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AIR EMISSION TEST REPORT

Title:	AIR EMISSION TEST REPORT FOR THE VERIFICATION OF AIR POLLUTANT EMISSIONS FROM A LANDFILL GAS FUELED TURBINE
Report Date:	October 22, 2020
Test Date:	September 25, 2020

Facility Information	
Name:	Arbor Hills Energy, LLC
Street Address:	1611 W. Five Mile Road
City, County:	Northville, Washtenaw
SRN:	N2688

Facility Permit Information	
Permit No.:	MI-ROP-N2688-2011
Emission Unit:	EUTURBINE4-S3 (Solar Taurus)

Testing Contractor	
Company:	Impact Compliance & Testing, Inc.
Mailing Address:	37660 Hills Tech Drive Farmington Hills, MI 48331
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Project No.:	2000113

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1.0 INTRODUCTION

Arbor Hills Energy, LLC (Arbor Hills Energy) operates three (3) EGT Typhoon gas-fired turbines and one (1) Solar Taurus gas-fired turbine at its renewable energy facility located at the Arbor Hills Landfill in Northville, Washtenaw County, Michigan. The turbines are fueled with landfill gas (LFG) that is collected from the Arbor Hills Landfill.

The conditions of Renewable Operating (RO) Permit No. MI-ROP-N2688-2011 issued to the source specify that for EUTURBINE4-S3, verification of the emission rates for carbon monoxide (CO), sulfur dioxide (SO_2), volatile organic compounds (VOC), and hydrogen chloride (HCl) is required.

The compliance test results presented in this report are for testing that was performed on September 25, 2020 for EUTURBINE4-S3. The exhaust gas sampling and analysis was performed using procedures specified in the Stack Test Protocol dated May 21, 2020.

Questions regarding this emission test report should be directed to:

Test Methods and Procedures	Tyler J. Wilson Senior Project Manager Impact Compliance and Testing, Inc. 37660 Hills Tech Drive Farmington Hills, MI 48331 (734) 464-3880 / Tyler.Wilson@ImpactCandT.com
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Responsible Official	Anthony Falbo Vice President, Operations

Report Certification

This test report was prepared by Impact Compliance & Testing, Inc. (ICT) based on field sampling data collected by ICT personnel Tyler Wilson, Andrew Eisenberg, and Jake Spry. Facility process data were collected and provided by Arbor Hills Energy employees or representatives.

A ROP Report Certification Form signed by the facility's Responsible Official accompanies this report.

I certify that the testing was conducted in accordance with the specified test methods and submitted test plan unless otherwise specified in this report. I believe the information provided in this report and its attachments are true, accurate, and complete.

Report Prepared By:

Tyler J. Wilson
Senior Project Manager
Impact Compliance & Testing, Inc.

2.0 SUMMARY OF TEST RESULTS AND OPERATING CONDITIONS

2.1 Purpose and Objective of the Tests

Stack testing was performed to measure CO, SO_2, VOC, and HCl emissions for one Solar Taurus turbine that is identified as EUTURBINE4-S3 to satisfy the testing requirement specified in RO Permit No. MI-ROP-N2688-2011.

The compliance test results presented in this report are for testing that was performed on September 25, 2020.

2.2 Operating Conditions During the Compliance Tests

Testing was performed while the unit operated at normal, maximum levels during the test periods. During the test event, the electricity generator connected to the Solar Taurus gas combustion turbine produced an average of 4.93 MW-hr.

Fuel flowrate (standard cubic feet per minute (scfm)), fuel methane content (%), power production (kW/MW), and fuel vacuum to plant (in. H_2O) were recorded at 15-minute intervals for each test period.

Appendix 1 provides operating records provided by Arbor Hills Energy representatives for the test periods.

Table 2.1 presents a summary of the average process operating conditions during the test periods.

Table 2.1 Average turbine operating conditions during the test periods

Device	Power Production (MW-hr)	Fuel Flowrate (scfm)	Methane Content (%)	Fuel Vacuum to Plant (in. H_2O)
#4 / Taurus	4.93	2,423	44.2	79.1

2.3 Summary of Air Pollutant Sampling Results

The gas exhausted from EUTURBINE4-S3 was sampled for three (3) one-hour test periods during the compliance testing performed September 25, 2020.

