

FINAL REPORT



FCA US, LLC

STERLING HEIGHTS, MICHIGAN

EMISSIONS TESTING REPORT: NORTH PAINT SHOP (RTO-NORTH, EU-TOPCOAT-NORTH, EU-SANDING-NORTH, & EU-PAINT-SPOT-REPAIR-NORTH)

RWDI #2407128

August 2, 2024

SUBMITTED TO

Jeremy Howe
Michigan EGLE

Air Quality Division Technical Programs
Unit (TPU)

Constitution Hall 2nd Floor, South
525 West Allegan Street

Joyce Zhu
Michigan EGLE

Southeast Michigan District
27700 Donald Court
Warren, Michigan
48092-2793

FCA US LLC
Sterling Heights Assembly Plant
38111 Van Dyke
Sterling Heights, Michigan 48312

SUBMITTED BY

Brad Bergeron, A.Sc.T., d.E.T.
Senior Project Manager | Principal
Brad.Bergeron@rwdi.com

Steve Smith, QSTI
Project Manager | Associate
Steve.Smith@rwdi.com

Ben Durham
Senior Field Technician
Ben.Durham@rwdi.com

RWDI USA LLC
Consulting Engineers & Scientists
2239 Star Court
Rochester Hills, Michigan 48309
T: 248.841.8442
F: 519.823.1316



RWDI#2407128

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EXECUTIVE SUMMARY

RWDI USA LLC (RWDI) was retained by FCA US, LLC (FCA) to complete the sampling program at their Sterling Heights Assembly Plant (SHAP) located at 38111 Van Dyke, Sterling Heights, Michigan. SHAP operates an automobile assembly plant that produces Ram trucks and operates a North Paint Shop (NPS) and a South Paint Shop (SPS). SHAP operates under Renewable operating permit (ROP) MI-ROP-B7248-2020a, this Source Testing Report covers the required testing in the North Paint Shop (NPS).

The test program included measurements of Particulate (PM, PM₁₀ and PM_{2.5}), and Total Hydrocarbons (THC), Methane and Non-methane organic compounds or Volatile Organic Compounds (NMOC or VOC). The testing was completed to fulfill the requirements within the Michigan Department of Environment, Great Lakes, and Energy (EGLE) issued ROP. ROP testing requirements are outlined under FG-Facility-NORTH Flexible Group Conditions V.1.a,b,j and V.2.

For VOCs, three (3) 60-minute tests were completed on the North RTO.

For Particulate (PM, PM₁₀ and PM_{2.5}) there (3) 120-minute test runs were completed following USEPA Methods 5 and 5/202 on the following:

- North RTO (RTO-NORTH) – USEPA Method 5/202
- Basecoat #1 (EU-TOPCOAT1-NORTH) – USEPA Method 5
- Basecoat #2 (EU-TOPCOAT2-NORTH) – USEPA Method 5
- Color Prep (EU-SANDING-NORTH) – USEPA Method 5
- Reprocess Booth (EU-SANDING-NORTH) – USEPA Method 5
- Rapid Reprocess (EU-PAINT-SPOT-REPAIR-NORTH)– USEPA Method 5

The testing program was completed June 3-6, 2024.

Executive Table i: Average Emission Data – Destruction Efficiency

Parameter	Emission Rate (ppmv _d / lb/hr & % Destruction)			
	Run 1	Run 2	Run 3	Average
VOC Inlet	79.6 ppmvd 67.0 lb/hr	80.5 ppmvd 68.7 lb/hr	83.8 ppmvd 71.4 lb/hr	81.3 ppmvd 69.0 lb/hr
VOC Outlet	3.39 ppmvd 2.62 lb/hr	3.51 ppmvd 2.66 lb/hr	3.45 ppmvd 2.65 lb/hr	3.45 ppmvd 2.65 lb/hr
RTO Combustion Temperature	1425°F	1424°F	1426°F	1425°F
Destruction Efficiency	96.1 %	96.1 %	96.3 %	96.2 %

Notes: All emission data is based on a volumetric flow rate expressed as cfm

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(RTO-NORTH, EU-TOPCOAT-NORTH, EU-SANDING-NORTH, & EU-PAINT-SPOT-REPAIR-NORTH)
FCA US, LLC – STERLING HEIGHTS ASSEMBLY PLANT



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Executive Table ii: Average Emission Data – PM, PM₁₀, and PM_{2.5}

Source	PM Emission Rate (lb/hr) and gr./dscf			
	Run 1	Run 2	Run 3	Average
North RTO	2.17 lb/hr 0.0022 gr./dscf	1.62 lb/hr 0.0017 gr./dscf	1.97 lb/hr 0.0020 gr./dscf	1.92 lb/hr 0.0020 gr./dscf
Basecoat #1 Application Booth	0.19 lb/hr 0.00054 gr./dscf	0.17 lb/hr 0.00048 gr./dscf	0.20 lb/hr 0.00057 gr./dscf	0.19 lb/hr 0.00053 gr./dscf
Basecoat #2 Application Booth	0.15 lb/hr 0.00045 gr./dscf	0.14 lb/hr 0.00041 gr./dscf	0.11 lb/hr 0.00031 gr./dscf	0.13 lb/hr 0.00039 gr./dscf
Color Prep Booth	0.18 lb/hr 0.00042 gr./dscf	0.32 lb/hr 0.00074 gr./dscf	0.16 lb/hr 0.00039 gr./dscf	0.22 lb/hr 0.00052 gr./dscf
Reprocess Booth	0.056 lb/hr 0.00032 gr./dscf	0.034 lb/hr 0.00020 gr./dscf	0.039 lb/hr 0.00023 gr./dscf	0.043 lb/hr 0.00025 gr./dscf
Rapid Reprocess Booth	0.28 lb/hr 0.00045 gr./dscf	0.28 lb/hr 0.00045 gr./dscf	0.59 lb/hr 0.00098 gr./dscf	0.39 lb/hr 0.00063 gr./dscf

Notes: All emission data is based on a volumetric flow rate expressed as cfm



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1 INTRODUCTION

RWDI USA LLC (RWDI) was retained by FCA US, LLC (FCA) to complete the sampling program at their Sterling Heights Assembly Plant (SHAP) located at 38111 Van Dyke, Sterling Heights, Michigan. SHAP operates an automobile assembly plant that produces Ram trucks and operates a North Paint Shop (NPS) and a South Paint Shop (SPS). SHAP operates under Renewable operating permit (ROP) MI-ROP-B7248-2020a, this Source Testing Report covers the required testing in the North Paint Shop (NPS).

The test program included measurements of Particulate (PM, PM₁₀ and PM_{2.5}), and Total Hydrocarbons (THC), Methane and Non-methane organic compounds (NMOC). The testing was completed to fulfill the requirements within the Michigan Department of Environment, Great Lakes, and Energy (EGLE)-issued ROP. ROP testing requirements are outlined under FG-Facility-NORTH Flexible Group Conditions V.1.a,b,j and V.2.

For NMOC, three (3) 60-minute tests were completed on the North RTO.

For Particulate (PM, PM₁₀ and PM_{2.5}) there (3) 120-minute test runs were completed following USEPA Methods 5 and 5/202 on the following:

- North RTO (RTO-NORTH)
- Basecoat #1 (EU-TOPCOAT1-NORTH)
- Basecoat #2 (EU-TOPCOAT2-NORTH)
- Color Prep (EU-SANDING-NORTH)
- Reprocess Booth (EU-SANDING-NORTH)
- Rapid Reprocess (EU-PAINT-SPOT-REPAIR-NORTH)

1.1 Location and Dates of Testing

The test program was completed between June 3rd and June 6th, 2024.

1.2 Purpose of Testing

The purpose of the emissions test program was to verify emissions required by Michigan Department of Environment, Great Lakes, and Energy (EGLE) Renewable Operating Permit MI-ROP-B7248-2020a.



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1.3 Description of Source

SHAP operates an automobile assembly plant that produces Light Duty Trucks for FCA US LLC. Under Flexible Groups: FG-FACILITY-NORTH these systems exhaust from the North Paint Shop (NPS). The following table outlines the sampling program:

Table 1.3.1: Summary of Sampling Program – RTO-NORTH

RTO-NORTH	
Emission Unit Description [Including Process Equipment & Control Device(s)]	FG-FACILITY-NORTH: A color preparation sanding booth (EU-SANDING-NORTH), followed by 3 parallel topcoat lines, each consisting of: a water-borne basecoat application followed by a solvent born clearcoat. All paint applications are performed by robotic and bell applicators (except in emergency back-up situations). A heated flash zone separates the basecoat and clearcoat operations. Once the clearcoat application is complete, the light duty truck cabs proceed the main bake oven. VOC emissions from the e-coat tank, the basecoat heated flash zones, and the clearcoat automatic sections of the paint spray booths, as well as the coating ovens associated with e-coat and topcoat are controlled by the Regenerative Thermal Oxidizer (RTO-NORTH).
Parameter Tested	VOC Destruction Efficiency and particulate matter, in addition to Stack Gas Velocity, Stack gas composition, and Moisture
Stack Tested	SVST-57 (North RTO)

Table 1.3.2: Summary of Sampling Program – EU-TOPCOAT1, 2 or 3-NORTH Basecoat Application Zones

EU-TOPCOAT1, 2, and 3 - NORTH	
Emission Unit Description [Including Process Equipment & Control Device(s)]	EU-TOPCOAT1,2, and 3-NORTH: For each of the Color Booth lines, the booth systems are equipped with basecoat application zone sections. The basecoat application zone is controlled by a water-wash system to control particulate. The exhaust from the waterwash system is exhausted to atmosphere.
Parameter Tested	Particulate matter, in addition to Stack Gas Velocity, Stack gas composition, and Moisture
Stack Tested	SVST-1 (basecoat) (Basecoat 1) SVST-4 (basecoat) (Basecoat 2)



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Table 1.3.3: Summary of Sampling Program – EU-SANDING-NORTH

EU-SANDING-NORTH	
Emission Unit Description [Including Process Equipment & Control Device(s)]	EU-SANDING-NORTH: Color prep and reprocess spot repair operations at north paint shop. Color prep is for powder paint repair and re-process spot repair is for repairs made after topcoat. The booth is controlled by filter.
Parameter Tested	Particulate matter, in addition to Stack Gas Velocity, Stack gas composition, and Moisture
Stack Tested	SVST-CLRPREP (Color Prep) SVST-RPRCS (Reprocess Booth)

Table 1.3.4: Summary of Sampling Program – EU-PAINT-SPOT-REPAIR-NORTH

EU-PAINT-SPOT-REPAIR-NORTH	
Emission Unit Description [Including Process Equipment & Control Device(s)]	EU-PAINT-SPOT-REPAIR-NORTH: The north paint shop spot repair operations consist of stalls for either re-routing damaged vehicles back to the topcoat spray booth or for repair of small paint defects or parts may be routed to a spot repair stall. Minor paint repair does not include full application of paint coating on the vehicles, only the impacted panels. Stacks are used for exhaust. The booth is controlled by filter.
Parameter Tested	Particulate matter, in addition to Stack Gas Velocity, Stack gas composition, and Moisture
Stack Tested	SVST-PNTSPTRPR North Paint Spot Repair (Rapid Reprocess)

1.4 Sampling Locations Overview

The sampling locations for each source is located outside. **Figure Section** outlines the stack diameters and upstream and downstream distances to flow disturbances.



