



**Davies & Co. (Environmental) Ltd**  
*Emissions Monitoring Specialists*

## **EMISSIONS MONITORING TEST REPORT**

**GILROES CREMATORIUM**  
**Groby Road**  
**Leicester**  
**LE3 9QG**

**8<sup>th</sup> - 10<sup>th</sup> November 2022**

**Streams 1 & 2 & Abatement Systems**

Report Authorised by \_\_\_\_\_ Date 8<sup>th</sup> December 2022

Technical Manager  
MCERTS level 2 (TE1, TE2, TE3 & TE4)  
Certified under the MCERTS scheme for Part B processes  
For the emission testing of crematoria  
MCERTS No. MM 16 1385

Gilroes Crematorium -KB/DEM-1948/08.12.22



**Davies & Co. (Environmental) Ltd**

Member of the Facultatieve Group

Moor Road  
Leeds, LS10 2DD, England  
Tel:

Email:

Registered in England, No. 715014  
VAT Registration No. GB 758435595  
Registered office: Moor Road, Leeds, LS10 2DD

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## EXECUTIVE SUMMARY

The results obtained from the annual emissions test of Gilroes Crematorium shows that cremators and abatement systems were compliant with the PG 5/2 (2012) requirements for the release of pollutants to atmosphere.

### Gilroes Stream 1 - Cremators 1 & 2 & Abatement System Emissions Monitoring November 2022

	Emission Result	Emission Limit Values PG5/2 (2012)	Compliant	Non-Compliant
Total Particulate Matter - mg/Nm <sup>3</sup> c.	2.08	<20	✓	
Hydrogen Chloride - mg/Nm <sup>3</sup> c.	0.96	<30	✓	
Carbon Monoxide - mg/Nm <sup>3</sup> c.	14.47	<100	✓	
Organic Compounds - mg/Nm <sup>3</sup> c.	3.24	<20	✓	
Mercury - µg/Nm <sup>3</sup> c.	1.06	<50	✓	

Note 1: All emissions as concentration levels are corrected to 11% v/v oxygen and dry gas

Note 2: Where multiple tests are performed for a given pollutant the emission result represents the average reading.

### Gilroes Stream 2 - Cremators 3 & 4 & Abatement System Emissions Monitoring November 2022

	Emission Result	Emission Limit Values PG5/2 (2012)	Compliant	Non-Compliant
Total Particulate Matter - mg/Nm <sup>3</sup> c.	4.83	<20	✓	
Hydrogen Chloride - mg/Nm <sup>3</sup> c.	5.52	<30	✓	
Carbon Monoxide - mg/Nm <sup>3</sup> c.	8.22	<100	✓	
Organic Compounds - mg/Nm <sup>3</sup> c.	2.25	<20	✓	
Mercury - µg/Nm <sup>3</sup> c.	4.91	<50	✓	

Note 1: All emissions as concentration levels are corrected to 11% v/v oxygen and dry gas

Note 2: Where multiple tests are performed for a given pollutant the emission result represents the average reading.

## 1. INTRODUCTION

The four cremators and two associated flue gas abatement systems at Gilroes Crematorium, Groby Road, Leicester, LE3 9QG were monitored on the 8<sup>th</sup>, 9<sup>th</sup> & 10<sup>th</sup> November 2022 to the requirements given in Process Guidance Note PG5/2 (2012) for emission releases to atmosphere.

The work was carried out on site by the following staff of Davies & Co (Engineering) Limited:

EA MCERTS Level 2  
MCERTS No: MM 18 1510

EA MCERTS Trainee  
MCERTS No: N/A

All test methods employed are the preferred methods given in the Environment Agency Technical Guidance Document M2 and Process Guidance Note PG 5/2 (2012) and were carried out using calibrated equipment. All analysis was conducted using UKAS approved methods.

The work on site involved monitoring the flue gas components after the flue gas abatement system fitted to the cremator with the plant operating normally.

The plant being tested comprises four cremators of model type FTIII, fitted with two nozzle-mix burners utilising natural gas as the support fuel.

The waste gases from Cremators 1 and 2 combine and are ducted to a common flue gas treatment plant which, throughout this report, is referred to as Stream 1. The treatment plant comprises a shell and tube boiler to cool the flue gases, a reagent feeder station that introduces a blend of activated carbon/sodium bicarbonate to react with the cooled gases, and a bag filter to clean the treated gases. The waste heat from the boiler in the form of warm water is dissipated to atmosphere via a finned tube air blast cooler situated outside the crematory.

The waste Gases from Cremators 3 and 4 combine and are ducted into a second flue gas treatment plant operating in the same manner as the plant attached to Cremators 1 and 2. This plant is referred to as Stream 2 throughout this report.

The plant operates under full microprocessor based automatic control that requires little manual intervention.

The cremators and flue gas abatement system were manufactured, installed and commissioned by Facultatieve Technologies Limited to meet the requirements of the Environmental Permitting (England & Wales) Regulations 2016 (EPR 2016) as relevant to new crematoria installations, summarised in Process Guidance Note PG5/2 (2012).

Measurements were undertaken to enable comparisons to be made of the operation of the cremators and associated abatement system with the requirements in terms of emission releases to air.

This report details the monitoring procedures used and the results obtained from this test work along with comparisons with the requirements and comments where appropriate.

Relevant procedures were followed to enable quality control to be maintained throughout the test preparation, site test work, laboratory analysis, calculations, and reporting.

The flue ducting and test points were in accordance with the requirements of EA TGN M1. Photographs of the sampling location are given below:

Stream 1:



Stream 2:



## 2. PROCEDURES

### 2.1 Total Particulate Matter

A flue gas sample was extracted and filtered to collect total particulate matter. A 47mm QMA filter paper was used with a particle retention of not less than 99.5% at a particle size of 0.3 micron. The flue gas extraction employed techniques given in BS EN 13284 Part 1.

The method employed was BS EN 13284 Part 1.

The sampling was conducted using apparatus in accordance with the requirements of BS EN 13284 Part 1.

This consisted of a heated known dimension Titanium nozzle, heated Titanium probe liner, heated Titanium filter housing with PTFE coated stainless steel frit containing glass microfibre filter (all heaters set to 160°C), PTFE sample line, borosilicate glass absorption impingers, gas dryer (silica gel), sample line to pump, pump, gas meter, critical orifice & digital manometer, pitot and impulse lines, type K thermocouple, balance (for gravimetric moisture) and datalogger. Calculations were performed to enable isokinetic flow to be maintained (based on online measurements of flue gas velocity and temperature to set nozzle flow / pump rate (l/min)).

Particulate matter analysis was carried out by weighing the filter and probe rinse collection on a calibrated balance, with the media being dried and weighed prior to and following the test.

Standard BS EN 13284 Part 1 was deviated from only in so far as a consequence of conducting tests in accordance with the requirements of PG5/2(12) that requires total particulate matter to be sampled for one hour of cremation. This therefore implies that only one sampling line can be used for each test run as sampling on 2 lines would require a stop halfway through the test to move the probe out of one port and into another thus losing a period within the allotted one hour needed to obtain an hourly average as required by PG5/2(12). This is contrary to BS EN 13284 Part 1 that requires 2 sample lines to be used during an isokinetic test i.e., four-point sampling (2 points x 2 lines) for a duct of this diameter.

The effect on uncertainty of using only one sample line is not considered to be significant and assumed to be within the calculated uncertainties stated in this report. These assumptions are on the basis that the preliminary pitot traverses confirmed the gas velocity profiles were well within required limits, and the duct dimensions were relatively small (350 mm diameter) considering the scope of BS EN 13284 Part 1. The duct was compliant with the requirements of the Standard in terms of duct dimensions and length measurements as well as meeting all requirements of Environment Agency Technical Guidance Note M1. In accordance with the Standard flue gas was sampled at 2 representative points along the sample line and as such there is no reason to suspect that the gas sampled from only one sampling line is not representative of the duct.

This recommended deviation is a reflection that cremation is a batch process, and that changing sampling ports part-way through a cremation could introduce more errors due to fact that a period of each cremation would not be sampled during the changeover process.

The tests reported herein were conducted to prove the performance of the cremator relative to PG 5/2 (2012).

A comparison of the test results was made with the continuous particulate emission monitor.

## 2.2 Hydrogen Chloride

A flue gas sample was extracted and filtered. A 47mm QMA filter paper was used with a particle retention of not less than 99.5% at a particle size of 0.3 micron. The flue gas extraction employed techniques given in BS EN 13284 Part 1.

The sampling was conducted using apparatus in accordance with the requirements of BS EN 13284 Part 1.

The method employed was BS EN 1911 Parts 1-3.

Laboratory analysis for hydrogen chloride was carried out on the absorption medium using Ion Chromatography (IC).

## 2.3 Mercury

A flue gas sample was extracted and filtered to collect solid phase mercury.

A 47mm QMA filter paper was used with a particle retention of not less than 99.5% at a particle size of 0.3 micron. The flue gas extraction employed techniques given in BS EN 13284 Part 1.

The gas sample was then passed through an absorption medium of acidified potassium dichromate to collect vapour phase mercury.

The method employed was BS EN 13211.

Laboratory analysis for solid and vapour phase mercury was carried out on the filter and absorption medium using Inductively Coupled Plasma (ICP-OES) Spectrophotometry.

## 2.4 Carbon Monoxide

A flue gas sample was continuously extracted, filtered, and dried before being passed through a pre-calibrated Horiba PG-350 infrared analyser for the on-line measurement of carbon monoxide.

The method employed was BS EN 15058.

The analyser has an MCERTS certification range of 0-75 & 0-6250 mg/Nm<sup>3</sup> and was zeroed with nitrogen and calibrated with a nominal 160 ppm carbon monoxide in balance nitrogen gas.

The analyser output was continuously recorded to an SD card using the inbuilt data logger.

For these tests, a relatively high range analyser was used due to the typical pattern of carbon monoxide concentration emissions from cremators being very low (often indicated as zero) for most of the cycle, but with occasional, high, short duration spikes of CO being emitted. The convention since non-continuous emissions monitoring became a mandatory requirement for cremators during 1990, has been to attempt to monitor the magnitude of spikes, as these are often the main contributor to total CO emissions. If, for example, a mean one-minute emission of CO was 100 mg/Nm<sup>3</sup>, it would be expected that the peak concentration during that one-minute averaging period would be considerably higher than this. It follows that utilising a lower range analyser would frequently understate CO emissions, despite increasing sensitivity at low CO concentrations.

## 2.5 Total Organic Compounds

A flue gas sample was continuously extracted and filtered before being passed via a heated line through a pre-calibrated SK-Elektronik GmbH Flame Ionisation Detection (FID) analyser for the on-line measurement of volatile organic compounds. The analyser was ranged 0-100 ppm (with autoranging for higher concentrations if required) total hydrocarbons and was zeroed with synthetic air and calibrated with a nominal 80 ppm propane in balance air gas.

The method employed was BS EN 12619.

The analyser output was continuously recorded using the inbuilt data logger.

Similar comments apply to TOC's as CO, in that the analyser scaling is set to quantify the peaks that are the nature of the emission.

## 2.6 Oxygen

A flue gas sample was continuously extracted, filtered, and dried before being passed through a pre-calibrated Horiba PG-350 paramagnetic analyser for the on-line measurement of flue oxygen.

The method employed was BS EN 14789.

The analyser was calibrated with nitrogen "zero" gas and nominal 21% Oxygen in balance nitrogen gas.

The analyser output was continuously recorded to an SD card using the inbuilt data logger.

## 2.7 Moisture

A flue gas sample was extracted and filtered. The gas sample was then passed through an absorption medium to collect any water vapour.

The method employed was BS EN 14790.

Flue gas moisture was determined gravimetrically by weighing the absorption medium and final gas drier prior to and following the test.

This was carried out alongside testing for hydrogen chloride and mercury.

## 2.8 Temperature

Flue gas temperature was measured using a calibrated Type K thermocouple.

The method employed was BS EN 13284 Part 1.

The flue gas temperature was continuously recorded using a KIMO digital thermomanometer.



## 2.9 Velocity and Volumetric Flow

Flue gas velocity was found from inserting a calibrated s-type pitot tube into the flue. The pitot head pressure was then measured and continuously recorded using a KIMO digital thermomanometer.

The method employed was BS EN 13284 Part 1.

Flue gas velocity was then calculated from Bernoulli's equation as the density of the flue gas was known (from measurements of flue gas moisture and temperature).

Flue gas volumetric flow rate was found from the measurement of the flue duct size and hence its area and corrected to normalised conditions (again from measurements of flue gas moisture and temperature).

### **3. RESULTS**

The results are summarised in Tables 1 - 6.

Total Particulate Matter and Hydrogen Chloride determinations are given in Tables 1 & 3 for Streams 1 & 2 respectively.

Mercury determinations are given in Tables 2 & 4 for Streams 1 & 2 respectively.

