

**RESULTS OF PARTICULATE EMISSIONS
MONITORING AT**

**VIP-HEINKE
ST PETERS ROAD
HUNTINGDON
CAMBRIDGESHIRE
PE29 7DA**

Air Tech E.C.S. Reference:

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20th – 21st September 2004

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REPORT STATUS

Issue	Status	Description	Prepared by	Date
1	Final Report	Issued to Client	A. Shakeri	27/10/2003
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Issue 1 of 2 - Client
Issue 2 of 2 - L.A

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1. INTRODUCTION

Mr. Gary Williamson has requested Air Tech ECS to undertake environmental monitoring within the premises of VIP-Heinke Limited, Huntingdon in order to ascertain the concentration of total particulate matter from various stacks at that site. Monitoring took place on 20th and 21st September 2004.

It is understood that the process is prescribed under Part B, Schedule 1 of the Environmental Protection (Prescribed Process and Substances) Regulations 1991, as amended, which governs industrial releases to atmosphere only. Guidance on the operation of the process and appropriate techniques that might be employed for the control and monitoring of air pollution arising from those processes is provided in the relevant Department of the Environment Process Guidance Notes, PG6/28, 'Rubber Conversion Processes.'

This report details the results of the survey and reflects conditions prevailing during the above dates. Comparisons shall be made between the limits listed in the Guidance Note and the concentration results from this survey.

2. PROCESS DETAILS

VIP-Heinke is one of the UK's leading manufacturers of rubber seals and gaskets for various pipe systems. The process generally involves the blending of natural rubber or synthetic elastomers with additives, the product is then milled to complete the mixing and blending process. The final product is produced via injection or compression moulding, or extrusion. The process is served by LEV extraction systems, which vent to atmosphere via a separate stacks. No abatement is applied before venting with the exception of the rubber milling process, which utilises a fabric filter system.

3. STRATEGY

The following parameters listed below were measured to characterise the emissions from the exhaust stack from the process:

- gas flow
- gas temperature
- total particulate matter

A preliminary velocity profile of the gas stream was measured prior to the collection of sample to determine: -

- Whether a correct sampling plane has been chosen, i.e. the flow at the sampling plane is, ideally linear with no flow swirl.
- A range of flow characteristics which are used in the K-factor calculation which determines the isokinetic sampling rate.
- How many sampling points should be used on each traverse.
- Efflux velocity.
- Volumetric flowrate.

It is understood that at the time of the survey all processes were operating under normal conditions.

4. **METHODOLOGY.**

4.1 **Particulate Matter**

Gas flow measurements were taken using an 'L' type pitot tube connected to a micro- manometer in accordance with the methods recommended in BS ISO 9096:2003 'Stationary Source Emissions – Manual Determination of Mass Concentration of Particulate Matter'. Gas temperatures were measured using a 'k' type thermocouple.

Gas flow and temperature measurements were taken at intervals of approximately 0.1x the duct diameter. Deviations in recorded measurements allowed for the determination of the suitability of the line for isokinetic sampling.

Duplicate samples for particulate matter were collected on 37mm pre-weighed sample filters using a TCR Tecora Isostack Plus automatic sampling unit, in accordance with the main procedural requirements of BS ISO 9096:2003 'Stationary Source Emissions – Manual Determination of Mass Concentration of Particulate Matter'. Following monitoring the sample filters were dried, re-weighed and the total quantity of particulate collected calculated. Thus the emission concentration was calculated from measurements of gas stream flow-rate and filter weight gain.

Sampling was carried out on a 4, 8, 12 or 16 point grid, which was dependant on stack dimensions.

Control sampling filters were taken onto site and subjected to handling procedures similar to those on which the samples were collected. The weight gain from any resulting contamination was determined for each, and the average result was subtracted from results obtained for exposed filters.

4.2 Volatile Organic Compounds

Volatile organic compounds (VOCs) were measured by using a Bernath Atomic 3006 heated flame ionisation detector (FID), in accordance with BS EN 13562:2002 'Stationary source emissions – Determination of the Mass Concentration of Total Gaseous Organic Carbon in Flue Gases from Solvent Using Processes – Continuous Flame Ionisation Detector Method'. The instrument is calibrated on site against a known propane standard before and after the monitoring period. Concentration levels were continually logged for a one hour period using an electronic data logging device by taking measurements every second and then taking the average over a 1 minute period. Concentration levels measured were subsequently converted to a carbon equivalent to facilitate comparison with the relevant Process Guidance Note.

Conversion calculation :- ppm (propane) to mg/m³ (carbon)

FID reading (ppm propane) x

$$\frac{\text{molecular weight propane}}{\text{molar volume of ideal gas}(0^{\circ}\text{C})} \times \frac{\text{molecular weight carbon}}{\text{molecular weight propane}} \times \frac{\text{N}^{\circ} \text{ of carbon atoms (propane)}}{\text{N}^{\circ} \text{ of carbon atoms (carbon)}}$$

= mg/m³(carbon) at STP.

$$\text{i.e.: FID Reading (ppm propane)} \times \frac{44}{22.4} \times \frac{12}{44} \times \frac{3}{1} = \text{mg/m}^3(\text{carbon}) \text{ at STP}$$

or: FID Reading (ppm propane) x 1.608 = mg/m³(carbon) at STP

5. EMISSION LIMITS

Under the Environmental Protection Act 1990 a number of industrial processes have to be registered. The registration for Part A processes is controlled by The Environment Agency (formerly Her Majesty's Inspectorate of Pollution). These are potentially the more polluting processes. Those which are deemed to be of a less polluting nature are classed as Part B processes and are controlled by Local Authority Environmental Health Departments.

The concentration limits which apply to the processes studied are stated in PG6/28 'Rubber Conversion Processes.' The emission limits relevant to the monitoring at VIP Heinke Limited are given below.

Emission	Emission Limit
Total Particulate Matter (From the storage and handling of carbon black)	10 mg/m ³
Total Particulate Matter (From all other sources)	50 mg/m ³
Volatile Organic Compounds (as total carbon excluding particulate matter)	50 mg/m ³

Emissions concentrations to be expressed at reference conditions 273 °K, 101.3 kPa.

6. DISCUSSION AND RESULTS

6.1 Particulate Matter

Particulate emissions from all stacks returned low results. The highest emission concentration recorded was from the first run on Stack 26. A result of 1.801mg/m^3 was returned. This value represents approximately 4% of the emission limit.

Deviations from BS ISO 9096:2003

During the sampling programme, the following deviations from BS ISO 9096:2003 were noted:-

Sampling of Stack 44 could only be completed across one line because of a lack of adequate sampling points.

6.2 Volatile Organic Compounds (VOCs)

Monitoring for VOCs returned low results from all stacks. The highest result was returned by stack 75 at 3.565mg/m^3 (as carbon). This result represents 7% of the emission limit.

