Terms of Reference

Determining the Nature of Waste & Classification of Waste

Section 1: Sampling and chemical analysis of waste

1.1 Sampling requirements (*Sampling plan to be submitted to ERA before commencement of works*)

Wastes are materials, which the holder discards, intends or is required to discard, and which may be sent for final disposal, reuse or recovery. Such materials are generally heterogeneous, and samples which are representative of this heterogeneous nature are required in order to determine the nature of such waste. In addition, it is necessary to specify the amount of waste for which the characteristics of interest need to be defined. Testing allows informed decisions to be made on the appropriate treatment, recovery and/or disposal operations that need to be carried out for the waste in question.

In order to undertake valid tests, samples which are representative of the waste in question are required. A sampling plan, as per standard method EN 14899 or equivalent, shall be completed and submitted for approval by the Authority prior to the undertaking of any sampling.

1.2. Compositional analysis

Following the submission of the sampling plan, a method statement including the standards which will be followed for the extraction and analyses of the waste in question should be provided. Such method statement should include the following as a minimum for each parameter to be tested:

- Standards to be followed (extraction + analysis);
- Limits of Detection; and
- Lab accreditation document to undertake such testing.

The following non-exhaustive list of standards, and their respective amendments, are to be utilized for the basic characterisation of waste to determine the total content in the waste (mg/kg), including any digestion of raw waste.

Table 1: Non-exhaustive list of CEN standards for the characterisation of waste

Standard Number	Standard Description
EN 13657	Digestion for subsequent determination of aqua regia soluble portion of elements (partial digestion of the solid waste prior to elementary analysis, leaving the silicate matrix intact)
EN 13656	Microwave-assisted digestion with hydrofluoric (HF), nitric (HNO_3) and hydrochloric (HCl) acid mixture for subsequent determination of elements (total digestion of the solid waste prior to elementary analysis)
EN 13137	Characterisation of waste. Determination of total organic carbon (TOC) in waste, sludges and sediments
EN 14346	Characterization of waste. Calculation of dry matter by determination of dry residue or water content
EN 16192	Characterization of waste. Analysis of eluates (expressed as mg/kg)
EN 14039	Characterization of waste. Determination of hydrocarbon content in the range of C10 to C40 by gas chromatography.

Moreover, should there be any parameters for which the laboratory is proposing an alternative method, it must be ensured that the proposed method is validated against the above required methodology. All testing is to be carried out at a laboratory accredited to EN ISO/IEC 17025 or equivalent standard methods, and detection limits for the different contaminants shall be provided.

If required, kindly refer to Annex 4 of Commission notice on technical guidance on the classification of waste (2018/C 124/01) for further guidance on sampling and chemical analysis of waste.

1.3. Determining the nature of the waste

Following a compositional analysis on the waste as indicated above, the applicant or a third party acting on his behalf, is required to determine the nature of the waste (i.e. whether it is of a hazardous or non-hazardous nature), by carrying out a desk-based Hazardous Property (HP) Assessment. It is to be highlighted that the compositional data derived from the chemical

analysis of the waste is to be used for the HP assessment and classification of waste (i.e. assessment of both organic and inorganic determinants).

A reasonable worst-case compound for each element identified from the compositional analysis, shall then be determined and for each of the said worst-case compound, the hazardous property and its related hazard statement shall be identified. The related hazard statements for the identified worst-case compounds shall be assessed and determined in line with the criteria laid down in Regulation (EC) No 1272/2008 (hereinafter referred to as the CLP Regulation). According to the CLP Regulation, a *hazard statement* means a code assigned to a hazard class and category that describes the nature of the hazards of a hazardous substance or mixture, including, where appropriate, the degree of hazard.

In simple terms, each worst-case compound identified has a related hazard statement that can be obtained from the CLP Regulation and the said hazard statement is in turn related to a hazardous property referred to in Schedule 3 of S.L. 549.63 - the Waste Regulations as per the table below.

Table 2: Examples of harmonised classification of hazardous substances pursuant to Regulation (EC) No 1272/2008.

Element	Worst-case compound	Hazard Class	Hazard Statement	Hazard Property
Arsenic	Diarsenic trioxide	Carc. 1A	H350	HP 7
		Acute Tox. 2 *	H300	HP 6
		Skin Corr. 1B	H314	HP 4
		Aquatic Acute 1	H400	HP 14
		Aquatic Chronic 1	H410	HP 14
Benzene	N/A	Flam. Liq. 2	H225	HP 3
		Carc. 1A	H350	HP 7
		Muta. 1B	H340	HP 11
		STOT RE 1	H372 **	HP 5
		Asp. Tox. 1	H304	HP 5
		Eye Irrit. 2	H319	HP 4
		Skin Irrit. 2	H315	HP 4

Once the compositional analysis is carried out, and the worst case compound, hazard statement and hazardous property of every parameter tested are identified, the applicant or a third party acting on his behalf shall determine the concentration of the compound of the respective element/parameter which constitutes a worst-case and then compare this determined concentration to the thresholds stipulated in Schedule 3 of S.L. 549.63 - the Waste Regulations. The waste would be classified as hazardous if it meets the conditions and/or exceeds the concentrations limits referred in Schedule 3 (as per definition provided above).

If chemical analysis results for a parameter under study:

(i) Exceeds the concentration limits for all the identified hazard statements, the material is classified as hazardous;
(ii) Does not exceed any concentration limits of the identified hazard statements, the material is classified as non-hazardous; and
(iii) Exceeds the concentration limits for at least one of the identified hazard statement, the material is classified as hazardous for its related hazardous property.

The compositional analysis together with the HP criteria assessment and/or the content of POPs shall then determine the method of disposal for the tested waste material.

Further to the above, classification of waste should be based on compositional data and leaching test results (*refer to Section 2*) should not be used for determining the hazardous nature of the waste. The only possible exemption from this principle may be in the characterisation of the waste by HP 15.

Section 2 – Landfill Waste Acceptance Criteria (WAC)

In the case that the client intends to dispose of the waste in an engineered landfill, testing in line with the requirements of Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills is required. Details of the testing to be carried out in this regard must also be included within the abovementioned method statement provided to the Authority.

On a general note, in addition to the lab analysis results, the applicant is to provide a review of the results obtained with concluding remarks and the proposed way forward with regards to the management of the waste in question. No actions in relation to the proposed management must be carried out without ERA's approval