Comparison of Test Results with site instrumentation is given in Tables 5 & 6 for Streams 1 & 2 respectively.

Carbon Monoxide, Total Organic Compounds, Oxygen, Temperature and Velocity and Volumetric Flow were continuously monitored.

All values in the tables are corrected to the reference conditions of 273K, 101.3kPa, 11%v/v oxygen and dry gas as given in PG5/2(12) where required.

All data logs and calculations can be seen in Appendix 1.

All analysis reports can be seen in Appendix 2.

**TABLE 1**  
**Gilroes Stream 1 - Cremators 1 & 2 & Abatement System**  
**Total Particulate Matter & Hydrogen Chloride Sampling**

	Test 1	Test 2	Test 3	Average	Requirement to PG5/2 (2012)
	08 November 2022 14:20 - 15:20	09 November 2022 09:30 - 10:30	09 November 2022 10:38 - 11:38		
Total Particulate Matter - mg/Nm <sup>3</sup> c.	2.57 ± 1.43	1.46 ± 1.03	2.21 ± 1.36	<b>2.08</b>	<20
Hydrogen Chloride - mg/Nm <sup>3</sup> c.	0.41 ± 0.09	1.30 ± 0.09	1.18 ± 0.14	<b>0.96</b>	<30
Carbon Monoxide - mg/Nm <sup>3</sup> c.	6.56 ± 0.33	7.94 ± 0.40	28.91 ± 1.45	<b>14.47</b>	<100
Carbon Monoxide First 30 mins - mg/Nm <sup>3</sup> c.	6.28 ± 0.31	14.79 ± 0.74	48.19 ± 2.41	<b>23.09</b>	<100
Carbon Monoxide Second 30 mins - mg/Nm <sup>3</sup> c.	6.84 ± 0.01	0.86 ± 0.01	8.99 ± 0.45	<b>5.56</b>	<100
Organic Compounds - mg/Nm <sup>3</sup> c.	1.02 ± 0.01	0.46 ± 0.02	8.23 ± 0.01	<b>3.24</b>	<20
Flue Oxygen - %v/v dry	14.46 ± 0.10	12.90 ± 0.10	13.97 ± 0.10	<b>13.78</b>	
Flue Moisture - %v/v	5.1 ± 0.5	5.8 ± 0.6	5.2 ± 0.5	<b>5.4</b>	
- %w/w	3.2 ± 0.3	3.7 ± 0.4	3.3 ± 0.3	<b>3.4</b>	
Flue Temperature - Deg C	129 ± 2	113 ± 2	128 ± 2	<b>123</b>	
Volumetric Flow - Nm <sup>3</sup> /h dry	2599 ± 52	2960 ± 59	2473 ± 49	<b>2677</b>	

Note 1: All emissions as concentration levels are given as mg/Nm<sup>3</sup> corrected to 11%v/v oxygen and dry gas

Note 2: All uncertainties (±) are calculated to a 95% confidence interval

Uncertainties estimated using the procedure suggested in the STA Quality Guidance Note QGN001-01



**TABLE 2**  
**Gilroes Stream 1 - Cremators 1 & 2 & Abatement System**  
**Mercury Sampling**

		Hg Test	Requirement to PG5/2 (2012)
		08 November 2022 11:13 - 14:08	
Mercury	- $\mu\text{g}/\text{Nm}^3\text{c.}$	1.06 $\pm$ 0.46	<50
Flue Oxygen	- %v/v dry	14.15 $\pm$ 0.10	
Flue Moisture	- %v/v	5.3 $\pm$ 0.5	
	- %w/w	3.4 $\pm$ 0.3	
Flue Temperature	- Deg C	128 $\pm$ 2	
Volumetric Flow	- $\text{Nm}^3/\text{h}$ dry	2743 $\pm$ 55	

Note 1: All emissions as concentration levels are given as  $\mu\text{g}/\text{Nm}^3$  or  $\text{mg}/\text{Nm}^3$  corrected to 11% v/v oxygen and dry gas

Note 2: All uncertainties ( $\pm$ ) are calculated to a 95% confidence interval

Uncertainties estimated using the procedure suggested in the STA Quality Guidance Note QGN001-01

**TABLE 3**

**Gilroes Stream 2 - Cremators 3 & 4 & Abatement System  
Total Particulate Matter & Hydrogen Chloride Sampling**

	Test 1	Test 2	Test 3	Average	Requirement to PG5/2 (2012)
	10 November 2022 10:34 - 11:34	10 November 2022 11:47 - 12:47	10 November 2022 12:59 - 13:59		
Total Particulate Matter - mg/Nm <sup>3</sup> c.	3.16 ± 1.16	2.24 ± 1.54	9.08 ± 1.70	<b>4.83</b>	<20
Hydrogen Chloride - mg/Nm <sup>3</sup> c.	4.70 ± 0.25	2.02 ± 0.14	9.84 ± 0.59	<b>5.52</b>	<30
Carbon Monoxide - mg/Nm <sup>3</sup> c.	4.74 ± 0.24	9.66 ± 0.48	10.27 ± 0.51	<b>8.22</b>	<100
Carbon Monoxide First 30 mins - mg/Nm <sup>3</sup> c.	8.51 ± 0.43	18.35 ± 0.92	11.90 ± 0.60	<b>12.92</b>	<100
Carbon Monoxide Second 30 mins - mg/Nm <sup>3</sup> c.	0.84 ± 0.01	0.69 ± 0.01	8.58 ± 0.43	<b>3.37</b>	<100
Organic Compounds - mg/Nm <sup>3</sup> c.	3.70 ± 0.01	2.20 ± 0.11	0.84 ± 0.01	<b>2.25</b>	<20
Flue Oxygen - %v/v dry	14.85 ± 0.10	15.51 ± 0.10	16.56 ± 0.10	<b>15.64</b>	
Flue Moisture - %v/v	6.4 ± 0.6	6.7 ± 0.7	3.8 ± 0.4	<b>5.7</b>	
- %w/w	4.1 ± 0.4	4.3 ± 0.4	2.4 ± 0.2	<b>3.6</b>	
Flue Temperature - Deg C	118 ± 2	118 ± 2	127 ± 2	<b>121</b>	
Volumetric Flow - Nm <sup>3</sup> /h dry	3035 ± 61	2943 ± 59	3420 ± 68	<b>3133</b>	

Note 1: All emissions as concentration levels are given as mg/Nm<sup>3</sup> corrected to 11%v/v oxygen and dry gas

Note 2: All uncertainties (±) are calculated to a 95% confidence interval

Uncertainties estimated using the procedure suggested in the STA Quality Guidance Note QGN001-01

**TABLE 4**  
**Gilroes Stream 2 - Cremators 3 & 4 & Abatement System**  
**Mercury Sampling**

		Hg Test	Requirement to PG5/2 (2012)
		09 November 2022 12:06 - 16:29	
Mercury	- $\mu\text{g}/\text{Nm}^3\text{c.}$	4.91 $\pm$ 0.43	<50
Flue Oxygen	- %v/v dry	15.43 $\pm$ 0.10	
Flue Moisture	- %v/v	3.5 $\pm$ 0.4	
	- %w/w	2.2 $\pm$ 0.2	
Flue Temperature	- Deg C	115 $\pm$ 2	
Volumetric Flow	- $\text{Nm}^3/\text{h}$ dry	2883 $\pm$ 58	

Note 1: All emissions as concentration levels are given as  $\mu\text{g}/\text{Nm}^3$  or  $\text{mg}/\text{Nm}^3$  corrected to 11% v/v oxygen and dry gas

Note 2: All uncertainties ( $\pm$ ) are calculated to a 95% confidence interval

Uncertainties estimated using the procedure suggested in the STA Quality Guidance Note QGN001-01

**TABLE 5**

**Gilroes Stream 1 - Cremators 1 & 2 & Abatement System  
Comparison of Test Results with Site Instrumentation**

Cremator Plant	Test	Date	Averaging Period (mins)	Carbon Monoxide mg/Nm <sup>3</sup>		Particulate mg/Nm <sup>3</sup>	
				Davies & Co	Site	Davies & Co	Site
Cremators 1 & 2 FGT Outlet	1	November 8, 2022	2 - 62	6.6	17.0	2.6	0.0
	2	November 9, 2022	2 - 62	7.9	47.0	1.5	0.0
	3	November 9, 2022	2 - 62	28.9	44.0	2.2	0.0

Note 1: All emission concentration levels are given as mg/Nm<sup>3</sup> corrected to 11% oxygen, 273K & dry gas

Note 2: Results as emitted from Flue Gas Treatment (FGT) plant with 2 cremators abated by 1 FGT

**TABLE 6**

**Gilroes Stream 2 - Cremators 3 & 4 & Abatement System  
Comparison of Test Results with Site Instrumentation**

Cremator Plant	Test	Date	Averaging Period (mins)	Carbon Monoxide mg/Nm <sup>3</sup>		Particulate mg/Nm <sup>3</sup>	
				Davies & Co	Site	Davies & Co	Site
Cremators 3 & 4 FGT Outlet	1	November 10, 2022	2 - 62	4.7	0.0	3.2	0.0
	2	November 10, 2022	2 - 62	9.7	21.0	2.2	0.0
	3	November 10, 2022	2 - 62	10.3	16.0	9.1	0.0

Note 1: All emission concentration levels are given as mg/Nm<sup>3</sup> corrected to 11% oxygen, 273K & dry gas

Note 2: Results as emitted from Flue Gas Treatment (FGT) plant with 2 cremators abated by 1 FGT

#### **4. COMMENTS**

The results obtained from this monitoring test work show compliance with the requirements given in Process Guidance Note PG5/2 (2012) for both Stream 1 and Stream 2 cremators and abatement systems.

The results are expressed in the summary tables as concentration levels as this is understood to be the basis of the permit issued by the regulator.

The cremators and flue gas clean up systems operated satisfactorily during testing without any failure or alarm events.

All coffins charged were constructed of standard materials to the knowledge the site operator and testing technicians.

No visible chimney emissions were observed throughout the test work.

PG5/2 (2012) states that the continuous emissions monitors (CEMs) should be periodically checked (calibrated) to ensure that the readings being reported are correct.

The CEM's on site are regularly maintained, checked, and calibrated in accordance with the manufacturer's recommendations, and were functional at the time of the tests.

The PCME particulate monitor primarily functions as a filter leak detector rather than being calibrated to give qualitative results. This instrument is more than capable of satisfying this function.

Tables 5 and 6 show some correlation between the onsite and periodic Carbon Monoxide measurements, with an overestimation given by the onsite instrumentation on both streams.

#### **5. QUALITY CONTROL**

All the tests performed were carried out to the methods given in the appropriate listed Standards using calibrated equipment. The gas analyser was calibrated prior to use using suitable calibration gases.

Analysis of the absorber solutions was carried out at an external UKAS laboratory following UKAS approved analysis methods.

For this test work the following external laboratory was used for the given determination:

RPS Laboratories	}	Hydrogen Chloride
		Mercury



## **APPENDIX 1**

### Data Logs and Calculations

## Explanation of Data Logs

Data is taken from analyser internal loggers and KIMO digital thermomanometer.

Times are synchronised to exact time.

Flue Gas Temp is direct from test flue thermocouple.

Meter Temp is direct from gas meter.

(The stated meter temperature is that of the sampled gas at the meter and is not the room ambient temperature. The temperature always increases during a test due to the heat gain from the sample pump that is contained in an enclosed box along with the gas meter, and this is quite normal).

Flue O<sub>2</sub> is from the Horiba PG-350 analyser.

CO is from the Horiba PG-350 analyser.

TOC is from the SK-Elektronik GmbH FID analyser expressed as carbon equivalent.

Sample Point Pa is from the pitot tube to a KIMO electronic manometer.

The room temperature was typically 20°C, and there were no issues with the analysers overheating.

Functional and calibration checks at the start and end of each test confirmed correct operation of the analysers.

All values in the tables are corrected to the reference conditions of 273K, 101.3kPa, 11%v/v oxygen and dry gas as given in PG5/2(12) where required.