7. CONCLUSIONS

From the results shown in the summary section it can be seen that during the monitored period, particulate and VOC emission concentrations were below those limits specified in Process Guidance Note PG/28 'Rubber Conversion Processes'

SUMMARY

SUMMARY OF PARTICULATE EMISSIONS, VIP-HEINKE, HUNTINGDON
20TH – 21ST SEPTEMBER 2004

Stack Reference	Determinant	Mean Emission Level (mg/m ³)	Emission Limit (mg/m ³)
Stack 41	Particulate Matter (run 1)	<0.305	50
	Particulate Matter (run 2)	<0.299	50
Stack 18	Particulate Matter (run 1)	<0.145	50
	Particulate Matter (run 2)	<0.136	50
Stack 19	Particulate Matter (run 1)	<0.174	50
	Particulate Matter (run 2)	<0.299	50
Stack 21	Particulate Matter (run 1)	0.969	50
	Particulate Matter (run 2)	<0.169	50
Stack 23	Particulate Matter (run 1)	<0.165	50
	Particulate Matter (run 2)	<0.147	50
Stack 26	Particulate Matter (run 1)	1.801	50
	Particulate Matter (run 2)	<0.169	50
Stack 34	Particulate Matter (run 1)	<0.211	50
	Particulate Matter (run 2)	<0.237	50
Stack 36	Particulate Matter (run 1)	0.466	50
	Particulate Matter (run 2)	<0.211	50
Stack 37	Particulate Matter (run 1)	<0.154	50
	Particulate Matter (run 2)	<0.157	50
Stack 44	Particulate Matter (run 1)	<0.06	10
	Particulate Matter (run 2)	<0.06	10
Stack 75	Particulate Matter (run 1)	0.469	50
	Particulate Matter (run 2)	<0.310	50

All results expressed at reference conditions (101.3KPa, 273°K)

SUMMARY OF VOC EMISSIONS, VIP-HEINKE, HUNTINGDON
20TH – 21ST SEPTEMBER 2004

Stack Reference	Determinant	Mean Emission Level (mg/m ³)	Emission Limit (mg/m ³)
Stack 41	VOCs	0.590	50
Stack 18	VOCs	0.936	50
Stack 19	VOCs	2.400	50
Stack 21	VOCs	1.608	50
Stack 23	VOCs	3.111	50
Stack 26	VOCs	1.692	50
Stack 34	VOCs	0.402	50
Stack 36	VOCs	3.167	50
Stack 37	VOCs	1.314	50
Stack 44	VOCs	0.000	50
Stack 75	VOCs	3.565	50

All results expressed at reference conditions (101.3KPa, 273°K)

Appendix 1-
Particulate Matter
Sampling Data

PARTICULATE SAMPLING DATA SHEET

Site : VIP-Heinke

Date: 20/09/2004

System Used: TCRTecora

Engineer(s): DT/AS

Stack Title: Stack41

Stack Diameter: 0.80m

Stack Area: 0.50m²

Stack Form: Circular

Preliminary Traverse Points		1	2	3	4	5	6	7	8	9	10
Distance Along Axis		0.05d	0.15d	0.25d	0.35d	0.45d	0.55d	0.65d	0.75d	0.85d	0.95d
1st Sample Line	Pitot-static (Pa)	7	6	6	7	7	20	17	15	15	9
	Velocity (ms ⁻¹)	3.5	3.2	3.0	3.3	3.5	5.7	5.3	4.9	5.0	4.7
	Gas temp (°C)	29	29	29	29	29	29	29	29	29	29
2nd Sample Line	Pitot-static (Pa)	8	14	11	7	9	11	11	7	7	5
	Velocity (ms ⁻¹)	3.5	4.8	4.3	3.4	3.9	4.2	4.2	3.4	3.4	2.8
	Gas temp (°C)	29	29	29	29	29	29	29	29	29	29

Highest/lowest pitot-static reading <9:1	Yes
Max temperature variation <5%	Yes
Pre Sampling Leak Test Satisfactory	Yes

Barometric Pressure (Pa)	1013
Gas Meter Temp (°C)	16

Sampling Location Data		First Sample								Second Sample								Third Sample							
Sample Point		A1	A2	A3	A4	B1	B2	B3	B4	A1	A2	A3	A4	B1	B2	B3	B4								
Pitot-static (Pa)		29	20			24	39			21	16			9	36										
Velocity (ms ⁻¹)		5.4	4.9			3.9	4.8			5.4	3.4			3.4	5.8										
Pump Setting (l/m)		Automatic Pump Setting								Automatic Pump Setting															
Sampling Times		Nozzle (mm)		7.6		Time (sec)		180		Nozzle (mm)		7.6		Time (sec)		180									
Filter Identification Number		c259			Time On		09.18		c286			Time On		09.43											
					Time Off		09.30					Time Off		09.55											
					Total (mins)		12					Total (mins)		12											
Dry Gas Meter Data		ON	75248		Sample Volume		0.140 m ³		ON	75388		Sample Volume		0.147 m ³											
		OFF	75388		Volume at STP		0.131 m ³		OFF	75534		Volume at STP		0.134 m ³											
Post Sampling Leak Test Satisfactory		Yes								Yes															

Test Result Data	First Sample				Second Sample				Third Sample			
Mass Collected On Filter	<0.04 mg				<0.04 mg							
Particulate Concentration	<0.305 mg/m ³				<0.299 mg/m ³							

PARTICULATE SAMPLING DATA SHEET

Site : VIP-Heinke

Date: 20/09/2004

System Used: TCRTecora

Engineer(s): DT/AS

Stack Title: Stack 18

Stack Diameter: 0.30m

Stack Area: 0.07m²

Stack Form: Circular

Preliminary Traverse Points		1	2	3	4	5	6	7	8	9	10
Distance Along Axis		0.05d	0.15d	0.25d	0.35d	0.45d	0.55d	0.65d	0.75d	0.85d	0.95d
1st Sample Line	Pitot-static (Pa)	37	55	53	67	71	70	70	60	43	36
	Velocity (ms ⁻¹)	7.9	9.5	9.4	10.6	10.9	10.8	10.8	10.0	8.4	7.8
	Gas temp (°C)	27	27	27	27	27	27	27	27	27	27
2nd Sample Line	Pitot-static (Pa)	47	65	61	67	66	66	62	46	63	68
	Velocity (ms ⁻¹)	8.8	10.4	10.1	10.6	10.5	10.5	10.2	8.8	10.3	10.6
	Gas temp (°C)	27	27	27	27	27	27	27	27	27	27

Highest/lowest pitot-static reading <9:1	Yes
Max temperature variation <10%	Yes
Pre Sampling Leak Test Satisfactory	Yes

Barometric Pressure (Pa)	1011
Gas Meter Temp (°C)	23

Sampling Location Data		First Sample								Second Sample								Third Sample							
Sample Point		A1	A2	A3	A4	B1	B2	B3	B4	A1	A2	A3	A4	B1	B2	B3	B4								
Pitot-static (Pa)		68	116			38	93			79	115			90	92										
Velocity (ms ⁻¹)		10.2	10.7			8.3	11.9			9.5	11.1			12.2	10.3										
Pump Setting (l/m)		Automatic Pump Setting								Automatic Pump Setting															
Sampling Times		Nozzle (mm)		7.6		Time (sec)		180		Nozzle (mm)		7.6		Time (sec)		180									
Filter Identification Number		b273			Time On		15.00		b290			Time On		15.20											
					Time Off		15.12					Time Off		15.32											
					Total (mins)		12					Total (mins)		12											
Dry Gas Meter Data		ON	77789		Sample Volume		0.303 m ³		ON	78092		Sample Volume		0.324 m ³											
		OFF	78092		Volume at STP		0.275 m ³		OFF	78416		Volume at STP		0.295 m ³											
Post Sampling Leak Test Satisfactory		Yes								Yes															

