



# AGGREGATES

## Environmental Product Declaration

This Environmental Product Declaration (EPD) is for aggregate products manufactured by Graniterock at A. R. Wilson Quarry (ARWQ).



## General information

### Environmental Product Declaration






This Environmental Product Declaration (EPD) reports the impacts for 1 US ton (dry weight) aggregates, for use in business-to-business (B2B) in accordance with ISO 14025, ISO 21930, and ASTM International's EPD program operator rules.

Product Name	Construction aggregate
Manufacturer Name and Address	<p>Corporate Office: Granite Rock Company 350 Technology Drive PO Box 50001 Watsonville, CA 95077</p> <p>A.R. Wilson Quarry Site Location: 1900 Quarry Road Aromas, CA 95004</p>
Program Operator	<p>ASTM International <a href="http://www.astm.org/EPDs.htm">http://www.astm.org/EPDs.htm</a></p> 
General Program instructions and Version Number	ASTM Program Operator for Product Category Rules (PCRs) and Environmental Product Declarations (EPDs), General Program Instructions. Version 8.0, revised April 29, 2020.
Declaration Number	EPD 1046
Reference PCR and Version Number	<p>ISO 21930:2017 Sustainability in Building Construction – Environmental Declarations of Building Products serves as the core PCR.</p> <p>Product Category Rule for Environmental Product Declarations: Construction Aggregates – NSF/ASTM 1126-23</p>
EPD Type and Scope (facility/product/average)	<p>Type III EPD Cradle-to-gate (modules A1 to A3) Facility specific</p>
Defined functional or declared unit	1 US Ton of aggregate
Product's intended Application and Use	This EPD is intended for business-to-business (B-to-B) audiences.
Product RSL (Reference Service Life) *	Not Applicable (B modules not included in scope)
Markets of Applicability	United States and Canada
Date of Issue	July 16, 2025
Period of Validity	Five years – until July15, 2030

Year of reported manufacturer primary data	November 1st, 2023 to October 31st, 2024
LCA Software and Version Number	Simapro 3.9
LCI Database and Version Number	USLCI, SmartData, Construction Aggregates – NSF/ASTM 1126-23 Annex A
LCIA Methodology and Version Number	TRACI 2.1 v1.04
Overall Data Quality Assessment Score	2.64– overall good
The sub-category PCR review was conducted by:	Industrial Ecology Consultants, Thomas P. Gloria, Ph.D t.gloria@industrial-ecology.com
This declaration was independently verified in accordance with ISO 14025: 2006. ISO 21930:2017 serves as the core PCR. Sub-category PCR: NSF/ASTM 1126: Construction Aggregates Product Category Rule	<input type="checkbox"/> Internal <input checked="" type="checkbox"/> External
This life cycle assessment was conducted in accordance with ISO 14044 and the reference PCR by:	Nawal Shoaib nawal@climateearth.com Climate Earth, Inc. 137 Park Place, Suite 204, Point Richmond, CA, 94801 (415) 391-2725 ▪ <a href="http://www.climateearth.com">http://www.climateearth.com</a>
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	Thomas P. Gloria, PhD <a href="mailto:t.gloria@industrial-ecology.com">t.gloria@industrial-ecology.com</a> Industrial Ecology Consultants 35 Bracebridge Rd. Newton, MA 02459-1728 (617) 553-4929 <a href="http://www.industrial-ecology.com">http://www.industrial-ecology.com</a>
Explanatory material may be obtained from the following:	Jon Erskine Director, Sustainability and Geology (831) 768-2069 jerskine@graniterock.com
*Only applicable where the LCA/EPD includes Module B.	







Products covered in this facility average EPD are detailed in Table 1. All products contain 100% construction aggregate. No hazardous materials were used in the manufacture of these products.