**Gilroes Stream 1 - Cremators 1 & 2 & Abatement System**

**Data Log**

**08 November 2022**

Test H1

Time	Flue Gas °C	Meter °C	Flue O <sub>2</sub> %v/v dry	CO mg/Nm <sup>3</sup> c.	TOC mg/Nm <sup>3</sup> c.	Sample Point Pa
14:20	130	23.0	16.20	0.52	5.30	141.3
14:21	131	23.0	17.19	33.42	5.23	102.8
14:22	131	23.0	14.67	25.57	3.00	91.8
14:23	130	23.0	14.77	17.24	2.83	65.6
14:24	130	23.0	14.59	11.56	1.80	80.8
14:25	130	23.0	17.12	6.09	3.46	78.7
14:26	129	23.0	14.45	0.38	1.73	65.5
14:27	129	23.0	14.67	0.40	1.42	64.7
14:28	130	23.0	14.30	6.21	0.95	92.7
14:29	132	23.0	13.46	20.76	2.07	118.5
14:30	133	23.0	13.71	14.37	0.68	94.9
14:31	133	23.0	14.61	11.38	1.29	80.5
14:32	133	23.0	14.21	9.50	1.03	77.4
14:33	133	23.0	14.07	10.49	1.09	73.1
14:34	132	23.0	14.18	7.10	1.14	69.9
14:35	132	23.0	14.06	3.58	0.91	71.0
14:36	131	23.0	14.29	1.74	0.91	58.3
14:37	131	23.0	14.26	0.56	0.74	32.9
14:38	130	23.0	15.52	1.33	0.62	22.9
14:39	130	23.0	14.67	1.58	0.54	31.3
14:40	129	23.0	14.63	1.21	0.75	24.8
14:41	129	23.0	14.41	1.44	0.55	29.6
14:42	129	23.0	14.49	1.12	0.68	22.7
14:43	129	23.0	14.40	1.45	0.51	31.4
14:44	129	24.0	14.35	1.21	0.71	31.0
14:45	128	24.0	14.41	0.94	0.52	24.7
14:46	128	24.0	14.44	0.43	0.52	21.6
14:47	128	24.0	14.30	0.62	0.51	26.0
14:48	128	24.0	14.25	0.87	0.50	41.8
14:49	128	24.0	14.47	0.38	0.52	26.4
14:50	128	24.0	15.39	1.34	0.61	39.5
14:51	127	24.0	14.65	1.45	0.54	21.3
14:52	127	24.0	13.85	0.35	0.48	29.7
14:53	127	24.0	14.27	0.37	0.51	19.9
14:54	126	24.0	14.66	0.40	0.54	24.1
14:55	126	24.0	14.75	0.40	0.54	22.3
14:56	126	24.0	14.95	0.41	0.56	19.7
14:57	126	24.0	15.08	0.60	0.57	23.6
14:58	125	24.0	15.24	0.44	0.59	22.2
14:59	125	24.0	15.47	0.45	0.62	31.0
15:00	125	24.0	15.67	0.47	0.64	30.6
15:01	125	24.0	15.39	0.45	0.61	20.3
15:02	125	24.0	15.25	0.44	1.76	36.7
15:03	124	25.0	16.31	0.54	1.15	26.5
15:04	124	25.0	16.70	0.59	0.79	32.2
15:05	126	25.0	16.45	0.55	0.75	91.4
15:06	128	25.0	16.56	0.57	1.18	112.6
15:07	128	25.0	14.87	21.43	0.55	95.2
15:08	129	25.0	12.56	15.51	0.40	70.8
15:09	129	25.0	12.41	6.42	0.39	71.3
15:10	130	25.0	12.61	5.22	0.40	79.7
15:11	129	25.0	13.04	4.88	0.43	74.6
15:12	129	25.0	13.37	3.86	0.45	73.6
15:13	129	25.0	13.06	6.74	0.43	70.2
15:14	130	25.0	12.41	10.19	0.39	75.2
15:15	130	25.0	12.24	8.07	0.39	77.2
15:16	132	25.0	13.89	26.04	0.48	91.5
15:17	132	25.0	13.05	26.12	1.78	93.4
15:18	134	25.0	12.71	22.73	0.41	118.4
15:19	134	25.0	12.89	25.44	0.42	109.2
15:20	133	25.0	13.30	13.96	0.44	85.7
<b>Average</b>	<b>129</b>	<b>23.9</b>	<b>14.46</b>	<b>6.56</b>	<b>1.02</b>	<b>58.8</b>

Carbon Monoxide First 30 mins	6.28
Carbon Monoxide Second 30 mins	6.84

**Gilroes Stream 1 - Cremators 1 & 2 & Abatement System**

**Data Log**

**09 November 2022**

Test H2

Time	Flue Gas °C	Meter °C	Flue O <sub>2</sub> %v/v dry	CO mg/Nm <sup>3</sup> c.	TOC mg/Nm <sup>3</sup> c.	Sample Point Pa
09:30	75	17.0	15.50	18.62	0.62	60.0
09:31	78	17.0	15.35	11.52	0.60	72.7
09:32	80	17.0	12.80	18.12	0.41	59.8
09:33	82	17.0	12.83	26.72	0.42	55.6
09:34	84	17.0	12.52	23.77	0.40	65.0
09:35	85	17.0	12.20	20.29	0.39	59.7
09:36	88	18.0	12.32	12.84	1.63	76.3
09:37	90	18.0	11.98	8.47	0.38	91.5
09:38	92	18.0	12.12	32.50	0.38	73.3
09:39	93	18.0	12.39	40.27	0.39	68.0
09:40	95	18.0	12.54	26.21	0.40	55.9
09:41	97	18.0	12.30	17.91	0.39	87.7
09:42	99	18.0	11.98	20.96	0.38	96.0
09:43	101	18.0	12.28	23.47	0.39	82.7
09:44	103	18.0	12.46	18.01	0.40	75.8
09:45	105	18.0	12.47	13.87	0.59	89.2
09:46	106	18.0	12.31	13.57	0.39	81.3
09:47	107	18.0	12.36	13.26	0.40	87.2
09:48	108	18.0	12.29	12.06	0.39	77.8
09:49	109	18.0	12.29	11.31	0.39	79.2
09:50	110	18.0	12.36	11.14	0.40	78.3
09:51	113	18.0	12.49	11.03	0.40	98.9
09:52	114	18.0	12.50	8.56	0.40	86.0
09:53	115	18.0	12.76	7.82	0.41	99.4
09:54	116	18.0	12.44	6.92	0.40	78.8
09:55	116	18.0	12.49	9.94	0.40	99.8
09:56	116	18.0	12.64	7.93	0.41	75.9
09:57	117	18.0	12.52	3.95	0.40	89.3
09:58	118	18.0	12.07	2.84	0.38	73.7
09:59	118	18.0	12.59	2.19	0.41	69.4
10:00	119	18.0	12.37	2.58	0.40	64.9
10:01	120	18.0	12.27	2.23	0.39	81.1
10:02	121	18.0	11.84	3.09	0.37	93.2
10:03	121	18.0	12.21	2.47	0.39	83.6
10:04	121	18.0	12.47	1.35	0.40	89.0
10:05	122	18.0	12.60	0.92	0.41	93.7
10:06	123	19.0	12.67	0.48	0.41	75.2
10:07	123	19.0	12.72	0.51	0.41	83.5
10:08	124	19.0	12.57	0.58	0.41	80.6
10:09	124	19.0	12.58	0.54	0.41	75.5
10:10	125	19.0	12.71	0.30	0.41	69.8
10:11	124	19.0	12.82	0.31	0.42	68.5
10:12	124	19.0	12.91	0.31	0.42	64.7
10:13	124	19.0	12.93	0.31	0.80	67.1
10:14	124	19.0	13.06	0.32	0.43	68.8
10:15	125	19.0	13.31	0.33	0.45	64.3
10:16	125	19.0	13.52	0.33	0.46	63.8
10:17	125	19.0	13.64	0.34	0.47	62.9
10:18	126	19.0	13.78	0.35	0.47	74.6
10:19	126	19.0	13.85	0.35	0.48	65.5
10:20	126	19.0	13.91	0.35	0.48	81.3
10:21	126	20.0	14.01	0.36	0.49	60.2
10:22	126	20.0	12.50	4.63	0.40	57.7
10:23	126	20.0	13.83	0.72	0.48	65.2
10:24	126	20.0	13.93	0.35	0.48	64.8
10:25	126	20.0	14.02	0.39	0.49	58.7
10:26	126	20.0	14.07	0.36	0.49	72.0
10:27	126	20.0	14.11	0.81	0.50	58.4
10:28	126	20.0	12.83	1.80	0.42	66.8
10:29	126	20.0	14.31	0.37	0.51	46.2
10:30	127	20.0	14.34	0.38	0.51	59.8
<b>Average</b>	<b>113</b>	<b>18.5</b>	<b>12.90</b>	<b>7.94</b>	<b>0.46</b>	<b>74.2</b>

Carbon Monoxide First 30 mins		14.79
Carbon Monoxide Second 30 mins		0.86

**Gilroes Stream 1 - Cremators 1 & 2 & Abatement System**

**Data Log**

**09 November 2022**

Test H3

Time	Flue Gas °C	Meter °C	Flue O <sub>2</sub> %v/v dry	CO mg/Nm <sup>3</sup> c.	TOC mg/Nm <sup>3</sup> c.	Sample Point Pa
10:38	130	20.0	14.80	0.40	0.82	101.6
10:39	130	20.0	14.63	0.39	0.96	68.0
10:40	129	20.0	14.19	27.17	1.37	54.9
10:41	129	20.0	14.47	44.45	2.17	58.7
10:42	129	20.0	14.35	113.79	3.05	58.5
10:43	128	20.0	14.89	72.43	4.51	57.9
10:44	128	20.0	14.35	26.55	5.05	59.1
10:45	128	20.0	12.59	18.46	5.12	67.1
10:46	128	20.0	12.62	20.07	6.39	47.9
10:47	128	20.0	12.94	35.94	7.22	57.7
10:48	129	20.0	14.15	59.08	10.73	63.0
10:49	130	20.0	14.47	76.99	11.77	73.4
10:50	130	20.0	13.28	47.78	10.58	75.2
10:51	131	20.0	13.07	38.50	16.61	91.2
10:52	130	20.0	12.65	48.58	12.78	63.8
10:53	130	20.0	12.95	37.29	18.94	81.2
10:54	129	20.0	13.45	45.77	14.30	65.7
10:55	130	20.0	13.89	59.58	14.63	57.3
10:56	129	20.0	13.75	42.15	14.55	43.7
10:57	129	20.0	13.97	36.04	14.14	40.0
10:58	128	20.0	13.51	48.72	17.97	44.9
10:59	128	20.0	13.55	54.29	13.78	43.4
11:00	128	20.0	13.51	49.93	22.54	42.8
11:01	128	20.0	13.68	49.87	13.02	55.2
11:02	128	20.0	13.60	64.19	11.64	63.2
11:03	128	20.0	13.54	77.14	11.10	55.7
11:04	129	20.0	13.37	77.02	10.34	71.0
11:05	129	20.0	13.33	85.65	10.02	63.3
11:06	129	20.0	13.76	65.33	11.03	60.5
11:07	129	20.0	13.79	36.60	9.91	56.1
11:08	129	20.0	13.77	33.58	9.15	47.0
11:09	129	20.0	13.92	26.30	8.75	47.7
11:10	129	20.0	13.55	17.04	14.78	62.8
11:11	130	20.0	13.39	19.34	8.17	63.0
11:12	130	20.0	13.37	38.72	7.17	68.5
11:13	130	21.0	13.75	35.35	7.06	65.5
11:14	129	21.0	13.82	27.38	14.53	50.8
11:15	129	21.0	13.76	16.82	7.39	49.5
11:16	129	21.0	13.50	17.65	6.48	49.4
11:17	129	21.0	13.46	18.49	6.71	48.4
11:18	129	21.0	13.56	17.56	6.08	38.4
11:19	129	21.0	13.76	10.58	6.81	46.5
11:20	129	21.0	13.60	5.91	6.06	38.2
11:21	129	21.0	13.71	5.71	5.44	49.1
11:22	129	21.0	13.73	2.80	4.98	48.4
11:23	129	21.0	13.64	1.32	4.89	39.9
11:24	128	21.0	13.53	0.96	5.39	34.4
11:25	128	21.0	14.32	0.68	5.36	37.6
11:26	128	21.0	14.10	0.59	4.89	40.0
11:27	128	21.0	13.94	0.38	4.35	29.7
11:28	127	21.0	13.64	0.49	3.87	27.9
11:29	127	21.0	14.25	0.84	4.17	25.7
11:30	126	21.0	14.43	0.38	4.52	35.2
11:31	127	21.0	14.77	0.88	4.32	35.8
11:32	127	21.0	15.49	0.55	4.48	49.3
11:33	127	21.0	15.77	0.48	4.45	40.5
11:34	126	21.0	15.17	0.43	3.79	38.6
11:35	126	21.0	16.08	0.69	4.20	48.9
11:36	127	21.0	16.91	0.61	7.29	57.9
11:37	126	21.0	15.45	0.45	5.45	41.5
11:38	127	21.0	15.10	0.42	3.98	47.5
<b>Average</b>	<b>128</b>	<b>20.4</b>	<b>13.97</b>	<b>28.91</b>	<b>8.23</b>	<b>53.2</b>

Carbon Monoxide First 30 mins		<b>48.19</b>
Carbon Monoxide Second 30 mins		<b>8.99</b>

