

# Vulcan

Materials Company  
WESTERN DIVISION



## Environmental Product Declaration

This Environmental Product Declaration (EPD) is for 12 concrete aggregate products manufactured by Vulcan Materials Company at their Pleasanton, California Sand and Gravel facility.

Vulcan Materials Company, Western Division  
500 North Brand Blvd.  
Suite 500  
Glendale, CA 91203-1923

# Vulcan Materials Company Environmental Product Declaration General Information

## Environmental Product Declaration

This declaration has been prepared in accordance with ISO 14025, ISO 21930, and ASTM International's EPD program operator rules.

### PCR review was conducted by:

Jamie Meil ▪ [jamie.meil@athenasmi.org](mailto:jamie.meil@athenasmi.org)

The PCR peer review report is available upon request: [cert@astm.org](mailto:cert@astm.org)

Independent verification of the declaration and data, according to ISO 14025:  internal  external

### Third-party verifier:

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Industrial Ecology Consultants

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### Product Category Rule:

ASTM Product Category Rules (PCR) for Construction  
Aggregates: Natural Aggregate, Crushed Concrete, and Iron/Steel  
Furnace Slag, issued January, 2017.

**Declared Unit:** 1 metric tonne (dry weight).

### Program Operator:

ASTM International  
<http://www.astm.org/EPDs.htm>



### EPD Owner:

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### LCA and EPD Developer:

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### Date of Issue:

October 16, 2017 (valid for 5 years until October 16, 2022).

**ASTM Declaration Number:** EPD-071

## Products

The 12 concrete aggregates covered in this EPD are produced at:

Pleasanton Sand & Gravel  
50 El Charro Road  
Pleasanton, CA 94588

Each aggregate is compliant with the standards and specifications listed in Table 1.

**Table1: Aggregates Covered in this Study**

Aggregate	Standard
Rock Dust	D1073-11
½" Crushed	D692
¾" Crushed	D692
¾" Crushed	D692
Manufactured (MFG) Sand	D1073-11
Class II Base	D2940
Crushed Class II Perm	D2940
Class II Perm	D2940
1" x #4	ASTM C33
¾" x #4	ASTM C33
¾" Pea Gravel	ASTM C33
Top Sand	ASTM C33

## Material Composition

The material composition of the aggregates covered in this study is 100% natural sand and gravel.

# Vulcan Materials Company

## Environmental Product Declaration

### General Information

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#### Pleasanton Rock Dust



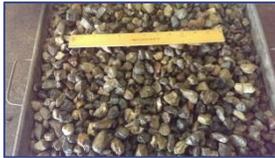
A fine sand-like material which is a by-product of crushing aggregates. Material must have 100% passing the 3/8" sieve. Typically, an asphalt aggregate but can also be used in concrete and may be used in other applications.

#### Pleasanton 1/2" Crushed



A 1/2" crushed aggregate which must have 100% passing the 3/4" sieve and may have material retained on the 1/2" sieve. Typically, an asphalt aggregate but can also be used in concrete and may be used in other applications.

#### Pleasanton 3/4" Crushed



A 3/4" crushed aggregate which must have 100% passing the 1" sieve and may have material retained on the 3/4" sieve. Typically, an asphalt aggregate but can also be used in concrete and may be used in other applications.

#### Pleasanton 3/8" Crushed



A 3/8" crushed aggregate which must have 100% passing the 1/2" sieve and may have material retained on the 3/8" sieve. Typically, an asphalt aggregate but can also be used in concrete and may be used in other applications.

#### Pleasanton Manufactured Sand



A sand-like material that has 100% passing the 3/8" sieve and may be produced using crushed fine materials. Typically, an asphalt aggregate but can also be used in concrete and may be used in other applications.

#### Pleasanton Class II Base



A 3/4" Class II aggregate base using only natural materials. Used in roadways as a base course in pavements and may be used in other applications.

#### Pleasanton Crushed Class II Perm



A crushed permeable material used for drainage applications and may be used in other applications.

#### Pleasanton Class II Perm



A permeable material used for drainage applications and may be used in other applications. Conforms to the specifications of Caltrans Section 68 (State of California, n.d.)

#### Pleasanton 1" X #4



A 1" aggregate that has 100% passing the 1 1/2" sieve with 95-100% passing the 1" sieve. Typically used as a concrete aggregate and may be used in other applications. Sometimes referred to as #57 aggregate.