**Table 1: Products manufactured at the A.R. Wilson Quarry**




Product Name	ASTM Standard	Product Description	Images
Certified Clean Fill Material	D2487	Wilson crusher fines material for fill applications. This type of rock is typically gray in color.	
Wilson #4 AREMA 1-1/2" Railroad Ballast	C33	Wilson #4 AREMA 1-1/2" Railroad Ballast is a clean, 100% crushed granite. This Ballast is produced daily at Wilson Quarry to meet the American Railway Engineering and Mining Association (AREMA) #4 Ballast Specifications as well as ASTM C-33 Size #4. This product has been used by the Railroad as Ballast Aggregate since the late 1800's. This type of rock is typically gray in color.	
Wilson 1 1/2" Class IV Baserock	D2940M	Similar to 1 1/2" Class II Baserock, Wilson 1 1/2" Class IV Baserock is well-graded crushed granite; the larger aggregate size provides additional stability. It has a higher percentage of fines than Class II, which makes it a little easier to grade and compact. Uses include compacted base under concrete, asphalt, and pavers. It can also be used as a driveway or pathway material and meets Cal Trans Section 25-1 for aggregate subbase. This material is typically gray in color.	
Wilson 1 1/2" Drain Rock	C33	Wilson 1 1/2" Drain Rock is a clean, crushed granite. This size drain rock is sometimes called for behind retaining walls and is often used in French drains and leach fields. This size of crushed drain rock can also be used as decorative rock in landscape applications. Aggregate color is typically gray but at times shifts to brown.	
Wilson 1 1/2" x 3/4" Railroad Ballast	C33	Wilson 1 1/2" x 3/4" Railroad Ballast is a clean, 100% crushed granite. This Ballast is produced daily at Wilson Quarry to meet the American Railway Engineering Association (AREA) #4 Ballast Specifications as well as ASTM C-33 Size #4. This type of rock is typically gray in color.	

Wilson 1" x #4 Concrete Rock	C33	Wilson 1" x #4 Concrete Rock is a clean, 100% crushed granite. This aggregate is produced daily at Wilson Quarry to meet ASTM C-33 Size #57 Specifications. This product is widely used as a coarse aggregate in Portland cement concrete. This type of rock is typically gray in color.	
Wilson 1-1/2" Class II Baserock	D2940M	Wilson 1-1/2" Class II Baserock is a crushed, well-graded blend of aggregates. 1-1/2" Class II Baserock is designed to provide additional stability over 3/4" Baserock. When properly compacted it provides an excellent base to concrete and asphalt, or can be used alone as a driveway or pathway. Graniterock 1-1/2" Class II Baserock meets the specifications of Cal Trans Section 26-1. This material is typically gray in color.	
Wilson 1-1/2" x 3/4" Concrete Rock	C33	Wilson 1-1/2" x 3/4" Concrete Rock is a clean, 100% crushed granite. This aggregate is produced daily at Wilson Quarry to meet ASTM C-33 Size #4 specifications as well as the American Railway Engineering Association (AREA) #4 Ballast Specifications. This product is also widely used in septic leach fields and drainage blankets. This type of rock is typically gray in color.	
Wilson 1/2" Drain Rock	C33	Wilson 1/2" Drain Rock is a clean, crushed granite. This product is ideally suited for use on pathways and as drain rock in blocks and behind retaining walls. This size of crushed drain rock can also be used in landscape applications and as a topdressing on baserock driveways. Aggregate color is typically gray but at times shifts to brown.	
Wilson 1/2" x #4 Concrete Rock	C33	Wilson 1/2" x #4 Concrete Rock is a clean, 100% crushed granite. It is produced daily to meet ASTM C-33 Size #7 as well as Caltrans Section 37 'Coarse' Aggregate Specifications. This product is ideally suited for use in concrete, chip seals, drainage blankets, and as roofing aggregate. Aggregate color is typically gray but at times shifts to brown.	
Wilson 1/2" x #4 Roofing Aggregate	D3910	Wilson 1/2" x #4 Roofing Aggregate is a clean, 100% crushed granite. It is produced daily to meet the Caltrans Section 37 'Coarse' Aggregate Specification for use in chip seals. This product is also ideally suited for use in concrete, drainage blankets, and as roofing aggregate. Aggregate color is typically gray but at times shifts to brown.	

