

Our Ref: P-RED17-050/EB/R1/Rev0
Client Ref:

15th June 2017

Darren Bates
Lawrence Automotive VMC Ltd
Browns Lane
Allesley
Coventry CV5 9DR

Dear Darren

Re: Emissions Monitoring

Please find enclosed a copy of your report for the monitoring carried out on the 6th, 7th and 14th to 16th September 2015.

If you have any questions with respect to the report please contact me on the numbers below or directly on 07971 628431; alternatively you can email me at elena@redwing.org.uk.

Yours sincerely

Elena Berek BSc (Hons), MSc, CSci, CChem MRSC
Director

PROJECT TEAM

Project work carried out by:

Elena Berek – Team Leader

MCerts Level 2 – MM 02 029

Philip Butler – Env Technician

MCerts Level 1 – MM 02 016

Report prepared by:

Elena Berek – Director

Signature:



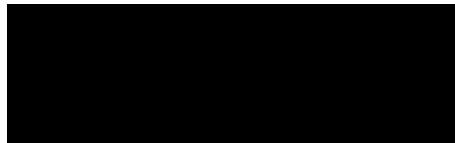
Date:

2nd June 2017

Report reviewed by:

Philip Butler - Director

Signature:



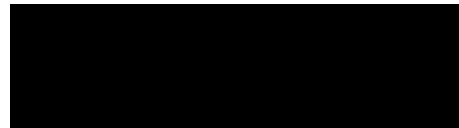
Date:

12th June 2017

Report authorised by:

Philip Butler

Signature:



Date:

12th June 2017



MAY 2017

EMISSIONS MONITORING

**Darren Bates
Lawrence Automotive VMC Ltd
Browns Lane
Allesley
Coventry CV5 9DR**

Prepared By

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Report Number P-RED17-050/EB/R1/Rev0

2nd June 2017



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EXECUTIVE SUMMARY (Page 1 of 1)

The following document details the emissions to air monitoring survey undertaken by Elena Berek and Philip Butler of Redwing Environmental Ltd at Lawrence Automotive, Browns Lane, Coventry during May 2017.

All results pertain to the dates monitored only; these dates include the 2nd and 3rd May 2017.

A summary of results is shown below:-

Emission point reference Stack N ^o	Total Particulate Matter range at reference conditions (mg/m ³)	Highest 30 minute VOC Concentrations at reference conditions (mg/m ³)	Isocyanate Concentrations at reference conditions (mg/m ³)	Velocity corrected to reference conditions (m/s)	Volume flow corrected to reference conditions (m ³ /hr)
VMC 3 Polyester Auto Cell 1	1.5 ± 0.24	43.9 ± 1.6 (34.5)	0.047 ± 0.009	6.9	6995
VMC 3 Polyester Auto Cell 2	1.0 ± 0.23	24.0 ± 1.2 (19.5)	0.024 ± 0.005	9.1	9293
VMC 3 Polyester Auto Cell 3	0.84 ± 0.22	8.3 ± 1.0 (7.9)	0.043 ± 0.009	8.8	9164
VMC 3 Manual PU Spray 1	8.2 ± 0.43	6.6 ± 0.93 (5.1)	0.038 ± 0.008	6.1	8459
VMC 3 PU Auto	3.7 ± 0.86	10.3 ± 0.98 (9.4)	0.037 ± 0.007	14.0	22252
Additional VMC 3 Booth 1	13.7 ± 0.60	37.7 ± 1.47 (31.3)	0.044 ± 0.009	5.4	7493
Additional VMC 3 Booth 2	0.8 ± 0.29	28.1 ± 1.4 (27.0)	0.025 ± 0.005	5.6	7765
Additional VMC 3 Booth 3	6.5 ± 0.41	17.1 ± 1.1 (14.6)	0.027 ± 0.005	5.3	7364

The figures in blue are the average concentrations obtained for the duration of the run

NOTE 1: Reference conditions are standard temperature (273K) and standard pressure (101.3kPa) without correction for water content



1.0 INTRODUCTION

The monitoring of the fourteen exhausts was monitored with respect to quotation **Q-RED17-050/EB/v0** for the compliance check monitoring of emissions to air. The substances requested for monitoring at each emission point are listed below:

Monitoring Programme

Stack Reference	Volatile Organic Compounds	Isocyanates	Total Particulate Matter
VMC 3 Polyester Auto Cell 1	✓	✓	✓
VMC 3 Polyester Auto Cell 2	✓	✓	✓
VMC 3 Polyester Auto Cell 3	✓	✓	✓
VMC 3 Manual PU Spray 1	✓	✓	✓
VMC 3 PU Auto	✓	✓	✓
Additional VMC 3 Booth 1	✓	✓	✓
Additional VMC 3 Booth 2	✓	✓	✓
Additional VMC 3 Booth 3	✓	✓	✓

- 1.1 The emission results will be compared to the results listed in the local authority permit.
- 1.2 The velocity and temperature profiles were within the required parameters or 3:1 metres/second and $\pm 10\%$ for temperature profile. This information indicates that the sample ports are in ideal positions to collect the samples under representative conditions.



1.3 Monitoring Results

Emission Point Reference	Substance to be Monitored	Emission Limit Value	Periodic Monitoring Result	Units	Uncertainty expressed at 95% confidence	Reference Conditions 273 K, 101.3 kPa	Date of Sampling	Start and End Times	Monitoring Method Reference	Operating Status
VMC 3 Polyester Auto Cell 1	Total Particulate Matter	50	1.5	mg/m ³	± 0.24	273, 101.3kPa	02/05/17	1016 – 1116	BS EN 13284-1	Normal
	Volatile Organic Compounds	50	43.9	mg/m ³	± 1.6			1016 – 1116	BS EN 12619	
	Isocyanates	0.1	0.047	mg/m ³	± 0.009			1016 – 1116	USEPA Method 36	
VMC 3 Polyester Auto Cell 2	Total Particulate Matter	50	1.0	mg/m ³	± 0.23	273, 101.3kPa	02/05/17	1126 – 1226	BS EN 13284-1	Normal
	Volatile Organic Compounds	50	24.0	mg/m ³	± 1.2			1126 – 1226	BS EN 12619	
	Isocyanates	0.1	0.024	mg/m ³	± 0.005			1126 – 1226	USEPA Method 36	
VMC 3 Polyester Auto Cell 3	Total Particulate Matter	50	0.84	mg/m ³	± 0.22	273, 101.3kPa	02/05/17	1254 – 1354	BS EN 13284-1	Normal
	Volatile Organic Compounds	50	8.3	mg/m ³	± 1.00			1254 – 1354	BS EN 12619	
	Isocyanates	0.1	0.043	mg/m ³	± 0.009			1254 - 1354	USEPA Method 36	



Emission Point Reference	Substance to be Monitored	Emission Limit Value	Periodic Monitoring Result	Units	Uncertainty expressed at 95% confidence	Reference Conditions 273 K, 101.3 kPa	Date of Sampling	Start and End Times	Monitoring Method Reference	Operating Status
VMC 3 PU Manual Spray 1	Total Particulate Matter	50	8.2	mg/m ³	± 0.43	273, 101.3kPa	02/05/17	1409 – 1509	BS EN 13284-1	Normal
	Volatile Organic Compounds	50	6.6	mg/m ³	± 0.93			1409 – 1509	BS EN 12619	
	Isocyanates	0.1	0.038	mg/m ³	± 0.008			1409 – 1509	USEPA Method 36	
VMC 3 PU Auto	Total Particulate Matter	50	3.7	mg/m ³	± 0.86	273, 101.3kPa	02/05/17	1520 – 1620	BS EN 13284-1	Normal
	Volatile Organic Compounds	50	10.3	mg/m ³	± 0.98			1520 – 1620	BS EN 12619	
	Isocyanates	0.1	0.037	mg/m ³	± 0.007			1520 – 1620	USEPA Method 36	
Additional VMC 3 Booth 1	Total Particulate Matter	50	13.7	mg/m ³	± 0.60	273, 101.3kPa	03/05/17	0955 – 1055	BS EN 13284-1	Normal
	Volatile Organic Compounds	50	37.7	mg/m ³	± 1.47			0955 – 1055	BS EN 12619	
	Isocyanates	0.1	0.044	mg/m ³	± 0.009			0955 – 1055	USEPA Method 36	



Emission Point Reference	Substance to be Monitored	Emission Limit Value	Periodic Monitoring Result	Units	Uncertainty expressed at 95% confidence	Reference Conditions 273 K, 101.3 kPa	Date of Sampling	Start and End Times	Monitoring Method Reference	Operating Status
Additional VMC 3 Booth 2	Total Particulate Matter	50	0.8	mg/m ³	± 0.29	273, 101.3kPa	03/05/17	1113 – 1213	BS EN 13284-1	Normal
	Volatile Organic Compounds	50	28.1	mg/m ³	± 1.4			1113 – 1213	BS EN 12619	
	Isocyanates	0.1	0.025	mg/m ³	± 0.005			1113 – 1213	USEPA Method 36	
Additional VMC 3 Booth 3	Total Particulate Matter	50	6.5	mg/m ³	± 0.41	273, 101.3kPa	03/05/17	1220 – 1320	BS EN 13284-1	Normal
	Volatile Organic Compounds	50	17.1	mg/m ³	± 1.10			1220 – 1320	BS EN 12619	
	Isocyanates	0.1	0.027	mg/m ³	± 0.005			1220 - 1320	USEPA Method 36	



2 Supporting Information (Held by Redwing Environmental Ltd)

2.1 General Information

2.1.1 Redwing Environmental Ltd staff details

Elena Berek MCerts Level 2 – TE1, TE2, TE3 & TE4
Registration number MM 02 029

Philip Butler – MCerts Trainee
Registration number MM 02 016

2.2 Redwing Environmental Ltd method details

2.2.1 Test Methods

2.2.2 Particulate matter BS EN 13284-1: 2002

2.2.3 Total particulate matter was sampled using a Zambelli isokinetic sampling system in accordance with BS EN 13284-1: 2002 – Determination of Low Range Mass Concentration of dust (< 50mg/m³).

2.2.4 The Zambelli sampling system monitors temperature, static pressure and velocities within the duct using an S-type pitot tube and K-type thermocouple. The sampling rate is continuously monitored and adjusted relative to the duct velocity to ensure isokinetic-sampling conditions are maintained throughout the monitoring period.

2.2.5 Exhaust gases were drawn under isokinetic conditions from the exhaust points using the Zambelli sampling probe, particulate matter was then collected on a pre-weighed quartz filter (or most suitable filter for process) contained within the filter cassette holder, and the total particulate matter determined gravimetrically.

2.2.6 It is also necessary to wash the probe and nozzle out with water and then acetone between sampling and the weight of the probe washing added to that collected on the sample filter. Analysis of an acetone/water blank will be carried out and the result corrected accordingly.

2.2.7 The sample positions were calculated with respect to BS EN 13284-1: 2002 – Stationary source emissions – Determination of Low Range Mass Concentration of dust.

2.2.8 Sampling may be carried out internally or externally, the method used will be reported and provided there are no deviations from the method the uncertainty for the monitoring procedure is reported to be within the requirements specified by the Hazardous Waste Directive (HWD) as stated in the Environment Agency Technical Document M2

Uncertainty: $\pm 30\%$



2.3 Stack Velocity, Pressure and Temperature Measurements

2.3.1 The stack velocity, pressure and temperature were measured by full pitot traverses of the duct using the points provided. Measurements were taken at ten equally spaced points along each proposed sampling line, excluding the 5% of the effective flue diameter from the wall.

2.4 Volatile organic compounds (BS EN 12619: 2013)

2.4.1 Monitoring to determine VOC emission concentrations was in accordance with BS EN 12619: 2013.

2.4.2 Volatile organic compound concentrations were measured using a Sick Maihak portable heated VOC analyser. The analyser works by burning the gas sample in a hydrogen flame. This ionises any organic compounds present and the current produced across an electric field is proportional to the number of carbon atoms.

2.4.3 The analyser and heated line were zeroed and calibrated with a test gas (80 ppm and 800ppm propane) prior to each sampling run. VOC sampling was undertaken over a period of at least 60 minutes to cover any process variation.

2.4.4 All data was logged onto a Grant Squirrel data logger set at 5 second logging intervals.

2.4.5 A list of response factors are available so that specific concentrations can be calculated for known solvents within the sample exhaust.

2.4.6 A heated line from the sample point to analyser was used to ensure that condensation did not occur therefore minimising the loss of sample concentration.

2.5 Leak tests for extractive techniques

2.5.1 All extractive-sampling techniques were tested for leaks before sampling proceeded. Any leaks present were eliminated prior to sampling and will be reported.

2.5.2 Leak checks are carried out during the calibration procedure, as the concentration of the calibration gas is known it is easily noticed if air is entering the sample line and diluting the gas.

2.6 Isocyanates (USEPA Method 36)

2.6.1 There are several Isocyanates; these include TDI, MDI, HDI and IPDI. The isocyanate monitored was TDI (Toluene diisocyanate). All Isocyanates follow the same procedure for sampling and analysis.

2.6.2 Isocyanates can be sampled non-isokinetically following MDHS 25 or isokinetically following USEPA Method 36. The same equipment used for Particulate sampling was used for the monitoring of Isocyanates.



3.0 Quality Assurance

- 3.1 Redwing Environmental Ltd will always endeavour to follow the methods specified in the Environment Agency Technical Guidance M2.
- 3.2 Redwing Environmental Ltd is accredited to ISO 9001: 2008 and ISO 14001:2004.

4.0 Disclaimer

- 4.1 Redwing Environmental Ltd confirms that in preparing this report all reasonable skill and care has been exercised.
 - 4.1.1 Unless specifically assigned or transferred within the terms of the agreement, Redwing Environmental Ltd asserts and retains all copyright, and other Intellectual Property Rights, in and over the report and its contents.