Table 2.2 presents a summary of results for EUTURBINE4-S3.

Test data presented in Table 2.2 is the three-test average for EUTURBINE4-S3. Annual ton per year (ton/yr) values are based on continuous operation (8,760 hr/yr) at the measured lb/hr emission rate. Actual ton/yr values will be reported by facility based on actual operating time.

The test results demonstrate compliance with the emission rates specified in MI-ROP-N2688-2011 for CO, VOC and HCl. Measured SO_2 emission rates exceeded the pounds per megawatt-hour (lb/MW-hr) and lb per million Btu heat input (lb/MMBtu) rates specified in MI-ROP-N2688-2011 for EUTURBINE4-S3.

Test results for each one-hour sampling period are presented in Section 6.0 of this report.

Table 2.2 Summary of EUTURBINE4-S3 emission rates compared to allowable emission rates

Emission Parameter		Turbine No. 4 Emissions	Permit Limit
CO	CO emissions (lb/hr)	7.67	13.2
	CO emissions (ton/yr)	33.6	57.8
SO_2	SO_2 emissions (lb/MWhr), or	2.02	0.9, or
	SO_2 emissions (lb/MMBtu)	0.16	0.15
VOC	VOC emissions (lb/hr)	0.13	0.80
	VOC emissions (ton/yr)	0.57	3.5
HCl	HCl emissions (lb/hr)	0.32	0.6
	HCl emissions (ton/yr)	1.41	2.5

3.0 SOURCE AND SAMPLING LOCATION DESCRIPTION

3.1 General Process Description

Landfill gas (LFG) containing methane is generated in the Landfill from the anaerobic decomposition of disposed waste materials. The LFG is collected from both active and capped landfill cells using a system of wells (gas collection system). The collected LFG is transferred to the Arbor Hills Energy facility where it is treated and used as fuel to produce electricity, which is transferred to the local utility.

3.2 Rated Capacities and Air Emission Controls

EUTURBINE4-S3 is fueled exclusively with LFG recovered from the adjacent Landfill, transferred to Arbor Hills Energy, and treated (compressed, dewatered and filtered) prior to its use as fuel. The fuel (treated LFG) consumption rate for EUTURBINE4-S3 is regulated automatically to maintain the required heat input rate to support the desired operating rate and is dependent on the fuel heat value (methane content).

EUTURBINE4-S3 typically produces up to 5.2 Megawatts (MW) of electricity. The combustion turbine is not equipped with add-on emission control equipment. NO_X emissions are suppressed by the use of dry low-NO_X combustors.

3.3 Sampling Location

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

The sampling ports for EUTURBINE4-S3 are located in the exhaust stack, which has an inner diameter of 42 inches. Three (3) sampling ports are located 90° offset from one another and provide a sampling location 8.33 feet (2.38 duct diameters) upstream and 15.5 feet (4.43 duct diameters) downstream from any flow disturbance. These dimensions satisfy the USEPA Method 1 criteria for a representative sample location.
Individual traverse points were determined in accordance with USEPA Method 1.

Appendix 2 provides a diagram of the emission test sampling locations.

4.0 SAMPLING AND ANALYTICAL PROCEDURES

A Stack Test Protocol for the air emission testing was reviewed and approved by the State of Michigan Department of Environment, Great Lakes, and Energy-Air Quality Division (EGLE-AQD). This section provides a summary of the sampling and analytical procedures that were used during the Arbor Hills Energy testing periods.

4.1 Summary of Sampling Methods

USEPA Method 1	Exhaust gas velocity measurement locations were determined based on the physical stack arrangement and requirements in USEPA Method 1.
USEPA Method 2	Exhaust gas velocity pressure was determined using a Type-S Pitot tube connected to a red oil incline manometer; temperature was measured using a K-type thermocouple connected to the Pitot tube.
USEPA Method 3A	Exhaust gas O_2 and CO_2 content was measured using zirconia ion/paramagnetic and infrared instrumental analyzers, respectively.
USEPA Method 4	Exhaust gas moisture was determined based on the water weight gain in chilled impingers.
USEPA Method 6C	Exhaust gas SO_2 concentration was measured using a pulsed ultraviolet florescence instrument analyzer.
USEPA Method 10	Exhaust gas CO concentration was measured using a non-dispersive infrared (NDIR) instrumental analyzer.
USEPA Method 25A	Exhaust gas VOC (as NMHC) concentration was measured using a flame ionization analyzer equipped with an internal methane separation GC column.
USEPA Method 26	Exhaust gas HCl concentration was measured using single point (non-isokinetic) sampling and analysis by ion chromatography.
GPA Method 2261	Fuel gas methane and heat content analysis by gas chromatography
ASTM Method D-5504	Fuel gas sulfur analysis by gas chromatography and chemiluminescence.

