

**Our Ref: P-RED13-084/EB/R1/Rev0**  
**Client Ref:**

**1<sup>st</sup> October 2013**

**Andy Jack**  
**Lawrence Automotive VMC Ltd**  
**Browns Lane**  
**Allesley**  
**Coventry CV5 9DR**

**Dear Andy**

**Re: Emissions Monitoring**

Please find enclosed a copy of your report for the monitoring carried out on the 2<sup>nd</sup> to the 4<sup>th</sup> and the 5<sup>th</sup> to the 6<sup>th</sup> September 2013.

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](mailto: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

**Vicki Gavin – Env Technician**

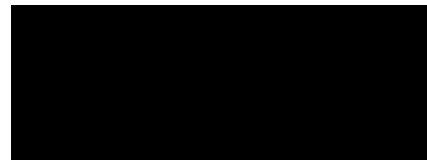
MCerts Level 1 – MM 02 018

**Tony Berek – Env Technician**

MCerts Trainee – MM 06 702

Report prepared by:

**Elena Berek – Director**



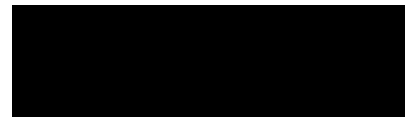
Signature:

Date:

1<sup>st</sup> October 2013

Report reviewed by:

**Philip Butler - Director**



Signature:

Date:

1<sup>st</sup> October 2013

Report authorised by:

Philip Butler



Signature:

Date:

1<sup>st</sup> October 2013



**SEPTEMBER 2013**

**EMISSIONS MONITORING**

**Andy Jack  
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Coventry CV5 9DR  
Tel: 02476 337888**

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**Report Number P-RED13-084/EB/R1/Rev0**

**1<sup>st</sup> October 2013**



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**EXECUTIVE SUMMARY (Page 1 of 1)**

The following document details the emissions to air monitoring survey undertaken by Elena Berek, Vicki Gavin and Tony Berek of Redwing Environmental Ltd at Lawrence Automotive, Browns Lane, Coventry during September 2013.

All results pertain to the dates monitored only; these dates include 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> September 2013.

A summary of results is shown below:-

Emission point reference Stack N <sup>o</sup>	Total Particulate Matter range at reference conditions (mg/m <sup>3</sup> )	Highest 30 minute VOC Concentrations at reference conditions (mg/m <sup>3</sup> )	Isocyanate Concentrations at reference conditions (mg/m <sup>3</sup> )	Velocity corrected to reference conditions (m/s)	Volume flow corrected to reference conditions (m <sup>3</sup> /hr)
VMC 3 Polyester Auto Cell 1	3.84 ± 0.27	41.3 ± 1.6 <b>(40.5)</b>	0.036 ± 0.005	6.1	6164
VMC 3 Polyester Auto Cell 2	3.35 ± 0.25	43.1 ± 1.2 <b>(30.5)</b>	<0.0002	8.2	8324
VMC 3 Polyester Auto Cell 3	2.09 ± 0.23	31.0 ± 0.91 <b>(22.7)</b>	<0.0002	7.8	8183
VMC 3 Manual PU Spray 1	2.24 ± 0.34	9.3 ± 0.32 <b>(7.9)</b>	0.0045 ± 0.0007	4.6	6392
VMC 3 PU Auto	1.63 ± 0.39	46.7 ± 1.9 <b>(31.4)</b>	0.0052 ± 0.0008	13.5	21447
Additional VMC 3 Booth 1	1.86 ± 0.31	26.4 ± 1.0 <b>(25.8)</b>	0.023 ± 0.003	4.5	6217
Additional VMC 3 Booth 2	0.39 ± 0.21	46.2 ± 1.7 <b>(42.7)</b>	0.020 ± 0.003	5.0	6940
Additional VMC 3 Booth 3	0.63 ± 0.26	46.0 ± 1.5 <b>(41.3)</b>	0.036 ± 0.005	6.1	6164
New Roof Spray Booth 1	0.62 ± 0.21	13.2 ± 0.53 <b>(13.6)</b>	0.0223 ± 0.003	12.9	13106
New Roof Spray Booth 2	0.18 ± 0.11	28.0 ± 1.0 <b>(25.6)</b>	0.014 ± 0.0021	15.4	15715
New Roof Spray Booth 3	0.28 ± 0.13	29.3 ± 1.1 <b>(28.3)</b>	0.0123 ± 0.002	8.5	8629



Emission point reference Stack N <sup>o</sup>	Total Particulate Matter range at reference conditions  (mg/m <sup>3</sup> )	Highest 30 minute VOC Concentrations at reference conditions  (mg/m <sup>3</sup> )	Isocyanate Concentrations at reference conditions  (mg/m <sup>3</sup> )	Velocity corrected to reference conditions  (m/s)	Volume flow corrected to reference conditions  (m <sup>3</sup> /hr)
New Roof Spray Booth 4	1.81 ± 0.43	34.6 ± 1.2 <b>(29.7)</b>	0.0183 ± 0.003	6.0	8547
New Roof Spray Booth 5	0.65 ± 0.30	47.0 ± 1.6 <b>(39.2)</b>	0.0143 ± 0.002	6.4	9107
New Roof Spray Booth 6	1.64 ± 0.68	14.0 ± 0.53 <b>(13.3)</b>	0.0177 ± 0.003	6.4	9182

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)**



## 1.0 INTRODUCTION

The monitoring of the fourteen exhausts was monitored with respect to quotation **Q-RED13-084/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	✓	✓	✓
New Roof Spray Booth 1	✓	✓	✓
New Roof Spray Booth 2	✓	✓	✓
New Roof Spray Booth 3	✓	✓	✓
New Roof Spray Booth 4	✓	✓	✓
New Roof Spray Booth 5	✓	✓	✓
New Roof Spray Booth 6	✓	✓	✓

- 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	3.84	mg/m <sup>3</sup>	± 0.27	273, 101.3kPa	3 <sup>rd</sup> September 2013	1100 – 1200	BS EN 13284-1	Normal
	Volatile Organic Compounds	50	41.3	mg/m <sup>3</sup>	± 1.6			1120 – 1220	BS EN 13526	
	Isocyanates	0.1	0.036	mg/m <sup>3</sup>	± 0.005			1207 - 1307	USEPA Method 36	
VMC 3 Polyester Auto Cell 2	Total Particulate Matter	50	3.35	mg/m <sup>3</sup>	± 0.25	273, 101.3kPa	3 <sup>rd</sup> September 2013	1250 – 1350	BS EN 13284-1	Normal
	Volatile Organic Compounds	50	43.1	mg/m <sup>3</sup>	± 1.2			1222 – 1322	BS EN 13526	
	Isocyanates	0.1	<0.0002	mg/m <sup>3</sup>	N/A			1400 - 1500	USEPA Method 36	
VMC 3 Polyester Auto Cell 3	Total Particulate Matter	50	2.09	mg/m <sup>3</sup>	± 0.23	273, 101.3kPa	4 <sup>th</sup> September 2013	0900 – 1000	BS EN 13284-1	Normal
	Volatile Organic Compounds	50	31.0	mg/m <sup>3</sup>	± 0.91			1324 – 1424	BS EN 13526	
	Isocyanates	0.1	<0.0002	mg/m <sup>3</sup>	N/A			1005 - 1105	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	2.24	mg/m <sup>3</sup>	± 0.34	273, 101.3kPa	3 <sup>rd</sup> September 2013	0900 – 1002	BS EN 13284-1	Normal
	Volatile Organic Compounds	50	9.3	mg/m <sup>3</sup>	± 0.32			0959 – 1059	BS EN 13526	
	Isocyanates	0.1	0.0045	mg/m <sup>3</sup>	± 0.0007			1000 - 1100	USEPA Method 36	
VMC 3 PU Auto	Total Particulate Matter	50	1.63	mg/m <sup>3</sup>	± 0.39	273, 101.3kPa	2 <sup>nd</sup> September 2013	1240 – 1342	BS EN 13284-1	Normal
	Volatile Organic Compounds	50	46.7	mg/m <sup>3</sup>	± 1.9			1427 – 1527	BS EN 13526	
	Isocyanates	0.1	0.0052	mg/m <sup>3</sup>	± 0.0008			1345 - 1445	USEPA Method 36	
Additional VMC 3 Booth 1	Total Particulate Matter	50	1.86	mg/m <sup>3</sup>	± 0.31	273, 101.3kPa	4 <sup>th</sup> September 2013	1410 – 1510	BS EN 13284-1	Normal
	Volatile Organic Compounds	50	26.4	mg/m <sup>3</sup>	± 1.0			1138 – 1238	BS EN 13526	
	Isocyanates	0.1	0.023	mg/m <sup>3</sup>	± 0.003			1512 - 1547	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	0.39	mg/m <sup>3</sup>	± 0.21	273, 101.3kPa	4 <sup>th</sup> September 2013	1230 – 1330	BS EN 13284-1	Normal
	Volatile Organic Compounds	50	46.2	mg/m <sup>3</sup>	± 1.7			1034 – 1134	BS EN 13526	
	Isocyanates	0.1	0.020	mg/m <sup>3</sup>	± 0.003			1332 - 1407	USEPA Method 36	
Additional VMC 3 Booth 3	Total Particulate Matter	50	0.63	mg/m <sup>3</sup>	± 0.26	273, 101.3kPa	4 <sup>th</sup> September 2013	1050 – 1151	BS EN 13284-1	Normal
	Volatile Organic Compounds	50	46.0	mg/m <sup>3</sup>	± 1.5			0931 – 1031	BS EN 13526	
	Isocyanates	0.1	0.012	mg/m <sup>3</sup>	± 0.002			1155 - 1230	USEPA Method 36	
New Roof Spray Booth 1	Total Particulate Matter	50	0.62	mg/m <sup>3</sup>	± 0.21	273, 101.3kPa	5 <sup>th</sup> September 2013	0825 – 0926	BS EN 13284-1	Normal
	Volatile Organic Compounds	50	13.6	mg/m <sup>3</sup>	± 0.53			0821 – 0921	BS EN 13526	
	Isocyanates	0.1	0.022	mg/m <sup>3</sup>	± 0.003			0932 - 1000	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
New Roof Spray Booth 2	Total Particulate Matter	50	0.18	mg/m <sup>3</sup>	± 0.11	273, 101.3kPa	5 <sup>th</sup> September 2013	1015 – 1116	BS EN 13284-1	Normal
	Volatile Organic Compounds	50	28.0	mg/m <sup>3</sup>	± 1.0			1011 – 1111	BS EN 13526	
	Isocyanates	0.1	0.014	mg/m <sup>3</sup>	± 0.0021			1120 -1148	USEPA Method 36	
New Roof Spray Booth 3	Total Particulate Matter	50	0.28	mg/m <sup>3</sup>	± 0.13	273, 101.3kPa	5 <sup>th</sup> September 2013	1230 – 1331	BS EN 13284-1	Normal
	Volatile Organic Compounds	50	29.3	mg/m <sup>3</sup>	± 1.1			1130 – 1230	BS EN 13526	
	Isocyanates	0.1	0.0123	mg/m <sup>3</sup>	± 0.002			1337 - 1405	USEPA Method 36	
New Roof Spray Booth 4	Total Particulate Matter	50	1.81	mg/m <sup>3</sup>	± 0.43	273, 101.3kPa	6 <sup>th</sup> September 2013	0740 – 0840	BS EN 13284-1	Normal
	Volatile Organic Compounds	50	34.6	mg/m <sup>3</sup>	± 1.2			0741 – 0841	BS EN 13526	
	Isocyanates	0.1	0.0183	mg/m <sup>3</sup>	± 0.003			0850 - 0922	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
New Roof Spray Booth 5	Total Particulate Matter	50	0.65	mg/m <sup>3</sup>	± 0.30	273, 101.3kPa	6 <sup>th</sup> September 2013	0930 – 1030	BS EN 13284-1	Normal
	Volatile Organic Compounds	50	47.0	mg/m <sup>3</sup>	± 1.6			0927 – 1027	BS EN 13526	
	Isocyanates	0.1	0.014	mg/m <sup>3</sup>	± 0.002			1035 - 1107	USEPA Method 36	
New Roof Spray Booth 6	Total Particulate Matter	50	1.64	mg/m <sup>3</sup>	± 0.68	273, 101.3kPa	6 <sup>th</sup> September 2013	1120 – 1220	BS EN 13284-1	Normal
	Volatile Organic Compounds	50	14.0	mg/m <sup>3</sup>	± 0.53			1040 – 1140	BS EN 13526	
	Isocyanates	0.1	0.0177	mg/m <sup>3</sup>	± 0.003			1230 - 1302	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

Vicki Gavin – MCerts Level 1  
Registration number MM 02 018

Tony Berek – Trainee  
Registration number MM 06 702

### **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/m<sup>3</sup>).

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 13526: 2001)**

2.4.1 Monitoring to determine VOC emission concentrations was in accordance with BS EN 13526: 2001.

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. The methods followed are listed as our Technical Procedures and will be put forward for UKAS accreditation.
- 3.2 Redwing Environmental Ltd is accredited to ISO 9001: 2008, ISO 14001:2004 and ISO 17025:2005

### **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 New Booth No 1		
		Lawrence Automotive		
		RUN 1		
Filter Reference No	G47-280813-27			
Date	4th September 2013			
Sample Period	14:10	to	15:10	
Velocity (m/s)	4.49			
Volume flow rate of Stack gas (m <sup>3</sup> /hr)	6217			
Average Stack Temp (°C)	23.6			
Temp Range ± 5% (°C)	8.77	to	38.43	
Lowest Velocity Reading (m/s)	4.31			
Highest Velocity Reading (m/s)	4.85			
Ratio (less than 3:1)	1.13	:	1	
Pre-conditioning temperature of Filter (°C)	180			
Instack sampling - Max Filter temperature (°C)	23.4			
Post-conditioning temperature Filter/Wash (°C)	160			
Oxygen %	19.2			
Carbon Dioxide %	0.30			
Moisture (%)	2.56			
Litres sampled	847			
Corrected volume sampled - STP (m <sup>3</sup> )	0.758			
Blank Filter Run weight gain (mg)	0.020	Blank Concentration (mg/m <sup>3</sup> )	0.026	
Blank Wash Run weight gain (mg)	0.040		0.053	
Weighing uncertainty of balance (mg)	0.074	This must be <5% of ELV	ELV = 50	2.5
Overall Blank value (mg/m <sup>3</sup> )	0.079	This must be <10% of ELV	ELV = 50	5.0
Particulate weight collected on filter (mg)	0.57			
Particulate weight collected in Wash (mg)	0.88			
Total Particulate weight collected (mg)	1.45			
Total Particulate Concentration, dry gas at STP (mg/m <sup>3</sup> )	1.91			
Total Particulate Concentration, wet gas at STP (mg/m <sup>3</sup> )	1.86			
Total Particulate Concentration corrected for 11% Oxygen, dry gas (mg/m <sup>3</sup> )	N/A			
Total Particulate Mass Emission (kg/hour)	0.01			



Stack Reference ID		VMC3 New Booth No 2			
		Lawrence Automotive			
		RUN 1			
Filter Reference No	G47-280813-25				
Date	4th September 2013				
Sample Period	12:30	to	13:30		
Velocity (m/s)	5.01				
Volume flow rate of Stack gas (m <sup>3</sup> /hr)	6940				
Average Stack Temp (°C)	23.0				
Temp Range ± 5% (°C)	8.15	to	37.75		
Lowest Velocity Reading (m/s)	4.97				
Highest Velocity Reading (m/s)	5.22				
Ratio (less than 3:1)	1.05	:	1		
Pre-conditioning temperature of Filter (°C)	180				
Instack sampling - Max Filter temperature (°C)	23.0				
Post-conditioning temperature Filter/Wash (°C)	160				
Oxygen %	19.5				
Carbon Dioxide %	0.40				
Moisture (%)	2.56				
Litres sampled	941				
Corrected volume sampled - STP (m <sup>3</sup> )	0.850				
Blank Filter Run weight gain (mg)	0.010	Blank Concentration (mg/m <sup>3</sup> )	0.012		
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 <sup>3</sup> )	0.035	This must be <10% of ELV	ELV = 50	5.0	
Particulate weight collected on filter (mg)	0.24				
Particulate weight collected in Wash (mg)	0.10				
Total Particulate weight collected (mg)	0.34				
Total Particulate Concentration, dry gas at STP (mg/m <sup>3</sup> )	0.40				
Total Particulate Concentration, wet gas at STP (mg/m <sup>3</sup> )	0.39				
Total Particulate Concentration corrected for 11% Oxygen, dry gas (mg/m <sup>3</sup> )	N/A				
Total Particulate Mass Emission (kg/hour)	0.0027				



Stack Reference ID		VMC3 Auto Cell 3		
	Lawrence Automotive			
	RUN 1			
Filter Reference No	G47-280813-23			
Date	4th September 2013			
Sample Period	10:50	to	11:51	
Velocity (m/s)	9.11			
Volume flow rate of Stack gas (m <sup>3</sup> /hr)	12620			
Average Stack Temp (°C)	33.2			
Temp Range ± 5% (°C)	17.89	to	48.51	
Lowest Velocity Reading (m/s)	8.98			
Highest Velocity Reading (m/s)	9.80			
Ratio (less than 3:1)	1.09	:	1	
Pre-conditioning temperature of Filter (°C)	180			
Instack sampling - Max Filter temperature (°C)	33.6			
Post-conditioning temperature Filter/Wash (°C)	160			
Oxygen %	19.6			
Carbon Dioxide %	0.50			
Moisture (%)	2.56			
Litres sampled	926			
Corrected volume sampled - STP (m <sup>3</sup> )	0.845			
Blank Filter Run weight gain (mg)	0.000	Blank Concentration (mg/m <sup>3</sup> )	0.000	
Blank Wash Run weight gain (mg)	0.030		0.035	
Weighing uncertainty of balance (mg)	0.074	This must be <5% of ELV	ELV = 50	2.5
Overall Blank value (mg/m <sup>3</sup> )	0.035	This must be <10% of ELV	ELV = 50	5.0
Particulate weight collected on filter (mg)	0.12			
Particulate weight collected in Wash (mg)	0.43			
Total Particulate weight collected (mg)	0.55			
Total Particulate Concentration, dry gas at STP (mg/m <sup>3</sup> )	0.65			
Total Particulate Concentration, wet gas at STP (mg/m <sup>3</sup> )	0.63			
Total Particulate Concentration corrected for 11% Oxygen, dry gas (mg/m <sup>3</sup> )	N/A			
Total Particulate Mass Emission (kg/hour)	0.0078			



Stack Reference ID		VMC3 Auto Cell 1		
	Lawrence Automotive			
	RUN 1			
Filter Reference No	G47-280813-17			
Date	3rd September 2013			
Sample Period	11:00	to	12:00	
Velocity (m/s)	6.06			
Volume flow rate of Stack gas (m <sup>3</sup> /hr)	6164			
Average Stack Temp (°C)	24.2			
Temp Range ± 5% (°C)	9.34	to	39.06	
Lowest Velocity Reading (m/s)	5.78			
Highest Velocity Reading (m/s)	6.68			
Ratio (less than 3:1)	1.15	:	1	
Pre-conditioning temperature of Filter (°C)	180			
Instack sampling - Max Filter temperature (°C)	25.1			
Post-conditioning temperature Filter/Wash (°C)	160			
Oxygen %	18.9			
Carbon Dioxide %	0.50			
Moisture (%)	2.55			
Litres sampled	1135			
Corrected volume sampled - STP (m <sup>3</sup> )	1.054			
Blank Filter Run weight gain (mg)	0.030	Blank Concentration (mg/m <sup>3</sup> )	0.028	
Blank Wash Run weight gain (mg)	0.030		0.028	
Weighing uncertainty of balance (mg)	0.077	This must be <5% of ELV	ELV = 50	2.5
Overall Blank value (mg/m <sup>3</sup> )	0.057	This must be <10% of ELV	ELV = 50	5.0
Particulate weight collected on filter (mg)	2.86			
Particulate weight collected in Wash (mg)	1.29			
Total Particulate weight collected (mg)	4.15			
Total Particulate Concentration, dry gas at STP (mg/m <sup>3</sup> )	3.94			
Total Particulate Concentration, wet gas at STP (mg/m <sup>3</sup> )	3.84			
Total Particulate Concentration corrected for 11% Oxygen, dry gas (mg/m <sup>3</sup> )	N/A			
Total Particulate Mass Emission (g/hour)	0.02			



Stack Reference ID		VMC3 Auto Cell 2		
	Lawrence Automotive			
	RUN 1			
Filter Reference No	G47-280813-19			
Date	3rd September 2013			
Sample Period	12:50	to	13:50	
Velocity (m/s)	8.18			
Volume flow rate of Stack gas (m <sup>3</sup> /hr)	8324			
Average Stack Temp (°C)	24.0			
Temp Range ± 5% (°C)	9.15	to	38.85	
Lowest Velocity Reading (m/s)	8.02			
Highest Velocity Reading (m/s)	8.69			
Ratio (less than 3:1)	1.08	:	1	
Pre-conditioning temperature of Filter (°C)	180			
Instack sampling - Max Filter temperature (°C)	29.8			
Post-conditioning temperature Filter/Wash (°C)	160			
Oxygen %	19			
Carbon Dioxide %	0.20			
Moisture (%)	2.55			
Litres sampled	1560			
Corrected volume sampled - STP (m <sup>3</sup> )	1.429			
Blank Filter Run weight gain (mg)	0.010	Blank Concentration (mg/m <sup>3</sup> )	0.007	
Blank Wash Run weight gain (mg)	0.010		0.007	
Weighing uncertainty of balance (mg)	0.079	This must be <5% of ELV	ELV = 50	2.5
Overall Blank value (mg/m <sup>3</sup> )	0.014	This must be <10% of ELV	ELV = 50	10.0
Particulate weight collected on filter (mg)	4.06			
Particulate weight collected in Wash (mg)	0.85			
Total Particulate weight collected (mg)	4.91			
Total Particulate Concentration, dry gas at STP (mg/m <sup>3</sup> )	3.44			
Total Particulate Concentration, wet gas at STP (mg/m <sup>3</sup> )	3.35			
Total Particulate Concentration corrected for 11% Oxygen, dry gas (mg/m <sup>3</sup> )	N/A			
Total Particulate Mass Emission (Kg/hour)	0.03			



