



# Staffordshire ERF

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## Annual Report 2018

EPR/HP3431HK

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## Contents

|   |    |
|---|----|
| 1. INTRODUCTION.....  | 3  |
| 2. FACILITY INFORMATION .....   | 3  |
| 3. OPERATIONAL INFORMATION .....  | 5  |
| 4. EMISSIONS TO AIR.....  | 7  |
| 4.1 Continuous Emissions .....  | 7  |
| 4.2 Extractive Sampling .....   | 9  |
| 4.3 Annual Mass Emissions .....   | 9  |
| 5 INCINERATOR BOTTOM ASH (IBA) AND AIR POLLUTION CONTROL (APC) RESIDUE..... | 9  |
| 5.1 IBA .....   | 9  |
| 5.2 APC .....   | 10 |
| 6 ENVIRONMENTAL CONTROLS .....  | 10 |
| APPENDIX A .....  | 12 |
| APPENDIX B .....  | 18 |
| APPENDIX C .....  | 22 |

## 1. INTRODUCTION

This is the Annual Performance Report for the Staffordshire Energy Recovery Facility (Staffordshire ERF) for 2018. This annual report is the facility's fifth complete annual report.

## 2. FACILITY INFORMATION

| Plant Operator    | Veolia ES Staffordshire Ltd  |
|-------------------|--|
| Name of Facility  | Staffordshire Energy Recovery Facility   |
| EPR Permit Number | HP3431HK   |
| Facility Address  | Staffordshire Energy Recovery Facility<br>The Dell<br>Enterprise Drive<br>Four Ashes<br>Wolverhampton<br>Staffordshire<br>WV10 7DF |
| Telephone Number  | 0203 567 6300  |

The ERF is operated by Veolia ES Staffordshire Ltd, a wholly owned subsidiary of Veolia. The plant is designed to burn predominantly residual municipal solid waste and now has a capacity to process up to 340,000 Tonnes annually. The facility has been built to serve Staffordshire County Council, its eight constituent Councils, and its other partner authorities.

The facility can generate approximately 29MW of electricity from waste. The facility uses 3.2MW and the balance is exported to the national grid. In tangible terms the electricity generated is equivalent to 66,000 homes.

The facility is designed so that it can supply heat, if a client becomes available in the future.

Technical details of the plant:

- Constructions Industrielles de la Mediterranee (CNIM) - Design
- Maximum Permitted Refuse throughput – 340,000 tonnes per annum
- Two waste streams each with a capacity of 20 tonnes per hour.
- Storage capacity 4,500 Tonnes – Approximately four and a half days full plant capacity
- Number of tipping bays – 5
- Steam output – 64.5 tonnes of steam per hour at 400°C at 60 BAR
- Flue gas treatment – CNIM ammonia injection for the reduction of NOx, dry lime injection for the removal of acid gases, activated carbon injection for removal of metals and dioxins followed by high performance bag filters for removal of particulates, dispersal via two 80 metre high stacks.
- Maximum energy generating capacity 29MW

The ERF is regulated by the Environment Agency and is certified in compliance with:

- ISO 9001 : 2008
- ISO 14001 : 2004, and
- OHSAS 18001 : 2007

The facility is permitted to accept the following waste types:

| Waste code   | Description  |
|--------------|--|
| <b>02</b>    | <b>WASTES FROM AGRICULTURE, HORTICULTURE, AQUACULTURE, FORESTRY, HUNTING AND FISHING, FOOD PREPARATION AND PROCESSING</b>  |
| <b>02 02</b> | <b>wastes from the preparation and processing of meat, fish and other foods of animal origin</b>   |
| 02 02 02     | animal-tissue waste  |
| 02 02 03     | materials unsuitable for consumption or processing   |
| <b>16</b>    | <b>WASTES NOT OTHERWISE SPECIFIED IN THE LIST</b>  |
| <b>16 03</b> | <b>off-specification batches and unused products</b>   |
| 16 03 06     | organic wastes other than those mentioned in 16 03 05  |
| <b>18</b>    | <b>WASTES FROM HUMAN OR ANIMAL HEALTH CARE AND/OR RELATED RESEARCH (except kitchen and restaurant wastes not arising from immediate health care)</b>                                 |
| <b>18 01</b> | <b>wastes from natal care, diagnosis, treatment or prevention of disease in humans</b>   |
| 18 01 04     | wastes whose collection and disposal is not subject to special requirements in order to prevent infection(for example dressings, plaster casts, linen, disposable clothing, diapers) |
| <b>19</b>    | <b>WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE</b>       |
| <b>19 12</b> | <b>wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified</b>  |
| 19 12 01     | paper and cardboard  |
| 19 12 07     | Wood other than that mentioned in 19 12 06   |
| 19 12 08     | textiles   |
| 19 12 10     | Combustible waste (refuse derived fuel)  |
| 19 12 12     | other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11  |

| Waste code   | Description  |
|--------------|--|
| <b>20</b>    | <b>MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS</b> |
| <b>20 01</b> | <b>separately collected fractions (except 15 01)</b>   |
| 20 01 01     | paper and cardboard  |
| 20 01 08     | biodegradable kitchen and canteen waste  |
| 20 01 10     | clothes  |
| 20 01 11     | textiles   |
| 20 01 38     | Wood other than that mentioned in 20 01 37   |
| 20 01 39     | plastics   |
| 20 01 99     | other fractions not otherwise specified (hygiene waste collected from domestic facilities that is not classified as clinical waste)            |
| <b>20 02</b> | <b>garden and park wastes (including cemetery waste)</b>   |
| 20 02 01     | biodegradable waste  |
| <b>20 03</b> | <b>other municipal wastes</b>  |
| 20 03 01     | Mixed municipal waste  |
| 20 03 02     | Waste from markets   |
| 20 03 03     | Street cleaning residues   |
| 20 03 07     | Bulky waste  |

### 3. OPERATIONAL INFORMATION

| Operational Details                |                              |        |
|------------------------------------|------------------------------|--------|
| Operational hours                  | Line 1: 8376<br>Line 2: 8396 | Hours  |
| Total Waste Incinerated            | 336449                       | Tonnes |
| Total Municipal Waste Incinerated  | 313866                       | Tonnes |
| Total Commercial Waste Incinerated | 22583                        | Tonnes |
| Metals Recovered                   | 5141                         | Tonnes |
| Incinerator Bottom Ash Produced    | 65857                        | Tonnes |
| APC Residues                       | 8227                         | Tonnes |

Reporting of Water and Other Raw Material Usage for the year 2018

| Raw Material       | Usage | Unit           | Specific Usage | Unit |
|--------------------|-------|----------------|----------------|------|
| Mains water        | 47516 | m <sup>3</sup> | 141.2          | kg/t |
| Total water usage  | 47516 | m <sup>3</sup> | 141.2          | kg/t |
| Ammonia            | 1120  | Tonnes         | 3.3            | Kg/t |
| Activated carbon   | 83    | Tonnes         | 0.25           | kg/t |
| Lime/hydrated lime | 4035  | Tonnes         | 12             | kg/t |

(Specific Usage is measured in kg/tonne waste incinerated)

Reporting of Energy Usage/Export for the year 2018

| Energy Source                              | Energy (MWh)      | Specific energy | Units                                      |
|--|-------------------|-----------------|--|
| Electricity produced                       | 226978            | 674.6           | KWh/tonne of waste incinerated (dry basis) |
| Electricity imported                       | 191               | 0.57            |  |
| Electricity Exported                       | 201884            | 600             |  |
| Electricity used by ERF                    | 25285             | 75.2            |  |
| Gas Oil                                    | 153299<br>Litres  | 0.46            | L/tonne of waste incinerated (dry basis)   |
| Thermal Energy produced (Steam Production) | 1029728<br>Tonnes | 3.1             | Tonnes/Tonne waste incinerated             |
| Waste heat utilised by ERF                 | 0                 | 0               | KWh/tonne of waste incinerated (dry basis) |

