Operating Conditions During the Compliance Tests

The enclosed flare testing was performed while EUENCLOSEDFLARE operated at an achievable operating capacity based on the amount of LFG that was available at the time of testing. Republic-CFL representatives provided fuel use (standard cubic feet per minute, scfm) in 15-minute increments for each test period. The average LFG fuel use for EUENCLOSEDFLARE was 1,521 scfm during test periods.

LFG fuel methane content (%) and enclosed flare combustion zone chamber temperature (°F) were also recorded by Republic-CFL representatives in 15-minute increments for each test period.

Appendix 1 provides operating records provided by Republic-CFL representatives for the enclosed flare test periods.

Average LFG fuel flowrate, LFG fuel methane content, and combustion zone chamber temperature for the enclosed flare is presented in Table 2.1 and Table 6.1.

The open flare testing was performed while EUOPENFLARE operated at an achievable operating capacity based on the amount of LFG that was available at the time of testing. ICT representatives recorded fuel use (scfm) at the beginning and end of the open flare demonstration. The average LFG fuel use for EUOPENFLARE was 686 scfm during the open flare demonstration.

Average LFG fuel flowrate for the open flare is presented in Table 2.2 and Table 6.2.

2.3 Summary of Air Pollutant Sampling Results

The gas exhausted from the sampled LFG fueled enclosed flare (EUENCLOSEDFLARE) was sampled for three (3) one-hour test periods, and the open flare demonstration for EUOPENFLARE consisted of one (1) 30-minute observation (visible emissions) and sampling period (inlet gas sampling), during the compliance testing performed May 22, 2024.

Table 2.3 presents the average measured NMOC concentration for the enclosed flare (average of the three test periods).

Table 2.4 presents the average measured opacity for the open flare.

Test results for each one-hour enclosed flare sampling period and the open flare demonstration, and comparison to the permitted limits are presented in Section 6.0 of this report.

Table 2.1 Average enclosed flare operating conditions during the test periods

Enclosed Flare Parameter	EUENCLOSEDFLARE
LFG fuel use (scfm)	1,521
LFG fuel methane content (%)	44.4
Combustion zone chamber temperature (°F)	1,425

Table 2.2 Average open flare operating conditions during the compliance demonstration

Open Flare Parameter	EUOPENFLARE
LFG fuel use (scfm)	686

Table 2.3 Measured air pollutant concentrations for the enclosed flare (three-test average)

Emission Unit	NMOC (ppmvd as hexane @ 3% O_2)
EUENCLOSEDFLARE	1.31
Permit Limit	***20***

Table 2.4 Average measured opacity for the open flare

Emission Unit	Opacity
EUOPENFLARE	0%
Permit Limit	***0%****

Note: There must be no visible emissions except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.

3.0 Source and Sampling Location Description

3.1 General Process Description

Republic-CFL is permitted to operate one (1) enclosed flare (EUENCLOSEDFLARE) and one (1) open flare (EUOPENFLARE) at its facility. The units are fueled with LFG and have a natural gas pilot.

3.2 Rated Capacities and Air Emission Controls

The enclosed flare has a rated design capacity of 2,800 scfm.

The open flare has a rated design capacity of 2,200 scfm.

The enclosed flare and open flare serve as control devices for LFG at the Republic-CFL facility. The flares themselves are not equipped with add-on emission control equipment.

3.3 Sampling Locations

The enclosed flare exhaust gas is released to the atmosphere through a dedicated vertical exhaust stack with a vertical release point.

The enclosed flare exhaust stack sampling ports are located in the vertical exhaust stack, with an inner diameter of 120 inches. The stack is equipped with two (2) sample ports, opposed 90°, that provide a sampling location at least 0.5 duct diameters upstream and at least 2.0 duct diameters downstream from any flow disturbance and satisfies the USEPA Method 1 criteria for a representative sample location.

Enclosed flare sample port locations were determined in accordance with USEPA Method 1.

Appendix 2 provides a diagram of the enclosed flare emission test sampling locations with actual stack dimension measurements.

The open flare exhaust gas is released to the atmosphere through a dedicated vertical exhaust stack with a vertical release point.

The open flare has a tip diameter of 12.0 inches.

