ANNEX 1 STANDARD FORMS

Standard forms are provided in this section for the recording and presentation of environmental monitoring and site investigation results

TABLE E.1(i) LANDFILL GAS FLARE EMISSIONS TO ATMOSPHERE
Emission Point:

Emission Point Ref. N^{o}:	Not applicable
Location :	Not applicable
Grid Ref. (12 digit, 6E,6N):	Not applicable
Vent Details Diameter: Height above Ground(m):	Not applicable
Date of commencement of emission:	Not applicable

Characteristics of Emission :

CO		Not applicable	
Total organic carbon (TOC)		Not applicable	
NOx		Not applicable	
Maximum volume of emission		Not applicable	
Temperature	^{o}C(max)	^{o}C(min)	^{o}C(avg)

(i) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up/shutdown to be included):*

Periods of Emission (avg)	____min/hr ____/day ___day/yr

TABLE E.1(ii) MAIN EMISSIONS TO ATMOSPHERE (1 Page for each emission point)

Emission Point Ref. Nº:	A2-1
Source of Emission:	Waste to Energy Line 1
Location :	See drawing UZT / BE008
Grid Ref. (12 digit, 6E,6N):	319961E , 233618N
Vent Details Diameter: Height above Ground(m):	Approximately 2,4 meters in inner diameter Approximately 100 metres above ground level
Date of commencement:	Trial Run of the Facility (presently scheduled for September 2010).

Characteristics of Emission :

(i) Volume to be emitted:			
Average/day	5,733,720 m^3/d[8]	Maximum/day	6,600,000 m^3/d [9]
Maximum rate/hour	275,000 m^3/h[10]	Min efflux velocity	2 $m.sec^{-1}$ [11]
(ii) Other factors			
Temperature	150 °C(max)	55 °C(min)	55 °C(avg)
For Combustion Sources: Volume terms expressed as : ☐ wet. ☒ dry. _____11_%O_2			

(iii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	60_min/hr 24_hr/day 365_day/yr

Emission Point Ref. Nº:	A2-2
Source of Emission:	Waste to Energy Line 2

[8] Volumes are given at standard conditions of: T=273 Kelvin, P=101.3 kPa, 11% O2 Dry Gas.
[9] Volumes are given at standard conditions of: T=273 Kelvin, P=101.3 kPa, 11% O2 Dry Gas.
[10] Volumes are given at standard conditions of: T=273 Kelvin, P=101.3 kPa, 11% O2 Dry Gas.
[11] Immediately prior to start-up of ventilation of the boiler/flue gas cleaning system with the induced draft fan the flow and thus the velocity will be approximately zero. The flue gas flow will be gradualy increased and thus whenever waste is being combusted the flow will not be less than than 2 meters pr second.

Location :	See drawing UZT / BE008
Grid Ref. (12 digit, 6E,6N):	319966E, 233617N
Vent Details Diameter: Height above Ground(m):	Approximately 2,4 meters in inner diameter Approximately 100 meter above ground level
Date of commencement:	Trial Run of the Facility (presently scheduled for September 2010)

Characteristics of Emission :

(i) Volume to be emitted:			
Average/day	5,733,720m^3/d[12]	Maximum/day	6,600,000 $^3/d$ [13]
Maximum rate/hour	275,000 m^3/h[14]	Min efflux velocity	2 $m.sec^{-1}$ [15]
(ii) Other factors			
Temperature	150 °C(max)	55 °C(min)	55 °C(avg)
For Combustion Sources: Volume terms expressed as : ☐ wet ☒ dry. _____11_%O_2			

(iii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	60_min/hr 24_hr/day 365_day/yr

[12] Volumes are given at standard conditions of: T=273 Kelvin, P=101.3 kPa, 11% O2 Dry Gas.
[13] Volumes are given at standard conditions of: T=273 Kelvin, P=101.3 kPa, 11% O2 Dry Gas.
[14] Volumes are given at standard conditions of: T=273 Kelvin, P=101.3 kPa, 11% O2 Dry Gas.
[15] Immediately prior to start-up of ventilation of the boiler/flue gas cleaning system with the induced draft fan the flow and thus the velocity will be approximately zero. The flue gas flow will be gradualy increased and thus whenever waste is being combusted the actual flow (Wet condition, actual O_2, actual temp)will not be less than than two meters pr second.

Emission Point Ref. N^{o}:	A2-3A
Source of Emission:	Emergency Diesel exhaust point
Location :	See drawing UZT / BE008
Grid Ref. (12 digit, 6E,6N):	319869E, 233552N
Vent Details Diameter: Height above Ground(m):	 Approximately 0.75 metres in inner diameter Approximately 25 metres above ground level
Date of commencement:	Trial Run of the Facility (presently scheduled for September 2010)

Characteristics of Emission :
Diesel engine emission

(i) [Volume to be emitted]:			
Average/day	21,667 m^3/d	Maximum/day	576,667 m^3/d
Maximum rate/hour	24,000 m^3/h	Min efflux velocity	5 $m.sec^{-1}$
(ii) Other factors			
Temperature	950 ^{o}C(max)	(min)	~500 ^{o}C(avg)
For Combustion Sources: Volume terms expressed as : ☐ wet. ☒ dry. 5 $\%O_2$			

(iii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	60 min/hr 2 hr/day 12 day/yr

Emission Point Ref. N^{o}:	A2-3B
Source of Emission:	Emergency Diesel exhaust point
Location :	See drawing UZT / BE008
Grid Ref. (12 digit, 6E,6N):	319869E, 233552N
Vent Details Diameter: Height above Ground(m):	 Approximately [0.75] metres in inner diameter Approximately [25] metres above ground level
Date of commencement:	Trial Run of the Facility (presently scheduled for September 2010)

Characteristics of Emission :
Diesel engine emission

(i) [Volume to be emitted]:			
Average/day	21,667 m^3/d	Maximum/day	576,667 m^3/d
Maximum rate/hour	24,000 m^3/h	Min efflux velocity	5 $m.sec^{-1}$
(ii) Other factors			
Temperature	950 ^{o}C(max)	(min)	~500 ^{o}C(avg)
For Combustion Sources: Volume terms expressed as : ☐ wet. ☒ dry. 5 $\%O_2$			

(iii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	60 min/hr 2 hr/day 12 day/yr

Emission Point Ref. N^{o}:	A2-3C
Source of Emission:	Emergency Diesel exhaust point
Location :	See drawing UZT / BE008
Grid Ref. (12 digit, 6E,6N):	319869E, 233552N
Vent Details Diameter: Height above Ground(m):	 Approximately 0.75 metres in inner diameter Approximately 25 metres above ground level
Date of commencement:	Trial Run of the Facility (presently scheduled for September 2010)

Characteristics of Emission :
Diesel engine emission

(i) [Volume to be emitted]:			
Average/day	21,667 m^3/d	Maximum/day	576,667 m^3/d
Maximum rate/hour	24,000 m^3/h	Min efflux velocity	5 $m.sec^{-1}$
(ii) Other factors			
Temperature	950 ^{o}C(max)	(min)	~500 ^{o}C(avg)
For Combustion Sources: Volume terms expressed as : ☐ wet. ☒ dry. 5 %O_2			

(iii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	60 min/hr 2 hr/day 12 day/yr

TABLE E.1(iii): MAIN EMISSIONS TO ATMOSPHERE - Chemical characteristics of the emission (1 table per emission point)

Emission Point Reference Number: **A2-1 (Waste to Energy Line 1)**

Parameter	Prior to treatment				Brief	As discharged					
	mg/Nm^3		kg/h		description of treatment	mg/Nm^3		kg/h.		kg/year	
	Avg	Max	Avg	Max		Avg	Max	Avg	Max	Avg	Max
Dust	2,000	3,000	478	825	Baghouse filter	5	10	1.2	2.8	10,464	24,090
TOC	5	10	1.2	2.8	(by combustion optimisation)	5	10	1.2	2.8	10,464	24,090
HCL	800	1,500	191	413	Lime & wetscrubber	8	10	2	3	16,742	24,090
HF	10	20	2.4	5.5	Lime & wetscrubber	0.8	1	0.2	0.3	1,674	2,409
SO_2	300	2,000	72	550	Lime & wetscrubber	40	50	10	14	83,712	120,450
NOx (as NO_2)	450	600	108	165	SNCR	180	200	43	55	376,706	481,800
Sum of Cd & Tl	0.5	1	0.12	0.28	Baghouse filter + AC	0.05	0.05	0.01	0.01	105	120
Hg	0.5	1	0.12	0.28	Baghouse filter + AC + wetscrubber	0.02	0.05	0.00	0.01	42	120
Sum of 9 heavy metals : Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V	10	30	2.4	8.3	Baghouse filter + AC	0.4	0.5	0.1	0.1	837	1,205
PCDD/F	1 ng/Nm^3	2 ng/Nm^3	0.0002 g/h	0.001 g/h	Baghouse filter + AC	0.05 ng/Nm^3	0.1 ng/Nm^3	0.00001 g/h	0.00003 g/h	0.1 g/year	0.2 g/year
CO	10	150(see note below)	2.4	41.3	(by combustion optimisation)	25	150 (see note below)	6.0	41.3	52,320	361,350

1. All values are at standard conditions of: T=273 Kelvin, P=101.3 kPa, 11% O2 Dry Gas
2. For the mg/Nm3 concentrations of Total dust, Gaseous and vaporous organic substances, expressed as total organic carbon, Hydrogen chloride (HCl), Hydrogen fluoride (HF) Sulphur dioxide (SO2) Nitrogen monoxide (NO) and nitrogen dioxide (NO2) expressed as nitrogen dioxide the emission level concentrations are daily average value calculated in accordance with EU directive 2000/76/EC
3. For the mg/Nm3 concentrations of Cadmium and its compounds, expressed as cadmium (Cd), Thallium and its compounds, expressed as thallium (Tl), Mercury and its compounds, expressed as mercury (Hg), Antimony and its compounds, expressed as antimony (Sb), Arsenic and its compounds, expressed as arsenic (As), Lead and its compounds, expressed as lead (Pb), Chromium and its compounds, expressed as chromium (Cr), Cobalt and its compounds, expressed as cobalt (Co), Copper and its compounds, expressed as copper (Cu), Manganese and its compounds, expressed as manganese (Mn), Nickel and its compounds, expressed as nickel (Ni), Vanadium and its compounds, expressed as vanadium (V) the emission level concentrations are all average values over the sample period of a minimum of 30 minutes and a maximum of 8 hours calculated in accordance with EU directive 2000/76/EC.

4. For the mg/Nm3 concentrations of dioxin and furans (PCDD/F) the emission value refers to the total concentration of dioxins and furans calculated using the concept of toxic equivalence in accordance with Annex I of EU 2000/76 The value is the average value measured over a sample period of a minimum of 6 hours and a maximum of 8 hours calculated in accordance with EU directive 2000/76/EC.

5. The following emission limit values of carbon monoxide (CO) concentrations shall not be exceeded in the combustion gases (excluding the start-up and shut-down phase):
— 50 milligrams/Nm3 of combustion gas determined as daily average value;
150 milligrams/Nm3 of combustion gas of at least 95 % of all measurements determined as 10-minute average values or 100 mg/m3 of combustion gas of all measurements determined as half-hourly average values taken in any 24-hour period.