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1.5 Personnel Involved in Testing

Table 1.5.1: Testing Personnel

Tom Caltrider Corporate Environmental Programs	FCA US, LLC	(248) 882-7169 Thomas.Caltrider@stellantis.com
Adekunle Sanni Environmental Specialist		(248) 808-0121 Adekunle.Sanni1@external.stellantis.com
Andrew Riley	State of Michigan Department of Environment, Great Lakes and Energy (EGLE) Technical Programs Unit	(586) 565-7379 RileyA8@michigan.gov
Iranna Konanahalli	State of Michigan Department of Environment, Great Lakes and Energy (EGLE) Warren District Office	(586) 596-7630 konanahalli@michigan.gov
Brad Bergeron Technical Director	RWDI USA LLC 2239 Star Court Rochester Hills, MI 48309	(248) 234-3885 Brad.Bergeron@rwdi.com
Steve Smith Project Manager		(734) 751-9701 Steve.Smith@rwdi.com
Ben Durham Senior Field Technician		Ben.Durham@rwdi.com
Mike Nummer Senior Field Technician		Michael.Nummer@rwdi.com
Roy Zimmer Field Technician		Roy.Zimmer@rwdi.com
Kate Strang Field Technician		Kate.Strang@rwdi.com
Shane Rabideau Field Technician		Shane.Rabideau@rwdi.com

2 SUMMARY OF RESULTS

2.1 Operating Data

FCA personnel monitored the process during the testing. All process data can be found in **Appendix A**.

2.2 Applicable Permit Number

MI-ROP-B7248-2020a.



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3 SOURCE DESCRIPTION

3.1 Description of Process and Emission Control Equipment

Refer to Section 1.3.

3.2 Process Flow Sheet or Diagram (if applicable)

Process flow diagram can be provided upon request.

3.3 Type and Quantity of Raw and Finished Materials

SHAP uses various types of coatings for the E-Coat and Topcoat process for vehicle production. Quantities of material vary by production needs. Natural gas is also used to fire the ovens and RTO.

3.4 Normal Rated Capacity of Process

SHAP North is capable of producing 30 jobs per hour per booth on the process line. Normal production is 15 to 30 jobs per hour per booth. Testing conditions were representative of normal operating conditions. Rapid Reprocess Booth is a repair operation and only has operations when necessary. Reprocess Booth is also limited in production volumes based on daily needs for additional work on vehicles.

3.5 Process Instrumentation Monitored During the Test

SHAP monitors RTO temperature.



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4 SAMPLING AND ANALYTICAL PROCEDURES

4.1 Description of Sampling Train and Field Procedures

4.1.1 Stack Velocity, Temperature, and Volumetric Flow Rate Determination

The exhaust velocities and flow rates were determined following the US EPA Method 2, "Determination of Stack Gas Velocity and Flow Rate (Type S Pitot Tube)". Velocity measurements were taken with a pre-calibrated S-Type pitot tube and incline manometer. Volumetric flow rates were determined following the equal area method as outlined in US EPA Method 2. 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.

The dry molecular weight of the stack gas was determined following calculations outlined in US EPA Method 3, "Determination of Molecular Weight of Dry Stack Gas". As per Section 8.6 of USEPA Method 2:

8.6 Determine the stack gas dry molecular weight. For combustion processes or processes that emit essentially CO₂, O₂, CO, and N₂, use Method 3. For processes emitting essentially air, an analysis need not be conducted; use a dry molecular weight of 29.0. For other processes, other methods, subject to the approval of the Administrator, must be used.

Therefore, for the North RTO, USEPA Method 3 was used for the inlet and the outlet. For all other sources as there is no combustion sources in the exhaust stream, a molecular weight of 29.0 was utilized.

Stack moisture content was determined through direct condensation and according to US EPA Method 4, "Determination of Moisture Content of Stack Gas". Moisture was collected at a single point during each test on the RTO inlet, and in concurrence with PM testing on all other sources.



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4.1.2 Sampling for Total Hydrocarbons, Methane and Non-Methane Organic Hydrocarbons (NMOCs) (Destruction Efficiency)

VOC (as Non-Methane Organic Hydrocarbons (NMOCs)) Destruction Efficiency testing were performed simultaneously on the inlet and outlet of the RTO-NORTH. The measurements were taken continuously following the USEPA Method 25A on the inlets and outlet (using a non-methane/methane analyzer).

The compliance test consisted of three 60-minute tests on the RTO at the preferred temperature as predetermined from SHAP. Regular performance checks on the CEM 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 were 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 $\pm 2\%$ 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 was used to confirm that the analyzer did not drift greater than $\pm 3\%$ throughout a test run.

Zero and upscale calibration checks were conducted both before and after each test run in order 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 JUM 109A, which measures the pollutant 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 delivers the sample gases from the stack to the CEM system. The heated sample line was designed to maintain the gas temperature above 250°F in order to prevent condensation of stack gas moisture within the line.



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4.1.3 Sampling for Particulate Matter (PM, PM₁₀ and PM_{2.5})

Particulate matter (PM/PM₁₀/PM_{2.5}) was sampled following procedures outlined in USEPA Method 5 and Method 202 (Condensable Particulate Matter).

As stated in Method 202, the impinger portion was only recovered and included as PM if the filtration temperature exceeded 85°F. For all sources except for the RTO-NORTH, the filtration temperature did not exceed 85°F, therefore, the impingers were only used for moisture determination. For the RTO, Method 202 was followed for recovery of condensable. In addition, nitrogen purges were not completed post sample to remove sulphates for any of the sampling. Sulfur dioxide exposure was not expected to be an issue at this source location.

4.2 Description of Recovery and Analytical Procedures

The recoveries followed USEPA Methods 5 and 202.

5 TEST RESULTS AND DISCUSSION

5.1 Detailed Results

Table 5.1.1: Average Emission Data – Destruction Efficiency

Parameter	Emission Rate (ppmv _d / lb/hr & % Destruction)			
	Run 1	Run 2	Run 3	Average
VOC Inlet	79.6 ppmvd 67.0 lb/hr	80.5 ppmvd 68.7 lb/hr	83.8 ppmvd 71.4 lb/hr	81.3 ppmvd 69.0 lb/hr
VOC Outlet	3.39 ppmvd 2.62 lb/hr	3.51 ppmvd 2.66 lb/hr	3.45 ppmvd 2.65 lb/hr	3.45 ppmvd 2.65 lb/hr
RTO Combustion Chamber Temperature	1425°F	1424°F	1426°F	1425°F
Destruction Efficiency	96.1 %	96.1 %	96.3 %	96.2 %

Notes: All emission data is based on a volumetric flow rate expressed as cfm



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Table 5.1.2: Average Emission Data – PM, PM₁₀, and PM_{2.5}

Source	PM Emission Rate (lb/hr) and gr./dsf			
	Run 1	Run 2	Run 3	Average
North RTO	2.17 lb/hr 0.0022 gr./dsf	1.62 lb/hr 0.0017 gr./dsf	1.97 lb/hr 0.0020 gr./dsf	1.92 lb/hr 0.0020 gr./dsf
Basecoat #1 Application Booth	0.19 lb/hr 0.00054 gr./dsf	0.17 lb/hr 0.00048 gr./dsf	0.20 lb/hr 0.00057 gr./dsf	0.19 lb/hr 0.00053 gr./dsf
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Color Prep Booth	0.18 lb/hr 0.00042 gr./dsf	0.32 lb/hr 0.00074 gr./dsf	0.16 lb/hr 0.00039 gr./dsf	0.22 lb/hr 0.00052 gr./dsf
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Rapid Reprocess Booth	0.28 lb/hr 0.00045 gr./dsf	0.28 lb/hr 0.00045 gr./dsf	0.59 lb/hr 0.00098 gr./dsf	0.39 lb/hr 0.00063 gr./dsf

Notes: All emission data is based on a volumetric flow rate expressed as cfm

Modifications

As discussed with EGLE prior to testing, FCA instructed RWDI to complete testing on EU-TOPCOAT 1 and EU-TOPCOAT2 due to slight differences between the application portion of the booths. In the original test plan, RWDI proposed to only complete testing on one (1) basecoat application section. EU-TOPCOAT2 and EU-TOPCOAT3 are identical.

Also, in reviewing the system, RWDI and FCA determined that there are two (2) exhausts related to EU-SANDING NORTH. The original Test Plan only included the Reprocess Booth. For the program, we included both COLOR PREP and Reprocess Booth to fulfill the condition of the ROP.

5.2 Process Upset Conditions During Testing

There were no major process upsets during testing.

5.3 Maintenance Performed in Last Three Months

Only routine maintenance has been performed within the last three months.



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5.4 Audit Samples

This test did not require any audit samples.

5.5 Field Data Sheets

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

5.6 Calibration Sheets

Calibration sheets can be found in **Appendix E**.

5.7 Laboratory Data

Laboratory data can be found in **Appendix F**.

5.8 Sample Calculations

Sample calculations can be found in **Appendix G**.

TABLES



Table 1: Summary of Sampling Parameters and Methodology

Source Location	No. of Tests	Sampling Parameter	Sampling Method
North RTO	3	Velocity, Temperature and Flow Rate	U.S. EPA ^[1] Method 1-4
	3	Total Hydrocarbon and NMOC	U.S. EPA ^[1] Method 25A
	3	Total Particulate Matter	U.S. EPA ^[1] Method 5-202
	3	Gas Dilution	U.S. EPA ^[1] Method 205
Basecoat #1	3	Velocity, Temperature and Flow Rate	U.S. EPA ^[1] Method 1-4
	3	Particulate Matter	U.S. EPA ^[1] Method 5
Basecoat #2	3	Velocity, Temperature and Flow Rate	U.S. EPA ^[1] Method 1-4
	3	Particulate Matter	U.S. EPA ^[1] Method 5
Color Prep	3	Velocity, Temperature and Flow Rate	U.S. EPA ^[1] Method 1-4
	3	Particulate Matter	U.S. EPA ^[1] Method 5
Rapid Reprocess	3	Velocity, Temperature and Flow Rate	U.S. EPA ^[1] Method 1-4
	3	Particulate Matter	U.S. EPA ^[1] Method 5
Reprocess Booth	3	Velocity, Temperature and Flow Rate	U.S. EPA ^[1] Method 1-4
	3	Particulate Matter	U.S. EPA ^[1] Method 5

Notes:

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

Table 2a: Sampling Summary and Sample Log - Total Hydrocarbons and NMOC

Source and Test #	Sampling Date	Start Time	End Time
North RTO			
Test #1	3-Jun-24	11:30 AM	12:29 PM
Test #2	3-Jun-24	1:08 PM to 1:41 PM	2:50 PM to 3:17 PM
Test #3	3-Jun-24	3:45 PM	4:44 PM

Table 2b: Sampling Summary and Sample Log - Particulate Matter

Source and Test #	Sampling Date	Start Time	End Time	Filter ID
Velocity & Particulate Matter				
Blank	6-Jun-24	-	-	A-388
North RTO				
Test #1	3-Jun-24	11:35 AM	1:44 PM	A-391
Test #2	3-Jun-24	2:40 PM	4:46 PM	A-390
Test #3	3-Jun-24	5:07 PM	7:13 PM	A-389
Basecoat #1				
Test #1	4-Jun-24	7:59 AM	10:02 AM	A-427
Test #2	4-Jun-24	10:45 AM	12:47 PM	A-424
Test #3	4-Jun-24	2:10 PM	4:12 PM	A-425
Basecoat #2				
Test #1	4-Jun-24	8:00 AM	10:04 AM	A-426
Test #2	4-Jun-24	10:45 AM	12:49 PM	A-387
Test #3	4-Jun-24	1:30 PM	3:34 PM	A-423
Color Prep				
Test #1	5-Jun-24	7:13 AM	11:20 AM	A-136
Test #2	5 & 6-Jun-24	11:33 AM to 12:29 PM, 2:29 PM to 3:09 PM	7:23 AM to 7:47 AM	A-166
Test #3	6-Jun-24	8:04 AM	10:07 AM	A-416
Rapid Reprocess				
Test #1	6-Jun-24	8:53 AM	10:55 AM	A-414
Test #2	6-Jun-24	11:02 AM	1:24 PM	A-412
Test #3	6-Jun-24	1:35 PM	3:37 PM	A-420
Reprocess Booth				
Test #1	6-Jun-24	7:47 AM	9:55 AM	A-415
Test #2	6-Jun-24	10:19 AM	12:22 PM	A-413
Test #3	6-Jun-24	12:32 PM	2:42 PM	A-421

Table 3a: Sampling Summary - Flow Characteristics (Total Hydrocarbons and NMOC)