Appendix 2 provides a diagram of the open flare demonstration sampling location.

4.0 Sampling and Analytical Procedures

A Stack Test Protocol for the air emission testing was reviewed and approved by EGLE-AQD. This section provides a summary of the sampling and analytical procedures that were used during the testing periods.

4.1 Summary of Sampling Methods

EUENCLOSEDFLARE

USEPA Method 4	Exhaust gas moisture was determined based on the water weight gain in chilled impingers.
USEPA Method 3A	Exhaust gas O_2 content was determined using a paramagnetic instrumental analyzer.
USEPA Method 25A / ALT-097	Exhaust gas NMOC (as NMHC) concentration was determined using a flame ionization analyzer equipped with methane separation column.

EUOPENFLARE

USEPA Method 22, Alternative 42	Exhaust visible emissions were determined by observation of opacity.
USEPA Method 3C, Alternative 42	Inlet gas carbon dioxide (CO_2), methane (CH_4), nitrogen (N_2), and O_2 were measured by evacuated canister to determine net heating value of the inlet gas.
USEPA Method 2D, Alternative 55	Exhaust gas exit velocity was calculated by flowrate measurements of the inlet gas stream, using a recently calibrated gas meter.

4.2 Exhaust Gas O_2 Determination (USEPA Method 3A)

O_2 content in the enclosed flare exhaust gas stream was measured continuously throughout each test period in accordance with USEPA Method 3A. The O_2 content of the exhaust was monitored using a Servomex 4900 gas analyzer that uses a paramagnetic sensor.

During each sampling period, a continuous sample of the RICE exhaust gas stream was extracted from the stack using a stainless-steel probe connected to a Teflon® heated sample line. The sampled gas was conditioned by removing moisture prior to being introduced to the analyzer; therefore, measurement of O_2 concentrations correspond to standard dry gas conditions. Instrument response data were recorded using an ESC Model 8816 data acquisition system that monitored the analog output of the instrumental analyzer continuously and logged data as one-minute averages.

Prior to, and at the conclusion of each test, the instrument was calibrated using upscale calibration and zero gas to determine analyzer calibration error and system bias (described in Section 5.0 of this document). Sampling times were recorded on field data sheets.

Appendix 3 provides O_2 calculation sheets. Raw instrument response data are provided in Appendix 4.

4.3 Exhaust Gas Moisture Content (USEPA Method 4)

Moisture content of the enclosed flare exhaust gas was determined in accordance with USEPA Method 4 using a chilled impinger sampling train. Exhaust gas moisture content measurements were performed concurrently with the instrumental analyzer sampling periods. At the conclusion of each sampling period the moisture gain in the impingers was determined gravimetrically by weighing each impinger to determine net weight gain.

Appendix 5 provides moisture content calculations and field data sheets.

4.4 Measurement of NMOC (USEPA Method 25A / ALT-097)

The NMOC concentration in the enclosed flare exhaust gas stream was measured continuously throughout each test period in accordance with USEPA Method 25A / ALT-097. NMOC pollutant concentration was determined using a Thermo Environmental Instruments, Inc. (TEI) Model 55i Methane / non-methane hydrocarbon (non-methane organic compound) analyzer. The TEI 55i analyzer contains an internal gas chromatograph column that separates methane from non-methane components. The concentration of NMOC in the sampled gas stream, after separation from methane, is determined relative to a propane standard using a flame ionization detector in accordance with USEPA Method 25A.

The USEPA Office of Air Quality Planning and Standards (OAQPS) has issued an alternate test method approving the use of the TEI 55i-series analyzer as an effective instrument for measuring NMOC from LFG fueled sources (ALT-097).

Samples of the exhaust gas were delivered directly to the instrumental analyzer using the Teflon® heated sample line to prevent condensation. The sample to the NHMC analyzer was not conditioned to remove moisture. Therefore, NMOC measurements correspond to standard conditions with no moisture correction (wet basis).

Prior to, and at the conclusion of each test, the instrument was calibrated using mid-range calibration (propane) and zero gas to determine analyzer calibration error and system bias (described in Section 5.0 of this document).

Appendix 3 provides NMOC calculation sheets. Raw instrument response data for the NMHC analyzer is provided in Appendix 4.

