

# Sample of a Compliant Life Cycle Impact Reduction Action Plan

for LEED version 4.1 credit:

Environmental Product Declarations, Option 2 (BD+C and ID+C rating systems)

*Note: This sample Action Plan is fictitious and is intended for illustrative purposes only. The information and analysis results shown herein do not represent any real company, manufacturer or product line.*

Company:

BCD Gypsum

Products Included:

Gypsum Finishing Compound

# Sample of a Life Cycle Impact Reduction Action Plan Report

## Impact information and Reduction Summary

|  |  |  |  |   |  |
|--|--|--|--|---|--|
| <b>Manufacturer:</b>   | BCD Gypsum Company   |  |  |   |  |
| <b>Manufacturer Contact Information:</b>   | John Doe, LCA Manager<br>John.Doe.LCAMgr@SAMPLEABC.com   |  |  |   |  |
| <b>Product Name:</b>   | BCD Product 123 (Gypsum Finishing Compound)  |  |  |   |  |
| <b>Product Type:</b>   | Commercial Building Product  |  |  |   |  |
| <b>Product Description:</b>  | Building product used for commercial installation  |  |  |   |  |
| <b>Location where the product was manufactured:</b>  | Alberta, Canada  |  |  |   |  |
| <b>Title of the Life Cycle Assessment/ Environmental Product Declaration that the Assessment is Based Upon:</b><br>(cannot be industry-wide) | EPD for BCD Product 123 Gypsum Finishing Compound  |  |  |   |  |
| <b>Life Cycle Assessment/ Environmental Product Declaration Type:</b>  | <input type="checkbox"/> Publicly available, critically reviewed LCA (conforming to ISO 14044)<br><input type="checkbox"/> Internally verified LCA with a product specific EPD (conforming to ISO 14025, EN 15804, or ISO 21930)<br><input checked="" type="checkbox"/> Product specific Type III EPD (external verification of LCA and EPD) |  |  |   |  |
| <b>Link to publicly available LCA or EPD (if available)</b>  | <a href="http://www.bcdgypsumsustainability.com">www.bcdgypsumsustainability.com</a>   |  |  |   |  |
| <b>LCA Framework/PCR</b>   | Gypsum PCR, North America  |  |  |   |  |
| <b>Date of LCA or EPD:</b>   | May 15, 2019   |  |  |   |  |
| <b>Scope:</b><br>(bolded modules are those that are required by the PCR)   | <i>Raw Materials and Manufacturing Modules</i>   | <i>Delivery and Installation Modules</i>   | <i>Use Phase Modules</i>   |   | <i>End of Life Modules</i>   |
|  | <input checked="" type="checkbox"/> <b>A1</b><br><input checked="" type="checkbox"/> <b>A2</b><br><input checked="" type="checkbox"/> <b>A3</b>  | <input checked="" type="checkbox"/> <b>A4</b><br><input checked="" type="checkbox"/> <b>A5</b> | <input checked="" type="checkbox"/> <b>B1</b><br><input checked="" type="checkbox"/> <b>B2</b><br><input checked="" type="checkbox"/> <b>B3</b><br><input checked="" type="checkbox"/> <b>B4</b> | <input checked="" type="checkbox"/> <b>B5</b><br><input checked="" type="checkbox"/> <b>B6</b><br><input checked="" type="checkbox"/> <b>B7</b> | <input checked="" type="checkbox"/> <b>C1</b><br><input checked="" type="checkbox"/> <b>C2</b><br><input checked="" type="checkbox"/> <b>C3</b><br><input checked="" type="checkbox"/> <b>C4</b> |
|  | <input type="checkbox"/> Module D: Benefits and Loads beyond system boundary   |  |  |   |  |
| <b>Describe how the scope of the product LCA or EPD aligns with actions identified in this Action Plan.</b>                                  | The specific actions identified in the Action Plan were identified through investigation of delivery module A4 (product packaging), which was required in the PCR, analyzed in the LCA and presented in the EPD.   |  |  |   |  |
| <b>LCA Software and Version:</b>   | GaBi: 8.2.1  |  |  |   |  |
| <b>LCA Dataset:</b>  | GaBi Service Pack 37   |  |  |   |  |
| <b>Action Plan Creation Date:</b>  | June 10, 2019  |  |  |   |  |
| <b>Action Plan Expiration Date:</b><br>(must be 4 years or less)   | June 10, 2023  |  |  |   |  |
| <b>Is this Action Plan applicable to all products listed in the corresponding LCA or EPD, or only a subset?</b>                              | Yes, 100%. The Action Plan is applicable to all gypsum finishing compound manufactured by BCD Gypsum since the Calgary, Alberta facility is our only manufacturing location for this product.  |  |  |   |  |