Wilson 1/2" x #4 Screenings	D3910	Wilson 1/2" x #4 Screenings is a clean, 100% crushed granite. It is produced daily to meet the Caltrans Section 37 'Coarse' Aggregate Specification for use in chip seals. This product is also ideally suited for use in concrete, drainage blankets, and as roofing aggregate. Aggregate color is typically gray but at times shifts to brown.	
Wilson 1/4" Drain Rock	C33	Wilson Quarry 1/4" Drain Rock is a clean, 100% crushed granite ideal for use as trench backfill or drainage filter aggregate. This product is produced daily and always available for shipment. Aggregate color is typically gray but at times shifts to brown.	
Wilson 1/4" x #10 Rock	C33	Wilson 1/4" x #10 Rock is a clean, crushed granite, that is also called 1/4" Drain Rock. This product is ideally suited for use on pathways and as drain rock in blocks and behind retaining walls. Aggregate color is typically gray but at times shifts to brown.	
Wilson 3/4" Class II Baserock	D2940M	Wilson 3/4" Class II Baserock is a crushed, well-graded blend of aggregates. Class II base is designed to compact tightly with the proper equipment. When compacted it provides an excellent base to concrete, pavers, and asphalt, or can be used alone as a driveway or pathway. Graniterock Class II Baserock meets the specifications of Cal Trans Section 26-1. This material is typically gray in color.	
Wilson 3/4" Class IV Baserock	D2940M	Similar to Wilson 3/4" Class II Baserock, Wilson 3/4" Class IV Baserock is well-graded crushed granite. It has a higher percentage of fines than Class II, which makes it a little easier to grade and compact. Uses include compacted base material under concrete, asphalt, and pavers. It can also be used as a driveway or pathway material, and meets Cal Trans Section 25-1 for aggregate subbase.	
Wilson 3/4" Drain Rock	C33	Wilson 3/4" Drain Rock is a clean, crushed granite. This product is ideally suited for use as drain rock pipe bedding in underground projects. This size drain rock is sometimes called for behind retaining walls and can be specified in French drains and leach fields. This size of crushed drain rock can also be used in landscape applications and as a top dressing on baserock driveways. Aggregate color is typically gray but at times shifts to brown.	

Wilson 3/4" x 1/2" Concrete Rock	C33	Wilson 3/4" x 1/2" Concrete Rock is a clean, 100% crushed granite. It is designed for use in Portland cement concrete as well as asphaltic concrete. This product is also ideally suited for use in drainage blankets. Aggregate color is typically gray but at times shifts to brown.	
Wilson 3/8" x #6 Screenings	D1139	Wilson 3/8" x #6 Screenings is a clean, 100% crushed granite. It is produced daily to meet the Caltrans Section 37 'Medium' Aggregate Specification for use in chip seals. This product also meets the specifications for Class 1 Type A Permeable Material (Section 68 – Caltrans Standard Specs) and is ideally suited for use in drainage blankets. Aggregate color is typically gray but at times shifts to brown.	
Wilson 5/16" x #8 Screenings	D1139	Wilson 5/16" x #8 Screenings is a clean, 100% crushed granite. It is produced daily to meet the Caltrans Section 37 'Medium Fine' Aggregate Specification for use in chip seals. This product is also ideally suited for use in drainage blankets. Aggregate color is typically gray but at times shifts to brown.	
Wilson Class I Type A Permeable	C33	Wilson Class 1 Type A Permeable is a clean, washed, crushed granite. The product meets Cal Trans Section 68-1 for permeable products. The aggregate is approximately 3/8" and is typically specified for uses such as behind retaining walls and in drainage situations using filter fabrics. This rock is typically gray in color.	
Wilson Class I Type B Permeable	C33	Wilson Class 1 Type B Permeable is a clean, washed, crushed granite. The product meets Cal Trans Section 68-1 for permeable products. The aggregate is approximately 3/4" and is typically specified for uses such as behind retaining walls and in drainage situations using filter fabrics. This rock is typically gray in color.	
Wilson Class II Permeable	C33	Wilson Class II Permeable is a permeable material used for drainage applications and conforms to the specifications of Cal Trans Section 68. This rock is typically gray in color.	