APPENDIX 1

Particulate and Velocity Certificates



Stack Reference ID		VMC3 Auto Cell 1		
	Lawrence Automotive			
	RUN 1			
Filter Reference No	G47-260417-01			
Date	2nd May 2017			
Sample Period	10:16	to	11:16	
Velocity (m/s)	6.87			
Volume flow rate of Stack gas (m ³ /hr)	6995			
Average Stack Temp (°C)	21.9			
Temp Range ± 5% (°C)	7.15	to	36.65	
Lowest Velocity Reading (m/s)	6.75			
Highest Velocity Reading (m/s)	7.57			
Ratio (less than 3:1)	1.12	:	1	
Pre-conditioning temperature of Filter (°C)	180			
Instack sampling - Max Filter temperature (°C)	22.4			
Post-conditioning temperature Filter/Wash (°C)	160			
Oxygen %	18.9			
Carbon Dioxide %	0.50			
Moisture (%)	2.57			
Litres sampled	1167			
Corrected volume sampled - STP (m ³)	1.101			
Blank Filter Run weight gain (mg)	0.010	Blank Concentration (mg/m ³)	0.009	
Blank Wash Run weight gain (mg)	0.050		0.045	
Weighing uncertainty of balance (mg)	0.074	This must be <5% of ELV	ELV = 50	2.5
Overall Blank value (mg/m ³)	0.054	This must be <10% of ELV	ELV = 50	5.0
Particulate weight collected on filter (mg)	0.78			
Particulate weight collected in Wash (mg)	0.87			
Total Particulate weight collected (mg)	1.65			
Total Particulate Concentration, dry gas at STP (mg/m ³)	1.50			
Total Particulate Concentration, wet gas at STP (mg/m ³)	1.46			
Total Particulate Concentration corrected for 11% Oxygen, dry gas (mg/m ³)	N/A			
Total Particulate Mass Emission (g/hour)	0.01			



Stack Reference ID		VMC3 Auto Cell 2		
	Lawrence Automotive			
	RUN 1			
Filter Reference No	G47-260417-03			
Date	2nd May 2017			
Sample Period	11:26	to	12:26	
Velocity (m/s)	9.13			
Volume flow rate of Stack gas (m ³ /hr)	9293			
Average Stack Temp (°C)	21.6			
Temp Range ± 5% (°C)	6.82	to	36.28	
Lowest Velocity Reading (m/s)	9.13			
Highest Velocity Reading (m/s)	9.68			
Ratio (less than 3:1)	1.06	:	1	
Pre-conditioning temperature of Filter (°C)	180			
Instack sampling - Max Filter temperature (°C)	17.0			
Post-conditioning temperature Filter/Wash (°C)	160			
Oxygen %	19			
Carbon Dioxide %	0.20			
Moisture (%)	2.57			
Litres sampled	1588			
Corrected volume sampled - STP (m ³)	1.494			
Blank Filter Run weight gain (mg)	0.030	Blank Concentration (mg/m ³)	0.020	
Blank Wash Run weight gain (mg)	0.040		0.027	
Weighing uncertainty of balance (mg)	0.075	This must be <5% of ELV	ELV = 50	2.5
Overall Blank value (mg/m ³)	0.047	This must be <10% of ELV	ELV = 50	10.0
Particulate weight collected on filter (mg)	0.27			
Particulate weight collected in Wash (mg)	1.33			
Total Particulate weight collected (mg)	1.60			
Total Particulate Concentration, dry gas at STP (mg/m ³)	1.07			
Total Particulate Concentration, wet gas at STP (mg/m ³)	1.04			
Total Particulate Concentration corrected for 11% Oxygen, dry gas (mg/m ³)	N/A			
Total Particulate Mass Emission (Kg/hour)	0.01			



Stack Reference ID		VMC3 Auto Cell 3		
	Lawrence Automotive			
	RUN 1			
Filter Reference No	G47-260417-05			
Date	2nd May 2017			
Sample Period	12:54	to	13:54	
Velocity (m/s)	8.76			
Volume flow rate of Stack gas (m ³ /hr)	9164			
Average Stack Temp (°C)	20.8			
Temp Range ± 5% (°C)	6.06	to	35.44	
Lowest Velocity Reading (m/s)	8.53			
Highest Velocity Reading (m/s)	9.37			
Ratio (less than 3:1)	1.10	:	1	
Pre-conditioning temperature of Filter (°C)	180			
Instack sampling - Max Filter temperature (°C)	17.0			
Post-conditioning temperature Filter/Wash (°C)	160			
Oxygen %	18.9			
Carbon Dioxide %	0.70			
Moisture (%)	2.57			
Litres sampled	1509			
Corrected volume sampled - STP (m ³)	1.420			
Blank Filter Run weight gain (mg)	0.020	Blank Concentration (mg/m ³)	0.014	
Blank Wash Run weight gain (mg)	0.040		0.028	
Weighing uncertainty of balance (mg)	0.074	This must be <5% of ELV	ELV = 50	2.5
Overall Blank value (mg/m ³)	0.042	This must be <10% of ELV	ELV = 50	10.0
Particulate weight collected on filter (mg)	0.20			
Particulate weight collected in Wash (mg)	1.03			
Total Particulate weight collected (mg)	1.23			
Total Particulate Concentration, dry gas at STP (mg/m ³)	0.87			
Total Particulate Concentration, wet gas at STP (mg/m ³)	0.84			
Total Particulate Concentration corrected for 11% Oxygen, dry gas (mg/m ³)	N/A			
Total Particulate Mass Emission (Kg/hour)	0.01			



Stack Reference ID		VMC3 PU Manual		
		Lawrence Automotive		
		RUN 1		
Filter Reference No	G47-260417-07			
Date	2nd May 2017			
Sample Period	14:09	to	15:09	
Velocity (m/s)	6.11			
Volume flow rate of Stack gas (m ³ /hr)	8459			
Average Stack Temp (°C)	22.4			
Temp Range ± 5% (°C)	7.63	to	37.17	
Lowest Velocity Reading (m/s)	5.83			
Highest Velocity Reading (m/s)	6.56			
Ratio (less than 3:1)	1.13	:	1	
Pre-conditioning temperature of Filter (°C)	180			
Instack sampling - Max Filter temperature (°C)	22.6			
Post-conditioning temperature Filter/Wash (°C)	160			
Oxygen %	19.6			
Carbon Dioxide %	0.50			
Moisture (%)	2.57			
Litres sampled	1104			
Corrected volume sampled - STP (m ³)	1.034			
Blank Filter Run weight gain (mg)	0.010	Blank Concentration (mg/m ³)	0.010	
Blank Wash Run weight gain (mg)	0.020		0.019	
Weighing uncertainty of balance (mg)	0.087	This must be <5% of ELV	ELV = 50	2.5
Overall Blank value (mg/m ³)	0.029	This must be <10% of ELV	ELV = 50	5.0
Particulate weight collected on filter (mg)	6.36			
Particulate weight collected in Wash (mg)	2.37			
Total Particulate weight collected (mg)	8.73			
Total Particulate Concentration, dry gas at STP (mg/m ³)	8.45			
Total Particulate Concentration, wet gas at STP (mg/m ³)	8.23			
Total Particulate Concentration corrected for 11% Oxygen, dry gas (mg/m ³)	N/A			
Total Particulate Mass Emission (kg/hour)	0.07			



Stack Reference ID		VMC3 PU Auto		
		Lawrence Automotive		
		RUN 1		
Filter Reference No	G47-260417-09			
Date	2nd May 2017			
Sample Period	15:20	to	16:20	
Velocity (m/s)	13.99			
Volume flow rate of Stack gas (m ³ /hr)	22252			
Average Stack Temp (°C)	25.6			
Temp Range ± 5% (°C)	10.67	to	40.53	
Lowest Velocity Reading (m/s)	13.97			
Highest Velocity Reading (m/s)	14.62			
Ratio (less than 3:1)	1.05	:	1	
Pre-conditioning temperature of Filter (°C)	180			
Instack sampling - Max Filter temperature (°C)	25.8			
Post-conditioning temperature Filter/Wash (°C)	160			
Oxygen %	19.2			
Carbon Dioxide %	0.20			
Moisture (%)	2.57			
Litres sampled	1449			
Corrected volume sampled - STP (m ³)	1.354			
Blank Filter Run weight gain (mg)	0.050	Blank Concentration (mg/m ³)	0.037	
Blank Wash Run weight gain (mg)	0.000		0.000	
Weighing uncertainty of balance (mg)	0.079	This must be <5% of ELV	ELV = 50	2.5
Overall Blank value (mg/m ³)	0.037	This must be <10% of ELV	ELV = 50	5.0
Particulate weight collected on filter (mg)	3.99			
Particulate weight collected in Wash (mg)	1.16			
Total Particulate weight collected (mg)	5.15			
Total Particulate Concentration, dry gas at STP (mg/m ³)	3.80			
Total Particulate Concentration, wet gas at STP (mg/m ³)	3.71			
Total Particulate Concentration corrected for 11% Oxygen, dry gas (mg/m ³)	N/A			
Total Particulate Mass Emission (kg/hour)	0.08			



Stack Reference ID		VMC3 New Booth No 1		
	Lawrence Automotive			
	RUN 1			
Filter Reference No	G47-260417-11			
Date	3rd May 2017			
Sample Period	09:55	to	10:55	
Velocity (m/s)	5.41			
Volume flow rate of Stack gas (m ³ /hr)	7493			
Average Stack Temp (°C)	21.9			
Temp Range ± 5% (°C)	7.15	to	36.65	
Lowest Velocity Reading (m/s)	5.23			
Highest Velocity Reading (m/s)	5.82			
Ratio (less than 3:1)	1.11	:	1	
Pre-conditioning temperature of Filter (°C)	180			
Instack sampling - Max Filter temperature (°C)	22.2			
Post-conditioning temperature Filter/Wash (°C)	160			
Oxygen %	19.2			
Carbon Dioxide %	0.30			
Moisture (%)	2.58			
Litres sampled	917			
Corrected volume sampled - STP (m ³)	0.870			
Blank Filter Run weight gain (mg)	0.010	Blank Concentration (mg/m ³)	0.011	
Blank Wash Run weight gain (mg)	0.030		0.034	
Weighing uncertainty of balance (mg)	0.099	This must be <5% of ELV	ELV = 50	2.5
Overall Blank value (mg/m ³)	0.046	This must be <10% of ELV	ELV = 50	5.0
Particulate weight collected on filter (mg)	9.62			
Particulate weight collected in Wash (mg)	2.63			
Total Particulate weight collected (mg)	12.25			
Total Particulate Concentration, dry gas at STP (mg/m ³)	14.08			
Total Particulate Concentration, wet gas at STP (mg/m ³)	13.71			
Total Particulate Concentration corrected for 11% Oxygen, dry gas (mg/m ³)	N/A			
Total Particulate Mass Emission (kg/hour)	0.11			



Stack Reference ID		VMC3 New Booth No 2		
	Lawrence Automotive			
	RUN 1			
Filter Reference No	G47-260417-13			
Date	3rd May 2017			
Sample Period	11:13	to	12:13	
Velocity (m/s)	5.60			
Volume flow rate of Stack gas (m ³ /hr)	7765			
Average Stack Temp (°C)	21.8			
Temp Range ± 5% (°C)	7.06	to	36.54	
Lowest Velocity Reading (m/s)	5.59			
Highest Velocity Reading (m/s)	5.93			
Ratio (less than 3:1)	1.06	:	1	
Pre-conditioning temperature of Filter (°C)	180			
Instack sampling - Max Filter temperature (°C)	21.8			
Post-conditioning temperature Filter/Wash (°C)	160			
Oxygen %	19.5			
Carbon Dioxide %	0.40			
Moisture (%)	2.58			
Litres sampled	903			
Corrected volume sampled - STP (m ³)	0.849			
Blank Filter Run weight gain (mg)	0.050	Blank Concentration (mg/m ³)	0.059	
Blank Wash Run weight gain (mg)	0.020		0.024	
Weighing uncertainty of balance (mg)	0.074	This must be <5% of ELV	ELV = 50	2.5
Overall Blank value (mg/m ³)	0.082	This must be <10% of ELV	ELV = 50	5.0
Particulate weight collected on filter (mg)	0.52			
Particulate weight collected in Wash (mg)	0.19			
Total Particulate weight collected (mg)	0.71			
Total Particulate Concentration, dry gas at STP (mg/m ³)	0.84			
Total Particulate Concentration, wet gas at STP (mg/m ³)	0.81			
Total Particulate Concentration corrected for 11% Oxygen, dry gas (mg/m ³)	N/A			
Total Particulate Mass Emission (kg/hour)	0.0064			

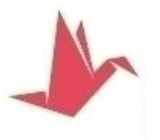


Stack Reference ID		VMC3 New Booth No 3		
	Lawrence Automotive			
	RUN 1			
Filter Reference No	G47-260417-15			
Date	3rd May 2017			
Sample Period	12:20	to	13:20	
Velocity (m/s)	5.32			
Volume flow rate of Stack gas (m ³ /hr)	7364			
Average Stack Temp (°C)	21.3			
Temp Range ± 5% (°C)	6.54	to	35.96	
Lowest Velocity Reading (m/s)	5.35			
Highest Velocity Reading (m/s)	5.59			
Ratio (less than 3:1)	1.04	:	1	
Pre-conditioning temperature of Filter (°C)	180			
Instack sampling - Max Filter temperature (°C)	21.7			
Post-conditioning temperature Filter/Wash (°C)	160			
Oxygen %	19.5			
Carbon Dioxide %	0.40			
Moisture (%)	2.58			
Litres sampled	908			
Corrected volume sampled - STP (m ³)	0.850			
Blank Filter Run weight gain (mg)	0.020	Blank Concentration (mg/m ³)	0.024	
Blank Wash Run weight gain (mg)	0.020		0.024	
Weighing uncertainty of balance (mg)	0.083	This must be <5% of ELV	ELV = 50	2.5
Overall Blank value (mg/m ³)	0.047	This must be <10% of ELV	ELV = 50	5.0
Particulate weight collected on filter (mg)	5.52			
Particulate weight collected in Wash (mg)	0.18			
Total Particulate weight collected (mg)	5.70			
Total Particulate Concentration, dry gas at STP (mg/m ³)	6.70			
Total Particulate Concentration, wet gas at STP (mg/m ³)	6.53			
Total Particulate Concentration corrected for 11% Oxygen, dry gas (mg/m ³)	N/A			
Total Particulate Mass Emission (kg/hour)	0.0484			