**Table or Summary of Largest Life Cycle Impacts identified in the Analysis (must include GWP):**

Table 7.8: Overall Environmental Impact Potentials for BCD Finishing Compound – Calgary, AB (per 100m<sup>2</sup> coverage)

| TRACI 2.1       |                        |               |                             |             |           |                        |                      |             |          |
|-----------------|------------------------|---------------|-----------------------------|-------------|-----------|------------------------|----------------------|-------------|----------|
| Impact Category | Unit                   | Raw Materials | Raw Material Transportation | Manufacture | Packaging | Final Product Shipping | Installation and Use | End of Life | Total    |
| GWP-T           | kg CO <sub>2</sub> eq. | 6.79E+00      | 5.90E+00                    | 2.18E+00    | 8.60E+00  | 5.85E+00               | 7.68E-02             | 1.70E+00    | 3.11E+01 |
| ODP-T           | kg CFC-11 eq.          | 6.49E-07      | 1.17E-06                    | 1.15E-09    | 4.28E-07  | 1.41E-06               | 2.64E-08             | 4.78E-07    | 4.17E-06 |
| AP-T            | kg SO <sub>2</sub> eq. | 4.18E-02      | 2.77E-02                    | 1.12E-02    | 3.34E-02  | 2.19E-02               | 5.01E-04             | 8.21E-03    | 1.45E-01 |
| EP-T            | kg N eq.               | 1.23E-02      | 1.25E-02                    | 2.32E-04    | 7.38E-03  | 6.77E-03               | 9.08E-05             | 1.98E-03    | 4.13E-02 |
| POCP-T          | kg O <sub>3</sub> eq.  | 5.61E-01      | 4.68E-01                    | 7.97E-02    | 5.37E-01  | 4.44E-01               | 1.35E-02             | 1.96E-01    | 2.30E+00 |
| ADP-T           | MJ                     | 2.46E+01      | 1.06E+01                    | 3.78E+00    | 3.29E+01  | 1.27E+01               | 2.50E-01             | 4.40E+00    | 8.92E+01 |

Table 7.15: Overall Environmental Impact Potentials for BCD Finishing Compound – Calgary, AB (TRACI 2.1, 100m<sup>2</sup> coverage)

