

# Attachment 7.1.3.1 Emissions Compliance Report

IEL Review Application W0232-01

Application ID LA003577


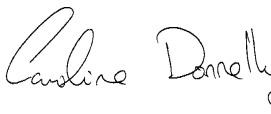
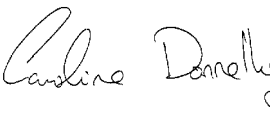
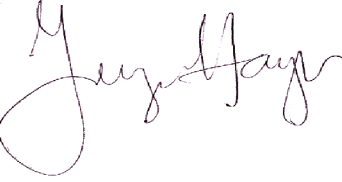
Dublin Waste to Energy

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## 1. Introduction

This attachment includes an assessment of the Dublin Waste to Energy Limited (DWtE) emissions in terms of compliance with current Emission Limit Values (ELVs) as well as providing an overview of recent monitoring data for the facility.

A comparison of the installation with BAT described in the applicable Draft BAT conclusions and with the emission levels associated with the best available techniques is included within section 4-7 of the IE Licence review application.

As this IE Licence review is concerned primarily with a proposed increase in the permitted maximum annual quantity of waste to be accepted at the DWtE facility, the information contained in the original licence application as well as in the applications for Technical Amendment A and B to the EPA with respect to site emission remains valid. No physical amendments to the consented operational facility are necessary to facilitate this capacity increase nor any changes to any previously consented emission limit values required. Therefore this IE Licence review application with respect to emissions only contains updated information or proposed changes in emission monitoring.

As agreed with the EPA this IE Licence Review application only contains the following Emission Attachments:

- Attachment 7-1 Emissions Overview;
- Attachment 7-1-3-1 Emissions Compliance Report (this report);
- Attachment 7-1-3-2 Emissions Impact Assessment (solely for emissions to air);
- Attachment 7-5 Noise Emissions and
- Attachment 7-7-1 Storm-Water.

## 2. Emissions to Air

### 2.1 Current Monitoring Schedule and Control Plans

A2-1 and A2-2 are the main emissions to atmosphere from the DWtE site. These main emission points are the twin stack emissions associated with each of the combustion lines.

Monitoring is carried out as per Schedule C.1.2 of IE licence W0232-01 as outlined below:

**C.1.2 Monitoring of Emissions to Air**

<b>Emission Point Reference No.: A2-1 and A2-2 (twin stack emission points)</b>		
<b>Parameters</b>	<b>Monitoring Frequency</b>	<b>Analysis Method / Technique <sup>Note 1</sup></b>
Total dust	Continuous	Iso-kinetic/gravimetric
PM <sub>10</sub> and PM <sub>2.5</sub>	Quarterly	To be agreed by the Agency
Gaseous and vaporous organic substances, expressed as total organic carbon	Continuous	Flame Ionisation Detector
Hydrogen chloride (HCl)	Continuous	Infra red analyser
Hydrogen fluoride (HF)	Quarterly	To be agreed by Agency
Sulphur dioxide (SO <sub>2</sub> )	Continuous	Infra red analyser
Oxides of Nitrogen (NO and NO <sub>2</sub> expressed as NO <sub>2</sub> )	Continuous	Infra red analyser
Nitrous oxide (N <sub>2</sub> O)	Quarterly	To be agreed by the Agency
Cadmium (as Cd) and thallium (as Tl), and their compounds	Quarterly	To be agreed by the Agency
Mercury (as Hg) and its compounds	Quarterly	To be agreed by the Agency
Antimony (as Sb), arsenic (as As), lead (as Pb), chromium (as Cr), cobalt (as Co), copper (as Cu), manganese (as Mn), nickel (as Ni), and vanadium (as V) and their compounds	Quarterly	To be agreed by the Agency
Dioxins/furans	Continuous sampling with analysis every two weeks. Biannual measurement, average value over sample period of between 6 and 8 hours. (Quarterly for first year of operation)	Continuous sampling method as per application. Other measurements as per CEN method (EN 1948, parts 1,2, and 3).
Carbon monoxide (CO)	Continuous	Infra red analyser
<b>Emission Point Reference No.: A2-3A, A2-3B &amp; A2-3C (Back-up Diesel Fired Electricity Generation Plant)</b>		
<b>Parameter</b>	<b>Monitoring Frequency <sup>Note 2</sup></b>	<b>Analysis Method/Technique</b>
CO	On installation	Flue gas analyser/datalogger
NO <sub>x</sub>	On installation	Flue gas analyser
Particulates	On installation	Isokinetic/Gravimetric
TOC	On installation	Flame ionisation

Note 1: Or other methods agreed in advance by the Agency.