Wilson Rip Rap/Coarse Rubble/Gabion	D6092-21	Wilson Boulders, or Rip Rap are clean crushed granite. Sizes run from 1' to 5' in diameter. These boulders can be used as part of a landscape theme or in engineering projects such as bank, river or coastline stabilization. All sizes of Cal Trans Specification Rip Rap up to 10 tons are available daily. Gabion rock runs 4" to 10" and is used as a stabilization rock or can be placed in gabion baskets to provide bank protection. Coarse Rubble is a non-spec material, which is generally used in emergency repair work to shore up banks and levees. It is available on a special order basis. These types of rock are typically gray in color.	
Wilson Type I Slurry Seal Aggregate	D3910	This crushed granite product is used specifically for Cal Trans slurry seal projects and meets Cal Trans Section 37-8 for slurry aggregates. This aggregate is typically gray in color.	
Wilson Type II Slurry Seal Aggregate	D3910	This crushed granite product is used specifically for Cal Trans slurry seal projects and meets Cal Trans Section 37-8 for slurry aggregates. This aggregate is typically gray in color.	
Wilson Type III Slurry Seal Aggregate	D3910	This crushed granite product is used specifically for Cal Trans slurry seal projects and meets Cal Trans Section 37-8 for slurry aggregates. This aggregate is typically gray in color.	
Wilson Concrete Sand	C33	Wilson Concrete Sand is primarily used as an ingredient in hot mix asphalt and concrete, meeting Cal Trans Section 39 requirements. It is also used as an ingredient for Portland cement concrete meeting the Cal Trans Section 90 and ASTM C-33 specifications. In some cases it is also used as a bedding material for interlocking pavers and concrete slabs.	
Wilson Premium Asphalt Sand	C33	Wilson Premium Asphalt Sand is primarily used as an ingredient in high performance hot mix asphalt, meeting Cal Trans Section 39 requirements.	

Wilson Premium Airport Sand	C33	Wilson Premium Airport Sand is primarily used as an ingredient in performance hot mix asphalt mixes.	
FAA P209 Crushed Aggregate Base Course	D2940M	Compactable impermeable gravel and sand blend used in airport construction for intermediate support underneath taxiways and runways, 1 1/2-inch maximum aggregate size.	
Engineered Fill	D2487	Wilson sand and gravel mixture for fill applications. This type of rock is typically gray in color.	

# LCA Study

## System boundary

This study captures the following mandatory cradle-to-gate (A1-A3) life cycle product stages (as illustrated in Figure 1):

A1 - Extraction and processing of raw materials including fuels used in extraction and transport within the process.

A2 – Specific transportation of raw materials from extraction site or source to manufacturing site (including any recovered materials from source to be recycled in the process) and including empty backhauls and transportation to interim distribution centers or terminals.

A3 – Manufacturing of the product, including all energy and materials required and all emissions and wastes produced.

Product Stage			Construction Process Stage		Use Stage							End of Life Stage			
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
Raw material supply	Transport	Manufacturing	Transport	Construction-installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