6. Activated Carbon (AC)

7. Selective Non-Catalytic Reduction (SNCR)

Emission Point Reference Number: **A2-2 (Waste to Energy Line 2)**

Parameter	Prior to treatment				Brief	As discharged					
	mg/Nm^3		kg/h		description of treatment	mg/Nm^3		kg/h.		kg/year	
	Avg	Max	Avg	Max		Avg	Max	Avg	Max	Avg	Max
Dust	2,000	3,000	478	825	Baghouse filter	5	10	1.2	2.8	10,464	24,090
TOC	5	10	1.2	2.8	(by combustion optimisation)	5	10	1.2	2.8	10,464	24,090
HCL	800	1,500	191	413	Lime & wetscrubber	8	10	27	3	16,742	24,090
HF	10	20	2.4	5.5	Lime & wetscrubber	0.8	1	0.2	0.3	1,674	2,409
SO_2	300	2,000	72	550	Lime & wetscrubber	40	50	10	14	83,712	120,450
NOx (as NO_2)	450	600	108	165	SNCR	180	200	43	55	376,706	481,800
Sum of Cd & Tl	0.5	1	0.12	0.28	Baghouse filter + AC	0.05	0.05	0.01	0.01	105	120
Hg	0.5	1	0.12	0.28	Baghouse filter + AC + wetscrubber	0.02	0.05	0.00	0.01	42	120
Sum of 9 heavy metals : Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V	10	30	2.4	8.3	Baghouse filter + AC	0.4	0.5	0.1	0.1	837	1,205
PCDD/F	1 ng/Nm^3	2 ng/Nm^3	0.0002 g/h	0.001 g/h	Baghouse filter + AC	0.05 ng/Nm^3	0.1 ng/Nm^3	0.00001 g/h	0.00003 g/h	0.1 g/year	0.2 g/year
CO	10	150(see note below)	2.4	41.3	(by combustion optimisation)	25	150 (see note below)	6.0	41.3	52,320	361,350

1. All values are at standard conditions of: T=273 Kelvin, P=101.3 kPa, 11% O2 Dry Gas

2. For the mg/Nm3 concentrations of Total dust, Gaseous and vaporous organic substances, expressed as total organic carbon, Hydrogen chloride (HCl), Hydrogen fluoride (HF) Sulphur dioxide (SO2) Nitrogen monoxide (NO) and nitrogen dioxide (NO2) expressed as nitrogen dioxide the emission level concentrations are daily average value calculated in accordance with EU directive 2000/76/EC

3. For the mg/Nm3 concentrations of Cadmium and its compounds, expressed as cadmium (Cd), Thallium and its compounds, expressed as thallium (Tl), Mercury and its compounds, expressed as mercury (Hg), Antimony and its compounds, expressed as antimony (Sb), Arsenic and its compounds, expressed as arsenic (As), Lead and its compounds, expressed as lead (Pb), Chromium and its compounds, expressed as chromium (Cr), Cobalt and its compounds, expressed as cobalt (Co), Copper and its compounds, expressed as copper (Cu), Manganese and its compounds, expressed as manganese

(Mn), Nickel and its compounds, expressed as nickel (Ni), Vanadium and its compounds, expressed as vanadium (V) the emission level concentrations are all average values over the sample period of a minimum of 30 minutes and a maximum of 8 hours calculated in accordance with EU directive 2000/76/EC.

4. For the mg/Nm3 concentrations of dioxin and furans (PCDD/F) the emission value refers to the total concentration of dioxins and furans calculated using the concept of toxic equivalence in accordance with Annex I of EU 2000/76 The value is the average value measured over a sample period of a minimum of 6 hours and a maximum of 8 hours calculated in accordance with EU directive 2000/76/EC.

5. The following emission limit values of carbon monoxide (CO) concentrations shall not be exceeded in the combustion gases (excluding the start-up and shut-down phase):
— 50 milligrams/Nm3 of combustion gas determined as daily average value;
— 150 milligrams/Nm3 of combustion gas of at least 95 % of all measurements determined as 10-minute average values or 100 mg/m3 of combustion gas of all measurements determined as half-hourly average values taken in any 24-hour period.

6. Activated Carbon (AC)

7. Selective Non-Catalytic Reduction (SNCR)

Emission Point Reference Number: **A2-3A (Emergency Diesel Exhaust Point)**

Parameter	Prior to treatment				Brief Description of treatment	As discharged					
	mg/Nm^3		kg/h			mg/Nm^3		kg/h.		kg/year	
	Approximiated values					Approximiated values					
	Avg	Max	Avg	Max		Avg	Max	Avg	Max	Avg	Max
Particles		150		3.6	N/A		150		3.6		86.4
NOx		2000		48.0			2000		48.0		1152
CO		1000		24.0			1000		24.0		576
TOC		200		4.8			200		4.8		115
SO_2		170		4.1			170		4.1		98.4

1. All values are at standard conditions of: T=273 Kelvin, P=101.3 kPa, 5% O2 Dry Gas

Emission Point Reference Number: **A2-3B (Emergency Diesel Exhaust Point)**

Parameter	Prior to treatment				Brief Description of treatment	As discharged					
	mg/Nm^3		kg/h			mg/Nm^3		kg/h.		kg/year	
	Approximiated values					Approximiated values					
	Avg	Max	Avg	Max		Avg	Max	Avg	Max	Avg	Max
Particles		150		3.6	N/A		150		3.6		86.4
NOx		2000		48.0			2000		48.0		1152
CO		1000		24.0			1000		24.0		576
TOC		200		4.8			200		4.8		115
SO_2		170		4.1			170		4.1		98.4

1. All values are at standard conditions of: T=273 Kelvin, P=101.3 kPa, 5% O2 Dry Gas

Emission Point Reference Number: **A2-3C (Emergency Diesel Exhaust Point)**

Parameter	Prior to treatment				Brief description of treatment	As discharged					
	mg/Nm^3		kg/h			mg/Nm^3		kg/h.		kg/year	
	Approximiated values					Approximiated values					
	Avg	Max	Avg	Max		Avg	Max	Avg	Max	Avg	Max
Particles		150		3.6	N/A		150		3.6		86.4
NOx		2000		48.0			2000		48.0		1152
CO		1000		24.0			1000		24.0		576
TOC		200		4.8			200		4.8		115
SO_2		170		4.1			170		4.1		98.4

1. All values are at standard conditions of: T=273 Kelvin, P=101.3 kPa, 5% O2 Dry Gas

TABLE E.1(iv): EMISSIONS TO ATMOSPHERE - Minor /Fugitive

Emission point	Description	Emission details[1]				Abatement system employed
Reference Numbers		material	mg/Nm$^{3(2)}$	kg/h.	kg/year	
Building ventilation	Building ventilation from boiler and FGT area	Heated/cooled atmospheric air	Not applicable			
Building ventilation	Building ventilation from administration building	Heated/cooled atmospheric air	Not applicable			

1 The maximum emission should be stated for each material emitted, the concentration should be based on the maximum 30 minute mean.
2 Concentrations should be based on Normal conditions of temperature and pressure, (i.e. 0°C101.3kPa). Wet/dry should be clearly stated. Include reference oxygen conditions for combustion sources.

Emissions of dust and VOCs (including odorous materials) from waste will be contained within the Waste Reception Hall, because this Hall will be maintained at a negative pressure relative to the outside air. Fugitive emissions will be drawn into the combustion plant, as part of the primary and secondary combustion air and will not escape to the atmosphere.

Fugitive emissions will arise during delivery of process materials and removal of ash and FGT Residues. However, these activities will take place within the WtE facility and will be largely contained within the shell of the building. Within this building, fugitive emissions will include:

- Ammonia vapours during delivery of ammonium hydroxide from
  - making and breaking hose connections and
  - pump and valve seals.
- Ammonia vapours from vent on ammonium hydroxide storage tank.
- Diesel fuel vapours
  - making and breaking hose connections and
  - pump and valve seals.
- Dust emissions during making and breaking of connections when delivering carbon and lime
- Dust emissions (FGT Residue and Ash) when making and breaking connections to transport vehicles

Some fugitive emissions of dust may arise from the Site and access roads, but these roads will be regularly swept and in dry weather conditions they will be wetted.

Extremely small fugitive emissions may also arise when handling other materials such treatment chemicals for boiler feedwater and cooling water.

TABLE E.2(i): EMISSIONS TO SURFACE WATERS
(One page for each emission)

Emission Point:

Emission Point Ref. N^{o}:	SW-1
Source of Emission:	Cooling water dischage
Location :	See drawing UZT / BE008
Grid Ref. (10 digit, 5E,5N):	320044,233782
Name of receiving waters:	Liffey Estuary
Flow rate in receiving waters:	App. 4 – 400 $m^3.sec^{-1}$ Dry Weather Flow[16] App. 4 – 30 $m^3.sec^{-1}$ 95%ile flow[17]
Available waste assimilative capacity:	Please see chapter 12 of the EIS for additional informatio

Emission Details: SW-1

[16] Including tidal flow
[17] Basic flow excl tidal flow

(i) Volume to be emitted			
Normal/day	~ 337,000 m^3	Maximum/day	~570,000 m^3
Maximum rate/hour	~ 24,000 m^3		

(ii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	___60_min/hr 24_hr/day 365_day/yr

TABLE E.2(ii): EMISSIONS TO SURFACE WATERS - Characteristics of the emission (1 table per emission point)

Emission point reference number : SW-1.

Parameter	Prior to treatment				As discharged				% Efficiency
	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	
Please see chapter 12 of the EIS which describes in detail the emissions to surface waters									

TABLE E.3(i): EMISSIONS TO SEWER (One page for each emission)

Emission Point: SE-1

Emission Point Ref. N^{o}:	SE-1
Location of connection to sewer :	Pigeon House Road, see drawing UZT / BE008
Grid Ref. (10 digit, 5E,5N):	319973,233733
Name of sewage undertaker:	Ringsend Wastewater Treatment Works.

Emission Details: Please see attachment E.3.

