# FINAL REPORT



# WASHINGTON 10 STORAGE CORPORATION

WASHINGTON TOWNSHIP, MICHIGAN

### WASHINGTON 10 COMPRESSOR STATION: 2023 FGENGINES2 EMISSIONS REPORT

RWDI #2303314 June 6, 2023

### SUBMITTED TO

**Kimberly Walker DT Midstream Environmental Technical Specialist** Kimberly.Walker@dtmidstream.com

Washington 10 Storage Corporation 12700 30 Mile Road Washington Township, MI 48095

Joyce Zhu **EGLE, Air Quality Division** 27700 Donald Court Warren, MI 48092-2793

**TPU Director EGLE**, Air Quality Division Constitution Hall, 2<sup>nd</sup> Floor South 525 West Allegan Street Lansing, MI 48933

### SUBMITTED BY

Mason Sakshaug, QSTI Supervisor | Associate Mason.Sakshaug@rwdi.com

Steve Smith, QSTI **Project Manager** Steve.Smith@rwdi.com

**RWDI USA LLC Consulting Engineers & Scientists** 2239 Star Court Rochester Hills, Michigan 48309

T: 248.841.8442 F: 519.823.1316

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## EXECUTIVE SUMMARY

RWDI USA LLC (RWDI) has been retained by Washington 10 Storage Corporation, a subsidiary of DT Midstream, Inc., to complete the emission sampling program at the Washington 10 Compressor Station located at 12700 30 Mile Rd, Washington Township, Michigan. This facility operates three 4-stroke lean-burn, 4,735 HP Caterpillar natural gas fired reciprocating engines. These engines are identified as EUENGINE4-6 (Flexible Group FGENGINES2) in Michigan ROP No. MI-ROP-N3391-2017a. The engines generate line pressure assisting the transmission of natural gas into and out of the gas storage field as well as to and from the pipeline transmission system in Southeast Michigan.

Executive Table i: EUENGINE4-6 Carbon Monoxide Reduction Efficiency & Inlet Emission Rates

	Carbon Monoxide						
Unit	Reduction Efficiency (%)	Inlet g/bhp-hr.					
EUENGINE4	96.5	1.72					
EUENGINE5	99.2	1.67					
EUENGINE6	99.9	1.65					
Permit Limit	93.0	2.5					

Executive Table ii: EUENGINE4-6 Nitrogen Oxides & Non-Methane Organic Compounds Emission Rates

Unit	Nitrogen Oxides	NMOC
	g/bhp-hr.	g/bhp-hr.
EUENGINE4	0.474	0.0007
EUENGINE5	0.427	0.0007
EUENGINE6	0.375	0.037
Permit Limit	0.9	1.0

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## INTRODUCTION

RWDI USA LLC (RWDI) has been retained by Washington 10 Storage Corporation, a subsidiary of DT Midstream, Inc., to complete the emission sampling program at the Washington 10 Compressor Station located at 12700 30 Mile Rd, Washington Township, Michigan. This facility operates three 4-stroke lean-burn, 4,735 HP Caterpillar natural gas fired reciprocating engines. These engines are identified as EUENGINE4-6 (Flexible Group FGENGINES2) in Michigan ROP No. MI-ROP-N3391-2017a. The engines generate line pressure assisting the transmission of natural gas into and out of the gas storage field as well as to and from the pipeline transmission system in Southeast Michigan.

### 1.1 Location and Dates of Testing

The test program was completed on April 11 and 12, 2023.

## 1.2 Purpose of Testing

This testing was conducted to show compliance with MI-ROP-N3391-2017a and 40 CFR Part 63 Subpart ZZZZ.

### **1.3 Description of Source**

This facility operates three 4-stroke lean-burn, 4,735 HP Caterpillar natural gas fired reciprocating engines.