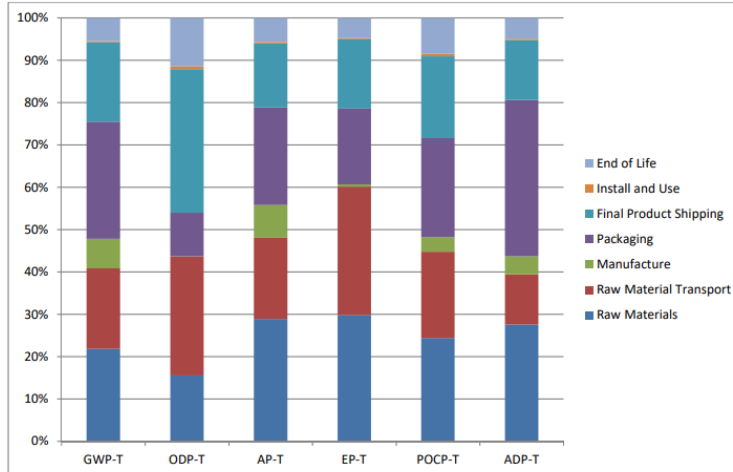
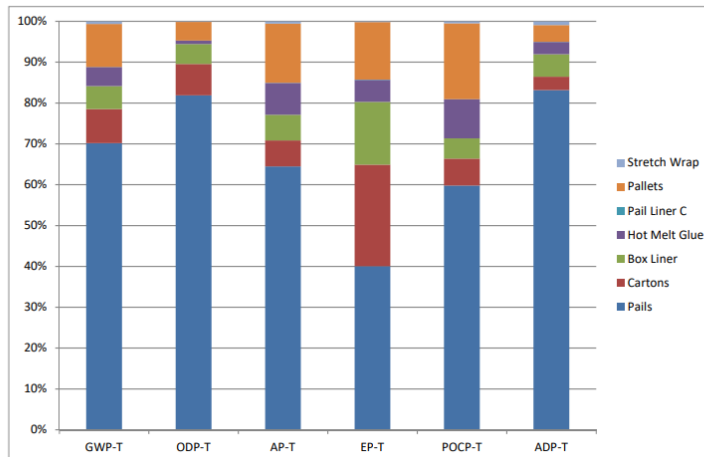





Table 7.11: Environmental Impact Potentials for Packaging for BCD Finishing Compound – Calgary, AB (TRACI 2.1, 100m<sup>2</sup>)



**Narrative Description of the Impact Areas Targeted for Reduction** (must include specific steps, dates, and timeline for completion, and include why/why not GWP is targeted for reduction and include a numeric impact reduction target. Actions must correspond to impact modules analyzed in the LCA or EPD):

The results for the Mid-Weight Gypsum Finishing Compound produced at the Calgary, AB plant, show that the packaging of the product accounts for 20-40% of the overall environmental impacts in 5 of the 6 TRACI environmental impacts reviewed in the study. Further analysis shows that the pails used in the packaging account for the largest impact component for these impact categories. BCD Gypsum Company has developed an action plan to reduce the overall life cycle impacts of the Mid-Weight Gypsum Finishing Compound by changing the packaging from the plastic pails to cartons made from recycled material which will result in a 20% impact reduction of GWP. Study of the product shows that this change in packaging has no impact on product quality and continues to promote recycling of product containers after the product is used. This action plan includes the following steps for anticipated completion by November 2022:

|  | Specific Steps   | Due Dates | Impact Reduction |
|--|--|-----------|------------------|
|  | 1. Ongoing product quality study to understand impact of new packing materials   | 12/1/2019 | N/A              |
|  | 2. Discontinued use of the plastic pails   | 3/1/2020  | N/A              |
|  | 3. Increase order of cardboard cartons to replace plastic pails  | 8/1/2019  | -20% GWP         |
|  | 4. Decommission of manufacturing packaging equipment specific to the pails   | 12/1/2020 | N/A              |
|  | 5. Ongoing follow up study with customer feedback  | 12/1/2021 | N/A              |
| <b>This Action Plan was prepared by:</b><br>(must be prepared by someone with experience conducting product-specific LCAs) |   |           |                  |
|  | John Doe, LCACP  |           |                  |
| <b>This Action Plan was confirmed by an executive of the manufacturer:</b>   |   |           |                  |
|  | Company Executive  |           |                  |

## Addendum to LCA Report: Action Plan for Impact Reduction

This life cycle assessment (LCA) was conducted for the Light Weight and Mid Weight Finishing Compounds produced by BCD Gypsum company Calgary, AB. This report is compiled in accordance with the EN 15804 Standard and the Product Category Rule (PCR) for Building-Related Products and Services: Part A-Calculation rules for the Life Cycle Assessment and requirements on the Project Report. The results will be published in accordance with the EN 15804 standard and the PCR Guidance-Texts for Building-Related Products and Services: Part B-Joint Compound EPD Requirements. This work was completed by the Sustainability Department of BCD Gypsum Company.

