Environmental Product Declaration

In accordance with ISO 14025 and EN 15804:2012+A2:2019 for:

Aggregates

from

Vilniaus karjerai, JSC

Programme:	The International EPD® System, www.environdec.com
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Environmental Product Declaration

This is an Environmental Product Declaration for aggregates, produced by Vilniaus karjerai, JSC. The declaration is registered in accordance with the EPD programme of the International EPD® System and the Product Category Rules for Construction Products 2019:14, version 1.1. The EPD are used in both business-to-business (B2B) and business-to-consumer (B2C) communication.

Company information

Owner of the EPD:
Vilniaus karjerai, JSC;
Zuku village, Senieji Trakai eldership, Trakai district
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Description of the organisation: Vilniaus karjerai, JSC is one of the Lithuania's leading suppliers of sand and aggregates for the building, construction, landscaping, decorative and leisure markets. Founded in 2008 on December 17th, the company developed a distinctive approach that has helped it to maintain a leading position within the industry. This approach is based on company's commitment to service quality, innovation, and technical progress, together with a real and visible concern for the environment.
The company's strategic and ongoing investments in plant, machinery and new technologies provides private and public sector clients with the confidence that their contracts will be executed using the latest technology and equipment. Company's equipment is maintained in the best condition by their own team of dedicated professionals whose pride in their job is clearly visible.
The company exploits Miskiniai (Trakai district) and Papiskes (Vilnius district) Sand and gravel deposits across South-Eastern Lithuania.

Name and location of production site: Zuku village, Senieji Trakai eldership, Trakai district, Lithuania.

Product information

Product name: Aggregates

Product description: The aggregates covered in this study consist of 100% natural sand, gravel, and crushed gravel. Aggregates are classified by particle size and consistency. They can be subdivided to natural stone aggregates (sand and gravel) and crushed aggregates (stone chippings and crushed stones).
Aggregates are generally available in the form of a homogeneous bulk product. The product characteristics are standardised, to ensure the necessary levels of reliability and processability. Sand occurs naturally and is composed of fine rock material and mineral particles (0/2mm and 0/4mm), gravel is composed of unconsolidated rock fragments (2/8mm, 2/16mm, 8/16mm and 4/16mm).

Stone is quarried, crushed, and ground to produce aggregates of various sizes: 0/2mm, 0/5mm, 5/8mm, 5/11mm, 8/11, 11/16mm, 11/22mm, 4/16mm, 0/32mm and 0/45mm.

Aggregates are broadly used in industries for a different purpose. They are a primary component in the production of concrete and asphalt, but also serve as a filter and fill material or as a basic material for road building and railway construction.

Product-related or management system-related certifications: company produces aggregates in various sizes and quality. Aggregates has CE marking and represents that products comply with the EU's New Approach Directive. The products are classified into product groups based on the stages of screening and crushing they pass. Products range and their compilation to EN Standards are listed in the table below.

Products manufactured at the Vilniaus karjerai, JSC classified into product groups

Product group	Product names	Standards			
		EN 12620[a]	EN 13242[b]	EN 13043[c]	EN 13285[d]
Sand and Gravel	Sand 0/2 mm (washed)	x		x	
	Sand 0/4 mm (washed)	x		x	
	Sand 0/4 mm		x	x	
	Gravel 2/8 mm (washed)	x			
	Gravel 8/16 mm (washed)	x			
	Gravel 2/16 mm (washed)	x			
	Gravel 4/16 mm (washed)	x			
	Gravel 4/16 mm		x		
Crushed gravel/stone	Crushed gravel 0/2 mm (washed)			x	
	Crushed gravel 0/5 (washed)			x	
	Crushed gravel 2/8 mm (washed)	x		x	
	Crushed gravel 5/8 mm (washed)	x		x	
	Crushed gravel 5/11 mm (washed)	x		x	
	Crushed gravel 8/11 mm (washed)	x		x	
	Crushed gravel 11/16 mm (washed)	x		x	
	Crushed gravel 11/22 mm (washed)	x		x	
	Crushed gravel 4/16 mm (washed)	x			
	Crushed gravel 0/32 mm		x	x	x
	Crushed gravel 0/45 mm		x	x	x