4.5 Visual Determination of Fugitive Emissions from Material Sources and Smoke Emissions from Flare (USEPA Method 22, Alternative 42)

ICT conducted a single, 30-minute observation of the open flare exhaust for smoke emissions. ICT observed continuously for 15 minutes, then took a break for six (6) minutes, and resumed observation for another 15 minutes, to ensure completion of the full 30-minute observation period.

Field data sheets for the open flare demonstration are provided in Appendix 6.

4.6 Determination the Net Heating Value of the Landfill Gas (USEPA Method 3C, Alternative 42)

ICT used Method 3C to determine the net heating value and major gases of the LFG used as fuel for the open flare. ICT obtained two (2) 30-minute integrated gas samples (one as a duplicate) and submitted to AirTECHNOLOGY Laboratories, Inc. (AirTECH) in City of Industry, California. AirTECH analyzed the compliance sample for CO_2, CH_4, N_2, and O_2 per USEPA Method 3C. Net heating values were then calculated based on the gas CH_4 content in accordance with 40 CFR 60.754(e) for the laboratory analyzed sample.

The AirTECH analytical report is presented in Appendix 7. Net heating value calculations for the open flare inlet gas are presented in Appendix 8.

The flare inlet gas (LFG) CH_4 content was also verified on-site using a calibrated Envision 200B series prior to, and after, the laboratory samples were obtained.

4.7 Volumetric Flow Rate (USEPA Method 2D, Alternative 55)

On May 20, 2009, USEPA approved the use of a mass flow meter in place of Method 2C to measure the flow rate to a utility flare. This alternative requires a "recent" calibration for the open flare flow meter. ICT used the open flare flow meter to measure the gas flowrate directed to the open flare. The measured flowrate was then divided by the open flare unobstructed cross-sectional areas to calculate flare tip exit velocity.

5.0 QA/QC Activities

5.1 Gas Divider Certification (USEPA Method 205)

A STEC Model SGD-710C 10-step gas divider was used to obtain appropriate calibration span gases. The ten-step STEC gas divider was NIST certified (within the last 12 months) with a primary flow standard in accordance with Method 205. When cut with an appropriate zero gas, the ten-step STEC gas divider delivered calibration gas values ranging from 0% to 100% (in 10% step increments) of the USEPA Protocol 1 calibration gas that was introduced into the system. The field evaluation procedures presented in Section 3.2 of Method 205 were followed prior to use of gas divider. The field evaluation yielded no errors greater than 2% of the triplicate measured average and no errors greater than 2% from the expected values.

5.2 Instrumental Analyzer Interference Check

The instrumental analyzer used to measure O_2 has had an interference response test preformed prior to its use in the field, pursuant to the interference response test procedures specified in USEPA Method 7E. The appropriate interference test gases (i.e., gases that would be encountered in the exhaust gas stream) were introduced into the analyzer, separately and as a mixture with the analyte that the analyzer is designed to measure. The analyzer exhibited a composite deviation of less than 2.5% of the span for all measured interferent gases. No major analytical components of the analyzer have been replaced since performing the original interference test.

5.3 Instrument Calibration and System Bias Checks

At the beginning of the day of the testing program, an initial three-point instrument calibration was performed for the O_2 analyzer by injecting calibration gas directly into the inlet sample port for the instrument. System bias checks were performed prior to and at the conclusion of each sampling period by introducing the upscale calibration gas and zero gas into the sampling system (at the base of the stainless-steel sampling probe prior to the particulate filter and Teflon® heated sample line) and determining the instrument response against the initial instrument calibration readings.

At the beginning of the test day, appropriate high-range, mid-range, and low-range span gases followed by a zero gas were introduced to the NMHC analyzer, in series at a tee connection, which is installed between the sample probe and the particulate filter, through a poppet check valve. After each one-hour test period, mid-range and zero gases were re-introduced in series at the tee connection in the sampling system to check against the method's performance specifications for calibration drift and zero drift error.