For this life cycle assessment, the BCD Sustainability Department collected specific data on energy and material inputs, wastes, water use, and transportation impacts for the Calgary, AB manufacturing plant. The data used was for calendar year 2016. Production data was used to allocate these inputs and wastes to the functional unit of 100m<sup>2</sup> of covered substrate considering an installation scenario as defined by a GA-214 Level 4 finish with the quantity adjusted for the measured shrinkage with a service life of 75 years.

GaBi 8.2 software was utilized for modeling the complete cradle-to-grave LCI for this study. Both primary and secondary LCI and metadata are used throughout the study. All secondary data is taken from literature, previous LCA studies, and life cycle databases. The Ecoinvent v3 (<http://ecoinvent.org/>), US-Ecoinvent v2.2 ([www.earthshift.com](http://www.earthshift.com)), and US LCI ([www.nrel.gov/lci](http://www.nrel.gov/lci)) databases are used in this analysis frequently and contain thousands of processes for material, processing, energy, and transportation. These databases are critically reviewed and require a paid license.

### Impact Areas Targeted for Reduction – Calgary, AB

An analysis of the life cycle results for the average Mid Weight Gypsum Finishing Compound produced at the Calgary, AB facility, indicates that the packaging used at the end of the manufacturing process accounts for most of the manufacturing Global Warming Impact Potential impacts, as well as 20-40% of four more impact categories, as seen below in Table 7.8 and Figure 7.15. Further analysis indicated these impacts are associated with the plastic pails used in the packaging, seen below in Figure 7.11. The targeted area for the reduction of impacts is identified as the packaging, with an emphasis on the pails, by replacing the pails with cartons which are lighter weight and made from recycled material.

Table 7.8: Overall Environmental Impact Potentials for BCD Finishing Compound – Calgary, AB (per 100m<sup>2</sup> coverage)

| TRACI 2.1       |                        |               |                             |             |           |                        |                      |             |          |
|-----------------|------------------------|---------------|-----------------------------|-------------|-----------|------------------------|----------------------|-------------|----------|
| Impact Category | Unit                   | Raw Materials | Raw Material Transportation | Manufacture | Packaging | Final Product Shipping | Installation and Use | End of Life | Total    |
| GWP-T           | kg CO <sub>2</sub> eq. | 6.79E+00      | 5.90E+00                    | 2.18E+00    | 8.60E+00  | 5.85E+00               | 7.68E-02             | 1.70E+00    | 3.11E+01 |
| ODP-T           | kg CFC-11 eq.          | 6.49E-07      | 1.17E-06                    | 1.15E-09    | 4.28E-07  | 1.41E-06               | 2.64E-08             | 4.78E-07    | 4.17E-06 |
| AP-T            | kg SO <sub>2</sub> eq. | 4.18E-02      | 2.77E-02                    | 1.12E-02    | 3.34E-02  | 2.19E-02               | 5.01E-04             | 8.21E-03    | 1.45E-01 |
| EP-T            | kg N eq.               | 1.23E-02      | 1.25E-02                    | 2.32E-04    | 7.38E-03  | 6.77E-03               | 9.08E-05             | 1.98E-03    | 4.13E-02 |
| POCP-T          | kg O <sub>3</sub> eq.  | 5.61E-01      | 4.68E-01                    | 7.97E-02    | 5.37E-01  | 4.44E-01               | 1.35E-02             | 1.96E-01    | 2.30E+00 |
| ADP-T           | MJ                     | 2.46E+01      | 1.06E+01                    | 3.78E+00    | 3.29E+01  | 1.27E+01               | 2.50E-01             | 4.40E+00    | 8.92E+01 |