4.2 Exhaust Gas Velocity Determination (USEPA Method 2)

The turbine exhaust stack gas velocities and volumetric flow rates were determined using USEPA Method 2 during each test period. An S-type Pitot tube connected to a red-oil manometer was used to determine velocity pressure at each traverse point across the stack cross section. Gas temperature was measured using a K-type thermocouple mounted to the Pitot tube.

Appendix 3 provides exhaust gas flowrate calculations and field data sheets.

4.3 Exhaust Gas Molecular Weight Determination (USEPA Method 3A)

CO_2 and O_2 content in the turbine exhaust gas stream was measured continuously throughout each test period in accordance with USEPA Method 3A. The CO_2 content of the exhaust was monitored using a single beam single wavelength (SBSW) infrared gas analyzer. The O_2 content of the exhaust was monitored using a gas analyzer that uses a paramagnetic sensor.

During each sampling period, a continuous sample of the turbine 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 analyzers; therefore, measurement of O_2 and CO_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 analyzers continuously and logged data as one-minute averages.

Prior to, and at the conclusion of each test, the instruments were 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 4 provides O_2 and CO_2 calculation sheets. Raw instrument response data are provided in Appendix 5.

4.4 Exhaust Gas Moisture Content (USEPA Method 4)

Moisture content of the turbine exhaust gas was determined in accordance with USEPA Method 4 using a chilled impinger sampling train. Moisture content was measured as part of the USEPA sampling procedures for HCl (i.e., not as a separate measurement train), which was performed concurrently with the instrumental analyzer test periods. During each sampling period, a gas sample was extracted from the source where moisture was removed from the sampled gas stream using impingers that were submersed in an ice bath. 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.

4.5 Sulfur Dioxide by Instrumental Analyzer (USEPA Method 6C)

Turbine exhaust gas SO_2 concentration measurements were performed using a Thermo Environmental Instruments, Inc. (TEI) Model 43i analyzer that uses pulsed ultraviolet fluorescence technology in accordance with USEPA Method 6C for the measurement of SO_2 concentration.

Exhaust gas was extracted from the turbine exhaust stack using the equipment and procedures described in Section 4.3. 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).

Appendix 4 provides SO_2 calculation sheets. Raw instrument response data are provided in Appendix 5.

4.6 Carbon Monoxide by Instrumental Analyzer (USEPA Method 10)

Turbine exhaust gas CO concentration measurements were performed using a Fuji Model ZRF analyzer that uses nondispersive infrared (NDIR) technology in accordance with USEPA Method 10 for the measurement of CO concentration.

Exhaust gas was extracted from the turbine exhaust stack using the equipment and procedures described in Section 4.3. 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).

Appendix 4 provides CO calculation sheets. Raw instrument response data are provided in Appendix 5.

4.7 Volatile Organic Compounds by Instrumental Analyzer (USEPA Method 25A)

VOC emission rate was determined by measuring the non-methane hydrocarbon (NMHC) concentration in the turbine exhaust gas. NMHC pollutant concentration was determined using a Thermo Environmental Instruments, Inc. (TEI) Model 55i Methane / Non-methane hydrocarbon analyzer. The TEI 55i analyzer contains an internal gas chromatograph column that separates methane from non-methane components. The concentration of NMHC 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.

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, VOC measurements correspond to standard conditions with no moisture correction (wet basis).

The instrumental analyzer was calibrated using certified propane concentrations in hydrocarbon-free air to demonstrate detector linearity and determine calibration drift and zero drift error.

Appendix 4 provides VOC calculation sheets. Raw instrument response data are provided in Appendix 5.