## Total Particulate Matter and Hydrogen Chloride

### Gilroes Stream 1 - Cremators 1 & 2 & Abatement System

Test Log	Test 1		Test 2		Test 3	
Barometric Pressure(kPa)	100.0		99.9		99.9	
Gas Meter Temperature(Deg C)	23.9		18.5		20.4	
Oxygen Concentration(%v/v dry)	14.46		12.90		13.97	
Flue Gas Volumetric Flow(Nm <sup>3</sup> /h dry)	2599		2960		2473	
	Start	End	Start	End	Start	End
Time	14:20	15:20	09:30	10:30	10:38	11:38
Gas Meter Reading(Am <sup>3</sup> dry)	7.989	8.804	8.814	9.712	9.717	10.505
Absorber Weight(g)	3238.7	3271.0	3285.4	3327.2	3315.2	3347.1
Filter Reference	47-3090		47-3089		2828.6	
Filter Weight(g)	0.15262	0.15358	0.15050	0.15124	0.15085	0.15173
Probe Rinse Reference	R1-PR-47-3090		R2-PR-47-3089		R3-PR-47-3093	
Probe Rinse Weight(g)	2.92128	2.92157	3.11587	3.11612	2.86800	2.86825
Sample Reference HCl	R1 ABC		R2 ABC		R3 AB	R3 C
Absorbent	H <sub>2</sub> O		H <sub>2</sub> O		H <sub>2</sub> O	H <sub>2</sub> O
Absorbent Volume(ml)	360		414		386	237
Absorbent(mg/l as HCl)	0.6		2.18		1.57	0.05
Blank(mg/l as HCl)	0.05		0.05		0.05	0.05

### Calculation: General

Barometric Pressure(kPa)	100.0	99.9	99.9
Gas Meter temperature(Deg C)	23.9	18.5	20.4
Gas Volume Sampled(Am <sup>3</sup> dry)	0.822	0.906	0.795
Gas Volume Sampled(Nm <sup>3</sup> dry)	0.7464	0.8369	0.7295
Mass of Dry Gas(g @ 1292.8 g/Nm <sup>3</sup> )	964.99	1081.97	943.12
Change in Absorber Weight(g)	32.3	41.8	31.9
Water Vapour Volume(Nm <sup>3</sup> @ 803.9 g/Nm <sup>3</sup> )	0.0402	0.0520	0.0397
Gas Volume(Nm <sup>3</sup> wet)	0.7866	0.8889	0.7692
Mass of Wet Gas(g)	997.29	1123.77	975.02
<b>Moisture Concentration(%v/v)</b>	<b>5.1</b>	<b>5.8</b>	<b>5.2</b>
<b>Moisture Concentration(%w/w)</b>	<b>3.2</b>	<b>3.7</b>	<b>3.3</b>

**Calculation: Particulate**

Increase In Filter Weights(g)	0.00125	0.00099	0.00113
Particulate Emission(mg/Nm <sup>3</sup> dry)	1.67	1.18	1.55
Oxygen Concentration(%v/v dry)	14.46	12.90	13.97
<b>Particulate Emission</b>	<b>2.57</b>	<b>1.46</b>	<b>2.21</b>
<b>(mg/Nm<sup>3</sup> @ 11 %v/v Oxygen dry)</b>			
Flue Gas Volumetric Flow(Nm <sup>3</sup> /h dry)	2599	2960	2473
<b>Particulate Emission(g/h)</b>	<b>4.35</b>	<b>3.50</b>	<b>3.83</b>
Required Sample Velocity(Nm/s)	7.50	8.55	7.14
Nozzle Used(mm)	6.0	6.0	6.0
Area of Nozzle(m <sup>2</sup> )	0.00002781	0.00002781	0.00002781
Test Duration(mins)	60	60	60
Actual Sample Velocity(Nm/s)	7.46	8.36	7.29
Isokinetic Closure(%)	99	98	102
		100	
Start Leak Check(%)	0.02	0.04	0.02
	@10 l/min	@10 l/min	@10 l/min
End Leak Check(%)	-	-	-
	@10 l/min	@10 l/min	@10 l/min

**Calculation: HCl**

Absorbent(mg/l as HCl)	0.6	2.18	1.62
Blank(mg/l as HCl)	0.05	0.05	0.05
Chloride Absorbed(mg/l as HCl)	0.55	2.13	1.57
Chloride Absorbed(mg as HCl)	0.20	0.88	0.61
HCl(mg)	0.20	0.88	0.61
HCl Emission(mg/Nm <sup>3</sup> dry)	0.27	1.05	0.83
Oxygen Concentration(%v/v dry)	14.46	12.90	13.97
<b>HCl Emission</b>	<b>0.41</b>	<b>1.30</b>	<b>1.18</b>
<b>(mg/Nm<sup>3</sup> @ 11 %v/v Oxygen dry)</b>			
Flue Gas Volumetric Flow(Nm <sup>3</sup> /h dry)	2599	2960	2473
<b>HCl Emission(g/h)</b>	<b>0.69</b>	<b>3.12</b>	<b>2.05</b>

**Gilroes Stream 1 - Cremators 1 & 2 & Abatement System**  
**Flue Gas Volumetric Flow**

Test Log	Test 1	Test 2	Test 3
Flue Gas Temperature(Deg C)	129	113	128
Flue Gas Pitot Head Sample Points(Pa)	58.8	74.2	53.2
Flue Gas Moisture(%v/v)	5.1	5.8	5.2
Flue Gas Moisture(%w/w)	3.2	3.7	3.3
Flue Gas Duct Dimensions(mm)	350mm Diameter Circular Duct		
Flue Gas Duct Area(m <sup>2</sup> )	0.0962		

**Calculation**

Flue Gas Density(kg/m <sup>3</sup> )	0.8672	0.9020	0.8682
Flue Gas Velocity(Am/s)	11.64	12.83	11.07
Flue Gas Volumetric Flowrate(Am <sup>3</sup> /h)	4032	4443	3835
Flue Gas Volumetric Flowrate(Am <sup>3</sup> /h dry)	3826	4183	3637
Flue Gas Volumetric Flowrate(Nm <sup>3</sup> /h dry)	2599	2960	2473



**Gilroes Stream 1 - Cremators 1 & 2 & Abatement System**

**Data Log**

**08/11/2022**

**Hg Test**

Time	Flue Gas °C	Meter °C	Flue O <sub>2</sub> %v/v dry	Pitot Head Pa
11:13	117	18.0	14.01	50.2
11:14	117	18.0	13.28	64.5
11:15	118	18.0	14.01	75.4
11:16	118	18.0	15.62	69.2
11:17	118	19.0	14.06	56.9
11:18	118	19.0	12.55	49.6
11:19	118	19.0	12.84	61.0
11:20	119	19.0	12.76	84.1
11:21	119	19.0	12.34	82.2
11:22	119	19.0	12.12	41.2
11:23	120	19.0	13.23	50.8
11:24	120	20.0	12.43	86.4
11:25	121	20.0	13.10	94.7
11:26	122	20.0	11.98	98.3
11:27	123	20.0	12.32	104.5
11:28	124	20.0	12.89	113.3
11:29	125	20.0	13.00	131.1
11:30	126	20.0	12.39	142.6
11:31	126	20.0	12.46	83.2
11:32	125	20.0	12.93	85.5
11:33	125	20.0	12.99	80.2
11:34	126	20.0	12.80	86.1
11:35	126	20.0	12.96	90.0
11:36	127	21.0	13.43	94.6
11:37	127	21.0	13.02	93.6
11:38	128	21.0	13.26	70.3
11:39	129	21.0	13.41	112.3
11:40	129	21.0	12.63	105.1
11:41	129	21.0	12.53	88.7
11:42	128	21.0	12.73	68.7
11:43	128	21.0	12.79	65.5
11:44	128	21.0	12.86	64.6
11:45	128	21.0	13.09	80.6
11:46	128	21.0	12.80	70.1
11:47	128	21.0	12.85	69.9
11:48	129	21.0	13.02	87.2
11:49	129	21.0	12.53	73.1
11:50	129	21.0	12.73	47.9
11:51	128	21.0	12.73	49.2
11:52	128	21.0	12.96	42.9
11:53	129	21.0	13.16	162.9
11:54	130	21.0	15.12	102.3
11:55	130	21.0	12.94	107.3
11:56	130	22.0	19.99	69.5
11:57	130	22.0	12.53	65.7
11:58	130	22.0	12.73	65.6
11:59	130	22.0	20.35	66.4
12:00	130	22.0	13.54	89.5
12:01	130	22.0	13.41	74.5
12:02	131	22.0	13.68	120.9
12:03	131	22.0	12.53	80.3
12:04	131	22.0	12.73	66.4
12:05	132	22.0	16.37	115.2
12:06	133	22.0	12.43	100.3
12:07	133	22.0	13.84	130.6
12:08	134	22.0	3.57	177.1
12:09	133	22.0	0.29	114.7
12:10	133	23.0	13.45	111.9
12:11	134	23.0	13.90	108.9
12:12	135	23.0	14.21	141.9
12:13	137	23.0	13.28	150.5
12:14	137	23.0	12.96	148.6
12:15	138	23.0	13.35	150.1



12:16	138	23.0	13.45	170.4
12:17	138	23.0	13.08	162.4
12:18	138	23.0	12.97	162.2
12:19	139	23.0	12.99	165.7
12:20	140	23.0	13.17	154.1
12:21	141	23.0	13.17	164.7
12:22	141	23.0	13.44	141.7
12:23	140	23.0	14.10	96.1
12:24	139	23.0	13.38	72.7
12:25	138	23.0	13.05	74.8
12:26	138	23.0	12.70	109.8
12:27	138	23.0	12.58	88.6
12:28	138	23.0	12.93	86.8
12:29	138	23.0	12.79	76.8
12:30	138	23.0	12.92	66.0
12:31	137	23.0	13.01	65.3
12:32	137	23.0	13.16	55.5
12:33	136	23.0	13.36	54.5
12:34	135	23.0	13.57	41.4
12:35	135	23.0	13.42	43.2
12:36	134	23.0	13.41	42.9
12:37	134	23.0	13.27	42.4
12:38	134	23.0	13.48	42.1
12:39	133	23.0	13.10	36.5
12:40	133	23.0	13.49	30.9
12:41	133	23.0	14.06	34.7
12:42	132	23.0	14.38	32.5
12:43	132	23.0	14.74	27.4
12:44	132	23.0	15.16	31.9
12:45	131	23.0	15.50	31.7
12:46	131	23.0	15.80	33.5
12:47	131	23.0	15.99	30.2
12:48	131	23.0	16.22	60.1
12:49	130	23.0	16.06	34.5
12:50	130	23.0	14.84	29.1
12:51	130	23.0	16.29	49.8
12:52	130	23.0	16.77	53.1
12:53	130	23.0	15.51	32.4
12:54	129	23.0	15.68	31.1
12:55	129	23.0	16.36	32.3
12:56	129	23.0	16.59	33.2
12:57	128	24.0	16.76	34.3
12:58	128	24.0	16.88	56.8
12:59	129	24.0	16.85	48.4
13:00	128	24.0	15.79	45.6
13:01	128	24.0	15.39	45.2
13:02	128	24.0	15.32	32.0
13:03	128	24.0	15.52	29.2
13:04	127	24.0	16.74	53.9
13:05	127	24.0	16.98	34.8
13:06	127	24.0	15.88	36.8
13:07	127	24.0	15.26	53.1
13:08	128	24.0	15.12	52.6
13:09	128	24.0	15.88	54.3
13:10	127	24.0	15.03	27.3
13:11	126	24.0	15.10	24.1
13:12	126	24.0	14.64	27.9
13:13	126	24.0	14.31	15.7
13:14	125	24.0	14.61	62.9
13:15	126	24.0	16.23	57.0
13:16	127	24.0	16.94	76.1
13:17	126	24.0	14.54	37.1
13:18	126	24.0	15.61	25.0
13:19	125	24.0	15.75	20.9
13:20	125	24.0	15.55	26.0
13:21	125	24.0	15.84	32.6
13:22	125	24.0	15.86	47.0
13:23	125	24.0	15.98	47.8
13:24	124	24.0	15.62	49.8
13:25	125	24.0	14.99	56.3
13:26	125	24.0	14.29	56.7
13:27	125	25.0	14.16	45.4