Stack Reference ID		VMC3 Auto Cell 3		
		Lawrence Automotive		
		RUN 1		
Filter Reference No	G47-280813-21			
Date	4th September 2013			
Sample Period	09:00	to	10:00	
Velocity (m/s)	7.85			
Volume flow rate of Stack gas (m <sup>3</sup> /hr)	8183			
Average Stack Temp (°C)	19.0			
Temp Range ± 5% (°C)	4.40	to	33.60	
Lowest Velocity Reading (m/s)	7.65			
Highest Velocity Reading (m/s)	8.53			
Ratio (less than 3:1)	1.11	:	1	
Pre-conditioning temperature of Filter (°C)	180			
Instack sampling - Max Filter temperature (°C)	26.6			
Post-conditioning temperature Filter/Wash (°C)	160			
Oxygen %	18.9			
Carbon Dioxide %	0.70			
Moisture (%)	2.56			
Litres sampled	1511			
Corrected volume sampled - STP (m <sup>3</sup> )	1.404			
Blank Filter Run weight gain (mg)	0.000	Blank Concentration (mg/m <sup>3</sup> )	0.000	
Blank Wash Run weight gain (mg)	0.060		0.043	
Weighing uncertainty of balance (mg)	0.077	This must be <5% of ELV	ELV = 50	2.5
Overall Blank value (mg/m <sup>3</sup> )	0.043	This must be <10% of ELV	ELV = 50	10.0
Particulate weight collected on filter (mg)	2.91			
Particulate weight collected in Wash (mg)	0.10			
Total Particulate weight collected (mg)	3.01			
Total Particulate Concentration, dry gas at STP (mg/m <sup>3</sup> )	2.14			
Total Particulate Concentration, wet gas at STP (mg/m <sup>3</sup> )	2.09			
Total Particulate Concentration corrected for 11% Oxygen, dry gas (mg/m <sup>3</sup> )	N/A			
Total Particulate Mass Emission (Kg/hour)	0.02			



Stack Reference ID		VMC3 PU Auto		
	Lawrence Automotive			
	RUN 1			
Filter Reference No	G47-280813-13			
Date	2nd September 2013			
Sample Period	12:40	to	13:42	
Velocity (m/s)	13.49			
Volume flow rate of Stack gas (m <sup>3</sup> /hr)	21447			
Average Stack Temp (°C)	29.3			
Temp Range ± 5% (°C)	14.19	to	44.42	
Lowest Velocity Reading (m/s)	13.22			
Highest Velocity Reading (m/s)	14.32			
Ratio (less than 3:1)	1.08	:	1	
Pre-conditioning temperature of Filter (°C)	180			
Instack sampling - Max Filter temperature (°C)	29.3			
Post-conditioning temperature Filter/Wash (°C)	160			
Oxygen %	19.2			
Carbon Dioxide %	0.20			
Moisture (%)	2.54			
Litres sampled	1394			
Corrected volume sampled - STP (m <sup>3</sup> )	1.272			
Blank Filter Run weight gain (mg)	0.020	Blank Concentration (mg/m <sup>3</sup> )	0.016	
Blank Wash Run weight gain (mg)	0.020		0.016	
Weighing uncertainty of balance (mg)	0.075	This must be <5% of ELV	ELV = 50	2.5
Overall Blank value (mg/m <sup>3</sup> )	0.031	This must be <10% of ELV	ELV = 50	5.0
Particulate weight collected on filter (mg)	2.05			
Particulate weight collected in Wash (mg)	0.08			
Total Particulate weight collected (mg)	2.13			
Total Particulate Concentration, dry gas at STP (mg/m <sup>3</sup> )	1.67			
Total Particulate Concentration, wet gas at STP (mg/m <sup>3</sup> )	1.63			
Total Particulate Concentration corrected for 11% Oxygen, dry gas (mg/m <sup>3</sup> )	N/A			
Total Particulate Mass Emission (kg/hour)	0.03			



Stack Reference ID		VMC3 PU Manual		
		Lawrence Automotive		
		RUN 1		
Filter Reference No	G47-280813-15			
Date	3rd September 2013			
Sample Period	09:00	to	10:02	
Velocity (m/s)	4.61			
Volume flow rate of Stack gas (m <sup>3</sup> /hr)	6392			
Average Stack Temp (°C)	24.4			
Temp Range ± 5% (°C)	9.53	to	39.27	
Lowest Velocity Reading (m/s)	4.31			
Highest Velocity Reading (m/s)	5.10			
Ratio (less than 3:1)	1.18	:	1	
Pre-conditioning temperature of Filter (°C)	180			
Instack sampling - Max Filter temperature (°C)	24.8			
Post-conditioning temperature Filter/Wash (°C)	160			
Oxygen %	19.6			
Carbon Dioxide %	0.50			
Moisture (%)	2.55			
Litres sampled	946			
Corrected volume sampled - STP (m <sup>3</sup> )	0.875			
Blank Filter Run weight gain (mg)	0.000	Blank Concentration (mg/m <sup>3</sup> )	0.000	
Blank Wash Run weight gain (mg)	0.020		0.023	
Weighing uncertainty of balance (mg)	0.075	This must be <5% of ELV	ELV = 50	2.5
Overall Blank value (mg/m <sup>3</sup> )	0.023	This must be <10% of ELV	ELV = 50	5.0
Particulate weight collected on filter (mg)	0.38			
Particulate weight collected in Wash (mg)	1.63			
Total Particulate weight collected (mg)	2.01			
Total Particulate Concentration, dry gas at STP (mg/m <sup>3</sup> )	2.30			
Total Particulate Concentration, wet gas at STP (mg/m <sup>3</sup> )	2.24			
Total Particulate Concentration corrected for 11% Oxygen, dry gas (mg/m <sup>3</sup> )	N/A			
Total Particulate Mass Emission (kg/hour)	0.01			





Stack Reference ID		New Roof Zone 1 Stack 1		
	Lawrence Automotive			
	RUN 1			
Filter Reference No	G47-280813-29			
Date	4th September 2013			
Sample Period	08:25	to	09:26	
Velocity (m/s)	12.88			
Volume flow rate of Stack gas (m <sup>3</sup> /hr)	13106			
Average Stack Temp (°C)	20.4			
Temp Range ± 5% (°C)	5.73	to	35.07	
Lowest Velocity Reading (m/s)	12.91			
Highest Velocity Reading (m/s)	13.37			
Ratio (less than 3:1)	1.04	:	1	
Pre-conditioning temperature of Filter (°C)	180			
Instack sampling - Max Filter temperature (°C)	20.5			
Post-conditioning temperature Filter/Wash (°C)	160			
Oxygen %	19.5			
Carbon Dioxide %	0.30			
Moisture (%)	2.14			
Litres sampled	1316			
Corrected volume sampled - STP (m <sup>3</sup> )	1.244			
Blank Filter Run weight gain (mg)	0.000	Blank Concentration (mg/m <sup>3</sup> )	0.000	
Blank Wash Run weight gain (mg)	0.100		0.080	
Weighing uncertainty of balance (mg)	0.074	This must be <5% of ELV	ELV = 50	2.5
Overall Blank value (mg/m <sup>3</sup> )	0.080	This must be <10% of ELV	ELV = 50	5.0
Particulate weight collected on filter (mg)	0.09			
Particulate weight collected in Wash (mg)	0.70			
Total Particulate weight collected (mg)	0.79			
Total Particulate Concentration, dry gas at STP (mg/m <sup>3</sup> )	0.64			
Total Particulate Concentration, wet gas at STP (mg/m <sup>3</sup> )	0.62			
Total Particulate Concentration corrected for 11% Oxygen, dry gas (mg/m <sup>3</sup> )	N/A			
Total Particulate Mass Emission (kg/hour)	0.0082			



Stack Reference ID		New Roof Zone 2 Stack 2			
		Lawrence Automotive			
		RUN 1			
Filter Reference No	G47-280813-31				
Date	5th September 2013				
Sample Period	10:15	to	11:16		
Velocity (m/s)	15.44				
Volume flow rate of Stack gas (m <sup>3</sup> /hr)	15715				
Average Stack Temp (°C)	23.1				
Temp Range ± 5% (°C)	8.30	to	37.91		
Lowest Velocity Reading (m/s)	15.64				
Highest Velocity Reading (m/s)	15.84				
Ratio (less than 3:1)	1.01	:	1		
Pre-conditioning temperature of Filter (°C)	180				
Instack sampling - Max Filter temperature (°C)	22.9				
Post-conditioning temperature Filter/Wash (°C)	160				
Oxygen %	19.2				
Carbon Dioxide %	0.40				
Moisture (%)	2.15				
Litres sampled	1551				
Corrected volume sampled - STP (m <sup>3</sup> )	1.431				
Blank Filter Run weight gain (mg)	0.000	Blank Concentration (mg/m <sup>3</sup> )	0.000		
Blank Wash Run weight gain (mg)	0.030		0.021		
Weighing uncertainty of balance (mg)	0.074	This must be <5% of ELV	ELV = 50	2.5	
Overall Blank value (mg/m <sup>3</sup> )	0.021	This must be <10% of ELV	ELV = 50	5.0	
Particulate weight collected on filter (mg)	0.06				
Particulate weight collected in Wash (mg)	0.20				
Total Particulate weight collected (mg)	0.26				
Total Particulate Concentration, dry gas at STP (mg/m <sup>3</sup> )	0.18				
Total Particulate Concentration, wet gas at STP (mg/m <sup>3</sup> )	0.18				
Total Particulate Concentration corrected for 11% Oxygen, dry gas (mg/m <sup>3</sup> )	N/A				
Total Particulate Mass Emission (kg/hour)	0.0028				



Stack Reference ID		New Roof Stack 3		
	Lawrence Automotive			
	RUN 1			
Filter Reference No	G47-280813-33			
Date	5th September 2013			
Sample Period	12:30	to	13:31	
Velocity (m/s)	8.48			
Volume flow rate of Stack gas (m <sup>3</sup> /hr)	8629			
Average Stack Temp (°C)	28.9			
Temp Range ± 5% (°C)	13.76	to	43.94	
Lowest Velocity Reading (m/s)	8.02			
Highest Velocity Reading (m/s)	9.12			
Ratio (less than 3:1)	1.14	:	1	
Pre-conditioning temperature of Filter (°C)	180			
Instack sampling - Max Filter temperature (°C)	29.7			
Post-conditioning temperature Filter/Wash (°C)	160			
Oxygen %	19.2			
Carbon Dioxide %	0.40			
Moisture (%)	2.15			
Litres sampled	1559			
Corrected volume sampled - STP (m <sup>3</sup> )	1.380			
Blank Filter Run weight gain (mg)	0.020	Blank Concentration (mg/m <sup>3</sup> )	0.014	
Blank Wash Run weight gain (mg)	0.010		0.007	
Weighing uncertainty of balance (mg)	0.074	This must be <5% of ELV	ELV = 50	2.5
Overall Blank value (mg/m <sup>3</sup> )	0.022	This must be <10% of ELV	ELV = 50	5.0
Particulate weight collected on filter (mg)	0.10			
Particulate weight collected in Wash (mg)	0.30			
Total Particulate weight collected (mg)	0.40			
Total Particulate Concentration, dry gas at STP (mg/m <sup>3</sup> )	0.29			
Total Particulate Concentration, wet gas at STP (mg/m <sup>3</sup> )	0.28			
Total Particulate Concentration corrected for 11% Oxygen, dry gas (mg/m <sup>3</sup> )	N/A			
Total Particulate Mass Emission (kg/hour)	0.0024			



Stack Reference ID		New Roof Stack 4			
		Lawrence Automotive			
		RUN 1			
Filter Reference No	G47-280813-35				
Date	6th September 2013				
Sample Period	07:40	to	08:40		
Velocity (m/s)	6.00				
Volume flow rate of Stack gas (m <sup>3</sup> /hr)	8547				
Average Stack Temp (°C)	15.5				
Temp Range ± 5% (°C)	1.07	to	29.93		
Lowest Velocity Reading (m/s)	5.48				
Highest Velocity Reading (m/s)	6.57				
Ratio (less than 3:1)	1.20	:	1		
Pre-conditioning temperature of Filter (°C)	180				
Instack sampling - Max Filter temperature (°C)	15.6				
Post-conditioning temperature Filter/Wash (°C)	160				
Oxygen %	20				
Carbon Dioxide %	0.20				
Moisture (%)	1.94				
Litres sampled	1096				
Corrected volume sampled - STP (m <sup>3</sup> )	1.033				
Blank Filter Run weight gain (mg)	0.000	Blank Concentration (mg/m <sup>3</sup> )	0.000		
Blank Wash Run weight gain (mg)	0.040		0.039		
Weighing uncertainty of balance (mg)	0.075	This must be <5% of ELV	ELV = 50	2.5	
Overall Blank value (mg/m <sup>3</sup> )	0.039	This must be <10% of ELV	ELV = 50	5.0	
Particulate weight collected on filter (mg)	0.64				
Particulate weight collected in Wash (mg)	1.27				
Total Particulate weight collected (mg)	1.91				
Total Particulate Concentration, dry gas at STP (mg/m <sup>3</sup> )	1.85				
Total Particulate Concentration, wet gas at STP (mg/m <sup>3</sup> )	1.81				
Total Particulate Concentration corrected for 11% Oxygen, dry gas (mg/m <sup>3</sup> )	N/A				
Total Particulate Mass Emission (kg/hour)	0.0155				



Stack Reference ID		New Roof Zone 5 Stack 5			
		Lawrence Automotive			
		RUN 1			
Filter Reference No	G47-280813-37				
Date	6th September 2013				
Sample Period	09:30	to	10:30		
Velocity (m/s)	6.39				
Volume flow rate of Stack gas (m <sup>3</sup> /hr)	9107				
Average Stack Temp (°C)	15.8				
Temp Range ± 5% (°C)	1.34	to	30.21		
Lowest Velocity Reading (m/s)	6.20				
Highest Velocity Reading (m/s)	7.35				
Ratio (less than 3:1)	1.19	:	1		
Pre-conditioning temperature of Filter (°C)	180				
Instack sampling - Max Filter temperature (°C)	16.3				
Post-conditioning temperature Filter/Wash (°C)	160				
Oxygen %	20				
Carbon Dioxide %	0.20				
Moisture (%)	1.94				
Litres sampled	1166				
Corrected volume sampled - STP (m <sup>3</sup> )	1.095				
Blank Filter Run weight gain (mg)	0.010	Blank Concentration (mg/m <sup>3</sup> )	0.009		
Blank Wash Run weight gain (mg)	0.010		0.009		
Weighing uncertainty of balance (mg)	0.074	This must be <5% of ELV	ELV = 50	2.5	
Overall Blank value (mg/m <sup>3</sup> )	0.018	This must be <10% of ELV	ELV = 50	5.0	
Particulate weight collected on filter (mg)	0.18				
Particulate weight collected in Wash (mg)	0.55				
Total Particulate weight collected (mg)	0.73				
Total Particulate Concentration, dry gas at STP (mg/m <sup>3</sup> )	0.67				
Total Particulate Concentration, wet gas at STP (mg/m <sup>3</sup> )	0.65				
Total Particulate Concentration corrected for 11% Oxygen, dry gas (mg/m <sup>3</sup> )	N/A				
Total Particulate Mass Emission (kg/hour)	0.0060				



Stack Reference ID		New Roof Zone 6 Stack 6			
		Lawrence Automotive			
		RUN 1			
Filter Reference No	G47-280813-39				
Date	6th September 2013				
Sample Period	11:20	to	12:20		
Velocity (m/s)	6.44				
Volume flow rate of Stack gas (m <sup>3</sup> /hr)	9182				
Average Stack Temp (°C)	15.8				
Temp Range ± 5% (°C)	1.34	to	30.21		
Lowest Velocity Reading (m/s)	6.20				
Highest Velocity Reading (m/s)	7.27				
Ratio (less than 3:1)	1.17	:	1		
Pre-conditioning temperature of Filter (°C)	180				
Instack sampling - Max Filter temperature (°C)	16.6				
Post-conditioning temperature Filter/Wash (°C)	160				
Oxygen %	20				
Carbon Dioxide %	0.20				
Moisture (%)	1.94				
Litres sampled	1245				
Corrected volume sampled - STP (m <sup>3</sup> )	1.165				
Blank Filter Run weight gain (mg)	0.000	Blank Concentration (mg/m <sup>3</sup> )	0.000		
Blank Wash Run weight gain (mg)	0.040		0.034		
Weighing uncertainty of balance (mg)	0.075	This must be <5% of ELV	ELV = 50	2.5	
Overall Blank value (mg/m <sup>3</sup> )	0.034	This must be <10% of ELV	ELV = 50	5.0	
Particulate weight collected on filter (mg)	0.81				
Particulate weight collected in Wash (mg)	1.14				
Total Particulate weight collected (mg)	1.95				
Total Particulate Concentration, dry gas at STP (mg/m <sup>3</sup> )	1.67				
Total Particulate Concentration, wet gas at STP (mg/m <sup>3</sup> )	1.64				
Total Particulate Concentration corrected for 11% Oxygen, dry gas (mg/m <sup>3</sup> )	N/A				
Total Particulate Mass Emission (kg/hour)	0.0151				



# APPENDIX 2

## Volatile Organic Compound Results



VMC3 New Spray Booth 1					
Date	Time	VOC mg/m3	Date	Time	VOC mg/m3
04-Sep-13	11:38:31	34.39	04-Sep-13	12:27:31	21.54
04-Sep-13	11:39:31	30.54	04-Sep-13	12:28:31	20.57
04-Sep-13	11:40:31	29.89	04-Sep-13	12:29:31	20.57
04-Sep-13	11:41:31	27.64	04-Sep-13	12:30:31	20.25
04-Sep-13	11:42:31	27.96	04-Sep-13	12:31:31	21.54
04-Sep-13	11:43:31	27.96	04-Sep-13	12:32:31	20.57
04-Sep-13	11:44:31	27.00	04-Sep-13	12:33:31	21.86
04-Sep-13	11:45:31	26.04	04-Sep-13	12:34:31	22.18
04-Sep-13	11:46:31	24.75	04-Sep-13	12:35:31	21.54
04-Sep-13	11:47:31	24.43	04-Sep-13	12:36:31	21.86
04-Sep-13	11:48:31	24.75	04-Sep-13	12:37:31	22.50
04-Sep-13	11:49:31	25.39			
04-Sep-13	11:50:31	25.07			
04-Sep-13	11:51:31	25.07			
04-Sep-13	11:52:31	23.79			
04-Sep-13	11:53:31	23.14			
04-Sep-13	11:54:31	23.46			
04-Sep-13	11:55:31	24.11			
04-Sep-13	11:56:31	29.25			
04-Sep-13	11:57:31	23.46			
04-Sep-13	11:58:31	24.75			
04-Sep-13	11:59:31	23.79			
04-Sep-13	12:00:31	24.75			
04-Sep-13	12:01:31	25.71			
04-Sep-13	12:02:31	27.00			
04-Sep-13	12:03:31	27.64			
04-Sep-13	12:04:31	27.64			
04-Sep-13	12:05:31	28.29			
04-Sep-13	12:06:31	28.93			
04-Sep-13	12:07:31	29.57			
04-Sep-13	12:08:31	30.86			
04-Sep-13	12:09:31	32.14			
04-Sep-13	12:10:31	32.46			
04-Sep-13	12:11:31	31.82			
04-Sep-13	12:12:31	30.21			
04-Sep-13	12:13:31	30.21			
04-Sep-13	12:14:31	29.25			
04-Sep-13	12:15:31	27.96			
04-Sep-13	12:16:31	25.39			
04-Sep-13	12:17:31	23.79			
04-Sep-13	12:18:31	24.75			
04-Sep-13	12:19:31	26.36			
04-Sep-13	12:20:31	27.00			
04-Sep-13	12:21:31	26.68			
04-Sep-13	12:22:31	27.64			
04-Sep-13	12:23:31	26.04			
04-Sep-13	12:24:31	25.39			
04-Sep-13	12:25:31	23.79			
04-Sep-13	12:26:31	22.18			
			<b>Average</b>		<b>25.8</b>





VMC3 New Spray Booth 2					
Date	Time	VOC mg/m3	Date	Time	VOC mg/m3
04-Sep-13	10:34:56	40.18	04-Sep-13	11:23:56	36.96
04-Sep-13	10:35:56	39.21	04-Sep-13	11:24:56	36.64
04-Sep-13	10:36:56	37.93	04-Sep-13	11:25:56	35.68
04-Sep-13	10:37:56	38.89	04-Sep-13	11:26:56	34.71
04-Sep-13	10:38:56	40.18	04-Sep-13	11:27:56	34.07
04-Sep-13	10:39:56	43.07	04-Sep-13	11:28:56	32.46
04-Sep-13	10:40:56	42.75	04-Sep-13	11:29:56	31.82
04-Sep-13	10:41:56	42.43	04-Sep-13	11:30:56	30.54
04-Sep-13	10:42:56	42.43	04-Sep-13	11:31:56	29.89
04-Sep-13	10:43:56	52.71	04-Sep-13	11:32:56	29.25
04-Sep-13	10:44:56	54.96	04-Sep-13	11:33:56	28.61
04-Sep-13	10:45:56	51.11			
04-Sep-13	10:46:56	49.82			
04-Sep-13	10:47:56	48.86			
04-Sep-13	10:48:56	47.25			
04-Sep-13	10:49:56	45.32			
04-Sep-13	10:50:56	41.46			
04-Sep-13	10:51:56	41.14			
04-Sep-13	10:52:56	41.46			
04-Sep-13	10:53:56	43.07			
04-Sep-13	10:54:56	43.39			
04-Sep-13	10:55:56	43.71			
04-Sep-13	10:56:56	43.07			
04-Sep-13	10:57:56	49.18			
04-Sep-13	10:58:56	48.21			
04-Sep-13	10:59:56	50.14			
04-Sep-13	11:00:56	49.18			
04-Sep-13	11:01:56	49.18			
04-Sep-13	11:02:56	49.82			
04-Sep-13	11:03:56	48.86			
04-Sep-13	11:04:56	49.18			
04-Sep-13	11:05:56	50.46			
04-Sep-13	11:06:56	50.79			
04-Sep-13	11:07:56	49.82			
04-Sep-13	11:08:56	50.46			
04-Sep-13	11:09:56	49.50			
04-Sep-13	11:10:56	48.54			
04-Sep-13	11:11:56	44.36			
04-Sep-13	11:12:56	41.79			
04-Sep-13	11:13:56	43.71			
04-Sep-13	11:14:56	40.82			
04-Sep-13	11:15:56	39.86			
04-Sep-13	11:16:56	37.29			
04-Sep-13	11:17:56	38.25			
04-Sep-13	11:18:56	37.93			
04-Sep-13	11:19:56	37.29			
04-Sep-13	11:20:56	37.93			
04-Sep-13	11:21:56	37.93			
04-Sep-13	11:22:56	37.61			
			<b>Average</b>		<b>42.7</b>