## Reporting of Waste Disposal and Recovery for the year 2018

| Waste Description                          | Disposal Route  | Annual Tonnes | Recovery Tonnes | Kg / Tonne Waste |
|--|-----------------|---------------|-----------------|------------------|
| 1) Hazardous Wastes                        |                 |               |                 |                  |
| APC Residues                               | Empire /Minosus | 8227          | 0               | 24.5             |
| IBA which is classified as hazardous waste |                 | 0             | 0               | 0                |
| Total hazardous waste                      | Empire /Minosus | 8227          | 0               | 24.5             |
|  |                 |               |                 |                  |
| 2) Non-Hazardous Wastes                    |                 |               |                 |                  |
| IBA  | Recycling       | 65857         | 65857           | 195.7            |
| Other non-hazardous wastes                 | Metals Recycled | 5141          | 5141            | 15.28            |
| Total non-hazardous waste                  |                 | 70997         | 70997           | 211              |
|  |                 |               |                 |                  |
| TOTAL WASTE                                | -               | 79224         | 70997           | 235.5            |

## Reporting of other performance indicators for the period 2018

| Parameter   | Result |
|---|--------|
| Number of periods of WID abnormal operation         | 0      |
| Cumulative hours of WID abnormal operation for 2018 | 0      |

## 4. EMISSIONS TO AIR

All gaseous emissions generated during the combustion process pass through an extensive flue gas cleaning process which starts in the boiler directly above the furnace with injected ammonia to reduce the levels of oxides of nitrogen. After the boiler, super heater and economiser the gases are cooled to approximately 150 degrees centigrade. Activated carbon is added to remove metals and dioxins, and lime is added to remove acidic gases such as SO<sub>2</sub> and HCL. Most of this reaction occurs in the bag filters where particulates are removed and APCr is formed. There is a recirculation of APC where the used lime and carbon is recirculated further to remove chlorinated gases via a recirculation silo. This secondary reactant is recirculated back to the original process via a lab loop. The cleaned gasses are finally released into the atmosphere through the chimney after the bag house.

In compliance with the IED and EPR Permit, the flue gasses are continuously monitored using MCERTS accredited equipment. In addition to the continuous monitoring, an extractive sampling campaign is undertaken on a quarterly basis by an approved service supplier. The organisation used for analysis and monitoring are accredited by the United Kingdom Accreditation Service (UKAS) and the Environment Agency's Monitoring Certification Scheme (MCERTS).

The parameters measured and their frequency of monitoring are summarised below.

| Parameters         | Continuous | Jan – Jun | Jul – Dec |
|--------------------|------------|-----------|-----------|
| Particulate Matter | ✓          |           |           |
| TOC                | ✓          |           |           |
| Hydrogen Chloride  | ✓          |           |           |
| Oxides of Nitrogen | ✓          |           |           |
| Carbon Monoxide    | ✓          |           |           |
| Sulphur Dioxides   | ✓          |           |           |
| Ammonia            | ✓          |           |           |
| Nitrous Oxide      |            | ✓         | ✓         |
| Hydrogen Fluoride  |            | ✓         | ✓         |
| Mercury            |            | ✓         | ✓         |
| Arsenic            |            | ✓         | ✓         |
| Cadmium            |            | ✓         | ✓         |
| Chromium           |            | ✓         | ✓         |
| Copper             |            | ✓         | ✓         |
| Cobalt             |            | ✓         | ✓         |
| Nickel             |            | ✓         | ✓         |
| Manganese          |            | ✓         | ✓         |
| Antimony           |            | ✓         | ✓         |
| Lead               |            | ✓         | ✓         |
| Thallium           |            | ✓         | ✓         |
| Vanadium           |            | ✓         | ✓         |
| Dioxins and Furans |            | ✓         | ✓         |
| Dioxin-like PCBs   |            | ✓         | ✓         |
| PAHs               |            | ✓         | ✓         |

### 4.1 Continuous Emissions

Through the process there is continuous emissions monitoring of six main pollutants with ELVs using MCERTS approved instruments. The pollutants measured in this way comprise: particulates, total organic carbon, carbon monoxide, sulphur dioxide and oxides of nitrogen.

Each pollutant has its own Emission Limit Value (ELV). A summary is shown below.

| Pollutant            | Chemical Symbol   | ELV      | Measurement       | Monitoring Standard           |
|----------------------|-------------------|----------|-------------------|-------------------------------|
| Particulates         | PMx               | 30mg/m3  | half hour average | BS EN 14181 and BS EN 15267-3 |
|                      |                   | 10mg/m3  | daily average     | BS EN 14181 and BS EN 15267-3 |
| Total Organic Carbon | TOC               | 20mg/m3  | half hour average | BS EN 14181 and BS EN 15267-3 |
|                      |                   | 10mg/m3  | daily average     | BS EN 14181 and BS EN 15267-3 |
| Hydrogen Chloride    | HCL               | 60mg/m3  | half hour average | BS EN 14181 and BS EN 15267-3 |
|                      |                   | 10mg/m3  | daily average     | BS EN 14181 and BS EN 15267-3 |
| Carbon Monoxide      | CO                | 150mg/m3 | 10 minute average | BS EN 14181 and BS EN 15267-3 |
|                      |                   | 50mg/m3  | daily average     | BS EN 14181 and BS EN 15267-3 |
| Sulphur Dioxide      | SO2               | 200mg/m3 | half hour average | BS EN 14181 and BS EN 15267-3 |
|                      |                   | 50mg/m3  | daily average     | BS EN 14181 and BS EN 15267-3 |
| Oxides of Nitrogen   | NO and NO2 as NOX | 400mg/m3 | half hour average | BS EN 14181 and BS EN 15267-3 |
|                      |                   | 200mg/m3 | daily average     | BS EN 14181 and BS EN 15267-3 |

A summary of the continuous emissions can be seen below for 2018 for average daily figures per month:

#### Stream 1 Monthly mean

|                      | ELV | Jan   | Feb   | Mar   | Apr   | May   | Jun   | Jul   | Aug   | Sep   | Oct   | Nov   | Dec   |
|----------------------|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Dust                 | 10  | 0.2   | 0.2   | 0.2   | 0.2   | 0.2   | 0.1   | 0.1   | 0.2   | 0.2   | 0.2   | 0.2   | 0.2   |
| Total Organic Carbon | 10  | 0.1   | 0.1   | 0.1   | 0     | 0.1   | 0.1   | 0.1   | 0.1   | 0     | 0     | 0.1   | 0.1   |
| Hydrogen Chloride    | 10  | 7     | 7.2   | 7.4   | 6.5   | 6.7   | 5.1   | 6.6   | 7.5   | 7.8   | 7.6   | 6.4   | 7.4   |
| Carbon Monoxide      | 50  | 3.9   | 6.1   | 5.7   | 5.1   | 3.8   | 3.1   | 4     | 5.3   | 4.7   | 5     | 5.4   | 5.8   |
| Sulphur Dioxide      | 50  | 26.5  | 31    | 29    | 29.9  | 23    | 28.4  | 22.9  | 25.7  | 28.3  | 31.5  | 36.4  | 33.2  |
| Oxides of Nitrogen   | 200 | 155.4 | 156.1 | 160.8 | 161.8 | 164.4 | 167.7 | 167.6 | 169.8 | 170.7 | 177.5 | 169.8 | 161.7 |

#### Stream 2 Monthly mean

|                      | ELV | Jan   | Feb   | Mar   | Apr   | May   | Jun   | Jul   | Aug   | Sep   | Oct   | Nov   | Dec   |
|----------------------|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Dust                 | 10  | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0.1   | 0.1   | 0.1   | 0.1   |
| Total Organic Carbon | 10  | 0.1   | 0.1   | 0.1   | 0.1   | 0.1   | 0.1   | 0.1   | 0.1   | 0     | 0     | 0.1   | 0     |
| Hydrogen Chloride    | 10  | 6.2   | 6.4   | 6.4   | 6.6   | 5.6   | 5.7   | 7.1   | 7.7   | 6.8   | 6.7   | 5.3   | 6.4   |
| Carbon Monoxide      | 50  | 2.7   | 4.5   | 4.4   | 3.9   | 3.3   | 3.3   | 2.8   | 3.6   | 4.2   | 4.1   | 4.6   | 4.2   |
| Sulphur Dioxide      | 50  | 25.8  | 32.3  | 26.5  | 31    | 27.6  | 31.3  | 27.9  | 29.9  | 31.2  | 35    | 37.6  | 35.7  |
| Oxides of Nitrogen   | 200 | 152.3 | 154.9 | 161.7 | 166.5 | 167.8 | 173.3 | 173.7 | 176.7 | 177.3 | 182.9 | 178.5 | 179.3 |

An interpretation shows that the emission levels are consistently stable from month to month. This data is communicated monthly to the public via our Veolia website in terms of a percentage of each ELV. A more detailed IED report is sent to the EA each month showing emissions per pollutant per line, per month in terms of half hourly averages and daily averages.