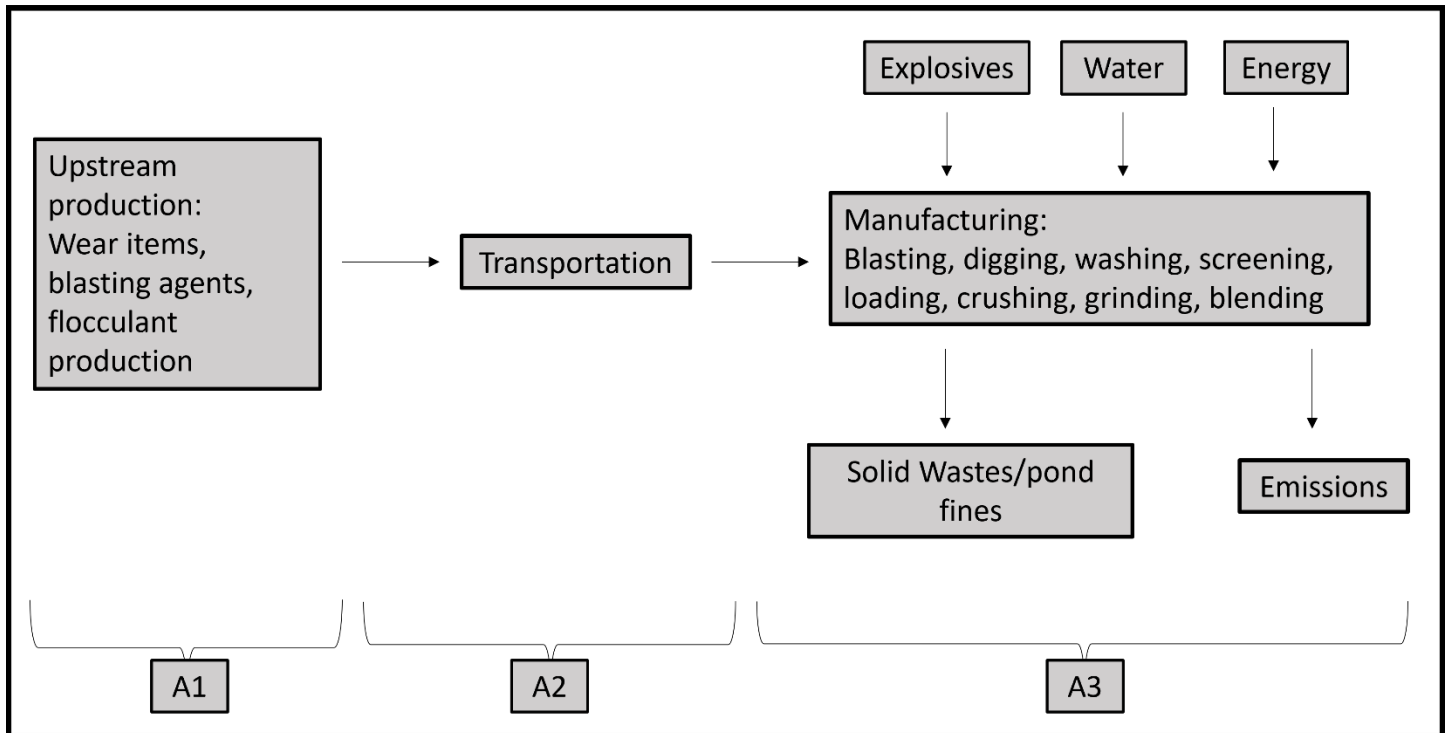
Figure 1. Life-Cycle Stages and Modules (Note: MND = module not declared; x = module included)

Except as noted above, all other life cycle stages as described in Figure 1 are excluded from the LCA study. The following processes are also excluded from the study:

1. Production, manufacture, and construction of manufacturing capital goods and infrastructure;
2. Production and manufacture of production equipment, delivery vehicles, and laboratory equipment;
3. Personnel-related activities (travel, furniture, office supplies);
4. Fuel used to transport personnel around the mine and sand & gravel facility.
5. Energy and water use related to company management and sales activities.

The main processes included in the system boundary are illustrated in Figure 2.

# System Boundary



**Figure 2. Main Processes Included in System Boundary**

Explanatory materials may be requested by contacting:

**JON ERSKINE, PG, CHG**

Director, Sustainability and Geology

[jerskine@graniterock.com](mailto:jerskine@graniterock.com)

OFFICE 831.768.2069

350 Technology Drive, Watsonville, CA 95076



## Secondary data sources

A list of each secondary with its LCI data sources is provided below.