APPENDIX 2

Volatile Organic Compound Results



VMC3 PA Cell 1 Spray Booth					
Date	Time	VOC mg/m3	Date	Time	VOC mg/m3
02-May-17	10:16:25	41.22	02-May-17	11:05:25	27.00
02-May-17	10:17:25	45.08	02-May-17	11:06:25	28.13
02-May-17	10:18:25	46.45	02-May-17	11:07:25	28.53
02-May-17	10:19:25	46.61	02-May-17	11:08:25	29.57
02-May-17	10:20:25	46.21	02-May-17	11:09:25	29.97
02-May-17	10:21:25	44.20	02-May-17	11:10:25	30.78
02-May-17	10:22:25	43.63	02-May-17	11:11:25	32.46
02-May-17	10:23:25	43.55	02-May-17	11:12:25	31.10
02-May-17	10:24:25	44.60	02-May-17	11:13:25	29.09
02-May-17	10:25:25	43.63	02-May-17	11:14:25	28.45
02-May-17	10:26:25	43.47	02-May-17	11:15:25	27.08
02-May-17	10:27:25	42.59			
02-May-17	10:28:25	42.91		Average	34.5
02-May-17	10:29:25	42.59			
02-May-17	10:30:25	40.74			
02-May-17	10:31:25	40.42			
02-May-17	10:32:25	39.86			
02-May-17	10:33:25	39.29			
02-May-17	10:34:25	36.40			
02-May-17	10:35:25	35.92			
02-May-17	10:36:25	36.00			
02-May-17	10:37:25	36.24			
02-May-17	10:38:25	36.08			
02-May-17	10:39:25	35.36			
02-May-17	10:40:25	34.71			
02-May-17	10:41:25	34.23			
02-May-17	10:42:25	34.15			
02-May-17	10:43:25	34.15			
02-May-17	10:44:25	33.11			
02-May-17	10:45:25	31.50			
02-May-17	10:46:25	30.78			
02-May-17	10:47:25	31.58			
02-May-17	10:48:25	31.74			
02-May-17	10:49:25	31.98			
02-May-17	10:50:25	31.82			
02-May-17	10:51:25	31.02			
02-May-17	10:52:25	29.65			
02-May-17	10:53:25	30.13			
02-May-17	10:54:25	30.70			
02-May-17	10:55:25	29.41			
02-May-17	10:56:25	29.41			
02-May-17	10:57:25	28.53			
02-May-17	10:58:25	28.45			
02-May-17	10:59:25	28.04			
02-May-17	11:00:25	27.00			
02-May-17	11:01:25	27.08			
02-May-17	11:02:25	27.88			
02-May-17	11:03:25	28.04			
02-May-17	11:04:25	27.40			



VMC3 PA Cell 2 Spray Booth					
Date	Time	VOC mg/m3	Date	Time	VOC mg/m3
02-May-17	11:26:03	27.24	02-May-17	12:15:03	11.65
02-May-17	11:27:03	25.15	02-May-17	12:16:03	11.25
02-May-17	11:28:03	24.27	02-May-17	12:17:03	10.77
02-May-17	11:29:03	24.67	02-May-17	12:18:03	12.05
02-May-17	11:30:03	25.55	02-May-17	12:19:03	13.82
02-May-17	11:31:03	25.79	02-May-17	12:20:03	14.06
02-May-17	11:32:03	26.20	02-May-17	12:21:03	13.26
02-May-17	11:33:03	25.71	02-May-17	12:22:03	12.21
02-May-17	11:34:03	24.51	02-May-17	12:23:03	11.49
02-May-17	11:35:03	24.91	02-May-17	12:24:03	11.65
02-May-17	11:36:03	25.39	02-May-17	12:25:03	11.81
02-May-17	11:37:03	23.95			
02-May-17	11:38:03	22.74		Average	19.5
02-May-17	11:39:03	21.70			
02-May-17	11:40:03	22.10			
02-May-17	11:41:03	22.10			
02-May-17	11:42:03	22.58			
02-May-17	11:43:03	22.90			
02-May-17	11:44:03	21.78			
02-May-17	11:45:03	22.98			
02-May-17	11:46:03	24.11			
02-May-17	11:47:03	24.59			
02-May-17	11:48:03	24.35			
02-May-17	11:49:03	24.19			
02-May-17	11:50:03	24.19			
02-May-17	11:51:03	23.63			
02-May-17	11:52:03	23.54			
02-May-17	11:53:03	23.95			
02-May-17	11:54:03	23.95			
02-May-17	11:55:03	23.95			
02-May-17	11:56:03	22.74			
02-May-17	11:57:03	23.14			
02-May-17	11:58:03	24.19			
02-May-17	11:59:03	24.83			
02-May-17	12:00:03	22.66			
02-May-17	12:01:03	20.33			
02-May-17	12:02:03	18.48			
02-May-17	12:03:03	17.28			
02-May-17	12:04:03	16.07			
02-May-17	12:05:03	15.11			
02-May-17	12:06:03	14.30			
02-May-17	12:07:03	13.90			
02-May-17	12:08:03	13.18			
02-May-17	12:09:03	12.62			
02-May-17	12:10:03	12.78			
02-May-17	12:11:03	12.62			
02-May-17	12:12:03	12.05			
02-May-17	12:13:03	12.05			
02-May-17	12:14:03	11.73			



VMC3 PA Cell 3 Spray Booth					
Date	Time	VOC mg/m3	Date	Time	VOC mg/m3
02-May-17	12:54:26	8.28	02-May-17	13:43:26	8.60
02-May-17	12:55:26	8.20	02-May-17	13:44:26	9.00
02-May-17	12:56:26	8.20	02-May-17	13:45:26	9.32
02-May-17	12:57:26	8.20	02-May-17	13:46:26	9.80
02-May-17	12:58:26	8.28	02-May-17	13:47:26	9.88
02-May-17	12:59:26	8.20	02-May-17	13:48:26	9.72
02-May-17	13:00:26	8.68	02-May-17	13:49:26	9.80
02-May-17	13:01:26	8.76	02-May-17	13:50:26	9.64
02-May-17	13:02:26	8.92	02-May-17	13:51:26	10.13
02-May-17	13:03:26	8.92	02-May-17	13:52:26	10.13
02-May-17	13:04:26	8.68	02-May-17	13:53:26	10.21
02-May-17	13:05:26	8.36			
02-May-17	13:06:26	8.20		Average	7.9
02-May-17	13:07:26	7.96			
02-May-17	13:08:26	7.71			
02-May-17	13:09:26	7.71			
02-May-17	13:10:26	7.31			
02-May-17	13:11:26	7.31			
02-May-17	13:12:26	7.23			
02-May-17	13:13:26	7.07			
02-May-17	13:14:26	7.07			
02-May-17	13:15:26	6.91			
02-May-17	13:16:26	6.83			
02-May-17	13:17:26	6.75			
02-May-17	13:18:26	6.67			
02-May-17	13:19:26	6.59			
02-May-17	13:20:26	6.51			
02-May-17	13:21:26	6.67			
02-May-17	13:22:26	6.59			
02-May-17	13:23:26	6.75			
02-May-17	13:24:26	6.99			
02-May-17	13:25:26	7.23			
02-May-17	13:26:26	7.47			
02-May-17	13:27:26	8.12			
02-May-17	13:28:26	8.76			
02-May-17	13:29:26	8.92			
02-May-17	13:30:26	8.36			
02-May-17	13:31:26	7.88			
02-May-17	13:32:26	7.39			
02-May-17	13:33:26	6.91			
02-May-17	13:34:26	6.67			
02-May-17	13:35:26	6.51			
02-May-17	13:36:26	6.43			
02-May-17	13:37:26	6.59			
02-May-17	13:38:26	6.51			
02-May-17	13:39:26	6.91			
02-May-17	13:40:26	7.39			
02-May-17	13:41:26	7.71			
02-May-17	13:42:26	7.96			



VMC3 PU Manual Spray Booth					
Date	Time	VOC mg/m3	Date	Time	VOC mg/m3
02-May-17	14:09:21	7.39	02-May-17	14:58:21	4.58
02-May-17	14:10:21	12.23	02-May-17	14:59:21	4.66
02-May-17	14:11:21	7.07	02-May-17	15:00:21	4.74
02-May-17	14:12:21	6.75	02-May-17	15:01:21	4.74
02-May-17	14:13:21	6.59	02-May-17	15:02:21	4.90
02-May-17	14:14:21	6.43	02-May-17	15:03:21	4.90
02-May-17	14:15:21	6.43	02-May-17	15:04:21	5.06
02-May-17	14:16:21	6.19	02-May-17	15:05:21	5.06
02-May-17	14:17:21	6.27	02-May-17	15:06:21	5.14
02-May-17	14:18:21	6.35	02-May-17	15:07:21	10.13
02-May-17	14:19:21	6.19	02-May-17	15:08:21	5.30
02-May-17	14:20:21	6.11			
02-May-17	14:21:21	6.03		Average	5.1
02-May-17	14:22:21	5.54			
02-May-17	14:23:21	5.87			
02-May-17	14:24:21	5.95			
02-May-17	14:25:21	5.71			
02-May-17	14:26:21	5.54			
02-May-17	14:27:21	5.14			
02-May-17	14:28:21	4.98			
02-May-17	14:29:21	5.06			
02-May-17	14:30:21	8.84			
02-May-17	14:31:21	4.26			
02-May-17	14:32:21	4.18			
02-May-17	14:33:21	4.34			
02-May-17	14:34:21	4.34			
02-May-17	14:35:21	4.26			
02-May-17	14:36:21	4.10			
02-May-17	14:37:21	4.02			
02-May-17	14:38:21	4.02			
02-May-17	14:39:21	4.02			
02-May-17	14:40:21	4.02			
02-May-17	14:41:21	3.94			
02-May-17	14:42:21	3.94			
02-May-17	14:43:21	3.94			
02-May-17	14:44:21	3.94			
02-May-17	14:45:21	3.94			
02-May-17	14:46:21	3.94			
02-May-17	14:47:21	3.94			
02-May-17	14:48:21	3.94			
02-May-17	14:49:21	3.94			
02-May-17	14:50:21	4.02			
02-May-17	14:51:21	9.00			
02-May-17	14:52:21	4.10			
02-May-17	14:53:21	4.18			
02-May-17	14:54:21	4.26			
02-May-17	14:55:21	4.42			
02-May-17	14:56:21	4.42			
02-May-17	14:57:21	4.50			



VMC3 PU Automatic Spray Booth					
Date	Time	VOC mg/m3	Date	Time	VOC mg/m3
02-May-17	15:20:19	7.55	02-May-17	16:09:19	10.21
02-May-17	15:21:19	16.88	02-May-17	16:10:19	10.29
02-May-17	15:22:19	8.20	02-May-17	16:11:19	10.45
02-May-17	15:23:19	8.28	02-May-17	16:12:19	10.61
02-May-17	15:24:19	8.36	02-May-17	16:13:19	10.69
02-May-17	15:25:19	11.73	02-May-17	16:14:19	10.77
02-May-17	15:26:19	8.44	02-May-17	16:15:19	10.93
02-May-17	15:27:19	8.52	02-May-17	16:16:19	10.93
02-May-17	15:28:19	8.28	02-May-17	16:17:19	11.17
02-May-17	15:29:19	10.61	02-May-17	16:18:19	9.00
02-May-17	15:30:19	8.12	02-May-17	16:19:19	12.54
02-May-17	15:31:19	7.96			
02-May-17	15:32:19	7.79		Average	9.4
02-May-17	15:33:19	12.54			
02-May-17	15:34:19	8.84			
02-May-17	15:35:19	7.47			
02-May-17	15:36:19	7.47			
02-May-17	15:37:19	7.39			
02-May-17	15:38:19	7.39			
02-May-17	15:39:19	7.39			
02-May-17	15:40:19	7.31			
02-May-17	15:41:19	7.39			
02-May-17	15:42:19	7.31			
02-May-17	15:43:19	7.39			
02-May-17	15:44:19	7.47			
02-May-17	15:45:19	7.63			
02-May-17	15:46:19	7.71			
02-May-17	15:47:19	7.79			
02-May-17	15:48:19	7.79			
02-May-17	15:49:19	7.96			
02-May-17	15:50:19	8.12			
02-May-17	15:51:19	8.28			
02-May-17	15:52:19	8.36			
02-May-17	15:53:19	8.52			
02-May-17	15:54:19	8.76			
02-May-17	15:55:19	8.84			
02-May-17	15:56:19	8.84			
02-May-17	15:57:19	8.84			
02-May-17	15:58:19	8.92			
02-May-17	15:59:19	9.08			
02-May-17	16:00:19	9.16			
02-May-17	16:01:19	9.40			
02-May-17	16:02:19	9.48			
02-May-17	16:03:19	9.56			
02-May-17	16:04:19	9.80			
02-May-17	16:05:19	12.21			
02-May-17	16:06:19	9.00			
02-May-17	16:07:19	10.04			
02-May-17	16:08:19	10.04			