## 4.2 Extractive Sampling

Typically these pollutants are far harder to measure and are only present in very low concentrations so are taken from the stack using appropriate methodologies.

Extractive testing data is shown in Appendix B.

An interpretation of the data shows that the extractive samples are an order of magnitude below the prescribed limits in the permit.

## 4.3 Annual Mass Emissions

CEMS gas mass emissions are calculated by the MCERT Software developed by Envirosoft. These are shown in Appendix B.

An interpretation of the CEMS Mass Emission is that there is generally a steady state of control. Extractive mass emissions are calculated by using CEMS data and extractive results.

| Annual Mass Emissions |       |              |
|-----------------------|-------|--------------|
| Parameter             | Units | Annual Total |
| Hydrogen Fluoride     | Kg    | 247.9        |
| Mercury               | Kg    | 1.8          |
| Arsenic               | Kg    | 1.0          |
| Cadmium               | Kg    | 1.2          |
| Chromium              | Kg    | 3.1          |
| Copper                | Kg    | 4.8          |
| Nickel                | Kg    | 4.3          |
| Manganese             | Kg    | 7.9          |
| Antimony              | Kg    | 1.6          |
| Lead                  | Kg    | 2.8          |
| Thallium              | Kg    | 1.0          |
| Dioxins and Furans*   | Kg    | 0.00003      |
| PAHs                  | Kg    | 0.9          |
| PCBs*                 | Kg    | 0.0007       |
| Cobalt                | Kg    | 1.0          |
| Vanadium              | Kg    | 1.0          |

\*Measured concentrations were used to derive these mass emissions ie NOT converted to toxic equivalence first. Non-detects included

# 5 INCINERATOR BOTTOM ASH (IBA) AND AIR POLLUTION CONTROL (APC) RESIDUE

## 5.1 IBA

The plant has undergone rigorous testing to prove that the IBA is non-hazardous. The IBA is of a consistently high standard and there have been no failures in the last 24 samples. IBA is transported to Ballast Phoenix in Castle Bromwich, where it is reprocessed into a number of different graded aggregates. Metals are further extracted from the process and recycled.

In addition to Dioxins/Furans and dioxin-like PCB's, Total Organic Carbon, metals tested in IBA are Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc and their compounds.

| Frequency | Monitoring | Test   | Limit    |
|-----------|------------|--|----------|
| Monthly   | IBA        | TOC  | < 3%     |
| Monthly   | IBA        | Metals, dioxins/furans and dioxin-like PCB's | No limit |

The results can be seen in Appendix C.

An interpretation shows that the results are uniform and that the IBA quality does not vary a great deal and is fully compliant.

## 5.2 APC

APC residue is the fine particulate matter that is removed at the end of the gas cleansing process. It contains residues from the waste gas and the reactants used to treat the gas. APC is captured in the bag house filters in the plant before the gas is emitted and dispersed through the ERF's two 80m stacks. The APC from the Staffordshire ERF is sent to another Veolia facility for use in their treatment facility, Empire Works or for permanent underground storage at Minosus.

The results can be seen in Appendix C.

An interpretation shows that the results are uniform and that the APC quality does not vary and is uniform.

## 6 ENVIRONMENTAL CONTROLS

Staffordshire ERF has an experienced Veolia management team from other existing plants. The plant has been designed using proven technology and experience and is performing well. The plant supports our company ethos, as we operate 10 facilities in the UK. Reliable environmental controls and a robust management system ensure that compliance with the Industrial Emissions Directive and EPR Permit.

Veolia staff are aware of the environmental impacts of their work and exercise a high standard of housekeeping. Training and competency of staff is controlled by the Veolia Business Management System. The Management System covers training, awareness and competence. The company identifies the training requirements of its employees and provides suitable resources to ensure they have the required knowledge, skills and expertise to carry out their duties.

APPENDIX A – EXTRACTIVE EMISSIONS  
APPENDIX B – MASS EMISSIONS  
APPENDIX C – IBA AND APC RESULTS

## APPENDIX A

Permit Number: ERR/HP3431HK Operator: Veolia ES Staffordshire Ltd

Facility: Staffordshire ERF Form Number: Air7 / 01/01/2012

Reporting of periodically monitored emissions to air for the period from 01/01/18 to 30/06/18

| Emission Point | Substance / Parameter  | Emission Limit Value   | Reference Period                              | Result <sup>[1]</sup>         | Test Method  | Result Date and Time <sup>[2]</sup> | Uncertainty <sup>[3]</sup> |
|----------------|--|------------------------|---|-------------------------------|--------------|-------------------------------------|----------------------------|
| A1 & A2        | Hydrogen fluoride  | 2 mg/m <sup>3</sup>    | Periodic over minimum 1-hour period           | A1: 0.02 mg/m <sup>3</sup>    | BS ISO 15713 | A1: 9/03/2018 7:25 – 8:25           | 14%                        |
|                |  |                        |   | A2: 0.03 mg/m <sup>3</sup>    |              | A2: 7/03/2018 12:15 – 13:15         | 14%                        |
| A1 & A2        | Cadmium & thallium and their compounds (total)                   | 0.05 mg/m <sup>3</sup> | over minimum 30 minute, maximum 8 hour period | A1: 0.0011 mg/m <sup>3</sup>  | BS EN 14385  | A1: 9/03/2018 7:30 – 9:32           | 8%                         |
|                |  |                        |   | A2: 0.0011 mg/m <sup>3</sup>  |              | A2: 8/03/2018 9:15 – 11:21          | 8%                         |
| A1 & A2        | Mercury and its compounds  | 0.05 mg/m <sup>3</sup> | over minimum 30 minute, maximum 8 hour period | A1: 0.0012 mg/m <sup>3</sup>  | BS EN 14385  | A1: 9/03/2018 7:30 – 9:32           | 14%                        |
|                |  |                        |   | A2: 0.00083 mg/m <sup>3</sup> |              | A2: 8/03/2018 9:15 – 11:21          | 14%                        |
| A1 & A2        | Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total) | 0.5 mg/m <sup>3</sup>  | over minimum 30 minute, maximum 8 hour period | A1: 0.02 mg/m <sup>3</sup>    | BS EN 14385  | A1: 9/03/2018 7:30 – 9:32           | 8%                         |
|                |  |                        |   | A2: 0.014 mg/m <sup>3</sup>   |              | A2: 8/03/2018 9:15 – 11:21          | 4%                         |
| A1 & A2        | N <sub>2</sub> O   | N/A                    | Periodic Over minimum 1-hour period           | A1: 0.31 mg/m <sup>3</sup>    | EA TGN M22   | A1: 6/03/2018 12:30-13:30           | 8%                         |
|                |  |                        |   | A2: 0.32 mg/m <sup>3</sup>    |              | A2: 7/03/2018 12:30-13:30           | 8%                         |