[a] - EN 12620:2002+A1:2008 *Aggregates for concrete.*
[b] - EN 13242:2002+A1:2007 *Aggregates for unbound and hydraulically bound materials for use in civil engineering work and road construction.*
[c] - EN 13043:2002, EN 13043:2002/AC:2004 *Aggregates for bituminous mixtures and surface treatments for roads, airfields, and other trafficked areas.*
[d] – LST EN 13285:2018 *Unbound mixtures*

UN CPC code: 153

Geographical scope: Europe

LCA information

Functional unit / declared unit: In accordance with the PCR the declared unit is 1 metric tonne of the product.

Time representativeness: Primary data was collected internally. The production data refers to the average of the period 2020 October – 2021 September.

Database(s) and LCA software used: The Ecoinvent database provides the life cycle inventory data for the raw and process materials obtained from the background system. The used database is Ecoinvent 3.6. The LCA software used is One Click LCA.

Description of system boundaries and production process: Cradle to gate. The LCA was carried out considering the Product stage phases - A1, A2, A3 in accordance with EN 15804. No modules C1-C4 and D are declared as product falls under exemption of 5.2 statement of EN 15804.

The current EPD covers the following operations of sand, gravel and crushed gravel production:

Overburden: to gain initial access to the sand and gravel, any soil must first be removed. This is called overburden removal and is carried out with excavator and dozer. This material is used to landscape the quarry or is stored for recultivation purposes for later.
Sifting, washing, and sorting: wheel loader digs the raw material from the ground after stripping and pull it in portable feeding hopper. Feeding hopper dosing the material on fixed belt conveyors. Material is transported by conveyors to Sand and gravel washing Plant to sift, wash and sort it. Plant produces different sizes of sand, gravel, and stones.
Crushing: wheel loader takes stones (fr. 16/60mm, fr. 60/100mm and fr. >100mm) and pull it in Portable feeding hopper. Feeding hopper dosing the material through belt conveyors to a Crushing Plant. Primary Jaw crusher break the stone down in size. It is then processed through a secondary Cone crusher to produce different sizes of dusts and crushed stones or mixture gravel chips for sale.
Material Testing: all materials are tested according to specifications to meet with the needs of our customers, this is an ongoing testing process which is carried out both internally in our own laboratory and externally tested in qualified material testing laboratories to European Union Standards
Recultivation: recultivation stage (technical recultivation and mining engineering recultivation when rehabilitating the lands disturbed by mining works) includes the following types of works: stripping and storing of fertile soil layer, surface levelling, transportation and application of fertile soil on the surface being reclaimed, construction of drainage and water delivery canals network, installation of soil-saving facilities. The technical stage of restoration is performed by mining enterprises. Depending on the purposes set, they distinguish between the following directions of land recultivation:

- nature conservation;
- for recreational purpose;
- for agricultural purpose;
- for forestry purpose.

Vilniaus karjerai, JSC for their operations use 100% green energy.

Data quality: The foreground data collected internally is based on yearly production amounts and extrapolations of measurements on specific machines and plants. Overall, the data quality can be described as good. The primary data collection has been done thoroughly.

Cut-off criteria: Life cycle inventory data for a minimum of 99% of total material and energy input flows have been included in the life cycle analysis. Although only materials having in summa less than 1% of weight of product were not used in calculations.

The system boundaries of the LCA study

Product stage			Assembly stage		Use stage							End of life stage				Resource recovery stage
Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling- potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
x	x	x	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

Description of the system boundary (X = Included in LCA; MND = Module Not declared)

Content information

Product components	Weight, %
Gravel and sand	100
TOTAL	**100**

No dangerous substances from the candidate list of SVHC for Authorisation are used in the product.

Packaging materials: Products delivery is separate service of the company, not declared in this EPD. In case of distribution no packaging is used, delivered as bulk material.