Note 2: Monitoring to be carried out on installation and thereafter as instructed by the Agency.

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The current Emission Limit Values (ELV's) assigned to A2-1 and A2-2, are as set out in Schedule B.1 of IE Licence W0232-01 and as contained in Technical Amendment A. These ELV's are outlined in Table 1 below.

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**Table 1. Emission Limits to Air**

Emission Point Reference No.: A2-1 & A2-2 (twin stack emissions, one for each incinerator line)  
 Location: Flue gas treatment and discharge area  
 Volume to be emitted: Maximum rate per hour: 275,000 m<sup>3</sup> per line/emission point  
 Minimum discharge height: 105 m above OD

Parameters	Units	Half Hour Average		Daily Average	Periodic
		A	B		
Total dust	mg/m <sup>3</sup>	30 <sup>Note 1</sup>	10 <sup>Note 1</sup>	10	-
Gaseous and vaporous organic substances, expressed as total organic carbon	mg/m <sup>3</sup>	20 <sup>Note 1</sup>	10 <sup>Note 1</sup>	10	-
Hydrogen chloride (HCl)	mg/m <sup>3</sup>	60 <sup>Note 1</sup>	10 <sup>Note 1</sup>	10	-
Hydrogen fluoride (HF)	mg/m <sup>3</sup>	4 <sup>Note 1</sup>	2 <sup>Note 1</sup>	1	-
Sulphur dioxide (SO <sub>2</sub> )	mg/m <sup>3</sup>	200 <sup>Note 1</sup>	50 <sup>Note 1</sup>	50	-
Oxides of Nitrogen (NO and NO <sub>2</sub> expressed as NO <sub>2</sub> )	mg/m <sup>3</sup>	400 <sup>Note 1</sup>	200 <sup>Note 1</sup>	200	-
The sum of Cadmium (as Cd) and thallium (as Tl), and their compounds <sup>Note 2</sup>	mg/m <sup>3</sup>	-	-	-	0.05
Mercury (as Hg) and its compounds <sup>Note 2</sup>	mg/m <sup>3</sup>	-	-	-	0.05
The sum of antimony (as Sb), arsenic (as As), lead (as Pb), chromium (as Cr), cobalt (as Co), copper (as Cu), manganese (as Mn), nickel (as Ni), and vanadium (as V) <sup>Note 2</sup>	mg/m <sup>3</sup>	-	-	-	0.5
Arsenic and its compounds <sup>Note 2</sup>	mg/m <sup>3</sup>	-	-	-	0.2
Dioxins/furans (TEQ) <sup>Note 3</sup>	ng/m <sup>3</sup>	-	-	-	0.1
Carbon monoxide (CO)	mg/m <sup>3</sup>	100 <sup>Note 4</sup>	-	50 <sup>Note 5</sup>	-

**Note 1:** None of the half-hourly average values shall exceed any of the emission limit values set out in column A, or, 97% of the half-hourly average values over the year shall not exceed any of the emission limit values set out in column B

**Note 2:** All average values over the period of a minimum of 30 minutes and a maximum of 8 hours. Metals include both gaseous, vapour and solid phased as well as their compounds (expressed as the metal or total as specified)

**Note 3:** Average values shall be measured over a sample period of a minimum of 6 hours and a maximum of 8 hours. The emission limit value refers to the total concentration of dioxins and furans calculated using the concept of toxic equivalence in accordance with Annex I of Directive 2000/76/EC.