The O_2 instrument was calibrated with USEPA Protocol 1 certified concentrations of O_2 in nitrogen and zeroed using hydrocarbon free nitrogen. The NMHC (NMOC) instrument was calibrated with USEPA Protocol 1 certified concentrations of propane in air and zeroed using hydrocarbon-free air. A STEC Model SGD-710C ten-step gas divider was used to obtain intermediate calibration gas concentrations as needed.

5.4 Determination of Exhaust Gas Stratification

A stratification test was performed for the enclosed flare exhaust stack. The stainless-steel sample probe was positioned at eight (8) sample points across the stack diameter. Pollutant concentration data were recorded at each sample point for a minimum of twice the maximum system response time.

The recorded concentration data for the enclosed flare exhaust stack indicated that the measured O_2 concentrations did not vary by more than 5% of the mean across the stack diameter. Therefore, the enclosed flare exhaust gas was considered to be unstratified and the compliance test sampling was performed at a single sampling location within the enclosed flare exhaust stack.

5.5 System Response Time

The response time of the sampling system was determined prior to the compliance test program by introducing upscale gas and zero gas, in series, into the sampling system using a tee connection at the base of the sample probe. The elapsed time for the analyzer to display a reading of 95% of the expected concentration was determined using a stopwatch.

Sampling periods did not commence until the sampling probe had been in place for at least twice the greatest system response time.

5.6 Methane/NMHC Separation Study

A demonstration of the TEI Model 55i methane / non-methane hydrocarbon (non-methane organic compound) separation efficiency was performed onsite. The analyzer was challenged with a Certified Standard Spec blend gas containing 995.1 ppmv methane and 11.03 ppmv non-methane compounds (specifically propane) for the demonstration. The TEI Model 55i instrumental analyzer was calibrated using certified cylinders of 2,516 ppmv methane and 84.09 ppmv propane. The blend gas was then injected into the analyzer and the measured methane and non-methane concentrations were recorded using a data logger. The measured methane concentration stabilized at 996.5 ppmv and the measured NMHC/NMOC concentration stabilized at 11.10 ppmv. The demonstrations indicate that the non-methane components (propane) did not elute with the methane (i.e., the internal column is highly efficient in separating methane and non-methane compounds).

5.7 Meter Box Calibrations

The dry gas meter sampling console used for moisture testing was calibrated prior to and after the testing program. This calibration uses the critical orifice calibration technique presented in USEPA Method 5. The metering console calibration exhibited no data outside the acceptable ranges presented in USEPA Method 5.

The digital pyrometer in the metering console was calibrated using a NIST traceable Omega® Model CL 23A temperature calibrator.

Appendix 9 presents test equipment quality assurance data (instrument calibration and system bias check records, calibration gas certifications, interference test results, meter box calibration records, and field equipment calibration records).

5.8 Open Flare Testing QA/QC Procedures

Prior to performing the sampling, the CH_4 content of the collected LFG was verified with a hand-held direct read-out instrument to verify the CH_4 concentration was greater than 40%. ICT prepared the appropriate Chain-of-Custody (COC) forms, as supplied by selected laboratory, prior to shipment of the sample SUMMA® canisters. Information on the COC included facility name, test and canister number, canister initial and final vacuum, ambient temperature and barometric pressure, and requested analytical parameters. The COC form was signed and dated by the person who conducted the sampling.

5.9 Laboratory QA/QC Procedures

ICT submitted the sample for analysis of fixed gases as outlined in USEPA Method 3C to the contract laboratory and directed the contract laboratory to follow the QA/QC procedures as described in 40 CFR 60, Appendix A, USEPA Method 3C.

The vacuum was verified by laboratory personnel upon receipt to confirm sample container integrity.

6.0 Results

6.1 Test Results and Allowable Limits

Enclosed flare operating data and air pollutant concentration measurement results for each one-hour test period are presented in Table 6.1.

Open flare operating data and compliance demonstration results are presented in Table 6.2.

The enclosed flare has the following allowable limit specified in MI-ROP-N5986-2023:

- 20 ppmvd as hexane @ 3% O_2 for NMOC.

The measured NMOC concentration for the enclosed flare / EUENCLOSEDFLARE is less than the allowable limit specified in MI-ROP-N5986-2023.

The open flare has the following allowable limit specified in MI-ROP-N5986-2023:

- 0% for opacity.