North RTO		Test No. 1	Test No. 2	Test No. 3	TOTAL AVERAGE
		Inlet	Inlet	Inlet	
Testing Date		3-Jun-24	3-Jun-24	3-Jun-24	-
Stack Temperature	°F	221	219	216	219
Moisture	%	2.46%	2.45%	2.20%	2.37%
Velocity	ft/s	46.0	46.5	46.2	46.2
Referenced Flow Rate	CFM	122,593	124,355	124,188	123,712
North RTO		Test No. 1	Test No. 2	Test No. 3	TOTAL AVERAGE
		Outlet	Outlet	Outlet	
Testing Date		3-Jun-24	3-Jun-24	3-Jun-24	-
Stack Temperature	°F	303	303	306	304
Moisture	%	2.88%	2.83%	2.82%	2.84%
Velocity	ft/s	43.4	42.5	42.2	42.7
Referenced Flow Rate	CFM	112,517	110,454	111,911	111,627

Notes:

[1] Referenced flow rate expressed as dry at 101.3 kPa, 68 °F, and Actual Oxygen

Table 3b: Sampling Summary - Flow Characteristics (Particulate Matter)

Source	Stack Gas Parameter		Test No. 1	Test No. 2	Test No. 3	TOTAL AVERAGE
North RTO	Stack Temperature	°F	305	307	308	306
	Moisture	%	2.9%	2.8%	2.8%	2.8%
	Velocity	ft/s	43.3	43.4	43.8	43.5
	Referenced Flow Rate ^[1]	dscfm	112,102	112,259	113,141	112,501
	Sampling Isokinetic Rate	%	99.5	100.0	99.7	100
Basecoat #1	Stack Temperature	°F	83	84	84	84
	Moisture	%	2.2%	2.0%	2.0%	2.1%
	Velocity	ft/s	42.9	42.8	42.5	42.7
	Referenced Flow Rate ^[1]	dscfm	40,927	40,893	40,617	40,812
	Sampling Isokinetic Rate	%	99.6	99.6	100.0	100
Basecoat #2	Stack Temperature	°F	84	84	84	84
	Moisture	%	2.3%	2.2%	1.9%	2.1%
	Velocity	ft/s	50.0	50.2	51.8	50.7
	Referenced Flow Rate ^[1]	dscfm	37,866	38,053	39,414	38,444
	Sampling Isokinetic Rate	%	99.4	99.5	99.9	100
Color Prep	Stack Temperature	°F	79	79	78	79
	Moisture	%	2.0%	2.0%	1.2%	1.7%
	Velocity	ft/s	42.4	42.7	41.2	42.1
	Referenced Flow Rate ^[1]	dscfm	49,638	49,635	48,452	49,242
	Sampling Isokinetic Rate	%	99.5	99.8	99.4	100
Rapid Reprocess	Stack Temperature	°F	71	71	71	71
	Moisture	%	1.6%	0.9%	1.2%	1.2%
	Velocity	ft/s	50.6	51.1	48.7	50.1
	Referenced Flow Rate ^[1]	dscfm	72,277	73,469	69,946	71,897
	Sampling Isokinetic Rate	%	99.3	98.8	99.2	99
Reprocess Booth	Stack Temperature	°F	69	70	70	70
	Moisture	%	1.2%	0.7%	0.9%	0.9%
	Velocity	ft/s	52.7	52.1	51.7	52.2
	Referenced Flow Rate ^[1]	dscfm	20,648	20,480	20,299	20,475
	Sampling Isokinetic Rate	%	98.4	99.1	100.2	99

Notes:

[1] All Referenced concentration values are expressed at 68°F, 29.92 in. Hg and Actual Oxygen

Detailed sampling results including individual test results can be found in Appendix B

TABLE 4: THC, Methane, and VOC EMISSIONS TABLE - RTO North

Source: FCA Sterling Heights Assembly Plant (SHAP) North RTO

RWDI Project # 2407128

Parameter	Test 1	Test 2	Test 3	Average
Date	3-Jun-24	3-Jun-24	3-Jun-24	--
Start Time:	11:30	13:08 to 13:41	15:45	--
Stop Time:	12:29	14:50 to 15:17	16:44	--
Duration (mins):	60	60	60	--
Average Combustion Chamber Temperature for RTO (°F):	1425	1424	1426	1425
Inlet RTO THC Concentration (as propane) (ppm _w):	79.0	80.5	83.7	81.1
Inlet RTO THC Concentration (as propane) (ppm _d):	81.0	82.5	85.6	83.0
Inlet RTO THC Concentration (as propane) (lb/hr _d):	68.15	70.45	72.96	70.5
Inlet RTO Methane Correction Factor	2.28	1.97	2.09	2.11
Inlet RTO CH4 Concentration (as methane) (ppm _w):	3.15	3.89	3.71	3.59
Inlet RTO CH4 Concentration (as Methane) (ppm _d):	3.23	3.99	3.80	3.67
Inlet RTO CH4 Concentration (as Propane) (ppm _d):	1.42	2.02	1.82	1.75
Inlet RTO CH4 Concentration (as propane) (lb/hr _d):	1.19	1.73	1.55	1.49
Inlet RTO VOC Concentration (as Propane) (ppm _d):	79.6	80.5	83.8	81.3
Inlet RTO VOC Concentration (as propane) (lb/hr _d):	66.96	68.7	71.4	69.0
Inlet RTO Flow Rate (dscfm):	122,593	124,355	124,188	123,712
Moisture:	2.46%	2.45%	2.20%	2.37%
Outlet RTO Flow Rate (dscfm):	112,517	110,454	111,911	111,627
Moisture:	2.88%	2.83%	2.82%	2.84%
Outlet RTO THC Concentration (as propane) (ppm _w):	3.52	3.68	3.61	3.60
Outlet RTO THC Concentration (as propane) (ppm _d):	3.62	3.79	3.71	3.71
Outlet RTO THC Concentration (as propane) (lb/hr _d):	2.80	2.87	2.85	2.84
Outlet RTO Methane Correction Factor	2.20	2.08	2.16	2.15
Outlet RTO CH4 Concentration (as methane) (ppm _w):	0.48	0.56	0.54	0.53
Outlet RTO CH4 Concentration (as Methane) (ppm _d):	0.50	0.58	0.55	0.54
Outlet RTO CH4 Concentration (as Propane) (ppm _d):	0.23	0.28	0.26	0.25
Outlet RTO CH4 Concentration (as propane) (lb/hr _d):	0.17	0.21	0.20	0.19
Outlet RTO VOC Concentration (as Propane) (ppm _d):	3.39	3.51	3.45	3.45
Outlet RTO VOC Concentration (as propane) (lb/hr _d):	2.62	2.66	2.65	2.65
Destruction Efficiency (VOC) (%):	96.1%	96.1%	96.3%	96.2%

Notes: ppm_w = parts per million by volume (wet basis)ppm_d = parts per million by volume (dry basis)mg/m³_d - milligrams per cubic meter (dry basis)lb/hr_d - pounds per hour (dry basis)

dscfm - standard cubic feet per minute (dry)

dm³/s - cubic meters per second (dry)

THC - Total Hydrocarbon

VOC - Non-methane organic compounds (THC minus methane, normalized to propane response)

Table 5: Summary of Particulate Matter Results - North RTO

Company	FCA SHAP			
Source	North RTO Outlet			
Date	3-Jun-24	3-Jun-24	3-Jun-24	
Test Number	Test 1	Test 2	Test 3	Average
Start Time	11:35	14:40	17:07	-
End Time	13:44	16:46	19:13	-

Stack Information				
Flow Rate (ft ³ /min) (Actual)	171,449	171,882	173,441	172,257
Flow (ft ³ /min) (Standard Wet)	115,424	115,533	116,430	115,796
Flow (ft ³ /min) (Standard Dry)	112,102	112,259	113,141	112,500
Flow (m ³ /min) (Standard Dry)	3,174	3,179	3,204	3,186

Percent Moisture (%)	2.88	2.83	2.82	2.85
Pressure Ps ("Hg)	29.19	29.19	29.19	29.19
Average Stack Temperature (T _s) (°F)	305.3	306.5	307.5	306.4
Molecular Weight of Stack Gas dry (M _d) (g/mole)	28.84	28.84	28.84	28.84
Molecular Weight of Stack Gas wet (M _s) (g/mole)	28.53	28.53	28.53	28.53
Stack Gas Specific Gravity (G _s) (kg/L)	1.0	1.0	1.0	1.0
Water Vapor Volume Fraction (%)	0.0	0.0	0.0	0.0
Average Stack Velocity (V _s) (ft/sec)	43.3	43.4	43.8	43.5
Cross Section Area of Stack (ft ²)	66.0	66.0	66.0	66.0
Percent Carbon Dioxide (%)	0.0	0.0	0.0	0.0
Percent Oxygen (%)	21.0	21.0	21.0	21.0
Percent Carbon Monoxide (%)	0.0	0.0	0.0	0.0
Percent Excess Air at Test Location (%)	-	-	-	-

Meter Info				
Isokinetic Variation I (%)	99.5	100.0	99.7	99.7
Meter Pressure Pm ("Hg)	29.4	29.4	29.4	29.4
Meter Temperature Tm (°F)	73.1	83.0	85.8	80.6
Measured Sample Volume Vm (ft ³)	88.92	91.16	92.11	90.73
Sample Volume (Vm St ft ³)	83.03	83.58	84.02	83.54
Sample Volume (Vm St m ³)	2.35	2.37	2.38	2.37
Total Weight of Sampled Gas (lbs) wet	6.30	6.34	6.38	6.34
Total Weight of Sampled Gas (lbs) dry	6.19	6.23	6.26	6.23
Gas Density Ps wet ("Hg)	0.07	0.07	0.07	0.07
Gas Density Ps dry ("Hg)	0.07	0.07	0.07	0.07
Condensate Volume (ft ³)	2.46	2.44	2.44	2.45
Nozzle Size (in ²)	0.00041	0.00041	0.00041	0.00
Impinger Gain (g)	30.9	33.5	32.0	32.1
Silica Gel Gain (g)	21.3	18.2	19.8	19.8
Total Gas Sampled (vm st ft ³ + condensate volume)	85.49	86.01	86.46	85.99

Particulate Results				
Nozzle/Probe/Filter Weight (mg)	3.7	2.1	3.3	3.0
Organic Condensable Particulate (mg)	3.5	3.4	2.9	3.3
Inorganic Condensable Particulate (mg)	5.6	4.3	5.5	5.1
Condensable Blank Correction (mg)	0.7	0.7	0.7	0.7
Total Particulate (mg)	12.1	9.1	11.0	10.7
Total Particulate Emission Rate (lb/hr)	2.17	1.62	1.97	1.92
Total Particulate Concentration lb/1000 lb (wet)	0.004	0.003	0.004	0.004
Total Particulate Concentration lb/1000 lb (dry)	0.004	0.003	0.004	0.004
Total Particulate Concentration (gr/dscf)	0.0022	0.0017	0.0020	0.0020

Table 6: Summary of Particulate Matter Results - Basecoat 1

Company	SHAP			
Source	Basecoat 1			
Date	4-Jun-24	4-Jun-24	4-Jun-24	
Test Number	Test 1	Test 2	Test 3	Average
Start Time	7:59	10:45	14:10	-
End Time	10:02	12:47	16:12	-

Stack Information				
Flow Rate (ft ³ /min) (Actual)	44,033	43,941	43,653	43,876
Flow (ft ³ /min) (Standard Wet)	41,852	41,719	41,452	41,674
Flow (ft ³ /min) (Standard Dry)	40,927	40,893	40,617	40,812
Flow (m ³ /min) (Standard Dry)	1,159	1,158	1,150	1,156

Percent Moisture (%)	2.21	1.98	2.01	2.07
Pressure Ps ("Hg)	29.27	29.27	29.27	29.27
Average Stack Temperature (T _s) (°F)	83.4	84.0	83.9	83.7
Molecular Weight of Stack Gas dry (M _d) (g/mole)	29.00	29.00	29.00	29.00
Molecular Weight of Stack Gas wet (M _s) (g/mole)	28.76	28.78	28.78	28.77
Stack Gas Specific Gravity (G _s) (kg/L)	1.0	1.0	1.0	1.0
Water Vapor Volume Fraction (%)	0.0	0.0	0.0	0.0
Average Stack Velocity (V _s) (ft/sec)	42.9	42.8	42.5	42.8
Cross Section Area of Stack (ft ²)	17.1	17.1	17.1	17.1
Percent Carbon Dioxide (%)	0.0	0.0	0.0	0.0
Percent Oxygen (%)	21.0	21.0	21.0	21.0
Percent Carbon Monoxide (%)	0.0	0.0	0.0	0.0
Percent Excess Air at Test Location (%)	-	-	-	-