VMC3 New Spray Booth 3					
Date	Time	VOC mg/m3	Date	Time	VOC mg/m3
04-Sep-13	09:31:18	67.18	04-Sep-13	10:20:18	28.29
04-Sep-13	09:32:18	64.29	04-Sep-13	10:21:18	28.29
04-Sep-13	09:33:18	60.75	04-Sep-13	10:22:18	27.96
04-Sep-13	09:34:18	59.79	04-Sep-13	10:23:18	27.32
04-Sep-13	09:35:18	58.50	04-Sep-13	10:24:18	27.32
04-Sep-13	09:36:18	57.86	04-Sep-13	10:25:18	27.00
04-Sep-13	09:37:18	56.57	04-Sep-13	10:26:18	27.96
04-Sep-13	09:38:18	55.93	04-Sep-13	10:27:18	28.29
04-Sep-13	09:39:18	53.04	04-Sep-13	10:28:18	28.93
04-Sep-13	09:40:18	50.79	04-Sep-13	10:29:18	29.57
04-Sep-13	09:41:18	50.14	04-Sep-13	10:30:18	27.64
04-Sep-13	09:42:18	49.82			
04-Sep-13	09:43:18	48.86			
04-Sep-13	09:44:18	46.93			
04-Sep-13	09:45:18	44.04			
04-Sep-13	09:46:18	42.43			
04-Sep-13	09:47:18	41.79			
04-Sep-13	09:48:18	41.14			
04-Sep-13	09:49:18	39.54			
04-Sep-13	09:50:18	40.18			
04-Sep-13	09:51:18	40.50			
04-Sep-13	09:52:18	39.86			
04-Sep-13	09:53:18	38.89			
04-Sep-13	09:54:18	38.57			
04-Sep-13	09:55:18	36.96			
04-Sep-13	09:56:18	35.68			
04-Sep-13	09:57:18	34.71			
04-Sep-13	09:58:18	33.75			
04-Sep-13	09:59:18	34.07			
04-Sep-13	10:00:18	33.75			
04-Sep-13	10:01:18	33.75			
04-Sep-13	10:02:18	34.71			
04-Sep-13	10:03:18	32.79			
04-Sep-13	10:04:18	31.50			
04-Sep-13	10:05:18	31.50			
04-Sep-13	10:06:18	31.50			
04-Sep-13	10:07:18	30.21			
04-Sep-13	10:08:18	30.21			
04-Sep-13	10:09:18	29.89			
04-Sep-13	10:10:18	28.93			
04-Sep-13	10:11:18	29.25			
04-Sep-13	10:12:18	30.21			
04-Sep-13	10:13:18	30.21			
04-Sep-13	10:14:18	29.25			
04-Sep-13	10:15:18	28.93			
04-Sep-13	10:16:18	28.61			
04-Sep-13	10:17:18	29.25			
04-Sep-13	10:18:18	28.61			
04-Sep-13	10:19:18	27.96			
			<b>Average</b>		<b>37.7</b>



VMC3 PA Cell 1 Spray Booth					
Date	Time	VOC mg/m3	Date	Time	VOC mg/m3
03-Sep-13	11:20:06	12.89	03-Sep-13	12:09:06	41.46
03-Sep-13	11:21:06	17.04	03-Sep-13	12:10:06	46.61
03-Sep-13	11:22:06	15.43	03-Sep-13	12:11:06	43.07
03-Sep-13	11:23:06	20.57	03-Sep-13	12:12:06	48.86
03-Sep-13	11:24:06	23.79	03-Sep-13	12:13:06	51.75
03-Sep-13	11:25:06	24.43	03-Sep-13	12:14:06	53.04
03-Sep-13	11:26:06	21.21	03-Sep-13	12:15:06	54.00
03-Sep-13	11:27:06	16.07	03-Sep-13	12:16:06	48.86
03-Sep-13	11:28:06	17.04	03-Sep-13	12:17:06	52.07
03-Sep-13	11:29:06	27.00	03-Sep-13	12:18:06	55.93
03-Sep-13	11:30:06	33.75	03-Sep-13	12:19:06	52.07
03-Sep-13	11:31:06	27.96			
03-Sep-13	11:32:06	27.96			
03-Sep-13	11:33:06	35.04			
03-Sep-13	11:34:06	38.89			
03-Sep-13	11:35:06	33.75			
03-Sep-13	11:36:06	32.79			
03-Sep-13	11:37:06	36.64			
03-Sep-13	11:38:06	39.86			
03-Sep-13	11:39:06	45.00			
03-Sep-13	11:40:06	41.79			
03-Sep-13	11:41:06	45.64			
03-Sep-13	11:42:06	47.57			
03-Sep-13	11:43:06	48.21			
03-Sep-13	11:44:06	43.39			
03-Sep-13	11:45:06	40.18			
03-Sep-13	11:46:06	38.57			
03-Sep-13	11:47:06	36.32			
03-Sep-13	11:48:06	36.64			
03-Sep-13	11:49:06	51.43			
03-Sep-13	11:50:06	47.57			
03-Sep-13	11:51:06	46.61			
03-Sep-13	11:52:06	51.75			
03-Sep-13	11:53:06	46.93			
03-Sep-13	11:54:06	42.43			
03-Sep-13	11:55:06	45.64			
03-Sep-13	11:56:06	48.21			
03-Sep-13	11:57:06	50.14			
03-Sep-13	11:58:06	52.71			
03-Sep-13	11:59:06	50.14			
03-Sep-13	12:00:06	53.36			
03-Sep-13	12:01:06	55.61			
03-Sep-13	12:02:06	51.75			
03-Sep-13	12:03:06	46.29			
03-Sep-13	12:04:06	48.86			
03-Sep-13	12:05:06	51.43			
03-Sep-13	12:06:06	43.71			
03-Sep-13	12:07:06	42.43			
03-Sep-13	12:08:06	42.43			
			<b>Average</b>		<b>40.5</b>



VMC3 PA Cell 2 Spray Booth					
Date	Time	VOC mg/m3	Date	Time	VOC mg/m3
03-Sep-13	12:22:09	1.61	03-Sep-13	13:11:09	37.58
03-Sep-13	12:23:09	10.93	03-Sep-13	13:12:09	37.09
03-Sep-13	12:24:09	8.04	03-Sep-13	13:13:09	39.07
03-Sep-13	12:25:09	7.07	03-Sep-13	13:14:09	42.77
03-Sep-13	12:26:09	5.79	03-Sep-13	13:15:09	43.52
03-Sep-13	12:27:09	7.07	03-Sep-13	13:16:09	46.98
03-Sep-13	12:28:09	8.04	03-Sep-13	13:17:09	49.95
03-Sep-13	12:29:09	4.50	03-Sep-13	13:18:09	49.20
03-Sep-13	12:30:09	3.86	03-Sep-13	13:19:09	44.26
03-Sep-13	12:31:09	7.39	03-Sep-13	13:20:09	42.28
03-Sep-13	12:32:09	6.43	03-Sep-13	13:21:09	43.76
03-Sep-13	12:33:09	3.21			
03-Sep-13	12:34:09	2.57			
03-Sep-13	12:35:09	2.57			
03-Sep-13	12:36:09	10.29			
03-Sep-13	12:37:09	2.89			
03-Sep-13	12:38:09	7.71			
03-Sep-13	12:39:09	3.21			
03-Sep-13	12:40:09	9.64			
03-Sep-13	12:41:09	32.88			
03-Sep-13	12:42:09	36.10			
03-Sep-13	12:43:09	39.07			
03-Sep-13	12:44:09	37.58			
03-Sep-13	12:45:09	35.36			
03-Sep-13	12:46:09	35.60			
03-Sep-13	12:47:09	38.08			
03-Sep-13	12:48:09	37.09			
03-Sep-13	12:49:09	37.09			
03-Sep-13	12:50:09	39.56			
03-Sep-13	12:51:09	41.79			
03-Sep-13	12:52:09	43.76			
03-Sep-13	12:53:09	46.73			
03-Sep-13	12:54:09	46.98			
03-Sep-13	12:55:09	42.03			
03-Sep-13	12:56:09	40.80			
03-Sep-13	12:57:09	43.27			
03-Sep-13	12:58:09	43.27			
03-Sep-13	12:59:09	42.53			
03-Sep-13	13:00:09	44.75			
03-Sep-13	13:01:09	39.56			
03-Sep-13	13:02:09	45.00			
03-Sep-13	13:03:09	43.52			
03-Sep-13	13:04:09	45.25			
03-Sep-13	13:05:09	43.76			
03-Sep-13	13:06:09	42.53			
03-Sep-13	13:07:09	40.30			
03-Sep-13	13:08:09	38.57			
03-Sep-13	13:09:09	37.83			
03-Sep-13	13:10:09	38.57			
			<b>Average</b>		<b>30.5</b>



VMC3 PA Cell 3 Spray Booth					
Date	Time	VOC mg/m3	Date	Time	VOC mg/m3
03-Sep-13	13:24:34	45.96	03-Sep-13	14:13:34	28.61
03-Sep-13	13:25:34	43.71	03-Sep-13	14:14:34	11.25
03-Sep-13	13:26:34	43.39	03-Sep-13	14:15:34	11.57
03-Sep-13	13:27:34	43.07	03-Sep-13	14:16:34	10.93
03-Sep-13	13:28:34	42.43	03-Sep-13	14:17:34	10.29
03-Sep-13	13:29:34	40.18	03-Sep-13	14:18:34	9.96
03-Sep-13	13:30:34	38.89	03-Sep-13	14:19:34	9.64
03-Sep-13	13:31:34	36.64	03-Sep-13	14:20:34	9.64
03-Sep-13	13:32:34	36.32	03-Sep-13	14:21:34	9.32
03-Sep-13	13:33:34	35.68	03-Sep-13	14:22:34	9.00
03-Sep-13	13:34:34	35.68	03-Sep-13	14:23:34	8.68
03-Sep-13	13:35:34	32.14			
03-Sep-13	13:36:34	30.86			
03-Sep-13	13:37:34	30.21			
03-Sep-13	13:38:34	29.89			
03-Sep-13	13:39:34	28.61			
03-Sep-13	13:40:34	28.61			
03-Sep-13	13:41:34	27.64			
03-Sep-13	13:42:34	26.04			
03-Sep-13	13:43:34	78.59			
03-Sep-13	13:44:34	24.43			
03-Sep-13	13:45:34	23.46			
03-Sep-13	13:46:34	22.50			
03-Sep-13	13:47:34	22.50			
03-Sep-13	13:48:34	22.18			
03-Sep-13	13:49:34	20.89			
03-Sep-13	13:50:34	20.89			
03-Sep-13	13:51:34	20.57			
03-Sep-13	13:52:34	19.61			
03-Sep-13	13:53:34	19.93			
03-Sep-13	13:54:34	18.96			
03-Sep-13	13:55:34	18.64			
03-Sep-13	13:56:34	18.64			
03-Sep-13	13:57:34	19.29			
03-Sep-13	13:58:34	19.93			
03-Sep-13	13:59:34	19.61			
03-Sep-13	14:00:34	18.00			
03-Sep-13	14:01:34	18.00			
03-Sep-13	14:02:34	17.68			
03-Sep-13	14:03:34	17.04			
03-Sep-13	14:04:34	15.75			
03-Sep-13	14:05:34	15.43			
03-Sep-13	14:06:34	14.46			
03-Sep-13	14:07:34	14.14			
03-Sep-13	14:08:34	13.18			
03-Sep-13	14:09:34	12.86			
03-Sep-13	14:10:34	12.54			
03-Sep-13	14:11:34	12.21			
03-Sep-13	14:12:34	11.57			
			<b>Average</b>		<b>22.7</b>





VMC3 PU Manual Spray Booth					
Date	Time	VOC mg/m3	Date	Time	VOC mg/m3
03-Sep-13	09:59:42	12.54	03-Sep-13	10:48:42	7.07
03-Sep-13	10:00:42	10.29	03-Sep-13	10:49:42	6.75
03-Sep-13	10:01:42	9.00	03-Sep-13	10:50:42	5.79
03-Sep-13	10:02:42	9.96	03-Sep-13	10:51:42	5.46
03-Sep-13	10:03:42	9.00	03-Sep-13	10:52:42	5.79
03-Sep-13	10:04:42	10.61	03-Sep-13	10:53:42	6.75
03-Sep-13	10:05:42	9.32	03-Sep-13	10:54:42	4.82
03-Sep-13	10:06:42	8.68	03-Sep-13	10:55:42	6.11
03-Sep-13	10:07:42	8.68	03-Sep-13	10:56:42	6.11
03-Sep-13	10:08:42	9.32	03-Sep-13	10:57:42	5.79
03-Sep-13	10:09:42	10.61	03-Sep-13	10:58:42	6.11
03-Sep-13	10:10:42	8.04			
03-Sep-13	10:11:42	7.71			
03-Sep-13	10:12:42	8.68			
03-Sep-13	10:13:42	9.32			
03-Sep-13	10:14:42	9.64			
03-Sep-13	10:15:42	9.00			
03-Sep-13	10:16:42	8.36			
03-Sep-13	10:17:42	9.32			
03-Sep-13	10:18:42	9.32			
03-Sep-13	10:19:42	8.36			
03-Sep-13	10:20:42	8.68			
03-Sep-13	10:21:42	8.04			
03-Sep-13	10:22:42	9.96			
03-Sep-13	10:23:42	8.36			
03-Sep-13	10:24:42	8.36			
03-Sep-13	10:25:42	7.39			
03-Sep-13	10:26:42	7.07			
03-Sep-13	10:27:42	7.39			
03-Sep-13	10:28:42	6.43			
03-Sep-13	10:29:42	7.07			
03-Sep-13	10:30:42	6.43			
03-Sep-13	10:31:42	8.36			
03-Sep-13	10:32:42	8.04			
03-Sep-13	10:33:42	6.75			
03-Sep-13	10:34:42	7.07			
03-Sep-13	10:35:42	7.39			
03-Sep-13	10:36:42	8.36			
03-Sep-13	10:37:42	8.36			
03-Sep-13	10:38:42	7.71			
03-Sep-13	10:39:42	7.39			
03-Sep-13	10:40:42	6.43			
03-Sep-13	10:41:42	8.04			
03-Sep-13	10:42:42	6.43			
03-Sep-13	10:43:42	6.75			
03-Sep-13	10:44:42	7.39			
03-Sep-13	10:45:42	7.71			
03-Sep-13	10:46:42	7.39			
03-Sep-13	10:47:42	6.75			
			<b>Average</b>		<b>7.9</b>



New Building Spray Booth 1					
Date	Time	VOC mg/m3	Date	Time	VOC mg/m3
05-Sep-13	08:21:07	12.78	05-Sep-13	09:10:07	13.90
05-Sep-13	08:22:07	12.54	05-Sep-13	09:11:07	12.21
05-Sep-13	08:23:07	12.38	05-Sep-13	09:12:07	18.64
05-Sep-13	08:24:07	16.55	05-Sep-13	09:13:07	17.92
05-Sep-13	08:25:07	15.91	05-Sep-13	09:14:07	12.38
05-Sep-13	08:26:07	24.99	05-Sep-13	09:15:07	13.66
05-Sep-13	08:27:07	27.64	05-Sep-13	09:16:07	19.21
05-Sep-13	08:28:07	24.59	05-Sep-13	09:17:07	20.97
05-Sep-13	08:29:07	22.26	05-Sep-13	09:18:07	18.72
05-Sep-13	08:30:07	25.55	05-Sep-13	09:19:07	12.05
05-Sep-13	08:31:07	20.41	05-Sep-13	09:20:07	16.31
05-Sep-13	08:32:07	16.88			
05-Sep-13	08:33:07	15.43			
05-Sep-13	08:34:07	12.62			
05-Sep-13	08:35:07	11.57			
05-Sep-13	08:36:07	10.77			
05-Sep-13	08:37:07	10.29			
05-Sep-13	08:38:07	10.04			
05-Sep-13	08:39:07	9.80			
05-Sep-13	08:40:07	9.48			
05-Sep-13	08:41:07	9.24			
05-Sep-13	08:42:07	9.08			
05-Sep-13	08:43:07	9.00			
05-Sep-13	08:44:07	8.84			
05-Sep-13	08:45:07	8.68			
05-Sep-13	08:46:07	8.52			
05-Sep-13	08:47:07	8.36			
05-Sep-13	08:48:07	8.28			
05-Sep-13	08:49:07	8.20			
05-Sep-13	08:50:07	8.12			
05-Sep-13	08:51:07	8.12			
05-Sep-13	08:52:07	8.04			
05-Sep-13	08:53:07	7.96			
05-Sep-13	08:54:07	7.88			
05-Sep-13	08:55:07	7.79			
05-Sep-13	08:56:07	7.71			
05-Sep-13	08:57:07	7.55			
05-Sep-13	08:58:07	7.47			
05-Sep-13	08:59:07	7.31			
05-Sep-13	09:00:07	7.23			
05-Sep-13	09:01:07	7.23			
05-Sep-13	09:02:07	7.15			
05-Sep-13	09:03:07	7.07			
05-Sep-13	09:04:07	6.99			
05-Sep-13	09:05:07	19.61			
05-Sep-13	09:06:07	22.10			
05-Sep-13	09:07:07	18.80			
05-Sep-13	09:08:07	19.85			
05-Sep-13	09:09:07	19.93			
			<b>Average</b>		<b>13.2</b>





New Building Spray Booth 2					
Date	Time	VOC mg/m3	Date	Time	VOC mg/m3
05-Sep-13	10:11:49	16.71	05-Sep-13	11:00:49	26.68
05-Sep-13	10:12:49	17.60	05-Sep-13	11:01:49	26.36
05-Sep-13	10:13:49	17.36	05-Sep-13	11:02:49	26.52
05-Sep-13	10:14:49	17.44	05-Sep-13	11:03:49	26.76
05-Sep-13	10:15:49	15.75	05-Sep-13	11:04:49	26.28
05-Sep-13	10:16:49	15.75	05-Sep-13	11:05:49	27.08
05-Sep-13	10:17:49	15.91	05-Sep-13	11:06:49	30.78
05-Sep-13	10:18:49	16.55	05-Sep-13	11:07:49	28.93
05-Sep-13	10:19:49	15.67	05-Sep-13	11:08:49	29.01
05-Sep-13	10:20:49	15.83	05-Sep-13	11:09:49	31.34
05-Sep-13	10:21:49	14.54	05-Sep-13	11:10:49	29.33
05-Sep-13	10:22:49	15.27			
05-Sep-13	10:23:49	14.87			
05-Sep-13	10:24:49	15.75			
05-Sep-13	10:25:49	15.83			
05-Sep-13	10:26:49	46.69			
05-Sep-13	10:27:49	24.83			
05-Sep-13	10:28:49	24.75			
05-Sep-13	10:29:49	33.51			
05-Sep-13	10:30:49	36.08			
05-Sep-13	10:31:49	32.87			
05-Sep-13	10:32:49	30.86			
05-Sep-13	10:33:49	30.29			
05-Sep-13	10:34:49	30.29			
05-Sep-13	10:35:49	29.33			
05-Sep-13	10:36:49	28.13			
05-Sep-13	10:37:49	27.80			
05-Sep-13	10:38:49	28.04			
05-Sep-13	10:39:49	27.16			
05-Sep-13	10:40:49	27.00			
05-Sep-13	10:41:49	25.23			
05-Sep-13	10:42:49	25.79			
05-Sep-13	10:43:49	26.44			
05-Sep-13	10:44:49	26.28			
05-Sep-13	10:45:49	26.44			
05-Sep-13	10:46:49	27.24			
05-Sep-13	10:47:49	27.80			
05-Sep-13	10:48:49	28.04			
05-Sep-13	10:49:49	26.28			
05-Sep-13	10:50:49	27.00			
05-Sep-13	10:51:49	26.84			
05-Sep-13	10:52:49	28.13			
05-Sep-13	10:53:49	30.54			
05-Sep-13	10:54:49	29.89			
05-Sep-13	10:55:49	26.04			
05-Sep-13	10:56:49	43.63			
05-Sep-13	10:57:49	29.25			
05-Sep-13	10:58:49	27.88			
05-Sep-13	10:59:49	26.84			
			<b>Average</b>		<b>25.6</b>