Environmental Information

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	Sand and Gravel	Crushed gravel/stone
		A1-A3	A1-A3
GWP – total	kg CO_2e	9.28E-1	3.64E0
GWP – fossil	kg CO_2e	9.24E-1	3.63E0
GWP – biogenic	kg CO_2e	3.28E-3	1.43E-2
GWP – LULUC	kg CO_2e	3.44E-4	1.48E-3
Ozone depletion pot.	kg CFC_{-11}e	1.99E-7	7.81E-7
Acidification potential	mol H^+e	1.01E-2	4.01E-2
EP-freshwater[2)]	kg Pe	1.69E-5	7.28E-5
EP-marine	kg Ne	4.45E-3	1.76E-2
EP-terrestrial	mol Ne	4.89E-2	1.93E-1
POCP (“smog”)	kg NMVOCe	1.34E-2	5.28E-2
ADP-minerals & metals	kg Sbe	3.05E-6	1.29E-5
ADP-fossil resources	MJ	1.26E1	4.96E1
Water use[1)]	m^3e depr.	3.56E-2	1.48E-1

1) GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential. 2) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. 3) Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO_4e.

Use of natural resources

Impact category	Unit	Sand and Gravel	Crushed gravel/stone
		A1-A3	A1-A3
Renew. PER as energy	MJ	1.07E1	4.69E1
Renew. PER as material	MJ	0.00	0.00
Total use of renew. PER	MJ	1.07E1	4.69E1
Non-re. PER as energy	MJ	1.26E1	4.96E1
Non-re. PER as material	MJ	0.00	0.00
Total use of non-re. PER	MJ	1.26E1	4.96E1
Secondary materials	kg	0.00	0.00
Renew. secondary fuels	MJ	0.00	0.00
Non-ren. secondary fuels	MJ	0.00	0.00
Use of net fresh water	m^3	1.38E-3	5.54E-3

PER = Primary energy resources

End of life - waste production

Impact category	Unit	Sand and Gravel	Crushed gravel/stone
		A1-A3	A1-A3
Hazardous waste	kg	1.6E-2	6.42E-2
Non-hazardous waste	kg	2.53E-1	1.04E0
Radioactive waste	kg	8.77E-5	3.44E-4

End of life - output flows

Impact category	Unit	Sand and Gravel	Crushed gravel/stone
		A1-A3	A1-A3
Components for re-use	kg	0.00	0.00
Materials for recycling	kg	0.00	0.00
Materials for energy rec	kg	0.00	0.00
Exported energy	MJ	0.00	0.00

Potential environmental impact – mandatory indicators according to EN 15804+A1, CML / ISO 21930

Impact category	Unit	Sand and Gravel	Crushed gravel/stone
		A1-A3	A1-A3
Global Warming Pot.	kg CO_2e	9.18E-1	3.6E0
Ozone depletion Pot.	kg CFC_{-11}e	1.59E-7	6.23E-7
Acidification	kg SO_2e	1.91E-3	7.75E-3
Eutrophication	kg PO_4^3e	4.47E-4	1.86E-3
POCP (“smog”)	kg C_2H_4e	1.58E-4	6.27E-4
ADP-elements	kg Sbe	3.05E-6	1.29E-5
ADP-fossil	MJ	1.26E1	4.96E1

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.*

Programme information

Programme:	The International EPD® System
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CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product category rules (PCR): PCR 2019:14 Construction products (version 1.1)
PCR review was conducted by: The International EPD® System
Independent third-party verification of the declaration and data, according to ISO 14025:2006: ☐ EPD process certification ☒ EPD verification
Third party verifier: Vladimir Kočí, LCA Studio Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025.

References

- General Programme Instructions of the International EPD® System. Version 4.0;
- PCR 2019:14 Construction products (version 1.1)
- EN 15804:2012+A2:2019 Sustainability of construction works. Environmental product declarations. Core rules for the product category of construction products.
- ISO 14020:2001 Environmental labels and declarations – General principles.
- ISO 14044:2006 Environmental management. Life Cycle Assessment. Requirements and guidelines.
- ISO 14025:2010 Environmental labels and declarations. Type III environmental declarations. Principles and procedures.

Tools and database

- One Click LCA tool;
- Ecoinvent 3.6 database

Contact information

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LCA author:

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