## 1.4 Personnel Involved in Testing

### Table 1: Testing Personnel

DT Midstream, Inc,	(724) 954-5329		
Washington 10 Storage Corporation	(248) 672-9894		
	(734) 751-9701		
승규가 가지 않는 것이 같이 가지 않는 것이다.	(734) 731-3701		
	(989) 323-0355		
Rochester Hills, MI			
48309	(734) 474-1731		
	(734) 552-7270		
	Washington 10 Storage Corporation         RWDI USA LLC         2239 Star Court         Rochester Hills, MI		

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## 2 SUMMARY OF RESULTS

## 2.1 Operating Data

Operating parameters used to regulate the compressor engines include speed (RPM) and torque (HP). Additional parameters monitored include fuel flow, inlet & exhaust temperature & pressure, timing, and fuel analysis. Operating parameters for each test can be found in **Appendix A**.

## 2.2 Applicable Permit Number

MI-ROP-N3391-2017a and 40 CFR Part 63 Subpart ZZZZ.

## **3 SOURCE DESCRIPTION**

### 3.1 Description of Process and Emission Control Equipment

EUENGINE4-6 are equipped with an oxidation catalyst which controls CO emissions.

## 3.2 Process Flow Sheet or Diagram (if applicable)

A process flow diagram is available upon request.

## 3.3 Type and Quantity of Raw and Finished Materials

EUENGINE4-6 are natural gas-fired reciprocating units.

## 3.4 Normal Rated Capacity of Process

The engines are rated at 4,735 HP and were ran at maximum achievable load.

## 3.5 Process Instrumentation Monitored During the Test

No process instrumentation was being monitored for this testing.

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## 4 SAMPLING AND ANALYTICAL PROCEDURES

## 4.1 Description of Sampling Train and Field Procedures

### 4.1.1 Carbon Monoxide, Oxides of Nitrogen, and Oxygen

NO<sub>x</sub>, CO, and O<sub>2</sub> concentrations were determined utilizing RWDI's continuous emissions monitoring (CEM) system. Prior to testing, a 3-point analyzer calibration error check was conducted using USEPA protocol gases. The calibration error check was performed by introducing zero, mid and high-level calibration gases directly into the analyzer. The calibration error check was performed to confirm that the analyzer response was within  $\pm 2\%$  of the certified calibration gas introduced. Prior to each test run, a system-bias test was performed where known concentrations of calibration gases were introduced at the probe tip to measure if the analyzers response was within  $\pm 5\%$  of the introduced calibration gas concentrations. At the conclusion of each test run a system-bias check was performed to evaluate the percent drift from pre and post-test system bias checks. The system bias checks were used to confirm that the analyzer did not drift greater than  $\pm 3\%$  throughout each test run.

Zero and upscale calibration checks were conducted both before and after each test run to quantify measurement system calibration drift and sampling system bias. Upscale is either the mid- or high-range gas, whichever most closely approximates the flue gas level. During these checks, the calibration gases were introduced into the sampling system at the probe outlet so that the calibration gases were analyzed in the same manner as the flue gas samples.

A gas sample was continuously extracted from the stack and delivered to a series of gas analyzers, which measure the pollutant or diluent concentrations in the gas. The analyzers were calibrated on-site using EPA Protocol No. 1 certified calibration mixtures. The probe tip was equipped with a sintered stainless-steel filter for particulate removal. The end of the probe was connected to a heated Teflon sample line, which delivered the sample gases from the stack to the CEM system. The heated sample line was designed to maintain the gas temperature above 250°F to prevent condensation of stack gas moisture within the line.

Before entering the analyzers, the gas sample passed directly into a refrigerated condenser, which cools the gas to approximately 35°F to remove the stack gas moisture. After passing through the condenser, the dry gas entered a Teflon-head diaphragm pump and a flow control panel, which delivered the gas in series to the NO<sub>x</sub>, CO, and O<sub>2</sub> analyzers. Each of these analyzers measure the respective gas concentrations on a dry volumetric basis.

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### 4.1.2 Non-Methane Organic Compounds

Non-Methane Organic Compounds (as propane) for VOCs and CH<sub>4</sub> concentrations were recorded simultaneously for each test.