New Building Spray Booth 3					
Date	Time	VOC mg/m3	Date	Time	VOC mg/m3
05-Sep-13	11:30:14	28.45	05-Sep-13	12:19:14	28.53
05-Sep-13	11:31:14	25.79	05-Sep-13	12:20:14	26.68
05-Sep-13	11:32:14	25.63	05-Sep-13	12:21:14	26.44
05-Sep-13	11:33:14	26.04	05-Sep-13	12:22:14	26.60
05-Sep-13	11:34:14	24.67	05-Sep-13	12:23:14	40.98
05-Sep-13	11:35:14	23.46	05-Sep-13	12:24:14	30.78
05-Sep-13	11:36:14	10.53	05-Sep-13	12:25:14	28.61
05-Sep-13	11:37:14	28.37	05-Sep-13	12:26:14	26.68
05-Sep-13	11:38:14	29.65	05-Sep-13	12:27:14	26.12
05-Sep-13	11:39:14	29.01	05-Sep-13	12:28:14	26.84
05-Sep-13	11:40:14	31.02	05-Sep-13	12:29:14	38.97
05-Sep-13	11:41:14	27.72			
05-Sep-13	11:42:14	27.48			
05-Sep-13	11:43:14	26.28			
05-Sep-13	11:44:14	26.12			
05-Sep-13	11:45:14	26.36			
05-Sep-13	11:46:14	25.79			
05-Sep-13	11:47:14	25.96			
05-Sep-13	11:48:14	26.60			
05-Sep-13	11:49:14	26.52			
05-Sep-13	11:50:14	26.12			
05-Sep-13	11:51:14	26.52			
05-Sep-13	11:52:14	39.70			
05-Sep-13	11:53:14	40.98			
05-Sep-13	11:54:14	30.70			
05-Sep-13	11:55:14	28.85			
05-Sep-13	11:56:14	27.64			
05-Sep-13	11:57:14	26.36			
05-Sep-13	11:58:14	26.68			
05-Sep-13	11:59:14	27.08			
05-Sep-13	12:00:14	27.80			
05-Sep-13	12:01:14	27.56			
05-Sep-13	12:02:14	26.68			
05-Sep-13	12:03:14	28.45			
05-Sep-13	12:04:14	28.85			
05-Sep-13	12:05:14	28.04			
05-Sep-13	12:06:14	29.33			
05-Sep-13	12:07:14	26.60			
05-Sep-13	12:08:14	26.68			
05-Sep-13	12:09:14	25.79			
05-Sep-13	12:10:14	25.15			
05-Sep-13	12:11:14	34.15			
05-Sep-13	12:12:14	31.74			
05-Sep-13	12:13:14	28.21			
05-Sep-13	12:14:14	27.16			
05-Sep-13	12:15:14	27.24			
05-Sep-13	12:16:14	25.88			
05-Sep-13	12:17:14	40.90			
05-Sep-13	12:18:14	31.50			
			<b>Average</b>		<b>28.3</b>



New Building Spray Booth 4					
Date	Time	VOC mg/m3	Date	Time	VOC mg/m3
06-Sep-13	07:41:37	73.93	06-Sep-13	08:30:37	23.30
06-Sep-13	07:42:37	49.82	06-Sep-13	08:31:37	22.50
06-Sep-13	07:43:37	47.41	06-Sep-13	08:32:37	46.61
06-Sep-13	07:44:37	45.00	06-Sep-13	08:33:37	25.71
06-Sep-13	07:45:37	42.59	06-Sep-13	08:34:37	24.11
06-Sep-13	07:46:37	40.18	06-Sep-13	08:35:37	23.30
06-Sep-13	07:47:37	38.57	06-Sep-13	08:36:37	22.50
06-Sep-13	07:48:37	36.96	06-Sep-13	08:37:37	22.50
06-Sep-13	07:49:37	35.36	06-Sep-13	08:38:37	22.50
06-Sep-13	07:50:37	33.75	06-Sep-13	08:39:37	22.50
06-Sep-13	07:51:37	32.14	06-Sep-13	08:40:37	22.50
06-Sep-13	07:52:37	32.14			
06-Sep-13	07:53:37	30.54			
06-Sep-13	07:54:37	30.54			
06-Sep-13	07:55:37	28.93			
06-Sep-13	07:56:37	35.36			
06-Sep-13	07:57:37	33.75			
06-Sep-13	07:58:37	32.95			
06-Sep-13	07:59:37	32.95			
06-Sep-13	08:00:37	32.14			
06-Sep-13	08:01:37	31.34			
06-Sep-13	08:02:37	30.54			
06-Sep-13	08:03:37	30.54			
06-Sep-13	08:04:37	29.73			
06-Sep-13	08:05:37	29.73			
06-Sep-13	08:06:37	28.93			
06-Sep-13	08:07:37	28.93			
06-Sep-13	08:08:37	28.93			
06-Sep-13	08:09:37	28.13			
06-Sep-13	08:10:37	28.13			
06-Sep-13	08:11:37	28.13			
06-Sep-13	08:12:37	27.32			
06-Sep-13	08:13:37	27.32			
06-Sep-13	08:14:37	26.52			
06-Sep-13	08:15:37	26.52			
06-Sep-13	08:16:37	25.71			
06-Sep-13	08:17:37	25.71			
06-Sep-13	08:18:37	25.71			
06-Sep-13	08:19:37	25.71			
06-Sep-13	08:20:37	24.91			
06-Sep-13	08:21:37	24.91			
06-Sep-13	08:22:37	24.91			
06-Sep-13	08:23:37	24.11			
06-Sep-13	08:24:37	24.11			
06-Sep-13	08:25:37	24.11			
06-Sep-13	08:26:37	23.30			
06-Sep-13	08:27:37	23.30			
06-Sep-13	08:28:37	23.30			
06-Sep-13	08:29:37	23.30			
			<b>Average</b>		<b>29.7</b>

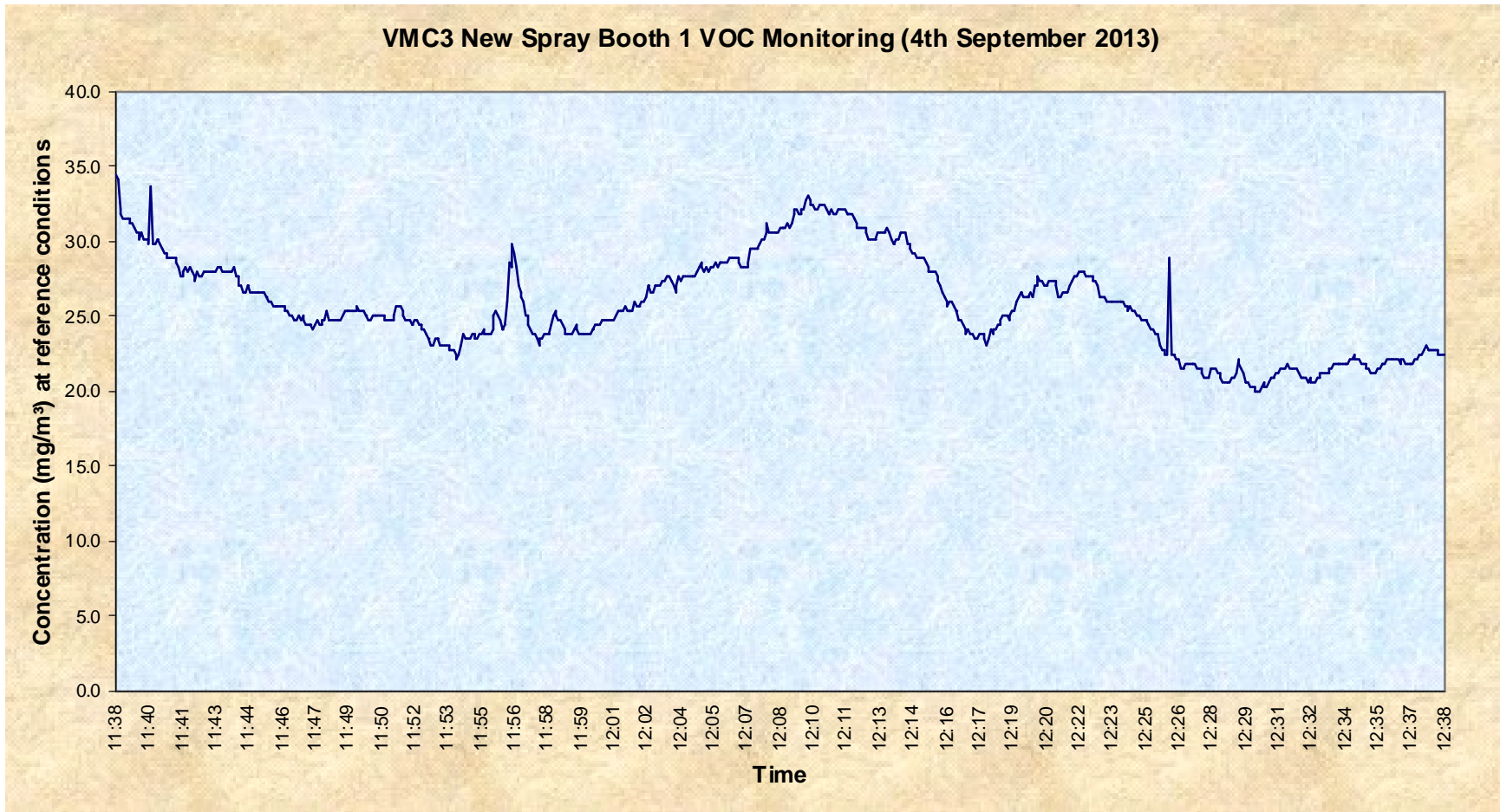


New Building Spray Booth 5					
Date	Time	VOC mg/m3	Date	Time	VOC mg/m3
06-Sep-13	09:27:11	15.27	06-Sep-13	10:16:11	52.54
06-Sep-13	09:28:11	14.46	06-Sep-13	10:17:11	45.74
06-Sep-13	09:29:11	14.46	06-Sep-13	10:18:11	52.54
06-Sep-13	09:30:11	14.46	06-Sep-13	10:19:11	57.49
06-Sep-13	09:31:11	14.46	06-Sep-13	10:20:11	85.92
06-Sep-13	09:32:11	14.46	06-Sep-13	10:21:11	78.50
06-Sep-13	09:33:11	14.46	06-Sep-13	10:22:11	77.88
06-Sep-13	09:34:11	15.27	06-Sep-13	10:23:11	48.83
06-Sep-13	09:35:11	15.27	06-Sep-13	10:24:11	41.41
06-Sep-13	09:36:11	15.27	06-Sep-13	10:25:11	35.85
06-Sep-13	09:37:11	15.27	06-Sep-13	10:26:11	32.14
06-Sep-13	09:38:11	15.27			
06-Sep-13	09:39:11	16.07		<b>Average</b>	<b>39.2</b>
06-Sep-13	09:40:11	19.29			
06-Sep-13	09:41:11	16.07			
06-Sep-13	09:42:11	16.07			
06-Sep-13	09:43:11	16.07			
06-Sep-13	09:44:11	16.07			
06-Sep-13	09:45:11	16.07			
06-Sep-13	09:46:11	16.07			
06-Sep-13	09:47:11	16.07			
06-Sep-13	09:48:11	15.27			
06-Sep-13	09:49:11	58.72			
06-Sep-13	09:50:11	63.05			
06-Sep-13	09:51:11	63.67			
06-Sep-13	09:52:11	63.05			
06-Sep-13	09:53:11	64.29			
06-Sep-13	09:54:11	83.45			
06-Sep-13	09:55:11	87.77			
06-Sep-13	09:56:11	103.85			
06-Sep-13	09:57:11	45.12			
06-Sep-13	09:58:11	34.00			
06-Sep-13	09:59:11	28.43			
06-Sep-13	10:00:11	27.20			
06-Sep-13	10:01:11	25.34			
06-Sep-13	10:02:11	24.73			
06-Sep-13	10:03:11	23.49			
06-Sep-13	10:04:11	24.73			
06-Sep-13	10:05:11	22.87			
06-Sep-13	10:06:11	30.29			
06-Sep-13	10:07:11	24.73			
06-Sep-13	10:08:11	44.51			
06-Sep-13	10:09:11	32.76			
06-Sep-13	10:10:11	27.20			
06-Sep-13	10:11:11	70.47			
06-Sep-13	10:12:11	64.29			
06-Sep-13	10:13:11	53.16			
06-Sep-13	10:14:11	75.41			
06-Sep-13	10:15:11	74.79			



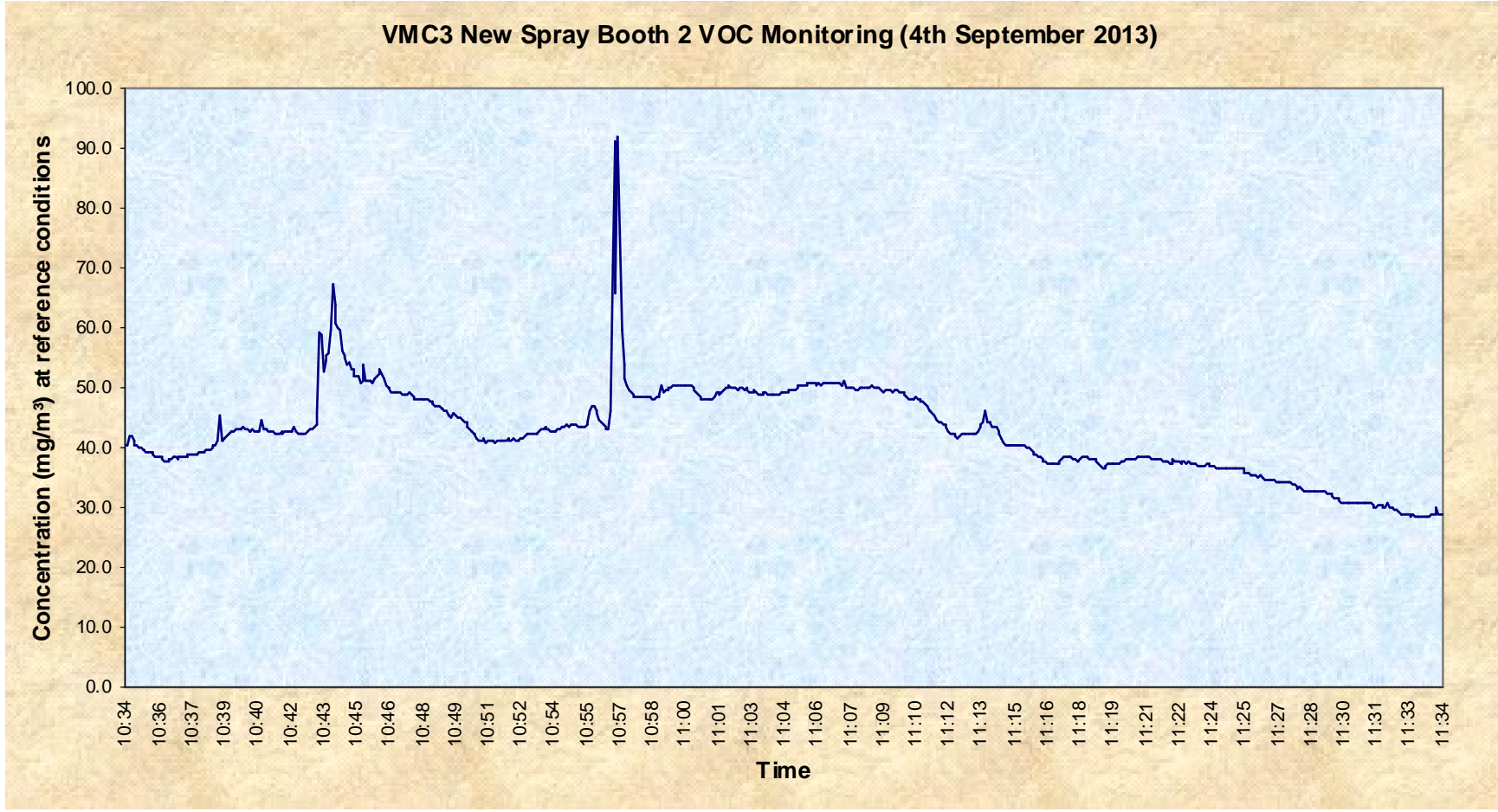
New Building Spray Booth 6					
Date	Time	VOC mg/m3	Date	Time	VOC mg/m3
06-Sep-13	10:40:13	17.68	06-Sep-13	11:29:13	12.05
06-Sep-13	10:41:13	16.88	06-Sep-13	11:30:13	12.05
06-Sep-13	10:42:13	16.07	06-Sep-13	11:31:13	12.05
06-Sep-13	10:43:13	16.07	06-Sep-13	11:32:13	12.05
06-Sep-13	10:44:13	15.27	06-Sep-13	11:33:13	12.05
06-Sep-13	10:45:13	15.27	06-Sep-13	11:34:13	12.05
06-Sep-13	10:46:13	15.27	06-Sep-13	11:35:13	12.05
06-Sep-13	10:47:13	14.46	06-Sep-13	11:36:13	12.05
06-Sep-13	10:48:13	14.46	06-Sep-13	11:37:13	12.05
06-Sep-13	10:49:13	14.46	06-Sep-13	11:38:13	12.05
06-Sep-13	10:50:13	13.66	06-Sep-13	11:39:13	12.05
06-Sep-13	10:51:13	13.66			
06-Sep-13	10:52:13	13.66			
06-Sep-13	10:53:13	13.66			
06-Sep-13	10:54:13	13.66			
06-Sep-13	10:55:13	13.66			
06-Sep-13	10:56:13	13.66			
06-Sep-13	10:57:13	13.66			
06-Sep-13	10:58:13	13.66			
06-Sep-13	10:59:13	13.66			
06-Sep-13	11:00:13	13.66			
06-Sep-13	11:01:13	13.66			
06-Sep-13	11:02:13	13.66			
06-Sep-13	11:03:13	12.86			
06-Sep-13	11:04:13	12.86			
06-Sep-13	11:05:13	12.86			
06-Sep-13	11:06:13	12.86			
06-Sep-13	11:07:13	12.86			
06-Sep-13	11:08:13	12.86			
06-Sep-13	11:09:13	12.86			
06-Sep-13	11:10:13	12.86			
06-Sep-13	11:11:13	12.86			
06-Sep-13	11:12:13	12.86			
06-Sep-13	11:13:13	12.86			
06-Sep-13	11:14:13	12.86			
06-Sep-13	11:15:13	12.86			
06-Sep-13	11:16:13	12.86			
06-Sep-13	11:17:13	12.86			
06-Sep-13	11:18:13	12.86			
06-Sep-13	11:19:13	12.86			
06-Sep-13	11:20:13	12.86			
06-Sep-13	11:21:13	12.86			
06-Sep-13	11:22:13	12.86			
06-Sep-13	11:23:13	12.86			
06-Sep-13	11:24:13	12.86			
06-Sep-13	11:25:13	12.05			
06-Sep-13	11:26:13	12.05			
06-Sep-13	11:27:13	12.86			
06-Sep-13	11:28:13	12.05			
			<b>Average</b>		<b>13.3</b>





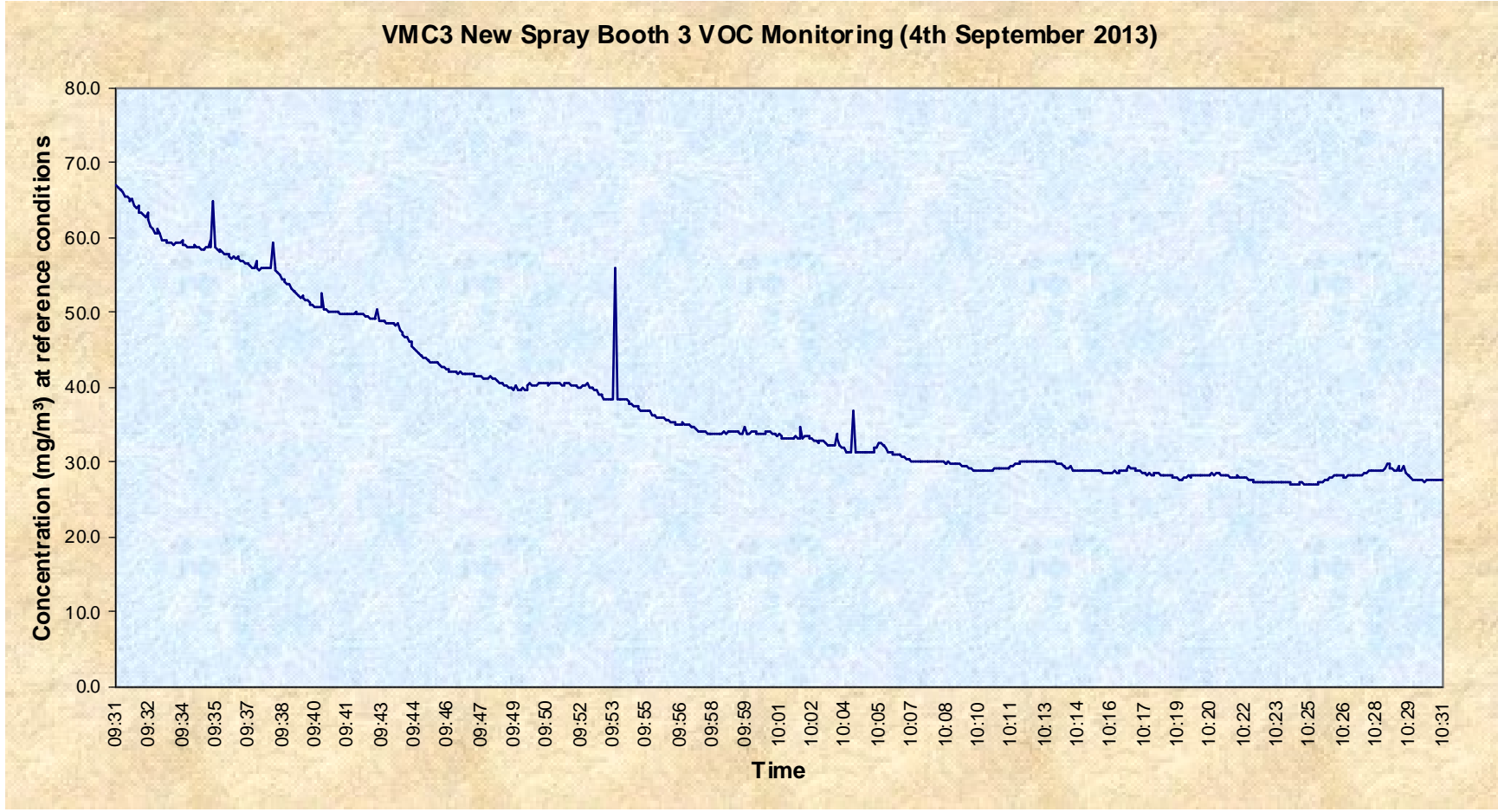
Average Run Time			Volatile Organic Compounds (ppm)			Volatile Organic Compounds (mg/m <sup>3</sup> )		
			Mean	Max	Min	Mean	Max	Min
11:38	to	12:08	16.42	21.40	13.80	26.39	34.39	22.18
12:08	to	12:38	15.67	20.60	12.40	25.20	33.11	19.93