Test Result Data	First Sample				Second Sample				Third Sample			
Mass Collected On Filter	<0.04 mg				<0.04 mg							
Particulate Concentration	<0.145 mg/m ³				<0.136 mg/m ³							

PARTICULATE SAMPLING DATA SHEET

Site : VIP-Heinke

Date: 20/09/2004

System Used: TCRTecora

Engineer(s): DT/AS

Stack Title: Stack 19

Stack Diameter: 0.50m

Stack Area: 0.20m²

Stack Form: Circular

Preliminary Traverse Points		1	2	3	4	5	6	7	8	9	10
Distance Along Axis		0.05d	0.15d	0.25d	0.35d	0.45d	0.55d	0.65d	0.75d	0.85d	0.95d
1st Sample Line	Pitot-static (Pa)	36	38	35	33	28	28	20	20	22	28
	Velocity (ms ⁻¹)	7.8	7.9	7.7	7.4	6.8	6.8	5.7	5.7	6.1	6.8
	Gas temp (°C)	26	26	26	26	26	26	26	26	26	26
2nd Sample Line	Pitot-static (Pa)	45	38	34	24	21	33	33	42	42	42
	Velocity (ms ⁻¹)	8.7	8.0	7.5	6.4	5.7	7.4	7.4	8.4	8.4	8.4
	Gas temp (°C)	26	26	26	26	26	26	26	26	26	26

Highest/lowest pitot-static reading <9:1	Yes
Max temperature variation <10%	Yes
Pre Sampling Leak Test Satisfactory	Yes

Barometric Pressure (Pa)	1011
Gas Meter Temp (°C)	23

Sampling Location Data		First Sample								Second Sample								Third Sample							
Sample Point		A1	A2	A3	A4	B1	B2	B3	B4	A1	A2	A3	A4	B1	B2	B3	B4								
Pitot-static (Pa)		34	70			67	61			51	84			23	71										
Velocity (ms ⁻¹)		7.9	8.2			8.8	7.9			7.8	8.1			7.6	8.3										
Pump Setting (l/m)		Automatic Pump Setting								Automatic Pump Setting															
Sampling Times		Nozzle (mm)		7.6		Time (sec)		180		Nozzle (mm)		7.6		Time (sec)		180									
Filter Identification Number		b271			Time On		14.28		b286			Time On		14.45											
					Time Off		14.40					Time Off		14.57											
					Total (mins)		12					Total (mins)		12											
Dry Gas Meter Data		ON	77274		Sample Volume		0.251 m ³		ON	77525		Sample Volume		0.264 m ³											
		OFF	77525		Volume at STP		0230 m ³		OFF	77789		Volume at STP		0.239 m ³											
Post Sampling Leak Test Satisfactory		Yes								Yes															

Test Result Data	First Sample	Second Sample	Third Sample
Mass Collected On Filter	<0.04 mg	<0.04 mg	
Particulate Concentration	<0.174 mg/m ³	<0.299 mg/m ³	

PARTICULATE SAMPLING DATA SHEET

Site : VIP-Heinke

Date: 20/09/2004

System Used: TCRTecora

Engineer(s): DT/AS

Stack Title: Stack 21

Stack Diameter: 0.28m

Stack Area: 0.06m²

Stack Form: Circular

Preliminary Traverse Points		1	2	3	4	5	6	7	8	9	10
Distance Along Axis		0.05d	0.15d	0.25d	0.35d	0.45d	0.55d	0.65d	0.75d	0.85d	0.95d
1st Sample Line	Pitot-static (Pa)	34	36	43	43	48	46	49	47	33	54
	Velocity (ms ⁻¹)	7.5	7.8	8.5	8.5	9.0	8.8	9.0	8.9	7.4	9.4
	Gas temp (°C)	25	25	25	25	25	25	25	25	25	25
2nd Sample Line	Pitot-static (Pa)	39	40	40	49	37	27	37	42	42	40
	Velocity (ms ⁻¹)	8.1	8.2	8.2	9.1	7.8	7.9	8.4	8.4	8.2	7.5
	Gas temp (°C)	25	25	25	25	25	25	25	25	25	25

Highest/lowest pitot-static reading <9:1	Yes
Max temperature variation <10%	Yes
Pre Sampling Leak Test Satisfactory	Yes

Barometric Pressure (Pa)	1011
Gas Meter Temp (°C)	25

Sampling Location Data		First Sample								Second Sample								Third Sample							
Sample Point		A1	A2	A3	A4	B1	B2	B3	B4	A1	A2	A3	A4	B1	B2	B3	B4								
Pitot-static (Pa)		43	57			89	56			72	67			58	93										
Velocity (ms ⁻¹)		7.8	7.7			7.2	7.4			8.9	9.4			8.2	8.5										
Pump Setting (l/m)		Automatic Pump Setting								Automatic Pump Setting															
Sampling Times		Nozzle (mm)		7.6		Time (sec)		180		Nozzle (mm)		7.6		Time (sec)		180									
Filter Identification Number		z248			Time On		13.45		z249			Time On		14.00											
					Time Off		13.57					Time Off		14.12											
					Total (mins)		12					Total (mins)		12											
Dry Gas Meter Data		ON	76757		Sample Volume		0.251 m ³		ON	77008		Sample Volume		0.266 m ³											
		OFF	77008		Volume at STP		0.227 m ³		OFF	77274		Volume at STP		0.240 m ³											
Post Sampling Leak Test Satisfactory		Yes								Yes															

Test Result Data	First Sample				Second Sample				Third Sample			
Mass Collected On Filter	0.22 mg				<0.04 mg							
Particulate Concentration	0.969 mg/m ³				<0.167 mg/m ³							

PARTICULATE SAMPLING DATA SHEET

Site : VIP-Heinke

Date: 20/09/2004

System Used: TCRTecora

Engineer(s): DT/AS

Stack Title: Stack 23

Stack Diameter: 0.48m

Stack Area: 0.18m²

Stack Form: Circular

Preliminary Traverse Points		1	2	3	4	5	6	7	8	9	10
Distance Along Axis		0.05d	0.15d	0.25d	0.35d	0.45d	0.55d	0.65d	0.75d	0.85d	0.95d
1st Sample Line	Pitot-static (Pa)	78	98	99	33	13	32	60	87	95	56
	Velocity (ms ⁻¹)	11.4	12.8	12.8	7.4	4.6	7.3	10.0	12.1	12.6	9.7
	Gas temp (°C)	30	30	30	30	30	30	30	30	30	30
2nd Sample Line	Pitot-static (Pa)	30	20	29	91	91	89	51	26	26	91
	Velocity (ms ⁻¹)	7.0	5.7	7.0	12.3	12.3	12.2	9.2	6.5	6.5	12.3
	Gas temp (°C)	30	30	30	30	30	30	30	30	30	30

Highest/lowest pitot-static reading <9:1	Yes
Max temperature variation <10%	Yes
Pre Sampling Leak Test Satisfactory	Yes