Meter Info				
Isokinetic Variation I (%)	99.9	99.9	100.3	100.0
Meter Pressure Pm ("Hg)	29.4	29.4	29.4	29.4
Meter Temperature Tm (°F)	79.5	85.7	86.2	83.8
Measured Sample Volume Vm (ft ³)	89.93	90.89	90.72	90.51
Sample Volume (Vm St ft ³)	86.36	86.31	86.06	86.24
Sample Volume (Vm St m ³)	2.45	2.44	2.44	2.44
Total Weight of Sampled Gas (lbs) wet	6.56	6.55	6.53	6.55
Total Weight of Sampled Gas (lbs) dry	6.47	6.47	6.45	6.46
Gas Density Ps wet ("Hg)	0.07	0.07	0.07	0.07
Gas Density Ps dry ("Hg)	0.07	0.07	0.07	0.07
Condensate Volume (ft ³)	1.95	1.74	1.77	1.82
Nozzle Size (in ²)	0.00030	0.00030	0.00030	0.00
Impinger Gain (g)	-24.8	15.2	16.9	2.4
Silica Gel Gain (g)	66.2	21.8	20.6	36.2
Total Gas Sampled (vm st ft ³ + condensate volume)	88.32	88.05	87.83	88.07

Particulate Results				
Nozzle/Probe/Filter Weight (mg)	3.0	2.7	3.2	3.0
Total Particulate (mg)	3.0	2.7	3.2	3.0
Total Particulate Emission Rate (lb/hr)	0.19	0.17	0.20	0.19
Total Particulate Concentration lb/1000 lb (wet)	0.0010	0.0009	0.0011	0.0010
Total Particulate Concentration lb/1000 lb (dry)	0.0010	0.0009	0.0011	0.0010
Total Particulate Concentration (gr/dscf)	0.00054	0.00048	0.00057	0.00053

Table 7: Summary of Particulate Matter Results - Basecoat 2

Company	SHAP			
Source	Basecoat 2			
Date	4-Jun-24	4-Jun-24	4-Jun-24	
Test Number	Test 1	Test 2	Test 3	Average
Start Time	8:00	10:45	13:30	-
End Time	10:04	12:49	15:34	-
Stack Information				
Flow Rate (ft ³ /min) (Actual)	40,926	41,101	42,392	41,473
Flow (ft ³ /min) (Standard Wet)	38,756	38,918	40,162	39,279
Flow (ft ³ /min) (Standard Dry)	37,866	38,053	39,414	38,444
Flow (m ³ /min) (Standard Dry)	1,072	1,078	1,116	1,089
Percent Moisture (%)	2.3	2.2	1.9	2.1
Pressure Ps ("Hg)	29.19	29.19	29.19	29.19
Average Stack Temperature (T _s) (°F)	83.9	84.0	83.7	83.8
Molecular Weight of Stack Gas dry (M _d) (g/mole)	29.00	29.00	29.00	29.00
Molecular Weight of Stack Gas wet (M _s) (g/mole)	28.75	28.76	28.80	28.77
Stack Gas Specific Gravity (G _s) (kg/L)	1.0	1.0	1.0	1.0
Water Vapor Volume Fraction (%)	0.0	0.0	0.0	0.0
Average Stack Velocity (V _s) (ft/sec)	50.0	50.2	51.8	50.7
Cross Section Area of Stack (ft ²)	13.6	13.6	13.6	13.6
Percent Carbon Dioxide (%)	0.0	0.0	0.0	0.0
Percent Oxygen (%)	21.0	21.0	21.0	21.0
Percent Carbon Monoxide (%)	0.0	0.0	0.0	0.0
Percent Excess Air at Test Location (%)	-	-	-	-
Meter Info				
Isokinetic Variation I (%)	99.7	99.8	100.1	99.9
Meter Pressure Pm ("Hg)	29.3	29.3	29.3	29.3
Meter Temperature Tm (°F)	71.9	88.3	89.9	83.4
Measured Sample Volume Vm (ft ³)	95.59	99.05	103.25	99.30
Sample Volume (Vm St ft ³)	89.31	89.79	93.37	90.82
Sample Volume (Vm St m ³)	2.53	2.54	2.64	2.57
Total Weight of Sampled Gas (lbs) wet	6.79	6.83	7.08	6.90
Total Weight of Sampled Gas (lbs) dry	6.69	6.73	7.00	6.81
Gas Density Ps wet ("Hg)	0.07	0.07	0.07	0.07
Gas Density Ps dry ("Hg)	0.07	0.07	0.07	0.07
Condensate Volume (ft ³)	2.10	2.04	1.77	1.97
Nozzle Size (in ²)	0.00027	0.00027	0.00027	0.00
Impinger Gain (g)	27.2	29.7	25.0	27.3
Silica Gel Gain (g)	17.3	13.6	12.6	14.5
Total Gas Sampled (vm st ft ³ + condensate volume)	91.40	91.83	95.15	92.79
Particulate Results				
Nozzle/Probe/Filter Weight (mg)	2.6	2.4	1.9	2.3
Total Particulate (mg)	2.6	2.4	1.9	2.3
Total Particulate Emission Rate (lb/hr)	0.15	0.14	0.11	0.13
Total Particulate Concentration lb/1000 lb (wet)	0.0008	0.0008	0.0006	0.0007
Total Particulate Concentration lb/1000 lb (dry)	0.0009	0.0008	0.0006	0.0007
Total Particulate Concentration (gr/dscf)	0.00045	0.00041	0.00031	0.00039

Table 8: Summary of Particulate Matter Results - Color Prep

Company	SHAP			
Source	Color prep			
Date	5-Jun-24	June 5 to 6, 2024	6-Jun-24	
Test Number	Test 1	Test 2	Test 3	Average
Start Time	7:13	11:33 to 12:29, 14:29 to 15:09	8:04	-
End Time	11:20	7:23 to 7:47	10:07	-
Stack Information				
Flow Rate (ft ³ /min) (Actual)	53,299	53,670	51,870	52,946
Flow (ft ³ /min) (Standard Wet)	50,629	50,673	49,038	50,114
Flow (ft ³ /min) (Standard Dry)	49,638	49,635	48,452	49,242
Flow (m ³ /min) (Standard Dry)	1,406	1,406	1,372	1,394
Percent Moisture (%)	2.0	2.0	1.2	1.7
Pressure Ps ("Hg)	29.00	28.84	28.84	28.90
Average Stack Temperature (T _s) (°F)	78.8	79.1	78.4	78.8
Molecular Weight of Stack Gas dry (M _d) (g/mole)	29.00	29.00	29.00	29.00
Molecular Weight of Stack Gas wet (M _w) (g/mole)	28.78	28.77	28.87	28.81
Stack Gas Specific Gravity (G _s) (kg/L)	1.0	1.0	1.0	1.0
Water Vapor Volume Fraction (%)	0.0	0.0	0.0	0.0
Average Stack Velocity (V _s) (ft/sec)	42.4	42.7	41.2	42.1
Cross Section Area of Stack (ft ²)	21.0	21.0	21.0	21.0
Percent Carbon Dioxide (%)	0.0	0.0	0.0	0.0
Percent Oxygen (%)	21.0	21.0	21.0	21.0
Percent Carbon Monoxide (%)	0.0	0.0	0.0	0.0
Percent Excess Air at Test Location (%)	-	-	-	-
Meter Info				
Isokinetic Variation I (%)	99.8	100.1	99.7	99.8
Meter Pressure Pm ("Hg)	29.2	29.0	29.0	29.0
Meter Temperature Tm (°F)	78.2	86.2	73.0	79.1
Measured Sample Volume Vm (ft ³)	94.95	97.15	92.24	94.78
Sample Volume (Vm St ft ³)	89.04	89.30	86.84	88.39
Sample Volume (Vm St m ³)	2.52	2.53	2.46	2.50
Total Weight of Sampled Gas (lbs) wet	6.76	6.78	6.56	6.70
Total Weight of Sampled Gas (lbs) dry	6.67	6.69	6.51	6.63
Gas Density Ps wet ("Hg)	0.07	0.07	0.07	0.07
Gas Density Ps dry ("Hg)	0.07	0.07	0.07	0.07
Condensate Volume (ft ³)	1.78	1.87	1.05	1.57
Nozzle Size (in ²)	0.00031	0.00031	0.00031	0.00
Impinger Gain (g)	19.2	21.9	8.6	16.6
Silica Gel Gain (g)	18.5	17.7	13.7	16.6
Total Gas Sampled (vm st ft ³ + condensate volume)	90.82	91.16	87.89	89.96
Particulate Results				
Nozzle/Probe/Filter Weight (mg)	2.4	4.3	2.2	3.0
Total Particulate (mg)	2.4	4.3	2.2	3.0
Total Particulate Emission Rate (lb/hr)	0.18	0.32	0.16	0.22
Total Particulate Concentration lb/1000 lb (wet)	0.0008	0.0014	0.0007	0.0010
Total Particulate Concentration lb/1000 lb (dry)	0.0008	0.0014	0.0007	0.0010
Total Particulate Concentration mg/dscm (dry)	0.952	1.701	0.895	1.182
Total Particulate Concentration (gr/dscf)	0.00042	0.00074	0.00039	0.00052

Table 9: Summary of Particulate Matter Results - Reprocess Booth

Company	SHAP			
Source	Reprocess Booth			
Date	6-Jun-24	5-Jun-24	6-Jun-24	
Test Number	Test 1	Test 2	Test 3	Average
Start Time	7:47	10:19	12:32	-
End Time	9:55	12:22	14:42	-

Stack Information				
Flow Rate (ft ³ /min) (Actual)	21,735	21,485	21,335	21,518
Flow (ft ³ /min) (Standard Wet)	20,904	20,621	20,490	20,672
Flow (ft ³ /min) (Standard Dry)	20,648	20,480	20,299	20,475
Flow (m ³ /min) (Standard Dry)	585	580	575	580

Percent Moisture (%)	1.2	0.7	0.9	0.9
Pressure Ps ("Hg)	28.83	28.83	28.83	28.83
Average Stack Temperature (T _s) (°F)	68.9	70.0	69.7	69.5
Molecular Weight of Stack Gas dry (M _{dj}) (g/mole)	29.00	29.00	29.00	29.00
Molecular Weight of Stack Gas wet (M _s) (g/mole)	28.87	28.92	28.90	28.90
Stack Gas Specific Gravity (G _s) (kg/L)	1.0	1.0	1.0	1.0
Water Vapor Volume Fraction (%)	0.0	0.0	0.0	0.0
Average Stack Velocity (V _s) (ft/sec)	52.7	52.1	51.7	52.2
Cross Section Area of Stack (ft ²)	6.9	6.9	6.9	6.9
Percent Carbon Dioxide (%)	0.0	0.0	0.0	0.0
Percent Oxygen (%)	21.0	21.0	21.0	21.0
Percent Carbon Monoxide (%)	0.0	0.0	0.0	0.0
Percent Excess Air at Test Location (%)	-	-	-	-