|         |   |                       |  |  |            |  |            |
|---------|---|-----------------------|--|--|------------|--|------------|
| A1 & A2 | Dioxins / Furans (I-TEQ)                          | 0.1 ng/m <sup>3</sup> | over minimum 6 hour period,<br>maximum 8 hour period | A1: 0.013-0.015 ng/m <sup>3</sup><br>A2: 0.011-0.014 ng/m <sup>3</sup>               | BS EN 1948 | A1: 6/03/2018 7:45 – 14:26<br>A2: 7/03/2018 7:30 – 13:33 | 15%<br>14% |
| A1 & A2 | Dioxin-like PCBs<br>(WHO-TEQ Humans /<br>Mammals) | No limit<br>applies   | over minimum 6 hour period,<br>maximum 8 hour period | A1: 0.0032-0.0032<br>ng/m <sup>3</sup><br>A2: 0.0025-0.0025<br>ng/m <sup>3</sup>     | BS EN 1948 | A1: 6/03/2018 7:45 – 14:26<br>A2: 7/03/2018 7:30 – 13:33 | 21%<br>21% |
| A1 & A2 | Dioxin-like PCBs (WHO-TEQ<br>Fish)                | No limit<br>applies   | over minimum 6 hour period,<br>maximum 8 hour period | A1: 0.00018-0.00018<br>ng/m <sup>3</sup><br>A2: 0.00014-0.00014<br>ng/m <sup>3</sup> | BS EN 1948 | A1: 6/03/2018 7:45 – 14:26<br>A2: 7/03/2018 7:30 – 13:33 | 19%<br>19% |
| A1 & A2 | Dioxin-like PCBs<br>(WHO-TEQ Birds)               | No limit<br>applies   | over minimum 6 hour period,<br>maximum 8 hour period | A1: 0.011-0.011 ng/m <sup>3</sup><br>A2: 0.0065-0.0065<br>ng/m <sup>3</sup>          | BS EN 1948 | A1: 6/03/2018 7:45 – 14:26<br>A2: 7/03/2018 7:30 – 13:33 | 13%<br>13% |
| A1 & A2 | Dioxins / furans (WHO-TEQ<br>Humans / Mammals)    | No limit<br>applies   | over minimum 6 hour period,<br>maximum 8 hour period | A1: 0.013-0.017 ng/m <sup>3</sup><br>A2: 0.011-0.016 ng/m <sup>3</sup>               | BS EN 1948 | A1: 6/03/2018 7:45 – 14:26<br>A2: 7/03/2018 7:30 – 13:33 | 16%<br>15% |
| A1 & A2 | Dioxins / furans (WHO-TEQ<br>Fish)                | No limit<br>applies   | over minimum 6 hour period,<br>maximum 8 hour period | A1: 0.012-0.016 ng/m <sup>3</sup><br>A2: 0.0084-0.014 ng/m <sup>3</sup>              | BS EN 1948 | A1: 6/03/2018 7:45 – 14:26<br>A2: 7/03/2018 7:30 – 13:33 | 17%<br>17% |
| A1 & A2 | Dioxins / furans (WHO-TEQ<br>Birds)               | No limit<br>applies   | over minimum 6 hour period,<br>maximum 8 hour period | A1: 0.023-0.026 ng/m <sup>3</sup><br>A2: 0.02-0.025 ng/m <sup>3</sup>                | BS EN 1948 | A1: 6/03/2018 7:45 – 14:26<br>A2: 7/03/2018 7:30 – 13:33 | 18%<br>17% |



| Emission Point | Substance / Parameter                          | Emission Limit Value | Reference Period                                  | Result <sup>[1]</sup>                                      | Test Method                       | Result Date and Time <sup>[2]</sup>           | Uncertainty <sup>[3]</sup> |
|----------------|--|----------------------|---|--|-----------------------------------|---|----------------------------|
| A1 & A2        | Poly-cyclic aromatic hydrocarbons (PAHs) Total | No limit applies     | over minimum 6 hour period, maximum 8 hour period | A1: 0.42 µg/m <sup>3</sup><br>A2: 0.63 µg/m <sup>3</sup>   | BS ISO 11338-1 and BS ISO 11338-2 | 12/03/18 7:10 – 13:11<br>8/03/18 7:20 – 13:21 | 14%<br>15%                 |
| A1 & A2        | Anthanthrene                                   | No limit applies     |   | A1: 0.012 µg/m <sup>3</sup><br>A2: 0.013 µg/m <sup>3</sup> |                                   | 12/03/18 7:10 – 13:11<br>8/03/18 7:20 – 13:21 | >100%<br>>100%             |
| A1 & A2        | Benzo[a]anthracene                             | No limit applies     |   | A1: 0.012 µg/m <sup>3</sup><br>A2: 0.013 µg/m <sup>3</sup> |                                   | 12/03/18 7:10 – 13:11<br>8/03/18 7:20 – 13:21 | >100%<br>>100%             |
| A1 & A2        | Benzo[b]fluoranthene                           | No limit applies     |   | A1: 0.012 µg/m <sup>3</sup><br>A2: 0.013 µg/m <sup>3</sup> |                                   | 12/03/18 7:10 – 13:11<br>8/03/18 7:20 – 13:21 | >100%<br>>100%             |
| A1 & A2        | Benzo[k]fluoranthene                           | No limit applies     |   | A1: 0.012 µg/m <sup>3</sup><br>A2: 0.013 µg/m <sup>3</sup> |                                   | 12/03/18 7:10 – 13:11<br>8/03/18 7:20 – 13:21 | >100%<br>>100%             |
| A1 & A2        | Benzo[b]naph(2,1-d)thiophene                   | No limit applies     |   | A1: 0.012 µg/m <sup>3</sup><br>A2: 0.013 µg/m <sup>3</sup> |                                   | 12/03/18 7:10 – 13:11<br>8/03/18 7:20 – 13:21 | >100%<br>>100%             |
| A1 & A2        | Benzo[c]phenanthrene                           | No limit applies     |   | A1: 0.012 µg/m <sup>3</sup><br>A2: 0.013 µg/m <sup>3</sup> |                                   | 12/03/18 7:10 – 13:11<br>8/03/18 7:20 – 13:21 | >100%<br>>100%             |
| A1 & A2        | Benzo[ghi]perylene                             | No limit applies     |   | A1: 0.012 µg/m <sup>3</sup><br>A2: 0.013 µg/m <sup>3</sup> |                                   | 12/03/18 7:10 – 13:11<br>8/03/18 7:20 – 13:21 | >100%<br>>100%             |
| A1 & A2        | Benzo[a]pyrene                                 | No limit applies     |   | A1: 0.012 µg/m <sup>3</sup><br>A2: 0.013 µg/m <sup>3</sup> |                                   | 12/03/18 7:10 – 13:11<br>8/03/18 7:20 – 13:21 | >100%<br>>100%             |
| A1 & A2        | Cholanthrene                                   | No limit applies     |   | A1: 0.012 µg/m <sup>3</sup><br>A2: 0.013 µg/m <sup>3</sup> |                                   | 12/03/18 7:10 – 13:11<br>8/03/18 7:20 – 13:21 | >100%<br>>100%             |
| A1 & A2        | Chrysene                                       | No limit applies     |   | A1: 0.012 µg/m <sup>3</sup><br>A2: 0.013 µg/m <sup>3</sup> |                                   | 12/03/18 7:10 – 13:11<br>8/03/18 7:20 – 13:21 | >100%<br>>100%             |
| A1 & A2        | Cyclopenta(c,d)pyrene                          | No limit applies     |   | A1: 0.012 µg/m <sup>3</sup><br>A2: 0.013 µg/m <sup>3</sup> |                                   | 12/03/18 7:10 – 13:11<br>8/03/18 7:20 – 13:21 | >100%<br>>100%             |
| A1 & A2        | Dibenzo[ah]anthracene                          | No limit applies     |   | A1: 0.012 µg/m <sup>3</sup><br>A2: 0.013 µg/m <sup>3</sup> |                                   | 12/03/18 7:10 – 13:11<br>8/03/18 7:20 – 13:21 | >100%<br>>100%             |
| A1 & A2        | Dibenzo[a,i]pyrene                             | No limit applies     |   | A1: 0.012 µg/m <sup>3</sup><br>A2: 0.013 µg/m <sup>3</sup> |                                   | 12/03/18 7:10 – 13:11<br>8/03/18 7:20 – 13:21 | >100%<br>>100%             |
| A1 & A2        | Fluoranthene                                   | No limit applies     |   | A1: 0.047 µg/m <sup>3</sup><br>A2: 0.013 µg/m <sup>3</sup> |                                   | 12/03/18 7:10 – 13:11<br>8/03/18 7:20 – 13:21 | 18%<br>>100%               |
| A1 & A2        | Indo[1,2,3-cd]pyrene                           | No limit applies     |   | A1: 0.012 µg/m <sup>3</sup><br>A2: 0.013 µg/m <sup>3</sup> |                                   | 12/03/18 7:10 – 13:11<br>8/03/18 7:20 – 13:21 | >100%<br>>100%             |
| A1 & A2        | Naphthalene                                    | No limit applies     |   | A1: 0.21 µg/m <sup>3</sup><br>A2: 0.43 µg/m <sup>3</sup>   |                                   | 12/03/18 7:10 – 13:11<br>8/03/18 7:20 – 13:21 | 18%<br>18%                 |

