FINAL REPORT

FCA US LLC

WARREN, MICHIGAN

WARREN TRUCK ASSEMBLY PLANT (WTAP) EAST PAINT SHOP – FGRTO EAST (SVRTOEAST & SVBTHCONCEAST) SOURCE TESTING REPORT

RWDI #2003780

July 15, 2022

SUBMITTED TO

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EXECUTIVE SUMMARY

RWDI USA LLC (RWDI) has been retained by FCA US LLC (FCA) to complete the emission sampling program at their Warren Truck Assembly Plant (WTAP) East Paint Shop located at 21500 Mound Road, Warren, Michigan. WTAP operates an automobile assembly plant that produces the RAM 1500 Classic. Under Permit to Install (PTI) 13-19B this compliance testing covers the required testing for the following:

- SVBTHCONCEAST:
  - validation of volatile organic compounds (VOC) removal efficiency (RE);
  - evaluation of nitrogen oxides emissions (NOx); and
  - evaluation of particulate matter ($PM/PM_{10}/PM_{2.5}$) emissions
- SVRTOEAST:
  - Evaluation of particulate matter ($PM/PM_{10}/PM_{2.5}$) emissions.

A copy of the Source Testing Plan and approval letter from the State of Michigan Department of Environment, Great Lakes and Energy (EGLE) is provided in **Appendix A**. The test program was completed the week of May 16th, 2022 and week of June 13th, 2022.

The previously issued November 24th, 2021 report provided the following results:

- Destruction efficiency (DE) for the regenerative thermal oxidizer (SVRTOEAST) serving the E-Coat Tank and curing oven (EUECOATEAST) per condition EUECOATEAST V.3, and the desorption portion from the two (2) Zeolite Concentrators (SVBTHCONCEAST) from the spraybooth portion of EU-COLOR-ONE, per condition FGTOPCOATEAST V.6.
- Measurements for oxides of nitrogen (NOx) on the SVRTOEAST exhaust (outlet) per condition FGRTOEAST V.2.

The results from the May/June testing and the November 2021 report complete the testing program outlined in the Source Testing Plan for SVRTOEAST and SVBTHCONCEAST.

For SVBTHCONCEAST, the PM testing was completed twice, once in May of 2022 and again in June of 2022. The May testing was completed using USEPA Method 5/202 as the filtration temperature was greater than 85°F. For the June testing event, RWDI was able to cool the probe and filter box sufficient to reduce the temperature to below 85°F. Ms. Regina Angellotti (EGLE) was on site for the testing in June of 2022 where Mr. Brad Bergeron (RWDI) discussed the cooling procedure that was completed on-site and the ability to maintain the filtration temperature of less than 85°F. As per US EPA Method 202, if the filtration temperature is at or below 85°F, than Method 202 is not required to be included as primary PM.

Executive Table i: SVBTHCONCEAST – Removal Efficiency

Parameter	Concentration & Emission Rate			
	Run 1	Run 2	Run 3	Average
Non-Methane Organic Compounds ($NMOC$) ($THC-CH_4$) Inlet (as propane)	231.62 ppmv 71.52 lbs/hr	270.89 ppmv 83.57 lbs/hr	278.11 ppmv 87.94 lbs/hr	260.21 ppmv 81.01 lbs/hr
Non-Methane Organic Compounds ($NMOC$) ($THC-CH_4$) Outlet (as propane)	4.32 ppmv 1.31 lbs/hr	4.90 ppmv 1.52 lbs/hr	5.26 ppmv 1.55 lbs/hr	4.82 ppmv 1.46 lbs/hr
Removal Efficiency	98.2 %	98.2 %	98.2 %	98.2 %

Executive Table ii: SVBTHCONCEAST – NOx Emissions

Parameter	Concentration & Emission Rate			
	Run 1	Run 2	Run 3	Average
NOx Outlet	0.30 ppmv 0.10 lb/hr	0.23 ppmv 0.07 lb/hr	0.02 ppmv 0.01 lb/hr	0.18 ppmv 0.06 lb/hr

Executive Table iii: SVBTHCONCEAST – PM Emissions – May 2022 Event (US EPA Method 5/202)