The measurements were taken continuously following USEPA Method 25A on each engine (using a nonmethane/methane analyzer). As outlined in Method 25A, the measurement location was taken at the centroid of each source.

Prior to testing, a 4-point analyzer calibration error check was conducted using USEPA protocol gases. The calibration error check was performed by introducing zero, low, mid, and high-level calibration gases up the heated line to the probe tip. The calibration error check was performed to confirm that the analyzer response is within  $\pm 5\%$  of the certified calibration gas introduced. At the conclusion of each test run a system-bias check was performed to evaluate the percent drift from pre- and post-test system bias checks. The system bias check was used to confirm that the analyzer did not drift greater than  $\pm 3\%$  throughout a test run.

Zero and mid gas calibration checks were conducted both before and after each test run to quantify measurement system calibration drift and sampling system bias. During these checks, the calibration gases were introduced into the sampling system at the probe tip so that the calibration gases were analyzed in the same manner as the flue gas samples.

A gas sample was continuously extracted from the stack and delivered to the gas analyzer, which measures the pollutant or diluent concentrations in the gas. The end of the probe was connected to a heated Teflon sample line, which delivered the sample gases from the stack to the CEM system. The heated sample line is designed to maintain the gas temperature above 250°F to prevent condensation of stack gas moisture within the line.

To subtract methane from THC, the methane must be converted from methane as methane to methane as propane and then subtracted from the THC number. The methane response factor (RF) is used in the conversion and is determined each test by introducing a known methane concentration to the analyzer and dividing the methane channel response by the THC channel response. Dividing methane by the RF gives methane as propane and is then subtracted from the THC concentration.

## 4.2 Description of Recovery and Analytical Procedures

There were no samples to recover during this test program. All testing used real time data from the analyzers.

## 4.3 Sampling Port Description

A figure of the testing sites is provided in the **Figures** section.

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# 5 TEST RESULTS AND DISCUSSION

## 5.1 Detailed Results

The following tables give the averages for each permit requirement. The **Tables** section and **Appendix B** provides a detailed breakdown of each test.

 Table 2: EUENGINE4-6 Carbon Monoxide Reduction Efficiency & Inlet Emission Rates

	Carbon Monoxide						
Unit	Reduction Efficiency (%)	Inlet g/bhp-hr.					
EUENGINE4	96.5	1.72					
EUENGINE5	99.2	1.67					
EUENGINE6	99.9	1.65					
Permit Limit	93.0	2.5					

Table 3: EUENGINE4-6 Nitrogen Oxides & Non-Methane Organic Compounds Emission Rates

Unit	Nitrogen Oxides	NMOC
Cinc	g/bhp-hr.	g/bhp-hr.
EUENGINE4	0.474	0.0007
EUENGINE5	0.427	0.0007
EUENGINE6	0.375	0.037
Permit Limit	0.9	1.0

## 5.2 Discussion of Results

Each unit was verified to mee the CO Removal Efficiency and the CO/NOx/NMOC emission limits (g/bhp-hr.).

## 5.3 Variations in Testing Procedures

The post-test leak check on the moisture train failed after Test 1 on EUENGINE4. Therefore, a 4<sup>th</sup> test was completed for EUENGINE4. All four (4) tests are included in the report, but only tests 2-4 are used in calculating the average emissions and CO RE for EUENGINE4.

For any test that concluded with a negative NMOC result, 0.1 ppm was used as an MDL for all calculations.

## 5.4 Process Upset Conditions During Testing

There were normal process breaks during production.

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## 5.5 Maintenance Performed in Last Three Months

Regular maintenance is performed monthly.

### 5.6 Re-Test

This was not a retest.

## 5.7 Audit Samples

This test did not require any audit samples.

### 5.8 Field Data Sheets

Field data sheets can be found in **Appendix D**.

### 5.9 Calibration Data

Calibration data can be found in Appendix E.

