

Final Single Case End-of-Waste decision ART28-0103
of 24th August 2026
establishing criteria determining when recycled aggregate Green Rock 4 produced by
Starrus Eco Holding Ltd.
24 Ballymount Rd Upper, Ballymount Dr, Kilnamanagh, Dublin;
ceases to be waste under Regulation 28 of the European Union (Waste Directive) Regulations
2011 – 2020

Section 1

Subject matter

ART28-0103 establishes criteria determining when recycled aggregate Green Rock 4 (GR4) 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, 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 users 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:

- deliberately or carelessly provides false or misleading information; or
- declares that waste has ceased to be waste, where the relevant end-of-waste criteria have not been demonstrated to have been fulfilled following recovery of waste;

commits 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 Starrus Eco Holding Ltd. 24 Ballymount Rd Upper, Ballymount Dr, Kilnamanagh, Dublin, D24 E097;
- (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' is defined as 2,000 tonnes of recycled aggregate produced from accepted construction and demolition waste under uniform processing conditions;
- (4) '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;

- (5) 'consignment' means a delivery quantity of recycled aggregate which leaves the production facility and may be contained in either one or several transport units;
- (6) 'construction & demolition (C&D) fines' refers to the small-sized fraction of waste that is mechanically separated from a mixed-sized waste stream by means of passing it through a screen (such as a trommel) during a waste processing activity. Fines are typically segregated from a mixed waste stream after an initial shredding, agitation or crushing pre-step. There is no set or uniform screen size used by all operators to generate fines. Depending on the origin or nature of the waste from which the fines are generated, they may be specifically described by the operator as organic fines, C&D fines, inert fines or by some other name.
- (7) 'construction works' has the meaning assigned in Regulation (EU) No 305/2011 of the European Parliament and of the Council laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC;
- (8) 'general use' means use in areas exposed (at ground surface without an overlying hydraulically or bituminous bound layer such as concrete or macadam) and present over a high permeability subsoil, which overlies a groundwater aquifer, and can include low permeability uses;
- (9) 'groundwater' has the meaning assigned in European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. no. 9 of 2010), as amended.
- (10) 'holder' means the natural or legal person who is in possession of recycled aggregate;
- (11) 'Landfill engineering applications' means the construction of berms, embankments, contouring works, haul roads, internal roads and other ancillary engineering works at a licensed landfill;
- (12) 'Licensed Landfill' means a landfill facility located within the State and operating under a licence issued by the Environmental Protection Agency;
- (13) 'low permeability use' means the recycled aggregate is for use in one or both of the following scenarios:
 - beneath areas of hardstanding (e.g. a hydraulically or bituminous bound layer); and/or
 - in areas of open ground, with:
 - Low groundwater vulnerability; or
 - Moderate groundwater vulnerability, where at least 1m of low permeability (<0.001m/d) clay is present below the aggregate;
- (14) 'load' is defined as an incoming delivery or collection quantity of construction and demolition waste which may originate from one or more sources.
- (15) '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;
- (16) 'mineral' means stone, rock, sand, gravel, concrete, brick, or ceramic tiles;
- (17) 'non-structural concrete' means concrete other than that described as 'structural concrete';
- (18) 'notified body' is a body which has an accreditation certificate issued by the INAB¹, or equivalent European body to carry out assessment and verification of constancy or performance (AVCP) in accordance with harmonised standards falling under the remit of the Construction Product Regulations (EU No. 305/2011) and to be recognised as a:
 - notified product certification body; and/or
 - notified factory production control certification body;
- (19) 'POPs Regulation' means European Union regulation 2019/1021 concerning the regulation of Persistent Organic Pollutants;
- (20) 'producer' means the waste operator who produces the recycled aggregate under a waste authorisation;
- (21) 'protected species and habitats' means species and habitats protected under Directive 92/43/EEC² and Directive

¹ In accordance with Article 40.1 of the Construction Product Regulations (Source: Irish Notification Procedures for the Purpose of the Construction Products Regulation (305/2011) (Government of Ireland, July 2020).

² Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora

2009/147/EC³;

- (22) 'qualified person' means suitably qualified, trained and experienced person who has the requisite knowledge and experience required for sampling, testing and waste characterisation;
- (23) 'qualified staff' means staff which are qualified by experience or training to monitor and assess the properties of recycled aggregate;
- (24) 'recovery operation' has the same meaning as 'waste recovery activity' assigned in the Waste Management Act 1996, as amended;
- (25) 'recycled aggregate' means an aggregate which has resulted from the recovery of mineral wastes and which complies with the criteria laid down within this decision;
- (26) 'specified use' means the suitable specific circumstances, as declared in the statement of conformity, under which the recycled aggregate can be used;
- (27) 'statement of conformity' means a statement/declaration that the recycled aggregate conform to end-of-waste criteria, product standards and specifications, and includes details of restrictions on the use of the recycled aggregate;
- (28) 'surface water' has the meaning assigned in European Communities Environmental Objectives (Surface Waters) Regulations, 2009 (S.I. No. 272 of 2009), as amended;
- (29) 'user' means manufacturers, supply companies, contractors and all those organisations or individuals responsible for the end use of the product;
- (30) 'visual inspection' means inspection using human senses or any non-specialised equipment.
- (31) '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 recycled aggregate (GR4)

1. Recycled aggregate (GR4) shall cease to be waste where all of the following conditions are demonstrated as fulfilled:
 - (a) the recycled aggregate (GR4) results from a recovery operation undertaken at an authorised waste facility;
 - (b) the waste used as input for the recovery operation complies with the 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 recycled aggregate (GR4) complies with the criteria set out in Part 3 of Annex I, including pollutant limits and physical contaminant limits;
 - (e) the producer has satisfied sampling and testing requirements set out in Part 4 of Annex I;
 - (f) the producer has satisfied storage requirements set out in Part 5 of Annex I;
 - (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 and restrictions on use

1. recycled aggregate (GR4) 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.

³ Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds

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 or consignment of recycled aggregate (GR4), whichever is of smaller quantity.
2. The statement of conformity shall be issued as documented evidence that the recycled aggregate (GR4) meets these criteria and that the material ceases to be waste.
3. The statement of conformity, including a completed chain of custody, shall be issued prior to the recycled aggregate being dispatched to the next holder.
4. The statement of conformity shall state the suitable specific use(s) for the recycled aggregate (GR4) and any associated restrictions as set out in Section 4.
5. The producer shall transmit the statement of conformity to the next holder of the recycled aggregate (GR4). 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.
6. The statement of conformity may be in electronic form.
7. The producer shall give competent authorities access to the statements of conformity upon request.
8. A safety data sheet of the recycled aggregate (GR4) 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 Quality Control (QC) Procedures concerning each of the following aspects:
 - (a) acceptance, control and quantification of waste used as input for the recovery operation as set out in Part 1 of Annex I, including quarantine, segregation, and control of non-conforming waste inputs;
 - (b) due diligence assessment (knowledge of inputs), including assessment of inputs for potential contamination for pollutants beyond those listed in Tables 1-3 of Annex I; This shall include an assessment for the presence of hazardous substances as may be identified in association with the source of the waste inputs;
 - (c) recognising hazardous constituents or contamination in waste used as input;
 - (d) monitoring of the treatment processes and techniques described in Part 2 of Annex I;
 - (e) monitoring of the quality of recycled aggregate (GR4) resulting from the recovery operation as set out in Parts 3 & 4 of Annex I (including sampling and testing);
 - (f) storage of recycled aggregate (GR4) as set out in Part 5 of Annex I;
 - (g) completion and sign-off of a statement of conformity as set out in Annex III;
 - (h) quarantine, segregation, control and quantification of non-conforming outputs from the recovery process;
 - (i) feedback from customers or product accreditation body concerning compliance with recycled aggregate (GR4) quality, including assessment, investigation, corrective actioning and tracking of non-conformance reports;
 - (j) record keeping of the results of monitoring conducted under points (a) to (h). All records including controls, inspections and training shall be maintained for a minimum of 5 years, which may include electronic records;
 - (k) review and improvement of the management system;
 - (l) training of staff on all aspects of the criteria including the sampling, testing, treatment system, monitoring, control and record keeping.
3. Where any of the treatments referred to in Part 2 of Annex I is carried out by a prior holder, or the same holder, the producer shall ensure that the supplier implements a management system for the pre-treatment which complies with the requirements of this Section.