(i) Volume to be emitted			
Normal/day	15.0 m^3	Maximum/day	30.0 m^3
Maximum rate/hour	5.0 m^3		

(ii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	60 min/hr 24 hr/day 365 day/yr

TABLE E.3(ii): EMISSIONS TO SEWER - Characteristics of the emission (1 table per emission point)

Emission point reference number : SE-1

Parameter	Prior to treatment				As discharged				% Efficiency
	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	
Please see Attachment E.3 which describes the emissions to sewer									

TABLE E.4(i): EMISSIONS TO GROUNDWATER (1 Page for each emission point)

Intentionally left blank as there will be no direct discharge to groundwater

Emission Point or Area:

Emission Point/Area Ref. Nº:	Not Applicable
Emission Pathway: (borehole, well, percolation area, soakaway, landspreading, etc.)	Not Applicable
Location :	Not Applicable
Grid Ref. (10 digit, 5E,5N):	Not Applicable
Elevation of discharge: (relative to Ordnance Datum)	Not Applicable
Aquifer classification for receiving groundwater body:	Not Applicable
Groundwater vulnerability assessment (including vulnerability rating):	Not Applicable
Identity and proximity of groundwater sources at risk (wells, springs, etc):	Not Applicable
Identity and proximity of surface water bodies at risk:	Not Applicable

Emission Details:

(i) Volume to be emitted Not Applicable			
Normal/day	Not Applicable m^3	Maximum/day	Not Applicable m^3
Maximum rate/hour	Not Applicable m^3		

(ii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	Not Applicable

Table E.5(i): NOISE EMISSIONS - Noise sources summary sheet

Source	Emission point Ref. No	Equipment Ref. No	Sound Pressure[1] dBA at reference distance	Octave bands (Hz) Sound Power Levels dB(A) re. 1pW										Impulsive or tonal qualities	Periods of Emission Day/Night
				31.5	63	125	250	500	1K	2K	4K	8K	sum		
01. Chimney W	N01		Not applicable	-	69	72	76	77	75	74	66	56	82.4	No	D and N
02. Chimney E	N02		Not applicable	-	69	72	76	77	75	74	66	56	82.4	No	D and N
03. Waste truck. 10 km/h, slow acc.	N03	Note 4	Not applicable	-	65.3	68.3	74.3	77.3	81.3	78.3	72.3	64.3	84.9	Rem. 1	D
04. Ash truck. 10 km/h, slow acc.	N04	Note 6	Not applicable	-	69.3	72.3	78.3	81.3	85.3	82.3	76.3	68.3	89	Rem. 1	D and N
05. Facade S, Reception hall	N05		Not applicable	-	76	74	80	75	77	74	68	60	84.5	No	D
06. Facade S, Waste Bunker	N06		Not applicable	-	63	61	67	62	64	61	55	47	71.5	No	D and N
07. Facade W, Reception hall	N07		Not applicable	-	69	67	73	68	70	67	61	53	77.5	No	D
08. Facade W, Ash building	N08		Not applicable	-	67	65	71	66	68	65	59	51	75.5	No	D and N
09. Facade W, Boiler building	N09		Not applicable	-	70	72	80	74	72	70	67	60	82.6	No	D and N
10. Facade W, Filter building	N10		Not applicable	-	63	65	72	67	72	68	66	55	77.2	No	D and N
11. Facade E, Reception hall	N11		Not applicable	-	74	72	78	73	75	72	66	58	82.5	No	D
12. Facade E, Boiler building	N12		Not applicable	-	73	75	84	77	75	74	70	63	86.2	No	D and N
13. Facade E, Filter building	N13		Not applicable	-	69	71	79	73	79	75	73	61	84	No	D and N
14. Facade N, Filter building	N14		Not applicable	-	68	70	77	72	77	73	71	60	82.2	No	D and N
15. Opening to reception hall	N15		Not applicable	-	79	82	88	91	95	92	86	78	98.7	Rem. 2	D
16a. Opening 1 to Ash building	N16a		Not applicable	-	67	70	76	79	83	80	74	66	86.7	Rem. 3	D and N

16b. Opening 2 to Ash building	N16b		Not applicable	-	67	70	76	79	83	80	74	66	86.7	Rem. 3	D and N
17a. Ventilation Waste bunker	N17a		Not applicable	-	80.1	82.2	83.7	84.2	85.1	85.8	79.6	70.7	92	No	D and N
17b. Ventilation Waste bunker	N17b		Not applicable	-	80.1	82.2	83.7	84.2	85.1	85.8	79.6	70.7	92	No	D and N
17c. Ventilation Waste bunker	N17c		Not applicable	-	80.1	82.2	83.7	84.2	85.1	85.8	79.6	70.7	92	No	D and N
18a. Ventilation various sort E	N18a		Not applicable	-	68.7	71	71.7	76	75.6	71.9	78.9	80.4	85	No	D and N
18b. Ventilation various sort N	N18b		Not applicable	-	68.7	71	71.7	76	75.6	71.9	78.9	80.4	85	No	D and N
18c. Ventilation various sort W	N18c		Not applicable	-	68.7	71	71.7	76	75.6	71.9	78.9	80.4	85	No	D and N
18d. Ventilation various sort S	N18d		Not applicable	-	68.7	71	71.7	76	75.6	71.9	78.9	80.4	85	No	D and N
19. Waste truck. Ramp up, heavy acc.	N19	Note 5	Not applicable	-	68.3	71.3	77.3	80.3	84.3	81.3	75.3	67.3	87.9	Rem. 1	D
20. Waste truck. Ramp down, slow acc.	N20	Note 4	Not applicable	-	61.3	64.3	70.3	73.3	77.3	74.3	68.3	60.3	80.9	Rem. 1	D

For items of plant sound power levels may be used.

Note 1: Tonal qualities depend on the level of maintenance of the trucks. Squeaking brakes and defective sound mufflers may cause tones, and loose parts on the trucks may cause impulses. Possible tones and impulses are estimated only to be audible at the reference positions at the site boundary, not at the residential reference positions.

Note 2: Impulses will occur while tipping solid waste such as wooden pallets into the bunker. The impulses are estimated only to be audible at the reference positions at the site boundary to the east and north, not at the residential reference positions. The walls of the reception hall are expected to prevent impulses at other positions.

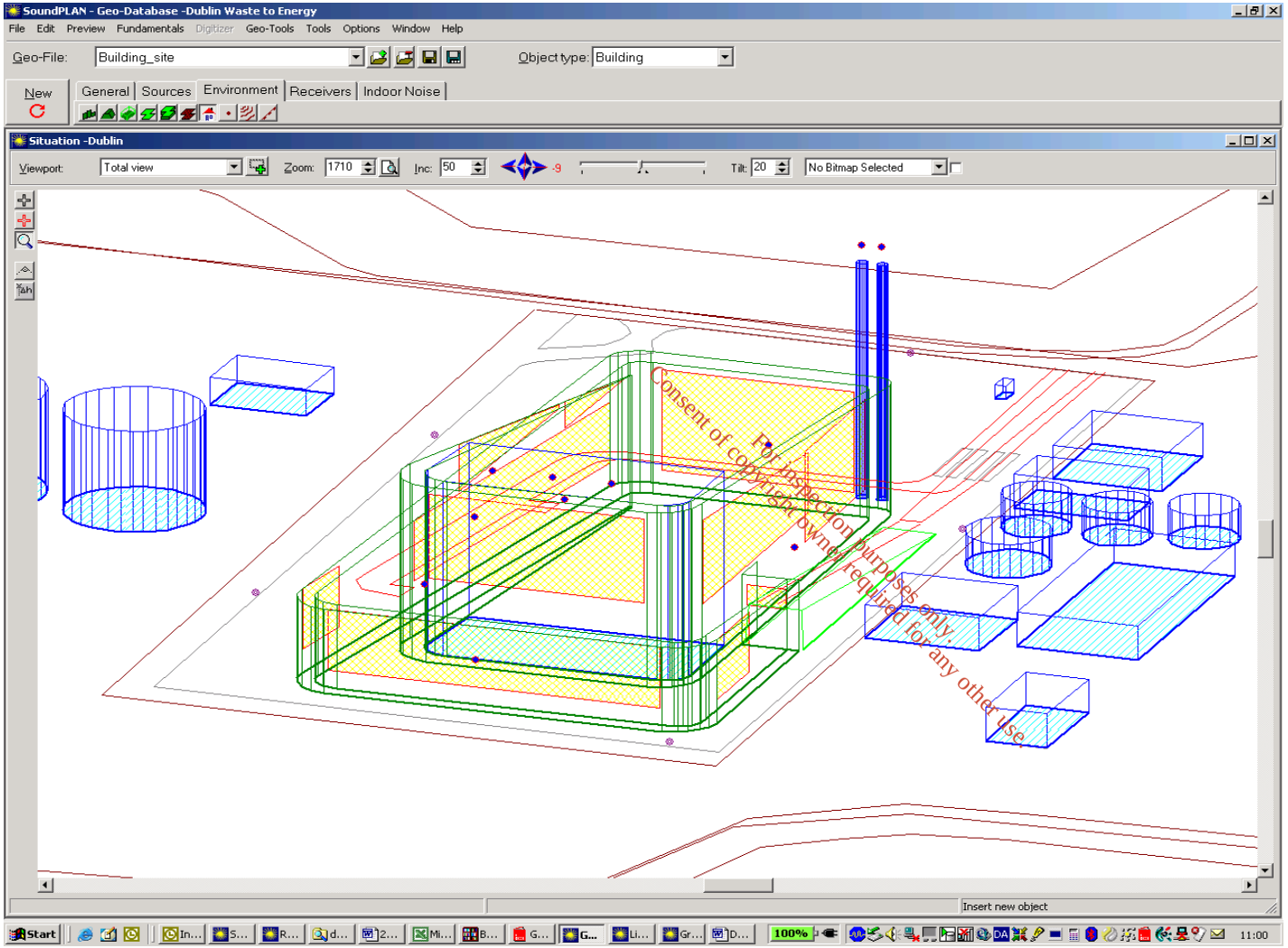
Note 3: Impulses from loading the ash trucks may cause impulses. The impulses are estimated only to be audible at the reference positions at the site boundary to the west, not at the residential reference positions. The walls of the ash building are expected to prevent impulses at other positions.

Note 4: The sound power level is for one waste truck with an engine load corresponding to slow acceleration, moving at an average speed of 10 km/h along the shown path. The maximum number of waste trucks is 50/hour during the day period.

Note 5: The sound power level is for one waste truck with an engine load corresponding to heavy acceleration, moving at an average speed of 10 km/h along the shown path, up the ramp to the reception hall.

