Environmental Product Declaration

This Environmental Product Declaration (EPD) is for seven recycled concrete aggregate products manufactured by Kangley Rock & Recycling at their Black River facility.
Environmental Product Declaration

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

Product Category Rule:
ASTM Product Category Rules (PCR) for Construction

Declared Unit: 1 metric ton (dry weight).

Program Operator:
ASTM International
http://www.astm.org/EPDs.htm

EPD Owner:
Kangley Rock & Recycling
9216 8th Ave S
Seattle, WA 98108
425-226-1000 • http://www.stonewayconcrete.com/

LCA and EPD Developer:
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Date of Issue:
February 21, 2018 (valid for 5 years until February 21, 2023).

ASTM Declaration Number: EPD-079

Products
The seven recycled concrete aggregates covered in this EPD are produced at:

Black River
510 Monster Road
Renton, WA 98055

Material Composition
The material composition of the aggregates covered in this study is 100% recycled concrete.
Each aggregate is compliant with the standards and specifications listed in Table 1.

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Name</th>
<th>Standards</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>65011</td>
<td>5/8 Crushed (CSTC)</td>
<td>D2940/D2940M-15</td>
<td>Graded Aggregate material for Bases or subbases for highway or airports.</td>
</tr>
<tr>
<td>65010</td>
<td>1 1/4 CSBC</td>
<td>D2940/D2940M-15</td>
<td>Graded Aggregate material for bases or subbases for highway or airports.</td>
</tr>
<tr>
<td>65043</td>
<td>ASTM 467 (1 1/2” Recycled)</td>
<td>ASTM C33/C33m-13</td>
<td>Lightweight coarse aggregate. Colors consist of gray, brown and tan.</td>
</tr>
<tr>
<td>65015</td>
<td>2” X 4”</td>
<td>ASTM C33/C33m-13</td>
<td>Typically used as a concrete aggregate and may be used in other applications.</td>
</tr>
<tr>
<td>65013</td>
<td>2” X 3/4 RC Ballast</td>
<td>ASTM C33/C33m-13</td>
<td>Heavy aggregate material. Colors consist of light gray and brown.</td>
</tr>
<tr>
<td>6501MR</td>
<td>2” Minus Recycled Gravel Barrow</td>
<td>ASTM C33/C33m-13</td>
<td>A 2” Minus aggregate used as a concrete aggregate and may be used in other applications.</td>
</tr>
<tr>
<td>65017</td>
<td>4”x 8”</td>
<td>ASTM C33/C33m-13</td>
<td>Typically used as a concrete aggregate and may be used in other applications.</td>
</tr>
</tbody>
</table>
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.

 Except as noted above, all other life cycle stages as described in Figure 1 are excluded from the Life Cycle Assessment (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.

Electricity impacts are calculated based on the 2012 resource mix at the level of North American Electricity Reliability Council (NERC) Western Electricity Coordinating Council (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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Stoneway Concrete
9216 8th Ave S
Seattle, WA  98108
425-226-1000
GMckinnon@stonewayconcrete.com
Environmental Impacts

