

**Final Single Case End-of-Waste Decision Art28-0079****24<sup>th</sup> April 2026****establishing criteria determining when sulphuric acid produced by  
Enva Ireland Ltd., Clonminam Industrial Estate, Portlaoise, Co. Laois  
ceases to be waste under Regulation 28 of the European Union (Waste Directive) Regulations  
2011 – 2020***Section 1***Subject matter**

Art28-0079 establishes criteria determining when sulphuric acid resulting from a recovery operation ceases to be waste.

These criteria do not:

- affect the obligation of the producer to hold and comply with a waste collection permit, certificate of registration, waste facility permit or waste/ industrial emissions licence or any other National or European legislation which may apply when transporting, handling, storing or processing waste;
- affect permitting or any other legal requirements that do not depend on the status of the material as a waste; and
- negate the producers or user' statutory obligations or requirements under any other authorisations (including planning permission), enactments or regulations.

The Environmental Protection Agency (herein referred to as the Agency) accepts no responsibility for material produced in compliance with these criteria. It is the producer's responsibility to ultimately ensure the material is fit for the intended use. It is the user's responsibility to store and use the material as specified by the producer. Any person who gives either to an authorised person, a relevant local authority or the Agency, information which to his or her knowledge is false or misleading in a material respect, shall be guilty of an offence under the Waste Management Act 1996 (End-of-waste) Regulations 2024.

*Section 2***Definitions**

For the purposes of this Decision, the definitions set out in the European Union (Waste Directive) Regulations 2011 – 2020 and Waste Management Act 1996, as amended shall apply.

In addition, the following definitions/ interpretations shall apply:

- 1) 'applicant' is Enva Ireland Limited, Clonminam Industrial Estate, Portlaoise, County Laois;
- 2) 'authorised waste facility' means a facility which has been granted a waste authorisation in the form of an Industrial Emissions licence, a waste licence, a waste facility permit or a certificate of registration;
- 3) 'batch' means a production quantity or stockpile of material produced at one time under conditions that are presumed uniform, that can be regarded as a single unit, and has a unique reference. In reference to Part 4, sampling and testing, a batch refers to each 25 tonnes of recovered product that will be tested;
- 4) 'CLP' means Classification, Labelling and Packaging: Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008;
- 5) 'competent authority' means any of the following: the Environmental Protection Agency (hereafter referred to as the Agency); a local authority, the National Waste Collection Permit Office, the Health and Safety Authority; the National Transfrontier Shipments of Waste Office, National Building Control and Market Surveillance Office; Transport Infrastructure Ireland, Geological Survey Ireland, Competition and Consumer Protection Commission, Food Safety Authority of Ireland or any other National or Irish governmental regulation body who may need to assess compliance with these criteria or any associated activity;
- 6) 'holder' means the natural or legal person who is in possession of sulphuric acid;
- 7) 'management system certification body' is a body which has an accreditation certificate issued by the Irish National Accreditation Board (INAB), or equivalent European accreditation body, to undertake quality management system certification to an approved standard;

- 8) 'producer' means Enva Ireland Limited (T/a Enva), Clonminam Industrial Estate, Portlaoise, County Laois, who produce the sulphuric acid;
- 9) 'qualified person' means suitably qualified, trained and experienced person who has the requisite knowledge and experience required for sampling, testing and waste characterisation;
- 10) 'qualified staff' means staff which are qualified by experience or training to monitor and assess the properties of sulphuric acid;
- 11) 'REACH' means Regulation 1907/2006/EC concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals;
- 12) 'recovered material' means sulphuric acid that meets the end-of-waste criteria;
- 13) 'recovery' is as defined in the Waste Management Act 1996 as amended;
- 14) 'specified use' means the suitable specific circumstances, as declared in the statement of conformity, under which the sulphuric acid can be used;
- 15) 'statement of conformity' means a statement/declaration that the recovered sulphuric acid conforms to end-of-waste criteria, product standards and specifications, and includes details of restriction on use of the recovered acid;
- 16) 'supplier' means the semiconductor manufacturer as described in the end of waste application;
- 17) 'user' means ferrous sulphate manufacturer/ producer/ supply companies, contractors and all organisations or individuals responsible for the end use of the recovered sulphuric acid;
- 18) 'waste' is as defined in the Waste Management Act 1996 as amended.

