

# **NSPS Tier II Landfill Gas Sampling Test Report**

**Prepared for:**

**Granger Waste Services:  
Grand River Landfill**



**June 23, 2021**



# Report Certification

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## NSPS Tier II Landfill Gas Sampling Test Report

### Grand River Landfill

8550 W Grand River Hwy. Grand Ledge, MI 48837

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

Impact Compliance and Testing, Inc.



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## Table of Contents

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<b>TABLE OF CONTENTS</b> .....	<b>III</b>
<b>1 INTRODUCTION</b> .....	<b>1</b>
<b>2 FIELD PROCEDURES</b> .....	<b>3</b>
<b>3 LABORATORY RESULTS</b> .....	<b>4</b>
<b>4 NMOC EMISSION RATE RESULTS AND DISCUSSION</b> .....	<b>5</b>
4.1 NMOC EMISSION RATE.....	5
4.2 NMOC EMISSION RATE DISCUSSION.....	5

### APPENDICES

**APPENDIX A TIER II LANDFILL GAS SAMPLING TEST PLAN**

**APPENDIX B LABORATORY ANALYTICAL RESULTS**

**APPENDIX C TIER II EMISSION RATE CALCULATIONS**

**APPENDIX D FIELD DATA**

## List of Tables, Figures and Drawings

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### Tables:

Table 1.1: Contact Information

Table 3.1: Analytical Results

Table 4.1: Projected NMOC Emission Rates

# 1 Introduction

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Impact Compliance & Testing (ICT) has conducted a Tier II Landfill gas (LFG) test at the Grand River Avenue Landfill (Grand River) site in Grand Ledge, Michigan. The test was conducted on the behalf of Granger Waste Management Company (Granger) and took place on May 10, 2021.

The names, addresses and telephone numbers of those involved with the open flare testing are listed in Table 1.1 below:

**Table 1.1 – Contact Information**

Name and Title	Company/Address	Phone Number
Serenity Skillman, Environmental Engineer	Granger Waste Services 16980 Wood Road, Lansing MI	734-371-9760
Clay Gaffey, Environmental Consultant	ICT 4180 Keller Rd. Suite B Holt, MI	517-481-3645
Summer Hitchens, Sr. Project Manager	ICT 37660 Hills Tech Dr. Farmington Hills, MI	734-357-8045

The purpose of the Tier II test was to revise the non-methane organic compound (NMOC) emission rate calculations submitted in accordance with the requirements of the New Source Performance Standards (NSPS) and Tier II Test Plan submitted to the Michigan Department of Environment, Great Lakes and Energy (EGLE) on April 12, 2021. The Tier II Test Plan is included as Appendix A.

The Grand River facility has an installation date of January 1, 1970, making the landfill subject to 40 CFR Part 62, Subpart GGG, as it commenced construction, reconstruction, or modification before May 30, 1991, as well as 40 CFR 62 Subpart OOO, as it commenced construction, reconstruction or modification before July 17, 2014. Subpart GGG requires compliance with sections of the new NSPS for Municipal Solid Waste Landfills promulgated in 40 CFR, Part 60 Subpart WWW and Subpart OOO with 40 CFR 60 Subpart Cf.

The landfill has a design capacity of 8.6 million megagrams (Mg), which exceeds the 2.5 million Mg threshold of Subpart WWW, OOO and Cf. The landfill is required to calculate and submit NMOC emission rate is less than 34 Mg per year (Formally subject to 50 Mg/yr under Subpart WWW, amended August 29, 2016, under Subpart Cf). Once the NMOC estimated emission rate exceeds 34 Mg per year, the landfill will have 12 months to submit a landfill gas collection and control system design plan. Granger has an uncontrolled emission rate below the 34 Mg NMOC per year threshold.

Granger conducted this Tier II assessment to meet the compliance schedule set forth in the federal NSPS requirement. The Tier II test results described in the report were used to obtain a site-specific NMOC concentration based on actual analytical data. The NMOC emissions rate calculation was based on this data to yield a more accurate estimate on NMOC emissions from the Grand River facility. The results of this calculation were used to assess the status of the facility in terms of LFG collection and control system requirements in accordance with NSPS. **The annual estimated NMOC emissions rate for 2021 is 7.21 Mg/yr based upon the site-specific NMOC concentration of 76 ppmv-hexane.**

This report will serve as a presentation of the Tier II test results and as a 5-year periodic NMOC emission report for the years 2021-2025. Included in this report is a description of the field procedures used to collect samples for laboratory analysis, the laboratory analytical results, data interpretations and discussion of the Tier II test results.

## 2 Field Procedures

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In accordance with the NSPS (40 CFR §60.754 (a)(3) & 40 CFR §60.35f (a)(3)), the Tier II sampling protocol requires two samples of landfill gas (LFG) be collected for every hectare of landfill that has retained waste for at least two years, up to a maximum of 50 samples. The standard Tier II test method requires penetration of the landfill surface and final cover to obtain LFG samples. Currently, Grand River has an active LFG collection and control system (GCCS) located in areas of the landfill that have retained waste for at least two years.