Meter Info				
Isokinetic Variation I (%)	98.7	99.3	100.5	99.5
Meter Pressure Pm ("Hg)	29.0	29.0	29.0	29.0
Meter Temperature Tm (°F)	70.3	79.0	88.5	79.3
Measured Sample Volume Vm (ft ³)	106.26	107.81	109.97	108.01
Sample Volume (Vm St ft ³)	102.66	102.47	102.73	102.62
Sample Volume (Vm St m ³)	2.91	2.90	2.91	2.91
Total Weight of Sampled Gas (lbs) wet	7.75	7.71	7.74	7.74
Total Weight of Sampled Gas (lbs) dry	7.69	7.68	7.70	7.69
Gas Density Ps wet ("Hg)	0.07	0.07	0.07	0.07
Gas Density Ps dry ("Hg)	0.07	0.07	0.07	0.07
Condensate Volume (ft ³)	1.27	0.71	0.97	0.98
Nozzle Size (in ²)	0.00029	0.00029	0.00029	0.00
Impinger Gain (g)	8.6	6.5	-0.2	5.0
Silica Gel Gain (g)	18.4	8.5	20.8	15.9
Total Gas Sampled (vm st ft ³ + condensate volume)	103.93	103.18	103.70	103.60

Particulate Results				
Nozzle/Probe/Filter Weight (mg)	2.1	1.3	1.5	1.6
Total Particulate (mg)	2.1	1.3	1.5	1.6
Total Particulate Emission Rate (lb/hr)	0.056	0.034	0.039	0.043
Total Particulate Concentration lb/1000 lb (wet)	0.00060	0.00037	0.00043	0.00047
Total Particulate Concentration lb/1000 lb (dry)	0.00060	0.00037	0.00043	0.00047
Total Particulate Concentration (gr/dscf)	0.00032	0.00020	0.00023	0.00025

Table 10: Summary of Particulate Matter Results - Rapid Reprocess Booth

Company	Shap			
Source	Rapid Reprocess			
Date	6-Jun-24	6-Jun-24	6-Jun-24	
Test Number	Test 1	Test 2	Test 3	Average
Start Time	8:53	11:02	13:25	--
End Time	10:55	13:24	15:37	--
Stack Information				
Flow ft3 (Actual)	76,511	77,262	73,730	75,834
Flow ft3 (Standard Wet)	73,455	74,152	70,791	72,799
Flow ft3 (Standard Dry)	72,277	73,469	69,946	71,897
Flow m3 (Standard Dry)	2,047	2,080	1,981	2,036
Percent Moisture	1.6	0.9	1.2	1.2
Pressure Ps ("Hg)	28.89	28.89	28.89	28.89
Average Stack Temperature Ts (F)	71.0	71.2	71.0	71.0
Molecular Weight of Stack Gas dry (Md)	29.00	29.00	29.00	29.00
Molecular Weight of Stack Gas wet (Ms)	28.82	28.90	28.87	28.86
Stack Gas Specific Gravity (Gs)	1.0	1.0	1.0	1.0
Water Vapor Volume Fraction	0.0	0.0	0.0	0.0
Average Stack Velocity Vs (ft/sec)	50.6	51.1	48.7	50.1
Area of Stack (ft2)	25.2	25.2	25.2	25.2
Percent Carbon Dioxide	0.0	0.0	0.0	0.0
Percent Oxygen	21.0	21.0	21.0	21.0
Percent Carbon Monoxide	0.0	0.0	0.0	0.0
Percent Excess Air at Test Location	-	-	-	-
Meter Info				
Isokinetic Variation I	99.5	99.1	99.5	99.4
Meter Pressure Pm ("Hg)	29.0	29.0	29.0	29.0
Meter Temperature Tm (F)	71.5	79.1	80.1	76.9
Measured Sample Volume Vm	80.82	82.94	79.43	81.06
Sample Volume (Vm St ft3)	74.69	75.58	72.22	74.16
Sample Volume (Vm St m3)	2.11	2.14	2.05	2.10
Total Weight of Sampled Gas (m g lbs) wet	5.65	5.70	5.45	5.60
Total Weight of Sampled Gas (m g lbs) dry	5.60	5.66	5.41	5.56
Gas Density Ps wet	0.07	0.07	0.07	0.07
Gas Density Ps dry	0.07	0.07	0.07	0.07
Condensate Volume	1.22	0.70	0.87	0.93
Nozzle Size	0.00022	0.00022	0.00022	0.00
Impinger Gain	10.4	5.5	6.1	7.3
Silica Gel Gain	15.4	9.4	12.4	12.4
Total Gas Sampled (vm st ft3 + condensate volume)	75.90	76.28	73.10	75.09
Particulate Results				
Nozzle/Probe/Filter Weight (mg)	2.2	2.2	4.6	3.0
lb/hr	0.28	0.28	0.59	0.39
lb/1000 lb (wet)	0.0009	0.0009	0.0019	0.0012
lb/1000 lb (dry)	0.0009	0.0009	0.0019	0.0012
mg/dscm (dry)	1.040	1.028	2.249	1.439
gr/dscf	0.00045	0.00045	0.00098	0.00063

FIGURES

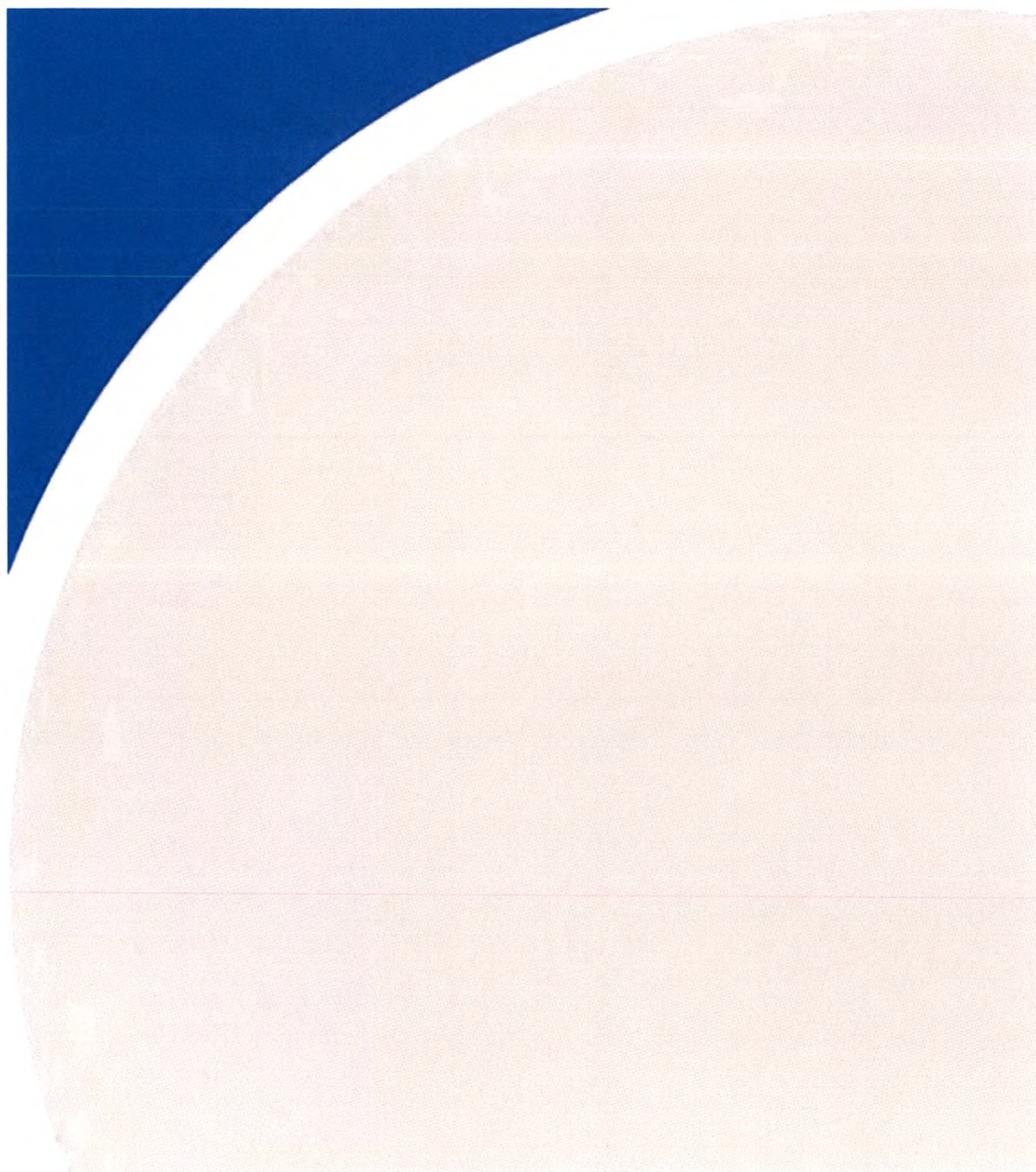
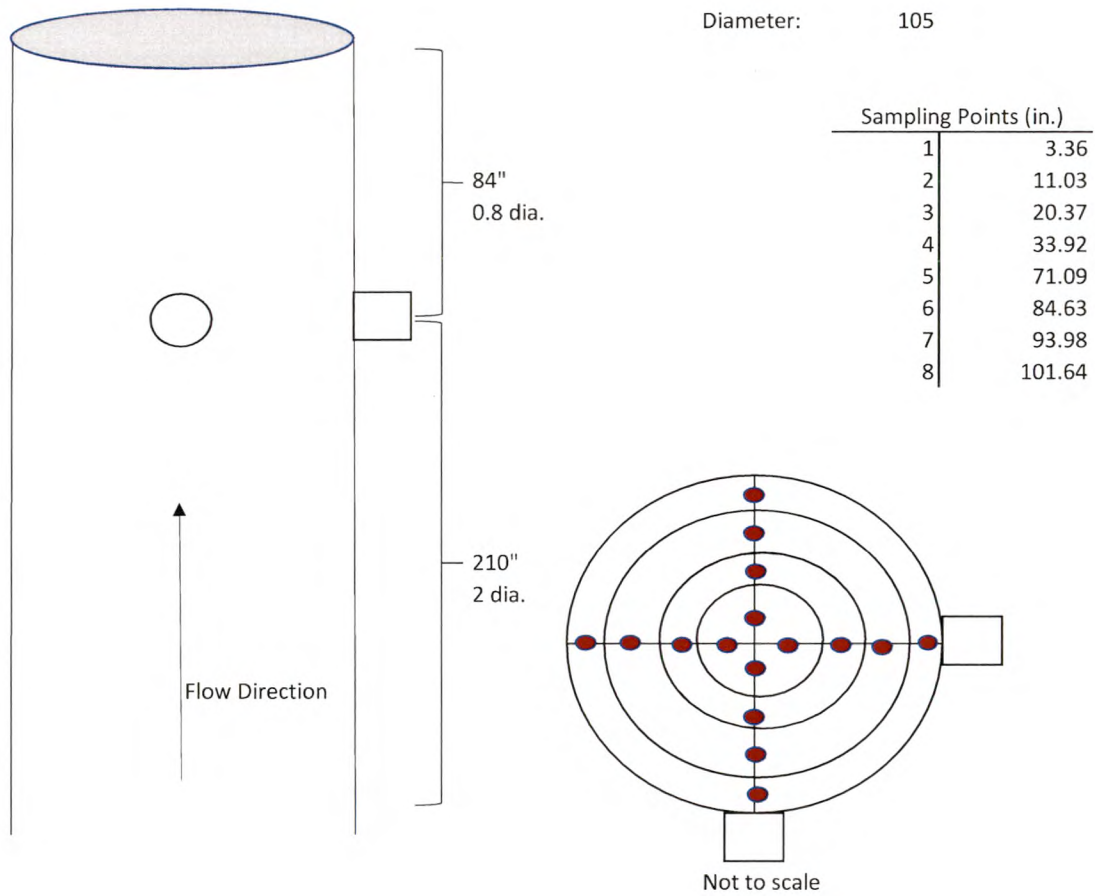