The list of definitions and interpretations above is intended to assist understanding of these criteria and does not purport to be a legal interpretation of said terms.

### *Section 3*

#### **Criteria for sulphuric acid**

1. Sulphuric acid shall cease to be waste where all of the following conditions are demonstrated as fulfilled:
  - (a) the sulphuric acid results from a recovery operation undertaken under an appropriate waste authorisation;
  - (b) the waste used as input for the recovery operation complies with the 'waste input' criteria set out in Part 1 of Annex I;
  - (c) the waste used as input for the recovery operation has been treated in accordance with the criteria set out in Part 2 of Annex I;
  - (d) the quality of the sulphuric acid complies with the criteria set out in Part 3 of Annex I, including pollutant limits;
  - (e) the producer has satisfied sampling and testing requirements set out in Part 4 of Annex I, in relation to each batch;
  - (f) the producer has satisfied storage requirements set out in Part 5 of Annex 1;
  - (g) the producer has satisfied requirements set out in Sections 4 to 6;
  - (h) the producer has satisfied requirements within any guidance issued by the Agency in relation to these criteria.

### *Section 4*

#### **Specific uses & restrictions on use**

1. Sulphuric acid fulfilling the criteria set out in Section 3 shall only be specified in the statement of conformity as suitable for use for purposes listed in Part 1 of Annex II.
2. The restrictions on use as listed in Part 2 of Annex II shall be specified in the statement of conformity.

---

### Section 5

#### Statement of conformity

1. The producer shall issue a statement of conformity using the template set out in Annex III for each batch of sulphuric acid.
2. The statement of conformity shall be issued as documented evidence that the sulphuric acid meets these criteria and that the material ceases to be waste.
3. The statement of conformity shall state the suitable specific use(s) for the sulphuric acid and any associated restrictions as set out in Section 4.
4. The producer shall transmit the statement of conformity to the next holder of the sulphuric acid. The producer shall retain a copy of the statement of conformity for a minimum of 5 years after its date of issue and shall make it available to competent authorities upon request.
5. The statement of conformity may be in electronic form.
6. The producer shall give competent authorities access to the statements of conformity upon request.
7. A safety data sheet of the sulphuric acid shall be included in the statement of conformity.

### Section 6

#### Management system

1. The producer shall implement a management system suitable to demonstrate compliance with the criteria referred to in Sections 3 to 5, and specific monitoring requirements set out in Annex I for each criterion.
2. The management system shall include a set of documented procedures concerning each of the following aspects:
  - (a) acceptance control of waste used as input for the recovery operation as set out in Part 1 of Annex I, including sampling, testing, storage, quarantine, and control of non-conforming waste input;
  - (b) monitoring of the treatment processes and techniques described in Part 2 of Annex I;
  - (c) monitoring of the quality of sulphuric acid resulting from the recovery operation as set out in Parts 3 & 4 of Annex I (including sampling and testing);
  - (d) record keeping of the results of monitoring, including controls, inspections and training shall be maintained for a minimum of 5 years, which may include electronic records;
  - (e) completion and sign-off of a statement of conformity as set out in Annex III;
  - (f) quarantine, control and quantification of non-conforming output from the recovery process;
  - (g) feedback from customers concerning compliance with sulphuric acid quality, including assessment, investigation, corrective actioning and tracking of non-conformance reports;
  - (h) review and improvement of the management system;
  - (i) training of staff on all aspects of the criteria including the sampling, testing, treatment system, monitoring, control and record keeping.
3. The management system shall be certified by a Management System Certification Body accredited by the Irish National Accreditation Board, or equivalent European accreditation body. This certification shall verify that the management system complies with the requirements of this Section. The verification shall be carried out annually.
4. The producer shall maintain records of the quantities of:
  - (a) waste used as input for the recovery operation per list of waste code;
  - (b) acid that has been recovered and can be demonstrated to meet these criteria;
  - (c) sulphuric acid which meets these criteria and has been dispatched or used;
  - (d) non-conforming outputs from the recovery operation; and
  - (e) any non-conforming outputs reintroduced into the recovery operation.
5. The producer shall make available on request by the competent authorities the management system and records for inspection.