## 5.10 Example Calculations

Example calculations can be found in **Appendix F**.

## 5.11 Laboratory Data

There was no laboratory data from this testing program.



# TABLES

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### Table 4: Summary of Sampling Parameters and Methodology

Source Location	No. of Tests per Stack	Sampling Parameter	Sampling Method
	4 <sup>[4]</sup>	Moisture Content	U.S. EPA <sup>11</sup> Method 4
	4 141	Oxygen	U.S. EPA <sup>[1]</sup> Method 3A
EUENGINE4	4 [2]	Nitrogen Oxides	U.S. EPA <sup>[1]</sup> Method 7E
	4 [2]	Carbon Monoxide	U.S. EPA <sup>[1]</sup> Method 10
	4 141	Non-Methane Organic Compounds	U.S. EPA <sup>[1]</sup> Method 25A
	3	Moisture Content	U.S. EPA <sup>[1]</sup> Method 4
EUENGINE5-6	3	Oxygen	U.S. EPA <sup>[1]</sup> Method 3A
	3	Nitrogen Oxides	U.S. EPA <sup>[1]</sup> Method 7E
	3	Carbon Monoxide	U.S. EPA <sup>[1]</sup> Method 10
	3	Non-Methane Organic Compounds	U.S. EPA <sup>11</sup> Method 25A

#### Notes:

[1] U.S. EPA - United States Environmental Protection Agency

[2] Due to a failed leak check for Test 1 on Engine 4, a 4th test was completed. All results from Test 1 are included in the report.

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## Table 5: Sampling Time Summary

Source and Test #	Sampling Date	Start Time	End Time						
EUENGINE4									
Test #1	11-Apr-23	10:45 AM	11:44 AM						
Test #2	11-Apr-23	12:50 PM	1:49 PM						
Test #3	11-Apr-23	2:30 PM	3:29 PM						
Test #4	11-Apr-23	4:10 PM	5:09 PM						
EUENGINE5									
Test #1	12-Apr-23	8:15 AM	9:14 AM						
Test #2	12-Apr-23	9:45 AM	10:44 AM						
Test #3	12-Apr-23	11:25 AM	12:24 PM						
EUENGINE6	nin maranan kanan yana kanan kana Kanan kanan kana	ใดหมุดและเลาะเลาะเลาะสามหารางการการการการการการการการการการการการการก	Lansanneaannaannaannaannaannaannaa						
Test #1	12-Apr-23	1:10 PM	2:09 PM						
Test #2	12-Apr-23	2:45 PM	3:44 PM						
Test #3	12-Apr-23	4:15 PM	5:14 PM						

## Table 6: EUENGINE4 CO Testing Summary RWDI Project #2303314

				C	0 <sub>2</sub>		0		c	CO Emissi	on Rate			Natural Gas Usage	
Test ID	Date	Start	End	9	%		om	lbs/mr	nBTU	lbs/hr		g/hp-hr		MMBTU/hr	ft <sup>3</sup> /hr
reactio	Date	Otart	Linu	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet		11.711
1	2023-04-11	10:45	11:44	11.4	11.3	397.3	12.5	0.55	0.0172	18.3	0.57	1.78	0.055	33.1	31,162
2	2023-04-11	12:50	13:49	11.4	11.3	361.1	27.2	0.50	0.0373	16.7	1.24	1.61	0.119	33.1	31,242
3	2023-04-11	14:30	15:29	11.4	11.3	381.9	4.6	0.53	0.0063	17.8	0.21	1.81	0.021	33.4	31,500
4	2023-04-11	16:10	17:09	11.4	11.3	383.8	7.1	0.54	0.0098	16.9	0.31	1.73	0.032	31.6	29,761
		Ave	rage	11.4	11.3	375.6	13.0	0.52	0.0178	17.1	0.59	1.72	0.057	32.7	30,834