[1] For dioxins and dioxin-like PCBs, the result are to be reported as a range based on: All congeners less than the detection limit assumed to be zero as a minimum, and all congeners less than the detection limit assumed to be at the detection limit as a maximum

[2] The date and time of the sample that produced the result is given.

[3] The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated.

Signed .....

Date.....17/7/18.....

(authorised to sign as representative of Operator)

Permit Number: ERR/HP3431HK Operator: Veolia ES Staffordshire Ltd

Facility: Staffordshire ERF Form Number: Air7 / 01/01/2012

Reporting of periodically monitored emissions to air for the period from 01/07/18 to 31/12/18

| Emission Point | Substance / Parameter  | Emission Limit Value   | Reference Period                                  | Result <sup>[1]</sup>  | Test Method  | Result Date and Time <sup>[2]</sup>                        | Uncertainty <sup>[3]</sup> |
|----------------|--|------------------------|---|--|--------------|--|----------------------------|
| A1 & A2        | Hydrogen fluoride  | 2 mg/m <sup>3</sup>    | Periodic over minimum 1-hour period               | A1: 0.08 mg/m <sup>3</sup><br>A2: 0.38 mg/m <sup>3</sup>               | BS ISO 15713 | A1: 13/09/2018 8:00 – 9:00<br>A2: 12/09/2018 9:00 – 10:00  | 14%<br>14%                 |
| A1 & A2        | Cadmium & thallium and their compounds (total)                   | 0.05 mg/m <sup>3</sup> | over minimum 30 minute, maximum 8 hour period     | A1: 0.0018 mg/m <sup>3</sup><br>A2: 0.0012 mg/m <sup>3</sup>           | BS EN 14385  | A1: 14/09/2018 7:15 – 9:16<br>A2: 14/09/2018 9:50 – 11:51  | 10%<br>8%                  |
| A1 & A2        | Mercury and its compounds  | 0.05 mg/m <sup>3</sup> | over minimum 30 minute, maximum 8 hour period     | A1: 0.0012 mg/m <sup>3</sup><br>A2: 0.00078 mg/m <sup>3</sup>          | BS EN 14385  | A1: 14/09/2018 7:15 – 9:16<br>A2: 14/09/2018 9:50 – 11:51  | 15%<br>14%                 |
| A1 & A2        | Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total) | 0.5 mg/m <sup>3</sup>  | over minimum 30 minute, maximum 8 hour period     | A1: 0.017 mg/m <sup>3</sup><br>A2: 0.01 mg/m <sup>3</sup>              | BS EN 14385  | A1: 14/09/2018 7:15 – 9:16<br>A2: 14/09/2018 9:50 – 11:51  | 5%<br>4%                   |
| A1 & A2        | N <sub>2</sub> O   | N/A                    | Periodic Over minimum 1-hour period               | A1: 0.74 mg/m <sup>3</sup><br>A2: 0.22 mg/m <sup>3</sup>               | EA TGN M22   | A1: 13/09/2018 11:00-12:00<br>A2: 12/09/2018 11:00-12:00   | 10%<br>10%                 |
| A1 & A2        | Dioxins / Furans (I-TEQ)   | 0.1 ng/m <sup>3</sup>  | over minimum 8 hour period, maximum 8 hour period | A1: 0.013-0.017 ng/m <sup>3</sup><br>A2: 0.012-0.013 ng/m <sup>3</sup> | BS EN 1948   | A1: 13/09/2018 7:15 – 13:18<br>A2: 12/09/2018 7:20 – 13:23 | 13%<br>13%                 |

|         |   |                  |   |  |            |  |            |
|---------|---|------------------|---|--|------------|--|------------|
| A1 & A2 | Dioxin-like PCBs (WHO-TEQ Humans / Mammals) | No limit applies | over minimum 6 hour period, maximum 8 hour period | A1: 0.0045-0.0045 ng/m <sup>3</sup><br>A2: 0.0034-0.0041 ng/m <sup>3</sup>     | BS EN 1948 | A1: 13/09/2018 7:15 – 13:18<br>A2: 12/09/2018 7:20 – 13:23 | 21%<br>21% |
| A1 & A2 | Dioxin-like PCBs (WHO-TEQ Fish)             | No limit applies | over minimum 6 hour period, maximum 8 hour period | A1: 0.00022-0.00023 ng/m <sup>3</sup><br>A2: 0.00018-0.00022 ng/m <sup>3</sup> | BS EN 1948 | A1: 13/09/2018 7:15 – 13:18<br>A2: 12/09/2018 7:20 – 13:23 | 20%<br>19% |
| A1 & A2 | Dioxin-like PCBs (WHO-TEQ Birds)            | No limit applies | over minimum 6 hour period, maximum 8 hour period | A1: 0.0069-0.0088 ng/m <sup>3</sup><br>A2: 0.007-0.0092 ng/m <sup>3</sup>      | BS EN 1948 | A1: 13/09/2018 7:15 – 13:18<br>A2: 12/09/2018 7:20 – 13:23 | 14%<br>13% |
| A1 & A2 | Dioxins / furans (WHO-TEQ Humans / Mammals) | No limit applies | over minimum 6 hour period, maximum 8 hour period | A1: 0.015-0.019 ng/m <sup>3</sup><br>A2: 0.014-0.015 ng/m <sup>3</sup>         | BS EN 1948 | A1: 13/09/2018 7:15 – 13:18<br>A2: 12/09/2018 7:20 – 13:23 | 13%<br>13% |
| A1 & A2 | Dioxins / furans (WHO-TEQ Fish)             | No limit applies | over minimum 6 hour period, maximum 8 hour period | A1: 0.015-0.018 ng/m <sup>3</sup><br>A2: 0.013-0.014 ng/m <sup>3</sup>         | BS EN 1948 | A1: 13/09/2018 7:15 – 13:18<br>A2: 12/09/2018 7:20 – 13:23 | 14%<br>14% |
| A1 & A2 | Dioxins / furans (WHO-TEQ Birds)            | No limit applies | over minimum 6 hour period, maximum 8 hour period | A1: 0.02-0.024 ng/m <sup>3</sup><br>A2: 0.019-0.02 ng/m <sup>3</sup>           | BS EN 1948 | A1: 13/09/2018 7:15 – 13:18<br>A2: 12/09/2018 7:20 – 13:23 | 18%<br>17% |