---

*Section 7*

**Entry into effect**

Single case End-of-Waste Criteria No. Art28-0079 shall be made available for use immediately following publication on the Agency's website.

*Section 8*

**Compliance**

The producer or holder of recovered sulphuric acid shall comply with any request made by a competent authority and/or authorised person in relation to the provision of evidence of compliance with these criteria or any associated waste, product, or health and safety requirements.

Any person who gives either to an authorised person, a relevant local authority or the Agency, information which to his or her knowledge is false or misleading in a material respect, shall be guilty of an offence under the Waste Management Act 1996 (End-of-waste) Regulations 2024.

**ANNEX I**  
**Criteria for sulphuric acid**

| Criteria  | Self-monitoring requirements   |
|---|--|
| <b>Part 1. Waste used as input for the recovery operation</b> |  |
| 1.1   | Inputs shall be restricted to the list of waste codes specified in Table 1.  |
| 1.2   | Inputs shall meet the incoming waste acceptance criteria of the waste authorisation under which the sulphuric acid is produced.  |
| 1.3   | Each load of waste input shall be assigned a unique identifier.  |
| 1.4   | Waste inputs shall originate from the 'wet etching' process used to produce semiconductors and silicon wafer components at an electronic component manufacturing facility.   |
| 1.5   | A full characterisation of the waste, including any elements used in the process shall be conducted prior to waste acceptance from the source site and on an annual basis thereafter. Enva will advise the EPA of any changes that affect the end of waste decision. |

**Table 1: Allowable inputs**

| LOW Code  | Description  |
|-----------|--|
| 06        | WASTES FROM INORGANIC CHEMICAL PROCESSES                                 |
| 06 01     | wastes from the manufacture, formulation, supply and use (MFSU) of acids |
| 06 01 01* | Sulphuric acid and sulphurous acid                                       |

**Part 2. Treatment process & techniques**

| Criteria | Self-monitoring requirements   |
|----------|--|
| 2.1      | <p>The advanced oxidation, hydrogen peroxide UV-irradiation (ultraviolet) technology of the Enviolet process needed to treat and recover the waste piranha acid for input into final use shall have been completed.</p> <p>The treatment processes shall be undertaken in accordance with the waste authorisation under which the recovered sulphuric acid is produced.</p> <p>Qualified staff shall operate the treatment technology in accordance with the manufacturer's specification.</p> <p>Training from the manufacturer shall be provided to staff on the operation and maintenance of the technology.</p> <p>Records of treatment equipment maintenance, servicing and breakdown shall be retained and incorporated into the quality management system.</p> <p>Maintenance and servicing shall be carried out by a qualified person.</p> |

| Criteria |  | Self-monitoring requirements  |
|----------|--|---|
| 2.2      | The treatment process shall include processes sufficient to reduce: <ul style="list-style-type: none"> <li>i hydrogen peroxide concentrations and TOC levels below those specified in Table 2;</li> <li>ii concentrations of heavy metals shall be below those specified in EN899;2022 and as outlined in Table 2</li> </ul> | Qualified staff shall monitor and review the efficacy of the treatment process regularly. |
| 2.3      | Each batch of the sulphuric acid produced shall be assigned a unique identifier.   |   |