VMC3 New Spray Booth 1					
Date	Time	VOC mg/m3	Date	Time	VOC mg/m3
03-May-17	09:55:53	16.07	03-May-17	10:44:53	37.77
03-May-17	09:56:53	17.68	03-May-17	10:45:53	37.77
03-May-17	09:57:53	18.48	03-May-17	10:46:53	38.57
03-May-17	09:58:53	19.29	03-May-17	10:47:53	40.18
03-May-17	09:59:53	18.48	03-May-17	10:48:53	42.59
03-May-17	10:00:53	19.29	03-May-17	10:49:53	42.59
03-May-17	10:01:53	35.36	03-May-17	10:50:53	42.59
03-May-17	10:02:53	20.89	03-May-17	10:51:53	40.98
03-May-17	10:03:53	22.50	03-May-17	10:52:53	42.59
03-May-17	10:04:53	25.71	03-May-17	10:53:53	42.59
03-May-17	10:05:53	25.71	03-May-17	10:54:53	44.20
03-May-17	10:06:53	23.30			
03-May-17	10:07:53	23.30		Average	31.3
03-May-17	10:08:53	24.11			
03-May-17	10:09:53	25.71			
03-May-17	10:10:53	27.32			
03-May-17	10:11:53	27.32			
03-May-17	10:12:53	25.71			
03-May-17	10:13:53	28.13			
03-May-17	10:14:53	28.93			
03-May-17	10:15:53	28.13			
03-May-17	10:16:53	25.71			
03-May-17	10:17:53	28.13			
03-May-17	10:18:53	28.13			
03-May-17	10:19:53	27.32			
03-May-17	10:20:53	27.32			
03-May-17	10:21:53	27.32			
03-May-17	10:22:53	26.52			
03-May-17	10:23:53	25.71			
03-May-17	10:24:53	26.52			
03-May-17	10:25:53	25.71			
03-May-17	10:26:53	26.52			
03-May-17	10:27:53	27.32			
03-May-17	10:28:53	28.13			
03-May-17	10:29:53	29.73			
03-May-17	10:30:53	32.14			
03-May-17	10:31:53	32.14			
03-May-17	10:32:53	31.34			
03-May-17	10:33:53	34.55			
03-May-17	10:34:53	43.39			
03-May-17	10:35:53	43.39			
03-May-17	10:36:53	42.59			
03-May-17	10:37:53	39.38			
03-May-17	10:38:53	37.77			
03-May-17	10:39:53	36.16			
03-May-17	10:40:53	37.77			
03-May-17	10:41:53	38.57			
03-May-17	10:42:53	39.38			
03-May-17	10:43:53	38.57			

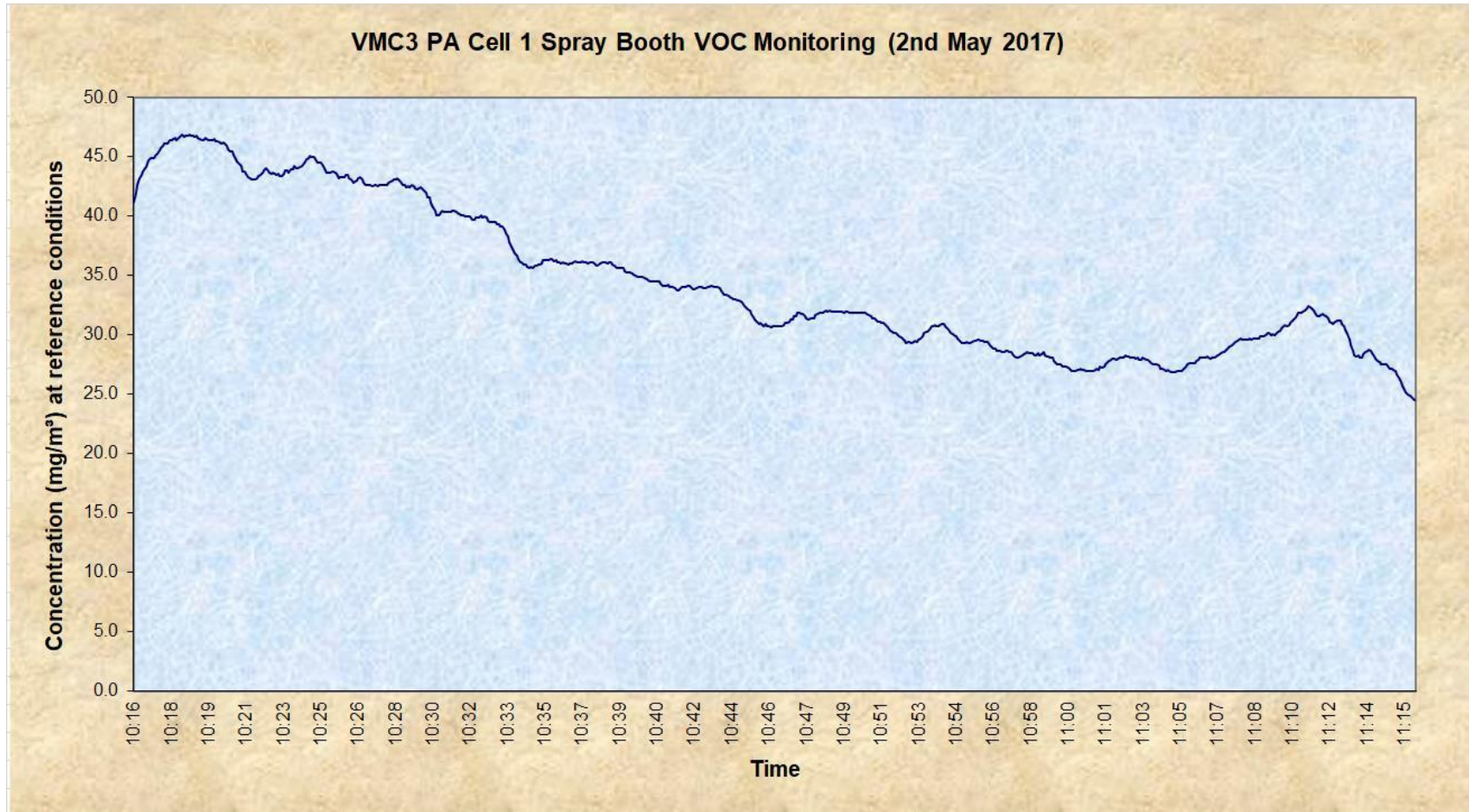


VMC3 New Spray Booth 2					
Date	Time	VOC mg/m3	Date	Time	VOC mg/m3
03-May-17	11:13:01	21.70	03-May-17	12:02:01	26.55
03-May-17	11:14:01	22.82	03-May-17	12:03:01	26.32
03-May-17	11:15:01	24.27	03-May-17	12:04:01	25.63
03-May-17	11:16:01	25.88	03-May-17	12:05:01	24.94
03-May-17	11:17:01	27.72	03-May-17	12:06:01	24.48
03-May-17	11:18:01	14.22	03-May-17	12:07:01	23.32
03-May-17	11:19:01	16.07	03-May-17	12:08:01	22.86
03-May-17	11:20:01	16.96	03-May-17	12:09:01	21.94
03-May-17	11:21:01	16.96	03-May-17	12:10:01	21.47
03-May-17	11:22:01	17.52	03-May-17	12:11:01	21.01
03-May-17	11:23:01	17.84	03-May-17	12:12:01	20.55
03-May-17	11:24:01	18.24			
03-May-17	11:25:01	19.29		Average	27.0
03-May-17	11:26:01	19.61			
03-May-17	11:27:01	30.54			
03-May-17	11:28:01	20.65			
03-May-17	11:29:01	20.41			
03-May-17	11:30:01	29.56			
03-May-17	11:31:01	29.79			
03-May-17	11:32:01	30.94			
03-May-17	11:33:01	31.17			
03-May-17	11:34:01	31.40			
03-May-17	11:35:01	30.94			
03-May-17	11:36:01	31.34			
03-May-17	11:37:01	34.64			
03-May-17	11:38:01	36.02			
03-May-17	11:39:01	35.33			
03-May-17	11:40:01	35.33			
03-May-17	11:41:01	35.79			
03-May-17	11:42:01	35.10			
03-May-17	11:43:01	35.33			
03-May-17	11:44:01	36.25			
03-May-17	11:45:01	36.48			
03-May-17	11:46:01	35.79			
03-May-17	11:47:01	36.25			
03-May-17	11:48:01	35.56			
03-May-17	11:49:01	34.87			
03-May-17	11:50:01	31.87			
03-May-17	11:51:01	30.02			
03-May-17	11:52:01	31.40			
03-May-17	11:53:01	29.33			
03-May-17	11:54:01	28.63			
03-May-17	11:55:01	26.79			
03-May-17	11:56:01	27.48			
03-May-17	11:57:01	27.25			
03-May-17	11:58:01	26.79			
03-May-17	11:59:01	27.25			
03-May-17	12:00:01	27.25			
03-May-17	12:01:01	27.02			



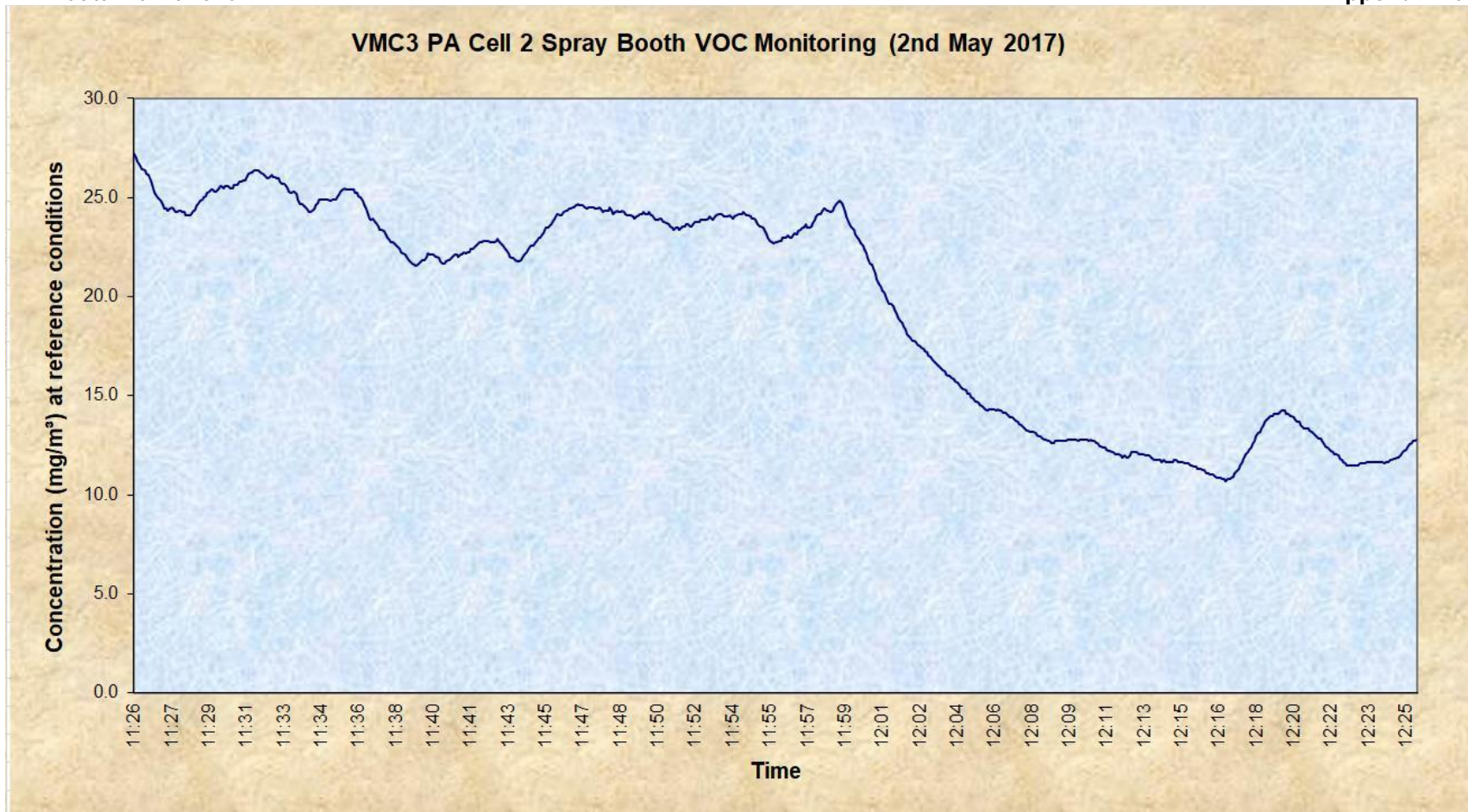
VMC3 New Spray Booth 3					
Date	Time	VOC mg/m3	Date	Time	VOC mg/m3
03-May-17	12:20:11	19.04	03-May-17	13:09:11	11.01
03-May-17	12:21:11	25.07	03-May-17	13:10:11	11.17
03-May-17	12:22:11	19.37	03-May-17	13:11:11	10.93
03-May-17	12:23:11	19.13	03-May-17	13:12:11	10.85
03-May-17	12:24:11	18.64	03-May-17	13:13:11	9.96
03-May-17	12:25:11	18.48	03-May-17	13:14:11	9.64
03-May-17	12:26:11	18.40	03-May-17	13:15:11	9.48
03-May-17	12:27:11	18.08	03-May-17	13:16:11	9.48
03-May-17	12:28:11	18.72	03-May-17	13:17:11	9.24
03-May-17	12:29:11	18.72	03-May-17	13:18:11	9.40
03-May-17	12:30:11	19.21	03-May-17	13:19:11	9.24
03-May-17	12:31:11	21.21			
03-May-17	12:32:11	18.16		Average	14.6
03-May-17	12:33:11	17.92			
03-May-17	12:34:11	17.44			
03-May-17	12:35:11	23.14			
03-May-17	12:36:11	16.55			
03-May-17	12:37:11	16.88			
03-May-17	12:38:11	17.28			
03-May-17	12:39:11	16.63			
03-May-17	12:40:11	15.59			
03-May-17	12:41:11	15.51			
03-May-17	12:42:11	14.46			
03-May-17	12:43:11	13.82			
03-May-17	12:44:11	13.34			
03-May-17	12:45:11	13.02			
03-May-17	12:46:11	13.66			
03-May-17	12:47:11	13.26			
03-May-17	12:48:11	13.98			
03-May-17	12:49:11	17.68			
03-May-17	12:50:11	14.38			
03-May-17	12:51:11	14.30			
03-May-17	12:52:11	14.38			
03-May-17	12:53:11	14.95			
03-May-17	12:54:11	15.27			
03-May-17	12:55:11	15.27			
03-May-17	12:56:11	14.71			
03-May-17	12:57:11	15.51			
03-May-17	12:58:11	14.79			
03-May-17	12:59:11	13.58			
03-May-17	13:00:11	13.42			
03-May-17	13:01:11	13.18			
03-May-17	13:02:11	13.02			
03-May-17	13:03:11	12.38			
03-May-17	13:04:11	11.97			
03-May-17	13:05:11	11.57			
03-May-17	13:06:11	11.33			
03-May-17	13:07:11	11.17			
03-May-17	13:08:11	11.17			





