

ATTACHMENT NUMBER J1

Monitoring

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Attachment J1.1

Proposed Environmental Monitoring Programme

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J1.1 PROPOSED ENVIRONMENTAL MONITORING PROGRAMME

1. GENERAL

Indaver proposes a programme of monitoring and sampling in order to ensure that emissions and discharges from the plant comply with set limits and that there are no significant adverse environmental effects due to the facility. This programme will cover both emissions monitoring and ambient monitoring.

As part of the site Environmental Management System, a procedure for environmental reporting will be drawn up and implemented, which will include reporting of monitoring results to the EPA.

It is proposed to monitor the following emission sources:

- Emissions to Air
- Noise Emissions
- Emissions to Ground
- Solid Residues

The following ambient monitoring will be carried out:

- Groundwater monitoring
- Noise monitoring
- Odour monitoring
- PM₁₀ monitoring
- Dust monitoring

2. EMISSIONS MONITORING

2.1 AIR EMISSIONS MONITORING

There will be one main emission and one minor emission to air:

- Stack (Emission Point Ref. No. A1.1)
- Emergency Generator (Emission Point Ref. No. A2.1)

During commissioning, the emissions from the back-up gas-fired generator will be tested to ensure that the emissions are below the levels specified in Table 2.3 in Attachment H1.1.

There will be one main stack on site through which atmospheric emissions will be discharged. The location of this air emission monitoring point is shown on Drawing No. 2666-22-DR-015 in Attachment J1.3. These atmospheric emissions will be

subject to a comprehensive monitoring and sampling programme as described in Table 2.1 below.

Table 2.1 *Stack Emissions Monitoring*

Parameter	Method of Measurement	Frequency
Dust	SIGRIST Photometer or similar ¹	Continuous
Dioxins/Furans	AMESA Dioxin Monitoring system or similar ²	Continuous sampling with analysis every 2 weeks as well as bi-annual sample taken over 6-8 hour period
Total Organic Carbon	Flame Ionisation Detector	Continuous
Oxygen, O ₂	Oxygen Monitor	Continuous
Carbon Monoxide, CO Nitrogen Oxides, NO _x Sulphur dioxide, SO ₂ Hydrogen Chloride, HCl	These parameters can be monitored using individual monitors or using a multi-component analyser ³	Continuous
Heavy Metals: Cadmium, Cd Thallium, Tl Mercury, Hg Antimony, Sb Arsenic, As Lead, Pb Chromium, Cr Cobalt, Co Copper, Cu Manganese, Mn Nickel, Ni Vanadium, V	Sampling and analysis by an accredited laboratory	Discontinuous - Quarterly for first year, 6 monthly for subsequent years
Hydrogen Fluoride, HF	Sampling and analysis by an accredited laboratory or internally by multi-component analyser ³	Discontinuous - Quarterly for first year, 6 monthly for subsequent years

Notes:

1. Dust emissions can be measured manually if required.
2. Continuous sampling of dioxins will be carried out and analysed every two weeks. At least 20 representative monitoring results should be available per year.
3. There will be back-up monitoring equipment in the form of mobile units or fixed laboratory.

2.1.1 Dioxins Monitoring

The readings from the continuous measurement devices will be sent for processing to two systems, the plant's control system and to an emissions registration software system. Process operators will be able to view the results on the plant's control system during operation of the plant. In the emissions registration software system, the information will be stored on hard disk and used to generate hourly, daily, monthly and annual average results, as appropriate.

The AMESA dioxin/furan monitoring system, or equivalent, will be installed, which is used for measuring dioxins/furans in other plants that comply with the German Environmental Regulation 17BIm SchV and TA Luft. In summary, the AMESA system will extract a volume stream constantly and isokinetically from the flue gases. Dioxins and furans will be collected on a cartridge filled with adsorber resin. The system will operate automatically and will store all necessary data both internally and on a removable SRAM card. The cartridge and SRAM card will then be sent for analysis by an accredited laboratory such as ENSR in Manchester, UK. Results for the PCDD/PCDF analysis will be presented as individual 2,3,7,8-containing congener concentrations, total homologue (tetra- to octa-) concentrations and I-TEQ values. Turn around time for the samples will be approximately 10 - 15 working days. A brochure on the AMESA dioxin/furan monitoring system is included in Attachment J1.2.

2.1.2 Air Conditioning and Calibration

An air conditioning unit shall be installed in the monitoring laboratory to ensure the atmosphere is maintained at the required temperature and humidity.

Calibration of all monitoring equipment shall be carried out internally on a monthly basis and, in order to validate these results, an external consultant shall carry out a calibration on an annual basis.

There will be a maintenance contract with equipment suppliers to ensure that if problems occur with monitoring equipment, that these will be remedied as soon as it is practicable.

2.2 NOISE EMISSIONS MONITORING

The significant external noise sources at the waste management facility will be as follows:

- Stack
- Air cooled condenser
- Turbine cooler

Noise from sources within buildings will also be emitted via the following louvres:

- Louvre Fan 1, Turbine Building
- Louvre Fan 2, Turbine Building

- Compressor Louvre Grids

The location of these noise sources is shown on Drawing No. 2666-22-DR-015 in Attachment J1.3.