### Part 3. Quality of sulphuric acid resulting from the treatment of the piranha acid.

| Criteria |   | Self-monitoring requirements  |
|----------|---|---|
| 3.1      | The sulphuric acid shall comply with customer specification, pollution limits specified in Part 2 Annex I and the European standard EN 899:2022.  | Qualified staff shall grade/classify each batch of sulphuric acid.<br><br>As technical standards and specifications are subject to regular review, it is the producer and user's responsibility to ensure that the latest version is referred to.   |
| 3.2      | The sulphuric acid shall, as required, comply with the relevant provisions of the: <ul style="list-style-type: none"> <li>i Classification, Labelling and Packaging (CLP) Regulation<sup>1</sup>;</li> <li>ii Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) Regulation<sup>2</sup>;</li> <li>iii Or any other relevant legislation requirements as applicable or as identified by the Agency.</li> </ul> | As regulations are subject to amendment and replacement, it is the producer and user's responsibility to ensure that current regulations are referred to.   |
| 3.3      | The sulphuric acid shall comply with the pollutant limit values specified in Table 2 and sampling and testing requirements set out in Part 4.   | A qualified person shall undertake sampling and testing.<br><br>A qualified person shall review the test results and determine material as compliant or non-compliant with this criterion.<br><br>A register of non-conforming product for these criteria shall be maintained by the producer. The register shall contain information as to the reasons for the non-conformance and the manner in which the non-conformance was rectified. The register shall also include information on the outlet for the non-conforming product, for example whether it is re-introduced to the start of the process, disposed of, or recovered as waste. |

<sup>1</sup> Classification, Labelling and Packaging - Regulation (EC) No 1272/2008 (CLP)

<sup>2</sup> Registration, Evaluation, Authorisation and Restriction of Chemicals - Regulation 1907/2006/EC (REACH)

**Table 2:** Limit values for sulphuric acid produced through the recovery of piranha acid.

| Parameter <sup>3</sup>                             | Units  | Concentration |
|--|--------|---------------|
| Sulphuric Acid (H <sub>2</sub> SO <sub>4</sub> )   | %      | 68 to 76      |
| Hydrogen Peroxide as H <sub>2</sub> O <sub>2</sub> | % mass | 0.01          |
| Sulphur Dioxide (SO <sub>2</sub> )                 | mg/kg  | 100           |
| Antimony as Sb                                     | mg/Kg  | ≤ 1           |
| Arsenic as As                                      | mg/Kg  | ≤ 0.4         |
| Cadmium as Cd                                      | mg/Kg  | ≤ 0.1         |
| Chromium as Cr                                     | mg/Kg  | ≤ 4           |
| Cobalt as Co                                       | mg/Kg  | ≤ 0.5         |
| Copper as Cu                                       | mg/Kg  | ≤ 0.5         |
| Iron as Fe   | mg/Kg  | ≤ 100         |
| Lead as Pb   | mg/Kg  | ≤ 4           |
| Manganese as Mn                                    | mg/Kg  | ≤ 0.5         |
| Mercury as Hg                                      | mg/Kg  | ≤ 0.1         |
| Nickel as Ni                                       | mg/Kg  | ≤ 4           |
| Selenium as Se                                     | mg/Kg  | ≤ 1           |
| TOC  | mg/Kg  | ≤ 1           |

#### Part 4. Sampling & testing

| Criteria |  | Self-monitoring requirements  |
|----------|--|---|
| 4.1      | <p>A verification sample shall be collected and tested as per defined batch size of 25 tonnes of recovered product.</p> <p>Samples and testing of sulphuric acid shall be conducted as follows:</p> <ul style="list-style-type: none"> <li>i. at an accredited laboratory, using accredited test methods, where available, for all parameters specified in Table 2; and</li> <li>ii. in accordance with relevant test methods as specified in EN 899 ;2022.</li> </ul> | <p>The laboratory selected shall be able to achieve detection limits for each parameter specified in Table 2.</p> <p>Laboratory analysis shall be undertaken in accordance with I.S. EN ISO-IEC 17025: General requirements for the competence of testing and calibration laboratories.</p> <p>Samples shall be collected by a qualified person.</p> <p>A sample shall comprise a composite of a minimum of 3 no. sub-samples</p> |

#### Part 5. Storage

|     |  |   |
|-----|--|---|
| 5.1 | Sulphuric acids pending the results of testing shall be identified and physically separated into batches per representative sample.              | A storage and labelling plan shall be established and maintained. Qualified staff shall regularly monitor storage and labelling plans and records and |
| 5.2 | Prior to dispatch or use, sulphuric acid that fulfils the criteria shall be kept in designated areas, separate from any other products or waste. |   |