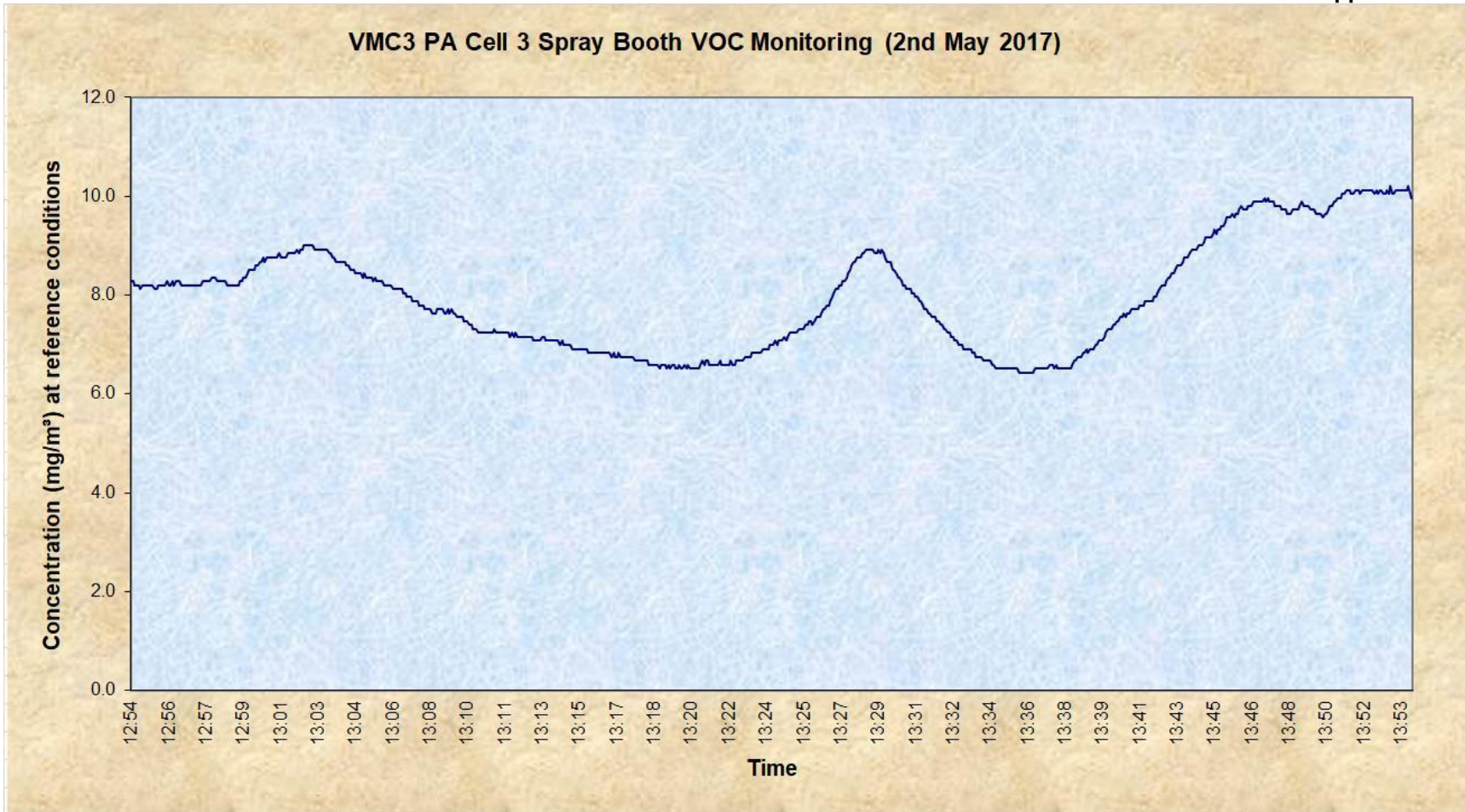
Average Run Time			Volatile Organic Compounds (ppm)			Volatile Organic Compounds (mg/m³)		
			Mean	Max	Min	Mean	Max	Min
10:16	to	10:46	27.30	29.15	24.95	43.88	46.85	40.10
10:46	to	11:16	22.09	25.15	19.05	35.50	40.42	30.62





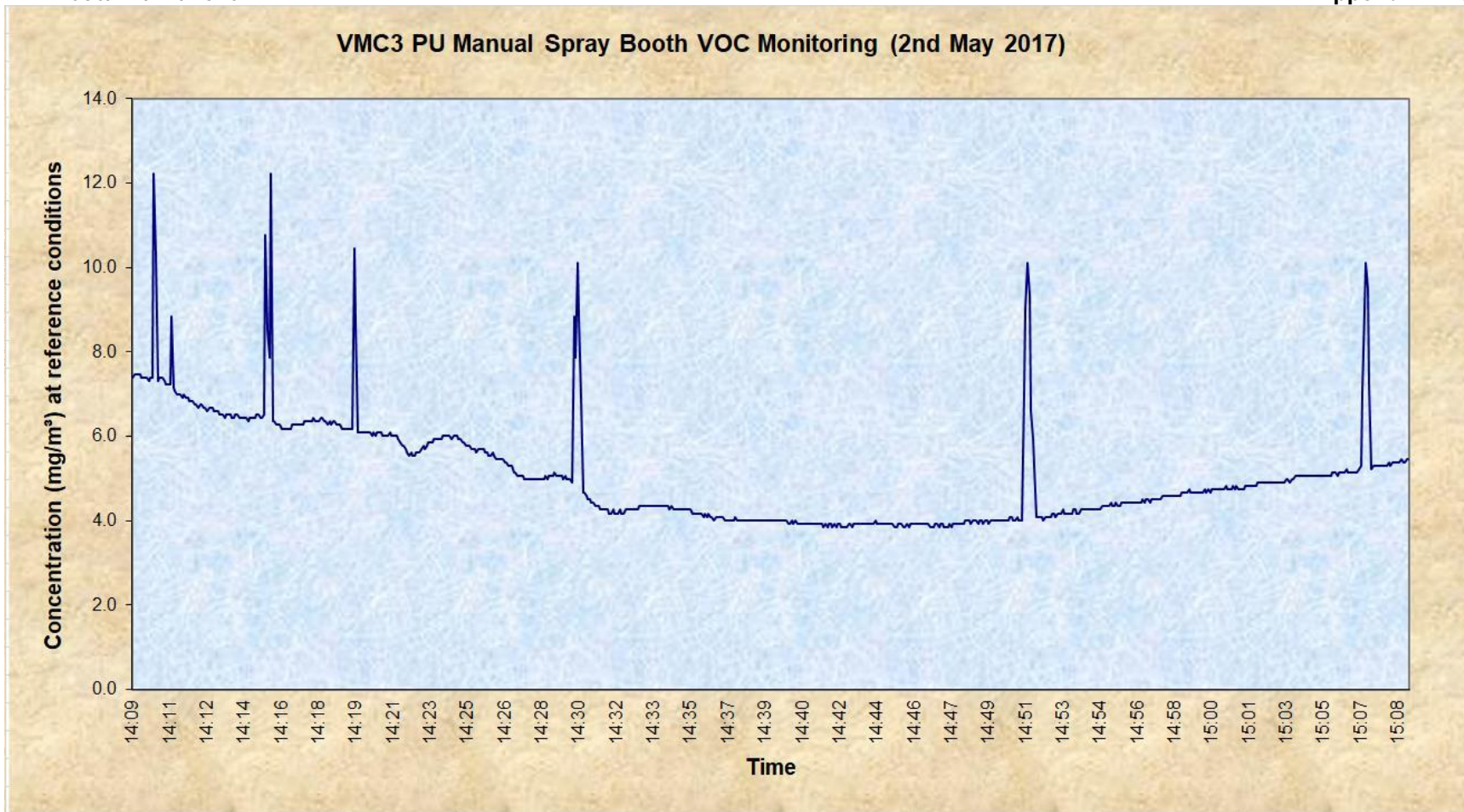
Average Run Time			Volatile Organic Compounds (ppm)			Volatile Organic Compounds (mg/m³)		
			Mean	Max	Min	Mean	Max	Min
11:26	to	11:56	14.95	16.95	13.40	24.03	27.24	21.54
11:56	to	12:26	9.30	15.45	6.65	14.96	24.83	10.69





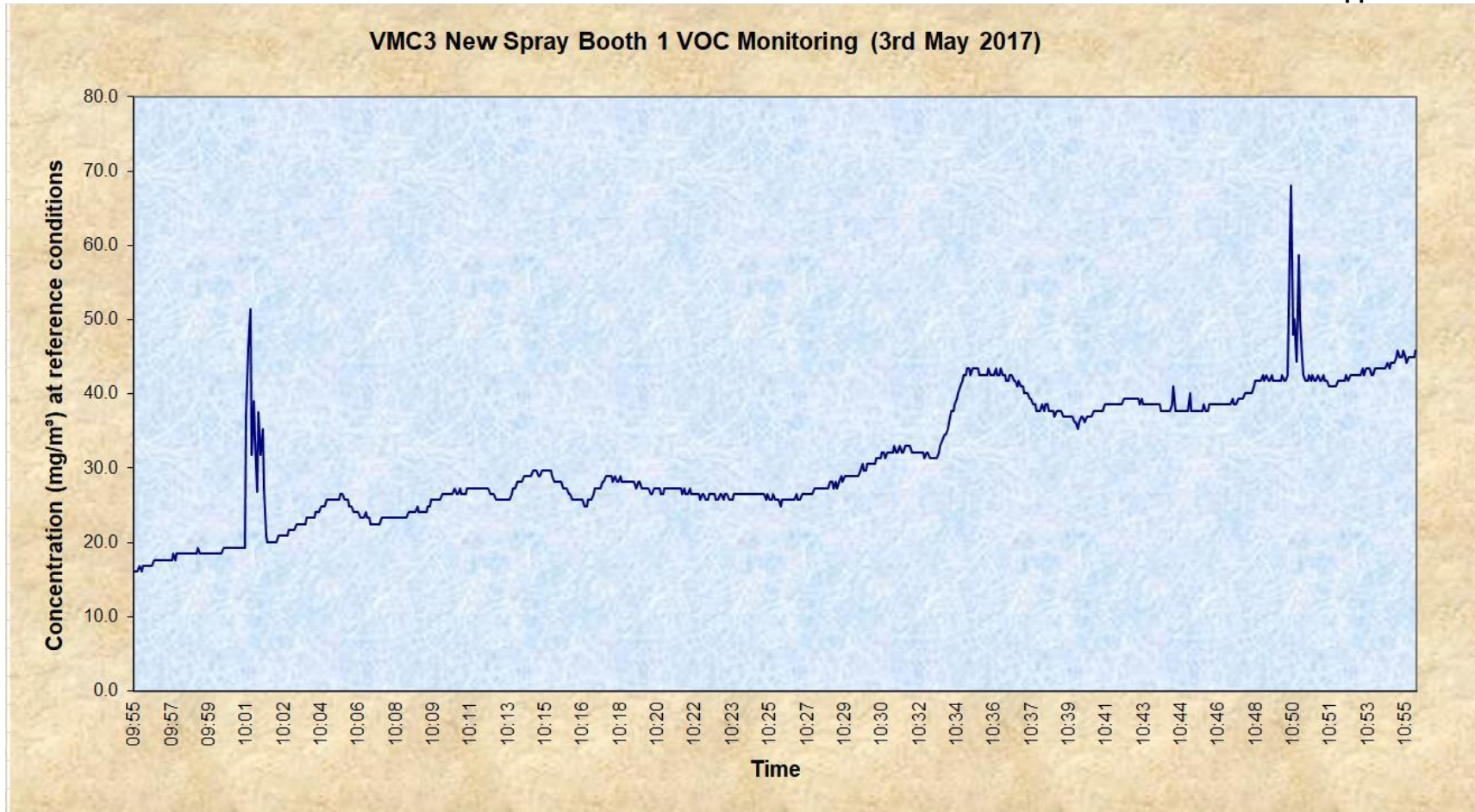
Average Run Time			Volatile Organic Compounds (ppm)			Volatile Organic Compounds (mg/m³)		
			Mean	Max	Min	Mean	Max	Min
12:54	to	13:24	4.74	5.60	4.05	7.62	9.00	6.51
13:24	to	13:54	5.15	6.35	4.00	8.28	10.21	6.43