Figure No. #1 North RTO Inlet



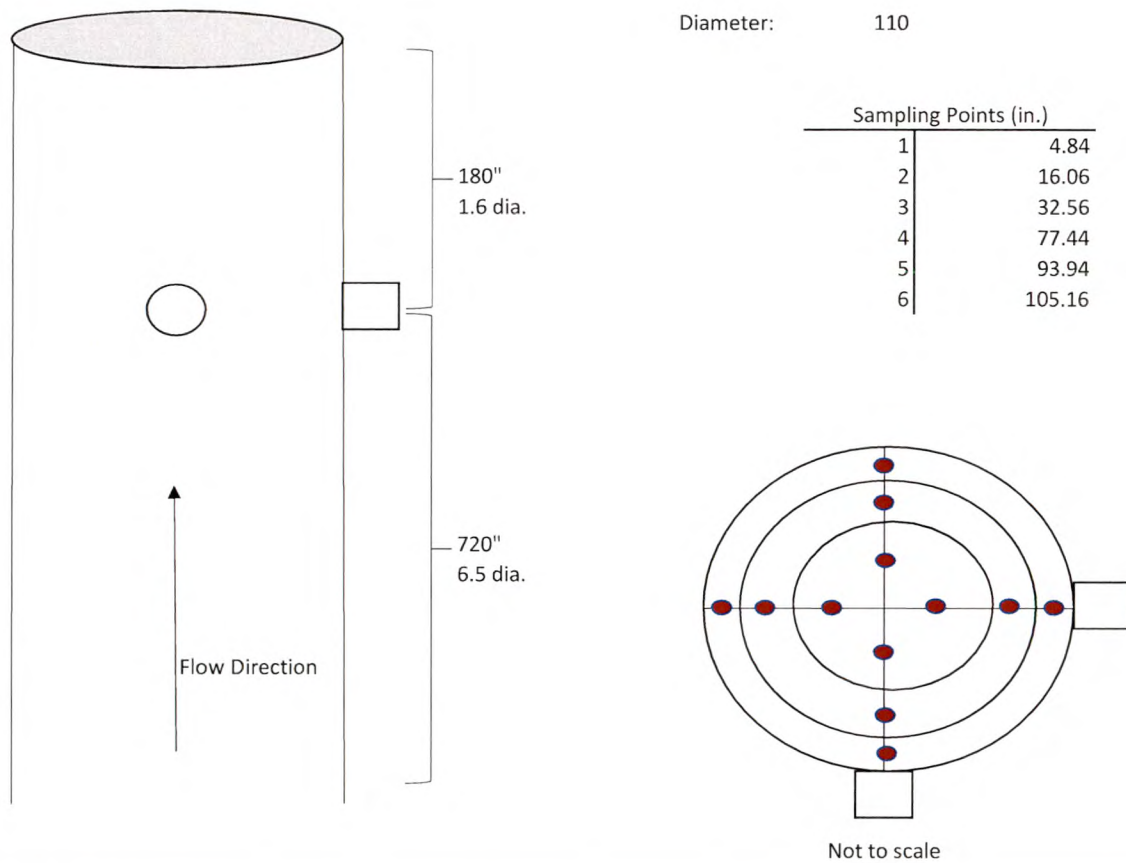
North RTO Inlet
FCA US, LLC
SHAP
Sterling Heights, MI

Date:
3-Jun-24

RWDI USA LLC
2239 Star Court
Rochester Hills, MI 48309



Figure No. #2 North RTO Outlet



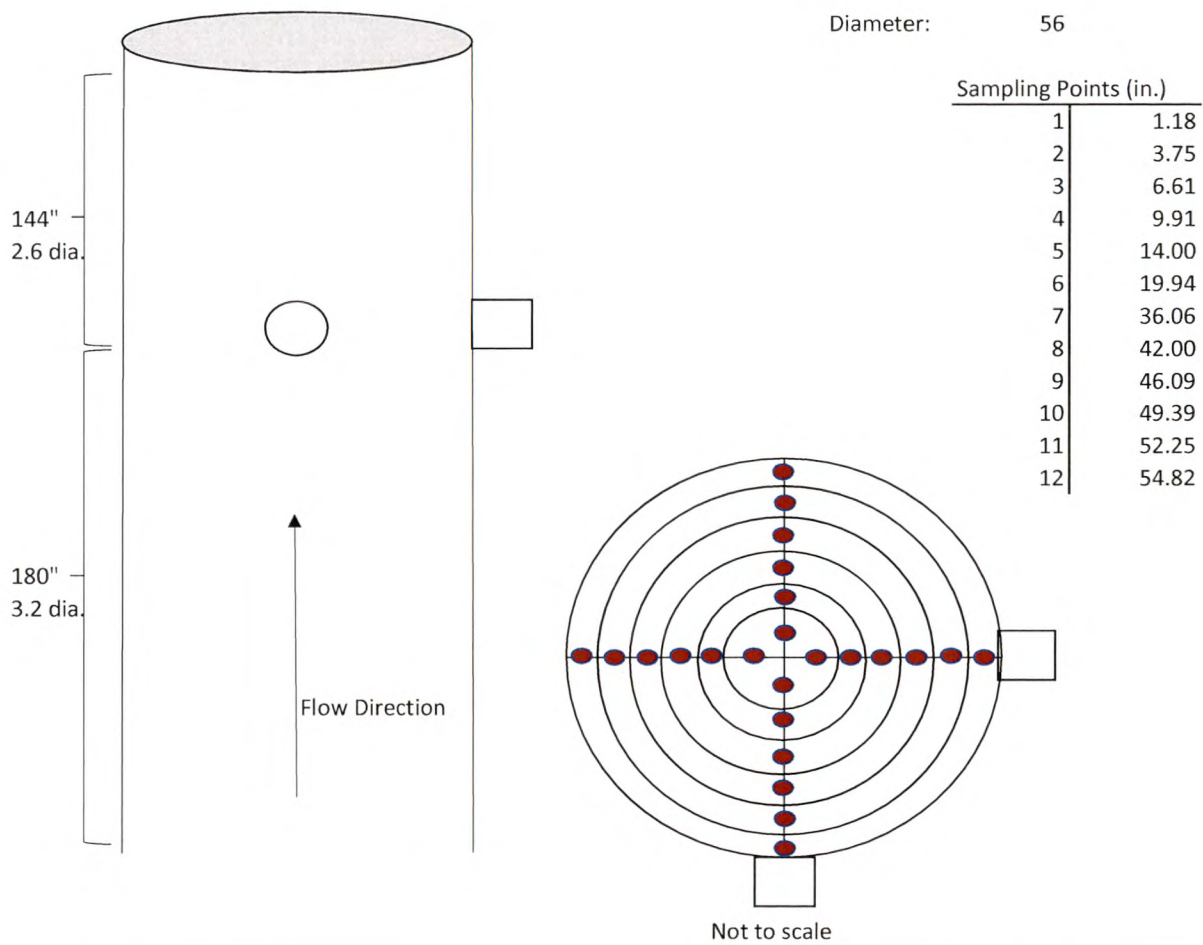
North RTO Outlet
FCA US, LLC
SHAP
Sterling Heights, MI

Date:
6/3/2024

RWDI USA LLC
2239 Star Court
Rochester Hills, MI 48309



Figure No. #3 Basecoat #1



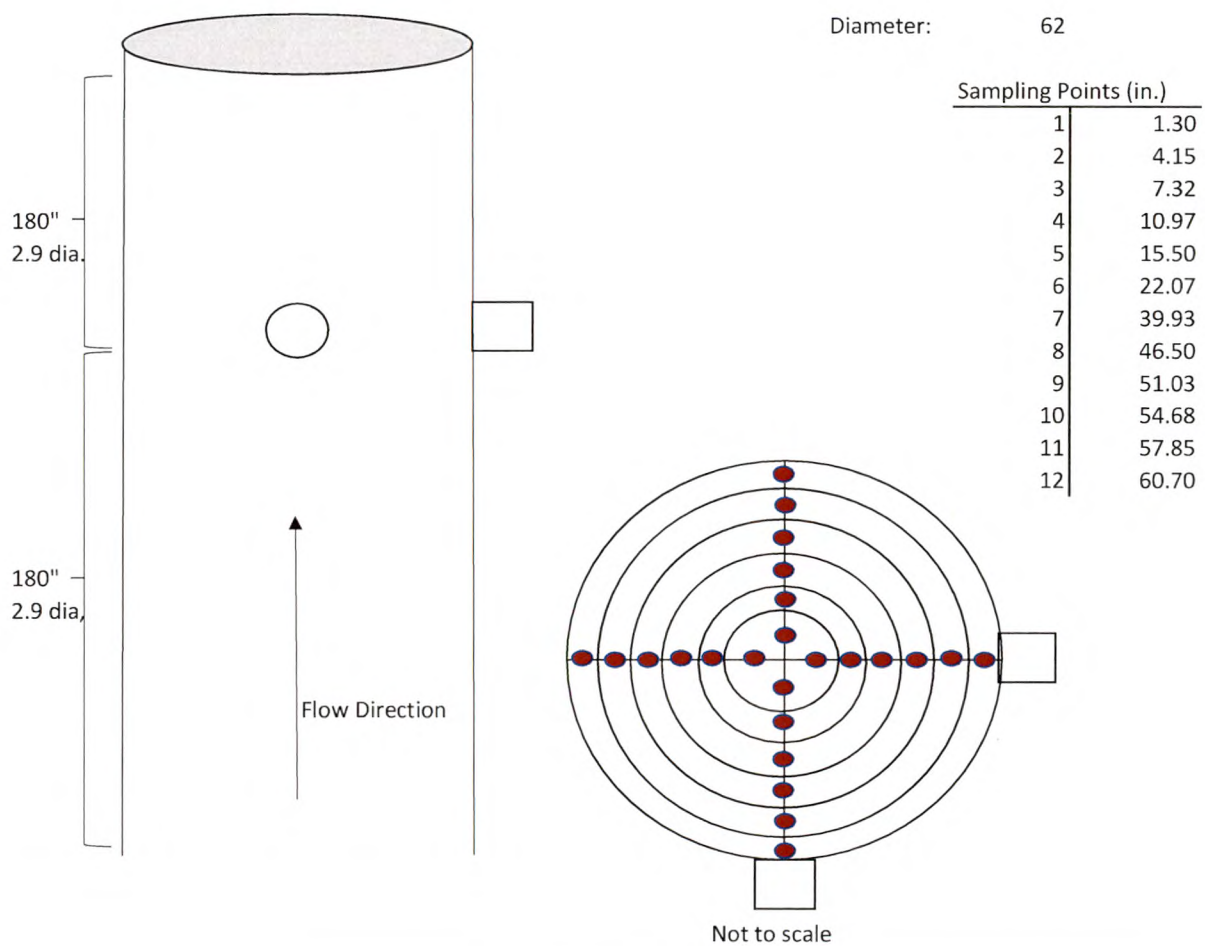
Basecoat #1
FCA US, LLC
SHAP
Sterling Heights, MI