13:28	125	25.0	14.18	61.9
13:29	125	25.0	14.33	45.0
13:30	124	25.0	14.40	31.9
13:31	125	25.0	14.28	45.1
13:32	124	25.0	14.49	35.5
13:33	124	25.0	14.39	37.2
13:34	124	25.0	14.48	37.2
13:35	124	25.0	14.52	36.2
13:36	124	25.0	14.33	34.7
13:37	124	25.0	14.31	45.6
13:38	123	25.0	14.50	33.5
13:39	123	25.0	14.39	29.0
13:40	123	25.0	14.61	26.6
13:41	123	25.0	14.40	61.9
13:42	123	25.0	15.06	54.1
13:43	124	25.0	14.53	61.2
13:44	123	25.0	13.01	30.4
13:45	123	25.0	13.09	22.2
13:46	123	25.0	13.40	30.4
13:47	122	25.0	13.77	25.6
13:48	122	25.0	14.09	38.1
13:49	123	25.0	14.15	48.6
13:50	122	25.0	13.43	26.9
13:51	122	25.0	13.59	26.9
13:52	122	25.0	14.86	27.1
13:53	121	25.0	15.45	29.3
13:54	121	25.0	15.81	37.9
13:55	121	25.0	16.08	40.1
13:56	121	25.0	15.25	24.6
13:57	121	25.0	15.00	30.4
13:58	121	25.0	16.33	26.1
13:59	120	25.0	16.85	32.3
14:00	121	25.0	17.13	67.6
14:01	122	25.0	17.22	71.2
14:02	121	25.0	14.50	40.9
14:03	121	25.0	14.64	35.6
14:04	122	25.0	16.07	65.7
14:05	122	25.0	16.01	75.0
14:06	122	25.0	15.97	63.1
14:07	123	25.0	15.23	64.7
14:08	122	25.0	15.59	49.3
<b>Average</b>	<b>128</b>	<b>22.9</b>	<b>14.1</b>	<b>65.5</b>



**Mercury**

**Gilroes Stream 1 - Cremators 1 & 2 & Abatement System**

**Test Log**

**Hg Test**

Barometric Pressure(kPa)  
Gas Meter Temperature(Deg C)  
Oxygen Concentration(%v/v dry)  
Flue Gas Volumetric Flow(Nm<sup>3</sup>/h dry)

100.0  
22.9  
14.15  
2743

	Start	End
Time	11:13	14:08
Gas Meter Reading(Am <sup>3</sup> dry)	5.542	7.951
Absorber Weight(g)	3191.4	3291.4
Filter Reference	S2.4	
Filter Fraction Analysed	1	
Filter(µg as Hg)	0.03	
Filter Blank(µg as Hg)	0.03	
Probe Rinse Reference	S2.42	
Probe Rinse Volume(ml)	54	
Probe Rinse(µg/l as Hg)	0.5	
Probe Rinse Blank(µg/l as Hg)	0.5	
Absorbent	4% K <sub>2</sub> CR <sub>2</sub> O <sub>7</sub> / 20% HNO <sub>3</sub> in H <sub>2</sub> O	
Absorbent Reference	R1 AB + C	
Absorbent Volume(ml)	595	297
Absorbent(µg/l as Hg)	2.7	0.5
Absorbent Blank(µg/l as Hg)	0.5	0.5

**Calculation: General**

Barometric Pressure(kPa)	100.0
Gas Meter Temperature(Deg C)	22.9
Gas Volume Sampled(Am <sup>3</sup> dry)	2.431
Gas Volume Sampled(Nm <sup>3</sup> dry)	2.2141
Mass of Dry Gas(g @ 1292.8 g/Nm <sup>3</sup> )	2862.34
Change in Absorber Weight(g)	100.0
Water Vapour Volume(Nm <sup>3</sup> @ 803.9 g/Nm <sup>3</sup> )	0.1244
Gas Volume(Nm <sup>3</sup> wet)	2.3385
Mass of Wet Gas(g)	2962.34
<b>Moisture Concentration(%v/v)</b>	<b>5.3</b>
<b>Moisture Concentration(%w/w)</b>	<b>3.4</b>

**Calculation: Mercury**

Filter( $\mu\text{g}$ as Hg)	0.00
Probe Rinse( $\mu\text{g}$ as Hg)	0.00
Absorbent( $\mu\text{g}$ as Hg)	1.61
Total Mercury Sampled( $\mu\text{g}$ )	1.61
Mercury Emission( $\mu\text{g}/\text{Nm}^3$ dry)	0.73
Oxygen Concentration(%v/v dry)	14.15
<b>Mercury Emission</b>	<b>1.06</b>
<b>(<math>\mu\text{g}/\text{Nm}^3</math> @ 11 %v/v Oxygen dry)</b>	
Flue Gas Volumetric Flowrate( $\text{Nm}^3/\text{h}$ dry)	2743
<b>Mercury Emission(g/h)</b>	<b>0.002</b>
Required Sample Velocity( $\text{Nm}/\text{s}$ )	7.92
Nozzle Used(mm)	6.0
Area of Nozzle( $\text{m}^2$ )	0.00002781
Test Duration(mins)	176
Actual Sample Velocity( $\text{Nm}/\text{s}$ )	7.54
Isokinetic Closure(%)	95

**Gilroes Stream 1 - Cremators 1 & 2 & Abatement System**

**Flue Gas Volumetric Flow**

**Test Log**

**Hg Test**

Flue Gas Temperature(Deg C)	128
Flue Gas Pitot Head Sample Points(Pa)	65.5
Flue Gas Moisture(%v/v)	5.3
Flue Gas Moisture(%w/w)	3.4
Flue Gas Duct Dimensions(mm)	350mm Diameter Circular Flue
Flue Gas Duct Area(m <sup>2</sup> )	0.0962

**Calculation**

Flue Gas Density(kg/m <sup>3</sup> )	0.8697
Flue Gas Velocity(Am/s)	12.27
Flue Gas Volumetric Flowrate(Am <sup>3</sup> /h)	4252
Flue Gas Volumetric Flowrate(Am <sup>3</sup> /h dry)	4026
<b>Flue Gas Volumetric Flowrate(Nm<sup>3</sup>/h dry)</b>	<b>2743</b>

**Gilroes Stream 2 - Cremators 3 & 4 & Abatement System**

**Data Log**

**10 November 2022**

Test H1

Time	Flue Gas °C	Meter °C	Flue O <sub>2</sub> %v/v dry	CO mg/Nm <sup>3</sup> c.	TOC mg/Nm <sup>3</sup> c.	Sample Point Pa
10:34	118	19.0	15.34	15.47	0.80	78.4
10:35	118	19.0	15.80	16.25	0.66	64.2
10:36	118	19.0	15.00	11.87	0.57	72.9
10:37	118	19.0	14.61	3.61	0.54	75.0
10:38	118	20.0	15.03	13.72	0.58	46.9
10:39	118	20.0	14.79	11.28	0.56	52.4
10:40	118	20.0	14.32	16.17	0.52	64.0
10:41	119	20.0	14.50	23.35	0.53	69.3
10:42	119	20.0	14.98	9.20	0.57	79.7
10:43	118	20.0	14.71	33.38	0.55	78.4
10:44	118	20.0	14.36	21.50	0.52	52.4
10:45	118	21.0	14.38	16.28	0.52	61.0
10:46	119	21.0	13.83	16.53	0.48	69.3
10:47	118	21.0	14.72	16.60	0.83	47.4
10:48	118	21.0	14.36	10.12	0.94	70.8
10:49	118	21.0	14.35	9.39	1.42	96.4
10:50	118	21.0	14.39	7.45	2.17	55.4
10:51	118	21.0	14.02	2.37	2.94	83.2
10:52	118	21.0	13.96	1.18	2.45	99.2
10:53	118	21.0	14.33	0.65	1.89	72.2
10:54	119	21.0	13.45	0.82	0.46	97.6
10:55	119	21.0	14.34	1.00	1.73	132.0
10:56	118	21.0	14.06	0.55	2.35	166.3
10:57	119	21.0	13.82	0.53	2.93	154.0
10:58	119	22.0	14.73	1.41	2.17	141.8
10:59	118	22.0	14.22	0.37	5.92	127.1
11:00	119	22.0	13.94	0.35	5.29	117.2
11:01	119	22.0	14.10	1.33	4.83	104.9
11:02	119	22.0	14.70	0.40	7.57	92.7
11:03	119	22.0	14.67	0.40	3.77	80.4
11:04	119	22.0	14.00	0.36	4.37	76.8
11:05	119	22.0	15.02	3.91	5.37	73.1
11:06	119	22.0	15.68	5.49	6.88	69.5
11:07	119	22.0	14.28	0.90	7.57	79.5
11:08	120	22.0	15.00	0.96	10.24	89.5
11:09	119	23.0	15.17	1.99	12.88	99.4
11:10	119	23.0	14.65	0.78	5.10	91.5
11:11	119	23.0	15.02	0.42	3.87	84.8
11:12	119	23.0	14.99	0.42	6.86	78.2
11:13	118	23.0	14.80	0.40	6.01	71.5
11:14	118	23.0	14.76	0.40	5.64	72.2
11:15	118	23.0	15.25	0.44	6.65	58.2
11:16	118	23.0	15.09	0.42	5.02	64.0
11:17	118	23.0	15.12	0.43	4.13	73.5
11:18	118	23.0	15.35	0.44	3.54	64.3
11:19	119	23.0	15.50	0.46	12.58	69.8
11:20	119	23.0	14.93	0.41	3.34	75.2
11:21	118	23.0	15.40	0.45	2.25	80.6
11:22	119	23.0	15.14	0.43	1.55	86.1
11:23	119	23.0	15.48	0.45	11.43	63.0
11:24	119	23.0	15.61	0.47	2.12	54.9
11:25	119	23.0	15.32	0.44	1.15	53.1
11:26	118	23.0	15.41	0.45	1.51	57.5
11:27	118	23.0	15.37	0.45	0.61	58.7
11:28	118	23.0	15.36	0.44	1.27	53.9
11:29	118	23.0	15.86	0.49	0.67	55.2
11:30	118	23.0	16.05	0.51	8.16	56.5
11:31	119	23.0	15.77	1.13	7.05	80.4
11:32	119	23.0	15.07	0.42	6.17	86.5
11:33	118	23.0	15.78	0.48	7.85	92.4
11:34	118	23.0	15.51	0.46	6.63	110.1
<b>Average</b>	<b>118</b>	<b>21.8</b>	<b>14.85</b>	<b>4.74</b>	<b>3.70</b>	<b>80.0</b>

<b>Carbon Monoxide First 30 mins</b>	<b>8.51</b>
<b>Carbon Monoxide Second 30 mins</b>	<b>0.84</b>

**Gilroes Stream 2 - Cremators 3 & 4 & Abatement System**

**Data Log**

**10 November 2022**

Test H2

Time	Flue Gas °C	Meter °C	Flue O <sub>2</sub> %v/v dry	CO mg/Nm <sup>3</sup> c.	TOC mg/Nm <sup>3</sup> c.	Sample Point Pa
11:47	119	23.0	16.21	11.76	5.00	99.7
11:48	119	23.0	15.02	50.26	3.67	120.8
11:49	118	23.0	15.35	32.00	3.34	129.8
11:50	119	23.0	15.42	28.17	3.88	153.2
11:51	119	23.0	15.31	27.06	3.04	120.3
11:52	119	23.0	15.09	23.80	3.00	116.6
11:53	119	23.0	16.06	18.76	4.37	113.1
11:54	119	23.0	15.35	26.80	3.34	100.6
11:55	119	23.0	14.82	22.58	3.16	107.2
11:56	119	23.0	15.27	31.04	3.76	113.8
11:57	118	23.0	15.55	40.66	3.73	93.2
11:58	118	23.0	15.53	22.84	4.89	91.6
11:59	118	23.0	15.24	48.58	3.32	90.0
12:00	117	23.0	15.39	37.85	3.15	88.3
12:01	118	23.0	15.85	41.13	3.25	86.7
12:02	118	23.0	15.04	43.63	2.28	91.4
12:03	118	23.0	14.65	20.36	1.93	83.4
12:04	117	23.0	15.07	15.56	1.92	81.7
12:05	117	23.0	14.84	5.34	4.65	81.3
12:06	117	24.0	14.36	1.83	1.82	80.5
12:07	117	24.0	14.54	0.51	1.72	79.6
12:08	119	24.0	15.03	0.42	2.12	79.7
12:09	117	24.0	14.76	0.40	1.60	91.4
12:10	119	24.0	14.41	0.38	1.42	91.5
12:11	119	24.0	14.89	0.41	4.01	86.5
12:12	119	24.0	15.16	0.43	1.72	80.4
12:13	119	24.0	14.06	5.01	1.48	74.3
12:14	119	24.0	15.82	1.55	1.91	68.2
12:15	119	24.0	15.70	0.47	1.72	62.1
12:16	120	24.0	15.64	1.82	4.83	63.0
12:17	120	24.0	15.90	7.42	3.96	46.6
12:18	120	24.0	15.21	2.35	3.34	36.5
12:19	119	24.0	14.40	3.57	2.71	32.1
12:20	119	24.0	16.02	1.19	2.36	42.8
12:21	119	24.0	15.88	0.49	2.65	45.6
12:22	119	24.0	16.02	0.50	2.32	55.5
12:23	119	24.0	15.18	0.43	1.57	55.4
12:24	119	24.0	14.63	0.39	1.01	69.8
12:25	118	24.0	15.14	0.43	2.71	47.4
12:26	119	24.0	16.21	0.52	1.05	65.7
12:27	119	24.0	15.45	0.45	1.51	66.7
12:28	119	24.0	15.60	0.47	1.32	65.7
12:29	118	25.0	15.37	0.45	1.36	41.0
12:30	117	25.0	15.12	0.43	1.35	31.5
12:31	118	25.0	17.10	0.65	1.65	59.4
12:32	118	25.0	16.43	0.55	1.37	56.5
12:33	118	25.0	15.17	0.43	0.88	63.8
12:34	118	25.0	16.13	0.52	0.71	63.3
12:35	118	25.0	15.15	0.43	0.59	57.0
12:36	118	25.0	15.85	0.49	0.95	67.9
12:37	118	25.0	16.49	0.56	0.82	61.9
12:38	118	25.0	15.69	0.47	0.85	53.9
12:39	118	25.0	16.37	0.54	0.75	70.3
12:40	118	25.0	16.58	0.57	1.10	75.3
12:41	118	25.0	15.75	0.48	0.66	61.7
12:42	119	25.0	16.76	0.59	0.82	80.5
12:43	119	25.0	16.34	0.54	0.74	58.7
12:44	118	25.0	15.92	0.49	0.68	54.4
12:45	119	25.0	16.84	0.61	0.83	73.5
12:46	119	25.0	16.06	0.51	0.70	64.3
12:47	118	25.0	16.12	0.51	0.71	69.8
<b>Average</b>	<b>118</b>	<b>24.0</b>	<b>15.51</b>	<b>9.66</b>	<b>2.20</b>	<b>75.6</b>

