

Life Cycle Assessment of Borate Treated Structural Systems

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Rio Tinto Borax has undertaken an initiative to integrate Sustainable Development into its business practices. At the outset of this effort, an internal team at the company established several objectives to help guide the project. These include employee safety, contribution to community needs, optimization of borate deposits, and sustainable development assessment of borate products and their applications.

With regard to products and applications, Borax has completed cradle-to-gate Life Cycle Assessment of its products consistent with ISO 14040 series LCA standards¹. Further, among the first LCA of borate applications, Borax has completed cradle-to-gate Life Cycle Assessments of Tim-bor® pressure treated lumber and zinc borate treated oriented strand board (OSB) structural sheathing consistent with ISO 14040 series LCA standards.¹⁰ An important goal for the LCA work on borate treated lumber and OSB is to place the resulting data into authoritative databases such as BEES and ATHENA™ so that architects, engineers, and builders can better characterize the sustainability of using borate treated structural materials in their building projects. A third party critical review was not carried out for this study, given the goal definition and the requirements of ISO 14040. However, Athena Sustainable Materials Institute was engaged throughout the study to review goal and scope definition and data as it was collected and modeled. Additionally, both Five Winds International (Borax's LCA contractor) and Borax employees internally reviewed the data.

The study includes the extraction of materials from earth (mining), processing and treatment (production) and packaging. It also includes the manufacture and transportation of raw and processing materials to Borax's sites, and onsite co-generated and purchased electricity. The extraction, refinement and delivery of purchased primary fuels are also included within the boundaries of the study. Additionally, it includes forestry/wood production and the manufacturing processes and raw materials to produce OSB and treated lumber. It also includes the transportation of both Borax products and borate treated lumber and OSB. Infrastructure, such as capital equipment, and overhead are excluded. This is common practice in LCA studies as they have shown minimal overall impact in the context of a product system life cycle. Overall, the study supports the business development efforts currently underway for Borate Treated Structural Systems that are currently available in the marketplace. This paper will provide the methodology utilized, resulting data sets as well as some analysis.

¹⁰ ISO 14040 (1997). Environmental management – Life cycle assessment - principals and framework. International Organization for Standardization, Geneva.

ISO 14041 (1998). Environmental management – Life cycle assessment – Goal and scope definition and inventory analysis. International Organization for Standardization, Geneva.

ISO 14042 (1998). Environmental management – Life cycle assessment – Life cycle impact assessment. International Organization for Standardization, Geneva.