4. 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.
5. The producer shall maintain records of the quantities of:
 - (a) waste used as input for the recovery operation per list of waste code;
 - (b) recycled aggregate (GR4) that have been recycled and can be demonstrated to meet these criteria;
 - (c) recycled aggregate (GR4) which meet these criteria and have been dispatched;
 - (d) non-conforming outputs from the recovery operation; and
 - (e) any non-conforming outputs reintroduced into the recovery operation.
6. The producer shall give competent authorities access to the management system and records upon request.
7. The producer shall make the management system and records available for inspection.

Section 7

Reporting

The producer shall report tonnages of recycled aggregates produced per annum on an annual basis as part of environmental performance reporting/ annual environmental reporting for the waste authorisation under which the material is produced or shall make such records available as may be otherwise prescribed by the Agency, Local Authorities, the National Waste Collection Permit Office or the National Transfrontier Shipment Office. 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.

Section 8

Entry into effect

Single case End-of-Waste Criteria No. Art28-0103 shall be available for use immediately following publication on the Agency's website.

Section 9

Compliance

The producer or holder of recycled aggregate (GR4) shall comply with any request made by a competent authority 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:

- deliberately or carelessly provides false or misleading information; or
- declares that waste has ceased to be waste, where the relevant end-of-waste criteria have not been demonstrated to have been fulfilled following recovery of waste;

commits an offence, under the Waste Management Act 1996 (End-of-waste) Regulations 2024.

ANNEX I

Criteria for recycled aggregate (GR4)

Part 1. Waste used as input for the recovery operation

Criteria		Requirements and monitoring
1.1	Inputs shall be restricted to the list of waste (LoW) codes: • 19 12 12 – other wastes from mechanical treatment of waste. The 19 12 12 wastes shall be restricted to those originating from the processing of; ○ 17 01 01 – concrete ○ 17 01 02 – bricks ○ 17 01 03 – tiles and ceramics ○ 17 01 07 – mixtures of concrete, bricks, tiles and ceramics ○ 17 05 04 - Soil and stones other than those mentioned in 17 05 03 ○ 17 09 04 - Mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03	Acceptance control of all waste received (by visual inspection) and of the accompanying documentation shall be carried out by qualified staff who are trained on how to recognise waste that does not fulfil the criteria set out in this section. Where visual inspection or due diligence assessment raises any suspicion of possible hazardous properties or contamination, further appropriate monitoring measures shall be taken, such as sampling and testing where appropriate. The staff shall be trained on potential hazardous properties or contamination that may be associated with Recycled aggregate and on material components or features that indicate these properties.
1.2	All incoming waste shall meet the incoming waste acceptance criteria of the waste authorisation under which the recycled aggregate (GR4) is produced and shall be subject to the acceptance and rejection procedures set out in the applicant's internal quality control procedures including, but not limited to: • Visual inspection of all incoming loads; • Verification of supplier declarations;	Non-conforming waste shall be managed in accordance with quarantine requirements specified in the waste authorisation.
1.3	Each load of waste input shall be assigned a unique identifier and shall not contain the following substances or materials: a. asbestos or asbestos containing material; b. epoxy resin; c. paint or other similar visible treatments; d. municipal waste; e. granulated tyre materials; f. bio-waste; g. waste originated from electrical and electronic equipment; h. persistent organic pollutants; i. coal tar; j. invasive species; k. waste generated arising from remediation of deleterious materials e.g. pyrite remediation, or defective concrete block remediation etc.; l. hazardous wastes m. C&D fines; and n. any other substance or material identified as unsuitable by the Agency.	The producer shall regularly review and revise quality control procedures to ensure they reflect current standards and operational requirements.
1.4	Non-conforming waste shall be quarantined and managed in accordance with the applicant's quality management system and internal procedures.	
1.5	A characterisation of the waste inputs shall also be conducted prior to waste acceptance from new source sites, identified on a risk-based manner. This characterisation shall include screening for specific parameters arising from due diligence carried out in accordance with Section 6, 2(b). The applicant will advise the EPA of any changes that affect the end-of-waste decision.	