**Note 4:** At least 95% of all 10-minute average values taken in any 24-hour period shall not exceed 150 mg/m<sup>3</sup> or all of the half-hourly average values taken in the same period shall not exceed 100 mg/m<sup>3</sup>

**Note 5:** At least 97% of the daily average values over the year shall not exceed the emission limit value.



## 2.2 Previous Compliance History

DWtE began accepting waste in June 2017. Since this time DWtE has recorded some ELV exceedances associated with emissions to air. All such ELV exceedances have been classified as minor, notified to the EPA, fully investigated by DWtE and closed out to the satisfaction of the EPA.

## 2.3 Emergency Generator

There is one emergency generator on site (A2-3A) which according to the Medium Combustion Plant (MCP) Regulations (S.I. Number 595 of 2017) is considered 'existing combustion plant' as it was in operation before the legislative deadline of 20<sup>th</sup> December 2018. However as this MCP operates less than 500 hours per year it is exempt from the Emission Limit Values set out in the MCP Regulations. As 'existing combustion plant' the emergency generator will not have to be registered until 2029. However as the facility is regulated through its IE Licence, the requirement for separate registration does not apply.

DWtE are requesting that the classification of this emergency generator be changed in the revised IE Licence from a main emission point to a potential emission point as defined by the EPA: **Potential Emissions**<sup>1</sup>

*These are emissions which only operate under abnormal process conditions. Typical examples include bursting discs, pressure relief valves, and emergency generators.*

The emergency generator is typically tested once a week for approximately a 60 minute period.

## 3. Emissions to Surface Water

### 3.1 Current Monitoring Schedule and Control Plans

There is no direct discharge to surface water, of process, sewage or storm water from the DWtE facility.

All process waste waters (e.g. boiler blow down, boiler water treatment reject water, scrubber water) are collected for recycling in the Flue Gas Treatment System or used for humidification/cooling of the bottom ash outlet.

Cooling water from the facility is discharged to the Liffey Estuary via emission point reference number SW-1. ELV's for SW-1 are contained in Schedule B.2 of IE licence W0232-01 and are as follows:

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<sup>1</sup> Licence Application Form Guidance Industrial Emissions (IE), Integrated Pollution Control (IPC) and Waste, Version 2 March 2018

**B.2 Emission limits to Water**

<b>Emission Point Reference No.:</b>	SW-1 Cooling Water Discharge	
<b>Name of Receiving Waters:</b>	Liffey Estuary	
<b>Location :</b>	Cooling water outfall	
<b>Volume to be emitted:</b>	Maximum in any one day :	570,000m <sup>3</sup>
	Maximum rate per hour	14,040 m <sup>3</sup>

Parameter	Emission Limit Value
Temperature rise ( $\Delta T$ ) relative to intake	9.0 °C
Total residual chlorine ( as HOCl)	0.5mg/l and 0.2mg/l (as 24 hour average)

Control and Monitoring requirements for SW-1, including monitoring equipment, monitoring frequency and analysis method/technique are outlined in Schedule C.2.1 and C.2.2 of IE licence W0232-01. These schedules are outlined below:

**Emission Point Reference No.:** SW-1 Cooling Water Discharge

**Monitoring :**

Monitoring to be Carried Out	Monitoring Frequency	Monitoring Equipment/Method
Temperature Rise ( $\Delta T$ )	Continuous	Temperature probe
Flow	Continuous	Flow meter/recorder
Hypochlorite/Chlorine Dosing	Concentration & Interval	To be agreed by the Agency

**Equipment:**

Control Parameter	Equipment	Backup Equipment
Temperature (intake & outlet)	Temperature probe	Spares held on site
Flow	Flow meter/recorder	Spares held on site
Hypochlorite/Chlorine dose (Total Residual Oxidant)	To be agreed by the Agency	To be agreed by the Agency

**Emission Point Reference No.:** SW-1 Cooling Water Discharge

Parameter	Monitoring Frequency	Analysis Method/Technique
Flow	Continuous	On-line flow meter with recorder
Temperature	Continuous	On-line temperature probe with recorder
pH	Continuous	pH electrode/meter and recorder
Total residual chlorine	Hourly	To be agreed by the Agency
Biological	Biennially	To be agreed by the Agency (Refer Condition 6.16)
Toxicity <sup>Note 1</sup>	As may be required	To be agreed by the Agency

**Note 1:** The number of toxic units (Tu) = 100/x hour EC/LC<sub>50</sub> in percentage vol/vol so that higher Tu values reflect greater levels of toxicity. For test regimes where species death is not easily detected, immobilisation is considered equivalent to death.