Table 7.15: Overall Environmental Impact Potentials for BCD Finishing Compound – Calgary, AB (TRACI 2.1, 100m<sup>2</sup> coverage)

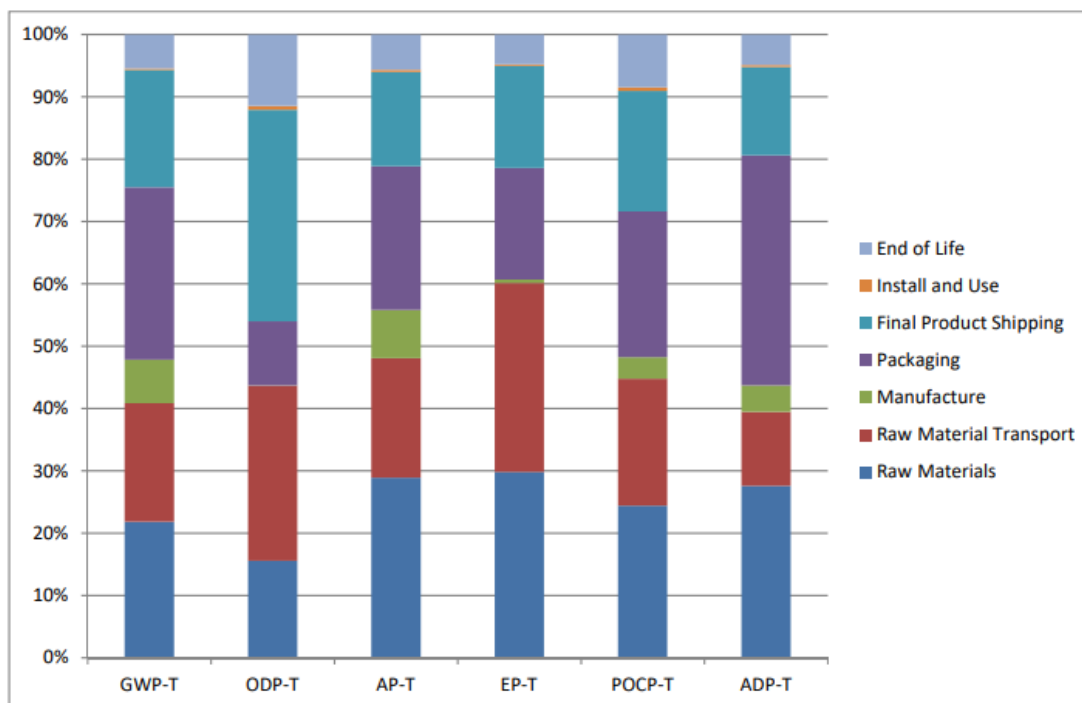
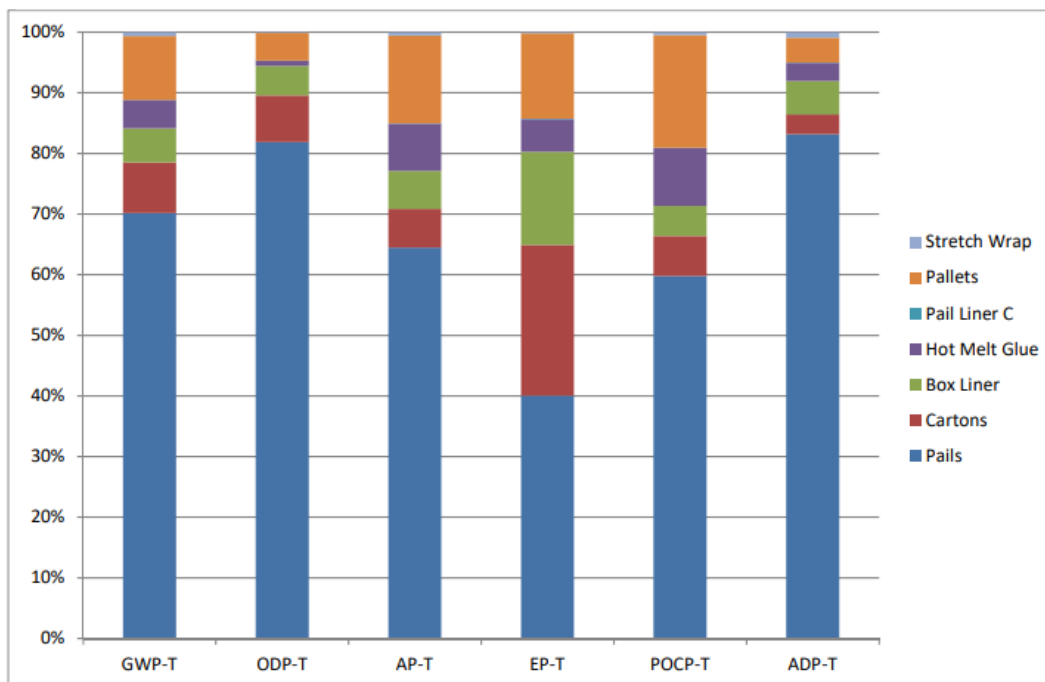
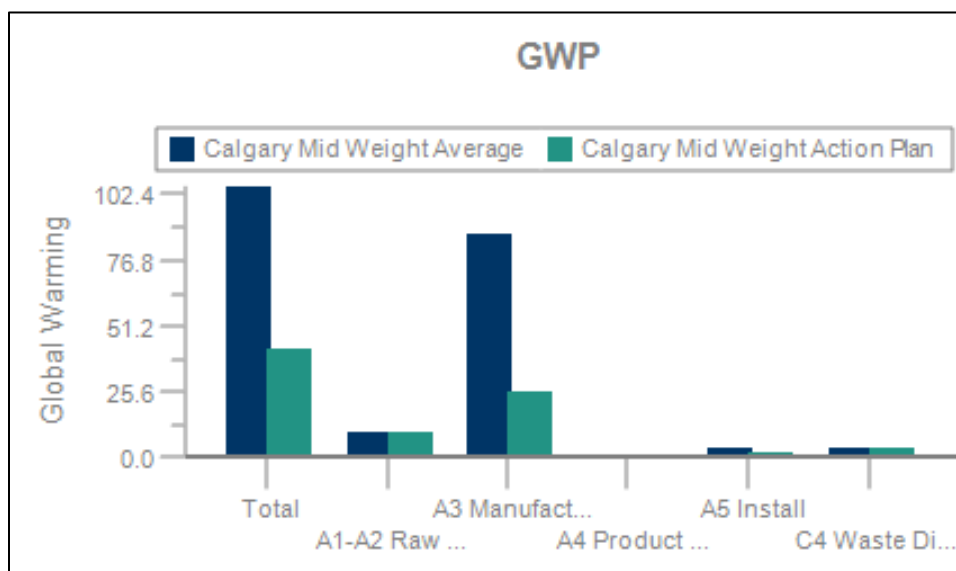
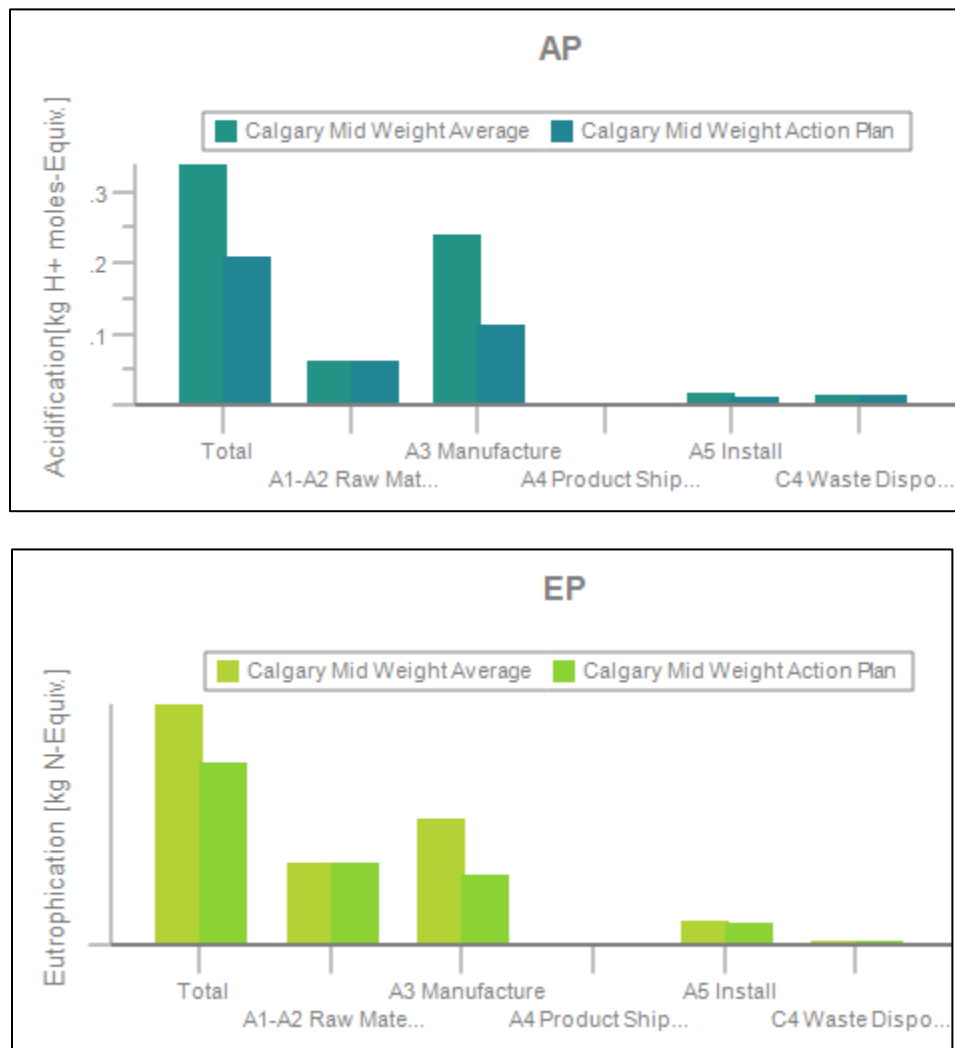