<sup>3</sup> Note 1: Any other parameter as may be identified following characterisation in accordance with Annex 1 Part 1 (1.5), subject to agreement by the Agency.

|            |   |  |
|------------|---|--|
| <p>5.3</p> | <p>The sulphuric acid shall not be stored for a period greater than 12 months. Products that exceed the time limit for storage of a period of 12 months shall be deemed a waste unless otherwise demonstrated by re-testing as per Part 3</p> | <p>undertake a review thereof bi-annually.</p> <p>Any sulphuric acid stored greater than 12 months shall be re-classified as waste and managed accordingly until classified otherwise.</p> |
|------------|---|--|

## ANNEX II

### Specific use & restrictions on use

#### 1. Specific uses

The sulphuric acid that is produced in compliance with these criteria shall only be suitable for the following specific uses:

- i. The manufacture of ferric sulphate for use as a wastewater treatment plant (WWTP) coagulant; and
- ii. As a pH correction agent in the treatment of wastewater discharge effluents.

#### 2. Restrictions on use

- 2.1 For the purpose of environmental and human health protection, sulphuric acid that is produced in compliance with these criteria is not suitable for use in the treatment of drinking water for human consumption.
- 2.2 The sulphuric acid shall not be used as a potable water treatment chemical.
- 2.3 The sulphuric acid is limited to sale and use in Ireland and in any other destination country where approval has been attained from the country's relevant competent authority that the recovered material is recognised by the competent authority in that jurisdiction as a non-waste prior to the material being placed on that market.
- 2.4 The sulphuric acid shall not be used in the agricultural industry as a pH reduction agent to reduce ammonia (NH<sub>3</sub>) emissions.

## ANNEX III

## Statement of conformity with the end-of-waste criteria

|     |  |
|-----|--|
| 1.  | <p><b><u>Producer of the sulphuric acid</u></b></p> <p>Producer Organisation Name:<br/>         Registered Company Address:<br/>         Waste Authorisation Ref. No.:<br/>         Address &amp; Eircode of Production:<br/>         Contact Tel:<br/>         Contact E-mail:<br/>         Date of production:</p> |
| 2.  | Assigned unique identifier   |
| 3.  | Quantity of the batch in m <sup>3</sup> :  |
| 4.  | <p><b><u>Classification/ specification &amp; suitability for use</u></b></p> <p>(a) The material in this batch is only suitable for the following specified use(s):<br/> <i>Specify applicable suitable uses</i></p> <ul style="list-style-type: none"> <li>•</li> </ul>   |
| 5.  | <p>The sulphuric acid in this batch complies with the customer specification, industry specification or standard listed below:</p> <ul style="list-style-type: none"> <li>• EN899:2022</li> </ul>  |
| 6.  | <p>Restrictions on use</p> <p>The material in this batch is not suitable for use in:</p> <ul style="list-style-type: none"> <li>•</li> </ul>   |
| 7.  | The sulphuric acid in this batch meets the criteria specified in Single Case End-of-Waste decision Art28-0079 for sulphuric acid.  |
| 8.  | The producer of sulphuric acid in this batch applies a management system certified by a Management System Certification Body accredited by the Irish National Accreditation Board, or equivalent European accreditation body.  |
| 9.  | The material has been tested at an accredited laboratory, using accredited test methods, where available, for all parameters listed in Table 2, in accordance with relevant test methods as specified in EN 899:2022.  |
| 10. | <p>Declaration of the producer of the sulphuric acid.</p> <p>I certify that the above information is complete and correct and to the best of my knowledge:</p> <p>Name:<br/>         Date:<br/>         Signature:</p>   |

11. **Chain of custody**

**Producer**

**As per Item 1.**

Date of transfer to next holder:

**Any other holder (where applicable)**

Organisation Name:

Contact Tel:

Contact E-mail:

Date of transfer to next holder:

**User**

Organisation Name (if applicable):

Name:

Contact Tel:

Contact E-mail:

Use Location:

**NOTE: it is the responsibility of the holder who transfers the sulphuric acid to the next holder to ensure the chain of custody has been completed to include details of the next holder. Failure to do so may be subject to enforcement action.**