Average Run Time			Volatile Organic Compounds (ppm)			Volatile Organic Compounds (mg/m <sup>3</sup> )		
			Mean	Max	Min	Mean	Max	Min
10:34	to	11:04	28.73	57.20	23.40	46.18	91.93	37.61
11:04	to	11:34	24.36	31.80	17.80	39.18	51.11	28.61

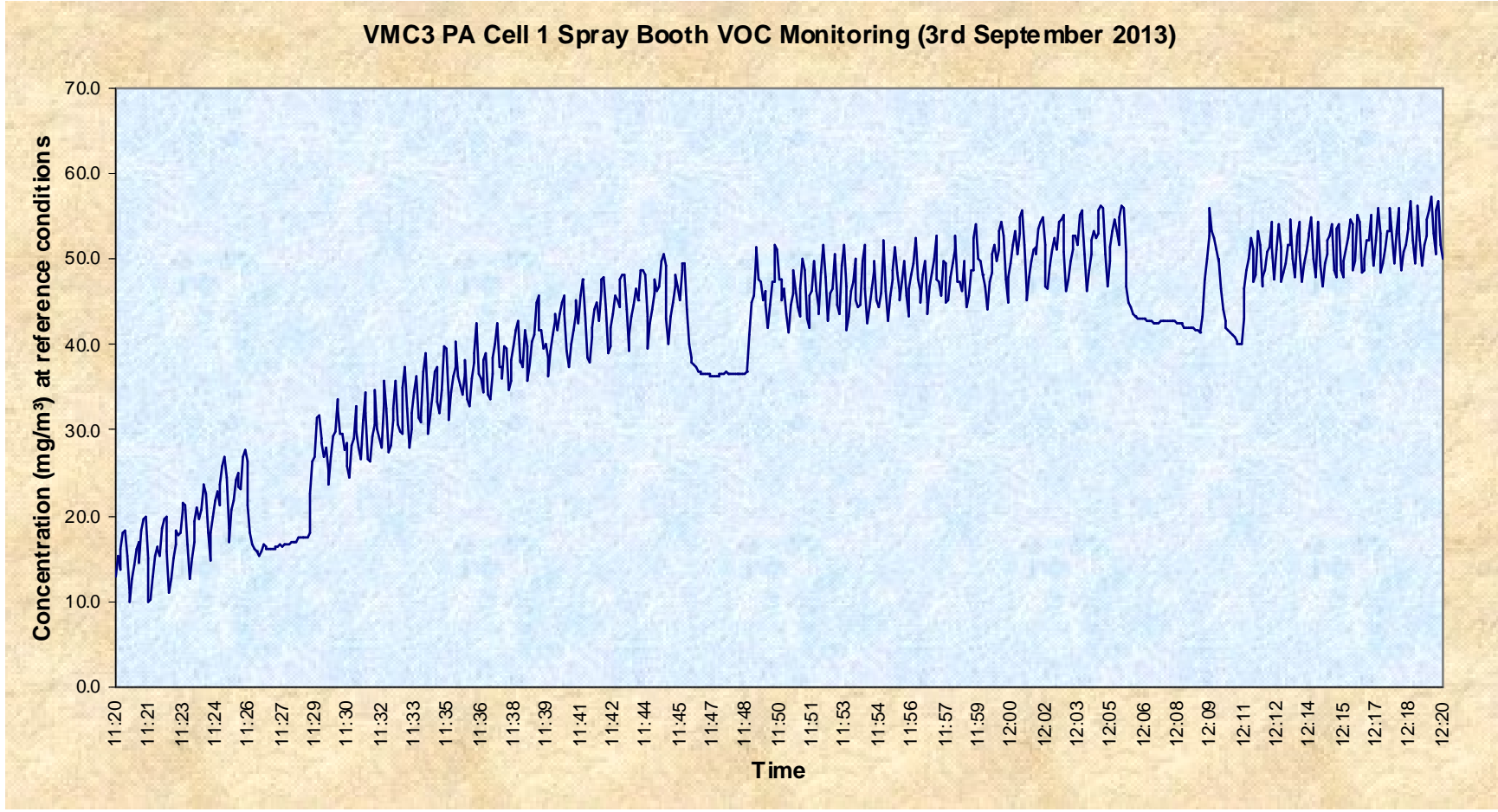




Average Run Time			Volatile Organic Compounds (ppm)			Volatile Organic Compounds (mg/m <sup>3</sup> )		
			Mean	Max	Min	Mean	Max	Min
9:31	to	10:01	28.66	41.80	20.80	46.05	67.18	33.43
10:01	to	10:31	18.28	23.00	16.80	29.39	36.96	27.00

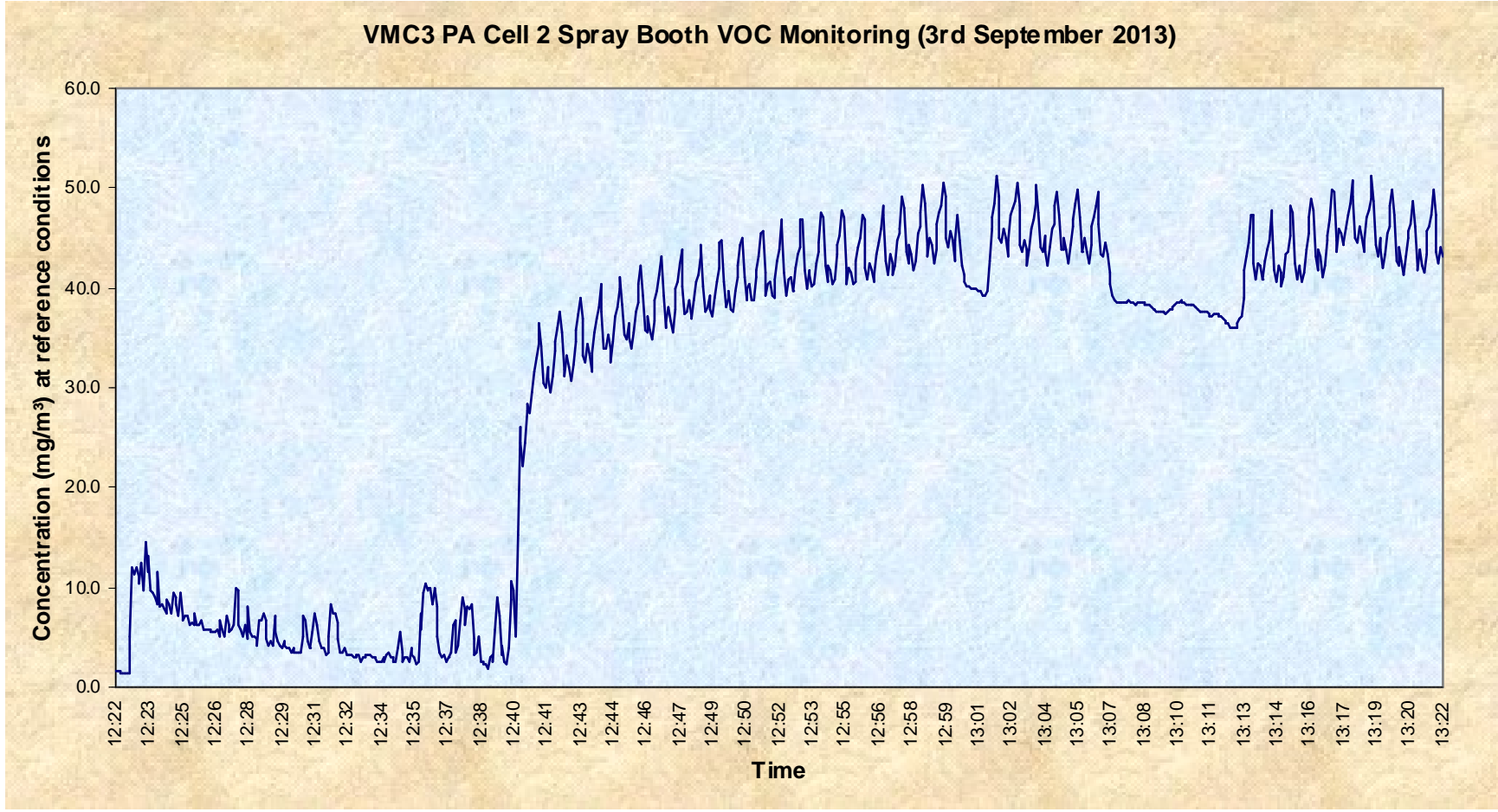






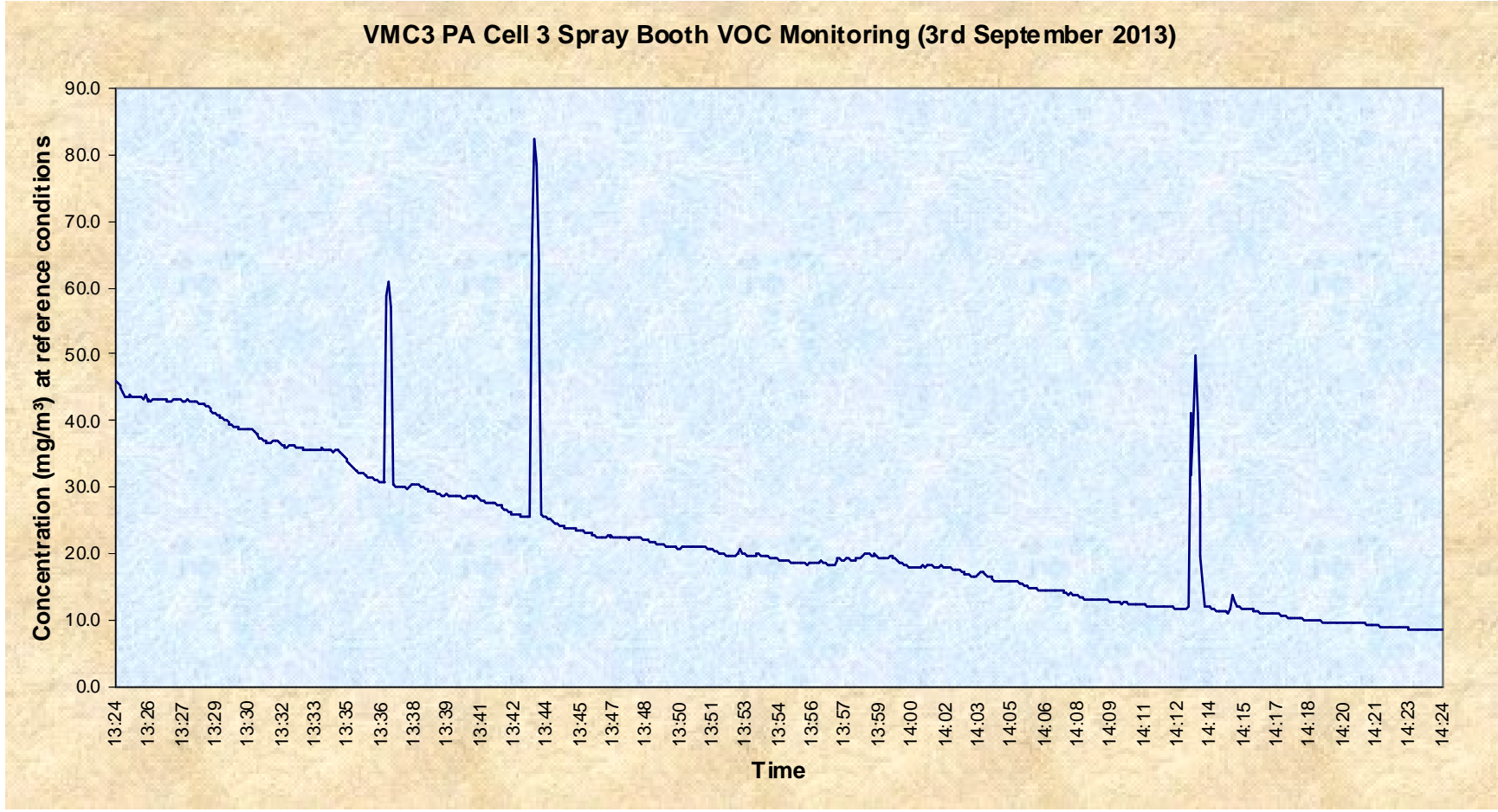
Average Run Time			Volatile Organic Compounds (ppm)			Volatile Organic Compounds (mg/m <sup>3</sup> )		
			Mean	Max	Min	Mean	Max	Min
11:20	to	11:50	14.51	24.80	6.20	23.31	39.86	9.96
11:50	to	12:20	25.70	32.20	19.40	41.30	51.75	31.18





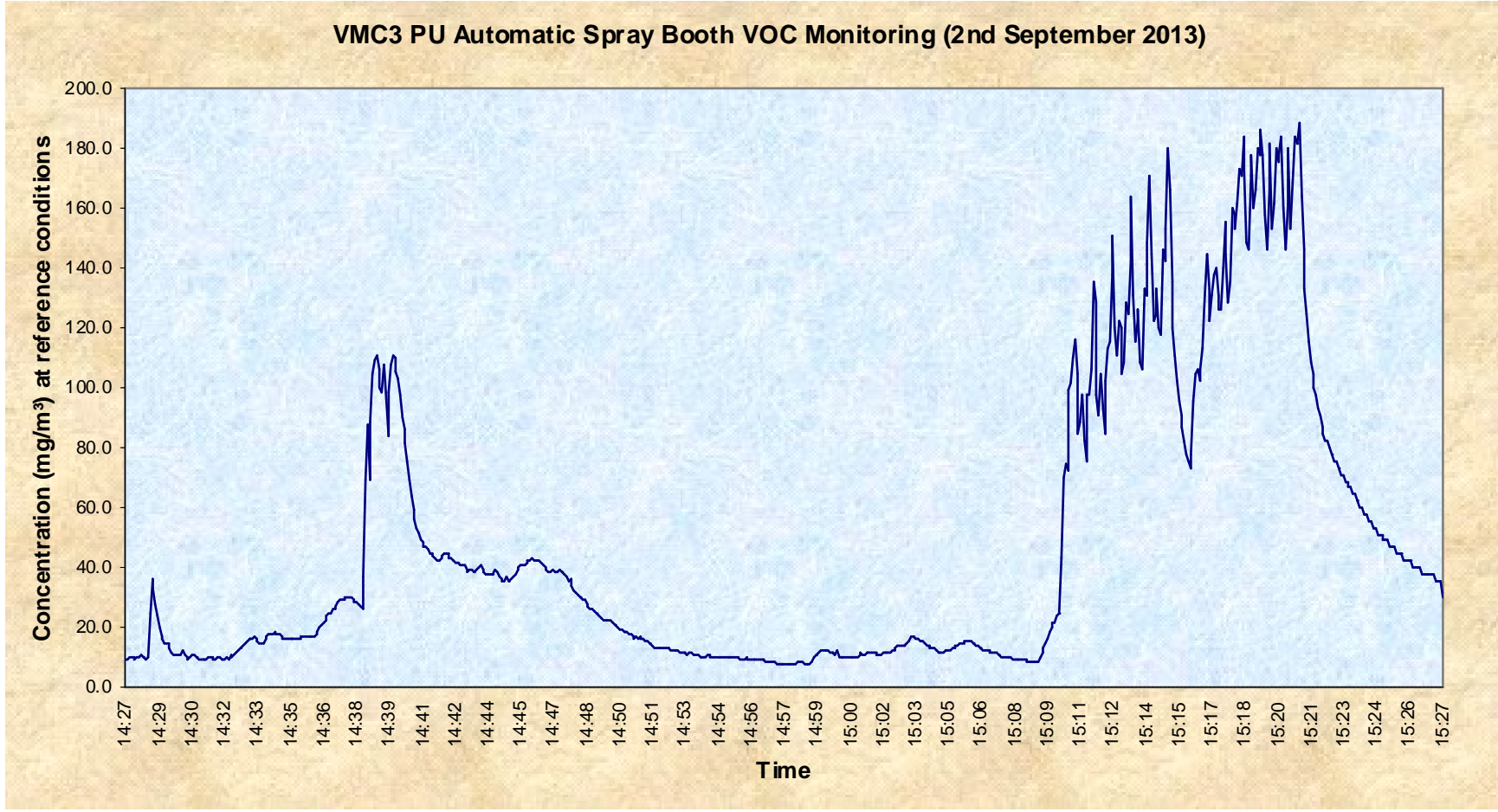
Average Run Time			Volatile Organic Compounds (ppm)			Volatile Organic Compounds (mg/m <sup>3</sup> )		
			Mean	Max	Min	Mean	Max	Min
12:22	to	12:52	11.14	28.46	0.80	17.91	45.74	1.29
12:52	to	13:22	26.79	31.85	22.46	43.06	51.18	36.10





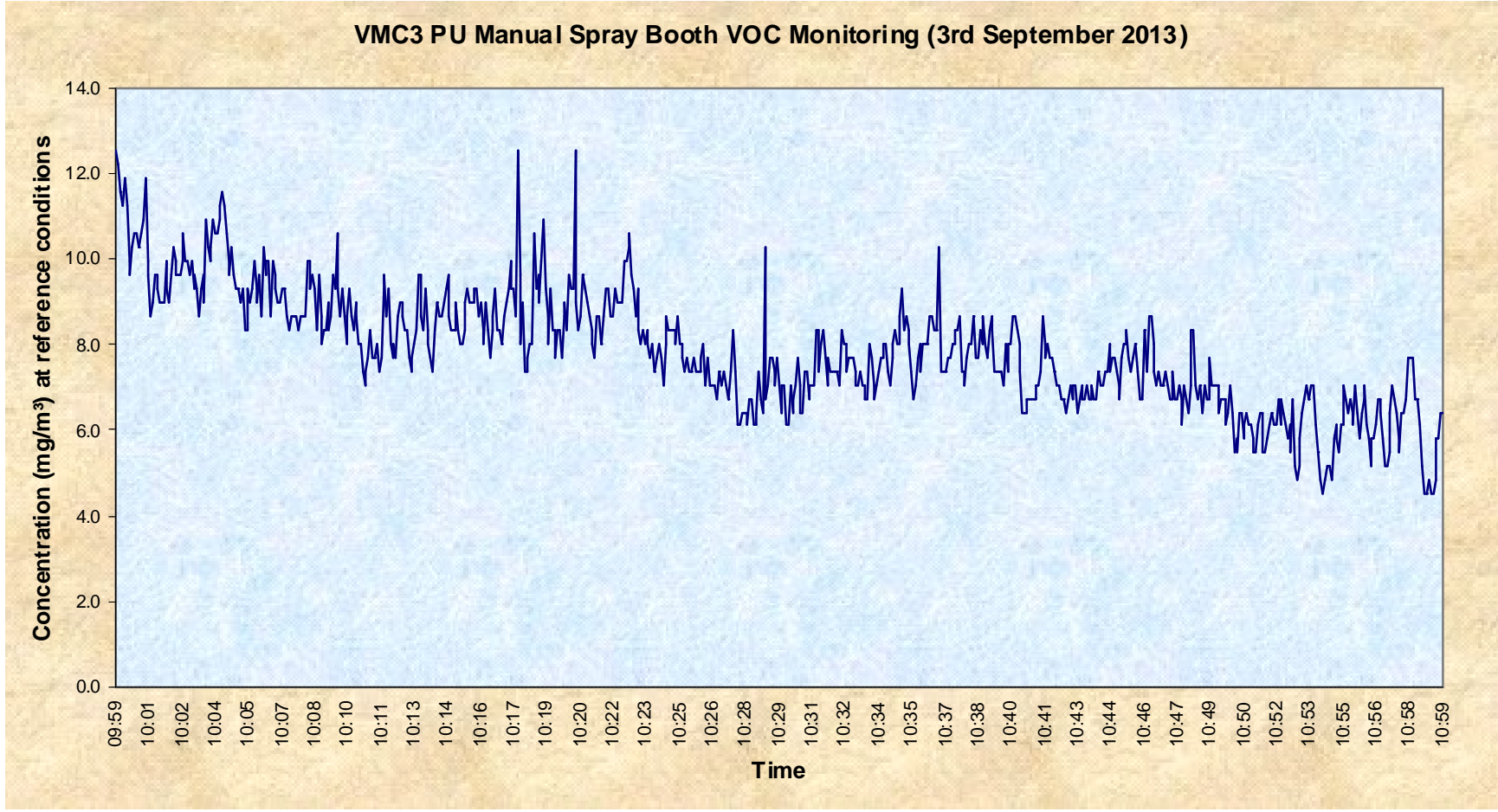
Average Run Time			Volatile Organic Compounds (ppm)			Volatile Organic Compounds (mg/m <sup>3</sup> )		
			Mean	Max	Min	Mean	Max	Min
13:24	to	13:54	19.28	51.20	11.80	30.98	82.29	18.96
13:54	to	14:24	8.91	31.10	5.40	14.33	49.98	8.68