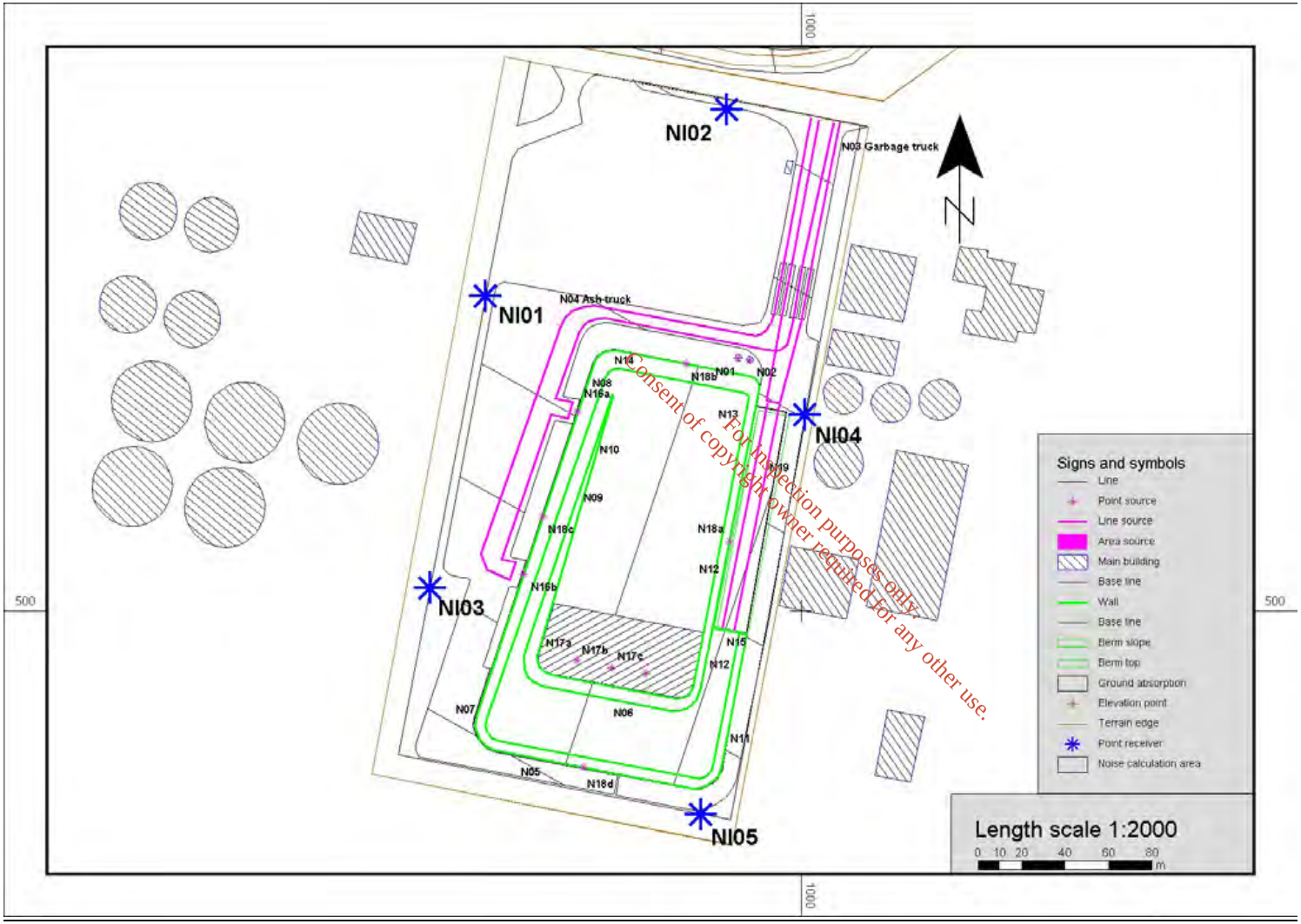
Note 6: The sound power level is for one ash truck with an engine load corresponding to slow acceleration, moving at an average speed of 10 km/h along the shown path. The maximum number of ash trucks is 14/hour during the day period.

The following picture shows the geo file of the site using the noise simulation program SoundPlan. Point sources (eg ventilation of the waste bunker) are shown as blue dots, facades are shown as yellow areas, and the path of the vehicles as red lines.



The site seen from Southeast.

The following picture shows the position of the noise sources. The numbering corresponds to table E.5(i).



All noise sources are located within the site boundary, defined by the coordinates (319907.572 – 233746.319), (319868.972 - 233709.695), (319809.579 – 233420.270), (319.966.556 – 233387.295), (320033.468 – 233720.316). It is not possible to specify the exact position of most of the sources in detail, as they are not point sources, but line sources (trucks) or area sources (facades). See the above figure.

TABLE F.1: ABATEMENT/TREATMENT CONTROL

Emission point reference number *:* A2-1 (Waste to Energy Line 1*)*

Control[1] parameter	Equipment[2]	Equipment maintenance	Equipment calibration	Equipment back-up	Monitoring to be carried out[3]	Monitoring equipment	Monitoring equipment calibration
Dust	Baghouse filter	As per supplier and license requirement	As per supplier and license requirement	Appropriate spare parts including additional filter bags on store + redundant key components	Continuous	[Photometer or similar]	As per supplier and license requirement
TOC	Advanced combustion control system incl. heat sensitive camera	As per supplier and license requirement	As per supplier and license requirement	Appropriate spare parts + redundant key components	Continuous	[Flame ionisation detector]	As per supplier and license requirement
HCL	Lime in bag filter + wet scrubber	As per supplier and license requirement	As per supplier and license requirement	Appropriate spare parts + reduction at both bag filter and wet scrubber + redundant key components	Continuous	[Individual monitor or multi-component analyser]	As per supplier and license requirement
HF	Lime in bag filter + wet scrubber	As per supplier and license requirement	As per supplier and license requirement	Appropriate spare parts + reduction at both bag filter and wet scrubber + redundant key components	Continuous	[Individual monitor or multi-component analyser]	As per supplier and license requirement
SO_2	Lime in bag filter + wet scrubber	As per supplier and license requirement	As per supplier and license requirement	Appropriate spare parts + reduction at both bag filter	Continuous	[Individual monitor or multi-component	As per supplier and license requirement

				and wet scrubber + redundant key components		analyser]	
NOx	Ammonia or urea in the SNCR system	As per supplier and license requirement	As per supplier and license requirement	Appropriate spare parts + redundant key components	Continuous	[Individual monitor or multi-component analyser]	As per supplier and license requirement
Sum of Cd & Tl	Baghouse filter	As per procedure of the accredited laboratory	As per procedure of the accredited laboratory	Appropriate spare parts including additional filter bags on store + redundant key components	Sample, quarterly the first year, two times per year in subsequent years	[Sampling and analysis by accredited laboratory]	As per procedure of the accredited laboratory
Hg	Baghouse filter + wet scrubber + activated carbon	As per procedure of the accredited laboratory	As per procedure of the accredited laboratory	Appropriate spare parts including additional filter bags on store + redundant key components	Sample, quarterly the first year, two times per year in subsequent years	[Sampling and analysis by accredited laboratory]	As per procedure of the accredited laboratory
Sum of 9 heavy metals : Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V	Baghouse filter	As per procedure of the accredited laboratory	As per procedure of the accredited laboratory	Appropriate spare parts including additional filter bags on store + redundant key components	Sample, quarterly the first year, two times per year in subsequent years	[Sampling and analysis by accredited laboratory]	As per procedure of the accredited laboratory
PCDD/F	Activated carbon + baghouse filter	As per procedure of the accredited laboratory	As per procedure of the accredited laboratory	Appropriate spare parts including additional filter bags on store + redundant key components	Sample, quarterly the first year, two times per year in subsequent years	[Sampling and analysis by accredited laboratory]	As per procedure of the accredited laboratory
CO	Advanced combustion control system incl. heat sensitive camera	As per supplier and license requirement	As per supplier and license requirement	Appropriate spare parts + redundant key components	Continuous	[Individual monitor or multi-component analyser]	As per supplier and license requirement

$PM_{2.5}$	Fine particle baghouse filter	As per procedure of the accredited laboratory	As per procedure of the accredited laboratory	Appropriate spare parts including additional filter bags on store + redundant key components	Sample, quarterly the first year, two times per year in subsequent years	[Photometer or similar]	As per procedure of the accredited laboratory

[1] List the operating parameters of the treatment/abatement system which control its function.
[2] List the equipment necessary for the proper function of the abatement/treatment system.
[3] List the monitoring of the control parameter to be carried out.

Regarding the minimisation of $PM_{2.5}$ the design of the proposed development includes a bag filter system optimised for the reduction of $PM_{2.5}$ and a wet scrubber system. The wet scrubber system located after the bag filter system will further reduce the particles in the range from $PM_{1.0}$ to $PM_{2.5}$. It is the view of the applicant that this will be sufficient for the reduction of $PM_{2.5}$ to a suitable level when taking into account the proposed development's contribution to the background level of $PM_{2.5}$ (see the Environmental Impact Statement, Section 8 "Air Quality and Climate").

For detailed description and schematics of all treatment/abatement systems please see attachment F1.

Emission point reference number : A2-2 (Waste to Energy Line 2)

Control[1] parameter	Equipment[2]	Equipment maintenance	Equipment calibration	Equipment back-up	Monitoring to be carried out[3]	Monitoring equipment	Monitoring equipment calibration
Dust	Baghouse filter	As per supplier and license requirement	As per supplier and license requirement	Appropriate spare parts including additional filter bags on store + redundant key components	Continuous	[Photometer or similar]	As per supplier and license requirement
TOC	Advanced combustion control system incl. heat sensitive camera	As per supplier and license requirement	As per supplier and license requirement	Appropriate spare parts + redundant key components	Continuous	[Flame ionisation detector]	As per supplier and license requirement
HCL	Lime in bag filter + wet scrubber	As per supplier and license requirement	As per supplier and license requirement	Appropriate spare parts + reduction at both bag filter and wet scrubber + redundant key components	Continuous	[Individual monitor or multi-component analyser]	As per supplier and license requirement
HF	Lime in bag filter + wet scrubber	As per supplier and license requirement	As per supplier and license requirement	Appropriate spare parts + reduction at both bag filter and wet scrubber + redundant key components	Continuous	[Individual monitor or multi-component analyser]	As per supplier and license requirement
SO_2	Lime in bag filter + wet scrubber	As per supplier and license requirement	As per supplier and license requirement	Appropriate spare parts + reduction at both bag filter and wet scrubber + redundant key components	Continuous	[Individual monitor or multi-component analyser]	As per supplier and license requirement
NOx	Ammonia or urea in the SNCR	As per supplier and license	As per supplier and license	Appropriate spare parts + redundant	Continuous	[Individual monitor or multi-	As per supplier and license

	system	requirement	requirement	key components		component analyser]	requirement
Sum of Cd & Tl	Baghouse filter	As per procedure of the accredited laboratory	As per procedure of the accredited laboratory	Appropriate spare parts including additional filter bags on store + redundant key components	Sample, quarterly the first year, two times per year in subsequent years	[Sampling and analysis by accredited laboratory]	As per procedure of the accredited laboratory
Hg	Baghouse filter + wet scrubber + activated carbon	As per procedure of the accredited laboratory	As per procedure of the accredited laboratory	Appropriate spare parts including additional filter bags on store + redundant key components	Sample, quarterly the first year, two times per year in subsequent years	[Sampling and analysis by accredited laboratory]	As per procedure of the accredited laboratory
Sum of 9 heavy metals : Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V	Baghouse filter	As per procedure of the accredited laboratory	As per procedure of the accredited laboratory	Appropriate spare parts including additional filter bags on store + redundant key components	Sample, quarterly the first year, two times per year in subsequent years	[Sampling and analysis by accredited laboratory]	As per procedure of the accredited laboratory
PCDD/F	Activated carbon + baghouse filter	As per procedure of the accredited laboratory	As per procedure of the accredited laboratory	Appropriate spare parts including additional filter bags on store + redundant key components	Sample, quarterly the first year, two times per year in subsequent years	[Sampling and analysis by accredited laboratory]	As per procedure of the accredited laboratory
CO	Advanced combustion control system incl. heat sensitive camera	As per supplier and license requirement	As per supplier and license requirement	Appropriate spare parts + redundant key components	Continuous	[Individual monitor or multi-component analyser]	As per supplier and license requirement
$PM_{2.5}$	Fine particle baghouse filter	As per procedure of the accredited laboratory	As per procedure of the accredited laboratory	Appropriate spare parts including additional filter bags on store +	Sample, quarterly the first year, two times per year in subsequent years	[Photometer or similar]	As per procedure of the accredited laboratory

				redundant key components			

[1] List the operating parameters of the treatment / abatement system which control its function.
[2] List the equipment necessary for the proper function of the abatement / treatment system.
[3] List the monitoring of the control parameter to be carried out.