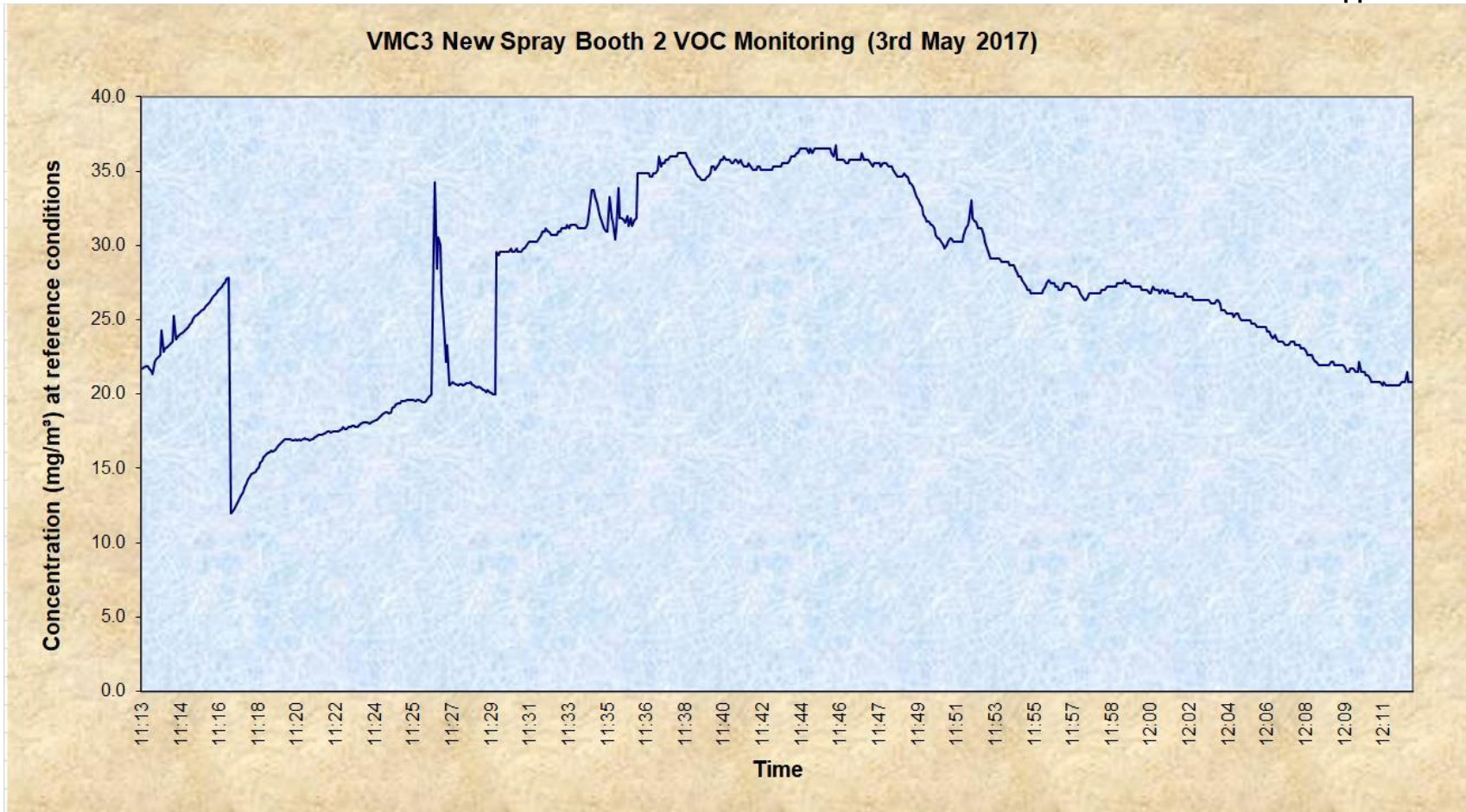
Average Run Time			Volatile Organic Compounds (ppm)			Volatile Organic Compounds (mg/m³)		
			Mean	Max	Min	Mean	Max	Min
14:09	to	14:39	4.09	7.61	3.45	6.58	12.23	5.54
14:39	to	15:09	2.96	6.30	2.50	4.76	10.13	4.02





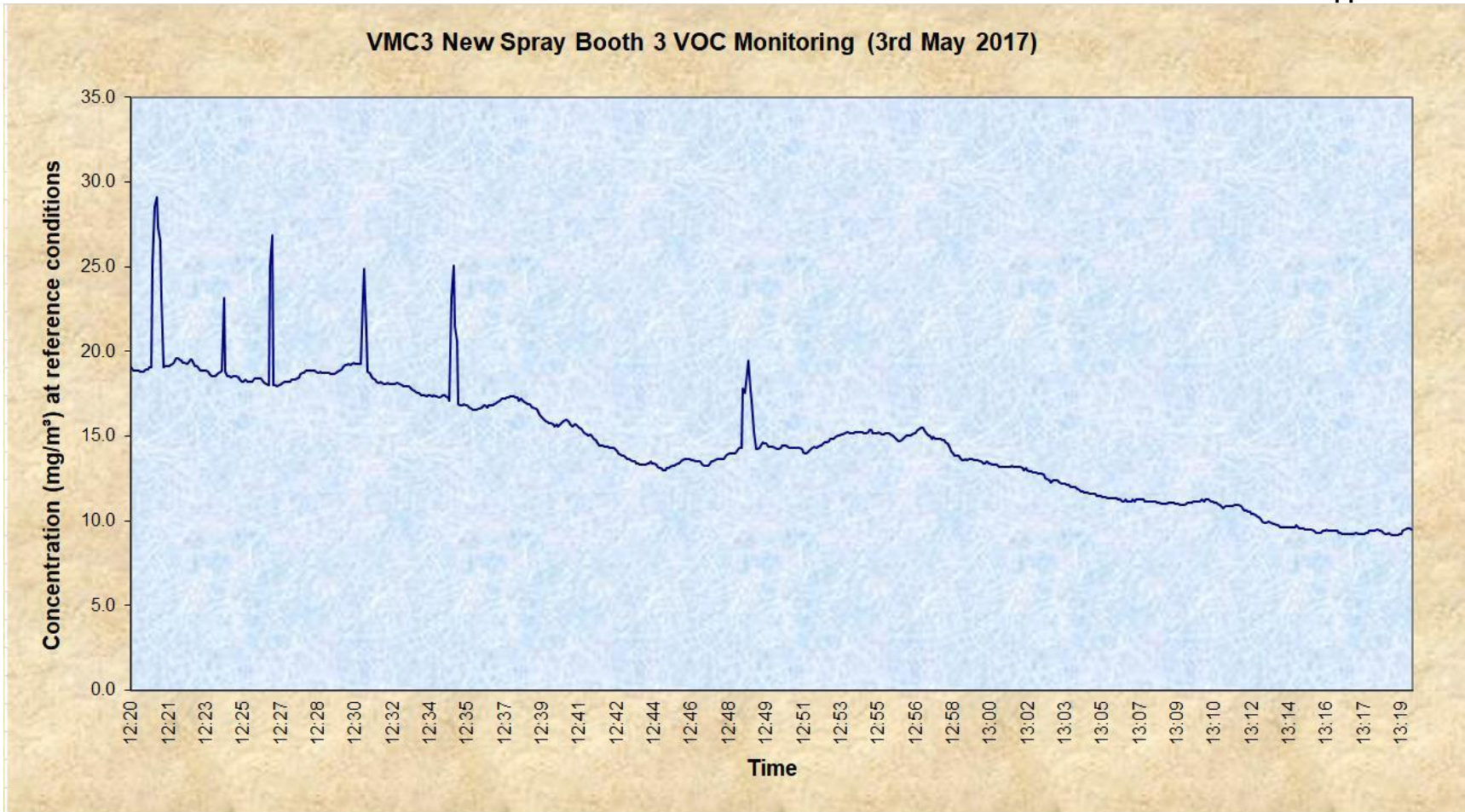
Average Run Time			Volatile Organic Compounds (ppm)			Volatile Organic Compounds (mg/m³)		
			Mean	Max	Min	Mean	Max	Min
9:55	to	10:25	15.46	32.00	10.00	24.84	51.43	16.07
10:25	to	10:55	23.49	42.30	15.50	37.71	67.98	24.91





Average Run Time			Volatile Organic Compounds (ppm)			Volatile Organic Compounds (mg/m³)		
			Mean	Max	Min	Mean	Max	Min
11:13	to	11:43	16.06	22.56	7.45	25.82	36.25	11.97
11:43	to	12:13	17.50	22.84	12.79	28.14	36.71	20.55





Average Run Time			Volatile Organic Compounds (ppm)			Volatile Organic Compounds (mg/m³)		
			Mean	Max	Min	Mean	Max	Min
12:20	to	12:50	10.63	18.10	8.10	17.08	29.09	13.02
12:50	to	13:20	7.55	9.65	5.70	12.14	15.51	9.16



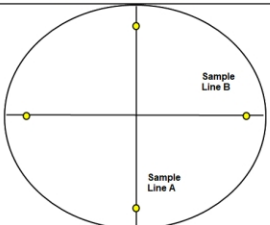
APPENDIX 3

Velocity raw information



Client	Lawrence Automotive								
Site Address	Browns Lane, Coventry								
Job Number	P-RED17-050								
Date	2nd May 2017								
Operator(s)	Elena Berek & Philip Butler								
Stack Reference	VMC3 Auto Cell 1			Isokinetic Sample Positions (%) multiply by diameter to obtain sample points		Sampling Plane Diagram			
Number of Stacks	1			1	14.60				
Stack Configuration	Round			2	85.40				
Dimensions (mtrs)	0.60			3	N/A				
Outlet Diameter (if applicable) (metres)				4	N/A				
Number of Sample Ports	2			5	N/A				
Number of Samples per Axis / Port	2			6	N/A				
Nozzle Diameter (mm)	8.0			7	N/A				
Nozzle Area (m ²)	0.00005024			8	N/A				
Stack Area (m ²)	0.283			Average Isokinetic Flow Rate (ltrs/min)		Axis 1	Axis 2		
Pitot Coefficient	0.86	Pitot Calibration Date		December 2015			21.26	N/A	
Position	Distance	Axis 1	Temperature	Swirl Test	Axis 2	Temperature	Swirl Test	Atmos. Pressure (kPa)	
No.	(cms)	(pa)	(C)	(°)	(pa)	(C)	(°)	101.2	
1	8.76	44	21.9	3.4	37	22.1	3.7	Static Pressure (pa)	
2	51.24	36	21.9	3.7	35	22.1	3.5	-44.0	
3	N/A							1 Axis	
4	N/A							2 Axis	
5	N/A							Velocity of flow (m/s)	
6	N/A							7.05	
7	N/A							6.69	
8	N/A							Volume Flow Rate (m ³ /s)	
Averages		40	21.9		36	22.1		1.99	
								1.89	
								Reduced Exit	
								N/A	
Mean Flue Gas Temp (in K) $T_p = ((\text{Mean } T_1 + \text{Mean } T_2)/2 + 273) =$								294.90	
Permitted Range of gas temperature readings (C) = $(0.95T_p - 273)$ to $(1.05T_p - 273) =$								7.15	36.65
Highest Velocity Reading (m/s) =								7.6	
Lowest Velocity Reading (m/s) =								6.8	
Ratio Highest/Lowest (Max permitted = 3:1)								1.12 : 1	
On site Checklist									
Initial Leak Check	<0.2	End of first run	<0.2		Start of 2 nd run	N/A	End of 2 nd run	N/A	
Acceptable Leak Check < 2% Vol (l/min)	0.43				Manometer Leak Check			OK	
Range of Gas Temps	OK				Pitot Leak Check			OK	
Passed minimum Velocity requirements (>5pa)	YES				Overall Isokinetic Ratio (%) (must be 95 to 115%)			Run 1	Run 2
Negative Local Flow Present, YES or NO (Yes = Fail)	NO				Are there sufficient rails and kick board? (YES, NO or N/A)			98.7	N/A
Is the Platform area greater than 5m ² ? (YES, NO or N/A)	N/A				Is the area in front of the sample line the length of the probe + 1 metre? (YES or NO)			YES	
Passed Highest to lowest Velocity (3:1)	YES								
Site Equipment Used									
Pitot Reference	RED 0289				Manometer Reference	RED 0404			
Thermometer Reference	RED 0351 & 0349				Thermocouple Reference	RED 0357			
Balance Reference	RED 0204				Sampling Pump Reference	RED 0258			
Tape Measure Reference	RED 0121				Barometer Reference	RED 0403			
DGM Thermocouple	RED 0274				Impinger Outlet Thermocouple	N/A			
Callipers	RED 0301				Condenser Thermocouple	N/A			



Client	Lawrence Automotive							
Site Address	Browns Lane, Coventry							
Job Number	P-RED17-050							
Date	2nd May 2017							
Operator(s)	Elena Berek & Philip Butler							
Stack Reference	VMC3 Auto Cell 2				Isokinetic Sample Positions (%) multiply by diameter to obtain sample points 1 14.60 2 85.40 3 N/A 4 N/A 5 N/A 6 N/A 7 N/A 8 N/A			
Number of Stacks	1				Sampling Plane Diagram 			
Stack Configuration	Round				Average Isokinetic Flow Rate (ltrs/min)			
Dimensions (mtrs)	0.60				Axis 1		Axis 2	
Outlet Diameter (if applicable) (metres)					27.83		27.21	
Number of Sample Ports	2				Atmos. Pressure (kPa)			
Number of Samples per Axis / Port	2				101.2			
Nozzle Diameter (mm)	8.0				Static Pressure (pa)			
Nozzle Area (m²)	0.00005024				-38.0			
Stack Area (m²)	0.283				1 Axis 2 Axis Velocity of flow (m/s) 9.23 9.03 Volume Flow Rate (m³/s) 2.61 2.55 Reduced Exit N/A			
Pitot Coefficient	0.86		Pitot Calibration Date		December 2016		Atmos. Pressure (kPa)	
Position	Distance	Axis 1	Temperature	Swirl Test	Axis 2	Temperature	Swirl Test	Static Pressure (pa)
No.	(cms)	(pa)	(C)	(°)	(pa)	(C)	(°)	
1	8.76	72	21.5	3.4	64	21.7	3.8	
2	51.24	65	21.6	4.0	67	21.8	3.6	
3	N/A							
4	N/A							
5	N/A							
6	N/A							
7	N/A							
8	N/A							
Averages		69	21.6		66	21.8		N/A
Mean Flue Gas Temp (in K) $T_p = ((\text{Mean } T_1 + \text{Mean } T_2)/2) + 273$					294.55			
Permitted Range of gas temperature readings (C) = $(0.95T_p - 273)$ to $(1.05T_p - 273)$					6.82		to 36.28	
Highest Velocity Reading (m/s) =					9.7			
Lowest Velocity Reading (m/s) =					9.1			
Ratio Highest/Lowest (Max permitted = 3:1)					1.06 : 1			
On site Checklist								
Initial Leak Check	<0.2	End of first run	<0.2		Start of 2 nd run	N/A	End of 2 nd run	N/A
Acceptable Leak Check < 2% Vol (l/min)	0.56				Manometer Leak Check			
Range of Gas Temps	OK				Pitot Leak Check			
Passed minimum Velocity requirements (>5pa)	YES				Overall Isokinetic Ratio (%) (must be 95 to 115%)			
Negative Local Flow Present, YES or NO (Yes = Fail)	NO				Run 1			
Is the Platform area greater than 5m²? (YES, NO or N/A)	N/A				99.7			
Passed Highest to lowest Velocity (3:1)	YES				Run 2			
				Are there sufficient rails and kick board? (YES, NO or N/A)				N/A
				Is the area in front of the sample line the length of the probe + 1 metre? (YES or NO)				YES
Site Equipment Used								
Pitot Reference	RED 0289				Manometer Reference			
Thermometer Reference	RED 0351 & 0349				RED 0404			
Balance Reference	RED 0204				Thermocouple Reference			
Tape Measure Reference	RED 0121				RED 0357			
DGM Thermocouple	RED 0274				Sampling Pump Reference			
Callipers	RED 0301				RED 0258			
				Barometer Reference				RED 0403
				Impinger Outlet Thermocouple				N/A
				Condenser Thermocouple				N/A



