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**AVONMOUTH HEALTHCARE WASTE INCINERATOR  
AND TRANSFER FACILITY**

**Environmental Permit Reference Number EPR/VP3130EF**

**ANNUAL PERFORMANCE REPORT FOR 2018**

SRCL Ltd  
Avonmouth  
Holesmouth Road  
Avonmouth  
Bristol  
BS11 9BP

January 2019

## **Introduction**

Condition 4.2.2 and 4.2.3 of the above permit requires the following:

4.2.2 A report or reports on the performance of the activities over the previous year shall be submitted to the Environment Agency by 31 January (or other date agreed in writing by the Environment Agency) each year. The report(s) shall include as a minimum:

- (a) a review of the results of the monitoring and assessment carried out in accordance with the permit including an interpretive review of that data;
- (b) the annual production /treatment data set out in schedule 4 table S4.2; and
- (c) the performance parameters set out in schedule 4 table S4.3 using the forms specified in table S4.4 of that schedule.
- (d) the functioning and monitoring of the incineration plant in a format agreed with the Environment Agency. The report shall, as a minimum requirement (as required by Chapter IV of the Industrial Emissions Directive) give an account of the running of the process and the emissions into air and water compared with the emission standards in the IED.

### **A. Review of the results of the monitoring and assessment**

Monitoring has been undertaken at the facility for the following:

- Extractive emission monitoring.
  - The results of these reports have been submitted as required to the Environment Agency, and all results have demonstrated compliance with the emission limits.
  - The table below shows the results of periodically monitored substances.

Substance	Emission limit value	1 <sup>st</sup> Half	2 <sup>nd</sup> half
Mercury and its compounds	0.05 mg/m <sup>3</sup>	0.0016 mg/m <sup>3</sup>	0.0027 mg/m <sup>3</sup>
Cadmium & thallium and their compounds (total)	0.05 mg/m <sup>3</sup>	0.003 mg/m <sup>3</sup>	0.001 mg/m <sup>3</sup>
Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)	0.5 mg/m <sup>3</sup>	0.02mg/m <sup>3</sup>	0.017 mg/m <sup>3</sup>
Dioxins and furans (I-TEQ)	0.1 ng/m <sup>3</sup>	0.0022 ng/m <sup>3</sup>	0.0023 ng/m <sup>3</sup>

- Continuous emission monitoring
  - The results of these reports have been submitted as required to the Environment Agency, and with the exception of the exceedences on the 01/02/2018, 24/02/2018, 17/05/2018 and 01/12/2018, have demonstrated compliance with the emission limits.
  - These exceedences (01/02/2018, 24/02/2018, 17/05/2018 and 01/12/2018) have been reported in accordance with permit requirements.

- Ash and APC residue monitoring
  - The results of these reports have been submitted as required to the Environment Agency, with the results continuing to demonstrate the classifications of these residues.
- Performance and Optimisation of NO<sub>x</sub>, following installation of SNCR system

Assessment and evaluation for all of these have been made and submitted in accordance with the relevant improvement conditions. Revisions to be made and submitted in accordance with recommendations from CAR.

## B. Annual production data

The performance parameters for the facility were as follows:

<b>Table S4.2 Annual production/treatment</b>		
<b>Parameter</b>	<b>Quantity</b>	<b>Units</b>
Total waste incinerated	4234	tonnes
Total waste transferred off-site		tonnes
Total electrical energy generated		KWhrs
Electrical energy exported	0	KWhrs
Electrical energy utilised by the installation	631151	KWhrs
Waste heat utilised by the installation	0	KWhrs
Total energy usage	3374.90	MWhrs
Energy exported as heat (if any)	n/a	KWhrs
Total quantity Incinerator Bottom Ash (IBA) exported	598.68	tonnes
Total quantity APC Residues exported	349.18	tonnes

## Operation of ERV

Date of ERV operation	Duration
27/04/2018	203 minutes
10/06/2018	20 minutes
08/07/2018	576 minutes
02/09/2018	3 minutes
27/09/2018	20 minutes
21/12/2018	44 minutes
26/12/2018	50 minutes