### 3.2 Previous Compliance History

Since DWtE began accepting waste on site there have been three ELV exceedances associated with SW-1. The last such exceedance was in August 2018. The previous two ELV exceedances occurred during commissioning of the DWtE facility. All such ELV breaches have been classified as minor, notified to the EPA, fully investigated by DWtE and closed out to the satisfaction of the EPA.

## 4. Storm water Emissions

### 4.1 Current Monitoring Schedule and Control Plans

Surface water runoff from building roofs, roads, parking areas etc. is stored in a 725m<sup>3</sup> attenuation tank for re-use in the process.

DWtE is connected to the neighbouring Ringsend Municipal Wastewater Treatment Plant (MWwTP) for discharge of sanitary effluent. Overflow from the attenuation tank also discharges to the MWwTP.

Overflow from the surface water attenuation tank is continuously monitored for pH and Total Organic Carbon (TOC) per Schedule C.2.3 of IE Licence W0232-01 as outlined below:

**Emission Point Reference No.:** Surface water overflow from reservoir

Parameter	Monitoring Frequency	Analysis Method/Technique
pH	Continuous	pH meter and recorder
TOC	Continuous	TOC analyser and recorder

### 4.2 Previous Compliance History

DWtE continuously monitor for pH and TOC on the overflow from the attenuation tank. However as part of this IE Licence review application DWtE are requesting a change in this monitoring regime. This is discussed in **Attachment 7-7-1-Storm Water**.

## 5. Noise

### 5.1 Current Monitoring Schedule and Control Plans

Limits of noise emission were set out in Schedule B.4 of IE Licence W0232-01. Noise monitoring requirements are set out in Schedule C.6.2 of IE Licence W0232-01. These schedules are presented below:

#### B.4 Noise emission limits

Day dB(A) $L_{\text{max}}$ (30 minutes)	Night dB(A) $L_{\text{max}}$ (30 minutes)
55 <sup>Note 1</sup>	45

Note 1: Construction period excepted.

#### C.6.2 Ambient Noise Monitoring

Monitoring Locations: At noise monitoring locations NL01 to NL10 (incl.)<sup>Note 1</sup>

Parameter	Monitoring Frequency	Analysis Method/Technique
L(A) <sub>EQ</sub> [30 minutes]	As specified in Condition 6.2	Standard <sup>Note 2</sup>
L(A) <sub>10</sub> [30 minutes]	As specified in Condition 6.2	Standard <sup>Note 2</sup>
L(A) <sub>90</sub> [30 minutes]	As specified in Condition 6.2	Standard <sup>Note 2</sup>
Frequency Analysis(1/3 Octave band analysis)	As specified in Condition 6.2	Standard <sup>Note 2</sup>

Note 1: Or as otherwise may be amended by agreement, or as necessary direction, of the Agency.

Note 2: "International Standards Organisation. ISO 1996. Acoustics - description and Measurement of Environmental noise. Parts 1, 2 and 3."

### 5.2 Previous Compliance History

The site has been in full compliance with their noise limits (both daytime and night-time) since commencement of waste acceptance on-site. DWtE are applying as part of this IE Licence review to amend monitoring conditions in Schedule C.6.2. Details of this proposed amendment are contained in **Attachment-7-5-Noise.**

## 6. Other Environmental Monitoring

Besides the parameters previously discussed in this report DWtE undertakes further monitoring as outlined in their IE Licence for:

- incinerator residues
- meteorological monitoring
- ambient ground water monitoring
- receiving water monitoring.