Barometric Pressure (Pa)	1011
Gas Meter Temp (°C)	25

Sampling Location Data		First Sample								Second Sample								Third Sample							
Sample Point		A1	A2	A3	A4	B1	B2	B3	B4	A1	A2	A3	A4	B1	B2	B3	B4								
Pitot-static (Pa)		44	114			105	33			90	82			64	68										
Velocity (ms ⁻¹)		7.8	10.3			10.5	6.5			12.1	9.1			10.1	7.4										
Pump Setting (l/m)		Automatic Pump Setting								Automatic Pump Setting															
Sampling Times		Nozzle (mm)		7.6		Time (sec)		180		Nozzle (mm)		7.6		Time (sec)		180									
Filter Identification Number		b268			Time On		16.20		b284			Time On		16.40											
					Time Off		16.32					Time Off		16.52											
					Total (mins)		12					Total (mins)		12											
Dry Gas Meter Data		ON	78970		Sample Volume		0.276 m ³		ON	79246		Sample Volume		0.299 m ³											
		OFF	79246		Volume at STP		0.243 m ³		OFF	79545		Volume at STP		0.273 m ³											
Post Sampling Leak Test Satisfactory		Yes								Yes															

Test Result Data	First Sample				Second Sample				Third Sample			
Mass Collected On Filter	0.07 mg				0.14 mg							
Particulate Concentration	0.24 mg/m ³				0.49 mg/m ³							

PARTICULATE SAMPLING DATA SHEET

Site : VIP-Heinke

Date: 20/09/2004

System Used: TCRTecora

Engineer(s): DT/AS

Stack Title: Stack 26

Stack Diameter: 0.32m

Stack Area: 0.08m²

Stack Form: Circular

Preliminary Traverse Points		1	2	3	4	5	6	7	8	9	10
Distance Along Axis		0.05d	0.15d	0.25d	0.35d	0.45d	0.55d	0.65d	0.75d	0.85d	0.95d
1st Sample Line	Pitot-static (Pa)	19	35	32	40	40	44	44	27	27	26
	Velocity (ms ⁻¹)	5.6	7.7	7.3	8.1	8.1	8.6	8.6	6.7	6.7	6.6
	Gas temp (°C)	26	26	26	26	26	26	26	26	26	26
2nd Sample Line	Pitot-static (Pa)	23	30	36	36	23	20	22	17	19	29
	Velocity (ms ⁻¹)	6.1	7.1	7.8	7.8	6.5	5.7	6.0	5.3	5.7	6.9
	Gas temp (°C)	26	26	26	26	26	26	26	26	26	26

Highest/lowest pitot-static reading <9:1	Yes
Max temperature variation <10%	Yes
Pre Sampling Leak Test Satisfactory	Yes

Barometric Pressure (Pa)	1004
Gas Meter Temp (°C)	19

Sampling Location Data		First Sample								Second Sample								Third Sample							
Sample Point		A1	A2	A3	A4	B1	B2	B3	B4	A1	A2	A3	A4	B1	B2	B3	B4								
Pitot-static (Pa)		60	56			55	55			59	72			61	59										
Velocity (ms ⁻¹)		7.8	7.1			8.0	7.5			8.3	8.5			8.5	8.7										
Pump Setting (l/m)		Automatic Pump Setting								Automatic Pump Setting															
Sampling Times		Nozzle (mm)		7.6		Time (sec)		180		Nozzle (mm)		7.6		Time (sec)		180									
Filter Identification Number		c255			Time On		11.25		c290			Time On		11.40											
					Time Off		11.37					Time Off		11.52											
					Total (mins)		12					Total (mins)		12											
Dry Gas Meter Data		ON	75875		Sample Volume		0.299 m ³		ON	76104		Sample Volume		0.256 m ³											
		OFF	76104		Volume at STP		0.211 m ³		OFF	76360		Volume at STP		0.236 m ³											
Post Sampling Leak Test Satisfactory		Yes								Yes															

Test Result Data	First Sample				Second Sample				Third Sample			
Mass Collected On Filter	0.38 mg				<0.04 mg							
Particulate Concentration	1.801 mg/m ³				<0.169 mg/m ³							

PARTICULATE SAMPLING DATA SHEET

Site : VIP-Heinke

Date: 20/09/2004

System Used: TCRTecora

Engineer(s): DT/AS

Stack Title: Stack 34

Stack Diameter: 0.32m

Stack Area: 0.08m²

Stack Form: Circular

Preliminary Traverse Points		1	2	3	4	5	6	7	8	9	10
Distance Along Axis		0.05d	0.15d	0.25d	0.35d	0.45d	0.55d	0.65d	0.75d	0.85d	0.95d
1st Sample Line	Pitot-static (Pa)	6	24	25	15	11	11	9	9	7	10
	Velocity (ms ⁻¹)	3.2	6.4	6.5	5.0	4.2	4.2	3.9	3.9	3.5	4.2
	Gas temp (°C)	25	25	25	25	25	25	25	25	25	25
2nd Sample Line	Pitot-static (Pa)	7	19	10	12	4	8	6	8	6	6
	Velocity (ms ⁻¹)	3.4	4.1	4.4	2.5	3.5	3.1	3.5	3.2	3.1	3.2
	Gas temp (°C)	25	25	25	25	25	25	25	25	25	25

Highest/lowest pitot-static reading <9:1	Yes
Max temperature variation <10%	Yes
Pre Sampling Leak Test Satisfactory	Yes

Barometric Pressure (Pa)	1003
Gas Meter Temp (°C)	23

Sampling Location Data		First Sample								Second Sample								Third Sample							
Sample Point		A1	A2	A3	A4	B1	B2	B3	B4	A1	A2	A3	A4	B1	B2	B3	B4								
Pitot-static (Pa)		53	34			38	25			28	38			50	28										
Velocity (ms ⁻¹)		8.1	8.4			6.3	5.5			6.3	5.5			5.6	6.3										
Pump Setting (l/m)		Automatic Pump Setting								Automatic Pump Setting															
Sampling Times		Nozzle (mm)		7.6		Time (sec)		180		Nozzle (mm)		7.6		Time (sec)		180									
Filter Identification Number		y239			Time On		11.55		y247			Time On		12.10											
					Time Off		12.07					Time Off		12.22											
					Total (mins)		12					Total (mins)		12											
Dry Gas Meter Data		ON	76360		Sample Volume		0.210 m ³		ON	76570		Sample Volume		0.187 m ³											
		OFF	76570		Volume at STP		0.190 m ³		OFF	76757		Volume at STP		0.169 m ³											
Post Sampling Leak Test Satisfactory		Yes								Yes															

Test Result Data	First Sample				Second Sample				Third Sample			
Mass Collected On Filter	<0.04 mg				<0.04 mg							
Particulate Concentration	<0.211 mg/m ³				<0.237 mg/m ³							