Regarding the minimisation of $PM_{2.5}$ the design of the proposed development includes a bag filter system optimised for the reduction of $PM_{2.5}$ and a wet scrubber system. The wet scrubber system located after the bag filter system will further reduce the particles in the range from $PM_{1.0}$ to $PM_{2.5}$. It is the view of the applicant that this will be sufficient for the reduction of $PM_{2.5}$ to a suitable level when taking into account the proposed development's contribution to the background level of $PM_{2.5}$ (see the Environmental Impact Statement, Section 8 "Air Quality and Climate").

For detailed description and schematics of all treatment/abatement systems please see attachment F1.

Emission point reference number *:* A2-3 (Emergency Diesel*)*

Control[1] parameter	Equipment [2]	Equipment maintenance	Equipment calibration	Equipment back-up	Monitoring to be carried out[3]	Monitoring equipment	Monitoring equipment calibration
CO	Combustion control system	As per procedure of the accredited laboratory	As per procedure of the accredited laboratory	Appropriate spare parts	Continuous	[Sampling and analysis by accredited laboratory]	As per procedure of the accredited laboratory
NO_x	Combustion control system	As per procedure of the accredited laboratory	As per procedure of the accredited laboratory	Appropriate spare parts	Continuous	[Sampling and analysis by accredited laboratory]	As per procedure of the accredited laboratory
HC	Combustion control system	As per procedure of the accredited laboratory	As per procedure of the accredited laboratory	Appropriate spare parts	Continuous	[Sampling and analysis by accredited laboratory]	As per procedure of the accredited laboratory
PM	Combustion control system	As per procedure of the accredited laboratory	As per procedure of the accredited laboratory	Appropriate spare parts	Continuous	[Sampling and analysis by accredited laboratory]	As per procedure of the accredited laboratory

[1] List the operating parameters of the treatment / abatement system which control its function.
[2] List the equipment necessary for the proper function of the abatement / treatment system.
[3] List the monitoring of the control parameter to be carried out.

Emission point reference number :SE-1, Refer to attachment E.3.

Control[1] parameter	Equipment [2]	Equipment maintenance	Equipment calibration	Equipment back-up	Monitoring to be carried out[3]	Monitoring equipment	Monitoring equipment calibration
pH – values, pH	PH-controller	As per supplier and license requirement	As per supplier and license requirement	Appropriate spare parts + redundant key components	Continuous	[Individual monitor or multi-component analyser]	As per supplier and license requirement
Flow, m³	Flow-meter	As per supplier and license requirement	As per supplier and license requirement	Appropriate spare parts + redundant key components	Continuous	[Individual monitor or multi-component analyser]	As per supplier and license requirement

TABLE F.2 to F.8 : EMISSIONS MONITORING AND SAMPLING POINTS - (1 table per media)

Emission Point Reference No(s). : A2-1

Parameter	Monitoring frequency	Accessibility of Sampling Points
Dust	Continuous monitoring according to 2000/76/EC.	(1) The sampling point is located within the building after the flue gas treatment system. The sampling point is thus easily accessible 24 hours/day from the internal grating walkways
Gaseous and vaporous organic substances, expressed as total organic carbon	Continuous monitoring according to 2000/76/EC.	As (1) above
Hydrogen chloride (HCl)	Continuous monitoring according to 2000/76/EC.	As (1) above
Hydrogen fluoride (HF)	Continuous monitoring according to 2000/76/EC.	As (1) above
Sulphur dioxide (SO2)	Continuous monitoring according to 2000/76/EC.	As (1) above
Nitrogen monoxide (NO) and nitrogen dioxide (NO2) expressed as nitrogen dioxide	Continuous monitoring according to 2000/76/EC.	As (1) above
Cadmium and its compounds, expressed as cadmium (Cd) Thallium and its compounds, expressed as thallium (Tl) Mercury and its compounds, expressed as mercury (Hg) Antimony and its compounds, expressed as antimony (Sb) Arsenic and its compounds, expressed as arsenic (As) Lead and its compounds, expressed as lead (Pb) Chromium and its compounds, expressed as chromium (Cr) Cobalt and its compounds, expressed as cobalt (Co) Copper and its compounds, expressed as copper (Cu) Manganese and its compounds, expressed as manganese (Mn) Nickel and its compounds, expressed as nickel (Ni) Vanadium and its compounds, expressed as vanadium (V)	Sample period of a minimum of 30 minutes and a maximum of 8 hours according to 2000/76/EC.	As (1) above
Dioxins and furans	Sample period of a minimum of 6 hours and a maximum of 8 hours according to 2000/76/EC.	As (1) above
Carbon monoxide (CO)	Continuous monitoring according	As (1) above

	to 2000/76/EC	

In addition to the main monitoring specified in the table above a comprehensive amount of additional monitoring will be carried out by the Facility's SCADA system. In order to display the extent of the additional monitoring, screenshots from the SCADA systen of the Elsam Odense WtE facility is included in Appendix F.2.2 (Translation list is included in the back of the appendix)

Emission Point Reference No(s). : A2-2

Parameter	Monitoring frequency	Accessibility of Sampling Points
Dust	Continuous monitoring according to 2000/76/EC.	(1) The sampling point is located within the building after the flue gas treatment system. The sampling point is thus easily accessible 24 hours/day from the internal grating walkways
Gaseous and vaporous organic substances, expressed as total organic carbon	Continuous monitoring according to 2000/76/EC.	As (1) above
Hydrogen chloride (HCl)	Continuous monitoring according to 2000/76/EC.	As (1) above
Hydrogen fluoride (HF)	Continuous monitoring according to 2000/76/EC.	As (1) above
Sulphur dioxide (SO2)	Continuous monitoring according to 2000/76/EC.	As (1) above
Nitrogen monoxide (NO) and nitrogen dioxide (NO2) expressed as nitrogen dioxide	Continuous monitoring according to 2000/76/EC.	As (1) above
Cadmium and its compounds, expressed as cadmium (Cd) Thallium and its compounds, expressed as thallium (Tl) Mercury and its compounds, expressed as mercury (Hg) Antimony and its compounds, expressed as antimony (Sb) Arsenic and its compounds, expressed as arsenic (As) Lead and its compounds, expressed as lead (Pb) Chromium and its compounds, expressed as chromium (Cr) Cobalt and its compounds, expressed as cobalt (Co) Copper and its compounds, expressed as copper (Cu) Manganese and its compounds, expressed as manganese (Mn) Nickel and its compounds, expressed as nickel (Ni) Vanadium and its compounds, expressed as vanadium (V)	Sample period of a minimum of 30 minutes and a maximum of 8 hours according to 2000/76/EC.	As (1) above
Dioxins and furans	Sample period of a minimum of 6 hours and a maximum of 8 hours according to 2000/76/EC.	As (1) above
Carbon monoxide (CO)	Continuous monitoring according to 2000/76/EC	As (1) above

In addition to the main monitoring specified in the table above a comprehensive amount of additional monitoring will be carried out by the Facility's SCADA system. In order to display the extent of the additional monitoring, screenshots from the SCADA systen of the Elsam Odense WtE facility is included in Appendix F.2.2 (Translation list is included in the back of the appendix)

Emission Point Reference No(s). : A2-3

Parameter	Monitoring frequency	Accessibility of Sampling Points
Particles, NOx, CO, TOC, SO_2	The emissions from the emergency diesel generator will be verfied to comply with license conditions during the trial run in the comissioning period.	Inspection ports for sampling will be incorporated in the exhaust gas duct from where periodical check of emissions can be conducted.
Odour	Not monitored electronically	Not Applicable

Emission Point Reference No(s). : SW1

Parameter	Monitoring frequency	Accessibility of Sampling Points
Temperature intake	Continous monitoring	The intake temperature measurement will be located immediately prior to the cooling water intake pump located north of Pigeon House Road. The signals from the measurement system are forwarded to and thus included in the overall plant SCADA system.
Temperature outfall	Continous monitoring	The outfall temperature measurement will be located immediately prior to discharge into the cooling water canal located north of Pigeon House Road. The signals from the measurement system are forwarded to and thus included in the overall plant SCADA system.
Flow	Continous monitoring	The cooling water flow will be monitored inside the Facility prior to the condensator. The signals from the measurement system are forwarded to and thus included in the overall plant SCADA system.
[Clorination/other cleaning product concentration]	[Continous monitoring]	The chlorination/other cleaning product concentration will be monitored inside the Facility subsequent to the condensator. The signals from the measurement system are forwarded to and thus included in the overall plant SCADA system.

Emission Point Reference No(s). : AA1

Parameter	Monitoring frequency	Accessibility of Sampling Points
Ambient air temperature	Continous monitoring	(2) The meteorological data station will be located on the roof of the

		building. The signals from the measurement system are forwarded to and thus included in the overall plant SCADA system.
Ambient wind direction	Continous monitoring	As in (2) above
Ambient wind speed	Continous monitoring	As in (2) above

TABLE Ff: Fugitive ENVIRONMENT MONITORING AND SAMPLING LOCATIONS (1 table per media)

Monitoring Point Reference No :_____

Parameter	Monitoring frequency	Accessibility of Sampling point

Not applicable.

Table G.1 Details of Process related Raw Materials, Intermediates, Products, etc., used or generated on the site

Ref. Nº or code	Material/ Substance[1]	CAS Number	Danger[2] Category	Amount Stored[a] (tonnes)	Annual Usage[b] (tonnes)	Nature of Use	R[3] – Phrase	S[3] - Phrase
I1	Waste for thermal treatment	(c)		10,000	600,000	Used for thermal treatment	R7	S16
I2	Water	7732-18-5	None	1000	400,000	Used as process water.		
I3	Ammoniawater (NH_4OH)	1336-21-6	I, O	180	2,500	Used in the deNOx SNCR process	R34, R50	S26, S36/37/39, S61
I4	Urea[d]	57-13-6	J	100	2,100	Potentially used in the deNOx SNCR process		
I5	Diesel oil	68334-30-5	H, O	80	1,200	Used for dozers, auxiliary burners and emergency diesel.	R40, R65, R66, R51/53	S36/37, S61, S62
I7	Lime(stone)	471-34-1	J	100	50,000	Used in the semi-dry FGT process	R36, R37, R38	S26, S36
I8	Active Carbon	7440-44-0	J, H	50	500	Used in the semi-dry FGT process	R36, R37	S24, S25, S26, S36
I9	Cooling water intake	7732-18-5	None	300	97,761,600	Used for cooling the steam from the turbine in order to generate electricity		
I10	Chlorine (or chlorine dioxide). Biocide for cooling water	7782-50-5	H, I	Produced by electrolysis. 10 tonnes	100	Used for cleaning of cooling water pipes	R23, R36/37/ 38, R50	S1/2, S9, S45, S61
I11	Electricity import in GWh			<1	1.7 GWh	Used in the event of turbine outage		
I12	NaOH for boiler water	1310-73-2	I	10	50	Used for boiler corrosion prevention	R35	S26, S37/39, S45
I13	NaOH for scrubber	1310-73-3	I	70	150	Used for SO_2 removal	R35	S26, S37/39, S45
I14	Plastmo PVC glue 2966	108-94-1; 109-99-9	D, J	0.005	0.005	Minor quantity used during service and maintenance	R11, R19, R36/37	S2, S16, S29
I15	TMT-15	17766-26-6	J	5	25	Used in water treatment plant	R36/R38	S26, S37/39
I16	FeCl3 (ferric chloride)	7705-08-0	I	5	15	Used in water treatment plant	R34	S26, S36/37/S39,