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

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

<table>
<thead>
<tr>
<th>Impact category</th>
<th>Unit1</th>
<th>1 1/4 CSBC</th>
<th>2” minus recycled gravel barrow</th>
<th>2” x 3/4 RC Ballast</th>
<th>2” x 4”</th>
<th>4” x 8”</th>
<th>5/8” Crushed (CSTC)</th>
<th>ASTM 467 (1/2” Recycled)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global warming potential</td>
<td>kg CO₂ eq</td>
<td>4.59</td>
<td>6.87</td>
<td>4.49</td>
<td>6.46</td>
<td>3.12</td>
<td>3.61</td>
<td>6.32</td>
</tr>
<tr>
<td>Acidification potential</td>
<td>kg SO₂ eq</td>
<td>0.04</td>
<td>0.04</td>
<td>0.03</td>
<td>0.04</td>
<td>0.03</td>
<td>0.03</td>
<td>0.04</td>
</tr>
<tr>
<td>Eutrophication potential</td>
<td>kg N eq</td>
<td>0.02</td>
<td>0.04</td>
<td>0.02</td>
<td>0.04</td>
<td>0.01</td>
<td>0.01</td>
<td>0.03</td>
</tr>
<tr>
<td>Smog creation potential</td>
<td>kg O₃ eq</td>
<td>0.90</td>
<td>0.94</td>
<td>0.87</td>
<td>0.95</td>
<td>0.83</td>
<td>0.85</td>
<td>0.93</td>
</tr>
<tr>
<td>Ozone depletion potential</td>
<td>kg CFC-11 eq</td>
<td>6.04E-07</td>
<td>8.35E-07</td>
<td>5.86E-07</td>
<td>7.95E-07</td>
<td>4.42E-07</td>
<td>4.96E-07</td>
<td>7.78E-07</td>
</tr>
<tr>
<td>Nonrenewable fossil</td>
<td>MJ (HHV)</td>
<td>89.9</td>
<td>118</td>
<td>87.7</td>
<td>114</td>
<td>69.9</td>
<td>76.7</td>
<td>111</td>
</tr>
<tr>
<td>Renewable (biomass)</td>
<td>MJ (HHV)</td>
<td>0.59</td>
<td>1.19</td>
<td>0.62</td>
<td>1.08</td>
<td>0.29</td>
<td>0.40</td>
<td>1.06</td>
</tr>
<tr>
<td>Renewable (solar, wind, hydroelectric, and geothermal)</td>
<td>MJ (HHV)</td>
<td>6.97</td>
<td>14.1</td>
<td>6.78</td>
<td>12.7</td>
<td>2.54</td>
<td>4.00</td>
<td>12.4</td>
</tr>
<tr>
<td>Nonrenewable material resources</td>
<td>kg</td>
<td>0.09</td>
<td>0.16</td>
<td>0.09</td>
<td>0.15</td>
<td>0.04</td>
<td>0.06</td>
<td>0.15</td>
</tr>
<tr>
<td>Renewable material resources</td>
<td>kg</td>
<td>0.04</td>
<td>0.07</td>
<td>0.04</td>
<td>0.06</td>
<td>0.02</td>
<td>0.02</td>
<td>0.06</td>
</tr>
<tr>
<td>Net fresh water</td>
<td>L</td>
<td>0.19</td>
<td>0.40</td>
<td>0.38</td>
<td>0.40</td>
<td>0.37</td>
<td>0.38</td>
<td>0.39</td>
</tr>
<tr>
<td>Non-hazardous waste generated</td>
<td>kg</td>
<td>0.03</td>
<td>0.03</td>
<td>0.03</td>
<td>0.03</td>
<td>0.03</td>
<td>0.03</td>
<td>0.03</td>
</tr>
<tr>
<td>Hazardous waste generated</td>
<td>kg</td>
<td>1.75E-04</td>
<td>3.36E-04</td>
<td>1.73E-04</td>
<td>3.05E-04</td>
<td>7.82E-05</td>
<td>1.11E-04</td>
<td>2.98E-04</td>
</tr>
</tbody>
</table>

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.

1 Equivalence (eq)
Higher Heating Value (HHV)
Sustainability

Black River facility is dedicated to environmental stewardship and is committed to exploring and actively seeking new ways to reduce the environmental impact on the environment at large. Black River will think resourcefully, work cooperatively and continuously strive to enhance our environmental efforts in order to better protect the environmental and the health and safety of our employees and the community in which we work and live.

Air Permits, Dust Suppression

Black River has taken the correct steps for staying compliant with State and Local air permit requirements. Dust suppression on all aggregate activities insures no fugitive dust leaves the property and will keep the surrounding environment safe. Black River facility maintains air permits under the Puget Sound Clean Air Agency. Additional information on air permit requirements in the Northwest area can be found at: www.pscleanair.org

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

At all of our locations including Black River all used oil is picked up on site by sanctioned oil recycling vendors. Once in the vendors care, they recycle the used oil appropriately. All Universal Waste (e.g. fluorescent light bulbs, small batteries) are picked up and removed by our approved vendor for recycling. All batteries considered too large for universal waste are stored in a completely secure and monitored area. The large batteries are sent to approved battery recycling vendors.

Clean Concrete Guidance

Black River facility strictly adheres to the Clean Concrete Guidance and cannot accept any products that present a threat to human health or the environment greater than that inherent to the material. Black River does not accept painted concrete, concrete debris, such as wood waste, concrete containing asbestos, concrete used at fuel storage facilities, or concrete used at electrical warehouses that could be considered toxic or hazardous. To ensure the material being disposed of and to keep the recycling facilities clean, Kangley Rock & Recycled has all customers sign a Clean Concrete Acceptance Agreement, a legally binding contract, before any material is accepted onsite. This acceptance agreement reserves the right to reject any material that presents signs of contamination or is deemed unsuitable per our acceptance guidelines.

Water Management

Black River recycles the majority of the water onsite in order to reduce the environmental impact on the surrounding area. Best Management Practices (BMP) and monthly responsibilities such as catch basin filters, monthly water sampling, and monthly inspections are in place to insure the storm water and processed water are all being treated correctly.