Parameter	Emission Rate			
	Run 1	Run 2	Run 3	Average
PM/PM10/$PM_{2.5}$ Outlet	0.340 lb/hr 0.0017 lb/1000 lb of exhaust air (wet)	0.254 lb/hr 0.0013 lb/1000 lb of exhaust air (wet)	0.261 lb/hr 0.0013 lb/1000 lb of exhaust air (wet)	0.285 lb/hr 0.0014 lb/1000 lb of exhaust air (wet)

Executive Table iv: SVBTHCONCEAST – PM Emissions – June 2022 Event (US EPA Method 5)

Parameter	Emission Rate			
	Run 1	Run 2	Run 3	Average
PM/PM10/$PM_{2.5}$ Outlet	0.055 lb/hr 0.0003 lb/1000 lb of exhaust air (wet)	0.073 lb/hr 0.0004 lb/1000 lb of exhaust air (wet)	0.067 lb/hr 0.0004 lb/1000 lb of exhaust air (wet)	0.065 lb/hr 0.0003 lb/1000 lb of exhaust air (wet)

Executive Table v: SVRTOEAST – PM Emissions

Parameter	Emission Rate			
	Run 1	Run 2	Run 3	Average
PM/PM10/$PM_{2.5}$ Outlet	0.699 lb/hr 0.0032 lb/1000 lb of exhaust air (wet)	0.468 lb/hr 0.0022 lb/1000 lb of exhaust air (wet)	0.532 lb/hr 0.0024 lb/1000 lb of exhaust air (wet)	0.566 lb/hr 0.0026 lb/1000 lb of exhaust air (wet)

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1 INTRODUCTION

RWDI USA LLC (RWDI) has been retained by FCA US LLC (FCA) to complete the emission sampling program at their Warren Truck Assembly Plant (WTAP) East Paint Shop located at 21500 Mound Road, Warren, Michigan. WTAP operates an automobile assembly plant that produces the RAM 1500 Classic. Under Permit to Install (PTI) 13-19B this compliance testing covers the required testing for the following:

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- SVRTOEAST:
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The results from the May/June testing and the November 2021 report complete the testing program outlined in the Source Testing Plan for SVRTOEAST and SVBTHCONCEAST.

For SVBTHCONCEAST, the PM testing was completed twice, once in May of 2022 and again in June of 2022. The May testing was completed using USEPA Method 5/202 as the filtration temperature was greater than 85°F. For the June testing event, we were able to cool the probe and filter box sufficient to reduce the temperature to below 85°F. Ms. Regina Angellotti (EGLE) was on site for the testing in June of 2022 where Mr. Brad Bergeron (RWDI) discussed the cooling procedure that was completed on-site and the ability to maintain the filtration temperature of less than 85°F. As per US EPA Method 202, if the filtration temperature is at or below 85°F, than Method 202 is not required to be included as primary PM.

1.1 Testing Personnel

The following table presents personnel that were involved with the testing program.

Table 1.1.1: Summary of Testing Personnel

Name	Title & Affiliation	Address	Contact Number
Mr. Brad Wargnier	Environmental Specialist FCA US LLC Warren Truck Assembly Plant	21500 Mound Road Warren, MI 48091	248.944.5263
Mr. Tom Caltrider	Corporate Environmental Programs EHS FCA US LLC	38111 Van Dyke Avenue Sterling Heights, MI 48312	248.882.7169
Ms. Regina Angellotti	Environmental Quality Analyst EGLE Air Quality Division	27700 Donald Court Warren, MI 48092	586.854.1611
Mr. Brad Bergeron	Senior Project Manager RWDI USA LLC	2239 Star Court Rochester Hills, MI 48309	519.817.9888
Mr. Steve Smith	Project Manager RWDI USA LLC	2239 Star Court Rochester Hills, MI 48309	734.751.9701
Mr. Mason Sakshaug	Senior Scientist – Supervisor RWDI USA LLC	2239 Star Court Rochester Hills, MI 48309	989.323.0355
Mr. Ben Durham	Senior Field Technician RWDI USA LLC	2239 Star Court Rochester Hills, MI 48309	734.474.1731
Mr. Mike Nummer	Senior Field Technician RWDI USA LLC	2239 Star Court Rochester Hills, MI 48309	586-863-8237
Mr. Juan Vargas	Scientist RWDI USA LLC	2239 Star Court Rochester Hills, MI 48309	513-293-3180

2 SOURCE DESCRIPTION

2.1 Plant and Sources Overview

This section gives a detailed description of each process that is regulated by either the RTO or the two (2) concentrators.