	Horsepower	CO Emiss	sion Rate	RE	
Test ID	bhp	g/bh	p-hr	%	
Testib	bub	Inlet	Outlet	70	
1	4677	1.78	0.06	96.9%	
2	4709	1.61	0.12	92.6%	
3	4450	1.81	0.02	98.8%	
4	4372	1.75	0.03	98.2%	Limit
Average	4510	1.72	0.06	96.5%	93%

lb/MMBTU =CO ppm x 0.000000726 x 8710 x (20.9/20.9-Actual O2) MMBTU = 1060.835 BTU/sft3 natural gas x ft3 of natural gas x 1 MMBTU/1,000,000 BTU Note: Test 1 was invalid due to a failed moisture train leak check. The results are included in the report, but the average result is calculated using tests 2-4.

### Table 7: EUENGINE4 NOx and NMOC Testing Summary

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				O <sub>2</sub>	NOx	N	Dx Emission Rat	te	Natural G	as Usage	
Test ID	Date	Start	End	%	ppm	Ibs/mmBTU	lbs/hr	g/hp-hr	MMBTU/hr	ft <sup>3</sup> /hr	1
Test ID	Date	Start	Enu	Outlet	Outlet	Outlet	Outlet	Outlet		it /iir	
1	2023-04-11	10:45	11:44	11.3	63.4	0.1437	4.75	0.461	33.1	31,162	]
2	2023-04-11	12:50	13:49	11.3	66.6	0.1503	4.98	0.480	33.1	31,242	1
3	2023-04-11	14:30	15:29	11.3	63.2	0.1425	4.76	0.485	33.4	31,500	1
4	·2023-04-11	16:10	17:09	11.3	62.8	0.1416	4.47	0.458	31.6	29,761	
		Ave	rage	11.3	64.2	0.1448	4.74	0.474	32.7	30,834	1

				O <sub>2</sub>	THC (as propane)	CH4 (as Propane)	NMOC (as Propane)	NMC	OC Emission F	Rate	
Test ID	Date	Start	End	%	ppm	ppm	ppm	lbs/mmBTU	lbs/hr	g/hp-hr	
TCSTID	Date	Otart	Liiu	Outlet	Outlet	Outlet	Outlet	Outlet	Outlet	Outlet	
1	2023-04-11	10:45	11:44	11.3	520.3	519.8	0.5	0.00108	0.0359	0.0035	
2	2023-04-11	12:50	13:49	11.3	528.4	539.5	0.1	0.00022	0.0071	0.0007	
3	2023-04-11	14:30	15:29	11.3	531.1	545.0	0.1	0.00022	0.0072	0.0007	
4	2023-04-11	16:10	17:09	11.3	488.0	553.3	0.1	0.00022	0.0068	0.0007	Permit Limi
		Ave	rage	11.3	515.8	545.9	0.1	0.00022	0.0070	0.0007	1.0 g/hp-hr

MMBTU = 1060.835 BTU/sft3 natural gas x ft3 of natural gas x 1 MMBTU/1,000,000 BTU

Ib/MMBTU =NOx ppm x 0.0000001194 x 8710 x (20.9/20.9-Actual O2)

Ib/MMBTU =THC (propane) ppm x 0.000000114 x 8710 x (20.9/20.9-Actual O2)

NMOC Results: After methane subtraction, NMOC showed a negative value in tests 2-4 so an MDL of 0.1 ppm was used for the results.

Note: Test 1 was invalid due to a failed moisture train leak check. The results are included in the report, but the average result is calculated using tests 2-4.