It is proposed to carry out monitoring of these sources on a once-off basis as part of the first annual noise survey.

The following information will be collected for each source during the noise monitoring survey:

- Sound Pressure Level (dBA) at reference distance of 1m from source
- Octave band analysis (dB)
- Location (in National Grid Co-ordinates)
- Elevation
- Periods of noise emission
- Details of any impulsive or tonal qualities
- Loading, i.e. whether source running at full load/80% load, etc.

2.3 MONITORING OF EMISSIONS TO GROUND

Samples will be taken from the sampling chamber on the effluent treatment system four times per annum and will be analysed for Biological Oxygen Demand (BOD), Total Suspended Solids (TSS) and Chemical Oxygen Demand (COD).

The location of this emission point is shown on Drawing No. 2666-22-DR-015 in Attachment J1.3.

2.4 SOLID RESIDUE MONITORING

As described in Attachment H11.1, a composite sample of each ash (Bottom ash, flue gas cleaning residues, boiler ash and gypsum) will be collected into a sampling container over a period of a week. These samples shall be sent to external consultants for compaction and drying. The samples shall then undergo the following tests at an accredited laboratory:

Table 2.2 Analysis of Ashes

Parameter	Frequency
Leachability and leachate (total soluble fraction, heavy metals soluble fraction and salts soluble fraction) ¹	Weekly initially, then less often if composition remains standard
Composition	Weekly initially, then less often if composition remains standard
Total Organic Carbon ²	Weekly

Notes:

1. Leachability and leachate testing will be carried out in accordance with the German DIN S4 standard.
2. A TOC analysis will be carried out on bottom ash to ensure compliance with the EU requirement of less than 5% unburnt material.

For flue gas cleaning residues, sampling and analysis will take place both before and after solidification.

2.5 MONITORING OF EMISSIONS TO SURFACE WATERS

Surface water run-off will pass through oil interceptors and therefore will be free of contamination. As an emission to surface waters will only occur during periods of prolonged heavy rainfall (i.e. 1 in 20 year storm), it is not proposed to carry out any monitoring.

3. AMBIENT MONITORING**3.1 AMBIENT NOISE MONITORING**

It is proposed to carry out annual noise monitoring at the three noise sensitive receptors (ANN1, ANN2 and ANN3), the locations of which are shown on Figure J1.1 in Attachment J1.4. It is also proposed to carry out annual noise monitoring at ANB1, which is representative of noise levels at the rear of the site, removed from noise from the road. Daytime (30 minute duration) and night-time (15 minute duration) noise measurements (including L_{Aeq} , L_{A10} and L_{A90}) will be taken at each of the four points. The location of ANB1 is shown on Drawing No. 2666-22-DR-015 in Attachment J1.3.

3.2 GROUNDWATER QUALITY MONITORING

It is proposed to carry out groundwater quality monitoring at three of the permanent monitoring wells located on the site (AGW1, AGW2 and AGW3), the locations of which are shown on Drawing No. 2666-22-DR-015 in Attachment J1.3.

Groundwater samples will be collected and analysed by external consultants twice in the first year of operation and annually thereafter for the following parameters:

- pH
- BOD
- TSS
- Ammonia (NH_3)
- Nitrogen Dioxide (NO_2)
- Total and Faecal Coliforms
- Pathogenic bacteria
- Total Hydrocarbons

3.3 ODOUR MONITORING

It is proposed to carry out odour monitoring at two locations, one upwind and one downwind of the site, on an annual basis, the locations of which are shown on Figure J1.1 in Attachment J1.4. Sampling will be carried out at these locations and will be analysed using semi-quantitative gas chromatography mass spectrophotometry.

It is also proposed to carry out an instantaneous olfactometric (smell) assessment at various locations within the site on a weekly basis. This will be carried out by Indaver staff.

3.4 PM₁₀ MONITORING

Prior to construction of the proposed facility, it is proposed to carry out monitoring for PM10 particulates for a period of three months at one location on the site to provide baseline ambient PM10 results, which will be forwarded to the EPA when available.

3.5 DUST MONITORING

It is proposed to carry out dust deposition monitoring for the duration of the construction phase at two locations on the site boundary to ensure that dust generation is minimised and that the amenities of the area are protected. The locations of dust deposition monitoring system will be agreed with the local authority prior to construction commencing.

3.6 ECOLOGICAL MONITORING

All studies carried out in relation to this facility have demonstrated that there will be no environmental impact on the surrounding environment and therefore ecological monitoring is not proposed for this facility.

4. PREVIOUS MONITORING

As part of the environmental impact assessment of the site, a number of monitoring surveys were carried out. Results of these surveys are provided in other sections of the waste licence application as detailed in Table 4.1 below.

Table 4.1 Previous Monitoring Surveys

Survey	Relevant Section of EIS/Waste Licence Application
Ambient Air Quality Monitoring	Attachment 4 of EIS
Baseline Dioxin Level Survey	Attachment 3 of EIS
Soil and Hydrogeological Investigation	Attachment 9 of the EIS and Attachment C6.2 of the Waste Licence Application
Ambient Noise Monitoring Surveys	Attachment 6 of the EIS and Attachment C8.1 of the Waste Licence Application