4.8 Hydrogen Chloride by Sample Train (USEPA Method 26)

HCl concentrations in the turbine exhaust gas were determined using a modified version of USEPA Method 26. A sample of the exhaust gas was withdrawn from the exhaust stack at a constant rate (i.e., non-isokinetic rate) using a glass lined probe and a quartz filter. The gas sample was bubbled through chilled impingers containing 0.1 normality sulfuric acid (0.1N H_2SO_4). The NaOH portion of the Method 26 sampling train was not used since halogen (Cl_2) concentrations were not included in the analysis.

The wetted portions of the sampling train were constructed of glass. A silonite-coated stainless-steel probe union was used.

At the end of each one-hour test period, the impinger solutions and rinses were recovered and shipped to a third-party laboratory (Enthalpy Analytical in Durham, North Carolina) for HCl analysis by ion chromatography (IC) analysis in accordance with USEPA Method 26.

Appendix 4 provides HCl calculation sheets. Appendix 6 provides a copy of the HCl laboratory analytical report.

4.9 Fuel Gas Analysis (ASTM Method D-5504 and GPA 2261)

In addition to the exhaust gas SO_2 concentration measurements, two (2) samples of the treated LFG used as fuel were analyzed (one (1) for sulfur content and one (1) for methane content and heat content). SO_2 emission calculations were performed based on the conversion of sulfur to SO_2. The two (2) samples of the treated LFG were collected during the test event (September 25, 2020) using Tedlar bags. The sample tubing was connected to the fuel header at a location after the treatment system and gas blower. The Tedlar bags were conditioned with the treated LFG prior to collecting the gas samples.

The gas samples were analyzed by SPL (Traverse City, MI). One (1) gas sample was analyzed for sulfur bearing compounds by ASTM D-5504. One (1) gas sample was analyzed for methane content and heat content by GPA 2261.

In addition, the EGLE-AQD requested that inlet LFG be sampled for hydrogen sulfide (H_2S) concentration twice per test period of the test event using Draeger® tubes.

Appendix 4 provides the SO_2 emission rates calculations based on analysis of the gas sample. Appendix 6 provides a copy of the laboratory analytical report for the treated LFG samples and a photo of the eight (8) Draeger® tubes.

5.0 QA/QC ACTIVITIES

5.1 Exhaust Gas Flow

Prior to arriving onsite, the instruments used during the source test to measure exhaust gas properties and velocity (barometer, pyrometer, Pitot tube, and scale) were calibrated to specifications outlined in the sampling methods.

The Pitot tube and connective tubing were leak-checked onsite, prior to the test event, to verify the integrity of the measurement system.

The absence of significant cyclonic flow for the exhaust configurations were verified using an S-type Pitot tube and oil manometer. The Pitot tube was positioned at each velocity traverse point with the planes of the face openings of the Pitot tube perpendicular to the stack cross-sectional plane. The Pitot tube was then rotated to determine the null angle (rotational angle as measured from the perpendicular, or reference, position at which the differential pressure is equal to zero).

5.2 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.

5.3 Instrumental Analyzer Interference Check

The instrumental analyzers used to measure CO, SO_2, O_2, and CO_2 have had an interference response test preformed prior to their 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 each analyzer, separately and as a mixture with the analyte that each analyzer is designed to measure. All of analyzers exhibited a composite deviation of less than 2.5% of the span for all measured interferent gases. No major analytical components of the analyzers have been replaced since performing the original interference tests.

5.4 Instrument Calibration and System Bias Checks

At the beginning of each day of the testing program, initial three-point instrument calibrations were performed for the CO, SO_2, CO_2, and O_2 analyzers by injecting calibration gas directly into the inlet sample port for each 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 each 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 instruments were calibrated with USEPA Protocol 1 certified concentrations of CO_2, O_2, CO, and SO_2 in nitrogen and zeroed using hydrocarbon free nitrogen. The NMHC (VOC) instrument was calibrated with USEPA Protocol 1 certified concentrations of propane in air and zeroed using hydrocarbon-free air. A STEC Model SGD-710C 10-step gas divider was used to obtain intermediate calibration gas concentrations as needed.