PARTICULATE SAMPLING DATA SHEET

Site : VIP-Heinke

Date: 20/09/2004

System Used: TCR Tecora

Engineer(s): DT/AS

Stack Title: Stack 36

Stack Diameter: 0.30m

Stack Area: 0.07m²

Stack Form: Circular

Preliminary Traverse Points		1	2	3	4	5	6	7	8	9	10
Distance Along Axis		0.05d	0.15d	0.25d	0.35d	0.45d	0.55d	0.65d	0.75d	0.85d	0.95d
1st Sample Line	Pitot-static (Pa)	19	50	38	32	26	26	28	17	17	24
	Velocity (ms ⁻¹)	5.6	9.1	8.0	7.3	6.6	6.6	6.8	3.4	3.4	6.4
	Gas temp (°C)	33	33	33	33	33	33	33	33	33	33
2nd Sample Line	Pitot-static (Pa)	36	63	64	61	54	54	39	22	22	11
	Velocity (ms ⁻¹)	7.9	10.3	10.3	10.1	9.5	9.5	8.1	6.1	6.1	4.2
	Gas temp (°C)	33	33	33	33	33	33	33	33	33	33

Highest/lowest pitot-static reading <9:1	Yes
Max temperature variation <10%	Yes
Pre Sampling Leak Test Satisfactory	Yes

Barometric Pressure (Pa)	994
Gas Meter Temp (°C)	23

Sampling Location Data		First Sample								Second Sample								Third Sample							
Sample Point		A1	A2	A3	A4	B1	B2	B3	B4	A1	A2	A3	A4	B1	B2	B3	B4								
Pitot-static (Pa)		57	87			45	66			84	72			53	66										
Velocity (ms ⁻¹)		9.4	10.6			9.1	8.6			9.7	10.4			10.2	9.2										
Pump Setting (l/m)		Automatic Pump Setting								Automatic Pump Setting															
Sampling Times		Nozzle (mm)		7.6		Time (sec)		180		Nozzle (mm)		7.6		Time (sec)		180									
Filter Identification Number		b280			Time On		17.00		b281			Time On		17.18											
					Time Off		17.12					Time Off		17.30											
					Total (mins)		12					Total (mins)		12											
Dry Gas Meter Data		ON	79545		Sample Volume		0.263 m ³		ON	79808		Sample Volume		0.213 m ³											
		OFF	79809		Volume at STP		0.236 m ³		OFF	80021		Volume at STP		0.190 m ³											
Post Sampling Leak Test Satisfactory		Yes								Yes															

Test Result Data	First Sample				Second Sample				Third Sample			
Mass Collected On Filter	0.11 mg				<0.04 mg							
Particulate Concentration	0.466 mg/m ³				<0.211 mg/m ³							

PARTICULATE SAMPLING DATA SHEET

Site : VIP-Heinke

Date: 20/09/2004

System Used: TCRTecora

Engineer(s): DT/AS

Stack Title: Stack 37

Stack Diameter: 0.30m

Stack Area: 0.07m²

Stack Form: Circular

Preliminary Traverse Points		1	2	3	4	5	6	7	8	9	10
Distance Along Axis		0.05d	0.15d	0.25d	0.35d	0.45d	0.55d	0.65d	0.75d	0.85d	0.95d
1st Sample Line	Pitot-static (Pa)	28	46	46	42	40	36	31	28	28	39
	Velocity (ms ⁻¹)	6.8	8.7	8.7	9.3	8.2	7.8	7.2	6.9	6.9	8.0
	Gas temp (°C)	33	33	33	33	33	33	33	33	33	33
2nd Sample Line	Pitot-static (Pa)	39	51	49	49	49	48	46	40	40	40
	Velocity (ms ⁻¹)	8.0	9.2	9.1	9.1	9.1	8.9	8.8	8.5	8.1	8.2
	Gas temp (°C)	33	33	33	33	33	33	33	33	33	33

Highest/lowest pitot-static reading <9:1	Yes
Max temperature variation <10%	Yes
Pre Sampling Leak Test Satisfactory	Yes

Barometric Pressure (Pa)	1040
Gas Meter Temp (°C)	26

Sampling Location Data		First Sample								Second Sample								Third Sample							
Sample Point		A1	A2	A3	A4	B1	B2	B3	B4	A1	A2	A3	A4	B1	B2	B3	B4								
Pitot-static (Pa)		88	57			82	76			51	49			48	79										
Velocity (ms ⁻¹)		10.8	10.2			10.5	8.4			9.1	9.3			9.6	8.8										
Pump Setting (l/m)		Automatic Pump Setting								Automatic Pump Setting															
Sampling Times		Nozzle (mm)		7.6		Time (sec)		180		Nozzle (mm)		7.6		Time (sec)		180									
Filter Identification Number		b278			Time On		15.45		b279			Time On		16.00											
					Time Off		15.57					Time Off		16.12											
					Total (mins)		12					Total (mins)		20											
Dry Gas Meter Data		ON	78416		Sample Volume		0.298m ³		ON	78700		Sample Volume		0.270 m ³											
		OFF	78700		Volume at STP		0.271m ³		OFF	79970		Volume at STP		0.254 m ³											
Post Sampling Leak Test Satisfactory		Yes								Yes															

Test Result Data	First Sample				Second Sample				Third Sample			
Mass Collected On Filter	<0.04 mg				<0.04 mg							
Particulate Concentration	0.154 mg/m ³				<0.157 mg/m ³							

PARTICULATE SAMPLING DATA SHEET

Site : VIP-Heinke

Date: 21/09/2004

System Used: TCRTecora

Engineer(s): DT/AS

Stack Title: Stack 44

Stack Diameter: 0.32m

Stack Area: 0.08m²

Stack Form: Circular

Preliminary Traverse Points		1	2	3	4	5	6	7	8	9	10
Distance Along Axis		0.05d	0.15d	0.25d	0.35d	0.45d	0.55d	0.65d	0.75d	0.85d	0.95d
1st Sample Line	Pitot-static (Pa)	46	45	40	47	41	38	34	29	36	28
	Velocity (ms ⁻¹)	8.8	8.6	8.2	8.8	8.3	8.0	7.5	7.0	7.8	6.9
	Gas temp (°C)	21	21	21	21	21	21	21	21	21	21
2nd Sample Line	Pitot-static (Pa)	-	-	-	-	-	-	-	-	-	-
	Velocity (ms ⁻¹)	-	-	-	-	-	-	-	-	-	-
	Gas temp (°C)	-	-	-	-	-	-	-	-	-	-

Highest/lowest pitot-static reading <9:1	Yes
Max temperature variation <10%	Yes
Pre Sampling Leak Test Satisfactory	Yes

Barometric Pressure (Pa)	1013
Gas Meter Temp (°C)	15

Sampling Location Data		First Sample								Second Sample								Third Sample							
Sample Point		A1	A2	A3	A4	B1	B2	B3	B4	A1	A2	A3	A4	B1	B2	B3	B4								
Pitot-static (Pa)		294	428			-	-			216	190			-	-										
Velocity (ms ⁻¹)		21.5	23.3			-	-			19.0	18.7			-	-										
Pump Setting (l/m)		Automatic Pump Setting								Automatic Pump Setting															
Sampling Times		Nozzle (mm)		6		Time (sec)		600		Nozzle (mm)		6		Time (sec)		600									
Filter Identification Number		b291			Time On		09.15		b293			Time On		09.50											
					Time Off		09.35					Time Off		10.10											
					Total (mins)		20					Total (mins)		20											
Dry Gas Meter Data		ON	80021		Sample Volume		0.719 m ³		ON	80740		Sample Volume		0.654 m ³											
		OFF	80740		Volume at STP		0.612 m ³		OFF	81394		Volume at STP		0.602 m ³											
Post Sampling Leak Test Satisfactory		Yes								Yes															