The parameter, frequency and analysis method/technique are as per Schedule C.4.1, C.5, C.6.1 and C.6.3 of IE Licence W0232-01 and are as follows:

### C.4.1 Monitoring of incinerator residues

Waste	Frequency	Parameter <sup>Note 1</sup>
Liquid and solid material from the cleaning of the flue gas treatment system and storage areas	per consignment	TOC, metals <sup>Note 2</sup> and their compounds, chloride, fluoride, sulphate, dioxins/furans and dioxin-like PCB's.
Bottom ash, fly ash, boiler ash and flue gas treatment residues	per consignment <sup>Note 3</sup>	TOC, metals <sup>Note 2</sup> and their compounds, chloride, fluoride, sulphate, dioxins/furans and dioxin-like PCB's.
<sup>Note 4</sup> Other		

**Note 1:** The scope and methods of analysis shall take account of the total soluble fraction, the metals soluble fraction shall be submitted with the Test Programme and shall be agreed with the Agency prior to the commencement of the waste activity.

**Note 2:** Metals shall include Ba, Cd, Mo, Sb, Se, Zn, Ti, Hg, Pb, Cr, Cu, Mn, Ni, As, Co, V and Sn.

**Note 3:** The TOC of the bottom ash and slag shall be determined on a weekly basis.

**Note 4:** Analytical requirements to be determined on a case by case basis.

### C.5 Meteorological Monitoring

Monitoring Location: To be agreed by the Agency.

Parameter	Monitoring Frequency	Analysis Method/Technique
Precipitation Volume	Daily	WMO Standard <sup>Note 1</sup>
Temperature (min/max.)	Daily	WMO Standard <sup>Note 1</sup>
Wind Speed and Direction	Continuous	WMO Standard <sup>Note 1</sup>
Atmospheric Pressure	Continuous	WMO Standard <sup>Note 1</sup>

**Note 1:** World Metrological Organisation Standards and Recommendations.



### C.6.1 Ambient Groundwater Monitoring

Monitoring Location: One monitoring borehole at agreed location along eastern boundary of site.

Parameter	Monitoring Frequency	Analysis Method/Technique
Potassium	Annually	Standard Method
Ammonia (NH <sub>4</sub> )	Annually	Standard Method
pH	Annually	pH electrode/meter
Metals(Cd, Tl, Hg, Pb, Cr, Cu, Mn, Ni, As, Co, V, Sn) and their compounds	Annually	Standard Method
Organohalogens <sup>Note 1</sup>	Annually	GC-MS

Note 1: Screening for priority pollutant list substances (such as US EPA volatile and/or semi-volatile compounds).

### C.6.3 Receiving Water Monitoring

Location: To be agreed <sup>Note 1</sup>

Parameter	Monitoring Frequency	Analysis Method/Technique
Dissolved oxygen	Biannually	Note 2
Temperature	Biannually	Note 2
Total residual chlorine	Biannually	Note 2

Note 1: Having regard to the requirements of Conditions 6.16 and 6.17.

Note 2: Third Schedule of S.I. No. 293 of 1988 or other method/techniques as agreed by the Agency.

DWtE undertakes this monitoring as outlined in their IE Licence, the results of which are presented to the EPA.

## 6.1 Request for a change in the monitoring frequency of Schedule C.4.1

With respect to monitoring of incinerator residues DWtE, is requesting a change in the monitoring frequency of Schedule C.4.1 to match the guidance in the draft BAT reference document for waste incineration (December 2018). BAT 7 of this document states:

*BAT is to monitor the content of unburnt substances t in slags and bottom ashes at the incineration plant with at least the frequency given below and in accordance with EN standards.*

Parameter	Standard(s)	Minimum monitoring frequency	Monitoring associated with
Loss on ignition <sup>(1)</sup>	EN 14899, and either EN 15169 or EN 15935	Once every three months	BAT 14
Total carbon <sup>(1)(2)</sup>	organic EN 14899, and either EN 13137 or EN 15936		

(1) Either the loss on ignition or the total organic carbon is monitored.

(2) Elemental carbon (e.g. determined according to DIN 19539) may be subtracted from the measurement result.

Therefore DWtE request that the monitoring frequency of Schedule C.4.1 is changed from per consignment to once every three months. DWtE has a considerable amount of monitoring data associated with Schedule C.4.1 which it has presented to the EPA. This data shows very little variance in monitoring results. Currently, the monitoring requirement per consignment is proving to be unnecessarily expensive and logistically complicated and also not in line with BAT.

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