Date:
3-Jun-24

RWDI USA LLC
2239 Star Court
Rochester Hills, MI 48309



Figure No. #5 Color Prep



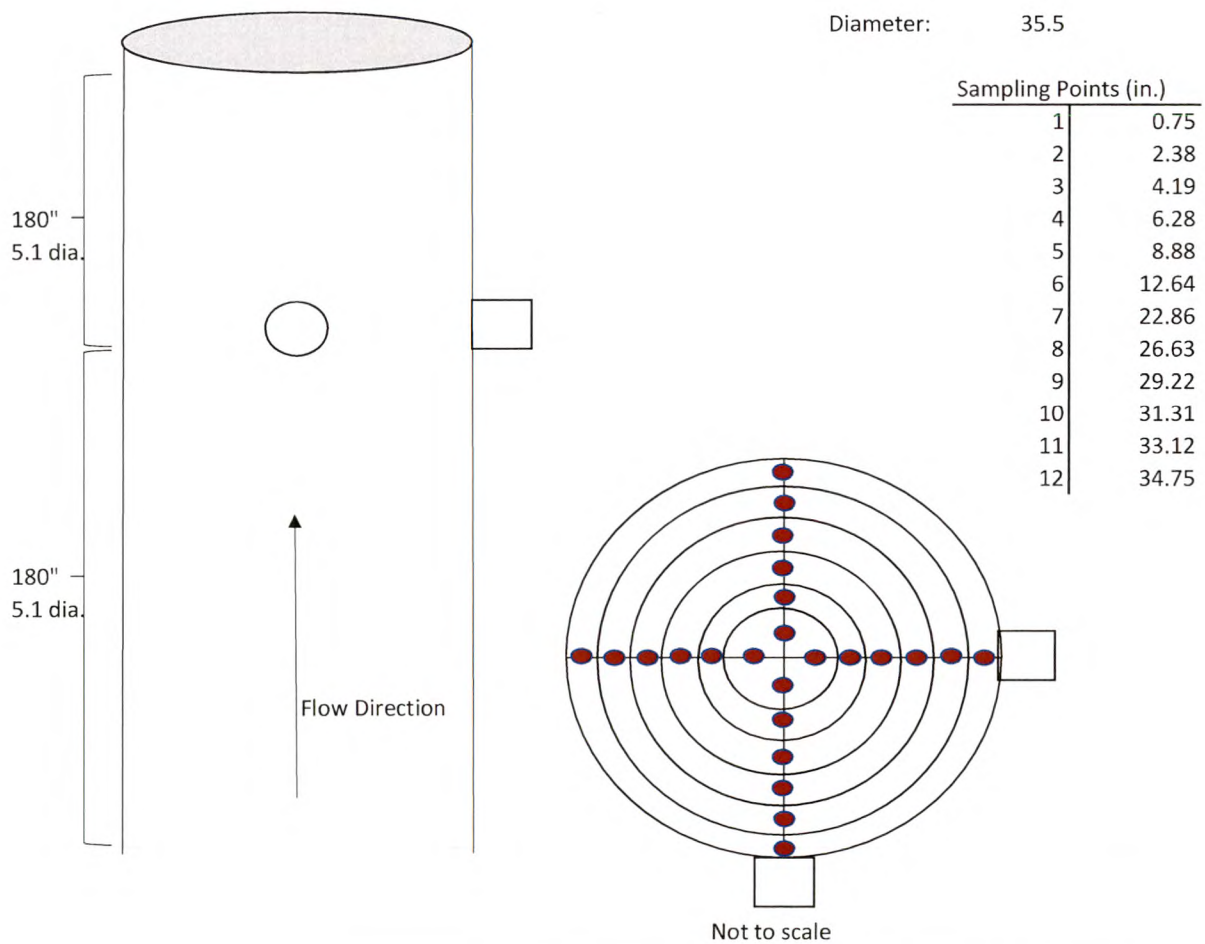
Color Prep
FCA US, LLC
SHAP
Sterling Heights, MI

Date:
4-Jun-24

RWDI USA LLC
2239 Star Court
Rochester Hills, MI 48309



Figure No. #6 Reprocess Booth



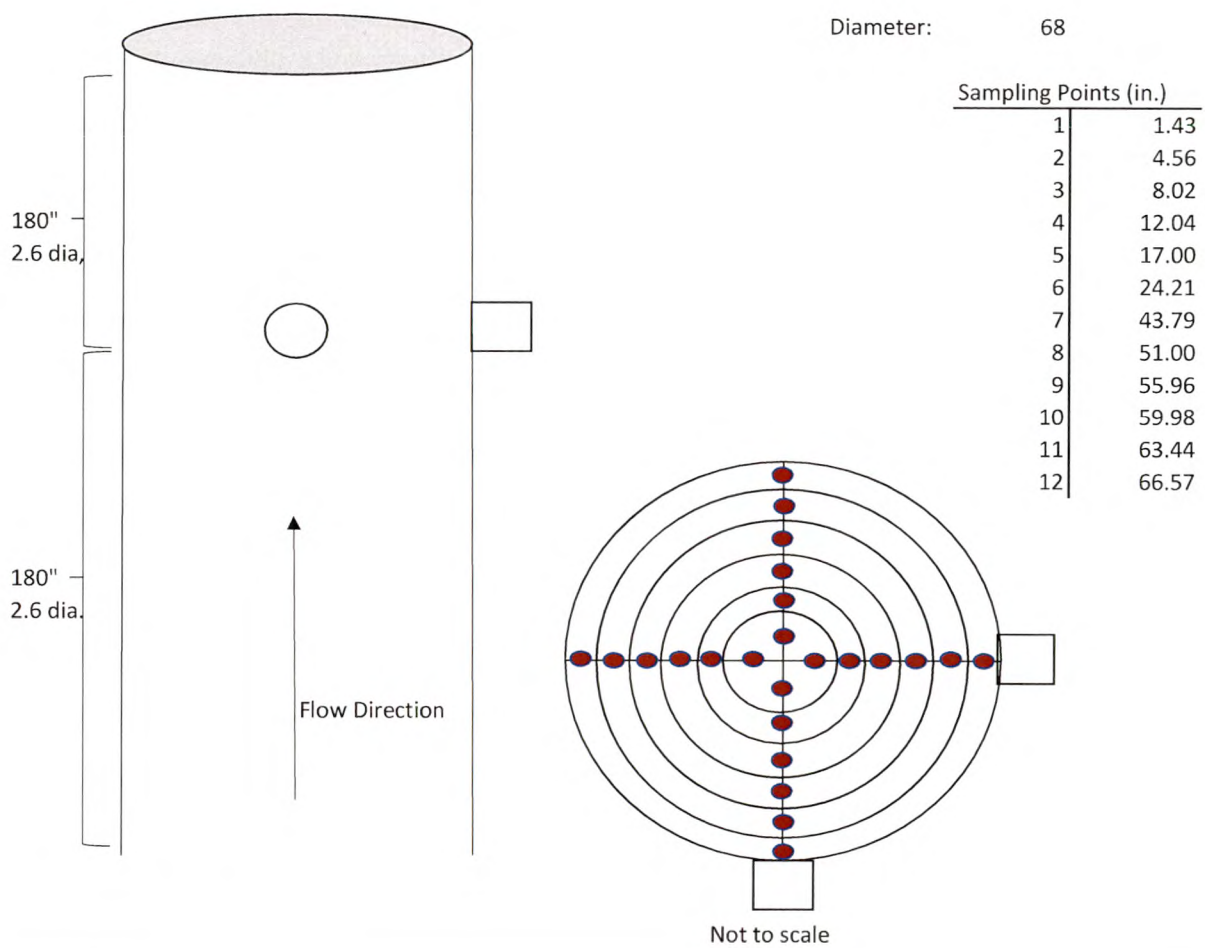
Reprocess Booth
FCA US, LLC
SHAP
Sterling Heights, MI

Date:
5-Jun-24

RWDI USA LLC
2239 Star Court
Rochester Hills, MI 48309



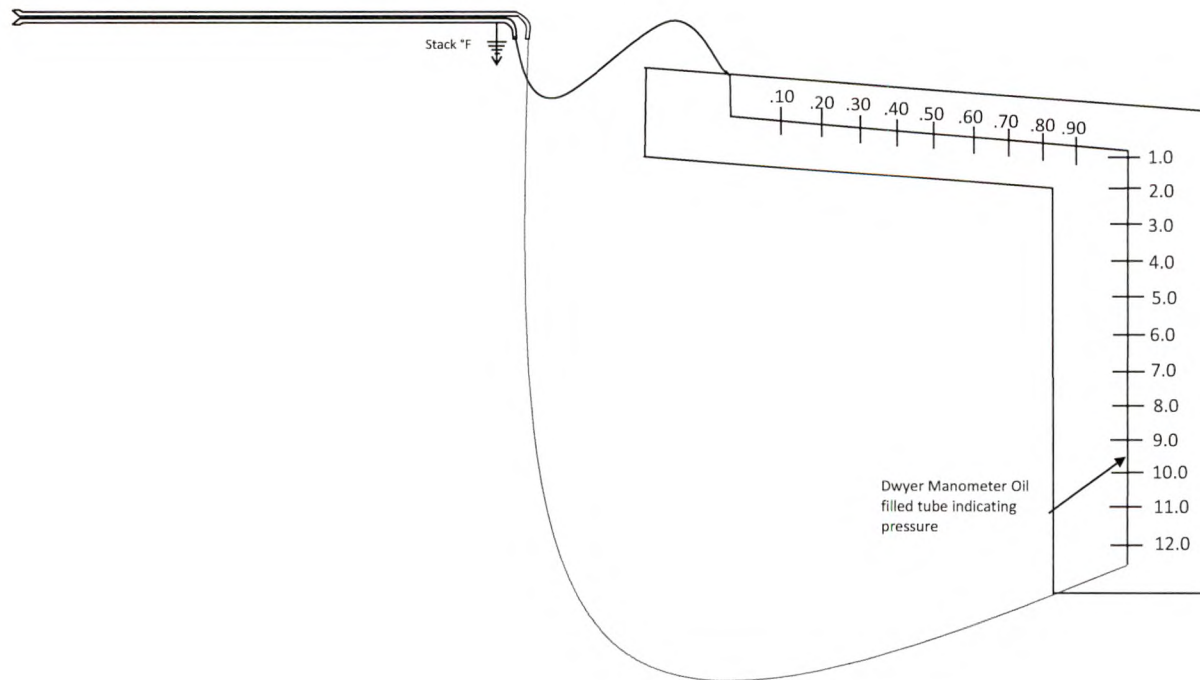
Figure No. #7 Rapid Reprocess



Rapid Reprocess
FCA US, LLC
SHAP
Sterling Heights, MI

Date:
6-Jun-24

RWDI USA LLC
2239 Star Court
Rochester Hills, MI 48309



USEPA Method 2

FCA US, LLC

SHAP

North Paint Shop

Sterling Heights, MI

Project #2407128

Figure No. 8

Date: 6/3/2024





Figure No. 9: USEPA Method 3 Schematic (Fyrite)



USEPA Method 3

FCA US, LLC
SHAP
North Paint Shop
Project #2407128

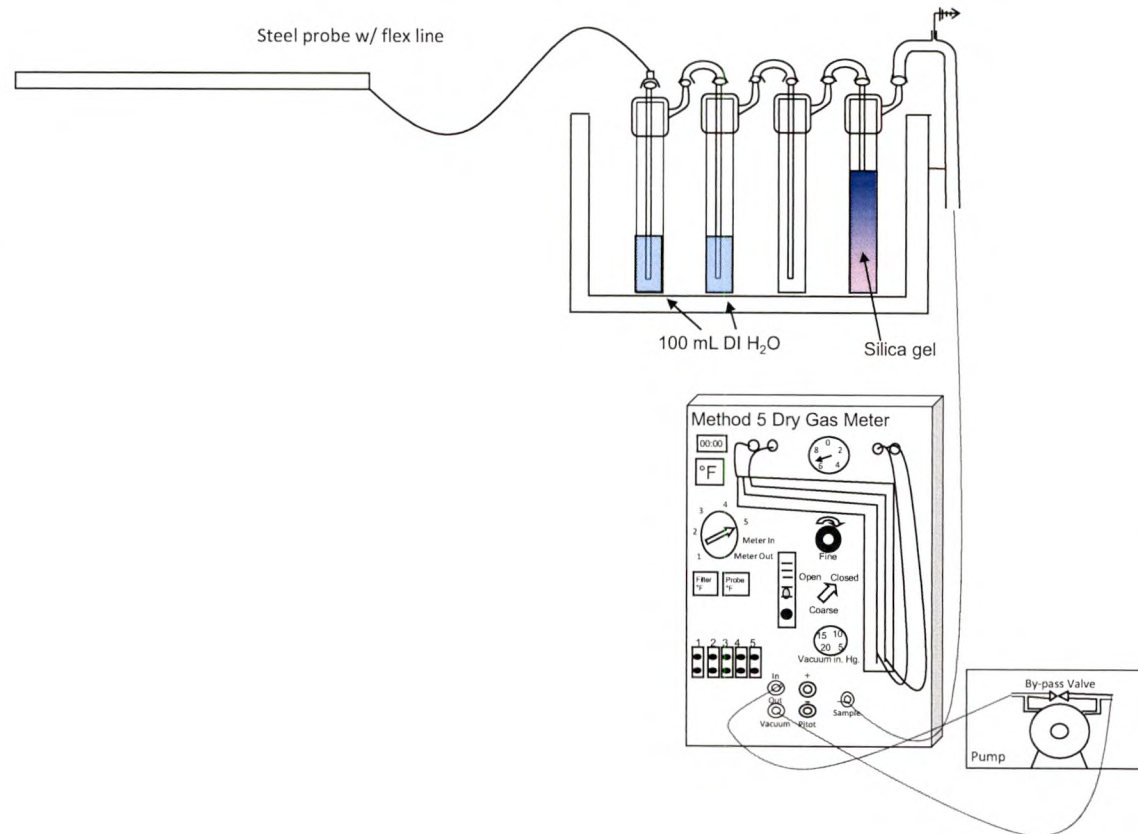
Figure No. 9:
Schematic of USEPA Method 3 (Fyrite)