**C. Annual performance parameters**

The performance parameters for the facility were as follows:

<b>Table S4.3 Performance parameters</b>					
<b>Parameter</b>	<b>Quarter 1</b>	<b>Quarter 2</b>	<b>Quarter 3</b>	<b>Quarter 4</b>	<b>Units</b>
Total waste incinerated	830.44	1,118.17	1,285.54	999.85	tonnes
Electrical energy exported, imported and used at the installation					KWhrs / tonne of waste incinerated
Electrical energy imported and used at the installation	139,344	182,254	241,274	68,279	KWhrs / tonne of waste incinerated
Mass of Bottom Ash produced	154	146	116	158	Kgs / tonne of waste incinerated
Mass of APC residues produced	119	66	57	104	Kgs / tonne of waste incinerated
Urea consumption	0	20	16	21	Ltrs/tonne of waste incinerated
Activated Carbon consumption	5	4	5	6	Kgs / tonne of waste incinerated
Lime consumption	82	50	43	68	Kgs / tonne of waste incinerated
Water consumption	2.3	1.7	1.9	1.6	Kgs / tonne of waste incinerated
Periods of abnormal operation	0	0	0	0	No of occasions
Cumulative hours for periods of abnormal operation	0	0	0	0	
Periods of operation of Emergency Relief Vent (ERV)	0	2	3	2	No of occasions
Duration in minutes of ERV events	0	223 minutes	599 minutes	94 minutes	

## **D. Functioning and monitoring of the incineration plant**

The Avonmouth Healthcare Waste Incinerator And Transfer Facility is situated on Holesmouth Road, Avonmouth, Bristol, BS11 9BP within a large industrial estate. The incinerator was commissioned in 2016. This is the first Annual Performance Report for the facility to cover a full twelve months of operation.

Details of the management of the plant are shown below:

**General Manager:** Mr Steve Simms  
**Plant Manager:** Mr. Lewis Turner  
**Address:** Avonmouth Healthcare Waste Incinerator  
Holesmouth Road  
Avonmouth  
Bristol  
BS11 9BP  
**Phone:** 0333 240 4855

### **General Description of the Process**

The Avonmouth plant incinerates clinical waste, including clinical wastes classed as hazardous under the Hazardous Waste Regulations 2005. The bulk of the waste is produced at hospitals, but also includes smaller quantities from doctors' surgeries, dentists, health clinics, residential and nursing homes, and from medical research facilities. The hazardous wastes incinerated include infectious waste and waste containing cytotoxic or cytostatic medicines.

The plant also incinerates small amounts of specialised wastes where it is recognised that high temperature incineration represents the best disposal option. These waste types include drugs confiscated by the Police or Customs and Excise, animal by-product wastes, genetically modified wastes, and certain confidential materials.

### **Plant Description**

The Avonmouth Incinerator is designed to process 750 kilograms per hour. The permit sets an annual throughput limit of 6570 tonnes a year. The incinerator is of stepped hearth design, with three main combustion hearths and an ash box. Clinical waste is loaded mechanically direct from the wheeled bins used to deliver the waste, into the inspection cradle which provides the opportunity to visually inspect the waste before it is tipped into the incinerator charging hopper. Any non-conformant waste can be identified, intercepted and reported in-line with company procedures. Errors in waste content are flagged for follow up with the waste producer

Once inspection complete the waste is discharged into the hopper where the waste is pushed onto the first hearth, and the combustion process commences. Hydraulic rams operate at intervals to push the waste along the first hearth, until it falls off the end onto the second hearth where the waste burns vigorously at a temperature of between 850°C and 1000 °C. The waste is then pushed from the second hearth onto the third hearth, where it burns out to produce an ash. This bottom ash is then pushed into an ash box, where the fixed carbon in

the ash is further burned out. The retention time on the hearths is approximately 8 hours, the residues are then dropped into an Ash quench pit at the end of the process before being dropped into a skip. Ram movements are programmed in relation to the number of bins fed.