2.1.1 EUECOATEAST

An electrodeposition (E-Coat) coating process consisting of a series dip tanks, rinses, a curing oven, a cooling tunnel, followed by a prep booth (light sanding) and spot prime coating booth. Repairs take place in a prep sanding booth (light sanding), followed by manual application of a small amount of spot prime coating in a spot prime coating booth. Emissions from the E-coat tanks and the curing oven are controlled by the RTO. Emissions from the pre booth are filtered, recirculated, and exhausted in-plant. Emissions from the spot prime booth are filtered and exhausted to atmosphere.

2.1.2 EUPWDRPREAST

A powder anti-chip coating application process in the east paint shop which is electrostatically applied. The spray booth also included the application of a colored powered basecoat for tutone application. The powder spray application is controlled by a particulate filtration system which is vented inside the plant.

2.1.3 EUTOPCOATEAST

An automatic topcoat spray application process with two parallel lines, each consisting of a waterborne basecoat coating booth, a basecoat observation zone, a basecoat ambient flash-off area, a basecoat heated flash-off area, a solvent borne clearcoat coating booth, a clearcoat observation zone, a clearcoat ambient flash-off area and a natural gas fired curing oven. Approximately 85 percent of the air from the spray zones is recirculated back into the process and the 15 percent is exhausted to the concentrator and RTO. Coating booth overspray is controlled by a waterwash particulate control system. A portion of the basecoat and clearcoat coating booth exhaust is filtered and recirculated to the booth air make-up system. All booth and flash-off area emissions are exhausted through a bank of particulate filters, the concentrator, and the RTO. Oven emissions are exhausted directly to the RTO. Solvent-based robots (clearcoat) capture and recover coatings and cleaning solvents in a purge pot collection system. Emissions from the observation zones are controlled by particulate control system and exhausted to the ambient air.

2.2 Sampling Locations Overview

The sampling locations for the RTO are located outside. This following table summarizes the sampling locations.

Table 2.2.1: Summary of the Stack Characteristics– SVRTOEAST

Source	Parameter	Diameter	Approximate Duct Diameters from Flow Disturbance	Number of Ports	Points per Traverse	Total Points per Test	Stack Temperature
SVRTOEAST Outlet	PM/PM10/PM2.5	72"	~8 downstream and ~2 Upstream	2	12	24 PM/Flow	~300°F

Table 2.2.2: Summary of the Stack Characteristics – SVBTHCONCEAST

Source	Parameter	Diameter	Approximate Duct Diameters from Flow Disturbance	Number of Ports	Points per Traverse	Total Points per Test	Stack Temperature
SVBOOTH CONC Concentrator Inlet (Combined)	THC	52x52"	<2 Downstream and <0.5 upstream	4	4 Flow	1 THC 16 Flow	~85°F
SVBOOTH CONC Concentrator Outlet (Combined)	THC and NOx	58"	~5 downstream and >2 upstream	2	8 Flow 12 PM	1 THC 1 NOx 16 Flow	~95°F

3 TESTING METHODOLOGIES

3.1 Description of Testing Methodologies

The following section provides brief descriptions of the sampling methods and discusses any modifications to the reference test methods that were completed with the testing.

3.1.1 USEPA Method 1 - "Sample and Velocity Traverses for Stationary Sources"

USEPA Method 1 is used in the selection of sampling ports and traverse points at which sampling for air pollutants will be performed. Based on diameter, upstream, and downstream disturbances. The stack is divided into a determined number of equally size areas, and sampling points are located within each area.

3.1.2 USEPA Method 2 – *"Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube)"*

USEPA Method 2 is used for the determination of the average velocity and the volumetric flow rate of a gas stream. Velocity measurements were taken with a pre-calibrated S-Type pitot tube and incline manometer. Temperature measurements were made simultaneously with the velocity measurements and were conducted using a chromel-alumel type "k" thermocouple in conjunction with a digital temperature indicator at each point as determined by USEPA Method 1.

