

REPORT FOR THE QUARTERLY EMISSIONS TO AIR FROM ENGINE EXHAUST STACKS USING A PORTABLE FLUE GAS ANALYSER

Permit Number: RP 3733 PC

Installation: Trecatti Landfill Site

Monitoring Dates: 19th May 2017

Client: Biffa Waste Services Ltd

Address: Rixton Old Hall
Manchester Road
Rixton
Warrington
WA3 6EW

Monitoring Organisation: EnviroDat Ltd

Address: Science & Technology Centre
Whiteknights Road
Reading
RG6 6BZ

Compiled By: Danny Gibbons

Project Engineer

Signed: 

Dated: 23rd May 2017

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1. INTRODUCTION

- 1.1 EnviroDat Limited was commissioned by Mr B Rigg, on behalf Biffa Waste Services Ltd, to measure the emissions to atmosphere from the installed landfill gas engines at Trecatti Landfill Site using an MCert Certified portable gas analyser (Testo 350XL and/or Horiba PG250).
- 1.2 Sampling was performed on the 19th May 2017.
- 1.3 The emission survey was conducted to provide information on engine performance and to provide regular improvement of emissions. Testing was specific to carbon monoxide and oxides of nitrogen, referenced to 5% oxygen normalised to standard temperature and pressure (STP).

2. SAMPLING PROCEDURES

- 2.1 The sampling and testing protocol adopted for this project was developed from Appendix C of the Environment Agencies Landfill Gas Technical Guidance Note 08, v2, 2010 'Guidance for Monitoring Landfill Gas Engine Emissions'.
- 2.2 The analysers used were within service and calibration specification. All sampling was performed from the 'turbo' port of the units, located within the engine container.
- 2.3 Calibration was performed with 268ppm nitric oxide and 1164ppm carbon monoxide (certified at $\pm 2\%$) and clean air. Extraction was effected by a transfer line, through a stainless steel filtered probe. Gas was drawn through the analyser using the internal pump of the unit. The gas was conditioned to remove moisture prior to analysis. The unit holds MCert certification.

3. RESULTS

3.1 The average measured concentrations of carbon monoxide, oxides of nitrogen (expressed as NO₂), and other parameters for the individual engines are given in the following table. The data is corrected to 273K, 101.3kPa, 5% O₂ and dry gas.

Engine ID	Sampling Time	Carbon Monoxide (mg(N)m ⁻³)	Oxides of Nitrogen as NO ₂ (mg(N)m ⁻³)	Oxygen (%)
Engine 1	09:34 - 9:43	873	564	6.65
Engine 3	09:48 - 9:57	1201	522	6.94
Emission Limit	-	1500	650	-

Note: Concentrations at 273K, 101.3 kPa, 5% O₂ and dry gas

Engine ID	Sampling Time	Carbon Monoxide (mg(N)m ⁻³)	Oxides of Nitrogen as NO ₂ (mg(N)m ⁻³)	Oxygen (%)
Engine 4	10:02-10:11	1108	452	7.02
Engine 5	10:22-10:31	642	452	7.10
Engine 6	10:40-11:49	1021	451	6.77
Engine 7	-	Off	line	-
Emission Limit	-	1400	500	-

Note: Concentrations at 273K, 101.3 kPa, 5%O₂ and dry gas

APPENDIX I

SITE DATA

ENGINE 1 (19/05/17)				
TIME	CO (mg/m ³)	NOX (mg/m ³)	O2 (%)	LOAD
09:34:00	894	602	6.67	704kWe 70%MCR
09:35:00	889	594	6.66	
09:36:00	889	606	6.62	
09:37:00	877	569	6.63	
09:38:00	874	563	6.67	
09:39:00	866	543	6.67	
09:40:00	861	528	6.68	
09:41:00	862	537	6.66	
09:42:00	860	550	6.64	
09:43:00	858	544	6.62	
Average	873	564	6.65	

ENGINE 3 (19/05/17)				
TIME	CO (mg/m ³)	NOX (mg/m ³)	O2 (%)	LOAD
09:48:00	1224	530	6.97	675kWe 70%MCR
09:49:00	1219	535	6.97	
09:50:00	1203	512	6.98	
09:51:00	1197	507	6.96	
09:52:00	1203	530	6.95	
09:53:00	1200	522	6.93	
09:54:00	1195	525	6.92	
09:55:00	1190	523	6.93	
09:56:00	1189	515	6.91	
09:57:00	1193	523	6.91	
Average	1201	522	6.94	

ENGINE 4 (19/05/17)				
TIME	CO (mg/m ³)	NOX (mg/m ³)	O2 (%)	LOAD
10:02:00	1098	405	7.13	750kwe 75% MCR
10:03:00	1099	416	7.09	
10:04:00	1101	421	7.08	
10:05:00	1110	454	7.03	
10:06:00	1116	468	7.00	
10:07:00	1113	460	7.01	
10:08:00	1118	485	6.95	
10:09:00	1110	477	6.97	
10:10:00	1109	466	6.98	
10:11:00	1103	466	6.98	
Average	1108	452	7.02	

ENGINE 5 (19/05/17)				
TIME	CO (mg/m ³)	NOX (mg/m ³)	O2 (%)	LOAD
10:22:00	635	409	7.11	650kwe 65% MCR
10:23:00	628	419	7.13	
10:24:00	634	407	7.11	
10:25:00	630	431	7.13	
10:26:00	648	479	7.08	
10:27:00	655	492	7.10	
10:28:00	654	494	7.14	
10:29:00	645	474	7.05	
10:30:00	645	465	7.07	
10:31:00	642	451	7.04	
Average	642	452	7.10	

ENGINE 6 (19/05/17)				
TIME	CO (mg/m ³)	NOX (mg/m ³)	O2 (%)	LOAD
10:40:00	1072	460	6.80	700kWe 70% MCR
10:41:00	1060	448	6.82	
10:42:00	1067	453	6.81	
10:43:00	1066	455	6.83	
10:44:00	1061	444	6.84	
10:45:00	850	450	6.50	
10:46:00	858	461	6.46	
10:47:00	1061	452	6.86	
10:48:00	1057	442	6.91	
10:49:00	1054	440	6.90	
Average	1021	451	6.77	