Table 7.11: Environmental Impact Potentials for Packaging of BCD Finishing Compound – Calgary, AB (TRACI 2.1, 100m<sup>2</sup> coverage)



The charts below show the potential decrease in environmental impacts that could be realized by replacing the plastic pails with cardboard cartons. The three charts analyze Global Warming Potential (GWP), Acidification Potential (AP), and Eutrophication Potential (EP).





The action plan for the replacement of the plastic pails is outlined below in Table 7.9. A gradual phase out of the plastic pails will begin immediately with targeted complete phase out by December 2019. In order accomplish this, the supplier of the cardboard cartons will need to be contacted to increase the order of the cartons to replace the pails. After complete phase out of the plastic pails is accomplished, the plant can begin to decommission the packaging equipment that was specific to the pails. Finally, the business will follow up with a customer feedback survey and updated study on the impact reductions.

| Table 7.9: Action Plan for Removal of Plastic Pails in Packaging               |           | Impact Reduction |
|--|-----------|------------------|
| 1. Ongoing product quality study to understand impact of new packing materials | 12/1/2019 | N/A              |
| 2. Discontinued use of the plastic pails                                       | 3/1/2020  | N/A              |
| 3. Increase order of cardboard cartons to replace plastic pails                | 8/1/2019  | -20% GWP         |
| 4. Decommission of manufacturing packaging equipment specific to the pails     | 12/1/2020 | N/A              |
| 5. Ongoing follow up study with customer feedback                              | 12/1/2021 | N/A              |