The flue gases from the incineration process then pass through a secondary chamber, or afterburner, where any gaseous products of combustion are burned out under oxygen rich conditions. This stage is designed to destroy any Carbon Monoxide, Volatile Organic Compounds, and dioxins and furans produced by the combustion process. And ammonia is injected into the process for further control and reduction of Oxides of Nitrogen emissions.

The flue gases are then cooled by passing through a waste-heat boiler and economiser, before passing into the final, abatement section of the process. Powdered lime (Calcium Hydroxide) and powdered activated carbon are added to the flue gases entering the abatement process to remove acid gases, heavy metals and residual dioxins and furans before discharge to atmosphere from the stack. The flue gases being discharged from the stack are continuously monitored for Hydrogen Chloride, Sulphur Dioxide, Carbon Monoxide, Oxides of Nitrogen, particulate matter (dust), Volatile Organic Compounds, oxygen and moisture content.

The incineration process produces two residues; bottom ash and spent lime.

- The bottom ash is sent to a non-hazardous landfill.
- The spent lime, which is the residue from the flue gas abatement process, went to a site in Northamptonshire, for the majority of the year, where it is used to neutralise acidic wastes.

### **Summary of Plant Operation**

A summary of the waste types processed is shown in Table A below, which shows the waste type both by a description and by its classification by the appropriate code from the European Waste Catalogue (EWC).

**Table A**

<b>Waste Type</b>	<b>EWC Code</b>	<b>Tonnes burned</b>
<b>Total clinical waste incinerated</b>	<b>All codes</b>	<b>4234</b>
<b>Hazardous waste incinerated</b>	<b>180103 &amp; 180108 (and others in small quantities)</b>	<b>3756</b>
<b>Cytotoxic &amp; cytostatic wastes incinerated</b>	<b>180108</b>	<b>164.3</b>

During 2018 routine maintenance has been undertaken, but there were no major breakdowns within the period.

The hours that the plants were non-operational were due to planned maintenance/ minor repairs.

### **Summary of Plant Improvements**

An SNCR system was installed to aid the control and reduction of oxides of Nitrogen from the facility.

### **Summary of Plant Monitoring**

The Avonmouth plant monitors are situated within a CEMS room in a building situated under the main stack. All the monitors are linked to a computerised reporting system, with software to correct the measured values to standard reference conditions and to produce daily and monthly printouts of the corrected emissions from the process. Any breaches of the emission limits set by the permit are reported immediately to the Environment Agency.

As well as the continuous monitoring systems, the plant is subject to extractive monitoring by an independent laboratory for those parameters that cannot be monitored continuously, which is defined as quarterly in the first year of operation, and bi-annually thereafter. The site became fully operational at 1<sup>st</sup> July 2016, therefore during 2017 three sets of extractive emissions tests have been undertaken with the results reported to the Environment Agency.

A summary of which pollutants are monitored continuously, and which are monitored periodically, is shown in Table B below;

**Table B**

<b>Pollutant</b>	<b>Continuously</b>	<b>Periodically</b>	<b>Operating time (%)</b>
Particulates	Yes		100
Oxides of Nitrogen	Yes		> 99
Sulphur Dioxide	Yes		> 99
Carbon Monoxide	Yes		> 99
Total Organic Carbon	Yes		> 99
Hydrogen Chloride	Yes		> 99
Cadmium and Thallium		Yes	
Mercury		Yes	
Other Heavy Metals		Yes	
Dioxins and Furans		Yes	
Hydrogen Fluoride		Yes	

It should be noted that all the instruments used for continuous monitoring have received MCERTS accreditation, and are subject to a number of quality assurance procedures known as QAL1, QAL2, QAL3. A report has been submitted and accepted by the agency (11/09/2018) in response to Improvement condition 7 of the Environmental Permit.

### **Summary of Plant Compliance**

Independent extractive tests were carried out as per permit requirements and all results submitted.

The site is operating against the company wide Environmental Management Systems which at other sites has been certified to the Standards ISO 14001 and ISO9001. The site was formally assessed by the British Standards Institute in February 2017.

No formal action was taken by the Environment Agency relating to the operation of the plant, emissions from the plant, or any other issues.

### **Summary of Information made Available**

This report has been supplied to the Environment Agency, who have placed in on the Public Register at their Office.