Part 2. Treatment process and techniques

Criteria		Requirements and monitoring
2.1	All treatment processes needed to prepare the Recycled aggregate for direct input into final use shall have been completed.	Treatment processes shall be undertaken in accordance with the waste authorisation under which the recycled aggregate (GR4) is produced.
2.2	The treatment process shall produce clean, specification-compliant recycled aggregate (GR4).	The producer shall regularly review and revise quality control procedures to ensure they reflect current standards and operational requirements.
2.3	Each batch of the recycled aggregate (GR4) produced shall be assigned a unique identifier for traceability and each batch number will have an associated batch record. The batch record shall include; • The batch number applicable to the batch of product; • The waste input load numbers used as raw materials to make that batch of product; • The number of samples taken from the batch for analysis inclusive of the date and time the sample was taken; • The results of sample analysis; • Quality control checks completed throughout the lifecycle of the process; • The results of any quality checks completed on the waste inputs and finished product; and • The approval or rejection of the finished product by a qualified person.	

Part 3. Quality of recycled aggregate (GR4) resulting from the recovery operation.

Criteria		Requirements and monitoring
3.1	Each batch of recycled aggregate (GR4) shall be verified in accordance with the applicant's internal quality control procedures.	Qualified staff shall grade/classify each batch of recycled aggregate (GR4). A register of non-conforming products 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 producer shall regularly review and revise quality control procedures to ensure they reflect current standards and operational requirements.
3.2	The recycled aggregate (GR4) must meet quality criteria requirements set out under the National EoW Criteria for recycled aggregates N001/2023.	If the national EoW criteria for recycled aggregates is amended at a later date, the criteria that apply to this single case application will remain as per the decision document for ART28-0103
3.3	The recycled aggregate shall, as required, comply with the relevant provisions of the:	As regulations are subject to amendment and replacement, it is the applicant's

	i. Classification, Labelling and Packaging (CLP) ⁴ Regulation; ii. Construction Product Regulation (CPR); iii. Building Regulations ⁵ ; iv. REACH ⁶ Regulation; v. POPs Regulation; vi. General Product Safety Regulations ⁷ ; Or any other relevant legislation requirements as applicable or as identified by the Agency.	responsibility to ensure that current regulations are referred to.
3.4	The recycled aggregate (GR4) shall comply with the specifications in Tables 1-3 and sampling and testing requirements set out in Part 4.	A qualified person shall undertake sampling and testing. A qualified person shall review the test results and determine material as compliant or non-compliant with this criterion. 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 recycled as waste.

Part 4. Sampling and Testing

Criteria		Requirements and monitoring
4.1	Incoming Recycled aggregate shall be verified on-site using the applicant's internal quality control procedures, namely; - GR-01-Waste Input Control Procedure and, - GR-01a- Waste Input Inspection Sheet and, with reference to the criteria outlined in Tables 1-3.	Samples shall be collected by a qualified person and be in accordance with the sampling and monitoring conditions of the site's waste facility permit.
4.2	A composite sample shall be prepared for detailed compositional analysis. Testing of the composite sample shall be conducted as follows: i. at a frequency of every batch produced; ii. at an accredited laboratory, using accredited test methods, where available, for all parameters specified in Tables 1-3;	The laboratory selected shall be able to achieve detection limits for each parameter specified in Table 1-3. Laboratory analysis shall be undertaken in accordance with I.S. EN ISO-IEC 17025: General requirements for the competence of testing and calibration laboratories. Samples shall be collected by a qualified person. A sample shall be a representative, composite sample prepared in

⁴ Classification, Labelling and Packaging - Regulation (EC) No 1272/2008 (CLP)

⁵ Building Regulations 1997, as amended

⁶ Registration, Evaluation, Authorisation and Restriction of Chemicals - Regulation 1907/2006/EC (REACH)

⁷ S.I. No. 726/2024 - European Union (General Product Safety) Regulations 2024

		accordance with the requirements of the accredited laboratory.
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Table 1GR4 Physical Contaminants limits