5.5 Determination of Exhaust Gas Stratification

A stratification test was performed for the exhaust stack. The stainless-steel sample probe was positioned at sample points correlating to 16.7, 50.0 (centroid), and 83.3% of 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 turbine exhaust stack indicated that the measured CO, CO_2, and O_2 concentrations did not vary by more than 5% of the mean across the stack diameter. Therefore, the turbine exhaust gas was considered to be unstratified and the compliance test sampling was performed at a single sampling location within the turbine exhaust stack.

5.6 Meter Box Calibrations

The dry gas meter sampling console, which was used for HCl testing and exhaust gas moisture content sampling, 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.

5.7 HCl Recovery and Analysis

All recovered Method 26 impinger solutions and rinses were stored in appropriate HDPE bottles with Teflon® lined caps. The liquid level on each bottle was marked with a permanent marker prior to shipment and the caps were secured closed with tape. A blank solution was prepared using 0.1 N H_2SO_4 and the high-purity water used for recovery and analyzed by the laboratory with the sample train solutions. QA/QC procedures used by the laboratory are included in the final report provided by Enthalpy Analytical.

Appendix 7 presents test equipment quality assurance data (Instrument calibration and system bias check records, calibration gas and gas divider certifications, interference test results, meter box calibration records, stratification checks, and probe, Pitot tube, scale, pyrometer, and barometer calibration records).

6.0 RESULTS

6.1 Turbine Exhaust Test Results and Allowable Emission Limits

Turbine operating data and air pollutant emission measurement results for each one-hour test period are presented in Tables 6.1 through 6.2.

Hourly (lb/hr) emission rates are compared to the allowable lb/hr (pph) limit specified in the RO Permit. Maximum annual (ton/yr) emissions presented in Tables 6.1 and 6.2 are calculated based on continuous operation (8,760 hours/yr) at the measured lb/hr emission rate. However, it should be noted that actual annual emissions will be calculated by the facility based on actual process operating hours.

The measured air pollutant emission rates for EUTURBINE4-S3, are less than the allowable limits specified in Section 3 of RO Permit No. MI-ROP-N2688-2011 for CO (13.2 pph and 57.8 tpy CO), VOC (0.80 pph and 3.5 tpy VOC), and HCl (0.6 pph and 2.5 tpy HCl); and exceed the allowable rates specified for SO_2 (0.9 pounds per megawatt-hour, lb/MWhr, or 0.15 pounds per million British Thermal Unit, lb/MMBtu).

6.2 Results of LFG Fuel Analyses

On the day of the test event (September 25, 2020), the treated LFG used as fuel for the Arbor Hills Energy facility was:

- Analyzed by Draeger® tubes twice for sulfur during each test period (two (2) additional pre-test Draeger® tube samples are included in this test report for a total of eight (8) samples).

- Sampled using a Tedlar bag and delivered to a third-party laboratory for analysis of sulfur-bearing compounds.

- Sampled using a Tedlar bag and delivered to a third-party laboratory for analysis of methane content and heat input.

The Draeger® tube results for the eight (8) samples ranged from approximately 350 to 370 ppm H_2S. The laboratory reported an H_2S content of 400 ppmv for the Tedlar bag sample with a calculated total reduced sulfur (TRS) content of 434 ppmv. The laboratory reported a methane content of 43.4% and a heat content of 433 Btu/scf.

6.3 Variations from Normal Sampling Procedures or Operating Conditions

The testing for all pollutants was performed in accordance with USEPA methods and the Stack Test Protocol dated May 21, 2020 (the test date was moved to September 25, 2020 as opposed to July 21, 2020, as specified in the test plan). The turbine operated at maximum achievable load during the test periods.

The EGLE-AQD Test Plan Approval letter requested that two (2) Draeger® tube samples be collected during each test period for a total of six (6) samples. The six (6) requested samples, plus two (2) additional samples, were collected and included in this report. The two (2) additional samples ("Pre-test") were collected prior to beginning Test No. 1, near the time that the Tedlar bag sampling (for sulfur and methane content/heat input) was performed, for informational purposes. The Tedlar bag sampling was performed shortly before the beginning of Test No. 1 because the samples were hand delivered to the laboratory (SPL in Traverse City, MI) so that they could be analyzed on the same day. EGLE-AQD representatives Mr. Mark Dziadosz and Ms. Diane Kavanaugh-Vetort approved and observed these procedures.