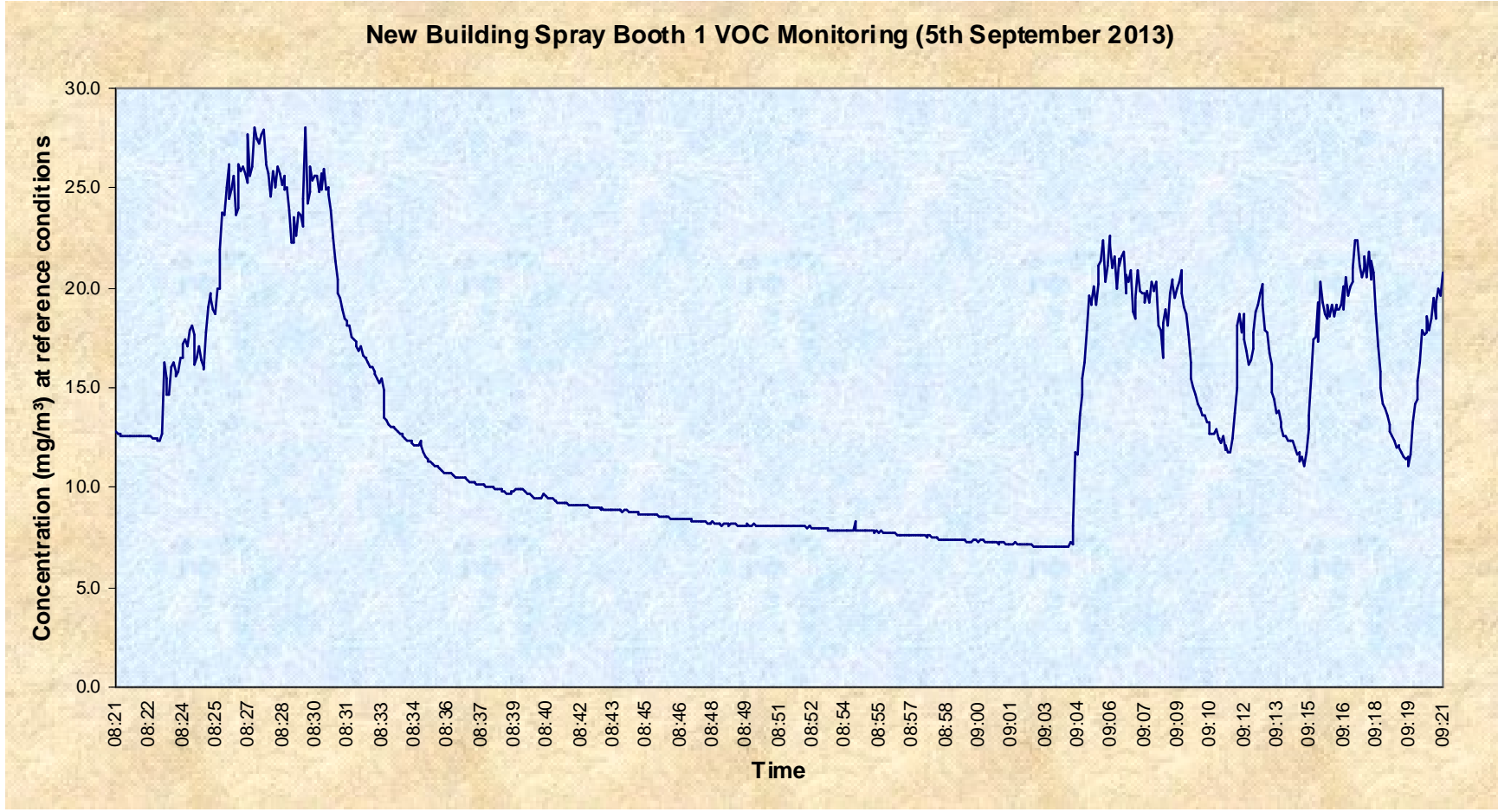
Average Run Time			Volatile Organic Compounds (ppm)			Volatile Organic Compounds (mg/m <sup>3</sup> )		
			Mean	Max	Min	Mean	Max	Min
14:27	to	14:57	19.51	68.86	5.52	31.36	110.67	8.87
14:57	to	15:27	14.48	26.77	4.83	23.27	43.03	7.76





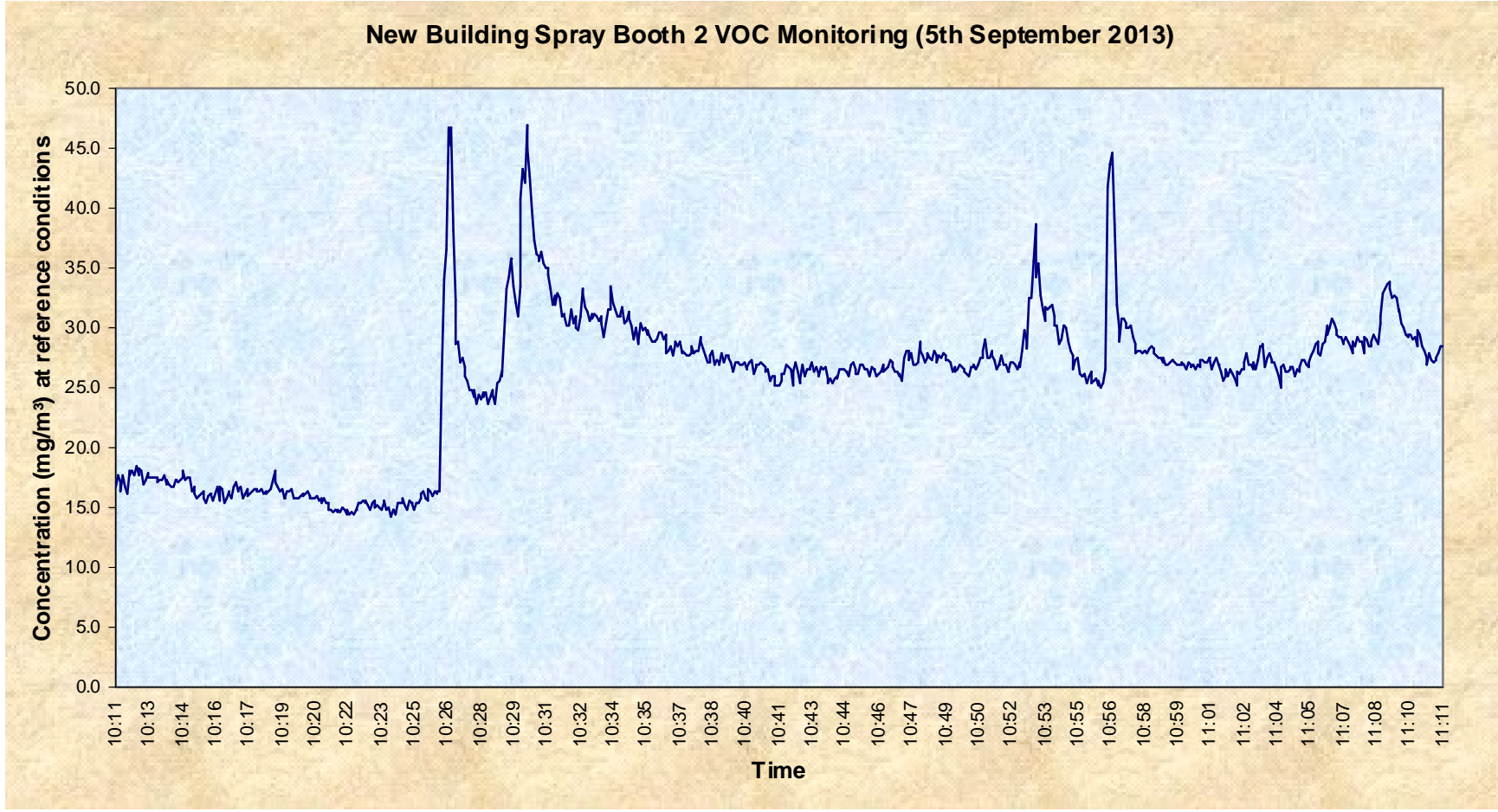
Average Run Time			Volatile Organic Compounds (ppm)			Volatile Organic Compounds (mg/m <sup>3</sup> )		
			Mean	Max	Min	Mean	Max	Min
9:59	to	10:29	5.77	7.80	4.40	9.27	12.54	7.07
10:29	to	10:59	5.15	7.80	3.80	8.28	12.54	6.11





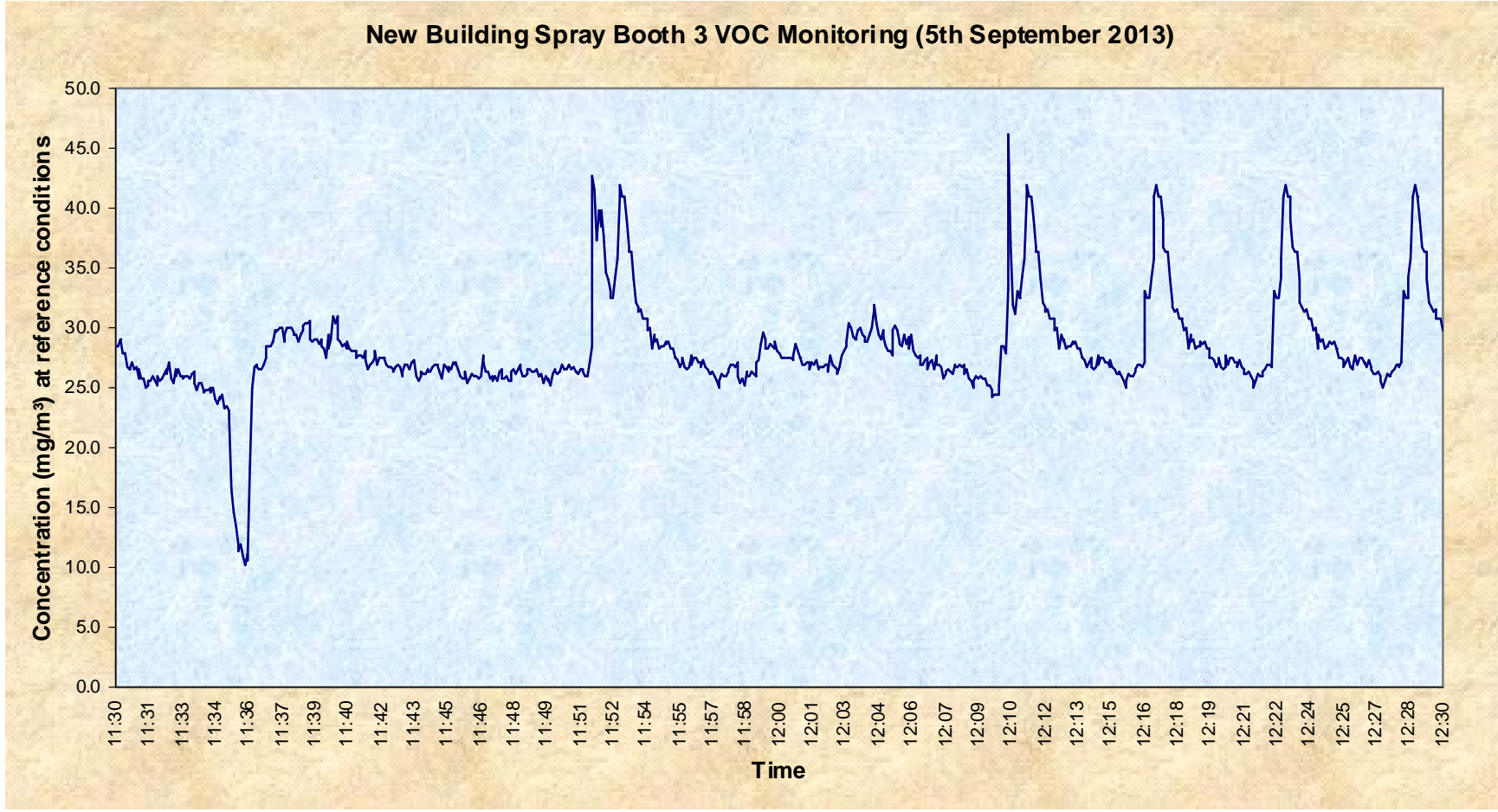
Average Run Time			Volatile Organic Compounds (ppm)			Volatile Organic Compounds (mg/m <sup>3</sup> )		
			Mean	Max	Min	Mean	Max	Min
8:21	to	8:51	8.49	17.45	5.00	13.64	28.04	8.04
8:51	to	9:21	7.96	14.05	4.35	12.79	22.58	6.99





Average Run Time			Volatile Organic Compounds (ppm)			Volatile Organic Compounds (mg/m <sup>3</sup> )		
			Mean	Max	Min	Mean	Max	Min
10:11	to	10:41	14.42	29.20	8.90	23.17	46.93	14.30
10:41	to	11:11	17.40	27.70	15.50	27.95	44.52	24.91

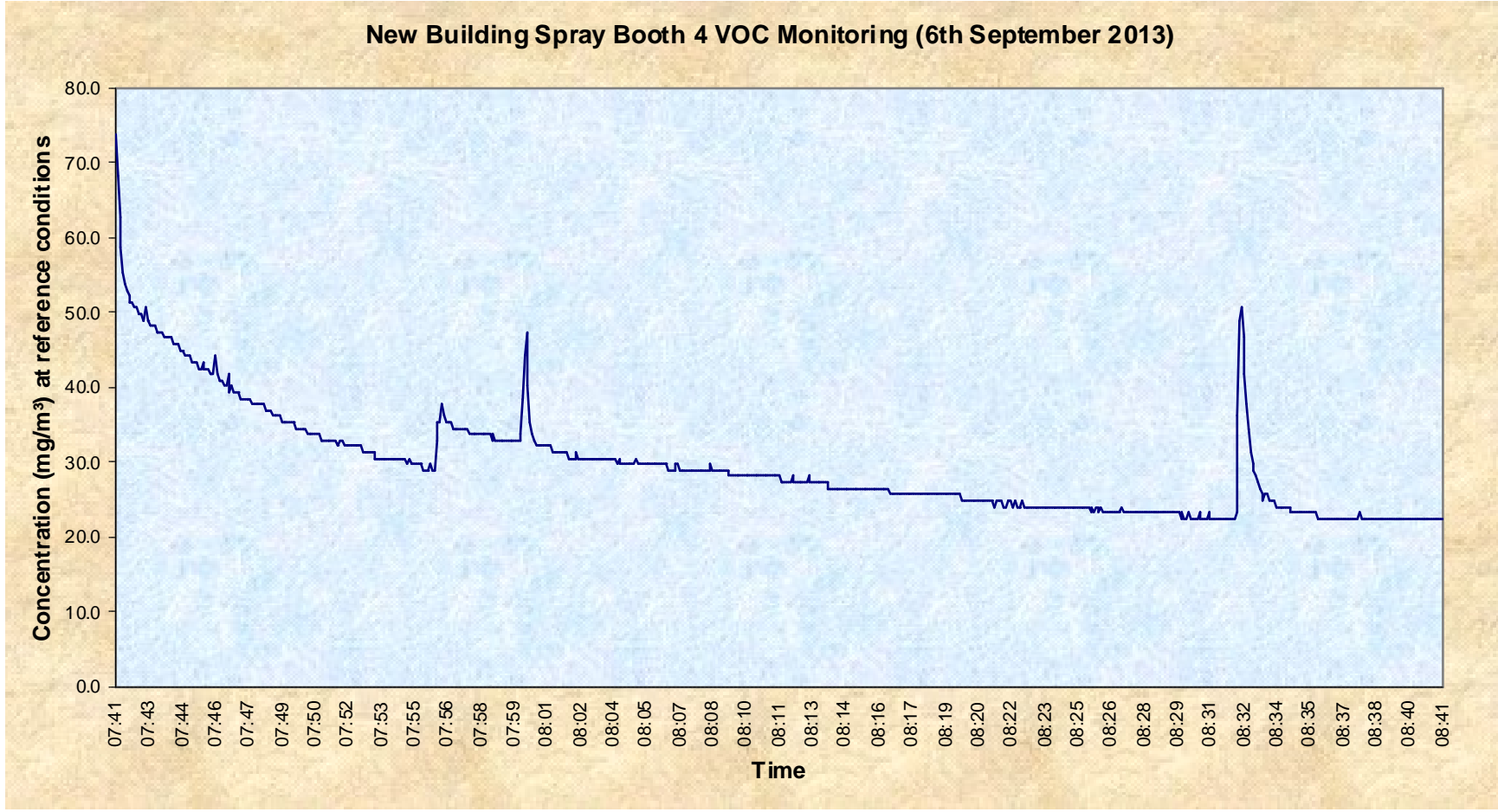




Average Run Time			Volatile Organic Compounds (ppm)			Volatile Organic Compounds (mg/m <sup>3</sup> )		
			Mean	Max	Min	Mean	Max	Min
11:30	to	12:00	16.96	26.50	6.30	27.25	42.59	10.13
12:00	to	12:30	18.21	28.75	15.05	29.26	46.21	24.19

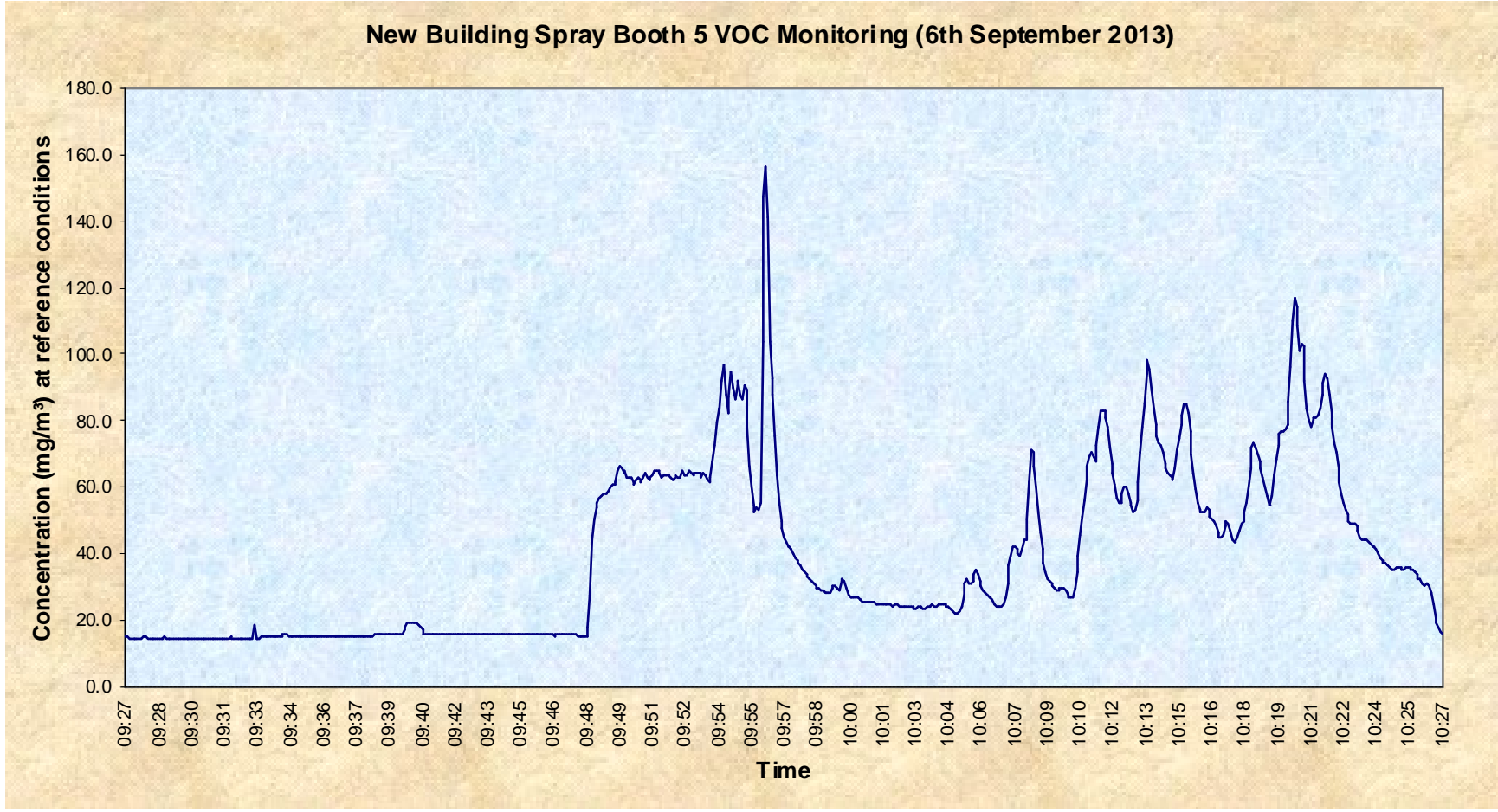






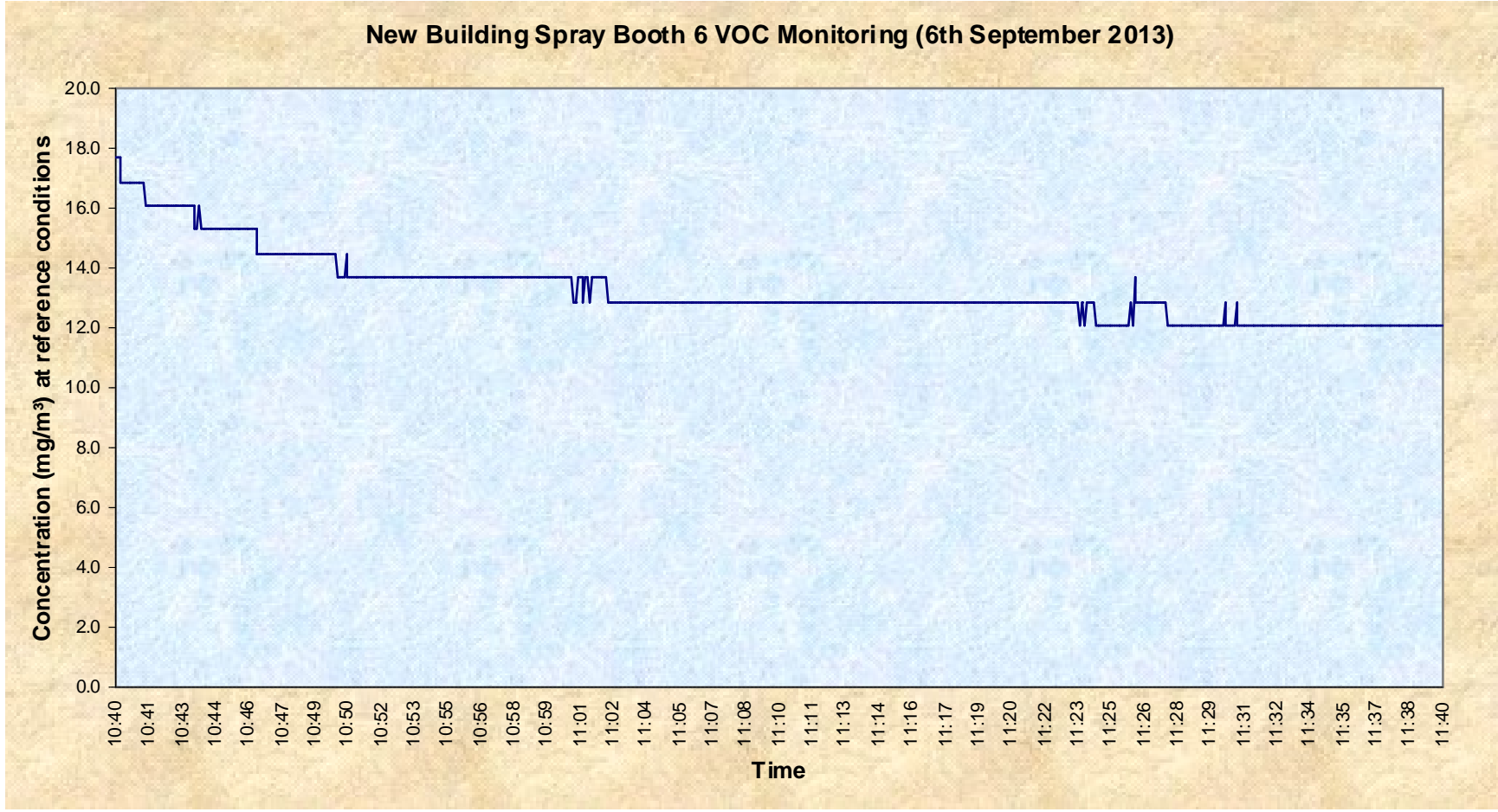
Average Run Time			Volatile Organic Compounds (ppm)			Volatile Organic Compounds (mg/m <sup>3</sup> )		
			Mean	Max	Min	Mean	Max	Min
7:41	to	8:11	21.53	46.00	17.50	34.61	73.93	28.13
8:11	to	8:41	15.36	31.50	14.00	24.70	50.63	22.50