Antifreeze: EcoInvent 3.8 (2021): “Ethylene glycol {GLO}| market for | Cut-off, U” and USLCI process (2020): “Tap water, at user/US- US-EI U”

Diesel: GREET (2023): “HD Truck: Combination Short-Haul CIDI - RDII 100 from distributed Conventional Petroleum Refinery, from Soybeans”

Electricity: U.S. DOE NETL (2020)

Explosives: NSF PCR for Construction Aggregates (2022) “Explosive”

Gasoline: USLCI process (2020): “Gasoline\_\_combusted\_in\_equipment\_\_RNA”

Lubricating oil: US-EI process (2021): “Lubricating oil, at plant/US”

Manganese: NSF PCR for Construction Aggregates (2024): “Manganese”

Natural gas: USLCI process (2020): “Operation of liquefied compressed natural gas equipment; industry average; > 56 kW and < 560 kW”

Propane: USLCI process (2020): “Operation of liquefied petroleum gas equipment; industry average; > 56 kW and < 560 kW”

Truck Transport: USLCI process (2020): “Transport, combination truck, short-haul, diesel powered, West/tkm/RNA”

Tires: US-EI process (2021): “Synthetic rubber, at plant/US- US-EI U” and EcoInvent 3.8 (2021): “Synthetic rubber {RoW}| production | Cut-off, U”

Steel wear parts: US-EI process (2021): “Steel, low-alloyed, at plant/US- US-EI U” and EcoInvent 3.8 (2021): “Steel, low-alloyed {RoW}| steel production, electric, low-alloyed | Cut-off, U”

Rubber wear parts: US-EI process (2021): “Synthetic rubber, at plant/US- US-EI U” and EcoInvent 3.8 (2021): “Synthetic rubber {RoW}| production | Cut-off, U”

Waste: EcoInvent 3.8 (2021): “Municipal solid waste {RoW}| treatment of, sanitary landfill | Cut-off, U”

## Data gaps

Electrical data collected for this plant included the entire plant. Some of the electricity reported may not be used directly in the production of the above mentioned products at the A.R. Wilson Quarry.

## Environmental Impacts

Cradle to Gate (A1-A3) facility average impact results per 1 US ton (short ton, TN.SH) for construction aggregates produced at ARWQ (see Table 2: Cradle-to-Gate Impact Results for ARWQ Covered in Study per 1 US ton Table 1) are outlined in Table 2

**Table 2: Cradle-to-Gate Impact Results for ARWQ Covered in Study per 1 US ton**

Impact category	Unit	A1	A2	A3	A1 to A3
Global warming	kg CO2 eq	0.11	0.01	1.98	2.10
Ozone depletion	kg CFC-11 eq	2.81E-08	3.70E-13	5.24E-09	3.34E-08
Eutrophication	kg N eq	8.56E-04	6.79E-06	5.30E-04	1.39E-03
Acidification	kg SO2 eq	2.41E-03	1.13E-04	0.01	0.01
Smog	kg O3 eq	3.84E-03	2.89E-03	0.23	0.23
Abiotic depletion non-fossil mineral	kg Sb eq	6.25E-08	x	1.57E-09	6.41E-08
Abiotic depletion (fossil fuels)	MJ	3.32	0.13	23.89	27.34
Renewable primary energy resources as energy	MJ	0.03	x	13.71	13.75
Renewable primary resources as material	MJ	x	x	x	x
Non-renewable primary resources as energy	MJ	3.40	0.13	29.33	32.85
Non-renewable primary resources as material	MJ	x	x	x	x
Consumption of fresh water	m3	0.03	x	43.81	43.84
Secondary materials	kg	x	x	x	x
Renewable secondary fuels	MJ	x	x	x	x
Non-renewable secondary fuels	MJ	x	x	x	x
Recovered energy	MJ	x	x	x	x
Hazardous waste disposed	kg	x	x	4.86E-03	4.86E-03
Non-hazardous waste disposed	kg	x	x	0.01	0.01
High-level radioactive waste	m3	3.23E-11	x	2.22E-12	3.45E-11
Intermediate and low-level radioactive waste	m3	3.24E-10	x	1.23E-10	4.48E-10
Components for reuse	kg	x	x	x	x
Materials for recycling	kg	x	x	0.05	0.05
Materials for energy recovery	kg	x	x	0.02	0.02
Recovered energy exported from product system	MJ	x	x	x	x
Calcination	kg CO2 eq	x	x	x	x
Biogenic CO2 emissions	kg CO2 eq	x	x	x	x