Test Result Data	First Sample				Second Sample				Third Sample			
Mass Collected On Filter	<0.04 mg				<0.04 mg							
Particulate Concentration	<0.06 mg/m ³				<0.06 mg/m ³							

PARTICULATE SAMPLING DATA SHEET

Site : VIP-Heinke

Date: 20/09/2004

System Used: TCRTecora

Engineer(s): DT/AS

Stack Title: Stack 75

Stack Diameter: 0.30m

Stack Area: 0.07m²

Stack Form: Circular

Preliminary Traverse Points		1	2	3	4	5	6	7	8	9	10
Distance Along Axis		0.05d	0.15d	0.25d	0.35d	0.45d	0.55d	0.65d	0.75d	0.85d	0.95d
1st Sample Line	Pitot-static (Pa)	6	13	7	8	3	5	7	5	12	2
	Velocity (ms ⁻¹)	3.1	4.6	3.3	3.6	2.4	2.8	3.5	3.0	4.5	2.0
	Gas temp (°C)	29	29	29	29	29	29	29	29	29	29
2nd Sample Line	Pitot-static (Pa)	7	11	2	5	5	3	9	5	8	9
	Velocity (ms ⁻¹)	3.4	4.3	1.6	2.9	2.9	2.2	3.8	2.9	3.5	3.8
	Gas temp (°C)	29	29	29	29	29	29	29	29	29	29

Highest/lowest pitot-static reading <9:1	Yes
Max temperature variation <10%	Yes
Pre Sampling Leak Test Satisfactory	Yes

Barometric Pressure (Pa)	1014
Gas Meter Temp (°C)	19

Sampling Location Data		First Sample								Second Sample								Third Sample							
Sample Point		A1	A2	A3	A4	B1	B2	B3	B4	A1	A2	A3	A4	B1	B2	B3	B4								
Pitot-static (Pa)		27	26			30	51			36	31			28	35										
Velocity (ms ⁻¹)		5.2	5.7			3.4	5.6			6.0	3.2			8.4	6.1										
Pump Setting (l/m)		Automatic Pump Setting								Automatic Pump Setting															
Sampling Times		Nozzle (mm)		7.6		Time (sec)		180		Nozzle (mm)		7.6		Time (sec)		180									
Filter Identification Number		c267			Time On		10.12		c276			Time On		10.30											
					Time Off		10.24					Time Off		10.42											
					Total (mins)		12					Total (mins)		12											
Dry Gas Meter Data		ON	75532		Sample Volume		0.138 m ³		ON	75670		Sample Volume		0.205 m ³											
		OFF	75670		Volume at STP		0.128 m ³		OFF	75975		Volume at STP		0.129 m ³											
Post Sampling Leak Test Satisfactory		Yes								Yes															

Test Result Data	First Sample				Second Sample				Third Sample			
Mass Collected On Filter	0.06 mg				<0.04 mg							
Particulate Concentration	<0.469 mg/m ³				<0.310 mg/m ³							

Appendix 2-
VOC Sampling Data

VOC SAMPLING DATA SHEET

SITE: VIP Heinke DATE: 20.09.04
 STACK TITLE: Stack 41

MASS FLOWRATES.

Efflux Velocity:	4.2	m/s
Stack Diameter:	0.80	m
Cross Sectional Area:	0.50	m ²
Mass volume flow rate (at reference conditions):	2.111	m ³ /s
Temperature within the stack:	302	°K
Barometric Pressure:	1013	Pa

Run 1	
Start Time	09.00
Time (mins)	
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	1
9	0
10	1
11	1
12	1
13	0
14	1
15	0

Mean = 0.33 ppm Propane

Run 2	
Start Time	09.15
Time (mins)	
1	1
2	1
3	1
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	1
15	0

Mean = 0.27 ppm Propane

Run 3	
Start Time	09.30
Time (mins)	
1	1
2	1
3	1
4	1
5	1
6	1
7	0
8	0
9	0
10	1
11	0
12	1
13	0
14	1
15	0

Mean = 0.60 ppm Propane

Run 4	
Start Time	09.45
Time (mins)	
1	1
2	1
3	1
4	1
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0

Mean = 0.27 ppm Propane

Mean Run 1 =	0.33 ppm	=	0.563 mg/m ³	Results as mg/m ³ Referenced to 273°K and 101.3kPa (STP) as Total Carbon
Mean Run 2 =	0.27 ppm	=	0.428 mg/m ³	
Mean Run 3 =	0.60 ppm	=	0.965 mg/m ³	
Mean Run 4 =	0.27 ppm	=	0.428 mg/m ³	
Total Mean =	0.36 ppm	=	0.590 mg/m ³	

VOC SAMPLING DATA SHEET

SITE: VIP Heinke **DATE:** 20.09.04
STACK TITLE: Stack 18

MASS FLOWRATES.

Efflux Velocity:	9.8	m/s
Stack Diameter:	0.3	m
Cross Sectional Area:	0.07	m ²
Mass volume flow rate (at reference conditions):	0.692	m ³ /s
Temperature within the stack:	300	°K
Barometric Pressure:	1013	Pa

Run 1	
Start Time	10.00
Time (mins)	
1	1
2	1
3	1
4	1
5	1
6	1
7	1
8	1
9	0
10	1
11	0
12	1
13	1
14	0
15	0

Mean = 0.73 ppm Propane

Run 2	
Start Time	10.15
Time (mins)	
1	1
2	1
3	1
4	1
5	1
6	1
7	0
8	1
9	0
10	1
11	1
12	0
13	0
14	1
15	0

Mean = 0.67 ppm Propane

Run 3	
Start Time	10.30
Time (mins)	
1	1
2	1
3	1
4	1
5	1
6	1
7	1
8	1
9	0
10	0
11	1
12	0
13	1
14	0
15	1

Mean = 0.73 ppm Propane

Run 4	
Start Time	10.45
Time (mins)	
1	1
2	1
3	1
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0

Mean = 0.20 ppm Propane

Mean Run 1 =	0.73 ppm	=	1.172 mg/m ³	Results as mg/m ³ Referenced to 273°K and 101.3kPa (STP) as Total Carbon
Mean Run 2 =	0.67 ppm	=	1.072 mg/m ³	
Mean Run 3 =	0.73 ppm	=	1.179 mg/m ³	
Mean Run 4 =	0.20 ppm	=	0.321 mg/m ³	
Total Mean =	0.58 ppm	=	0.936 mg/m ³	

VOC SAMPLING DATA SHEET

SITE: VIP Heinke **DATE:** 20.09.04
STACK TITLE: Stack 19

MASS FLOWRATES.