The USEPA Method 26 HCl sampling train did not pass the post-test leak check for Test No. 1. After investigation, the ICT crew determined that the glass probe liner broke as the probe/sampling train was being removed from the sample port, after completion of the test. EGLE-AQD representative Mr. Mark Dziadosz agreed with ICT's determination, so an additional test period was not required. The sampling train moisture and HCl catches from Test No. 1 were comparable to the moisture and HCl catches from Test No. 2 and Test No. 3.

Table 6.1 Measured exhaust gas conditions and pollutant emission rates Turbine No. 4 (EUTURBINE4-S3)

Test No. Test date Test period (24-hr clock)	1 9/25/2020 1025-1125	2 9/25/2020 1315-1415	3 9/25/2020 1500-1600	Three Test Average
Fuel flowrate (scfm)	2,453	2,416	2,400	2,423
Generator output (MW)	4.99	4.91	4.88	4.93
LFG methane content (%)	44.4	44.2	44.0	44.2
Exhaust O_2 Content (%)	15.5	15.8	15.8	15.7
Exhaust CO_2 Content (%)	5.10	5.02	4.89	5.00
Exhaust Moisture Content (%)	9.51	9.46	9.52	9.50
Exhaust Temperature (°F)	970	965	967	967
Exhaust Flowrate (scfm)	42,882	42,706	42,396	42,661
Exhaust Flowrate (dscfm)	38,816	38,655	38,361	38,611
CO Concentration (ppmvd)	47.6	46.0	43.0	45.5
CO Emission Rate (lb/hr)	8.06	7.75	7.19	7.67
CO Permit Limit (lb/hr)	-	-	-	*13.2*
CO Emission Rate (ton/yr)	35.3	34.0	31.5	33.6
CO Permit Limit (ton/yr)	-	-	-	*57.8*
VOC Concentration (ppmvd)	0.49	0.43	0.41	0.45
VOC Emission Rate (lb/hr)	0.14	0.13	0.12	0.13
VOC Permit Limit (lb/hr)	-	-	-	*0.8*
VOC Emission Rate (ton/yr)	0.63	0.56	0.53	0.57
VOC Permit Limit (ton/yr)	-	-	-	*3.5*
SO_2 Concentration (ppmvd)	26.5	25.4	25.5	25.8
SO_2 Emission Rate (lb/hr)	10.3	9.82	9.76	9.94
SO_2 Emission Rate (lb/MW-hr)	2.05	2.00	2.00	2.02
SO_2 Permit Limit (lb/MW-hr)	-	-	-	*0.9*
SO_2 Emission Rate (lb/MMBtu)	0.16	0.16	0.16	0.16
SO_2 Permit Limit (lb/MMBtu)	-	-	-	*0.15*

Table 6.1 Measured exhaust gas conditions and pollutant emission rates Turbine No. 4 (EUTURBINE4-S3) [Continued]

Test No. Test date Test period (24-hr clock)	1 9/25/2020 1025-1125	2 9/25/2020 1315-1415	3 9/25/2020 1500-1600	Three Test Average
HCl Catch Weight (µg)	2,795	2,487	2,522	2,601
HCl Concentration (ppmvd)	1.57	1.40	1.42	1.46
HCl Emission Rate (lb/hr)	0.35	0.31	0.31	0.32
HCl Permit Limit (lb/hr)	-	-	-	*0.6*
HCl Emission Rate (ton/yr)	1.51	1.35	1.35	1.41
HCl Permit Limit (ton/yr)	-	-	-	*2.5*

Table 6.2 Summary of LFG fuel sulfur content analyses

Test No.	Pre-test	1	2	3
Draeger® tube[1] (ppm H_2S)	350, 370	350, 350	350, 360	360, 360
Lab result (ppm H_2S)	400	--	--	--
Lab result[2] (ppm TRS)	434	--	--	--
Lab result (% CH_4)	43.4	--	--	--
Lab result (Btu/scf)	433	--	--	--

Table 6.2 Notes

1. Estimated from observation of Draeger® tubes. Photos are provided in Appendix 6.
2. TRS concentration based on the total of all sulfur-bearing compounds detected in the sample. See laboratory report in Appendix 6.