# Table 8: EUENGINE5 CO Testing Summary RWDI Project #2303314

	Inlet		Inlet         Outlet           9:14         11.7         11.5           10:44         11.7         11.5		) <sub>2</sub>	с	0	CO Emission Rate					Natural Ga	as Usage		
Test ID	Date	Start			pp	om	lbs/mr	nBTU	lbs	/hr	g/h	p-hr	MMBTU/hr	ft <sup>3</sup> /hr		
Test ID	Date	Start	End	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	WIND TO/III	it /nr	
1	2023-04-11	8:15	9:14	11.7	11.5	363.0	2.8	0.52	0.0039	15.6	0.12	1.68	0.013	30.0	28,250	
2	2023-04-11	9:45	10:44	11.7	11.5	361.6	2.8	0.52	0.0040	15.7	0.12	1.67	0.013	30.1	28,388	
3	2023-04-11	11:25	12:24	11.7	11.5	361.6	3.1	0.52	0.0044	15.6	0.13	1.66	0.014	30.2	28,442	
		Ave	rage	11.7	11.5	362.1	2.9	0.52	0.0041	15.6	0.12	1.67	0.013	30.1	28,360	

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	Horsepower	CO Emis	sion Rate	DE	
Test ID	bhp	g/bh	ip-hr	%	
Test ID	Dub	Inlet	Outlet	70	
1	4212	1.68	0.013	99.3%	
2	4241	1.67	0.013	99.2%	36
3	4280	1.66	0.014	99.2%	Limit
Average	4244	1.67	0.013	99.2%	93.0%

MMBTU = 1061.925 BTU/sft3 natural gas x ft3 of natural gas x 1 MMBTU/1,000,000 BTU lb/MMBTU =C0 ppm x 0.0000000726 x 8710 x (20.9/20.9-Actual O2)

### Table 9: EUENGINE5 NOx and NMOC Testing Summary

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	Inlet Date Start End			0 <sub>2</sub>	NOx	N	Ox Emission Ra	te	Natura	al Gas Usage	
Test ID	Data	Start	End	%	ppm	Ibs/mmBTU	lbs/hr	g/hp-hr	MMBTU/hr	ft <sup>3</sup> /hr	
Testib	Date	Start	LIIU	Outlet	Outlet	Outlet	Outlet	Outlet	IALIAID LOVIII	11 /11	
1	2023-04-11	8:15	9:14	11.5	55.8	0.1286	3.86	0.415	30.0	28,250	
2	2023-04-11	9:45	10:44	11.5	57.3	0.1326	4.00	0.427	30.1	28,388	
3	2023-04-11	11:25	12:24	11.5	59.3	0.1367	4.13	0.438	30.2	28,442	Permit
		Ave	rage	11.5	57.5	0.1326	3.99	0.427	30.1	28,360	0.9 g/

	Inlet			O <sub>2</sub>	THC (as propane)	CH4 (as Propane)	NMOC (as Propane)	N	IMOC Emissio	on Rate	
Test ID	Date	Start	End	%	ppm	ppm	ppm	lbs/mmBTU	lbs/hr	g/hp-hr	
Testib	Date	Start	Linu	Outlet	Outlet	Outlet	Outlet	Outlet	Outlet	Outlet	
1	2023-04-11	8:15	9:14	11.5	575.3	580.0	0.1	0.00022	0.0066	0.0007	1
2	2023-04-11	9:45	10:44	11.5	552.0	590.2	0.1	0.00022	0.0067	0.0007	1
3	2023-04-11	11:25	12:24	11.5	549.9	564.3	0.1	0.00022	0.0067	0.0007	Permit Limit
		Ave	rage	11.5	559.1	578.2	0.1	0.00022	0.0066	0.0007	1.0 g/hp-hr

MMBTU = 1061.925 BTU/sft3 natural gas x ft3 of natural gas x 1 MMBTU/1,000,000 BTU

lb/MMBTU =NOx ppm x 0.0000001194 x 8710 x (20.9/20.9-Actual O2)

lb/MMBTU =THC (propane) ppm x 0.000000114 x 8710 x (20.9/20.9-Actual O2) NMOC Results: After methane subtraction, NMOC showed a negative value in tests 1-3 so an MDL of 0.1 ppm was used for the results.