Under the provisions of the NSPS, the owner or operator of a landfill can propose an alternative method, subject to regulatory agency approval, to determine the site-specific NMOC concentration as specified in 40 CFR §60.754(a)(5) and §60.35f (a)(5). In consideration of this, Grand River requested a modified LFG sampling protocol previously outlined in the USEPA's "Municipal Solid Waste Landfill New Source Performance Standards (NSPS) and Emission Guidelines (EG) – Questions and Answers", November 1998. This method consists of collecting composite LFG samples from the LFG main header just prior to entering the Granger LFG to Energy (LFGTE) facility. Composite LFG samples from the GCCS are equivalent to a composite sample from LFG sample probes within the extents of the active GCCS. As such, the installed extraction wells would be serving as the LFG sample probes. In addition, the facility as noted in the Tier II test plan submitted to EGLE on April 12, 2021 (attached in Appendix A).

The samples were collected at the site as follows:

1. Prior to sampling, ICT verified that the GCCS wells or collectors had an applied vacuum at the time of the Tier II test.
2. Prior to collecting the LFG samples, an Elkins Earthworks Envision Meter, a portable LFG monitoring unit was used to measure oxygen, carbon dioxide, methane, and balance gas concentrations as a check for any indication of air leaks in the LFG system. The concentrations were observed to be within the limits allowed under EPA Method 25C for NSPS Tier II testing.
3. A total of three (3), 6-liter Summa® canisters, preconditioned by the contract laboratory with an inert gas (helium) from each sample location were used to collect LFG samples at the header pipe near the inlet of the blower to the LFGTE facility. The sampling train for a Summa® canister was connected to the LFG head and purged until stable readings were achieved.
4. The Summa® canister was then connected to the sampling train and the canister valve opened. An integrated sample of LFG was collected over a 40-minute period. The sampling was terminated after the canister was full, with only a slight vacuum (approximately -2.0 inches of mercury [Hg]) remaining. At this point the valve was closed.
5. The canisters were then sent via FedEx to Air Technology Laboratories, Inc. (ATL) in the City of Industry, California for laboratory analysis. The three (3) canisters were analyzed using EPA Method 25C for the NMOC analysis, with oxygen and nitrogen concentration of each sample being determined by EPA Method 3C.

### 3 Laboratory Results

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The certified analytical results are presented in Appendix B. The equations provided in section 6 of EPA Method 25C were used to correct for dilution of the samples by water vapor, nitrogen and pressurization of the canister in the laboratory.

Three (3) samples were drawn from each canister and analyzed by ATL. The average of the three results for each canister is shown in the following table and is expressed as total NMOC parts per million volume (ppmv) as carbon. Conversion to total NMOC by volume as hexane was performed by dividing each sample concentration by six. The average of all collected samples was taken to determining a representative NMOC concentration in the LFG.

**Table 3.1 Analytical Results**

<b>Canister ID Number</b>	<b>Weighting Factor</b>	<b>NMOC as carbon (ppmv)</b>	<b>NMOC as Hexane (ppmv)<sup>1</sup></b>
<b>GGR-1</b>	1/3	450	75
<b>GGR-2</b>	1/3	450	75
<b>GGR-3</b>	1/3	460	77
<b>Average</b>			<b>76</b>

(1) NMOC as carbon divide by six to obtain NMOC as hexane.

## 4 NMOC Emission Rate Results and Discussion

### 4.1 NMOC Emission Rate

The Tier II NMOC emission rate calculation was completed to provide an estimate of the NMOC emissions using the site-specific NMOC concentration for Grand River. The estimated Tier II NMOC emission rate was based on the historical annual waste acceptance rate for Grand River through 2020, an average annual waste acceptance rate of 30,000 Mg/yr through 2025, and a site-specific NMOC concentration of 87 ppmv as hexane determined by the Tier II testing at the site. The estimated 2021 NMOC emission rate for Grand River was calculated to be 7.21 Mg/yr. The NSPS Tier II NMOC emission rate calculations are included in Appendix C. Landfill Gas Emissions Model (LandGEM) was used to calculate yearly NMOC emissions rate.

### 4.2 NMOC Emission Rate Discussion

The LandGEM results indicate that the NMOC emission rate is projected to remain below the regulatory compliance limit of 34 Mg/yr for the next five years. 40 CFR §60.757 (b)(1) and §60.35f (c)(1) states the NMOC emission rate report shall contain an annual or 5-year estimate of the NMOC emission rate calculated using the formula and procedures described in §60.754 (a) and §60.35f (a).

For the next five years, Grand River anticipates an average annual waste acceptance rate of 30,000 Mg/yr. The NMOC emission rates for the next five years are shown in Table 4.1. The supporting calculations are provided in Appendix C.

**Table 4.1 Projected NMOC Emission Rates**

Year	Average Annual Waste Intake Rate (Mg)	NMOC Emission Rate (Mg/yr)
2021	30,000	7.21
2022	30,000	7.00
2023	30,000	6.80
2024	30,000	6.60
2025	30,000	6.41

The NMOC emission rate calculations do not exceed 34 Mg/yr for the next 5-year period, therefore this report will serve as a five-year report for NSPS compliance as provided within the NSPS under 40 CFR 60.757(b)(1) and §60.35f (c)(1).