Client	Lawrence Automotive																									
Site Address	Browns Lane, Coventry																									
Job Number	P-RED17-050																									
Date	2nd May 2017																									
Operator(s)	Elena Berek & Philip Butler																									
Stack Reference	VMC3 Auto Cell 3				<table border="1"> <thead> <tr> <th colspan="2">Isokinetic Sample Positions (%) multiply by diameter to obtain sample points</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>14.60</td> </tr> <tr> <td>2</td> <td>85.40</td> </tr> <tr> <td>3</td> <td>N/A</td> </tr> <tr> <td>4</td> <td>N/A</td> </tr> <tr> <td>5</td> <td>N/A</td> </tr> <tr> <td>6</td> <td>N/A</td> </tr> <tr> <td>7</td> <td>N/A</td> </tr> <tr> <td>8</td> <td>N/A</td> </tr> </tbody> </table>				Isokinetic Sample Positions (%) multiply by diameter to obtain sample points		1	14.60	2	85.40	3	N/A	4	N/A	5	N/A	6	N/A	7	N/A	8	N/A
Isokinetic Sample Positions (%) multiply by diameter to obtain sample points																										
1	14.60																									
2	85.40																									
3	N/A																									
4	N/A																									
5	N/A																									
6	N/A																									
7	N/A																									
8	N/A																									
Number of Stacks	1																									
Stack Configuration	Round																									
Dimensions (mtrs)	0.60																									
Outlet Diameter (if applicable) (metres)																										
Number of Sample Ports	2																									
Number of Samples per Axis / Port	2																									
Nozzle Diameter (mm)	8.0																									
Nozzle Area (m ²)	0.00005024				Average Isokinetic Flow Rate (ltrs/min)																					
Stack Area (m ²)	0.283				Axis 1		Axis 2																			
Pitot Coefficient	0.86		Pitot Calibration Date		December 2016		Atmos. Pressure (kPa)																			
Position	Distance	Axis 1	Temperature	Swirl Test	Axis 2	Temperature	Swirl Test	101.2																		
No.	(cms)	(pa)	(C)	(°)	(pa)	(C)	(°)	Static Pressure (pa)																		
1	8.76	64	20.7	4.2	56	20.8	4.4	-33.0																		
2	51.24	67	20.8	4.4	61	20.8	4.7	1 Axis																		
3	N/A							2 Axis																		
4	N/A							Velocity of flow (m/s)																		
5	N/A							9.00																		
6	N/A							8.51																		
7	N/A							Volume Flow Rate (m ³ /s)																		
8	N/A							2.55																		
Averages		66	20.8		59	20.8		N/A																		
Mean Flue Gas Temp (in K) $T_p = ((\text{Mean } T_1 + \text{Mean } T_2)/2) + 273$ =								293.75																		
Permitted Range of gas temperature readings (C) = $(0.95T_p - 273)$ to $(1.05T_p - 273)$ =								6.06 to 35.44																		
Highest Velocity Reading (m/s) =								9.4																		
Lowest Velocity Reading (m/s) =								8.5																		
Ratio Highest/Lowest (Max permitted = 3:1)								1.10 : 1																		
On site Checklist																										
Initial Leak Check	<0.2	End of first run	<0.2		Start of 2 nd run	N/A	End of 2 nd run	N/A																		
Acceptable Leak Check < 2% Vol (l/min)	0.54				Manometer Leak Check			OK																		
Range of Gas Temps	OK				Pitot Leak Check			OK																		
Passed minimum Velocity requirements (>5pa)	YES				Overall Isokinetic Ratio (%) (must be 95 to 115%)			Run 1																		
Negative Local Flow Present, YES or NO (Yes = Fail)	NO				Are there sufficient rails and kick board? (YES, NO or N/A)			Run 2																		
Is the Platform area greater than 5m ² ? (YES, NO or N/A)	N/A				Is the area in front of the sample line the length of the probe + 1 metre? (YES or NO)			N/A																		
Passed Highest to lowest Velocity (3:1)	YES							94.1																		
Site Equipment Used																										
Pitot Reference	RED 0289				Manometer Reference			RED 0404																		
Thermometer Reference	RED 0351 & 0349				Thermocouple Reference			RED 0357																		
Balance Reference	RED 0204				Sampling Pump Reference			RED 0258																		
Tape Measure Reference	RED 0121				Barometer Reference			RED 0403																		
DGM Thermocouple	RED 0274				Impinger Outlet Thermocouple			N/A																		
Callipers	RED 0301				Condenser Thermocouple			N/A																		



Client	Lawrence Automotive										
Site Address	Browns Lane, Coventry										
Job Number	P-RED17-050										
Date	2nd May 2017										
Operator(s)	Elena Berek & Philip Butler										
Stack Reference	VMC3 PU Manual				Isokinetic Sample Positions (%) multiply by diameter to obtain sample points						
	Number of Stacks			1	1	14.60					
Stack Configuration			Round	2	3	85.40					
Dimensions (mtrs)			0.70	3	4	N/A					
Outlet Diameter (if applicable) (metres)				4	5	N/A					
Number of Sample Ports			1	5	6	N/A					
Number of Samples per Axis / Port			2	6	7	N/A					
Nozzle Diameter (mm)			8.0	7	8	N/A					
Nozzle Area (m ²)			0.00005024	Average Isokinetic Flow Rate (ltrs/min)			Axis 1	Axis 2			
Stack Area (m ²)			0.385				19.17	17.64			
Pitot Coefficient	0.86	Pitot Calibration Date			December 2016			Atmos. Pressure (kPa)			
Position	Distance	Axis 1	Temperature	Swirl Test	Axis 2	Temperature	Swirl Test	101.2			
No.	(cms)	(pa)	(C)	(°)	(pa)	(C)	(°)	Static Pressure (pa)			
1	10.22	33	22.4	3.5	29	22.4	3.2	-26.0			
2	59.78	32	22.4	4.0	26	22.4	3.5	1 Axis	2 Axis		
3	N/A							Velocity of flow (m/s)			
4	N/A							6.36	5.85		
5	N/A							Volume Flow Rate (m ³ /s)			
6	N/A							2.45	2.25		
7	N/A							Reduced Exit			
8	N/A							N/A			
Averages		33	22.4		28	22.4		N/A			
Mean Flue Gas Temp (in K) $T_p = ((\text{Mean } T_1 + \text{Mean } T_2)/2 + 273) =$							295.40				
Permitted Range of gas temperature readings (C) = $(0.95T_p - 273)$ to $(1.05T_p - 273) =$							7.63		to		37.17
Highest Velocity Reading (m/s) =									6.6		
Lowest Velocity Reading (m/s) =									5.8		
Ratio Highest/Lowest (Max permitted = 3:1)							1.13 : 1				
On site Checklist											
Initial Leak Check	<0.2	End of first run	<0.2		Start of 2 nd run	N/A	End of 2 nd run	N/A			
Acceptable Leak Check < 2% Vol (l/min)	0.38				Manometer Leak Check			OK			
Range of Gas Temps	OK				Pitot Leak Check			OK			
Passed minimum Velocity requirements (>5pa)	YES				Overall Isokinetic Ratio (%) (must be 95 to 115%)			Run 1	Run 2		
Negative Local Flow Present, YES or NO (Yes = Fail)	NO				Are there sufficient rails and kick board? (YES, NO or N/A)			106.7	N/A		
Is the Platform area greater than 5m ² ? (YES, NO or N/A)	N/A				Is the area in front of the sample line the length of the probe + 1 metre? (YES or NO)			YES			
Passed Highest to lowest Velocity (3:1)	YES										
Site Equipment Used											
Pitot Reference	RED 0286				Manometer Reference	RED 0404					
Thermometer Reference	RED 0351 & 0349				Thermocouple Reference	RED 0357					
Balance Reference	RED 0204				Sampling Pump Reference	RED 0258					
Tape Measure Reference	RED 0121				Barometer Reference	RED 0403					
DGM Thermocouple	RED 0274				Impinger Outlet Thermocouple	N/A					
Callipers	RED 0301				Condenser Thermocouple	N/A					



Client	Lawrence Automotive							
Site Address	Browns Lane, Coventry							
Job Number	P-RED17-050							
Date	2nd May 2017							
Operator(s)	Elena Berek & Philip Butler							
Stack Reference	VMC3 PU Auto				Isokinetic Sample Positions (%) multiply by diameter to obtain sample points		Sampling Plane Diagram	
Number of Stacks	1				1	14.60		
Stack Configuration	Round				2	85.40		
Dimensions (mtrs)	0.75				3	N/A		
Outlet Diameter (if applicable) (metres)					4	N/A		
Number of Sample Ports	1				5	N/A		
Number of Samples per Axis / Port	2				6	N/A		
Nozzle Diameter (mm)	6.0				7	N/A		
Nozzle Area (m²)	0.00002826				8	N/A		
Stack Area (m²)	0.442				Average Isokinetic Flow Rate (ltrs/min)		Axis 1	Axis 2
Pitot Coefficient	0.86	Pitot Calibration Date			December 2016			Atmos. Pressure (kPa)
Position	Distance	Axis 1	Temperature	Swirl Test	Axis 2	Temperature	Swirl Test	101.2
No.	(cms)	(pa)	(C)	(°)	(pa)	(C)	(°)	Static Pressure (pa)
1	10.95	151	25.6	3.8	148	25.7	3.6	72.0
2	64.05	160	25.6	3.5	162	25.6	3.4	1 Axis
3	N/A							2 Axis
4	N/A							Velocity of flow (m/s)
5	N/A							14.00
6	N/A							13.98
7	N/A							Volume Flow Rate (m³/s)
8	N/A							6.19
								6.18
								Reduced Exit
Averages		156	25.6		155	25.7		N/A
Mean Flue Gas Temp (in K) $T_p = ((\text{Mean } T_1 + \text{Mean } T_2)/2 + 273) =$								298.60
Permitted Range of gas temperature readings (C) = $(0.95T_p - 273)$ to $(1.05T_p - 273) =$								10.67 to 40.53
Highest Velocity Reading (m/s) =								14.6
Lowest Velocity Reading (m/s) =								14.0
Ratio Highest/Lowest (Max permitted = 3:1)								1.05 : 1
On site Checklist								
Initial Leak Check	<0.2	End of first run	<0.2		Start of 2 nd run	N/A	End of 2 nd run	N/A
Acceptable Leak Check < 2% Vol (l/min)	0.47				Manometer Leak Check			OK
Range of Gas Temps	OK				Pitot Leak Check			OK
Passed minimum Velocity requirements (>5pa)	YES				Overall Isokinetic Ratio (%) (must be 95 to 115%)			Run 1
Negative Local Flow Present, YES or NO (Yes = Fail)	NO							100.6
Is the Platform area greater than 5m²? (YES, NO or N/A)	N/A				Are there sufficient rails and kick board? (YES, NO or N/A)			Run 2
Passed Highest to lowest Velocity (3:1)	YES				Is the area in front of the sample line the length of the probe + 1 metre? (YES or NO)			N/A
Site Equipment Used								
Pitot Reference	RED 0289				Manometer Reference	RED 0404		
Thermometer Reference	RED 0351 & 0349				Thermocouple Reference	RED 0357		
Balance Reference	RED 0204				Sampling Pump Reference	RED 0258		
Tape Measure Reference	RED 0121				Barometer Reference	RED 0403		
DGM Thermocouple	RED 0274				Impinger Outlet Thermocouple	N/A		
Callipers	RED 0301				Condenser Thermocouple	N/A		