This EPD meets all comparability requirements stated in ISO 14025:2006. However, differences in certain assumptions, data quality, and variability between LCA data sets may still exist. As such, caution should be exercised when evaluating EPDs from different manufacturers or programs, as the EPD results may not be entirely comparable. Any EPD comparison must be carried out at the construction works level per ISO 21930:2017 guidelines. The results of this EPD reflect an average performance by the product and its actual impacts may vary on a case-to-case basis.

Cradle to Gate (A1-A3) facility average impact results per 1 metric tonne for construction aggregates produced at AWRQ (see **Error! Reference source not found.**) are outlined in Table 3

**Table 3: Cradle-to-Gate Impact Results for ARWQ Covered in Study per 1 metric tonne**

Impact category	Unit	A1	A2	A3	A1 to A3
Global warming	kg CO2 eq	0.12	0.01	2.18	2.32
Ozone depletion	kg CFC-11 eq	3.10E-08	4.07E-13	5.78E-09	3.68E-08
Eutrophication	kg N eq	9.43E-04	7.49E-06	5.84E-04	1.54E-03
Acidification	kg SO2 eq	2.66E-03	1.24E-04	0.01	0.01
Smog	kg O3 eq	4.23E-03	3.19E-03	0.25	0.26
Abiotic depletion non-fossil mineral	kg Sb eq	6.89E-08	x	1.73E-09	7.07E-08
Abiotic depletion (fossil fuels)	MJ	3.66	0.14	26.34	30.14
Renewable primary energy resources as energy	MJ	0.04	x	15.12	15.15
Renewable primary resources as material	MJ	x	x	x	x
Non-renewable primary resources as energy	MJ	3.74	0.14	32.33	36.21
Non-renewable primary resources as material	MJ	x	x	x	x
Consumption of fresh water	m3	0.03	x	48.29	48.32
Secondary materials	kg	x	x	x	x
Renewable secondary fuels	MJ	x	x	x	x
Non-renewable secondary fuels	MJ	x	x	x	x
Recovered energy	MJ	x	x	x	x
Hazardous waste disposed	kg	x	x	0.01	0.01
Non-hazardous waste disposed	kg	x	x	0.02	0.02
High-level radioactive waste	m3	3.56E-11	x	2.45E-12	3.81E-11
Intermediate and low-level radioactive waste	m3	3.58E-10	x	1.36E-10	4.94E-10
Components for reuse	kg	x	x	x	x
Materials for recycling	kg	x	x	0.06	0.06
Materials for energy recovery	kg	x	x	0.02	0.02
Recovered energy exported from product system	MJ	x	x	x	x
Calcination	kg CO2 eq	x	x	x	x
Biogenic CO2 emissions	kg CO2 eq	x	x	x	x

This EPD meets all comparability requirements stated in ISO 14025:2006. However, differences in certain assumptions, data quality, and variability between LCA data sets may still exist. As such, caution should be exercised when evaluating EPDs from different manufacturers or programs, as the EPD results may not be entirely comparable. Any EPD comparison must be carried out at the construction works level per ISO 21930:2017 guidelines. The results of this EPD reflect an average performance by the product and its actual impacts may vary on a case-to-case basis.

## References

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