Ref. Nº or code	Material/ Substance[1]	CAS Number	Danger[2] Category	Amount Stored[a] (tonnes)	Annual Usage[b] (tonnes)	Nature of Use	R[3] – Phrase	S[3] - Phrase
								S45
I17	Polymer	106-97-8, 74-98-6	C	0.1	0.1	Used in water treatment plant	R12	S23, S51
I18	Steering fluid (for turbines)	111-46-6	H	0.2	0.2	Used for turbine operation	R22	S13, S20, S46
I19	Lubrication fluids	64742-56-9	J	0.5	4.6	Used for lubrication of various plant components		
I20	Kema ZN-595 Zink spray	106-97-8; 74-98-6; 330-20-7; 67-64-1; 142-82-5	C	0.015	0.015	Used for surface coating	R12, R52/53, R66, R67	S9, S16, S23
I21	725 Nickel Anti-Seize Compound (Bulk)	7440-02-0 & 8052-41-3	H	0.005	0.005	Minor quantity used during service and maintenance	R40, R43	S23, S24, S36, S53
I22	Sic-RK-85-ET (RK-70-ET, PK-85-ET)	7664-38-2	J	4	4	Used during service and maintenance	R36/38	S26, S28, S37, S38
I23	LPG	106-97-8	C	2	2	Used for heating	R12	S9, S21, S33
I24	Reagent 781096 (13HNEO-046)	7697-37-2	J	1	1	Used during service and maintenance	R36/38	
I25	Drewfloc 2214	64742-47-8	H	0.05	0.05	Minor quantity used during service and maintenance	R36/R38, R65	S26, S36
I26	Oxygen, gaseous	7782-44-7	D	0.025	0.025	Minor quantity used during service and maintenance	R8	S17, S21
I27	Acetylene	74-86-2 & 67-64-1	C	0.025	0.025	Minor quantity used during service and maintenance	R5, R6, R12	
I28	Taski Calcacid W3 (lime remover) ((12706.05 and 12706.06))	77-92-9; 79-14-1; 68515-73-1	J	0.02	0.02	Minor quantity used during service and maintenance	R36	S26
I29	Taski Bruco Accel Z94 (12706.17)	64425-86-1; 107-98-2; 67-63-0; 1310-	J, O	0.005	0.005	Minor quantity used during service and maintenance	R38, R41, R51	S26, S27/39

Ref. Nº or code	Material/ Substance[1]	CAS Number	Danger[2] Category	Amount Stored[a] (tonnes)	Annual Usage[b] (tonnes)	Nature of Use	R[3] – Phrase	S[3] - Phrase
		58-3						
I30	Acetic acid	64-19-7	I	0.005	0.005	Minor quantity used during service and maintenance	R34	S23, S26, S36/37/39, S45
I31	Bruco Storrent (12716.17)	141-43-5; 112-34-5; 10043-52-4	J	0.005	0.005	Minor quantity used during service and maintenance	R36/38, R52/53	S26
I32	Acetone (8804.00)	67-64-1	D, J	0.005	0.005	Minor quantity used during service and maintenance	R11, R36, R66, R67	S9, S16, S23, S26
I33	725 Nickel Anti-Seize Compound (Bulk)	7440-02-0 & 8052-41-3	H	0.005	0.005	Minor quantity used during service and maintenance	R40, R43	S23, S24, S36, S53
I34	Mistral Spray, dark/grey 650 °C	64742-95-6; 67-64-1; 123-86-4; 74-98-6; 106-97-8	D, J	0.005	0.005	Minor quantity used during service and maintenance	R11, R36, R52/53	S2, S16, S23, S26, S38, S46
I35	Dana Glue (25715.02 + 25715.05)	108-88-3;141-78-6; 64742-49-0; 8050-09-7;1314-13-2	D, H	0.005	0.005	Minor quantity used during service and maintenance	R20, R38, R67, R52/53	S7/9, S16, S29, S46
I36	Kema GM-12 Lubrication	74-98-6; 106-97-8; 110-54-3	C	0.005	0.005	Minor quantity used during service and maintenance	R12, R52/53	S9, S16, S23
I37	Tangit Reiniger	109-99-9; 67-64-1	D, J	0.005	0.005	Minor quantity used during service and maintenance	R11, R19, R36, R66, R67	S16, S26, S29, S46
O1	Cooling water	7732-18-5	None	300	97,761,600	Used for cooling the steam from the turbine in order to generate electricity	None	None

Ref. Nº or code	Material/ Substance[1]	CAS Number	Danger[2] Category	Amount Stored[a] (tonnes)	Annual Usage[b] (tonnes)	Nature of Use	R[3] – Phrase	S[3] - Phrase
O2	Chlorination/ biocides	7681-52-9	H, I	See chapter 12 of the EIS	See chapter 12 of the EIS	Used for cleaning of cooling water pipes	R20, R21, R22, R34, R41	S1, S2, S28, S45, S50
O3	FGT-residues, fly ash and boiler ash	301-04-2	G, O	700	27,000	Product from the semidry FGT-system	R33, R61, R62, R48/22, R50/53	S35, S38, S45, S53, S61
O4	Bottom ash residue	(c)	J	10,000	120,000	Product from the combustion of waste	R36/38	S22, S26, S27
O5	Electricity export GWh	(c)		0	500 GWh	Product of the energy recovery and electricity generation		
O6	Rainwater to sewer	7732-18-5	None	Included in I2	5000	Surplus rainwater	None	None
O7	Sanitary and other water to sewer	7732-18-6	None	0	30	Water from within the facility	None	None

Notes: 1. In cases where a material comprises a number of distinct and available dangerous substances, please give details for each component substance.
2. c.f. Article 2(2) of SI Nº 77/94
3. c.f. Schedules 2 and 3 of SI Nº 77/94

Applicant notes:
(a) The values listed under "Amount Stored" are the quantities typically stored as specified by the waste application guidance notes (not necessarily equal to maximum values).
(b) Annual usage data are listed as annual average values
(c) The product is not a chemical product. Therefore, it has no CAS no.
(d) This chemical substance is not classified in Annex 1 of Directive 67/548/EEC. However, it can cause irritation of eyes and skin.

TABLE H.1(i): WASTE - Hazardous Waste Recovery/Disposal

Waste material	EWC Code	Main source[1]	Quantity		On-site Recovery/Disposal (Method & Location)	Off-site Recovery, reuse or recycling (Method, Location & Undertaker)	Off-site Disposal (Method, Location & Undertaker)
			Tonnes / month	m^3 / month			
Contaminated soil			Please see chapter 11 of the EIS for handling of contaminated soil				
Flue gas treatment residues (including fly ash and boiler ash)	EWC Codes 19 01 13 or 19 01.14 respectively	The flue gas treatment residues will consist of a mix of reaction products, excess lime and spent activated carbon and boiler ash from the fourth pass of the boiler (also known as fly ash). The residues comprise a complex composition of minerals, organic materials, heavy metals and salts, which are leachable	27,000 t / year or about 2,200 t / month		Conveyed to 2 silos, west of the flue gas treatment equipment, each having a gross volume of 350m³.		The ash will be transported off site in closed containers and will be shipped to Continental Europe for disposal from a container terminal on the southside of Dublin Port. The flue gas treatment residues could be either hazardous or non-hazardous for transport. It is expected that this residue will be classified as suitable for disposal in a hazardous waste landfill.

Hazardous water		Once a year in connection with the annual overhaul of the flue gas system	50 m3 once a year		This water will be discharged into a sump in an enclosed concrete tank with sufficient capacity to hold the water.	.	No treatment of the flue gas treatment residues (or boiler ash) will take place on site. The sludge from the sump will be removed from the tank by means of a gully emptier by a licensed waste company and transferred to a licensed treatment/disposal facility.

[1] A reference should be made to the main activity / process for each waste.

TABLE H.1(ii) WASTE - Other Waste Recovery/Disposal

Waste material	EWC Code	Main source[1]	Quantity		On-site recovery/disposal[2] (Method & Location)	Off-site Recovery, reuse or recycling (Method, Location & Undertaker)	Off-site Disposal (Method, Location & Undertaker)
			Tonnes / month	m^3 / month			
Bottom ash	EWC Code 19 01 12, deemed non hazardous	Residue left at the end of the grate after the burnout of the waste is known as bottom ash. It will consist of inert material from the combustion process such as silicates, minerals, ferrous and non-ferrous metal pieces and glass.	120,000 t/ year or about 10,000 t / month		The bottom ash will be temporarily stored on-site in the bottom ash bunker.	Bottom ash from waste incineration in EU countries, is used in road construction or as railway ballast, following treatment in an ash recycling plant. The bottom ash will be transported off site for pre-treatment prior to end use in Europe. In the longer term, it is intended to reuse the bottom ash in Ireland in connection with road works and similar projects.	.
Boiler ash - Please look at table H.1(i)							
Waste oil			- minor amounts			stored in properly bunded area prior to recycling off site	

1 A reference should be made to the main activity/ process for each waste.
2 The method of disposal or recovery should be clearly described and referenced to Attachment H.1

Table I.2(i) SURFACE WATER QUALITY

Water quality is addressed in chapter 12 of the EIS.

(Sheet 1 of 2) Monitoring Point/ Grid Reference: _____

Parameter	Results (mg/l)				Sampling method[2] (grab, drift etc.)	Normal Analytical Range[2]	Analysis method / technique
	Date	Date	Date	Date			
pH							
Temperature							
Electrical conductivity EC							
Ammoniacal nitrogen NH_4-N							
Chemical oxygen demand							
Biochemical oxygen demand							
Dissolved oxygen DO							
Calcium Ca							
Cadmium Cd							
Chromium Cr							
Chloride Cl							
Copper Cu							
Iron Fe							
Lead Pb							
Magnesium Mg							
Manganese Mn							
Mercury Hg							

Surface Water Quality (Sheet 2 of 2)

Parameter	Results (mg/l)				Sampling method (grab, drift etc.)	Normal Analytical Range	Analysis method / technique
	Date	Date	Date	Date			
Nickel Ni							
Potassium K							
Sodium Na							
Sulphate SO_4							
Zinc Zn							
Total alkalinity (as $CaCO_3$)							
Total organic carbon TOC							
Total oxidised nitrogen TON							
Nitrite NO_2							
Nitrate NO_3							
Faecal coliforms (/100mls)							
Total coliforms (/100mls)							
Phosphate PO_4							

Table I.4(i) GROUNDWATER QUALITY

Groundwater quality is addressed in chapter 11 of the EIS. Groundwater sample results are provided in the appendix to chapter 11.