Client	Lawrence Automotive																									
Site Address	Browns Lane, Coventry																									
Job Number	P-RED17-050																									
Date	3rd May 2017																									
Operator(s)	Elena Berek & Philip Butler																									
Stack Reference	VMC3 New Booth No 1				<table border="1"> <thead> <tr> <th colspan="2">Isokinetic Sample Positions (%) multiply by diameter to obtain sample points</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>14.60</td> </tr> <tr> <td>2</td> <td>85.40</td> </tr> <tr> <td>3</td> <td>N/A</td> </tr> <tr> <td>4</td> <td>N/A</td> </tr> <tr> <td>5</td> <td>N/A</td> </tr> <tr> <td>6</td> <td>N/A</td> </tr> <tr> <td>7</td> <td>N/A</td> </tr> <tr> <td>8</td> <td>N/A</td> </tr> </tbody> </table>				Isokinetic Sample Positions (%) multiply by diameter to obtain sample points		1	14.60	2	85.40	3	N/A	4	N/A	5	N/A	6	N/A	7	N/A	8	N/A
Isokinetic Sample Positions (%) multiply by diameter to obtain sample points																										
1	14.60																									
2	85.40																									
3	N/A																									
4	N/A																									
5	N/A																									
6	N/A																									
7	N/A																									
8	N/A																									
Number of Stacks	1																									
Stack Configuration	Round				Average Isokinetic Flow Rate (ltrs/min)																					
Dimensions (mtrs)	0.70				Axis 1		Axis 2																			
Outlet Diameter (if applicable) (metres)					16.82		15.78																			
Number of Sample Ports	1				Atmos. Pressure (kPa)																					
Number of Samples per Axis / Port	2				101.1																					
Nozzle Diameter (mm)	8.0				Static Pressure (pa)																					
Nozzle Area (m ²)	0.00005024				-19.0																					
Stack Area (m ²)	0.385				<table border="1"> <thead> <tr> <th colspan="2">Velocity of flow (m/s)</th> </tr> </thead> <tbody> <tr> <td>1 Axis</td> <td>2 Axis</td> </tr> <tr> <td>5.58</td> <td>5.24</td> </tr> </tbody> </table>				Velocity of flow (m/s)		1 Axis	2 Axis	5.58	5.24												
Velocity of flow (m/s)																										
1 Axis	2 Axis																									
5.58	5.24																									
Pitot Coefficient	0.86	Pitot Calibration Date		December 2016		Reduced Exit																				
Position	Distance	Axis 1	Temperature	Swirl Test	Axis 2	Temperature	Swirl Test																			
No.	(cms)	(pa)	(C)	(°)	(pa)	(C)	(°)																			
1	10.22	26	21.9	3.6	23	21.9	3.7																			
2	59.78	24	21.9	3.8	21	21.8	3.8																			
3	N/A																									
4	N/A																									
5	N/A																									
6	N/A																									
7	N/A																									
8	N/A																									
Averages		25	21.9		22	21.9																				
Mean Flue Gas Temp (in K) $T_p = ((\text{Mean } T_1 + \text{Mean } T_2)/2 + 273) =$				294.90																						
Permitted Range of gas temperature readings (C) = $(0.95T_p - 273)$ to $(1.05T_p - 273) =$				7.15		to 36.65																				
Highest Velocity Reading (m/s) =				5.8																						
Lowest Velocity Reading (m/s) =				5.2																						
Ratio Highest/Lowest (Max permitted = 3:1)				1.11 : 1																						
On site Checklist																										
Initial Leak Check	<0.2	End of first run	<0.2		Start of 2 nd run	N/A	End of 2 nd run																			
Acceptable Leak Check < 2% Vol (l/min)	0.34				Manometer Leak Check		OK																			
Range of Gas Temps	OK				Pitot Leak Check		OK																			
Passed minimum Velocity requirements (>5pa)	YES				Overall Isokinetic Ratio (%) (must be 95 to 115%)		Run 1 99.1																			
Negative Local Flow Present, YES or NO (Yes = Fail)	NO				Are there sufficient rails and kick board? (YES, NO or N/A)		Run 2 N/A																			
Is the Platform area greater than 5m ² ? (YES, NO or N/A)	N/A				Is the area in front of the sample line the length of the probe + 1 metre? (YES or NO)		YES																			
Passed Highest to lowest Velocity (3:1)	YES																									
Site Equipment Used																										
Pitot Reference	RED 0289			Manometer Reference			RED 0404																			
Thermometer Reference	RED 0351 & 0349			Thermocouple Reference			RED 0357																			
Balance Reference	RED 0204			Sampling Pump Reference			RED 0258																			
Tape Measure Reference	RED 0121			Barometer Reference			RED 0403																			
DGM Thermocouple	RED 0274			Impinger Outlet Thermocouple			N/A																			
Callipers	RED 0301			Condenser Thermocouple			N/A																			



Client	Lawrence Automotive																									
Site Address	Browns Lane, Coventry																									
Job Number	P-RED17-050																									
Date	3rd May 2017																									
Operator(s)	Elena Berek & Philip Butler																									
Stack Reference	VMC3 New Booth No 2				<table border="1"> <thead> <tr> <th colspan="2">Isokinetic Sample Positions (%) multiply by diameter to obtain sample points</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>14.60</td> </tr> <tr> <td>2</td> <td>85.40</td> </tr> <tr> <td>3</td> <td>N/A</td> </tr> <tr> <td>4</td> <td>N/A</td> </tr> <tr> <td>5</td> <td>N/A</td> </tr> <tr> <td>6</td> <td>N/A</td> </tr> <tr> <td>7</td> <td>N/A</td> </tr> <tr> <td>8</td> <td>N/A</td> </tr> </tbody> </table>				Isokinetic Sample Positions (%) multiply by diameter to obtain sample points		1	14.60	2	85.40	3	N/A	4	N/A	5	N/A	6	N/A	7	N/A	8	N/A
Isokinetic Sample Positions (%) multiply by diameter to obtain sample points																										
1	14.60																									
2	85.40																									
3	N/A																									
4	N/A																									
5	N/A																									
6	N/A																									
7	N/A																									
8	N/A																									
Number of Stacks	1																									
Stack Configuration	Round				Average Isokinetic Flow Rate (ltrs/min)																					
Dimensions (mtrs)	0.70				Axis 1		Axis 2																			
Outlet Diameter (if applicable) (metres)					16.98		16.81																			
Number of Sample Ports	2				Atmos. Pressure (kPa)																					
Number of Samples per Axis / Port	2				101.1																					
Nozzle Diameter (mm)	8.0				Static Pressure (pa)																					
Nozzle Area (m ²)	0.00005024				-27.0																					
Stack Area (m ²)	0.385				<table border="1"> <thead> <tr> <th colspan="2">Velocity of flow (m/s)</th> </tr> </thead> <tbody> <tr> <td>1 Axis</td> <td>2 Axis</td> </tr> <tr> <td>5.63</td> <td>5.58</td> </tr> </tbody> </table>				Velocity of flow (m/s)		1 Axis	2 Axis	5.63	5.58												
Velocity of flow (m/s)																										
1 Axis	2 Axis																									
5.63	5.58																									
Pitot Coefficient	0.86	Pitot Calibration Date		December 2016		Reduced Exit																				
Position	Distance	Axis 1	Temperature	Swirl Test	Axis 2	Temperature	Swirl Test																			
No.	(cms)	(pa)	(C)	(°)	(pa)	(C)	(°)																			
1	10.22	27	21.8	4.6	24	21.9	4.4																			
2	59.78	24	21.8	5.0	26	21.9	4.7																			
3	N/A																									
4	N/A																									
5	N/A																									
6	N/A																									
7	N/A																									
8	N/A																									
Averages		26	21.8		25	21.9																				
Mean Flue Gas Temp (in K) $T_p = ((\text{Mean } T_1 + \text{Mean } T_2)/2 + 273) =$				294.80																						
Permitted Range of gas temperature readings (C) = $(0.95T_p - 273)$ to $(1.05T_p - 273) =$				7.06		to 36.54																				
Highest Velocity Reading (m/s) =				5.9																						
Lowest Velocity Reading (m/s) =				5.6																						
Ratio Highest/Lowest (Max permitted = 3:1)				1.06 : 1																						
On site Checklist																										
Initial Leak Check	<0.2	End of first run	<0.2		Start of 2 nd run	N/A	End of 2 nd run																			
Acceptable Leak Check < 2% Vol (l/min)	0.34				Manometer Leak Check		OK																			
Range of Gas Temps	OK				Pitot Leak Check		OK																			
Passed minimum Velocity requirements (>5pa)	YES				Overall Isokinetic Ratio (%) (must be 95 to 115%)		Run 1 99.8																			
Negative Local Flow Present, YES or NO (Yes = Fail)	NO				Are there sufficient rails and kick board? (YES, NO or N/A)		Run 2 N/A																			
Is the Platform area greater than 5m ² ? (YES, NO or N/A)	N/A				Is the area in front of the sample line the length of the probe + 1 metre? (YES or NO)		YES																			
Passed Highest to lowest Velocity (3:1)	YES																									
Site Equipment Used																										
Pitot Reference	RED 0289				Manometer Reference	RED 0404																				
Thermometer Reference	RED 0351 & 0349				Thermocouple Reference	RED 0357																				
Balance Reference	RED 0204				Sampling Pump Reference	RED 0258																				
Tape Measure Reference	RED 0121				Barometer Reference	RED 0403																				
DGM Thermocouple	RED 0274				Impinger Outlet Thermocouple	N/A																				
Callipers	RED 0301				Condenser Thermocouple	N/A																				



Client	Lawrence Automotive									
Site Address	Browns Lane, Coventry									
Job Number	P-RED17-050									
Date	3rd May 2017									
Operator(s)	Elena Berek & Philip Butler									
Stack Reference	VMC3 New Booth No 3				Isokinetic Sample Positions (%) multiply by diameter to obtain sample points		Sampling Plane Diagram			
Number of Stacks	1				1	14.60				
Stack Configuration	Round				2	85.40				
Dimensions (mtrs)	0.70				3	N/A				
Outlet Diameter (if applicable) (metres)					4	N/A				
Number of Sample Ports	2				5	N/A				
Number of Samples per Axis / Port	2				6	N/A				
Nozzle Diameter (mm)	8.0				7	N/A				
Nozzle Area (m²)	0.00005024				8	N/A				
Stack Area (m²)	0.385				Average Isokinetic Flow Rate (ltrs/min)		Axis 1	Axis 2		
Pitot Coefficient	0.86	Pitot Calibration Date			December 2016			Atmos. Pressure (kPa)		
Position	Distance	Axis 1	Temperature	Swirl Test	Axis 2	Temperature	Swirl Test	101.1		
No.	(cms)	(pa)	(C)	(°)	(pa)	(C)	(°)	Static Pressure (pa)		
1	10.22	22	21.3	4.4	22	21.2	4.3	-18.0		
2	59.78	24	21.2	4.8	23	21.2	4.5	1 Axis	2 Axis	
3	N/A							Velocity of flow (m/s)		
4	N/A							5.34	5.29	
5	N/A							Volume Flow Rate (m³/s)		
6	N/A							2.06	2.03	
7	N/A							Reduced Exit		
8	N/A							N/A		
Averages		23	21.3		23	21.2				
Mean Flue Gas Temp (in K) $T_p = ((\text{Mean } T_1 + \text{Mean } T_2)/2 + 273) =$								294.25		
Permitted Range of gas temperature readings (C) = $(0.95T_p - 273)$ to $(1.05T_p - 273) =$								6.54 to 35.96		
Highest Velocity Reading (m/s) =								5.6		
Lowest Velocity Reading (m/s) =								5.4		
Ratio Highest/Lowest (Max permitted = 3:1)								1.04 : 1		
On site Checklist										
Initial Leak Check	<0.2	End of first run	<0.2		Start of 2 nd run	N/A	End of 2 nd run	N/A		
Acceptable Leak Check < 2% Vol (l/min)	0.32				Manometer Leak Check			OK		
Range of Gas Temps	OK				Pitot Leak Check			OK		
Passed minimum Velocity requirements (>5pa)	YES				Overall Isokinetic Ratio (%) (must be 95 to 115%)			Run 1	Run 2	
Negative Local Flow Present, YES or NO (Yes = Fail)	NO				Are there sufficient rails and kick board? (YES, NO or N/A)			99.8	N/A	
Is the Platform area greater than 5m²? (YES, NO or N/A)	N/A				Is the area in front of the sample line the length of the probe + 1 metre? (YES or NO)			YES		
Passed Highest to lowest Velocity (3:1)	YES									
Site Equipment Used										
Pitot Reference	RED 0289				Manometer Reference			RED 0404		
Thermometer Reference	RED 0351 & 0349				Thermocouple Reference			RED 0357		
Balance Reference	RED 0204				Sampling Pump Reference			RED 0258		
Tape Measure Reference	RED 0121				Barometer Reference			RED 0403		
DGM Thermocouple	RED 0274				Impinger Outlet Thermocouple			N/A		
Callipers	RED 0301				Condenser Thermocouple			N/A		



APPENDIX 4

Isocyanate Results



Client	Lawrence Automotive								
Site Address	Browns Lane, Coventry								
Job Number	P-RED17-050/EB/R1/Rev0								
Date	2nd May 2017								
Operator(s)	Elena Berek & Philip Butler								
Pump Reference	Sample ID	Location / Process / Operator	Pump Flow (mls/min)		Sample Duration (mins)		Total Volume (l)	Mass of Analyte (ug)	Concentration (mg/m ³)
RED 0010	17/050/33	VMC 3 POLYESTER AUTOMATIC SPRAY CELL 3	Initial	79089.00	Start	12:54	334	14.50	0.0434
			Final	79423.00	Finish	13:54			
			Average	334.00	Total	60			
RED 0010	17/050/34	VMC 3 POLYESTER AUTOMATIC SPRAY CELL 2	Initial	78773.00	Start	11:26	316	7.50	0.0237
			Final	79089.00	Finish	12:26			
			Average	316.00	Total	60			
RED 0010	17/050/35	VMC 3 POLYESTER AUTOMATIC SPRAY CELL 1	Initial	78453.00	Start	10:16	320	14.90	0.0466
			Final	78773.00	Finish	11:16			
			Average	320.00	Total	60			
RED 0010	17/050/36	P U AUTOMATIC SPRAY CELL	Initial	79756.00	Start	15:20	333	12.40	0.0372
			Final	80089.00	Finish	16:20			
			Average	333.00	Total	60			
RED 0010	17/050/37	VMC 3 PU MANUAL SPRAY 1	Initial	79423.00	Start	14:09	333	12.50	0.0375
			Final	79756.00	Finish	15:09			
			Average	333.00	Total	60			
N/A	17/050/38	Blank	Initial	n/a	Start	n/a	327	<0.05	<0.0002
			Final	n/a	Finish	n/a			
			Average	n/a	Total	n/a			



Client	Lawrence Automotive										
Site Address	Browns Lane, Coventry										
Job Number	P-RED17-050/EB/R1/Rev0										
Date	3rd May 2017										
Operator(s)	Elena Berek & Philip Butler										
Pump Reference	Sample ID	Location / Process / Operator			Pump Flow (mls/min)		Sample Duration (mins)		Total Volume (l)	Mass of Analyte (ug)	Concentration (mg/m³)
RED 0010	17/050/39	ADDITIONAL VMC 3 SPRAY BOOTH 1			Initial	80089.00	Start	9:55	323.00	14.2	0.044
					Final	80412.00	Finish	10:55			
					Average	323.00	Total	60			
RED 0010	17/050/40	ADDITIONAL VMC 3 SPRAY BOOTH 2			Initial	80412.00	Start	11:13	322.00	8.1	0.025
					Final	80734.00	Finish	12:13			
					Average	322.00	Total	60			
RED 0010	17/050/41	ADDITIONAL VMC 3 SPRAY BOOTH 3			Initial	80734.00	Start	12:20	328.00	8.9	0.027
					Final	81062.00	Finish	13:20			
					Average	328.00	Total	60			
N/A	17/050/42	Blank			Initial	n/a	Start	n/a	324.33	<0.05	<0.0002
					Final	n/a	Finish	n/a			
					Average	n/a	Total	n/a			