Efflux Velocity:	7.3	m/s
Stack Diameter:	0.3	m
Cross Sectional Area:	0.07	m ²
Mass volume flow rate (at reference conditions):	0.511	m ³ /s
Temperature within the stack:	298	°K
Barometric Pressure:	1013	Pa

Run 1	
Start Time	11.00
Time (mins)	
1	1
2	1
3	1
4	1
5	1
6	2
7	2
8	1
9	2
10	1
11	2
12	1
13	1
14	1
15	2

Mean = 1.33 ppm Propane

Run 2	
Start Time	11.15
Time (mins)	
1	2
2	2
3	2
4	2
5	2
6	2
7	1
8	1
9	1
10	1
11	1
12	1
13	1
14	1
15	1

Mean = 1.40 ppm Propane

Run 3	
Start Time	11.30
Time (mins)	
1	1
2	2
3	2
4	2
5	2
6	2
7	1
8	2
9	3
10	2
11	1
12	2
13	1
14	2
15	1

Mean = 1.73 ppm Propane

Run 4	
Start Time	11.45
Time (mins)	
1	2
2	2
3	2
4	2
5	2
6	2
7	2
8	1
9	1
10	1
11	1
12	1
13	2
14	1
15	1

Mean = 1.53 ppm Propane

Mean Run 1 =	1.33 ppm	=	2.140 mg/m ³	Results as mg/m ³ Referenced to 273°K and 101.3kPa (STP) as Total Carbon
Mean Run 2 =	1.40 ppm	=	2.250 mg/m ³	
Mean Run 3 =	1.73 ppm	=	2.780 mg/m ³	
Mean Run 4 =	1.53 ppm	=	2.400 mg/m ³	
Total Mean =	1.49 ppm	=	2.400 mg/m ³	

VOC SAMPLING DATA SHEET

SITE: VIP Heinke **DATE:** 20.09.04
STACK TITLE: Stack 21

MASS FLOWRATES.

Efflux Velocity:	8.3	m/s
Stack Diameter:	0.3	m
Cross Sectional Area:	0.07	m ²
Mass volume flow rate (at reference conditions):	0.586	m ³ /s
Temperature within the stack:	298	°K
Barometric Pressure:	1013	Pa

Run 1	
Start Time	12.00
Time (mins)	
1	1
2	1
3	1
4	1
5	1
6	1
7	1
8	1
9	1
10	1
11	1
12	1
13	1
14	1
15	1

Mean = 1.0 ppm Propane

Run 2	
Start Time	12.15
Time (mins)	
1	1
2	1
3	1
4	1
5	1
6	1
7	1
8	1
9	1
10	1
11	1
12	1
13	1
14	1
15	1

Mean = 1.0 ppm Propane

Run 3	
Start Time	12.30
Time (mins)	
1	1
2	1
3	1
4	1
5	1
6	1
7	1
8	1
9	1
10	1
11	1
12	1
13	1
14	1
15	1

Mean = 1.0 ppm Propane

Run 4	
Start Time	12.45
Time (mins)	
1	1
2	1
3	1
4	1
5	1
6	1
7	1
8	1
9	1
10	1
11	1
12	1
13	1
14	1
15	1

Mean = 1.0 ppm Propane

Mean Run 1 =	1.0 ppm	=	1.608 mg/m ³	Results as mg/m³ Referenced to 273°K and 101.3kPa (STP) as Total Carbon
Mean Run 2 =	1.0 ppm	=	1.608 mg/m ³	
Mean Run 3 =	1.0 ppm	=	1.608 mg/m ³	
Mean Run 4 =	1.0 ppm	=	1.608 mg/m ³	
Total Mean =	1.0 ppm	=	1.608 mg/m³	

VOC SAMPLING DATA SHEET

SITE: VIP Heinke **DATE:** 20.09.04
STACK TITLE: Stack 23

MASS FLOWRATES.

Efflux Velocity:	10.0	m/s
Stack Diameter:	0.48	m
Cross Sectional Area:	0.18	m ²
Mass volume flow rate (at reference conditions):	1.809	m ³ /s
Temperature within the stack:	300	°K
Barometric Pressure:	1013	Pa

Run 1	
Start Time	13.00
Time (mins)	
1	2
2	2
3	2
4	2
5	2
6	2
7	2
8	3
9	2
10	1
11	2
12	2
13	2
14	2
15	2

Mean = 2.00 ppm Propane

Run 2	
Start Time	13.15
Time (mins)	
1	2
2	2
3	2
4	3
5	3
6	3
7	2
8	2
9	3
10	2
11	1
12	2
13	1
14	1
15	2

Mean = 2.07 ppm Propane

Run 3	
Start Time	13.30
Time (mins)	
1	2
2	1
3	1
4	1
5	1
6	1
7	1
8	1
9	1
10	1
11	2
12	2
13	2
14	2
15	2

Mean = 1.40 ppm Propane

Run 4	
Start Time	13.45
Time (mins)	
1	2
2	2
3	2
4	2
5	2
6	2
7	1
8	2
9	2
10	2
11	3
12	3
13	3
14	3
15	3

Mean = 2.27 ppm Propane

Mean Run 1 =	2.00 ppm	=	3.216 mg/m ³	Results as mg/m ³ Referenced to 273°K and 101.3kPa (STP) as Total Carbon
Mean Run 2 =	2.07 ppm	=	3.323 mg/m ³	
Mean Run 3 =	1.40 ppm	=	3.251 mg/m ³	
Mean Run 4 =	2.27 ppm	=	3.644 mg/m ³	
Total Mean =	1.94ppm	=	3.111 mg/m ³	

VOC SAMPLING DATA SHEET

SITE: VIP Heinke **DATE:** 20.09.04
STACK TITLE: Stack 26

MASS FLOWRATES.

Efflux Velocity:	<u>7.4</u>	m/s
Stack Diameter:	<u>0.3</u>	m
Cross Sectional Area:	<u>0.07</u>	m ²
Mass volume flow rate (at reference conditions):	<u>0.518</u>	m ³ /s
Temperature within the stack:	<u>298</u>	°K
Barometric Pressure:	<u>1013</u>	Pa

Run 1	
Start Time	14.00
Time (mins)	
1	0
2	0
3	0
4	0
5	0
6	1
7	2
8	1
9	1
10	1
11	1
12	1
13	1
14	0
15	1

Mean = 0.67 ppm Propane

Run 2	
Start Time	14.15
Time (mins)	
1	1
2	1
3	0
4	0
5	1
6	0
7	0
8	0
9	1
10	1
11	1
12	1
13	1
14	1
15	1

Mean = 0.67 ppm Propane

Run 3	
Start Time	14.30
Time (mins)	
1	1
2	1
3	1
4	2
5	2
6	2
7	2
8	2
9	2
10	2
11	1
12	1
13	2
14	2
15	2

Mean = 1.67 ppm Propane

Run 4	
Start Time	14.45
Time (mins)	
1	1
2	1
3	1
4	1
5	1
6	2
7	2
8	1
9	2
10	1
11	1
12	1
13	1
14	1
15	1

Mean = 1.20 ppm Propane

Mean Run 1 =	0.67 ppm	=	1.072 mg/m ³	Results as mg/m³ Referenced to 273°K and 101.3kPa (STP) as Total Carbon
Mean Run 2 =	0.67 ppm	=	1.072 mg/m ³	
Mean Run 3 =	1.67 ppm	=	2.68 mg/m ³	
Mean Run 4 =	1.20 ppm	=	1.929 mg/m ³	
Total Mean =	1.05 ppm	=	1.692 mg/m³	

MASS FLOWRATES.