Physical Contaminants	Green Rock 3 Limit (by weight)
Total	1%
Ferrous and non-ferrous metals	1%
Soils (including topsoil, clay and sediment)	1%
Gypsum	1%
Glass	1%
Wood	1%
Plastic	1%
Rubber	1%
Bituminous materials	1%
Asbestos	"No Asbestos Detected"

Table 2 GR4 Leachate Pollutant Limit Values

RA (Output) – Leachate Pollutant Limit Value (PLVs)	
Compound	All values based on L/S = 10:1 leach test (mg/kg)
	Low permeability uses scenario PLV
Arsenic	0.063
Barium	11
Cadmium	0.0074
Total Chromium	0.54
Copper	16
Mercury	0.0057
Molybdenum	0.6
Nickel	0.15
Lead	0.078
Antimony	0.37
Selenium	0.3
Zinc	0.71
Vanadium	2.2
Chloride	950
Sulphate	2,200
Fluoride	9.1
Phenol	0.1
Dissolved Organic Carbon	400

Table 3 GR4 Chemical Pollutant Limit Values

Pollutant Limit Values	Limit
Total Organic Carbon (TOC)	2.4% (24,000 mg/kg)
Total BTEX	0.025 mg/kg
PCBs (7 Congeners)	0.035 mg/kg
Mineral Oil (C10-C40) Note 1	50 mg/kg
Total PAHs (17 including	2 mg/kg
Chromium VI	2 mg/kg
Arsenic	40 mg/kg
Lead	310 mg/kg

Part 5. Storage

Criteria		Requirements and monitoring
5.1	Recycled aggregate (GR4) pending the results of testing, shall be identified and physically separated into individual 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 undertake a review thereof bi-annually. Any recycled aggregate (GR4) stored greater than 24 months shall be re-classified as waste and managed accordingly until classified otherwise.
5.2	Prior to dispatch or use, recycled aggregate (GR4) that fulfil the criteria shall be kept in designated areas, separate from any other products or waste.	
5.3	The recycled aggregate (GR4) shall not be stored for a period greater than 24 months. Products that exceed the time limit for storage shall be deemed a waste unless otherwise demonstrated by re-testing as per Part 4.	

ANNEX II
Specific use and restrictions on use
1. Specific uses

The recycled aggregate (GR4) that is produced in compliance with these criteria shall only be suitable for use as;

- Landfill engineering applications.

2. Restrictions on use

1. The recycled aggregate (GR4) is limited to use in Licensed Landfills only.
2. The recycled aggregate (GR4) is limited to use in Ireland and in any other destination country where approval has been attained from the country's relevant competent authority that the recycled aggregate (GR4) is recognised by the competent authority in that jurisdiction as a non-waste prior to the material being used/placed on the market.

ANNEX III

Statement of conformity with the end-of-waste criteria

1.	<u>Producer of the recycled aggregate (GR4)</u> Producer Organisation Name: Registered Company Address: Waste Authorisation Ref. No.: Address and Eircode of Production: Contact Tel: Contact E-mail: Date of Production:
2.	Quantity of the consignment in kg:
3.	<u>Classification/ specification and suitability for use</u> (a) The material in this consignment is only suitable for the following specified use(s): <i>Specify applicable suitable uses</i> •
4.	The recycled aggregate (GR4) in this consignment complies with the customer specification, industry specification or standard listed below: •
5.	<u>Restrictions on use</u> The material in this consignment is <u>not suitable</u> for use in: •
6.	The recycled aggregate (GR4) in this consignment meets the criteria specified in Single Case End-of-Waste decision Art28-0103 for recycled aggregate (GR4).
7.	The producer of recycled aggregate (GR4) in this consignment applies a management system certified by a Management System Certification Body accredited by the Irish National Accreditation Board, or equivalent European accreditation body.
8.	The material has been tested at an accredited laboratory, using accredited test methods, where available, for all parameters listed in Tables 1-3.
9.	Declaration of the producer of recycled aggregate (GR4) in this consignment: I certify that the above information is complete and correct to the best of my knowledge: Name: Date: Signature:
10.	<u>Chain of custody</u> 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 recycled aggregate (GR4) to the next holder to ensure the chain of custody has been completed to include details of the next holder.