#### Pleasanton 3/4" X #4



A 3/4" aggregate that has 100% passing the 1" sieve with 95-100% passing the 3/4" sieve. Typically used as a concrete aggregate and may be used in other applications. Sometimes referred to as #67 aggregate.

aggregate.

#### Pleasanton 3/8" Pea Gravel



A 3/8" aggregate that has 100% passing the 1/2" sieve with 85-100% passing the 3/8" sieve. Typically used as a concrete aggregate and may be used in other applications.

#### Pleasanton Top Sand



A washed sand that has 100% passing the 3/8" sieve. Used for ready mix applications and may be used in other applications.

# Vulcan Materials Company

## Environmental Product Declaration

### LCA Study

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#### 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 (including recycled 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.

PRODUCTION Stage (Mandatory)			CONSTRUCTION Stage		USE Stage					END-OF-LIFE Stage			
Extraction and upstream production	Transport to factory	Manufacturing	Transport to site	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	De-construction/Demolition	Transport to waste processing or disposal	Waste processing	Disposal of waste
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4

**Figure 1. Life-Cycle Stages and Modules**

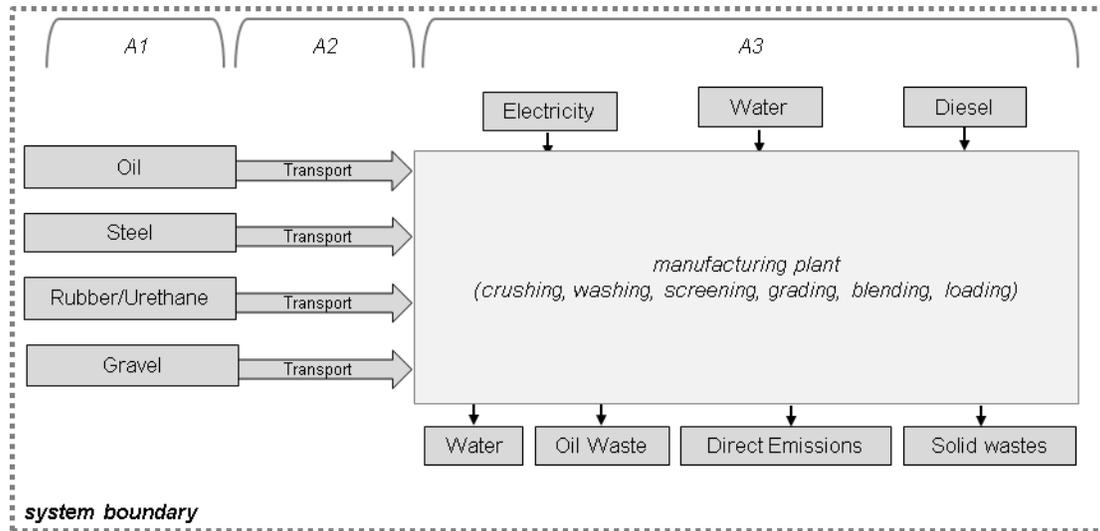
Except as noted above, all other life cycle stages as described in Figure 1 are excluded from the LCA study. The following processes are also excluded from the study:

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.

# Vulcan Materials Company Environmental Product Declaration LCA Study

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



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

Electricity impacts are calculated based on the 2012 resource mix at the level of North American Electricity Reliability Council (NERC) WECC region. The 2015 grid mix contains: 27.2% coal, 25.7% hydro, 28.4% natural gas, 8% nuclear, 5% solar, 2% geothermal.

Explanatory materials may be requested by contacting:

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# Vulcan Materials Company

## Environmental Product Declaration

### Environmental Impacts

Cradle to Gate (A1-A3) impact results per 1 metric tonne (dry weight) of product are outlined in Table 2 for each aggregate.