Carbon Monoxide First 30 mins		<b>18.35</b>
Carbon Monoxide Second 30 mins		<b>0.69</b>



**Gilroes Stream 2 - Cremators 3 & 4 & Abatement System**

**Data Log**

**10 November 2022**

Test H3

Time	Flue Gas °C	Meter °C	Flue O <sub>2</sub> %v/v dry	CO mg/Nm <sup>3</sup> c.	TOC mg/Nm <sup>3</sup> c.	Sample Point Pa
12:59	124	24.0	16.11	0.51	1.09	146.3
13:00	123	24.0	16.91	78.23	0.82	111.2
13:01	123	24.0	16.07	16.47	0.68	110.1
13:02	123	24.0	16.34	13.15	1.11	116.8
13:03	124	24.0	16.95	22.21	0.83	127.4
13:04	124	24.0	16.21	9.14	0.70	110.1
13:05	126	24.0	16.80	10.83	0.80	145.3
13:06	126	24.0	15.82	14.15	0.65	121.7
13:07	126	24.0	16.12	13.26	0.69	129.8
13:08	127	24.0	15.92	14.76	0.66	154.0
13:09	128	24.0	15.26	21.30	0.58	140.0
13:10	129	24.0	15.52	27.16	0.61	164.6
13:11	130	24.0	15.34	34.22	0.59	134.8
13:12	130	24.0	15.42	26.34	0.60	141.6
13:13	130	24.0	15.45	18.05	2.52	133.0
13:14	130	24.0	15.56	14.98	0.62	123.8
13:15	131	24.0	15.38	9.56	0.60	121.2
13:16	131	24.0	15.51	6.96	0.61	109.8
13:17	130	24.0	15.56	4.68	0.62	84.6
13:18	129	24.0	16.58	3.14	0.76	73.1
13:19	129	24.0	16.60	2.49	0.76	64.7
13:20	129	24.0	16.59	2.11	0.76	73.5
13:21	129	24.0	16.45	1.15	0.74	72.2
13:22	129	24.0	15.52	0.46	0.90	79.1
13:23	129	25.0	15.56	0.46	0.62	72.2
13:24	128	25.0	16.29	0.53	0.71	74.6
13:25	128	25.0	16.46	0.55	0.74	92.8
13:26	129	25.0	16.55	0.56	0.75	94.2
13:27	129	25.0	15.94	0.50	0.66	89.0
13:28	129	25.0	15.82	0.48	0.65	72.1
13:29	128	25.0	16.52	0.56	0.75	69.3
13:30	128	25.0	17.10	0.65	0.86	79.7
13:31	128	25.0	17.30	0.68	0.91	78.4
13:32	127	25.0	16.82	0.60	0.81	46.9
13:33	126	25.0	17.52	0.72	0.97	52.4
13:34	127	25.0	17.55	0.73	0.98	64.0
13:35	126	25.0	16.30	0.53	0.71	48.4
13:36	125	25.0	17.50	0.72	0.96	69.9
13:37	127	25.0	17.74	0.78	1.04	83.1
13:38	125	25.0	16.36	0.54	0.72	64.2
13:39	125	25.0	17.60	0.74	0.99	72.9
13:40	125	25.0	17.94	0.83	1.10	75.0
13:41	124	25.0	16.81	0.60	0.80	47.4
13:42	124	25.0	17.97	0.83	1.11	70.8
13:43	125	25.0	17.99	1.11	1.12	96.4
13:44	123	25.0	16.42	0.55	0.73	55.4
13:45	123	25.0	18.01	0.85	1.13	84.2
13:46	124	25.0	18.29	0.94	1.25	99.2
13:47	124	25.0	16.74	0.59	0.79	72.2
13:48	123	25.0	17.44	1.79	0.95	97.6
13:49	125	25.0	17.12	1.64	0.87	132.0
13:50	128	25.0	16.10	0.51	1.30	147.6
13:51	128	25.0	17.65	65.57	1.01	122.7
13:52	128	25.0	16.15	28.00	0.69	118.9
13:53	127	25.0	15.77	12.18	0.64	99.7
13:54	127	25.0	17.07	14.80	0.86	130.9
13:55	128	25.0	17.30	23.08	0.91	137.4
13:56	128	25.0	16.54	16.46	0.75	115.8
13:57	129	25.0	16.47	18.13	0.74	106.5
13:58	128	25.0	16.77	23.51	0.80	100.6
13:59	129	25.0	16.44	38.69	0.74	108.0
<b>Average</b>	<b>127</b>	<b>24.6</b>	<b>16.56</b>	<b>10.27</b>	<b>0.84</b>	<b>98.9</b>

Carbon Monoxide First 30 mins		11.90
Carbon Monoxide Second 30 mins		8.58

## Total Particulate Matter and Hydrogen Chloride

### Gilroes Stream 2 - Cremators 3 & 4 & Abatement System

Test Log	Test 1		Test 2		Test 3	
Barometric Pressure(kPa)	101.4		101.4		101.4	
Gas Meter Temperature(Deg C)	21.8		24.0		24.6	
Oxygen Concentration(%v/v dry)	14.85		15.51		16.56	
Flue Gas Volumetric Flow(Nm <sup>3</sup> /h dry)	3035		2943		3420	
	Start	End	Start	End	Start	End
Time	10:34	11:34	11:47	12:47	12:59	13:59
Gas Meter Reading(Am <sup>3</sup> dry)	4.430	5.478	5.505	6.392	6.408	7.458
Absorber Weight(g)	3261.1	3315.4	3220.5	3268.3	3230.6	3261.8
Filter Reference	47-3198		47-3113		2828.6	
Filter Weight(g)	0.14849	0.14909	0.14864	0.14867	0.15091	0.15137
Probe Rinse Reference	R1-PR-47-3198		R2-PR-47-3113		R3-PR-47-3168	
Probe Rinse Weight(g)	3.12913	3.13043	3.14426	3.14524	2.88326	2.88670
Sample Reference HCl	R1 ABC		R2 ABC		R3 AB	R3 C
Absorbent	H <sub>2</sub> O		H <sub>2</sub> O		H <sub>2</sub> O	H <sub>2</sub> O
Absorbent Volume(ml)	413		357		234	118
Absorbent(mg/l as HCl)	6.9		2.6		18.1	0.05
Blank(mg/l as HCl)	0.05		0.05		0.05	0.05

### Calculation: General

Barometric Pressure(kPa)	101.4	101.4	101.4
Gas Meter temperature(Deg C)	21.8	24.0	24.6
Gas Volume Sampled(Am <sup>3</sup> dry)	1.057	0.895	1.059
Gas Volume Sampled(Nm <sup>3</sup> dry)	0.9802	0.8235	0.9728
Mass of Dry Gas(g @ 1292.8 g/Nm <sup>3</sup> )	1267.26	1064.59	1257.65
Change in Absorber Weight(g)	54.3	47.8	31.2
Water Vapour Volume(Nm <sup>3</sup> @ 803.9 g/Nm <sup>3</sup> )	0.0675	0.0595	0.0388
Gas Volume(Nm <sup>3</sup> wet)	1.0478	0.8829	1.0116
Mass of Wet Gas(g)	1321.56	1112.39	1288.85
<b>Moisture Concentration(%v/v)</b>	<b>6.4</b>	<b>6.7</b>	<b>3.8</b>
<b>Moisture Concentration(%w/w)</b>	<b>4.1</b>	<b>4.3</b>	<b>2.4</b>

**Calculation: Particulate**

Increase In Filter Weights(g)	0.00190	0.00101	0.00390
Particulate Emission(mg/Nm <sup>3</sup> dry)	1.94	1.23	4.01
Oxygen Concentration(%v/v dry)	14.85	15.51	16.56
<b>Particulate Emission</b>	<b>3.16</b>	<b>2.24</b>	<b>9.08</b>
<b>(mg/Nm<sup>3</sup> @ 11 %v/v Oxygen dry)</b>			
Flue Gas Volumetric Flow(Nm <sup>3</sup> /h dry)	3035	2943	3420
<b>Particulate Emission(g/h)</b>	<b>5.88</b>	<b>3.61</b>	<b>13.71</b>
Required Sample Velocity(Nm/s)	8.76	8.50	9.87
Nozzle Used(mm)	6.0	6.0	6.0
Area of Nozzle(m <sup>2</sup> )	0.00002781	0.00002781	0.00002781
Test Duration(mins)	60	60	60
Actual Sample Velocity(Nm/s)	9.79	8.23	9.72
Isokinetic Closure(%)	112	97	98
		102	
Start Leak Check(%)	0.02	0.02	0.02
	@10 l/min	@10 l/min	@10 l/min
End Leak Check(%)	-	-	-
	@10 l/min	@10 l/min	@10 l/min

**Calculation: HCl**

Absorbent(mg/l as HCl)	6.9	2.6	18.15
Blank(mg/l as HCl)	0.05	0.05	0.05
Chloride Absorbed(mg/l as HCl)	6.85	2.55	18.1
Chloride Absorbed(mg as HCl)	2.83	0.91	4.23
HCl(mg)	2.83	0.91	4.23
HCl Emission(mg/Nm <sup>3</sup> dry)	2.89	1.10	4.34
Oxygen Concentration(%v/v dry)	14.85	15.51	16.56
<b>HCl Emission</b>	<b>4.70</b>	<b>2.02</b>	<b>9.84</b>
<b>(mg/Nm<sup>3</sup> @ 11 %v/v Oxygen dry)</b>			
Flue Gas Volumetric Flow(Nm <sup>3</sup> /h dry)	3035	2943	3420
<b>HCl Emission(g/h)</b>	<b>8.76</b>	<b>3.25</b>	<b>14.86</b>

**Gilroes Stream 2 - Cremators 3 & 4 & Abatement System**  
**Flue Gas Volumetric Flow**

Test Log	Test 1	Test 2	Test 3
Flue Gas Temperature(Deg C)	118	118	127
Flue Gas Pitot Head Sample Points(Pa)	80.0	75.6	98.9
Flue Gas Moisture(%v/v)	6.4	6.7	3.8
Flue Gas Moisture(%w/w)	4.1	4.3	2.4
Flue Gas Duct Dimensions(mm)	350mm Diameter Circular Duct		
Flue Gas Duct Area(m <sup>2</sup> )	0.0962		

**Calculation**

Flue Gas Density(kg/m <sup>3</sup> )	0.8877	0.8871	0.8744
Flue Gas Velocity(Am/s)	13.43	13.06	15.04
Flue Gas Volumetric Flowrate(Am <sup>3</sup> /h)	4652	4524	5209
Flue Gas Volumetric Flowrate(Am <sup>3</sup> /h dry)	4352	4219	5010
Flue Gas Volumetric Flowrate(Nm <sup>3</sup> /h dry)	3035	2943	3420