The measured opacity for the open flare / EUOPENFLARE is less than the allowable limit specified in MI-ROP-N5986-2023.

6.2 Variations from Normal Sampling Procedures or Operating Conditions

The testing for all pollutants was performed in accordance with USEPA methods and the approved Stack Test Protocol.

The testing was performed while the flares operated at an achievable operating capacity based on the amount of LFG that was available at the time of testing. No variations from normal operating conditions occurred during the test periods.

Table 6.1 Measured exhaust gas conditions and air pollutant concentrations for the enclosed flare (EUENCLOSEDFLARE)

Test No. Test Date Test Period (24-hr clock)	1 05/22/2024 0740-0840	2 05/22/2024 0857-0957	3 05/22/2024 1014-1114	Three Test Average
LFG fuel flowrate (scfm)	1,534	1,525	1,503	1,521
Combustion temperature (°F)	1,429	1,430	1,414	1,425
LFG methane content (%)	44.5	44.7	43.8	44.4
Exhaust Gas Composition				
O_2 content (% vol)	13.5	13.6	13.6	13.6
Moisture (% vol)	7.0	8.7	9.0	8.2
Non-Methane Organic Compounds				
NMOC conc. (ppmv)[1]	1.34	0.64	0.98	0.99
NMOC emissions (ppmvd as C_6)[2]	1.74	0.86	1.32	1.31
NMOC permit limit (ppmvd as C_6)[2]	-	-	-	*20*

1. Measured as non-methane hydrocarbons, as propane.
2. Parts per million by volume, dry basis (ppmvd) as hexane (C_6) @ 3% oxygen.

Table 6.2 Open flare demonstration summary (EUOPENFLARE)

Test Date: 5/22/2024 LFG Sampling Sampling Time (24-hr clock)	On-site 1100	On-site 1133	On-site 1148	Laboratory 1101-1131
CH_4 (%)	51.8	51.7	52.0	52.0
CO_2 (%)	36.5	36.9	37.9	37.0
O_2 (%)	1.1	1.1	1.2	3.5
N_2 (%)	N/A	N/A	N/A	16.0
Balance (%)	10.6	10.3	8.9	N/A

Criteria	Result	*Limit*
Visible Emissions	0 minutes	*<5 minutes during observation*
Net Heating Value	19.6 MJ/m^3	*≥7.45 MJ/m^3*
Exit Velocity	14.6 ft/s	*<60 ft/s*

Operating Conditions	Start	End	Average
LFG Fuel Use (scfm)	689	683	686

Landfill Gas Fueled Enclosed Flare
Process Operating Data

Facility: Carleton Farms Landfill
Location: New Boston, MI
Date: 5/22/2024
Unit ID: EUENCLOSEDFLARE

Date	EUENCLOSEDFLARE	Test #	Combustion Zone Chamber Temp. (°F)	Fuel Flow (scfm)	Fuel CH_4 (%)
5/22/2024	7:40	1	1,450	1,536	44.7
	7:55	1	1,432	1,535	44.4
	8:10	1	1,403	1,536	44.5
	8:25	1	1,444	1,531	44.4
	8:40	1	1,417	1,532	44.7
	Average	**1**	**1,429**	**1,534**	**44.5**

5/22/2024	EUENCLOSEDFLARE	Test #	Combustion Zone Chamber Temp. (°F)	Fuel Flow (scfm)	Fuel CH_4 (%)
	8:57	2	1,436	1,531	44.6
	9:12	2	1,417	1,530	44.9
	9:27	2	1,434	1,525	45.0
	9:42	2	1,411	1,526	44.9
	9:57	2	1,452	1,513	44.1
	Average	**2**	**1,430**	**1,525**	**44.7**

5/22/2024	EUENCLOSEDFLARE	Test #	Combustion Zone Chamber Temp. (°F)	Fuel Flow (scfm)	Fuel CH_4 (%)
	10:14	3	1,407	1,526	44.7
	10:29	3	1,424	1,504	43.8
	10:44	3	1,420	1,495	43.7
	10:59	3	1,413	1,493	43.3
	11:14	3	1,408	1,495	43.6
	Average	**3**	**1,414**	**1,503**	**43.8**