A cyclonic verification check is done prior to testing to verify cyclicity is absent from the flow. The average absolute value of all points measure must be at or below 20 degrees for the flow measurements to be valid at the designated sampling point. The average absolute value of the angle of flow for all sampling points was at or below 20 degrees, so the sampling location is not considered cyclonic.

For the flow measurements, the following flow rate determinations were completed:

- During each Particulate testing event
- At the inlet and outlet of SVBTHCONCEAST during each Removal Efficiency test
- At the outlet of SVBTHCONCEAST during each NOx test

3.1.3 USEPA Method 3 – *"Gas Analysis for the Determination of Dry Molecular Weight"*

USEPA Method 3 is used for the determination of CO_2 and O_2 concentrations and dry molecular weight of a sample of effluent gas stream of a fossil-fuel combustion process or other process. A Fyrite analyzer was used in the analysis by introducing sample gas to each the CO_2 and O_2 during each test. Each Fyrite has a specific indicating chemical for either CO_2 or O_2 and introducing sample gas creates a reaction which indicates the percentage of the respected gas. Sample gas is introduced to the Fyrite using a one-way squeeze bulb, and then mixed multiple times with the specified chemical. The results are then used to calculate the dry molecular weight of the sample gas.

During the NOx testing, RWDI also completed O_2 and CO2 determination using US EPA Method 3A at the outlet of SVBTHCONCEAST.

3.1.4 USEPA Method 4 – *"Determination of Moisture Content in Stack Gases"*

USEPA Method 4 is used to determine the moisture content of stack gas. Moisture is determined via direct condensation. In the case of determining moisture content during an isokinetic test, a gas sample is drawn through a probe and filter, then through a series of impingers (impinger type and contents vary depending on the isokinetic method) and dropped to a temperature below 68° Fahrenheit to ensure all moisture is removed from the sample. The impingers are analyzed gravimetrically pre and post test to determine total moisture gain. Moisture content is then calculated based on moisture gain and total sample volume passed through the impingers.

All moisture data from the outlets of each source were taken from the 4-hour particulate runs. The moisture from the inlet of SCBTHCONCEAST taken during the removal efficiency testing was determined using wet/dry bulb as agreed to with Ms. Regina Angellotti from EGLE.

3.1.5 USEPA Method 5 – *"Determination of Particulate Matter Emissions from Stationary Sources"*

Particulate matter ($PM/PM_{10}/PM_{2.5}$) was sampled following procedures outlined in USEPA Method 5 and Method 202 (Condensable Particulate Matter).

USEPA Method 5 is used to determine filterable particulate matter from the specified source. The sample gas is sampled isokinetically through a stainless-steel nozzle, then a glass/quartz (stainless-steel may also be used) probe-liner, and through a glass-fiber filter. The probe and filter are designed to keep the sampling temperature at 248 ± 25 °F per the method standards. USEPA Method 5 can be combined with other methods, but everything up to the filter is considered filterable particulate matter.

Prior to testing, a leak check is performed on the sampling train to ensure a leak-free system. The probe nozzle is then set to the first sampling point, and sampling begins once all temperatures and flow rates are established. Sampling occurs for a pre-determined amount of time and at all pre-determined sampling points. Sampling rate is determined based on in-stack conditions including flow rate and stack gas temperature. A valid test must sample at an average rate ±10% of 100% isokinetic sampling. Once testing is complete, a post-test leak check is done to show a leak-proof sampling system. The system is leak checked at a vacuum (Hg") at or just above the maximum vacuum seen during the test.

Once all sampling procedures are complete, recovery begins as soon as possible. The impingers in the train must be weighed prior to recovery for moisture content analysis. For USEPA Method 5, all used sampling equipment up to the filter is rinsed three times with acetone. The probe and nozzle must be rinsed and thoroughly brushed (three times for glass/quartz, six times for stainless-steel). The front half of the filter holder is then rinsed three time with acetone into the same glass sample jar as the probe and nozzle rinse. The filter is then collected and placed in a petri dish. All USEPA Method 5 recovered samples are analyzed gravimetrically by RWDI USA LLC and the Method 202 recovered samples were analyzed by Enthalpy Labs in Durham, North Carolina.