# Table 10: EUENGINE6 CO Testing Summary RWDI Project #2303314

				o	2	С	0		с	O Emissio	on Rate			Natural G	as Usage	
Test ID	Date	Start	End	9	6	pp	om	lbs/mr	nBTU	lbs	/hr	g/h	p-hr	MMBTU/hr	ft <sup>3</sup> /hr	
Test ID	Date	Start	Liiu	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet		it /nr	
1	2023-04-11	13:10	14:09	11.8	11.6	381.5	0.96	0.55	0.0014	17.1	0.042	1.74	0.0043	30.8	29,004	
2	2023-04-11	14:45	15:44	11.8	11.5	380.7	0.12	0.55	0.0002	15.8	0.005	1.76	0.0005	28.6	26,965	
3	2023-04-11	16:15	17:14	11.7	11.5	380.4	0.26	0.55	0.0004	12.8	0.009	1.43	0.0010	23.4	22,059	
		Ave	rage	11.8	11.5	380.9	0.45	0.55	0.0006	15.2	0.018	1.65	0.0019	27.6	26,009	

	Horsepower	CO Emis	sion Rate	DE	
Test ID	bhp	g/bh	ip-hr	%	
Test ID	pub	Inlet	Outlet	70	
1	4443	1.74	0.0043	99.75%	
2	4052	1.76	0.0005	99.97%	
3	4062	1.43	0.0010	99.93%	Limit
Average	4186	1.65	0.0019	99.89%	93%

MMBTU = 1061.925 BTU/sft3 natural gas x ft3 of natural gas x 1 MMBTU/1,000,000 BTU lb/MMBTU =CO ppm x 0.0000000726 x 8710 x (20.9/20.9-Actual O2)

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# Table 11: EUENGINE6 NOx and NMOC Testing Summary RWDI Project #2303314

		0 <sub>2</sub>			NOx	N	Dx Emission Ra	te	Natura	al Gas Usage	
Test ID	Date	Start	End	%	ppm	Ibs/mmBTU	lbs/hr	g/hp-hr	MMBTU/hr	ft <sup>3</sup> /hr	
Testib	Date	Start	Liiu	Outlet	Outlet	Outlet	Outlet	Outlet		it /ir	
1	2023-04-11	13:10	14:09	11.6	55.4	0.1293	3.98	0.406	30.8	29,004	
2	2023-04-11	14:45	15:44	11.5	53.2	0.1233	3.53	0.395	28.6	26,965	
3	2023-04-11	16:15	17:14	11.5	53.4	0.1238	2.90	0.324	23.4	22,059	Permit
		Ave	rage	11.5	54.0	0.1255	3.47	0.375	27.6	26,009	0.9 g/h

				<b>O</b> <sub>2</sub>	THC (as propane)	CH4 (as Propane)	NMOC (as Propane)	N	MOC Emissio	on Rate	
Test ID	Date	Start	End	%	ppm	ppm	ppm	Ibs/mmBTU	lbs/hr	g/hp-hr	]
TESTID	Date	Start	Linu	Outlet	Outlet	Outlet	Outlet	Outlet	Outlet	Outlet	
1	2023-04-11	13:10	14:09	11.6	580.8	565.2	15.6	0.0348	1.072	0.109	]
2	2023-04-11	14:45	15:44	11.5	587.7	613.9	0.1	0.0002	0.006	0.001	
3	2023-04-11	16:15	17:14	11.5	587.2	606.6	0.1	0.0002	0.005	0.001	Permit Lim
		Ave	rage	11.5	585.2	595.2	5.3	0.0117	0.361	0.037	1.0 g/hp-h

MMBTU = 1061.925 BTU/sft3 natural gas x ft3 of natural gas x 1 MMBTU/1,000,000 BTU

lb/MMBTU =NOx ppm x 0.0000001194 x 8710 x (20.9/20.9-Actual O2)

Ib/MMBTU =THC (propane) ppm x 0.000000114 x 8710 x (20.9/20.9-Actual O2)

NMOC Results: After methane subtraction, NMOC showed a negative value in tests 2-3 so an MDL of 0.1 ppm was used for the results.



# FIGURES

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