5/22/2024	EUENCLOSEDFLARE	Combustion Zone Chamber Temp. (°F)	Fuel Flow (scfm)	Fuel CH_4 (%)
	3-Test Average	**1,425**	**1,521**	**44.4**

Enclosed Flare Process Operating Data

Facility Name: Republic Services- CFL
Location: New Boston, MI
Test Date: 5/22/2024

Enclosed Flare ID: EUENCLOSEDFLARE

TEST NO. 1
Start Time: 07:40

	Fuel Use (scfm)	Fuel CH_4 (%)	Combustion Zone Chamber Temp. (°F)
0 min	1536	44.71	1450
15 min	1535	44.39	1432
30 min	1536	44.51	1403
45 min	1531	44.43	1444
60 min	1532	44.70	1417

Stop Time: 8:40

TEST NO. 2
Start Time: 0857

	Fuel Use (scfm)	Fuel CH_4 (%)	Combustion Zone Chamber Temp. (°F)
0 min	1531	44.59	1436
15 min	1530	44.85	1417
30 min	1525	45.02	1434
45 min	1526	44.9	1411
60 min	1513	44.06	1452

Stop Time: 9:57

TEST NO. 3
Start Time: 10:14

	Fuel Use (scfm)	Fuel CH_4 (%)	Combustion Zone Chamber Temp. (°F)
0 min	1526	44.66	1407
15 min	1504	43.84	1424
30 min	1495	43.69	1420
45 min	1493	43.28	1413
60 min	1495	43.62	1408

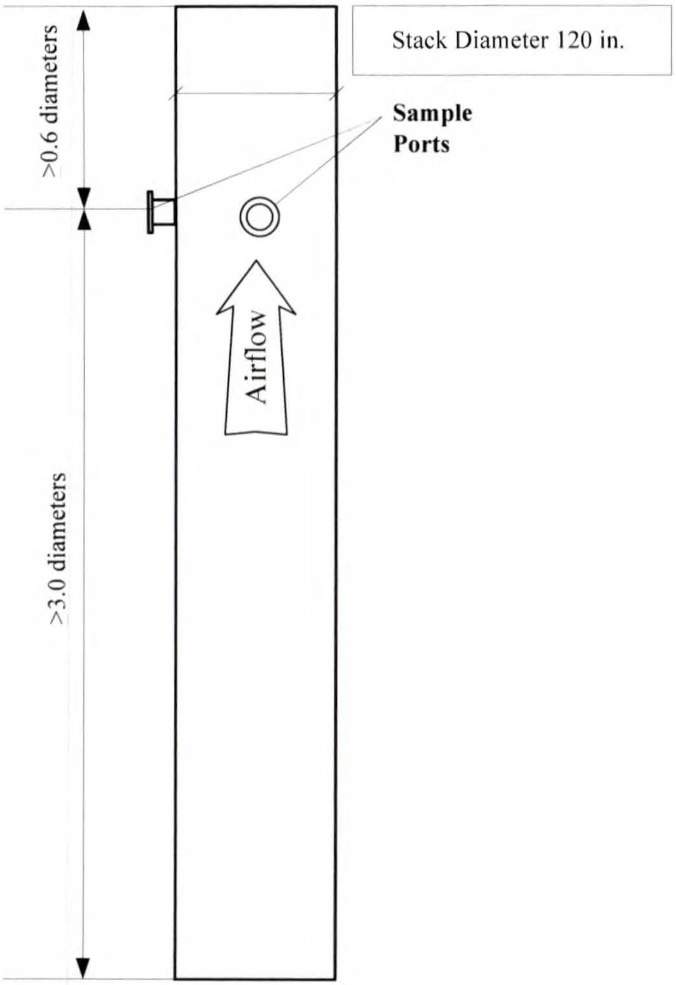
Stop Time: 11:14

Operator Initials: TK

Note - Operating hours are recorded at the beginning of the first test.