**Table 2: Cradle-to-Gate Impact Results for Aggregates Covered in Study**

Impact category	Unit <sup>1</sup>	Rock Dust	1/2" Crushed	3/4" Crushed	3/8" Crushed	MFG Sand	Class II Base	Crushed Class II Perm	Class II Perm	1" x #4	3/4" x #4	Pea Gravel	Top Sand
Global warming potential	kg CO <sub>2</sub> eq	5.72	5.65	5.63	5.75	7.49	5.31	5.26	4.50	4.43	4.48	4.61	4.87
Acidification potential	kg SO <sub>2</sub> eq	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Eutrophication potential	kg N eq	0.04	0.03	0.03	0.04	0.05	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Smog creation potential	kg O <sub>3</sub> eq	0.72	0.71	0.71	0.72	0.80	0.71	0.70	0.69	0.67	0.68	0.69	0.72
Ozone depletion potential	kg CFC-11 eq	4.71E-07	4.65E-07	4.64E-07	4.73E-07	6.49E-07	4.26E-07	4.23E-07	3.42E-07	3.36E-07	3.41E-07	3.54E-07	3.76E-07
Nonrenewable fossil	MJ (HHV)	77.4	76.5	76.2	77.8	100.4	72.0	71.5	61.7	60.6	61.4	63.1	66.6
Nonrenewable nuclear	MJ (HHV)	11.3	11.2	11.2	11.4	15.7	10.2	10.15	8.14	8.01	8.13	8.44	8.97
Renewable (biomass)	MJ (HHV)	1.04	1.02	1.02	1.04	1.44	0.93	0.92	0.74	0.72	0.74	0.76	0.81
Renewable (solar, wind, hydroelectric, and geothermal)	MJ (HHV)	13.1	12.9	12.9	13.2	18.3	11.8	11.67	9.27	9.12	9.26	9.63	10.25
Nonrenewable material resources	kg	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Renewable material resources	kg	0.06	0.06	0.06	0.06	0.09	0.06	0.06	0.04	0.04	0.04	0.05	0.05
Net fresh water	L	0.63	0.61	0.60	0.64	0.72	0.67	0.64	0.66	0.61	0.63	0.63	0.70
Non-hazardous waste generated	kg	0.07	0.07	0.07	0.07	0.08	0.07	0.07	0.07	0.07	0.07	0.07	0.08
Hazardous waste generated	kg	3.01E-04	2.98E-04	2.97E-04	3.03E-04	4.18E-04	2.72E-04	2.70E-04	2.16E-04	2.13E-04	2.16E-04	2.24E-04	2.38E-04

This EPD only covers the cradle-to-gate impacts of aggregates using a declared unit and the results cannot be used to compare between products. EPDs from different programs (using different PCR) may not be comparable.

<sup>1</sup> Equivalence (eq)  
Higher Heating Value (HHV)

# Vulcan Materials Company

## Environmental Product Declaration

### Environmental Impacts

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#### Air Permits, Dust Suppression

Air permitting is dedicated to maintaining full compliance with State and local air permit requirements. Pleasanton assures that dust suppression is applied to control fugitive dust from leaving the property. The Pleasanton facility maintains air permits under the Bay Area Air Quality Management District. Additional information on air permits can be found at: <http://www.baaqmd.gov/>

#### Universal Waste, Used Oil, Anti-Freeze, Used Batteries

Pleasanton's used oil is picked up on site by our approved oil recycling vendor. The used oil is recycled at a CA-permitted recycling facility. Universal Waste such as fluorescent light bulbs and small batteries are picked up and removed by our approved vendor for recycle. All used large batteries are stored in a secure and monitored area. The used batteries are sent to approved battery recycling vendors. Additional information on waste recycling can be found at <http://www.calrecycle.ca.gov/usedoil/> <http://www.dtsc.ca.gov/HazardousWaste/UniversalWaste/index.cfm>

#### Water Management

Pleasanton maintains a site specific National Pollution Discharge Elimination System (NPDES) general water permit to ensure control and handling of process waters and storm water. Pleasanton reuses water on site in the interest of water conservation. Pleasanton also contributes to beneficial basin water recharge by providing water to the State Zone 7 Water Agency. Additional information on NPDES permitting and the Zone 7 Water Agency can be found at: <http://www.waterboards.ca.gov/sanfranciscobay/> <http://www.zone7water.com/>

#### Mining and Reclamation

The Pleasanton site operates under Surface Mining Permit-16, issued by Alameda County, California. Post-mining reclamation activities are governed by a County approved reclamation plan, which conforms to the State of California's Surface Mining and Reclamation Act (SMARA). The reclamation plan assures the property is returned to a safe and stable condition, which will support secondary uses after mining is complete. Reclamation obligations are fully bonded per SMARA and reviewed and updated as warranted annually.