Average Run Time			Volatile Organic Compounds (ppm)			Volatile Organic Compounds (mg/m <sup>3</sup> )		
			Mean	Max	Min	Mean	Max	Min
9:27	to	9:57	19.58	97.31	9.00	31.46	156.39	14.46
9:57	to	10:27	29.27	72.69	10.00	47.03	116.83	16.07





Average Run Time			Volatile Organic Compounds (ppm)			Volatile Organic Compounds (mg/m <sup>3</sup> )		
			Mean	Max	Min	Mean	Max	Min
10:40	to	11:10	8.72	11.00	8.00	14.02	17.68	12.86
11:10	to	11:40	7.77	8.50	7.50	12.48	13.66	12.05



# APPENDIX 3

## Velocity raw information



Client	Lawrence Automotive								
Site Address	Browns Lane, Coventry								
Job Number	P-RED13-084								
Date	4th September 2013								
Operator(s)	Vicki Gavin & Tony Berek								
Stack Reference	VMC3 New Booth No 1				Isokinetic Sample Positions (%) multiply by diameter to obtain sample points				
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	1				5	N/A			
Number of Samples per Axis / Port	2				6	N/A			
Nozzle Diameter (mm)	8.0				7	N/A			
Nozzle Area (m <sup>2</sup> )	0.00005024				8	N/A			
Stack Area (m <sup>2</sup> )	0.385				Average Isokinetic Flow Rate (ltrs/min)				
Pitot Coefficient	0.84		Pitot Calibration Date		15/03/13		Atmos. Pressure (kPa)		
Position	Distance	Axis 1	Temperature	Swirl Test	Axis 2	Temperature	Swirl Test	102.0	
No.	(cms)	(pa)	(C)	(°)	(pa)	(C)	(°)	Static Pressure (pa)	
1	10.22	15	23.6	4.0	19	23.6	4.0	-8.0	
2	59.78	18	23.6	4.0	16	23.6	4.0	1 Axis	
3	N/A							2 Axis	
4	N/A							Velocity of flow (m/s)	
5	N/A							4.42	
6	N/A							4.55	
7	N/A							Volume Flow Rate (m <sup>3</sup> /s)	
8	N/A							1.70	
Averages		17	23.6		18	23.6		1.75	
Mean Flue Gas Temp (in K) $T_p = ((\text{Mean } T_1 + \text{Mean } T_2)/2 + 273) =$								296.60	
Permitted Range of gas temperature readings (C) = $(0.95T_p - 273)$ to $(1.05T_p - 273) =$								8.77 to 38.43	
Highest Velocity Reading (m/s) =								4.9	
Lowest Velocity Reading (m/s) =								4.3	
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 <sup>nd</sup> run	N/A	End of 2 <sup>nd</sup> run	N/A	
Acceptable Leak Check < 2% Vol (l/min)	0.27				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							Run 2	
Is the Platform area greater than 5m <sup>2</sup> ? (YES, NO or N/A)	N/A				Are there sufficient rails and kick board? (YES, NO or N/A)			N/A	
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)			YES	
Site Equipment Used									
Pitot Reference	RED 0237				Manometer Reference				RED 0404
Thermometer Reference	RED 0351 & 0352				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
Calipers	RED 0301				Condenser Thermocouple				N/A



Client	Lawrence Automotive									
Site Address	Browns Lane, Coventry									
Job Number	P-RED13-084									
Date	4th September 2013									
Operator(s)	Vicki Gavin & Tony Berek									
Stack Reference	VMC3 New Booth No 2				Isokinetic Sample Positions (%) multiply by diameter to obtain sample points					
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 (m <sup>2</sup> )	0.00005024				8	N/A				
Stack Area (m <sup>2</sup> )	0.385				Average Isokinetic Flow Rate (ltrs/min)					
				Axis 1	Axis 2					
				14.83	15.37					
Pitot Coefficient	0.84		Pitot Calibration Date			15/03/13		Atmos. Pressure (kPa)		
Position	Distance	Axis 1	Temperature	Swirl Test	Axis 2	Temperature	Swirl Test	102.0		
No.	(cms)	(pa)	(C)	(°)	(pa)	(C)	(°)	Static Pressure (pa)		
1	10.22	20	22.9	4.0	22	23	5.0	-19.0		
2	59.78	21	23.0	5.0	22	23	5.0	1 Axis	2 Axis	
3	N/A							Velocity of flow (m/s)		
4	N/A							4.92	5.10	
5	N/A							Volume Flow Rate (m <sup>3</sup> /s)		
6	N/A							1.89	1.96	
7	N/A							Reduced Exit		
8	N/A									
Averages		21	23.0		22	23.0		N/A		
Mean Flue Gas Temp (in K) $T_p = ((\text{Mean } T_1 + \text{Mean } T_2)/2 + 273) =$					295.95					
Permitted Range of gas temperature readings (C) = $(0.95T_p - 273)$ to $(1.05T_p - 273) =$					8.15		to 37.75			
Highest Velocity Reading (m/s) =					5.2					
Lowest Velocity Reading (m/s) =					5.0					
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 <sup>nd</sup> run	N/A	End of 2 <sup>nd</sup> run	N/A		
Acceptable Leak Check < 2% Vol (l/min)	0.30				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								103.6	N/A
Is the Platform area greater than 5m <sup>2</sup> ? (YES, NO or N/A)	N/A				Are there sufficient rails and kick board? (YES, NO or N/A)				N/A	
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)				YES	
Site Equipment Used										
Pitot Reference	RED 0237				Manometer Reference				RED 0404	
Thermometer Reference	RED 0351 & 0352				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	
Calipers	RED 0301				Condenser Thermocouple				N/A	



Client	Lawrence Automotive									
Site Address	Browns Lane, Coventry									
Job Number	P-RED13-084									
Date	4th September 2013									
Operator(s)	Vicki Gavin & Tony Berek									
Stack Reference	VMC3 Auto Cell 3				Isokinetic Sample Positions (%) multiply by diameter to obtain sample points					
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)	6.0				7	N/A				
Nozzle Area (m <sup>2</sup> )	0.00002826				8	N/A				
Stack Area (m <sup>2</sup> )	0.385				Average Isokinetic Flow Rate (ltrs/min)					
				Axis 1		Axis 2				
				14.99		15.90				
Pitot Coefficient	0.84		Pitot Calibration Date			15/03/13		Atmos. Pressure (kPa)		
Position	Distance	Axis 1	Temperature	Swirl Test	Axis 2	Temperature	Swirl Test	102.0		
No.	(cms)	(pa)	(C)	(°)	(pa)	(C)	(°)	Static Pressure (pa)		
1	10.22	63	33.2	4.0	75	33.2	5.0	-77.0		
2	59.78	65	33.2	5.0	69	33.2	5.0	1 Axis	2 Axis	
3	N/A							Velocity of flow (m/s)		
4	N/A							8.84	9.38	
5	N/A							Volume Flow Rate (m <sup>3</sup> /s)		
6	N/A							3.40	3.61	
7	N/A							Reduced Exit		
8	N/A									
Averages		64	33.2		72	33.2		N/A		
Mean Flue Gas Temp (in K) $T_p = ((\text{Mean } T_1 + \text{Mean } T_2)/2 + 273) =$					306.20					
Permitted Range of gas temperature readings (C) = $(0.95T_p - 273)$ to $(1.05T_p - 273) =$					17.89		to		48.51	
Highest Velocity Reading (m/s) =					9.8					
Lowest Velocity Reading (m/s) =					9.0					
Ratio Highest/Lowest (Max permitted = 3:1)					1.09 : 1					
On site Checklist										
Initial Leak Check	<0.2	End of first run	<0.2		Start of 2 <sup>nd</sup> run	N/A	End of 2 <sup>nd</sup> run	N/A		
Acceptable Leak Check < 2% Vol (l/min)	0.30				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								105.6	N/A
Is the Platform area greater than 5m <sup>2</sup> ? (YES, NO or N/A)	N/A				Are there sufficient rails and kick board? (YES, NO or N/A)				N/A	
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)				YES	
Site Equipment Used										
Pitot Reference	RED 0237				Manometer Reference				RED 0404	
Thermometer Reference	RED 0351 & 0352				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	
Calipers	RED 0301				Condenser Thermocouple				N/A	



Client	Lawrence Automotive							
Site Address	Browns Lane, Coventry							
Job Number	P-RED13-084							
Date	3rd September 2013							
Operator(s)	Vicki Gavin & Tony Berek							
Stack Reference	VMC3 Auto Cell 1				Isokinetic Sample Positions (%) multiply by diameter to obtain sample points			
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 <sup>2</sup> )	0.00005024				8	N/A		
Stack Area (m <sup>2</sup> )	0.283				Average Isokinetic Flow Rate (ltrs/min)			
Pitot Coefficient	0.84	Pitot Calibration Date			15/03/13			Atmos. Pressure (kPa)
Position	Distance	Axis 1	Temperature	Swirl Test	Axis 2	Temperature	Swirl Test	102.3
No.	(cms)	(pa)	(C)	(°)	(pa)	(C)	(°)	Static Pressure (pa)
1	8.76	33	24.2	4.0	36	24.2	4.0	-47.0
2	51.24	28	24.2	4.0	27	24.2	3.0	1 Axis
3	N/A							2 Axis
4	N/A							Velocity of flow (m/s)
5	N/A							6.01
6	N/A							6.10
7	N/A							Volume Flow Rate (m <sup>3</sup> /s)
8	N/A							1.70
Averages		31	24.2		32	24.2		1.73
Mean Flue Gas Temp (in K) $T_p = ((\text{Mean } T_1 + \text{Mean } T_2)/2 + 273) =$								297.20
Permitted Range of gas temperature readings (C) = $(0.95T_p - 273)$ to $(1.05T_p - 273) =$								9.34 to 39.06
Highest Velocity Reading (m/s) =								6.7
Lowest Velocity Reading (m/s) =								6.8
Ratio Highest/Lowest (Max permitted = 3:1)								1.15 : 1
On site Checklist								
Initial Leak Check	<0.2	End of first run	<0.2		Start of 2 <sup>nd</sup> run	N/A	End of 2 <sup>nd</sup> run	N/A
Acceptable Leak Check < 2% Vol (l/min)	0.36				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							104.7
Is the Platform area greater than 5m <sup>2</sup> ? (YES, NO or N/A)	N/A				Are there sufficient rails and kick board? (YES, NO or N/A)			N/A
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)			YES
Site Equipment Used								
Pitot Reference	RED 0237				Manometer Reference			RED 0404
Thermometer Reference	RED 0351 & 0352				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
Calipers	RED 0301				Condenser Thermocouple			N/A





Client	Lawrence Automotive								
Site Address	Browns Lane, Coventry								
Job Number	P-RED13-084								
Date	3rd September 2013								
Operator(s)	Vicki Gavin & Tony Berek								
Stack Reference	VMC3 Auto Cell 2				Isokinetic Sample Positions (%) multiply by diameter to obtain sample points				
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 <sup>2</sup> )	0.00005024				8	N/A			
Stack Area (m <sup>2</sup> )	0.283				Average Isokinetic Flow Rate (ltrs/min)				
Pitot Coefficient	0.84		Pitot Calibration Date		15/03/13		Atmos. Pressure (kPa)		
Position	Distance	Axis 1	Temperature	Swirl Test	Axis 2	Temperature	Swirl Test	102.3	
No.	(cms)	(pa)	(C)	(°)	(pa)	(C)	(°)	Static Pressure (pa)	
1	8.76	57	24.0	3.0	61	24	4.0	-34.0	
2	51.24	52	24.0	4.0	56	24	4.0	1 Axis	
3	N/A							2 Axis	
4	N/A							Velocity of flow (m/s)	
5	N/A							8.03	
6	N/A							8.32	
7	N/A							Volume Flow Rate (m <sup>3</sup> /s)	
8	N/A							2.27	
Averages		55	24.0		59	24.0		2.35	
Mean Flue Gas Temp (in K) $T_p = ((\text{Mean } T_1 + \text{Mean } T_2)/2 + 273) =$								297.00	
Permitted Range of gas temperature readings (C) = $(0.95T_p - 273)$ to $(1.05T_p - 273) =$								9.15 to 38.85	
Highest Velocity Reading (m/s) =								8.7	
Lowest Velocity Reading (m/s) =								8.0	
Ratio Highest/Lowest (Max permitted = 3:1)								1.08 : 1	
On site Checklist									
Initial Leak Check	<0.2	End of first run	<0.2		Start of 2 <sup>nd</sup> run	N/A	End of 2 <sup>nd</sup> run	N/A	
Acceptable Leak Check < 2% Vol (l/min)	0.48				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							Run 2	
Is the Platform area greater than 5m <sup>2</sup> ? (YES, NO or N/A)	N/A				Are there sufficient rails and kick board? (YES, NO or N/A)			N/A	
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)			YES	
Site Equipment Used									
Pitot Reference	RED 0237				Manometer Reference				RED 0404
Thermometer Reference	RED 0351 & 0352				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
Calipers	RED 0301				Condenser Thermocouple				N/A



Client	Lawrence Automotive							
Site Address	Browns Lane, Coventry							
Job Number	P-RED13-084							
Date	4th September 2013							
Operator(s)	Vicki Gavin & Tony Berek							
Stack Reference	VMC3 Auto Cell 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)	0.60			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 (m²)	0.00005024			8	N/A			
Stack Area (m²)	0.283			Average Isokinetic Flow Rate (ltrs/min)		Axis 1	Axis 2	
Pitot Coefficient	0.84	Pitot Calibration Date			15/03/13		Atmos. Pressure (kPa)	
Position	Distance	Axis 1	Temperature	Swirl Test	Axis 2	Temperature	Swirl Test	102.0
No.	(cms)	(pa)	(C)	(°)	(pa)	(C)	(°)	Static Pressure (pa)
1	8.76	59	19.0	4.0	53	19	5.0	-45.0
2	51.24	52	19.0	5.0	48	19	5.0	1 Axis
3	N/A							2 Axis
4	N/A							Velocity of flow (m/s)
5	N/A							8.04
6	N/A							7.67
7	N/A							Volume Flow Rate (m³/s)
8	N/A							2.27
Averages		56	19.0		51	19.0		N/A
Mean Flue Gas Temp (in K) $T_p = ((\text{Mean } T_1 + \text{Mean } T_2)/2 + 273) =$					292.00			
Permitted Range of gas temperature readings (C) = $(0.95T_p - 273)$ to $(1.05T_p - 273) =$					4.40		to 33.60	
Highest Velocity Reading (m/s) =					8.5			
Lowest Velocity Reading (m/s) =					7.7			
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 <sup>nd</sup> run	N/A	End of 2 <sup>nd</sup> run	N/A
Acceptable Leak Check < 2% Vol (l/min)	0.48				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							Run 2
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)			N/A
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)			YES
Site Equipment Used								
Pitot Reference	RED 0237				Manometer Reference			RED 0404
Thermometer Reference	RED 0351 & 0352				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
Calipers	RED 0301				Condenser Thermocouple			N/A



Client	Lawrence Automotive							
Site Address	Browns Lane, Coventry							
Job Number	P-RED13-084							
Date	2nd September 2013							
Operator(s)	Vicki Gavin & Tony Berek							
Stack Reference	VMC3 PU Auto				Isokinetic Sample Positions (%) multiply by diameter to obtain sample points			
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 (m <sup>2</sup> )	0.00002826				8	N/A		
Stack Area (m <sup>2</sup> )	0.442				Average Isokinetic Flow Rate (ltrs/min)			
Pitot Coefficient	0.84		Pitot Calibration Date		15/03/13		Atmos. Pressure (kPa)	
Position	Distance	Axis 1	Temperature	Swirl Test	Axis 2	Temperature	Swirl Test	102.5
No.	(cms)	(pa)	(C)	(°)	(pa)	(C)	(°)	Static Pressure (pa)
1	10.95	158	29.3	4.0	163	29.3	4.0	70.0
2	64.05	139	29.3	4.0	145	29.3	3.0	1 Axis
3	N/A							2 Axis
4	N/A							Velocity of flow (m/s)
5	N/A							13.36
6	N/A							13.61
7	N/A							Volume Flow Rate (m <sup>3</sup> /s)
8	N/A							5.90
								6.01
								Reduced Exit
Averages		149	29.3		154	29.3		N/A
Mean Flue Gas Temp (in K) $T_p = ((\text{Mean } T_1 + \text{Mean } T_2)/2 + 273) =$					302.30			
Permitted Range of gas temperature readings (C) = $(0.95T_p - 273)$ to $(1.05T_p - 273) =$					14.19 to 44.42			
Highest Velocity Reading (m/s) =					14.3			
Lowest Velocity Reading (m/s) =					13.2			
Ratio Highest/Lowest (Max permitted = 3:1)					1.08 : 1			
On site Checklist								
Initial Leak Check	<0.2	End of first run	<0.2		Start of 2 <sup>nd</sup> run	N/A	End of 2 <sup>nd</sup> run	N/A
Acceptable Leak Check < 2% Vol (l/min)	0.45				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							Run 2
Is the Platform area greater than 5m <sup>2</sup> ? (YES, NO or N/A)	N/A				Are there sufficient rails and kick board? (YES, NO or N/A)			N/A
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)			YES
Site Equipment Used								
Pitot Reference	RED 0237			Manometer Reference			RED 0404	
Thermometer Reference	RED 0351 & 0352			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	
Calipers	RED 0301			Condenser Thermocouple			N/A	



Client	Lawrence Automotive							
Site Address	Browns Lane, Coventry							
Job Number	P-RED13-084							
Date	3rd September 2013							
Operator(s)	Vicki Gavin & Tony Berek							
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	85.40		
Dimensions (mtrs)	0.70				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)	8.0				7	N/A		
Nozzle Area (m <sup>2</sup> )	0.00005024				8	N/A		
Stack Area (m <sup>2</sup> )	0.385				Average Isokinetic Flow Rate (ltrs/min)			
Pitot Coefficient	0.84	Pitot Calibration Date			15/03/13			Atmos. Pressure (kPa)
Position	Distance	Axis 1	Temperature	Swirl Test	Axis 2	Temperature	Swirl Test	102.3
No.	(cms)	(pa)	(C)	(°)	(pa)	(C)	(°)	Static Pressure (pa)
1	10.22	21	24.4	3.0	20	24.4	3.0	-12.0
2	59.78	15	24.4	4.0	16	24.4	4.0	1 Axis
3	N/A							2 Axis
4	N/A							Velocity of flow (m/s)
5	N/A							4.61
6	N/A							4.61
7	N/A							Volume Flow Rate (m <sup>3</sup> /s)
8	N/A							1.78
Averages		18	24.4		18	24.4		1.78
Mean Flue Gas Temp (in K) $T_p = ((\text{Mean } T_1 + \text{Mean } T_2)/2 + 273) =$								297.40
Permitted Range of gas temperature readings (C) = $(0.95T_p - 273)$ to $(1.05T_p - 273) =$								9.53 to 39.27
Highest Velocity Reading (m/s) =								5.1
Lowest Velocity Reading (m/s) =								4.3
Ratio Highest/Lowest (Max permitted = 3:1)								1.18 : 1
On site Checklist								
Initial Leak Check	<0.2	End of first run	<0.2		Start of 2 <sup>nd</sup> run	N/A	End of 2 <sup>nd</sup> run	N/A
Acceptable Leak Check < 2% Vol (l/min)	0.28				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							109.7
Is the Platform area greater than 5m <sup>2</sup> ? (YES, NO or N/A)	N/A				Are there sufficient rails and kick board? (YES, NO or N/A)			N/A
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)			YES
Site Equipment Used								
Pitot Reference	RED 0237				Manometer Reference			RED 0404
Thermometer Reference	RED 0351 & 0352				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
Calipers	RED 0301				Condenser Thermocouple			N/A