Appendix 2

- Diagrams of Sampling Locations



Enclosed Flare (EUENCLOSEDFLARE)

4/15/24 (TW)	**Republic Services of Michigan I, LLC - CFL Enclosed Flare Sampling Location Diagram**		
	Scale None	Sheet 1 of 1	IMPACT COMPLIANCE · TESTING

EUOPENFLARE

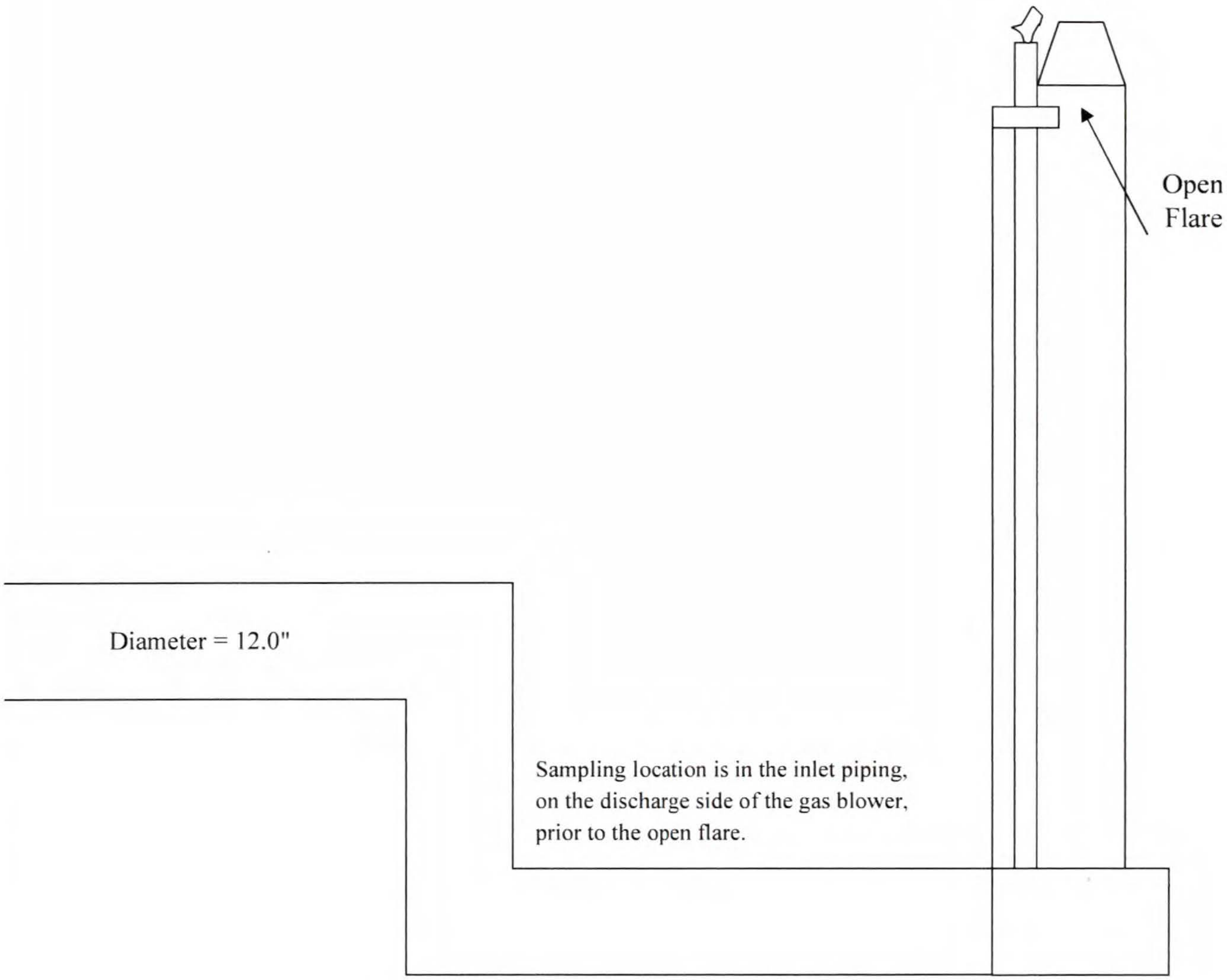


Diagram not to scale

Figure 1. Sampling location for the open flare performance demonstration to be conducted at the Republic Services of Michigan I, LLC - Carleton Farms Landfill	IMPACT COMPLIANCE & TESTING