Efflux Velocity:	7.2	m/s
Stack Diameter:	0.3	m
Cross Sectional Area:	0.07	m ²
Mass volume flow rate (at reference conditions):	0.504	m ³ /s
Temperature within the stack:	306	°K
Barometric Pressure:	1013	Pa

Run 1

Run 2

VOC SAMPLING DATA SHEET

MASS FLOWRATES.

Efflux Velocity:	4.5	m/s
Stack Diameter:	0.3	m
Cross Sectional Area:	0.07	m ²
Mass volume flow rate (at reference conditions):	3.150	m ³ /s
Temperature within the stack:	297	°K
Barometric Pressure:	1013	Pa

Run 1	
Start Time	15.00
Time (mins)	
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	1
10	0
11	0
12	0
13	0
14	0
15	0

Mean = 0.07 ppm Propane

Run 2	
Start Time	15.15
Time (mins)	
1	0
2	0
3	0
4	0
5	0
6	1
7	1
8	1
9	1
10	1
11	0
12	0
13	0
14	0
15	0

Mean = 0.33 ppm Propane

Run 3	
Start Time	15.30
Time (mins)	
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0

Mean = 0.00 ppm Propane

Run 4	
Start Time	15.45
Time (mins)	
1	0
2	1
3	1
4	1
5	1
6	1
7	1
8	1
9	1
10	1
11	0
12	0
13	0
14	0
15	0

Mean = 0.60 ppm Propane

Mean Run 1 =	0.07 ppm	=	0.112 mg/m ³	Results as mg/m ³ Referenced to 273°K and 101.3kPa (STP) as Total Carbon
Mean Run 2 =	0.33 ppm	=	0.536 mg/m ³	
Mean Run 3 =	0.00 ppm	=	0.000 mg/m ³	
Mean Run 4 =	0.60 ppm	=	0.964 mg/m ³	
Total Mean =	0.25 ppm	=	0.402 mg/m ³	

VOC SAMPLING DATA SHEET

SITE: VIP Heinke **DATE:** 20.09.04
STACK TITLE: Stack 37

MASS FLOWRATES.

Efflux Velocity:	<u>8.2</u>	m/s
Stack Diameter:	<u>0.3</u>	m
Cross Sectional Area:	<u>0.07</u>	m ²
Mass volume flow rate (at reference conditions):	<u>0.574</u>	m ³ /s
Temperature within the stack:	<u>303</u>	°K
Barometric Pressure:	<u>1013</u>	Pa

Run 1	
Start Time	17.00
Time (mins)	
1	1
2	1
3	1
4	0
5	0
6	0
7	0
8	0
9	0
10	1
11	1
12	1
13	1
14	0
15	0

Mean = 0.47 ppm Propane

Run 3	
Start Time	17.30
Time (mins)	
1	0
2	1
3	1
4	1
5	1
6	2
7	2
8	1
9	1
10	0
11	0
12	0
13	0
14	0
15	0

Mean = 0.67 ppm Propane

Run 2	
Start Time	17.15
Time (mins)	
1	1
2	1
3	1
4	1
5	1
6	1
7	1
8	1
9	1
10	1
11	1
12	1
13	1
14	1
15	1

Mean = 1.00 ppm Propane

Run 4	
Start Time	17.45
Time (mins)	
1	1
2	1
3	1
4	1
5	1
6	0
7	0
8	1
9	0
10	1
11	2
12	2
13	2
14	2
15	2

Mean = 1.13 ppm Propane

Mean Run 1 =	<u>0.47 ppm</u>	=	<u>0.750 mg/m³</u>	Results as mg/m³ Referenced to 273°K and 101.3kPa (STP) as Total Carbon
Mean Run 2 =	<u>1.00 ppm</u>	=	<u>1.608 mg/m³</u>	
Mean Run 3 =	<u>0.67 ppm</u>	=	<u>1.072 mg/m³</u>	
Mean Run 4 =	<u>1.13 ppm</u>	=	<u>1.822 mg/m³</u>	
Total Mean =	<u>0.82ppm</u>	=	<u>1.314 mg/m³</u>	

VOC SAMPLING DATA SHEET

SITE: VIP Heinke **DATE:** 21.09.04
STACK TITLE: Stack 44

MASS FLOWRATES.

Efflux Velocity:	8.0	m/s
Stack Diameter:	0.46	m
Cross Sectional Area:	0.16	m ²
Mass volume flow rate (at reference conditions):	1.329	m ³ /s
Temperature within the stack:	293	°K
Barometric Pressure:	1013	Pa

Run 1	
Start Time	09.00
Time (mins)	
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0

Mean = 0.00 ppm Propane

Run 2	
Start Time	09.15
Time (mins)	
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0

Mean = 0.00 ppm Propane

Run 3	
Start Time	09.30
Time (mins)	
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0

Mean = 0.00 ppm Propane

Run 4	
Start Time	09.45
Time (mins)	
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0

Mean = 0.00 ppm Propane

Mean Run 1 =	0.00 ppm	=	0.000 mg/m ³	Results as mg/m ³ Referenced to 273°K and 101.3kPa (STP) as Total Carbon
Mean Run 2 =	0.00 ppm	=	0.000 mg/m ³	
Mean Run 3 =	0.00 ppm	=	0.000 mg/m ³	
Mean Run 4 =	0.00 ppm	=	0.000 mg/m ³	
Total Mean =	0.00 ppm	=	0.000mg/m ³	

VOC SAMPLING DATA SHEET

SITE: VIP Heinke DATE: 21.09.04
 STACK TITLE: Stack 75

MASS FLOWRATES.

Efflux Velocity:	<u>3.3</u>	m/s
Stack Diameter:	<u>0.3</u>	m
Cross Sectional Area:	<u>0.07</u>	m ²
Mass volume flow rate (at reference conditions):	<u>0.230</u>	m ³ /s
Temperature within the stack:	<u>302</u>	°K
Barometric Pressure:	<u>1013</u>	Pa

Run 1	
Start Time	10.00
Time (mins)	
1	2
2	2
3	2
4	2
5	2
6	3
7	3
8	3
9	3
10	3
11	3
12	3
13	3
14	2
15	3

Mean = 2.60 ppm Propane

Run 2	
Start Time	10.15
Time (mins)	
1	2
2	2
3	2
4	1
5	1
6	1
7	3
8	3
9	3
10	3
11	3
12	3
13	3
14	3
15	3

Mean = 2.40 ppm Propane

Run 3	
Start Time	10.30
Time (mins)	
1	2
2	2
3	3
4	2
5	2
6	3
7	3
8	3
9	3
10	3
11	2
12	2
13	2
14	2
15	2

Mean = 2.40 ppm Propane

Run 4	
Start Time	10.45
Time (mins)	
1	2
2	1
3	1
4	1
5	2
6	2
7	2
8	2
9	2
10	2
11	1
12	1
13	1
14	1
15	1

Mean = 1.47 ppm Propane

Mean Run 1 =	2.60 ppm	=	4.180 mg/m ³	Results as mg/m ³ Referenced to 273°K and 101.3kPa (STP) as Total Carbon
Mean Run 2 =	2.40 ppm	=	3.859 mg/m ³	
Mean Run 3 =	2.40 ppm	=	3.859 mg/m ³	
Mean Run 4 =	1.47 ppm	=	2.358 mg/m ³	
Total Mean =	2.21 ppm	=	3.565 mg/m ³	