| Emission Point | Substance / Parameter                          | Emission Limit Value | Reference Period                                  | Result <sup>[1]</sup>                                      | Test Method                       | Result Date and Time <sup>[2]</sup>            | Uncertainty <sup>[3]</sup> |
|----------------|--|----------------------|---|--|-----------------------------------|--|----------------------------|
| A1 & A2        | Poly-cyclic aromatic hydrocarbons (PAHs) Total | No limit applies     | over minimum 6 hour period, maximum 8 hour period | A1: 0.35 µg/m <sup>3</sup><br>A2: 0.36 µg/m <sup>3</sup>   | BS ISO 11338-1 and BS ISO 11338-2 | 17/09/18 7:35 – 13:36<br>18/09/18 7:15 – 13:16 | 13%<br>14%                 |
| A1 & A2        | Anthanthrene                                   | No limit applies     |   | A1: 0.014 µg/m <sup>3</sup><br>A2: 0.043 µg/m <sup>3</sup> |                                   | 17/09/18 7:35 – 13:36<br>18/09/18 7:15 – 13:16 | >100%<br>18%               |
| A1 & A2        | Benzo[a]anthracene                             | No limit applies     |   | A1: 0.014 µg/m <sup>3</sup><br>A2: 0.014 µg/m <sup>3</sup> |                                   | 17/09/18 7:35 – 13:36<br>18/09/18 7:15 – 13:16 | >100%<br>>100%             |
| A1 & A2        | Benzo[b]fluoranthene                           | No limit applies     |   | A1: 0.027 µg/m <sup>3</sup><br>A2: 0.029 µg/m <sup>3</sup> |                                   | 17/09/18 7:35 – 13:36<br>18/09/18 7:15 – 13:16 | 18%<br>18%                 |
| A1 & A2        | Benzo[k]fluoranthene                           | No limit applies     |   | A1: 0.027 µg/m <sup>3</sup><br>A2: 0.029 µg/m <sup>3</sup> |                                   | 17/09/18 7:35 – 13:36<br>18/09/18 7:15 – 13:16 | 18%<br>18%                 |
| A1 & A2        | Benzo[b]naph(2,1-d)thiophene                   | No limit applies     |   | A1: 0.014 µg/m <sup>3</sup><br>A2: 0.014 µg/m <sup>3</sup> |                                   | 17/09/18 7:35 – 13:36<br>18/09/18 7:15 – 13:16 | >100%<br>>100%             |
| A1 & A2        | Benzo[c]phenanthrene                           | No limit applies     |   | A1: 0.014 µg/m <sup>3</sup><br>A2: 0.014 µg/m <sup>3</sup> |                                   | 17/09/18 7:35 – 13:36<br>18/09/18 7:15 – 13:16 | >100%<br>>100%             |
| A1 & A2        | Benzo[ghi]perylene                             | No limit applies     |   | A1: 0.068 µg/m <sup>3</sup><br>A2: 0.043 µg/m <sup>3</sup> |                                   | 17/09/18 7:35 – 13:36<br>18/09/18 7:15 – 13:16 | 18%<br>18%                 |
| A1 & A2        | Benzo[a]pyrene                                 | No limit applies     |   | A1: 0.027 µg/m <sup>3</sup><br>A2: 0.014 µg/m <sup>3</sup> |                                   | 17/09/18 7:35 – 13:36<br>18/09/18 7:15 – 13:16 | 18%<br>>100%               |
| A1 & A2        | Cholanthrene                                   | No limit applies     |   | A1: 0.014 µg/m <sup>3</sup><br>A2: 0.014 µg/m <sup>3</sup> |                                   | 17/09/18 7:35 – 13:36<br>18/09/18 7:15 – 13:16 | >100%<br>>100%             |
| A1 & A2        | Chrysene                                       | No limit applies     |   | A1: 0.014 µg/m <sup>3</sup><br>A2: 0.014 µg/m <sup>3</sup> |                                   | 17/09/18 7:35 – 13:36<br>18/09/18 7:15 – 13:16 | 18%<br>>100%               |
| A1 & A2        | Cyclopenta(c,d)pyrene                          | No limit applies     |   | A1: 0.014 µg/m <sup>3</sup><br>A2: 0.014 µg/m <sup>3</sup> |                                   | 17/09/18 7:35 – 13:36<br>18/09/18 7:15 – 13:16 | >100%<br>>100%             |
| A1 & A2        | Dibenzo[ah]anthracene                          | No limit applies     |   | A1: 0.014 µg/m <sup>3</sup><br>A2: 0.014 µg/m <sup>3</sup> |                                   | 17/09/18 7:35 – 13:36<br>18/09/18 7:15 – 13:16 | >100%<br>>100%             |
| A1 & A2        | Dibenzo[a,i]pyrene                             | No limit applies     |   | A1: 0.014 µg/m <sup>3</sup><br>A2: 0.014 µg/m <sup>3</sup> |                                   | 17/09/18 7:35 – 13:36<br>18/09/18 7:15 – 13:16 | >100%<br>>100%             |
| A1 & A2        | Fluoranthene                                   | No limit applies     |   | A1: 0.054 µg/m <sup>3</sup><br>A2: 0.058 µg/m <sup>3</sup> |                                   | 17/09/18 7:35 – 13:36<br>18/09/18 7:15 – 13:16 | 18%<br>18%                 |
| A1 & A2        | Indo[1,2,3-cd]pyrene                           | No limit applies     |   | A1: 0.014 µg/m <sup>3</sup><br>A2: 0.014 µg/m <sup>3</sup> |                                   | 17/09/18 7:35 – 13:36<br>18/09/18 7:15 – 13:16 | 18%<br>>100%               |
| A1 & A2        | Naphthalene                                    | No limit applies     |   | A1: 0.014 µg/m <sup>3</sup><br>A2: 0.014 µg/m <sup>3</sup> |                                   | 17/09/18 7:35 – 13:36<br>18/09/18 7:15 – 13:16 | >100%<br>>100%             |

[1] For dioxins and dioxin-like PCBs, the result are to be reported as a range based on: All congeners less than the detection limit assumed to be zero as a minimum, and all congeners less than the detection limit assumed to be at the detection limit as a maximum

[2] The date and time of the sample that produced the result is given.

[3] The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated.

Signed 

Date 24/12/19

(authorised to sign as representative of Operator)

## APPENDIX B

OPERATIONAL SUMMARY for each month of the YEAR 2018

Operator: Veolia

Installation: Stafford EfW

Confidence adjusted values

Release Point: Unit 1

**Average concentrations from valid 30 min (10 min for CO) averages.**

| Month                 | NO x         | CO         | SO2       | HCl        | VOC        | NH3        | Dust       | Flow          |
|-----------------------|--------------|------------|-----------|------------|------------|------------|------------|---------------|
|                       | (mg/m3)      | (mg/m3)    | (mg/m3)   | (mg/m3)    | (mg/m3)    | (mg/m3)    | (mg/m3)    | (Nm3/hr)      |
| January               | 155.4        | 3.9        | 26.5      | 7.04       | 0.05       | 4.84       | 0.23       | 123727        |
| February              | 156.1        | 4          | 31        | 7.21       | 0.1        | 5.5        | 0.24       | 123739        |
| March                 | 160.8        | 3.8        | 29        | 7.41       | 0.07       | 4.55       | 0.23       | 127658        |
| April                 | 168.1        | 3.3        | 29.9      | 6.52       | 0.04       | 4.68       | 0.23       | 122896        |
| May                   | 164.4        | 2.6        | 23        | 6.67       | 0.09       | 5.44       | 0.23       | 120456        |
| June                  | 167.7        | 2.2        | 28.4      | 5.06       | 0.08       | 4.64       | 0.12       | 121474        |
| July                  | 167.6        | 1.7        | 22.9      | 6.65       | 0.07       | 3.55       | 0.14       | 115922        |
| August                | 169.8        | 2.2        | 25.7      | 7.53       | 0.06       | 4.18       | 0.2        | 117558        |
| September             | 170.7        | 3.2        | 28.3      | 7.79       | 0.04       | 5.23       | 0.24       | 120360        |
| October               | 177.5        | 3.4        | 31.5      | 7.58       | 0.02       | 3.85       | 0.23       | 122250        |
| November              | 169.8        | 3.8        | 36.4      | 6.39       | 0.1        | 4.26       | 0.23       | 121638        |
| December              | 161.7        | 4.2        | 33.2      | 7.38       | 0.09       | 4.4        | 0.23       | 122187        |
| <b>Yearly Average</b> | <b>165.8</b> | <b>3.2</b> | <b>29</b> | <b>6.9</b> | <b>0.1</b> | <b>4.6</b> | <b>0.2</b> | <b>121655</b> |