(Sheet 1 of 2) Monitoring Point/ Grid Reference: _____

Parameter	Results (mg/l)				Sampling method (composite etc.)	Normal Analytical Range	Analysis method / technique
	Date	Date	Date	Date			
pH							
Temperature							
Electrical conductivity EC							
Ammoniacal nitrogen NH_4-N							
Dissolved oxygen DO							
Residue on evaporation (180°C)							
Calcium Ca							
Cadmium Cd							
Chromium Cr							
Chloride Cl							
Copper Cu							
Cyanide Cn, total							
Iron Fe							
Lead Pb							
Magnesium Mg							
Manganese Mn							
Mercury Hg							
Nickel Ni							
Potassium K							

Sodium Na							

GROUNDWATER QUALITY (SHEET 2 OF 2)

Parameter	Results (mg/l)				Sampling method (composite, dipper etc.)	Normal Analytical Range	Analysis method / technique
	Date	Date	Date	Date			
Phosphate PO_4							
Sulphate SO_4							
Zinc Zn							
Total alkalinity (as $CaCO_3$)							
Total organic carbon TOC							
Total oxidised nitrogen TON							
Arsenic As							
Barium Ba							
Boron B							
Fluoride F							
Phenol							
Phosphorus P							
Selenium Se							
Silver Ag							
Nitrite NO_2							
Nitrate NO_3							
Faecal coliforms (/100mls)							
Total coliforms (/100mls)							
Water level (m OD)							

Table I.6(i) Ambient Noise Assessment

Third Octave** analysis **for noise emissions should be used to determine tonal noises

The noise emission from the planned waste to energy plant has been predicted. A detailed 3-D sound prediction model. of the plant is used for this purpose. The noise calculation is done using the program SoundPlan 6.1. The calculations are based on all significant noise sources of the plant, and includes shielding and reflections of buildings, ground absorption, terrain edges, mean spreading loss etc.

The following figure shows the predicted maximum sound pressure level at Day and Night at the reference positions. Position NI01 – NI05 are at the site boundary surrounding the site to North, East, South and West. Position NI06 – NI10 are at noise sensitive locations. The values state the ambient noise level, meaning the sum of the calculated specific noise level from the site and the measured background noise level. The calculated noise levels emitted from the site are equivalent to $L(A)_{eq}$, and therefore $L(A)_{eq}$ from the measurements are used below.

	National Grid Reference	Sound Pressure Levels DAY			Sound Pressure Levels NIGHT		
	(5N, 5E)	$L(A)_{eq}$	$L(A)_{10}$	$L(A)_{90}$	$L(A)_{eq}$	$L(A)_{10}$	$L(A)_{90}$
SITE BOUNDARY							
Location NI01:	319.859.577 – 233.646.158	62,6	NA	NA	53,8	NA	NA
Location NI02:	319.961.144 – 233.732.730	65,7	NA	NA	58,0	NA	NA
Location NI03:	319.829.560 – 233.510.806	59,8	NA	NA	54,5	NA	NA
Location NI04:	320.002.424 – 233.585.836	72,8	NA	NA	68,6	NA	NA
Location NI05:	319.945.449 – 233.404.550	54,4	NA	NA	54,6	NA	NA
NOISE SENSITIVE LOCATIONS							
Location NI06:	319.874.704 – 233.217.120	48,3	NA	NA	44,9	NA	NA
Location NI07:	Seafort Avenue	56,5	NA	NA	57,3	NA	NA
Location NI08:	Beach Avenue	-	NA	NA	-	NA	NA
Location NI09:	St. Luke's Road	63,8	NA	NA	59,6	NA	NA
Location NI10:	Coastguards Cottage	-	NA	NA	-	NA	NA

Figure I.6(i).1 "Maximum sound pressure level, ambient noise:"

The following figure shows the specific noise emission from the Site.

	National Grid Reference	Sound Pressure Levels DAY			Sound Pressure Levels NIGHT		
	(5N, 5E)	$L(A)_{eq}$	$L(A)_{10}$	$L(A)_{90}$	$L(A)_{eq}$	$L(A)_{10}$	$L(A)_{90}$
SITE BOUNDARY							
Location NI01:	319.859.577 – 233.646.158	56,6	NA	NA	50,3	NA	NA
Location NI02:	319.961.144 – 233.732.730	55,9	NA	NA	51,6	NA	NA
Location NI03:	319.829.560 – 233.510.806	55,5	NA	NA	51,1	NA	NA
Location NI04:	320.002.424 – 233.585.836	70,8	NA	NA	67,8	NA	NA
Location NI05:	319.945.449 – 233.404.550	50,0	NA	NA	49,5	NA	NA
NOISE SENSITIVE LOCATIONS							
Location NI06:	319.874.704 – 233.217.120	27,8	NA	NA	25,8	NA	NA
Location NI07:	Seafort Avenue	31,0	NA	NA	27,8	NA	NA
Location NI08:	Beach Avenue	23,9	NA	NA	21,8	NA	NA
Location NI09:	St. Luke's Road	24,5	NA	NA	23,0	NA	NA
Location NI10:	Coastguards Cottage	27,8	NA	NA	23,4	NA	NA

Figure I.6(i).2 "Noise from the Site, specific noise:"

It is seen, that the highest noise level is at position NI04, the site boundary to the East. This level is caused by garbage trucks moving up and down the ramp to the reception hall, and also by repeated reflections between the buildings of the sewage treatment plant and the façade of the plant. An effective means to reduce the noise level is to place a shielding wall at the site boundary at the ramp.

The noise emitted to the noise sensitive locations NI06 – NI10 are very low, and when compared to the background noise level it is seen, that noise from the site is insignificant.

The following figure shows the background noise level.

	National Grid Reference	Sound Pressure Levels DAY			Sound Pressure Levels NIGHT		
	(5N, 5E)	$L(A)_{eq}$	$L(A)_{10}$	$L(A)_{90}$	$L(A)_{eq}$	$L(A)_{10}$	$L(A)_{90}$
SITE BOUNDARY							
Location NI01:	319.859.577 – 233.646.158	61,4	61	53	51,3	52	50
Location NI02:	319.961.144 – 233.732.730	65,2	67	60	56,9	57	55
Location NI03:	319.829.560 – 233.510.806	57,8	58	52	51,8	54	49
Location NI04:	320.002.424 – 233.585.836	68,5	70	64	60,7	61	60
Location NI05:	319.945.449 – 233.404.550	52,5	54	50	53,0	54	51
NOISE SENSITIVE LOCATIONS							
Location NI06:	319.874.704 – 233.217.120	48,3	49	45	44,8	47	41
Location NI07:	Seafort Avenue	56,5	57	45	57,3	56	40
Location NI08:	Beach Avenue	-	-	-	-	-	-
Location NI09:	St. Luke's Road	63,8	66	56	59,5	60	47
Location NI10:	Coastguards Cottage	-	-	-	-	-	-

Figure I.6(i).3 "Background noise level, residual noise"

The measurements at locations NI01 – NI06 are made by Elsam Engineering, for details see report 230588 "Dublin Waste to Energy, Noise and vibration in the existing environment, measuring report." (Appendix 6.1 of the EIS)

For measurements at location NI07 and NI09 see Technical report AI/03/1804NR01a “Baseline noise & vibration monitoring in relation to proposed thermal treatment plant, Ringsend, Co. Dublin.

The following figure shows a noise grid of the noise emission from the site at the day period:

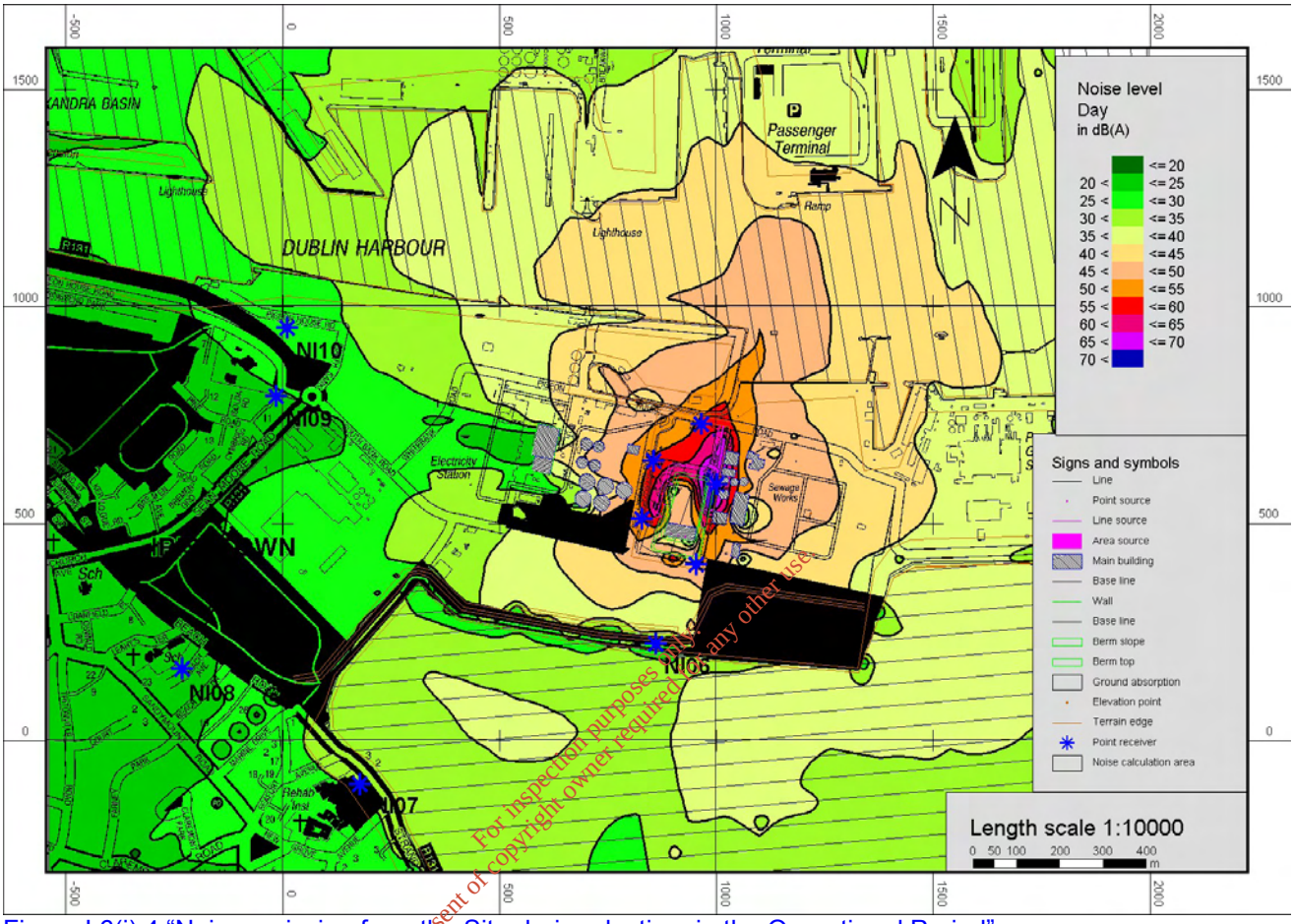


Figure I.6(i).4 “Noise emission from the Site during daytime in the Operational Period”

The following figure shows a noise grid of the noise emission from the site at the night period:

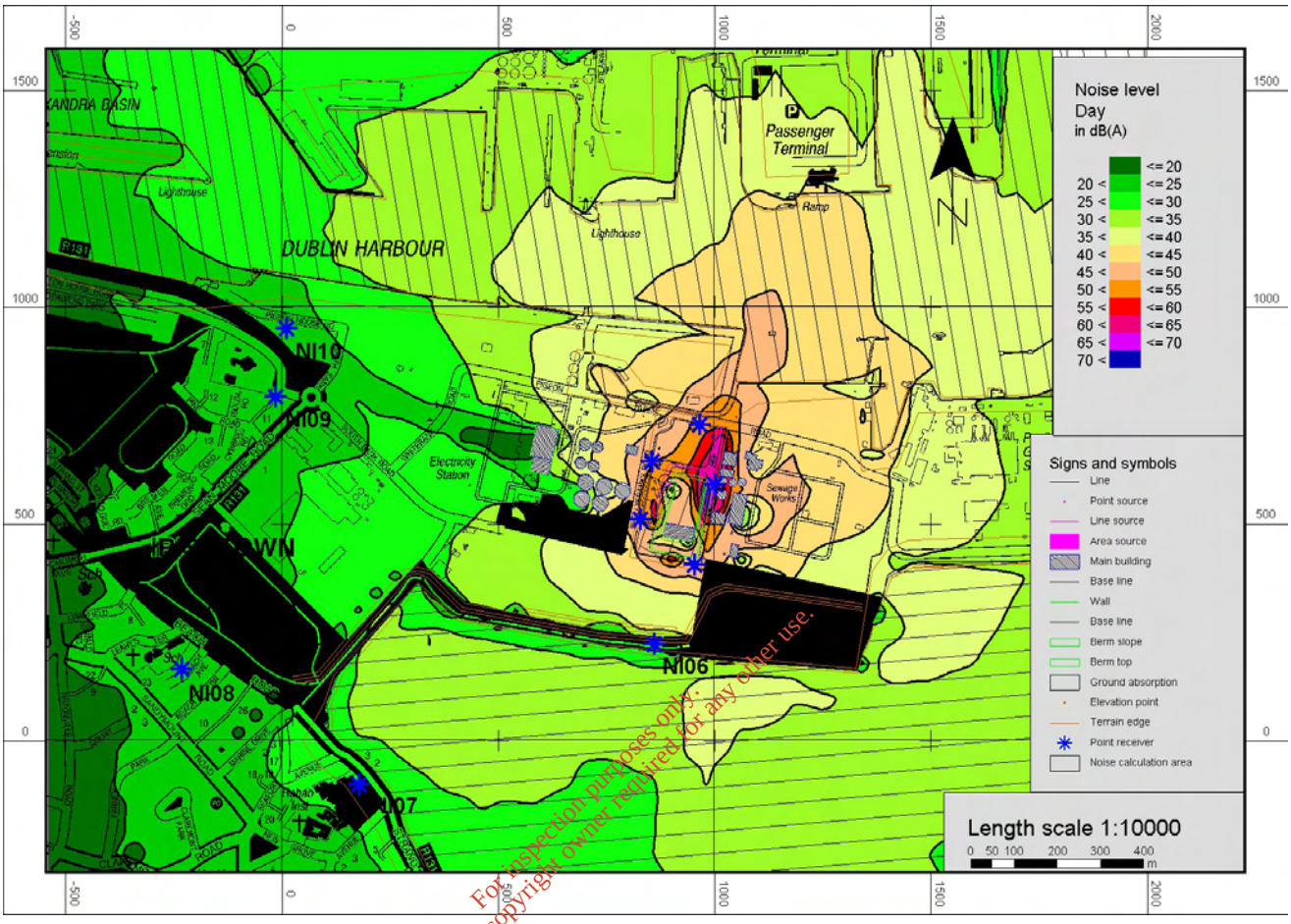


Figure I.6(i).5 “Noise emission from the Site during nighttime in the Operational Period”

The following figure shows the reference positions NI01 – NI05 at site boundary:

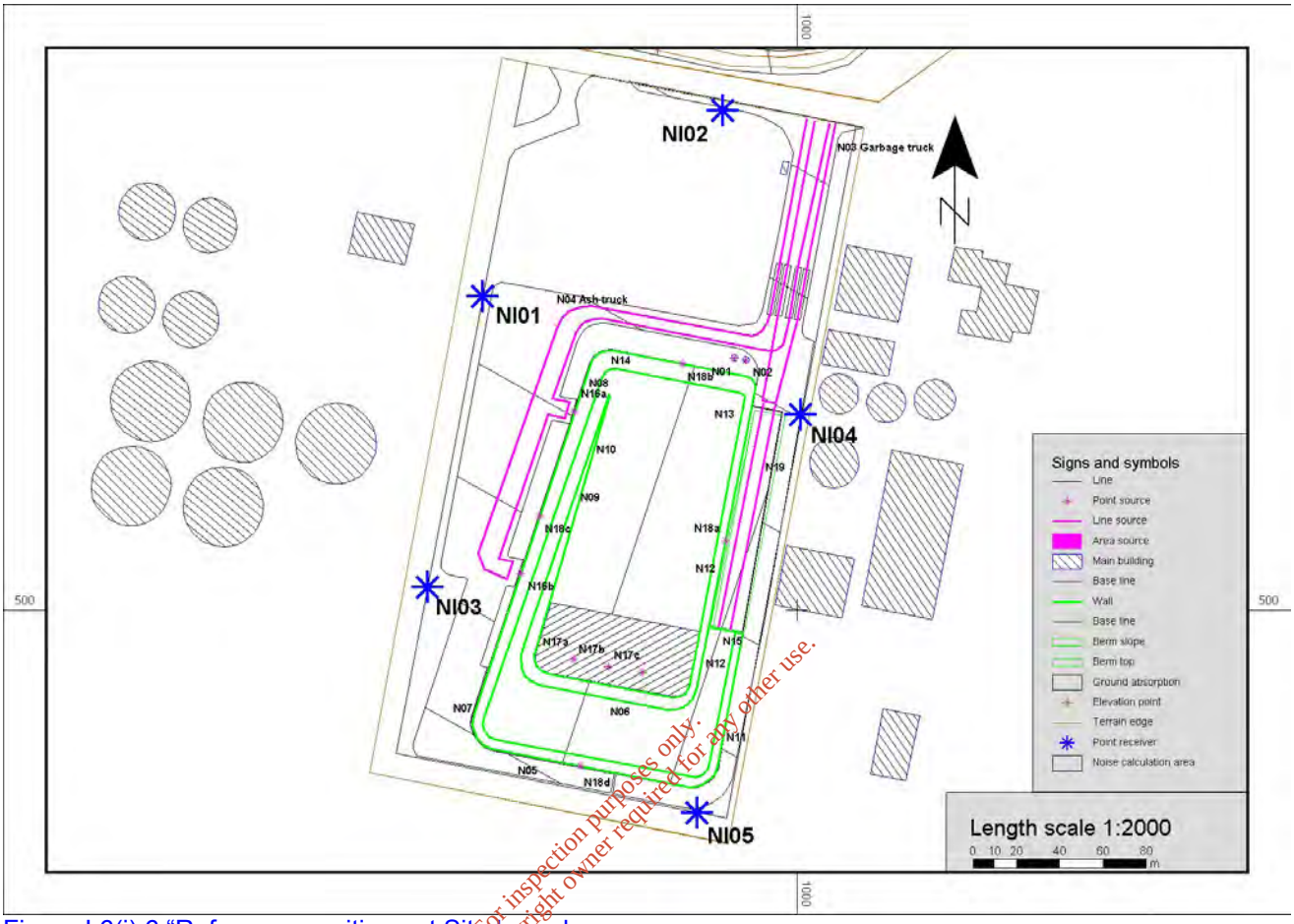


Figure I.6(i).6 “Reference positions at Site boundary

The following figure shows the reference positions NI06 – NI10 at noise sensitive locations in addition to reference positions at site boundary:

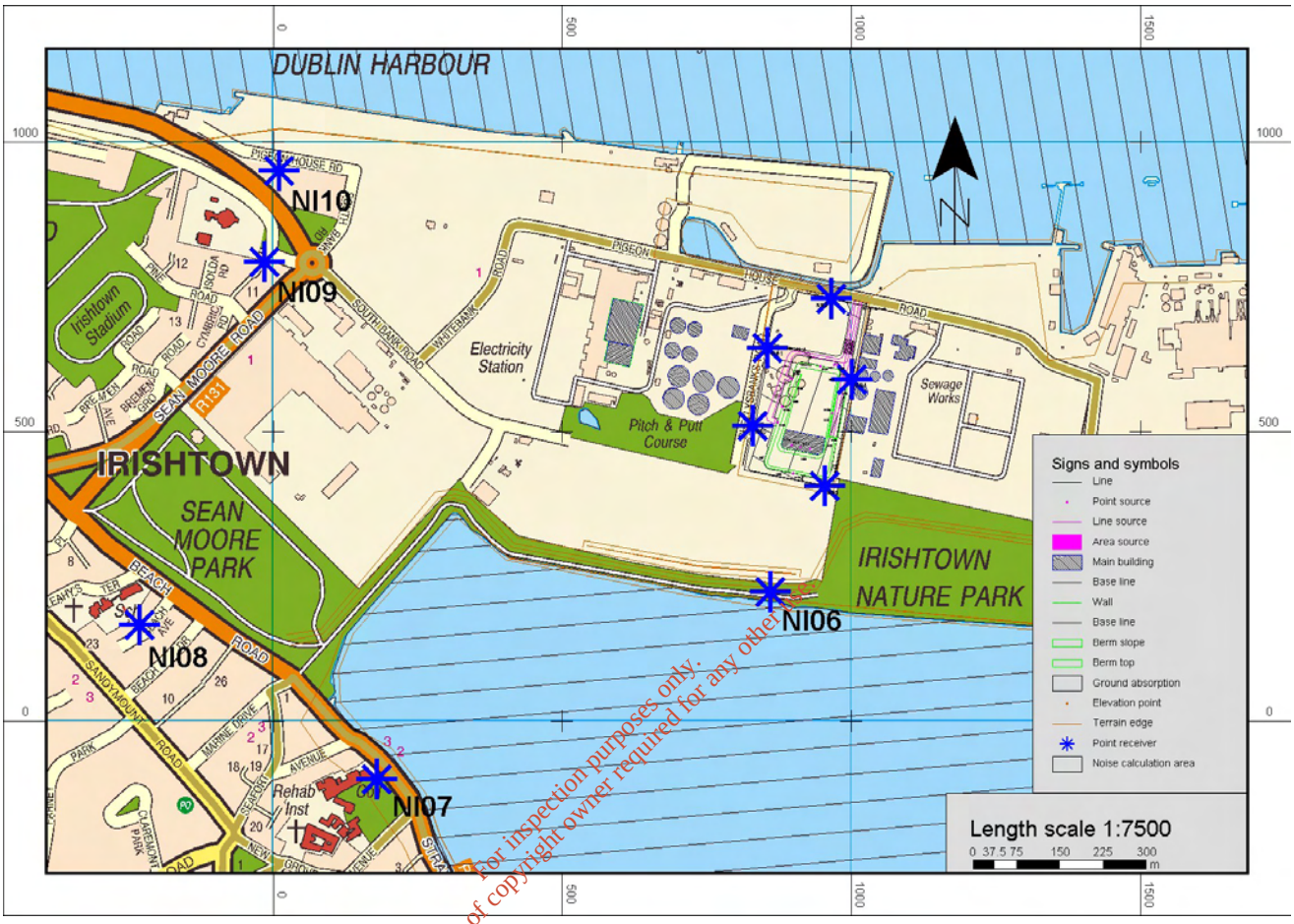


Figure I.6(i).7 Reference positions at noise sensitive locations NI06 – NI10