3.1.6 USEPA Method 202 – "Dry Impinger Method for Determining Condensable Particulate Emissions from Stationary Sources"

USEPA Method 202 is an isokinetic method used to measure condensable particulate (CPM) emissions from a stationary source. CPM is collected after the filterable particulate matter is removed by the filterable particulate matter filter. The test follows all procedures laid out in USEPA Method 5. The impingers for the 202 train are as follows:

- After leaving the filter housing of the filterable particulate matter filter, the gas stream enters a vertical condenser to begin cooling the air sample and dropping out CPM;
- The sample is drawn through a large potbelly impinger that collects moisture;
- The sample is then drawn through a modified Greenburg-Smith impinger to drop out any remaining CPM;
- The CPM filter collects any remaining CPM in the air sample. The gas must be kept at a temperature between 65° and 85° Fahrenheit.

After the filter, the gas is then passed through a modified Greenberg-Smith impinger containing water, and an impinger containing silica gel to capture any remaining moisture.

Recovery of the USEPA Method 202 train begins immediately following sampling. Weights on all impingers are taken to determine moisture content. If necessary, a nitrogen purge is performed for one hour in compliance with section 8.5.3 of the test method (if sulfur dioxide is not suspected to be part of the process, then the nitrogen purge may be skipped). Nitrogen purges were not completed as noted in the Source Testing Plan. Following the filterable particulate filter and up to the CPM filter must be rinsed twice with water, once with acetone, and twice with hexane. Any condensed water in the first two impingers can be poured into the sample jar with the water rinses. The acetone and hexane rinses can be combined into the same jar. The CPM filter is put into either a sample jar on its own, or a petri dish. All samples are carried via courier to Enthalpy in Durham, North Carolina for analysis.

3.1.6.1 Modification

For SVBTHCONCEAST, the PM testing was completed twice, once in May of 2022 and again in June of 2022. The May testing was completed using USEPA Method 5/202 as the filtration temperature was greater than 85°F. For the June testing event, RWDI was able to cool the probe and filter box sufficient to reduce the temperature to below 85°F. Ms. Regina Angellotti (EGLE) was on site for the testing in June of 2022 where Mr. Brad Bergeron (RWDI) discussed the cooling procedure that was completed on-site and the ability to maintain the filtration temperature of less than 85°F. As per US EPA Method 202, if the filtration temperature is at or below 85°F, then Method 202 is not required to be included as primary PM.

3.1.7 Sampling for Total Hydrocarbons (Destruction Efficiency)

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

The compliance test consisted of three 60-minute tests on each of the Zeolite Concentrators at the preferred temperature as predetermined from WTAP. Regular performance checks on the CEMS were carried out by zero and span calibration checks using USEPA Protocol calibration gases. These checks verified the ongoing precision of the monitor with time by introducing pollutant-free (zero) air followed by known calibration gas (span) into the monitor. The response of the monitor to pollutant-free air and the corresponding sensitivity to the span gases was reviewed frequently as an ongoing indication of analyzer performance.

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 directly into the analyzer. The calibration error check was performed to confirm that the analyzer response is within ±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 checks were used to confirm that the analyzer did not drift greater than ±3% throughout a 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 or heated filter system. 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 in order to prevent condensation of stack gas moisture within the line.

3.1.8 Sampling for Nitrogen Oxides, Oxygen and Carbon Dioxide

Oxides of Nitrogen (NOx), oxygen and carbon dioxide concentrations were determined utilizing RWDI's continuous emissions monitoring (CEM) system at the Concentrator outlet. 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 is within ±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 ±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 ±3% throughout a 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 will deliver the sample gases from the stack to the CEM system. The heated sample line is designed to maintain the gas temperature above 250°F in order to prevent condensation of stack gas moisture within the line.

Before entering the analyzers, the gas sample passed directly into a refrigerated condenser, which cooled 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 O_2, CO_2, and NOx analyzers (as applicable). Each of these analyzers measured the respective gas concentrations on a dry volumetric basis.