## Mass release

| Month        | NO x            | CO            | SO2            | HCl            | VOC          | NH3            | Dust          | Burn time   |
|--------------|-----------------|---------------|----------------|----------------|--------------|----------------|---------------|-------------|
|              | (kg)            | (kg)          | (kg)           | (kg)           | (kg)         | (kg)           | (kg)          | (hrs)       |
| January      | 18015           | 391.3         | 3044.5         | 1076.38        | 5.79         | 445.51         | 28.41         | 743         |
| February     | 16361.4         | 362.8         | 3213.4         | 996.86         | 11.25        | 457.42         | 27.22         | 672         |
| March        | 18849           | 390.5         | 3379.5         | 1145.66        | 8.17         | 419.71         | 28.51         | 732         |
| April        | 18733.8         | 319.2         | 3290.4         | 958.39         | 4.06         | 415.11         | 27.47         | 720         |
| May          | 15525.2         | 216           | 2156.9         | 833.09         | 8.33         | 409.13         | 24.08         | 623         |
| June         | 13627.8         | 155.1         | 2272.8         | 542.38         | 6.31         | 300.79         | 10.76         | 530         |
| July         | 18093.8         | 162.5         | 2845.3         | 956.79         | 7.25         | 305.77         | 17.28         | 740         |
| August       | 18736.6         | 216.2         | 3230           | 1104.81        | 6.57         | 367.89         | 23.82         | 744         |
| September    | 18616.7         | 307.6         | 3055.6         | 1120.95        | 4.61         | 453.34         | 27.68         | 719         |
| October      | 20287.3         | 344.4         | 3568.1         | 1144.8         | 1.51         | 350.49         | 28.27         | 743         |
| November     | 17319.3         | 340           | 3668.2         | 860.59         | 10.35        | 344.54         | 25.49         | 666         |
| December     | 18516.2         | 422.6         | 3760.1         | 1115.74        | 11.09        | 400.42         | 28.47         | 744         |
| <b>Total</b> | <b>212682.1</b> | <b>3628.2</b> | <b>37484.8</b> | <b>11856.4</b> | <b>85.29</b> | <b>4670.12</b> | <b>297.46</b> | <b>8376</b> |

## OPERATIONAL SUMMARY for each month of the YEAR 2018

Operator: Veolia

Installation: Stafford EfW

Confidence adjusted values

Release Point: Unit 2

**Average concentrations from valid 30 min (10 min for CO) averages.**

| Month                 | NO x<br>(mg/m3) | CO<br>(mg/m3) | SO2<br>(mg/m3) | HCl<br>(mg/m3) | VOC<br>(mg/m3) | NH3<br>(mg/m3) | Dust<br>(mg/m3) | Flow<br>(Nm3/hr) |
|-----------------------|-----------------|---------------|----------------|----------------|----------------|----------------|-----------------|------------------|
| January               | 152.3           | 2.7           | 25.8           | 6.2            | 0.08           | 5.56           | 0.00            | 127612           |
| February              | 154.9           | 2.9           | 32.3           | 6.42           | 0.11           | 6.23           | 0.00            | 128189           |
| March                 | 161.7           | 3.1           | 26.5           | 6.35           | 0.11           | 4.23           | 0.00            | 126462           |
| April                 | 166.5           | 2.4           | 31             | 6.62           | 0.09           | 4.21           | 0.00            | 126370           |
| May                   | 167.8           | 1.8           | 27.6           | 5.57           | 0.13           | 3.88           | 0.01            | 122829           |
| June                  | 173.3           | 2.1           | 31.3           | 5.66           | 0.08           | 2.81           | 0.00            | 124387           |
| July                  | 173.7           | 1.1           | 27.9           | 7.05           | 0.08           | 2.73           | 0.01            | 117275           |
| August                | 176.7           | 1.6           | 29.9           | 7.72           | 0.08           | 3.06           | 0.02            | 119517           |
| September             | 177.3           | 3             | 31.2           | 6.8            | 0.03           | 2.73           | 0.11            | 124864           |
| October               | 182.9           | 2.8           | 35             | 6.71           | 0.02           | 2.08           | 0.11            | 126076           |
| November              | 178.5           | 3.1           | 37.6           | 5.27           | 0.06           | 2.03           | 0.11            | 125065           |
| December              | 179.3           | 2.8           | 35.7           | 6.44           | 0.03           | 1.89           | 0.11            | 125371           |
| <b>Yearly Average</b> | <b>170</b>      | <b>2.5</b>    | <b>31</b>      | <b>6.4</b>     | <b>0.1</b>     | <b>3.5</b>     | <b>0.04</b>     | <b>124501</b>    |

## Mass release

| Month        | NO x          | CO          | SO2            | HCl             | VOC          | NH3            | Dust         | Burn time   |
|--------------|---------------|-------------|----------------|-----------------|--------------|----------------|--------------|-------------|
|              | (kg)          | (kg)        | (kg)           | (kg)            | (kg)         | (kg)           | (kg)         | (hrs)       |
| January      | 18083.9       | 281.4       | 3048.7         | 976.61          | 9.48         | 526.11         | 0.00         | 740         |
| February     | 16749.6       | 277.7       | 3476.1         | 920.79          | 13.44        | 537.6          | 0.01         | 672         |
| March        | 17873.7       | 302         | 2924.1         | 930.87          | 11.99        | 374.14         | 0.00         | 696         |
| April        | 19002.1       | 241.7       | 3508.1         | 1000.43         | 10.11        | 384.67         | 0.00         | 719         |
| May          | 12495.4       | 122.2       | 2044.6         | 551.98          | 10.36        | 231.66         | 0.93         | 483         |
| June         | 19386.3       | 213.1       | 3456.1         | 837.62          | 8.86         | 251.84         | 0.00         | 716         |
| July         | 18868.3       | 111.8       | 3489.2         | 1021.23         | 9.38         | 238.05         | 0.74         | 738         |
| August       | 19759.3       | 166.2       | 3794.9         | 1146.88         | 9.21         | 274.84         | 2.31         | 744         |
| September    | 19981.6       | 304.2       | 3474.4         | 1015.04         | 3.31         | 246.99         | 14.24        | 720         |
| October      | 21476.1       | 287.1       | 4071.9         | 1045.59         | 2.04         | 196.14         | 14.86        | 743         |
| November     | 19128.7       | 292.6       | 3998.5         | 750.69          | 6.51         | 174.67         | 13.02        | 681         |
| December     | 20966         | 294         | 4140.7         | 997.55          | 3.2          | 176.85         | 14.88        | 744         |
| <b>Total</b> | <b>223771</b> | <b>2894</b> | <b>41427.3</b> | <b>11195.28</b> | <b>97.89</b> | <b>3613.56</b> | <b>60.99</b> | <b>8396</b> |

**APPENDIX C**

Permit Number : ERR/HP3431HK

Operator : Veolia ES Staffordshire Ltd

Permit Reference Number: EPR/3431HK

Operator : Veolia

Analysis month: Jan-18

Installation : Staffordshire ERF

Form Number : Residue 1/01/01/2012

Reporting of Ash Composition for the period from

**Ash Composition (LOI/TOC):**

|            | LOI (%) | % Carbon (TOC) % <sub>w</sub> |
|------------|---------|-------------------------------|
| Bottom ash |         | 1,7                           |