Client	Lawrence Automotive							
Site Address	Browns Lane, Coventry							
Job Number	P-RED13-084							
Date	4th September 2013							
Operator(s)	Vicki Gavin & Tony Berek							
Stack Reference	New Roof Zone 1 Stack 1				Isokinetic Sample Positions (%) multiply by diameter to obtain sample points			
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	1				5	N/A		
Number of Samples per Axis / Port	2				6	N/A		
Nozzle Diameter (mm)	6.0				7	N/A		
Nozzle Area (m <sup>2</sup> )	0.00002826				8	N/A		
Stack Area (m <sup>2</sup> )	0.283				Average Isokinetic Flow Rate (ltrs/min)			
				Axis 1	Axis 2			
				21.87	21.79			
Pitot Coefficient	0.84	Pitot Calibration Date			15/03/13			Atmos. Pressure (kPa)
Position	Distance	Axis 1	Temperature	Swirl Test	Axis 2	Temperature	Swirl Test	102.0
No.	(cms)	(pa)	(C)	(°)	(pa)	(C)	(°)	Static Pressure (pa)
1	8.76	137	20.4	6.0	144	23.6	5.5	-8.0
2	51.24	147	20.4	5.0	138	23.6	6.0	1 Axis
3	N/A							2 Axis
4	N/A							Velocity of flow (m/s)
5	N/A							12.90
6	N/A							12.85
7	N/A							Volume Flow Rate (m <sup>3</sup> /s)
8	N/A							3.65
				Reduced Exit				3.63
Averages		142	20.4		141	23.6		N/A
Mean Flue Gas Temp (in K) $T_p = ((\text{Mean } T_1 + \text{Mean } T_2)/2 + 273) =$				293.40				
Permitted Range of gas temperature readings (C) = $(0.95T_p - 273)$ to $(1.05T_p - 273) =$				5.73 to 35.07				
Highest Velocity Reading (m/s) =				13.4				
Lowest Velocity Reading (m/s) =				12.9				
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 <sup>nd</sup> run	N/A	End of 2 <sup>nd</sup> run	N/A
Acceptable Leak Check < 2% Vol (l/min)	0.44			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							Run 2
Is the Platform area greater than 5m <sup>2</sup> ? (YES, NO or N/A)	N/A			Are there sufficient rails and kick board? (YES, NO or N/A)				N/A
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)				YES
Site Equipment Used								
Pitot Reference	RED 0237			Manometer Reference				RED 0404
Thermometer Reference	RED 0351 & 0352			Thermocouple Reference				RED 0357
Balance Reference	RED 0204			Sampling Pump Reference				RED 0196
Tape Measure Reference	RED 0121			Barometer Reference				RED 0403
DGM Thermocouple	RED 0234			Impinger Outlet Thermocouple				N/A
Calipers	RED 0301			Condenser Thermocouple				N/A



Client	Lawrence Automotive							
Site Address	Browns Lane, Coventry							
Job Number	P-RED13-084							
Date	5th September 2013							
Operator(s)	Elena Berek & Tony Berek							
Stack Reference	New Roof Zone 2 Stack 2				Isokinetic Sample Positions (%) multiply by diameter to obtain sample points			
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)	6.0				7	N/A		
Nozzle Area (m <sup>2</sup> )	0.00002826				8	N/A		
Stack Area (m <sup>2</sup> )	0.283				Average Isokinetic Flow Rate (ltrs/min)			
Pitot Coefficient	0.84	Pitot Calibration Date			15/03/13			Atmos. Pressure (kPa)
Position	Distance	Axis 1	Temperature	Swirl Test	Axis 2	Temperature	Swirl Test	101.3
No.	(cms)	(pa)	(C)	(°)	(pa)	(C)	(°)	Static Pressure (pa)
1	8.76	198	23.1	4.0	202	23	5.0	42.0
2	51.24	203	23.1	4.0	198	23	5.0	1 Axis
3	N/A							2 Axis
4	N/A							Velocity of flow (m/s)
5	N/A							15.45
6	N/A							15.43
7	N/A							Volume Flow Rate (m <sup>3</sup> /s)
8	N/A							4.37
Averages		201	23.1		200	23.0		4.36
Mean Flue Gas Temp (in K) $T_p = ((\text{Mean } T_1 + \text{Mean } T_2)/2 + 273) =$								296.10
Permitted Range of gas temperature readings (C) = $(0.95T_p - 273)$ to $(1.05T_p - 273) =$								8.30 to 37.91
Highest Velocity Reading (m/s) =								15.8
Lowest Velocity Reading (m/s) =								15.6
Ratio Highest/Lowest (Max permitted = 3:1)								1.01 : 1
On site Checklist								
Initial Leak Check	<0.2	End of first run	<0.2		Start of 2 <sup>nd</sup> run	N/A	End of 2 <sup>nd</sup> run	N/A
Acceptable Leak Check < 2% Vol (l/min)	0.52				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							Run 2
Is the Platform area greater than 5m <sup>2</sup> ? (YES, NO or N/A)	N/A				Are there sufficient rails and kick board? (YES, NO or N/A)			N/A
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)			YES
Site Equipment Used								
Pitot Reference	RED 0237				Manometer Reference			RED 0404
Thermometer Reference	RED 0351 & 0352				Thermocouple Reference			RED 0357
Balance Reference	RED 0204				Sampling Pump Reference			RED 0196
Tape Measure Reference	RED 0121				Barometer Reference			RED 0403
DGM Thermocouple	RED 0234				Impinger Outlet Thermocouple			N/A
Calipers	RED 0301				Condenser Thermocouple			N/A



Client	Lawrence Automotive								
Site Address	Browns Lane, Coventry								
Job Number	P-RED13-084								
Date	5th September 2013								
Operator(s)	Elena Berek & Tony Berek								
Stack Reference	New Roof Stack 3				Isokinetic Sample Positions (%) multiply by diameter to obtain sample points				
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 <sup>2</sup> )	0.00005024				8	N/A			
Stack Area (m <sup>2</sup> )	0.283				Average Isokinetic Flow Rate (ltrs/min)				
				Axis 1		Axis 2			
				25.07		26.04			
Pitot Coefficient	0.84		Pitot Calibration Date		15/03/13			Atmos. Pressure (kPa)	
Position	Distance	Axis 1	Temperature	Swirl Test	Axis 2	Temperature	Swirl Test	101.3	
No.	(cms)	(pa)	(C)	(°)	(pa)	(C)	(°)	Static Pressure (pa)	
1	8.76	63	28.8	3.4	57	28.9	4.3	4.0	
2	51.24	51	28.9	3.9	66	28.9	4.5	1 Axis	2 Axis
3	N/A							Velocity of flow (m/s)	
4	N/A							8.32	8.64
5	N/A							Volume Flow Rate (m <sup>3</sup> /s)	
6	N/A							2.35	2.44
7	N/A							Reduced Exit	
8	N/A								
Averages		57	28.9		62	28.9		N/A	
Mean Flue Gas Temp (in K) $T_p = ((\text{Mean } T_1 + \text{Mean } T_2)/2 + 273) =$					301.85				
Permitted Range of gas temperature readings (C) = $(0.95T_p - 273)$ to $(1.05T_p - 273) =$					13.76		to		43.94
Highest Velocity Reading (m/s) =					9.1				
Lowest Velocity Reading (m/s) =					8.0				
Ratio Highest/Lowest (Max permitted = 3:1)					1.14 : 1				
On site Checklist									
Initial Leak Check	<0.2	End of first run	<0.2		Start of 2 <sup>nd</sup> run	N/A	End of 2 <sup>nd</sup> run	N/A	
Acceptable Leak Check < 2% Vol (l/min)	0.50		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					96.6	N/A		
Is the Platform area greater than 5m <sup>2</sup> ? (YES, NO or N/A)	N/A		Are there sufficient rails and kick board? (YES, NO or N/A)			N/A			
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)			YES			
Site Equipment Used									
Pitot Reference	RED 0237		Manometer Reference			RED 0404			
Thermometer Reference	RED 0351 & 0352		Thermocouple Reference			RED 0357			
Balance Reference	RED 0204		Sampling Pump Reference			RED 0196			
Tape Measure Reference	RED 0121		Barometer Reference			RED 0403			
DGM Thermocouple	RED 0234		Impinger Outlet Thermocouple			N/A			
Calipers	RED 0301		Condenser Thermocouple			N/A			



Client	Lawrence Automotive							
Site Address	Browns Lane, Coventry							
Job Number	P-RED13-084							
Date	6th September 2013							
Operator(s)	Elena Berek & Tony Berek							
Stack Reference	New Roof Stack 4			Isokinetic Sample Positions (%) multiply by diameter to obtain sample points		Sampling Plane Diagram		
Number of Stacks	1			1	6.70			
Stack Configuration	Round			2	25.00			
Dimensions (mtrs)	0.71			3	75.00			
Outlet Diameter (if applicable) (metres)				4	93.30			
Number of Sample Ports	1			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)	0.396			Average Isokinetic Flow Rate (ltrs/min)		Axis 1	Axis 2	
Pitot Coefficient	0.84	Pitot Calibration Date			15/03/13		18.08	N/A
Position	Distance	Axis 1	Temperature	Swirl Test	Axis 2	Temperature	Swirl Test	Atmos. Pressure (kPa)
No.	(cms)	(pa)	(C)	(°)	(pa)	(C)	(°)	101.3
1	4.76	36	15.5	5.0				Static Pressure (pa)
2	17.75	25	15.5	5.0				-16.0
3	53.25	28	15.5	5.5				1 Axis
4	66.24	35	15.5	5.0				2 Axis
5	N/A							Velocity of flow (m/s)
6	N/A							6.00
7	N/A							N/A
8	N/A							Volume Flow Rate (m³/s)
Averages		31	15.5					2.37
Mean Flue Gas Temp (in K) $T_p = ((\text{Mean } T_1 + \text{Mean } T_2)/2 + 273) =$								288.50
Permitted Range of gas temperature readings (C) = $(0.95T_p - 273)$ to $(1.05T_p - 273) =$								1.07 to 29.93
Highest Velocity Reading (m/s) =								6.6
Lowest Velocity Reading (m/s) =								5.5
Ratio Highest/Lowest (Max permitted = 3:1)								1.20 : 1
On site Checklist								
Initial Leak Check	<0.2	End of first run	<0.2		Start of 2 <sup>nd</sup> run	N/A	End of 2 <sup>nd</sup> run	N/A
Acceptable Leak Check < 2% Vol (l/min)	0.36				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							98.3
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)			N/A
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)			YES
Site Equipment Used								
Pitot Reference	RED 0237				Manometer Reference			RED 0404
Thermometer Reference	RED 0351 & 0352				Thermocouple Reference			RED 0357
Balance Reference	RED 0204				Sampling Pump Reference			RED 0196
Tape Measure Reference	RED 0121				Barometer Reference			RED 0403
DGM Thermocouple	RED 0234				Impinger Outlet Thermocouple			N/A
Calipers	RED 0301				Condenser Thermocouple			N/A





Client	Lawrence Automotive							
Site Address	Browns Lane, Coventry							
Job Number	P-RED13-084							
Date	6th September 2013							
Operator(s)	Elena Berek & Tony Berek							
Stack Reference	New Roof Zone 5 Stack 5			Isokinetic Sample Positions (%) multiply by diameter to obtain sample points		Sampling Plane Diagram		
Number of Stacks	1			1	6.70			
Stack Configuration	Round			2	25.00			
Dimensions (mtrs)	0.71			3	75.00			
Outlet Diameter (if applicable) (metres)				4	93.30			
Number of Sample Ports	1			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)	0.396			Average Isokinetic Flow Rate (ltrs/min)		Axis 1	Axis 2	
Pitot Coefficient	0.84	Pitot Calibration Date			15/03/13		19.26	N/A
Position	Distance	Axis 1	Temperature	Swirl Test	Axis 2	Temperature	Swirl Test	Atmos. Pressure (kPa)
No.	(cms)	(pa)	(C)	(°)	(pa)	(C)	(°)	101.3
1	4.76	44	15.8	5.0				Static Pressure (pa)
2	17.75	32	15.8	6.0				-3.0
3	53.25	34	15.8	6.0				1 Axis
4	66.24	33	15.7	5.0				2 Axis
5	N/A							Velocity of flow (m/s)
6	N/A							6.39
7	N/A							N/A
8	N/A							Volume Flow Rate (m³/s)
Averages		36	15.8					2.53
Mean Flue Gas Temp (in K) $T_p = ((\text{Mean } T_1 + \text{Mean } T_2)/2 + 273) =$								288.78
Permitted Range of gas temperature readings (C) = $(0.95T_p - 273)$ to $(1.05T_p - 273) =$								1.34 to 30.21
Highest Velocity Reading (m/s) =								7.4
Lowest Velocity Reading (m/s) =								6.2
Ratio Highest/Lowest (Max permitted = 3:1)								1.19 : 1
On site Checklist								
Initial Leak Check	<0.2	End of first run	<0.2		Start of 2 <sup>nd</sup> run	N/A	End of 2 <sup>nd</sup> run	N/A
Acceptable Leak Check < 2% Vol (l/min)	0.39				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							100.9
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)			N/A
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)			YES
Site Equipment Used								
Pitot Reference	RED 0237				Manometer Reference			RED 0404
Thermometer Reference	RED 0351 & 0352				Thermocouple Reference			RED 0357
Balance Reference	RED 0204				Sampling Pump Reference			RED 0196
Tape Measure Reference	RED 0121				Barometer Reference			RED 0403
DGM Thermocouple	RED 0234				Impinger Outlet Thermocouple			N/A
Calipers	RED 0301				Condenser Thermocouple			N/A



Client	Lawrence Automotive							
Site Address	Browns Lane, Coventry							
Job Number	P-RED13-084							
Date	6th September 2013							
Operator(s)	Elena Berek & Tony Berek							
Stack Reference	New Roof Zone 6 Stack 6			Isokinetic Sample Positions (%) multiply by diameter to obtain sample points		Sampling Plane Diagram		
Number of Stacks	1			1	6.70			
Stack Configuration	Round			2	25.00			
Dimensions (mtrs)	0.71			3	75.00			
Outlet Diameter (if applicable) (metres)				4	93.30			
Number of Sample Ports	1			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)	0.396			Average Isokinetic Flow Rate (ltrs/min)		Axis 1	Axis 2	
Pitot Coefficient	0.84	Pitot Calibration Date			15/03/13		Atmos. Pressure (kPa)	
Position	Distance	Axis 1	Temperature	Swirl Test	Axis 2	Temperature	Swirl Test	101.3
No.	(cms)	(pa)	(C)	(°)	(pa)	(C)	(°)	Static Pressure (pa)
1	4.76	44	15.8	5.0				-3.0
2	17.75	32	15.8	6.0				1 Axis
3	53.25	34	15.8	6.0				2 Axis
4	66.24	33	15.7	5.0				Velocity of flow (m/s)
5	N/A							6.44
6	N/A							N/A
7	N/A							Volume Flow Rate (m³/s)
8	N/A							2.55
Averages		36	15.8					N/A
Mean Flue Gas Temp (in K) $T_p = ((\text{Mean } T_1 + \text{Mean } T_2)/2 + 273) =$					288.78			
Permitted Range of gas temperature readings (C) = $(0.95T_p - 273)$ to $(1.05T_p - 273) =$					1.34		to 30.21	
Highest Velocity Reading (m/s) =					7.3			
Lowest Velocity Reading (m/s) =					6.2			
Ratio Highest/Lowest (Max permitted = 3:1)					1.17 : 1			
On site Checklist								
Initial Leak Check	<0.2	End of first run	<0.2		Start of 2 <sup>nd</sup> run	N/A	End of 2 <sup>nd</sup> run	N/A
Acceptable Leak Check < 2% Vol (l/min)	0.39				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							Run 2
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)			N/A
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)			YES
Site Equipment Used								
Pitot Reference	RED 0237				Manometer Reference			RED 0404
Thermometer Reference	RED 0351 & 0352				Thermocouple Reference			RED 0357
Balance Reference	RED 0204				Sampling Pump Reference			RED 0196
Tape Measure Reference	RED 0121				Barometer Reference			RED 0403
DGM Thermocouple	RED 0234				Impinger Outlet Thermocouple			N/A
Calipers	RED 0301				Condenser Thermocouple			N/A



# **APPENDIX 4**

## **Isocyanate Results**



<b>Client</b>	Lawrence Automotive								
<b>Site Address</b>	Browns Lane, Coventry								
<b>Job Number</b>	P-RED13-084/EB/R1/Rev0								
<b>Date</b>	2nd to the 4th September 2013								
<b>Operator(s)</b>	Elena Berek, Tony Berek & Vicki Gavin								
Pump Reference	Sample ID	Location / Process / Operator	Pump Flow (mls/min)		Sample Duration (mins)		Total Volume (l)	Mass of Analyte (ug)	Concentration (mg/m <sup>3</sup> )
RED 0258	13/084/106	VMC 3 POLYESTER AUTOMATIC SPRAY CELL 3 4th September 2013	Initial	953923.00	Start	10:05	352	<0.07	<0.0002
			Final	954275.00	Finish	11:05			
			Average	352.00	Total	60			
RED 0258	13/084/105	VMC 3 POLYESTER AUTOMATIC SPRAY CELL 2 3rd September 2013	Initial	952054.00	Start	14:00	291	<0.07	<0.0002
			Final	952345.00	Finish	15:00			
			Average	291.00	Total	60			
RED 0258	13/084/104	VMC 3 POLYESTER AUTOMATIC SPRAY CELL 1 3rd September 2013	Initial	950144.00	Start	12:07	348	12.40	0.0356
			Final	950492.00	Finish	13:07			
			Average	348.00	Total	60			
RED 0258	13/084/100	P U AUTOMATIC SPRAY CELL 2nd September 2013	Initial	947234.00	Start	13:45	351	1.81	0.0052
			Final	947585.00	Finish	14:45			
			Average	351.00	Total	60			
RED 0258	13/084/102	VMC 3 PU MANUAL SPRAY 1 3rd September 2013	Initial	948648.00	Start	10:00	361	1.61	0.0045
			Final	949009.00	Finish	11:00			
			Average	361.00	Total	60			
N/A	13/084/103	Blank	Initial	n/a	Start	n/a	341	0.7	0.002
			Final	n/a	Finish	n/a			
			Average	n/a	Total	n/a			



<b>Client</b>	Lawrence Automotive								
<b>Site Address</b>	Browns Lane, Coventry								
<b>Job Number</b>	P-RED13-084/EB/R1/Rev0								
<b>Date</b>	5th and 6th September 2013								
<b>Operator(s)</b>	Elena Berek, Tony Berek & Vicki Gavin								
Pump Reference	Sample ID	Location / Process / Operator	Pump Flow (mls/min)		Sample Duration (mins)		Total Volume (l)	Mass of Analyte (ug)	Concentration (mg/m <sup>3</sup> )
RED 0258	13/084/111	NEW ROOF SPRAY BOOTH 1 5th September 2013	Initial	581510.00	Start	9:32	352	7.85	0.0223
			Final	581862.00	Finish	10:00			
			Average	352.00	Total	28			
RED 0258	13/084/112	NEW ROOF SPRAY BOOTH 2 5th September 2013	Initial	583418.00	Start	11:20	330	4.62	0.0140
			Final	583748.00	Finish	11:48			
			Average	330.00	Total	28			
RED 0258	13/084/113	NEW ROOF SPRAY BOOTH 3 5th September 2013	Initial	585316.00	Start	13:37	309	3.81	0.0123
			Final	585625.00	Finish	14:05			
			Average	309.00	Total	28			
RED 0258	13/084/115	NEW ROOF SPRAY BOOTH 4 6th September 2013	Initial	586723.00	Start	8:50	317	5.79	0.0183
			Final	587040.00	Finish	9:22			
			Average	317.00	Total	32			
RED 0258	13/084/116	NEW ROOF SPRAY BOOTH 5 6th September 2013	Initial	588211.00	Start	10:35	348	4.99	0.0143
			Final	588559.00	Finish	11:07			
			Average	348.00	Total	32			
RED 0258	13/084/117	NEW ROOF SPRAY BOOTH 6 6th September 2013	Initial	589805.00	Start	12:30	378	6.69	0.0177
			Final	590183.00	Finish	13:02			
			Average	378.00	Total	32			



<b>Client</b>	Lawrence Automotive								
<b>Site Address</b>	Browns Lane, Coventry								
<b>Job Number</b>	P-RED13-084/EB/R1/Rev0								
<b>Date</b>	4th September 2013								
<b>Operator(s)</b>	Elena Berek, Tony Berek & Vicki Gavin								
Pump Reference	Sample ID	Location / Process / Operator	Pump Flow (mls/min)		Sample Duration (mins)		Total Volume (l)	Mass of Analyte (ug)	Concentration (mg/m <sup>3</sup> )
RED 0258	13/084/110	ADDITIONAL VMC 3 SPRAY BOOTH 1 4th September 2013	Initial	957663.00	Start	15:12	367.00	8.3	0.023
			Final	958030.00	Finish	15:47			
			Average	367.00	Total	35			
RED 0258	13/084/109	ADDITIONAL VMC 3 SPRAY BOOTH 2 4th September 2013	Initial	956502.00	Start	13:32	313.00	6.2	0.020
			Final	956815.00	Finish	14:07			
			Average	313.00	Total	35			
RED 0258	13/084/108	ADDITIONAL VMC 3 SPRAY BOOTH 3 4th September 2013	Initial	955210.00	Start	11:55	345.00	4.2	0.012
			Final	955555.00	Finish	12:30			
			Average	345.00	Total	35			
			Initial		Start				
			Final		Finish				
			Average		Total				