**Gilroes Stream 2 - Cremators 3 & 4 & Abatement System**

**Data Log**

**09/11/2022**

Hg Test

Time	Flue Gas °C	Meter °C	Flue O <sub>2</sub> %v/v dry	Pitot Head Pa
12:06	99	21.0	15.07	127.8
12:07	99	21.0	15.26	96.8
12:08	99	21.0	13.98	74.1
12:09	100	21.0	14.25	97.9
12:10	101	21.0	13.71	89.6
12:11	101	21.0	13.65	102.8
12:12	102	21.0	14.03	117.7
12:13	103	21.0	13.70	98.7
12:14	104	21.0	13.46	95.6
12:15	105	21.0	13.35	118.1
12:16	106	21.0	13.25	138.6
12:17	108	21.0	12.89	133.8
12:18	109	21.0	13.29	145.3
12:19	110	21.0	13.39	149.7
12:20	112	21.0	13.36	162.4
12:21	113	21.0	13.33	161.1
12:22	115	21.0	13.57	158.0
12:23	116	21.0	13.46	176.7
12:24	117	21.0	13.52	156.5
12:25	118	21.0	13.64	146.2
12:26	118	21.0	13.89	129.4
12:27	119	21.0	14.28	140.4
12:28	119	21.0	14.08	133.9
12:29	120	21.0	13.70	142.2
12:30	122	21.0	13.71	183.5
12:31	122	21.0	13.48	141.1
12:32	122	21.0	13.63	150.8
12:33	123	21.0	14.02	145.6
12:34	124	21.0	14.23	152.1
12:35	125	21.0	13.56	159.5
12:36	124	22.0	13.79	112.7
12:37	124	22.0	13.78	122.3
12:38	124	22.0	13.99	117.4
12:39	125	22.0	14.09	125.6
12:40	124	22.0	13.88	105.4
12:41	123	22.0	14.05	84.1
12:42	123	22.0	13.54	76.0
12:43	123	22.0	13.61	83.6
12:44	123	22.0	14.02	89.7
12:45	123	22.0	13.68	115.5
12:46	123	22.0	13.48	73.6
12:47	122	22.0	13.53	73.8
12:48	122	22.0	15.33	75.5
12:49	122	22.0	14.67	75.0
12:50	121	22.0	14.45	76.2
12:51	121	22.0	14.56	65.1
12:52	121	22.0	14.84	71.4
12:53	120	22.0	15.05	61.9
12:54	120	22.0	14.92	81.2
12:55	121	22.0	15.48	97.3
12:56	121	22.0	14.93	76.5
12:57	120	22.0	14.79	68.0
12:58	120	22.0	16.13	86.5
12:59	120	22.0	15.48	76.1
13:00	120	22.0	15.65	87.2
13:01	120	22.0	15.96	71.3
13:02	119	23.0	15.32	56.6
13:03	119	23.0	15.67	73.5
13:04	119	23.0	16.19	60.5
13:05	118	23.0	15.68	59.0
13:06	119	23.0	16.16	79.1
13:07	118	23.0	16.15	71.3
13:08	119	23.0	15.10	94.2



13:09	119	23.0	15.16	145.4
13:10	121	23.0	16.79	112.9
13:11	120	23.0	17.06	106.4
13:12	119	23.0	15.63	88.5
13:13	118	23.0	15.47	69.9
13:14	119	23.0	16.24	81.8
13:15	118	23.0	16.04	73.6
13:16	119	23.0	15.49	78.8
13:17	119	23.0	15.95	74.5
13:18	119	23.0	15.38	65.2
13:19	119	23.0	15.28	65.8
13:20	119	23.0	14.95	69.9
13:21	119	23.0	14.48	60.1
13:22	119	23.0	14.54	59.1
13:23	119	23.0	14.84	66.0
13:24	119	23.0	15.07	62.2
13:25	119	23.0	15.44	66.0
13:26	119	23.0	15.60	48.6
13:27	119	23.0	15.53	53.5
13:28	118	23.0	14.84	52.1
13:29	118	23.0	14.68	48.4
13:30	118	23.0	14.52	48.9
13:31	118	23.0	14.63	47.6
13:32	118	23.0	14.81	42.3
13:33	117	23.0	14.82	41.0
13:34	117	23.0	14.80	39.8
13:35	117	23.0	14.64	47.0
13:36	117	23.0	14.66	43.8
13:37	117	23.0	14.81	41.7
13:38	117	23.0	14.76	40.8
13:39	116	23.0	14.72	39.4
13:40	116	23.0	14.91	41.2
13:41	116	23.0	14.74	35.7
13:42	115	23.0	14.81	32.9
13:43	115	23.0	14.72	32.5
13:44	115	23.0	14.81	43.3
13:45	115	23.0	14.80	53.0
13:46	115	23.0	14.91	54.9
13:47	115	23.0	14.35	45.9
13:48	114	23.0	13.72	37.9
13:49	114	23.0	14.97	35.1
13:50	114	23.0	15.14	48.3
13:51	115	23.0	15.19	54.6
13:52	114	23.0	14.17	38.1
13:53	113	23.0	14.83	32.5
13:54	114	23.0	16.72	49.7
13:55	113	23.0	15.70	49.9
13:56	114	23.0	14.97	74.3
13:57	115	23.0	15.07	68.5
13:58	114	23.0	14.34	68.8
13:59	115	23.0	15.35	68.4
14:00	115	23.0	15.27	60.9
14:01	114	23.0	15.43	65.7
14:02	115	23.0	15.66	61.5
14:03	115	23.0	15.64	73.5
14:04	115	23.0	15.08	49.5
14:05	115	23.0	14.90	57.8
14:06	115	23.0	14.75	75.9
14:07	115	23.0	15.54	52.6
14:08	116	23.0	15.19	71.4
14:09	116	23.0	14.82	69.4
14:10	116	23.0	15.55	62.2
14:11	116	23.0	15.54	58.7
14:12	116	23.0	14.91	53.6
14:13	116	23.0	15.15	61.4
14:14	116	23.0	16.06	63.2
14:15	116	23.0	15.85	65.7
14:16	117	23.0	15.55	67.4
14:17	117	23.0	14.96	70.1
14:18	117	23.0	15.45	61.4
14:19	117	23.0	15.76	77.3
14:20	117	23.0	16.68	57.3



14:21	117	23.0	15.25	52.4
14:22	118	23.0	15.97	74.3
14:23	118	23.0	16.41	62.9
14:24	118	23.0	15.46	58.4
14:25	117	23.0	15.69	43.8
14:26	118	23.0	16.52	59.6
14:27	117	23.0	15.81	59.1
14:28	117	23.0	15.50	54.1
14:29	117	23.0	16.79	53.7
14:30	116	23.0	16.10	33.6
14:31	116	23.0	17.18	34.0
14:32	117	23.0	18.91	52.6
14:33	117	23.0	16.56	45.4
14:34	116	23.0	15.45	49.6
14:35	116	23.0	16.39	45.9
14:36	116	23.0	16.68	39.5
14:37	116	23.0	16.91	48.2
14:38	117	23.0	17.16	60.1
14:39	116	23.0	17.10	53.5
14:40	115	23.0	15.50	28.7
14:41	115	23.0	16.10	31.5
14:42	116	23.0	18.15	63.2
14:43	116	23.0	16.71	57.0
14:44	116	23.0	15.96	52.8
14:45	115	23.0	15.71	55.0
14:46	116	23.0	15.99	54.0
14:47	116	23.0	16.45	48.2
14:48	115	23.0	15.50	57.3
14:49	116	23.0	16.51	62.7
14:50	115	23.0	15.77	44.2
14:51	115	23.0	15.78	52.8
14:52	115	23.0	17.42	43.9
14:53	115	23.0	15.99	40.0
14:54	115	23.0	16.21	66.6
14:55	115	23.0	16.92	52.8
14:56	115	23.0	15.48	45.4
14:57	116	23.0	16.36	64.7
14:58	115	23.0	16.64	51.6
14:59	115	23.0	15.51	49.4
15:00	115	23.0	16.24	49.8
15:01	115	23.0	17.03	42.8
15:02	114	23.0	15.99	34.8
15:03	115	23.0	17.56	42.1
15:04	115	23.0	18.14	42.7
15:05	114	23.0	15.31	36.2
15:06	114	23.0	15.46	41.2
15:07	113	23.0	15.66	35.4
15:08	113	23.0	15.65	32.4
15:09	113	23.0	15.08	34.6
15:10	112	23.0	14.91	28.8
15:11	112	24.0	14.75	31.6
15:12	112	24.0	15.55	36.4
15:13	112	24.0	15.19	35.8
15:14	111	24.0	14.83	36.0
15:15	111	24.0	15.56	36.6
15:16	111	24.0	15.55	37.4
15:17	110	24.0	14.91	28.1
15:18	110	24.0	15.16	25.2
15:19	109	24.0	16.06	21.8
15:20	110	24.0	15.86	32.3
15:21	109	24.0	15.55	34.6
15:22	109	24.0	14.96	21.7
15:23	108	24.0	15.46	18.3
15:24	108	24.0	16.39	22.5
15:25	108	24.0	16.14	21.2
15:26	107	24.0	15.64	18.3
15:27	107	24.0	15.51	18.6
15:28	107	24.0	15.74	37.9
15:29	107	24.0	16.85	40.4
15:30	109	24.0	15.84	104.5
15:31	110	24.0	16.23	88.6
15:32	109	24.0	16.91	55.9



15:33	108	24.0	15.80	52.4
15:34	108	24.0	16.16	48.7
15:35	109	24.0	16.39	70.8
15:36	109	24.0	16.49	59.7
15:37	109	24.0	15.93	80.6
15:38	109	24.0	16.52	71.2
15:39	110	24.0	15.56	65.9
15:40	110	24.0	15.34	58.6
15:41	110	24.0	15.84	66.7
15:42	110	24.0	15.45	74.1
15:43	110	24.0	15.54	59.3
15:44	110	24.0	15.28	56.4
15:45	110	24.0	15.18	55.2
15:46	110	24.0	15.13	62.3
15:47	110	24.0	15.20	64.4
15:48	110	24.0	15.20	57.4
15:49	110	24.0	15.27	54.3
15:50	110	24.0	15.21	47.5
15:51	109	24.0	15.25	43.2
15:52	109	24.0	15.43	32.9
15:53	109	24.0	15.46	26.9
15:54	109	24.0	15.36	34.4
15:55	109	24.0	15.37	34.7
15:56	109	24.0	15.34	28.6
15:57	109	24.0	15.66	40.8
15:58	109	24.0	16.05	46.0
15:59	109	24.0	16.38	51.4
16:00	109	24.0	16.00	45.8
16:01	109	24.0	16.71	49.8
16:02	109	24.0	17.22	50.4
16:03	109	24.0	17.34	67.6
16:04	109	24.0	16.73	45.5
16:05	110	24.0	16.88	73.0
16:06	110	24.0	17.10	80.7
16:07	110	24.0	15.74	64.3
16:08	110	24.0	17.33	65.1
16:09	112	24.0	18.52	109.6
16:10	112	24.0	15.91	88.1
16:11	112	24.0	15.05	67.0
16:12	112	24.0	16.16	72.5
16:13	112	24.0	16.18	81.6
16:14	112	24.0	15.82	59.7
16:15	113	24.0	15.69	83.6
16:16	113	24.0	16.76	90.4
16:17	114	24.0	16.48	69.4
16:18	113	24.0	15.58	52.7
16:19	113	24.0	16.30	67.6
16:20	113	24.0	17.37	63.4
16:21	113	24.0	17.45	60.7
16:22	114	24.0	18.13	83.6
16:23	114	24.0	16.77	55.9
16:24	115	24.0	17.09	97.9
16:25	116	24.0	17.40	88.1
16:26	116	24.0	16.50	82.1
16:27	116	24.0	16.29	91.6
16:28	116	24.0	15.91	75.9
16:29	116	24.0	15.80	76.0
<b>Average</b>	<b>115</b>	<b>23.0</b>	<b>15.4</b>	<b>67.7</b>





**Mercury**

**Gilroes Stream 2 - Cremators 3 & 4 & Abatement System**

**Test Log**

**Hg Test**

Barometric Pressure(kPa)  
Gas Meter Temperature(Deg C)  
Oxygen Concentration(%v/v dry)  
Flue Gas Volumetric Flow(Nm<sup>3</sup>/h dry)

99.9  
23.0  
15.43  
2883

	Start	End
Time	12:06	16:29
Gas Meter Reading(Am <sup>3</sup> dry)	0.522	4.399
Absorber Weight(g)	3221.4	3326.2
Filter Reference	S2.9	
Filter Fraction Analysed	1	
Filter(µg as Hg)	0.03	
Filter Blank(µg as Hg)	0.03	
Probe Rinse Reference	S2.92	
Probe Rinse Volume(ml)	68	
Probe Rinse(µg/l as Hg)	0.5	
Probe Rinse Blank(µg/l as Hg)	0.5	
Absorbent	4% K <sub>2</sub> CR <sub>2</sub> O <sub>7</sub> / 20% HNO <sub>3</sub> in H <sub>2</sub> O	
Absorbent Reference	R1 AB + C	
Absorbent Volume(ml)	588	242
Absorbent(µg/l as Hg)	16.5	0.5
Absorbent Blank(µg/l as Hg)	0.5	0.5