3.1.9 Gas Dilution (Method 205)

Calibration gas was mixed using an Environics 4040 Gas Dilution System. The mass flow controllers are factory calibrated using a primary flow standard traceable to the United States National Institute of Standards and Technology (NIST). Each flow controller utilizes an 11-point calibration table with linear interpolation, to increase accuracy and reduce flow controller nonlinearity. The calibration is done yearly, and the records are included in **Appendix G3.** A multi-point EPA Method 205 check was executed in the field prior to testing to ensure accurate gas-mixtures. The gas dilution system consisting of calibrated orifices or mass flow controllers and dilutes a high-level calibration gas to within ±2% of predicted values. The gas divider is capable of diluting gases at set increments and was evaluated for accuracy in the field in accordance with US EPA Method 205 "*Verification of Gas Dilution Systems for Field Instrument Calibrations*". Before testing, the gas divider dilutions were measured to evaluate that the responses are within ±2% of predicted values. In addition, a certified mid-level calibration gas within ±10% of one of the tested dilution gases were introduced into an analyzer to ensure the response of the gas calibration is within ±2% of gas divider dilution concentration.

4 PROCESS DATA

During the emissions testing, plant process data was monitored and collected by WTAP personnel to ensure representative operation of the facility. The following information was collected:

1. Production rate for each process (EUECOATWEST, EUPRIMERWEST, and EUTOPCOATWEST);
2. RTO combustion chamber operating temperature during each test; and
3. Desorb inlet gas temperature for Zeolite Concentrators during each test.

Process data is provided in **Appendix J**.

5 RESULTS

All calibration information for the equipment used for this study is included in **Appendix G**. The following tables summarize the testing results, and more detailed tables can be found in **Appendix C, D, and E** for SVBTHCONCEAST (removal efficiency, NOx emission and PM results (May and June) and SVRTOEAST PM results.

Table 5.1: SVBTHCONCEAST – Removal Efficiency

Parameter	Concentration & Emission Rate			
	Run 1	Run 2	Run 3	Average
Non-Methane Organic Compounds (NMOC) (THC-CH_4) Inlet (as propane)	231.62 ppmv 71.52 lbs/hr	270.89 ppmv 83.57 lbs/hr	278.11 ppmv 87.94 lbs/hr	260.21 ppmv 81.01 lbs/hr
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Removal Efficiency	98.2 %	98.2 %	98.2 %	98.2 %

Table 5.2: SVBTHCONCEAST – NOx Emissions

Parameter	Concentration & Emission Rate			
	Run 1	Run 2	Run 3	Average
NOx Outlet	0.30 ppmv 0.10 lb/hr	0.23 ppmv 0.07 lb/hr	0.02 ppmv 0.01 lb/hr	0.18 ppmv 0.06 lb/hr

Table 5.3: SVBTHCONCEAST – PM Emissions – May 2022 Event (US EPA Method 5/202)

Parameter	Emission Rate			
	Run 1	Run 2	Run 3	Average
PM/PM10/$PM_{2.5}$ Outlet	0.340 lb/hr 0.0017 lb/1000 lb of exhaust air (wet)	0.254 lb/hr 0.0013 lb/1000 lb of exhaust air (wet)	0.261 lb/hr 0.0013 lb/1000 lb of exhaust air (wet)	0.285 lb/hr 0.0014 lb/1000 lb of exhaust air (wet)

Table 5.4: SVBTHCONCEAST – PM Emissions – June 2022 Event (US EPA Method 5)

Parameter	Emission Rate			
	Run 1	Run 2	Run 3	Average
PM/PM10/$PM_{2.5}$ Outlet	0.055 lb/hr 0.0003 lb/1000 lb of exhaust air (wet)	0.073 lb/hr 0.0004 lb/1000 lb of exhaust air (wet)	0.067 lb/hr 0.0004 lb/1000 lb of exhaust air (wet)	0.065 lb/hr 0.0003 lb/1000 lb of exhaust air (wet)

Table 5.5: SVRTOEAST – PM Emissions

Parameter	Emission Rate			
	Run 1	**Run 2**	**Run 3**	**Average**
PM/PM10/$PM_{2.5}$ Outlet	0.699 lb/hr 0.0032 lb/1000 lb of exhaust air (wet)	0.468 lb/hr 0.0022 lb/1000 lb of exhaust air (wet)	0.532 lb/hr 0.0024 lb/1000 lb of exhaust air (wet)	0.566 lb/hr 0.0026 lb/1000 lb of exhaust air (wet)

6 CONCLUSIONS

Testing was successfully completed the week of May 15th, 2022 and June 16th, 2022. All parameters were tested in accordance with USEPA referenced methodologies or with modifications agreed to by EGLE in the field as noted in report.