Date: June 2, 2024





Figure No. #10 USEPA Method 4 Schematic



USEPA Method 4

FCA US, LLC

SHAP

North RTO Inlet

Sterling Heights, MI

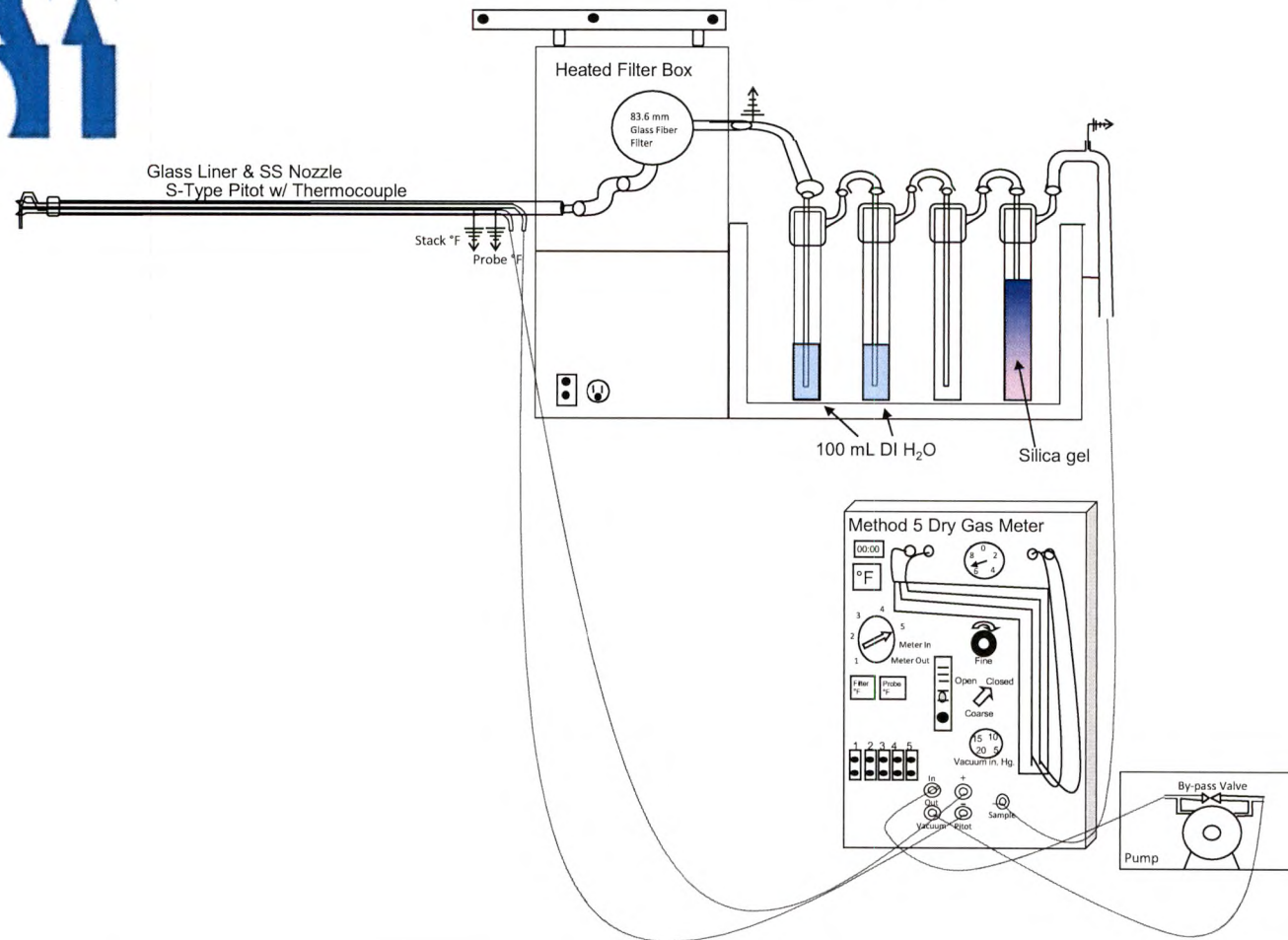
Project #2407128

Date: June 3, 2024





Figure No. #11 USEPA Method 5 Schematic



USEPA Method 5

FCA US, LLC

SHAP

North Paint Shop

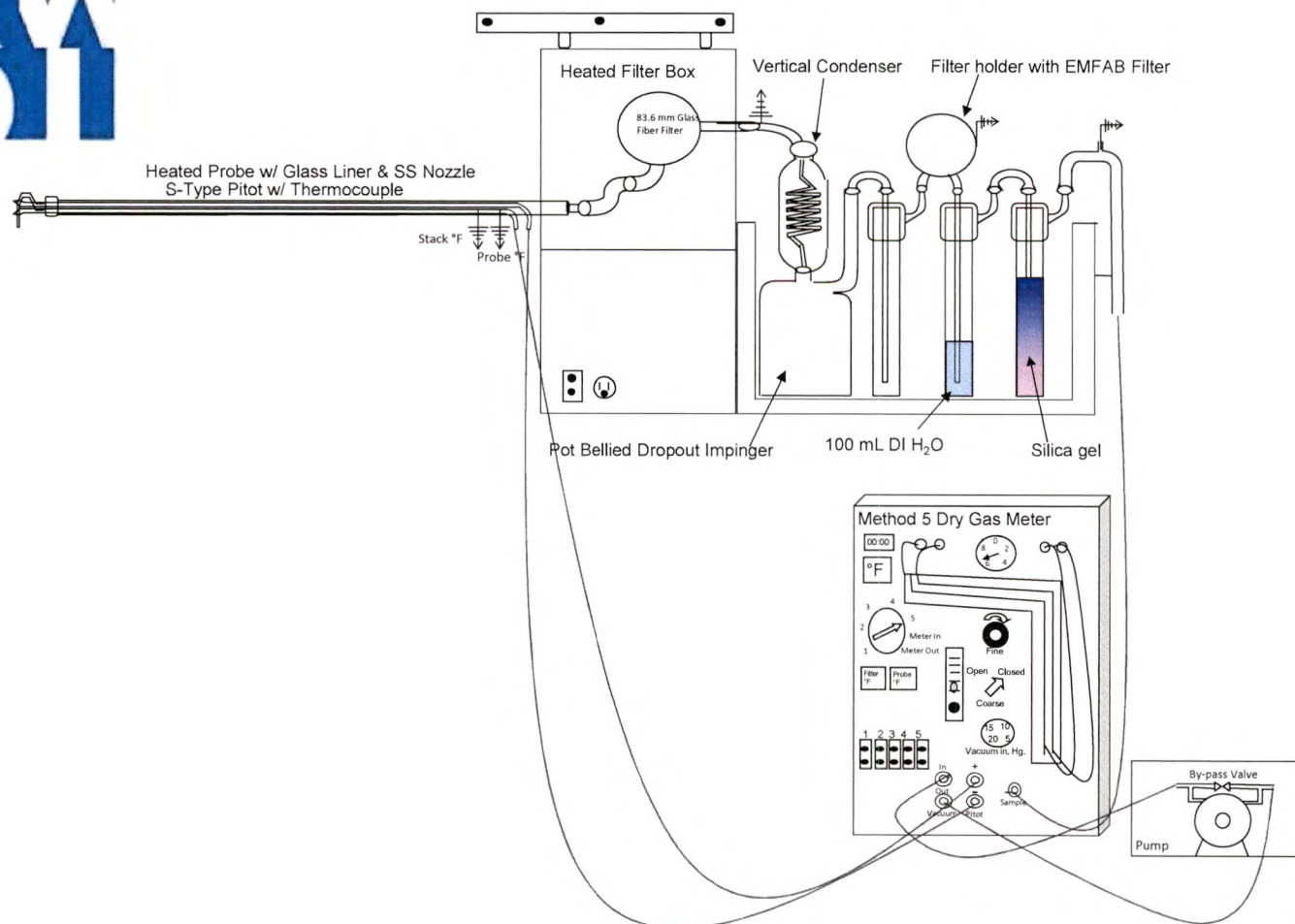
Sterling Heights, MI

Project #2407128





Figure No. #12 USEPA Method 5/202 Schematic



USEPA Method 5/202

FCA US, LLC

SHAP

North Paint Shop
Sterling Heights, MI

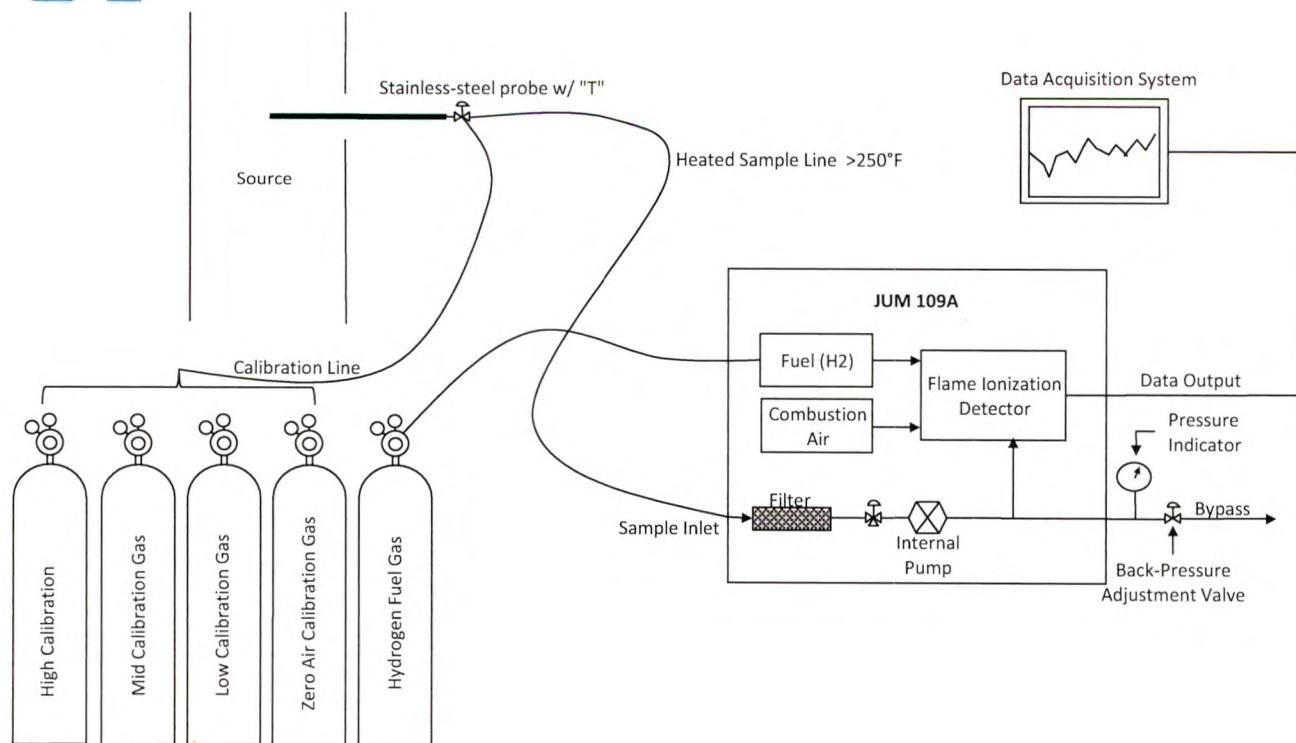
Project #2407128

Date: June 3, 2024





Figure No. #13: USEPA Method 25A Schematic



USEPA Method 25A

FCA US, LLC

SHAP

North Paint Shop

Sterling Heights, MI

Project #2407128

Date: June 3, 2024