\* At least one of LOI or TOC to be reported

**Ash Composition (Metals, Dioxins, etc.)**

|             | Sb<br>mg/kg | Cd<br>mg/kg | Tl<br>mg/kg | Hg<br>mg/kg | Pb<br>mg/kg | Cr<br>mg/kg | Cu<br>mg/kg | Mn<br>mg/kg | Ni<br>mg/kg | As<br>mg/kg | Co<br>mg/kg | V<br>mg/kg | Zn<br>mg/kg | DIOXIN &<br>FURANS<br>I-TEQ ng/kg | DIOXINS, FURANS &<br>DIOXIN-LIKE PCBs |       |      |
|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------------|-------------|-----------------------------------|---------------------------------------|-------|------|
|             |             |             |             |             |             |             |             |             |             |             |             |            |             |                                   | WHO-TEQ ng/kg                         |       |      |
|             |             |             |             |             |             |             |             |             |             |             |             |            |             |                                   | Humans/<br>mammals                    | Birds | Fish |
| Bottom ash  | 61,4        | 12,5        | 0,0792      | 0,396       | 466         | 87,8        | 3771        | 2702        | 148         | 7,71        | 31,2        | 79,7       | 2867        | 9,34                              | 8,82                                  | 14,4  | 9,63 |
| APC residue | 630         | 137         | 0,7         | 5,9         | 853         | 60,6        | 599         | 653         | 32,6        | 45,8        | 8,7         | 65,6       | 8244        | 556                               | 520                                   | 1245  | 591  |

Signed:



Date:

23/4/18

(authorised to sign as representative of Operator)



Permit Number : ERR/HP3431HK

Operator : Veolia ES Staffordshire Ltd

Permit Reference Number: EPR/3431HK

Operator : Veolia

Analysis month: Apr-18

Installation : Staffordshire ERF

Form Number : Residue 1/01/01/2012

Reporting of Ash Composition for the period from

| Ash Composition (LOI/TOC): |         |                    |
|----------------------------|---------|--------------------|
|                            | LOI (%) | % Carbon (TOC) %/w |
| Bottom ash                 |         | 1.00               |

\* At least one of LOI or TOC to be reported

| Ash Composition (Metals, Dioxins, etc.) |             |             |             |             |             |             |             |             |             |             |             |            |             |                                |  | DIOXINS, FURANS & DIOXIN-LIKE PCBs |       |      |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------------|-------------|--------------------------------|--|------------------------------------|-------|------|
|   | Sb<br>mg/kg | Cd<br>mg/kg | Tl<br>mg/kg | Hg<br>mg/kg | Pb<br>mg/kg | Cr<br>mg/kg | Cu<br>mg/kg | Mn<br>mg/kg | Ni<br>mg/kg | As<br>mg/kg | Co<br>mg/kg | V<br>mg/kg | Zn<br>mg/kg | DIOXIN & FURANS<br>I-TEQ ng/kg |  | WHO-TEQ ng/kg                      |       |      |
|   |             |             |             |             |             |             |             |             |             |             |             |            |             |                                |  | Humans/<br>mammals                 | Birds | Fish |
| Bottom ash                              | 59.6        | 5.40        | 0.09        | 0.43        | 334         | 115.0       | 1419        | 1174        | 150         | 8.60        | 34.4        | 61.9       | 1992        | 2.65                           |  | 2.66                               | 4.72  | 2.89 |
| APC residue                             | 745         | 183         | 0.90        | 7.50        | 1018        | 79.6        | 501         | 490         | 30.6        | 59.2        | 10.70       | 42.7       | 8063        | 585                            |  | 540                                | 1299  | 621  |

Signed:



Date:

17/7/18

(authorised to sign as representative of Operator)

Permit Number : ERR/HP3431HK

Operator : Veolia ES Staffordshire Ltd

Permit Reference Number: EPR/HP3431HK

Operator : Veolia

Analysis month: Jul-18

Installation : Staffordshire ERF

Form Number : Residue 1/01/01/2012

Reporting of Ash Composition for the period from

**Ash Composition (LOI/TOC):**

|            | LOI (%) | % Carbon (TOC) <sup>w/w</sup> |
|------------|---------|-------------------------------|
| Bottom ash |         | 0.80                          |

\* At least one of LOI or TOC to be reported

**Ash Composition (Metals, Dioxins, etc.)**

|             | Sb<br>mg/kg | Cd<br>mg/kg | Tl<br>mg/kg | Hg<br>mg/kg | Pb<br>mg/kg | Cr<br>mg/kg | Cu<br>mg/kg | Mn<br>mg/kg | Ni<br>mg/kg | As<br>mg/kg | Co<br>mg/kg | V<br>mg/kg | Zn<br>mg/kg | DIOXIN &<br>FURANS<br>I-TEQ ng/kg | DIOXINS, FURANS &<br>DIOXIN-LIKE PCBs |       |      |
|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------------|-------------|-----------------------------------|---------------------------------------|-------|------|
|             |             |             |             |             |             |             |             |             |             |             |             |            |             |                                   | WHO-TEQ ng/kg                         |       |      |
|             |             |             |             |             |             |             |             |             |             |             |             |            |             |                                   | Humans/<br>mammals                    | Birds | Fish |
| Bottom ash  | 97.5        | 10.00       | 0.08        | 0.38        | 293         | 88.7        | 2360        | 693         | 58.5        | 7.01        | 22.5        | 18.7       | 1692        | 1.65                              | 1.95                                  | 2.95  | 2.06 |
| APC residue | 804         | 196         | 1.00        | 1.50        | 1038        | 67.7        | 426         | 387         | 20.1        | 55.9        | 7.00        | 10.4       | 8332        | 183                               | 171                                   | 391   | 192  |

Signed:



Date: 19.10.18

(authorised to sign as representative of Operator)



Permit Number : ERR/HP3431HK

Operator : Veolia ES Staffordshire Ltd

Permit Reference Number: EPR/3431HK

Operator : Veolia

Analysis month: Oct-18

Installation : Staffordshire ERF

Form Number : Residue 1/01/01/2012

Reporting of Ash Composition for the period from

October to December 2018


**Ash Composition (LOI/TOC):**

|            | LOI (%) | % Carbon (TOC) <sup>w/w</sup> |
|------------|---------|-------------------------------|
| Bottom ash |         | 1.30                          |

\* At least one of LOI or TOC to be reported

**Ash Composition (Metals, Dioxins, etc.)**

|             | Sb<br>mg/kg | Cd<br>mg/kg | Tl<br>mg/kg | Hg<br>mg/kg | Pb<br>mg/kg | Cr<br>mg/kg | Cu<br>mg/kg | Mn<br>mg/kg | Ni<br>mg/kg | As<br>mg/kg | Co<br>mg/kg | V<br>mg/kg | Zn<br>mg/kg | DIOXIN &<br>FURANS<br>I-TEQ ng/kg | DIOXINS, FURANS &<br>DIOXIN-LIKE PCBs |       |      |
|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------------|-------------|-----------------------------------|---------------------------------------|-------|------|
|             |             |             |             |             |             |             |             |             |             |             |             |            |             |                                   | WHO-TEQ ng/kg                         |       |      |
|             |             |             |             |             |             |             |             |             |             |             |             |            |             |                                   | Humans/<br>mammals                    | Birds | Fish |
| Bottom ash  | 88.4        | 8.52        | 0.08        | 0.39        | 549         | 84.3        | 1932        | 1028        | 61.6        | 7.75        | 66.8        | 26.5       | 1840        | 1.66                              | 1.54                                  | 3.04  | 1.64 |
| APC residue | 720         | 170         | 0.70        | 5.30        | 982         | 69.5        | 476         | 410         | 20.3        | 57.5        | 6.60        | 16.0       | 7964        | 214                               | 193                                   | 509   | 221  |

Signed: 

Date:

24/11/19

(authorised to sign as representative of Operator)