**Calculation: General**

Barometric Pressure(kPa)	99.9
Gas Meter Temperature(Deg C)	23.0
Gas Volume Sampled(Am <sup>3</sup> dry)	3.912
Gas Volume Sampled(Nm <sup>3</sup> dry)	3.5584
Mass of Dry Gas(g @ 1292.8 g/Nm <sup>3</sup> )	4600.28
Change in Absorber Weight(g)	104.8
Water Vapour Volume(Nm <sup>3</sup> @ 803.9 g/Nm <sup>3</sup> )	0.1304
Gas Volume(Nm <sup>3</sup> wet)	3.6887
Mass of Wet Gas(g)	4705.08
<b>Moisture Concentration(%v/v)</b>	<b>3.5</b>
<b>Moisture Concentration(%w/w)</b>	<b>2.2</b>

**Calculation: Mercury**

Filter( $\mu\text{g}$ as Hg)	0.00
Probe Rinse( $\mu\text{g}$ as Hg)	0.00
Absorbent( $\mu\text{g}$ as Hg)	9.70
Total Mercury Sampled( $\mu\text{g}$ )	9.70
Mercury Emission( $\mu\text{g}/\text{Nm}^3$ dry)	2.73
Oxygen Concentration(%v/v dry)	15.43
<b>Mercury Emission</b>	<b>4.91</b>
<b>(<math>\mu\text{g}/\text{Nm}^3</math> @ 11 %v/v Oxygen dry)</b>	
Flue Gas Volumetric Flowrate( $\text{Nm}^3/\text{h}$ dry)	2883
<b>Mercury Emission(g/h)</b>	<b>0.008</b>
Required Sample Velocity( $\text{Nm}/\text{s}$ )	8.32
Nozzle Used(mm)	6.0
Area of Nozzle( $\text{m}^2$ )	0.00002781
Test Duration(mins)	264
Actual Sample Velocity( $\text{Nm}/\text{s}$ )	8.08
Isokinetic Closure(%)	97

**Gilroes Stream 2 - Cremators 3 & 4 & Abatement System**

**Flue Gas Volumetric Flow**

<b>Test Log</b>	<b>Hg Test</b>
Flue Gas Temperature(Deg C)	115
Flue Gas Pitot Head Sample Points(Pa)	67.7
Flue Gas Moisture(%v/v)	3.5
Flue Gas Moisture(%w/w)	2.2
Flue Gas Duct Dimensions(mm)	350mm Diameter Circular Flue
Flue Gas Duct Area(m <sup>2</sup> )	0.0962

**Calculation**

Flue Gas Density(kg/m <sup>3</sup> )	0.9030
Flue Gas Velocity(Am/s)	12.25
Flue Gas Volumetric Flowrate(Am <sup>3</sup> /h)	4243
Flue Gas Volumetric Flowrate(Am <sup>3</sup> /h dry)	4093
<b>Flue Gas Volumetric Flowrate(Nm<sup>3</sup>/h dry)</b>	<b>2883</b>

**Gilroes Crematorium - Streams 1 & 2**  
**Emissions Monitoring November 2022**  
**Instrumental Gas Analyser Calibrations**

Date	Operators	Combustion Gas Analyser	Flame Ionisation Detector
8th - 9th November 2022	LP/AD	Horiba PG350 (ETC-12.08)	SK PT63 (ETC-S13.08)

Calibration Gas	Certified Concentration	Analyser Range	T90 Time	Analyser Span	Pre-sample Cal		Post-sample Cal		Zero Drift	Span Drift	Drift Acceptable
					Zero	Span	Zero	Span			
Carbon Monoxide	164.36ppm	200ppm	62	164.4	0.04	164.4	0.01	162.5	-0.01	-1.1	Yes
Propane	85.11ppm	100ppm	44	80.1	0.05	80.0	0.09	80.0	0.11	-0.26	Yes
Oxygen	21.44%	25%	55	21.4	0.02	21.4	0.04	21.3	0.19	-0.75	Yes

**Gilroes Crematorium - Streams 1 & 2**  
**Emissions Monitoring November 2022**  
**Instrumental Gas Analyser Calibrations**

Date	Operators	Combustion Gas Analyser	Flame Ionisation Detector
9th - 10th November 2022	LP/AD	Horiba PG350 (ETC-12.08)	SK PT63 (ETC-S13.08)

Calibration Gas	Certified Concentration	Analyser Range	T90 Time	Analyser Span	Pre-sample Cal		Post-sample Cal		Zero Drift	Span Drift	Drift Acceptable
					Zero	Span	Zero	Span			
Carbon Monoxide	164.36ppm	200ppm	79	163.8	0.03	163.8	-0.02	161	-0.03	-1.7	Yes
Propane	85.11ppm	100ppm	45	80.0	0.04	80.7	0.11	80.1	0.14	-0.01	Yes
Oxygen	21.44%	25%	85	21.4	0.01	21.4	0.06	21.3	-0.19	-0.09	Yes

## **APPENDIX 2**

Analysis Reports

**Gilroes Stream 1 - Cremators 1 & 2 & Abatement System**

**Particulate Weight Determination**

Reference		Clean Dry Weight g	Dirty Dry Weight g	
Filters	47-3092	BLK	0.15055	0.15071
	47-3090	R1	0.15262	0.15358
	47-3089	R2	0.15050	0.15124
	47-3093	R3	0.15085	0.15173
Rinses	BLK-PR-47-3092		3.03311	3.03336
	R1-PR-47-3090		2.92128	2.92157
	R2-PR-47-3089		3.11587	3.11612
	R3-PR-47-3093		2.86800	2.86825

**Gilroes Stream 2 - Cremators 3 & 4 & Abatement System**

**Particulate Weight Determination**

Reference		Clean Dry Weight g	Dirty Dry Weight g	
Filters	47-3169	BLK	0.14952	0.14969
	47-3198	R1	0.14849	0.14909
	47-3113	R2	0.14864	0.14867
	47-3168	R3	0.15091	0.15137
Rinses	BLK-PR-47-3169		2.86293	2.86333
	R1-PR-47-3198		3.12913	3.13043
	R2-PR-47-3113		3.14426	3.14524
	R3-PR-47-3168		2.88326	2.88670

## Certificate of Analysis

**Report No.:** 22-14196-1

**Issue No.:** 1  
**Date of Issue:** 28/11/2022

**Customer Details:** Envirocare (Stack), Bradford Chamber Business Park, New Lane, Bradford, BD4 8BX

**Customer Contact:**

**Customer Order No.:** EK-0219 ETC-35106

**Customer Reference:** Not Supplied

**Quotation Reference:** Q22-04556

**Description:** 10 liquid samples

**Date Received:** 15/11/2022

**Date Started:** 18/11/2022

**Date Completed:** 28/11/2022

**Test Methods:** Details available on request (refer to SOP code against relevant result/s)

**Notes:** None

**Approved By:** Operational Manager

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This certificate shall not be reproduced except in full without the prior written approval of the laboratory.  
Observations and interpretations are outside of the scope of UKAS accreditation.  
Results reported herein relate only to the items supplied to the laboratory for testing.  
Results on an Interim Report are not dry-weight corrected.  
Where the laboratory is not responsible for the sampling, results apply to the sample(s) as they were received.  
The laboratory shall not be responsible for any information that is supplied by the customer that may affect the validity of results.



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## Certificate of Analysis

<b>Report No.:</b>	<b>22-14200-1</b>
<b>Issue No.:</b>	<b>1</b>
<b>Date of Issue</b>	<b>24/11/2022</b>
<b>Customer Details:</b>	Envirocare (Stack), Bradford Chamber Business Park, New Lane, Bradford, BD4 8BX
<b>Customer Contact:</b>	
<b>Customer Order No.:</b>	EK-0219 ETC-35108
<b>Customer Reference:</b>	Not Supplied
<b>Quotation Reference:</b>	Q22-04556
<b>Description:</b>	10 liquid samples, 4 solid samples
<b>Date Received:</b>	15/11/2022
<b>Date Started:</b>	16/11/2022
<b>Date Completed:</b>	24/11/2022
<b>Test Methods:</b>	Details available on request (refer to SOP code against relevant result/s)
<b>Notes:</b>	None

**Approved By:** **Operational Manager**

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## Results Summary

Report No.: 22-14196-1

Customer Reference: Not Supplied

Customer Order No: EK-0219 ETC-35106

Customer Sample No	S1.1: EK-0219 - Stream 1 - HCl - R1 - IMP ABC	S1.2: EK-0219 - Stream 1 - HCl - R2 - IMP ABC	S1.3: EK-0219 - Stream 1 - HCl - R3 - IMP ABC	S1.4: EK-0219 - Stream 1 - HCl - R3 - IMP C	S1.5: EK-0219 - Stream 1 - HCl - B1 - IMP ABC	S1.6: EK-0219 - Stream 2 - HCl - R1 - IMP ABC	S1.7: EK-0219 - Stream 2 - HCl - R2 - IMP ABC	S1.8: EK-0219 - Stream 2 - HCl - R3 - IMP AB	S1.9: EK-0219 - Stream 2 - HCl - R3 - IMP C	S1.10: EK-0219 - Stream 2 - HCl - B1 - IMP ABC
RPS Sample No	144792	144793	144794	144795	144796	144797	144798	144799	144800	144801
Sample Matrix	SOLUTION	SOLUTION	SOLUTION	SOLUTION	SOLUTION	SOLUTION	SOLUTION	SOLUTION	SOLUTION	SOLUTION
Sampling Date	08/11/2022	09/11/2022	09/11/2022	09/11/2022	08/11/2022	10/11/2022	10/11/2022	10/11/2022	10/11/2022	10/11/2022

Determinand	CAS No	Codes	SOP	RL	Units										
volume of sample supplied		U	N/A	n/a	ml	365	427	392	240	325	420	360	235	110	225
hydrogen chloride	7647-01-0	UM	C27	0.05	ug/mL	0.60	2.18	1.57	< 0.05	< 0.05	6.90	2.60	18.1	< 0.05	< 0.05

## Results Summary

Report No.: 22-14200-1

Customer Reference: Not Supplied

Customer Order No: EK-0219 ETC-35106

Customer Sample No	S2.1: EK-0219 - Stream 1 - Hg/Vapour Phase - R1 - IMP AB	S2.2: EK-0219 - Stream 1 - Hg/Vapour Phase - R1 - IMP C	S2.3: EK-0219 - Stream 1 - Hg/Vapour Phase - B1 - IMP ABC	S2.4: EK-0219 - Stream 1 - Hg/Particulate Phase - R1 - Filter & Rinse Combined	S2.4: EK-0219 - Stream 1 - Hg/Particulate Phase - R1 - Filter & Rinse Combined	S2.5: EK-0219 - Stream 1 - Hg/Particulate Phase - B1 - Filter & Rinse Combined	S2.5: EK-0219 - Stream 1 - Hg/Particulate Phase - B1 - Filter & Rinse Combined	S2.6: EK-0219 - Stream 2 - Hg/Vapour Phase - R1 - IMP AB	S2.7: EK-0219 - Stream 2 - Hg/Vapour Phase - R1 - IMP C	S2.8: EK-0219 - Stream 2 - Hg/Vapour Phase - B1 - IMP ABC	S2.9: EK-0219 - Stream 2 - Hg/Particulate Phase - R1 - Filter & Rinse Combined	S2.9: EK-0219 - Stream 2 - Hg/Particulate Phase - R1 - Filter & Rinse Combined	S2.10: EK-0219 - Stream 2 - Hg/Particulate Phase - B1 - Filter & Rinse Combined	S2.10: EK-0219 - Stream 2 - Hg/Particulate Phase - B1 - Filter & Rinse Combined
RPS Sample No	144827	144828	144829	144830	144831	144832	144833	144834	144835	144836	144837	144838	144839	144840
Sample Matrix	SOLUTION	SOLUTION	SOLUTION	FILTER	SOLUTION	FILTER	SOLUTION	SOLUTION	SOLUTION	SOLUTION	FILTER	SOLUTION	FILTER	SOLUTION
Sampling Date	08/11/2022	08/11/2022	08/11/2022	08/11/2022	08/11/2022	08/11/2022	08/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022	09/11/2022

Determinand	CAS No	Codes	SOP	RL	Units										
volume of sample supplied		U	N/A	n/a	ml	547	262	276	54	51	548	216	262	68	54
mercury	7439-97-6	UM	M112	0.03	ug				< 0.03	< 0.03			< 0.03		< 0.03
mercury	7439-97-6	UM	M112	0.5	ug/l	2.7	< 0.5	< 0.5			16.5	< 0.5	< 0.5		
mercury	7439-97-6	UM	M112	0.5	ug/l				< 0.50	< 0.50				< 0.50	< 0.50