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April 24th 2017

**Comments from the Ecology Action Centre on The Proposal Submitted by Lafarge Canada  
To the Province of Nova Scotia, Department of Environment  
April 24, 2017**

**Summary**

The Ecology Action Centre strongly opposes the burning of tires for fuel. Based on our research and communication with one of the top experts in the field, we believe the burning of tires at the Brookfield facility poses a health risk to surrounding communities and the natural environment. When the full life cycle of the alternative uses for recycled tires is considered, we estimate based on US Environmental Protection Agency data that burning tires for fuel will not reduce overall greenhouse gas emissions.

We are concerned that approval of incineration of tires will set a dangerous precedent for recycling programs in Nova Scotia. In particular, we believe that most Nova Scotians would not be happy to hear that the proceeds of the tire recycling fee are going to go to a large multi-national company to burn tires, rather than to a local company that recycles tires and creates more jobs.

Production of Tire Derived Aggregate (TDA) presents an alternative to burning tires. In the recycling hierarchy, recycling, rather than heat recovery or burning, is considered a higher or better use. A local company claims that it can use all the tires produced in Nova Scotia on an annual basis for TDA. The production of TDA creates more jobs and local economic benefits, reduces greenhouse gas emissions by just as much, and has other clear health and environmental benefits. We strongly encourage the Minister of the Environment and the Government of Nova Scotia to reject the proposal to burn tires.

## Air Quality and Health Risks

The Lafarge Environmental Assessment (EA) submission lacks a full exploration of the risks involved in burning whole tires for energy. Air quality expert Dr. Carman raised several concerns about the risks of Tire Derived Fuel (TDF) use in cement manufacturing. Cement kilns are complex physical systems with many parameters, and the conditions inside cannot be kept perfectly constant, therefore variations in temperature, oxygen, and mixing are expected (N. Carman, Personal Communication, April 2017). Low temperature or oxygen can result in incomplete combustion and release of several persistent, bioaccumulating toxins such as polycyclic aromatic hydrocarbons (PAH), dioxins and furans. Heavy metals can also be released. (Energy Justice, 2007). Modelling shows that many of these pollutants are predicted to increase (see Appendix F of the Lafarge submission). The model suggests that even with the increases the emissions will still meet current air quality standards, but this modelling did not take into account the potential for emission exceedances due to incomplete combustion events. The Brookfield cement plant has a history of events where kiln heat is insufficient for complete combustion. In 2014 air quality was so poor that people in the surrounding community were driven into their homes (Sullivan, 2014). Many of the emissions related to tire burning are extremely toxic to children, carcinogenic, and cause neurodegeneration; the submission does not discuss or put in place a plan to respond if or when exceedances of air quality standards for these pollutants occur.

Lafarge Canada has emphasized the benefit of burning tires over coal because of the reduction in NO<sub>x</sub>, SO<sub>2</sub> and greenhouse gas emissions. We are concerned about the inconsistent results that researchers have obtained when looking at other cement facilities using tires for fuel. Tests show a wide range of results, from reductions in many major pollutants to increases in most. In the case of highly toxic dioxins and furans, research has shown results ranging from a 30% decrease in dioxin and furan emissions to a 3400% increase when using tires (Duggirala, 2009) (MacDonald, 2008). The modelling for the proposal in question suggests a 28% increase in dioxins and furans (see Appendix F), a value not disclosed during the January 26, 2017 consultation (refer to page 17 of Appendix F where

Lafarge responded that no changes in dioxin and furan emissions were expected). What leads to an increase in dioxins and furans is the chlorine content of the fuel; tires contain three times the chlorine as compared to coke-coal (752mg/kg to 183mg/kg) (Gibson, 2015).

Currently there are about one million used tires discarded and recycled every year in Nova Scotia. While the cement plant is currently equipped to burn materials such as asphalt shingles, tire derived fuel requires additional precautions to protect the environment. What additional pollution controls, if any, does Lafarge plan to install at the cement plant to mitigate the additional air pollution expected from the burning of the tires? When a similar project was reviewed by the United States Environmental Protection Agency the recommendation was for the most stringent pollution controls (Miller, 1999). There is no indication of intention in the environmental assessment to retrofit the cement plant for better pollution control.

### **Greenhouse Gas Emissions**

The scope of the environmental assessment submitted by Lafarge is too limited. The broader environmental impacts of a material shift away from recycling tires into tire-derived aggregate (TDA) need to be considered. Life cycle assessment by the US EPA indicates that recycling tires into TDA causes a significant net greenhouse gas emission reduction of 0.39 metric tonnes CO<sub>2</sub>Eq /short ton. This is because recycling tires into TDA avoids emissions associated with the extraction and processing of raw materials to make other aggregate. By comparison, burning tires as TDF in a cement kiln to displace coal consumption is estimated to save about 0.40 metric tonnes CO<sub>2</sub>Eq /short ton (Environmental Protection Agency, 2015). The amounts of greenhouse gas emissions saved by these two uses for recycled tires are practically identical. This indicates that diverting used tires away from aggregate production and into cement kiln fuel does not result in any significant overall greenhouse gas reduction, when the existing uses for waste tires are taken into account.

Considering that there is no overall greenhouse gas reduction, it is our view that the risks of higher air pollutant emissions and the net loss of economic value and jobs from the production of tire derived aggregate that would come with burning tires for fuel are not justified. The best result in the life cycle of a tire is recycling.

### **Tire Derived Aggregate**

The current method of recycling tires and manufacturing tire derived aggregate (TDA) has not only been proven successful, but has been previously reviewed and recommended by the Interdepartmental Committee on Used-tire Management in Nova Scotia. In their 2008 report to the Minister of Environment, the Committee stated that TDA “fills a genuine demand, is environmentally sound, and offers a solid economic opportunity.” This is even truer for tire recycling in the province today (Interdepartmental committee on used-tire management in Nova Scotia, 2008).

Tire derived aggregate (TDA) is a processed tire product that, when used as backfill, improves the strength of soil for engineering projects such as roads or buildings. In addition it has the potential to reduce frost damage when used for roadways or bridges (Moore, 2016). A lot of work has gone into proving the product, and the province is seeing increasing market demand. Beyond its use in roadways, there are two additional market opportunities: in septic systems and engineered wetlands (Scrap Tire News, 2012). Furthermore, TDA was recently used in an awarding winning project, the Amherst Wastewater Treatment Facility, recipient of the 2014 Lieutenant Governor's Award for Excellence in Engineering (Dillion Consulting Limited, 2014). It is clear that TDA is a viable recycling approach in Nova Scotia. Choosing to shift towards burning tires directly affects this local business, and sets a poor precedent for Nova Scotia being a recycling leader.

An additional benefit of using tires for TDA production is that it reduces the need for quarries to produce aggregate from mined materials from the Earth, thus reducing the impact of

quarrying and the demand for new quarries. Delaying or avoiding the need to open new quarries is an environmental benefit that is lost if tires are diverted to be used as fuel.

### **Global Issue**

Tire derived fuels are an approach to tire management in some other jurisdictions. However, cement facilities around the world have experienced backlash from community groups and environmental organizations. This includes other Lafarge cement facilities. For example, in Slovenia a Lafarge facility had its permits to burn waste revoked due to the public response and environmental impact (Zero Waste Europe, 2014). Efforts to replace traditional fuels are not new in the cement industry as they can lead to huge cost savings for the company. However waste tires cannot be considered an environmentally sustainable fuel in Nova Scotia.

### **Valued Ecosystem Components**

Lafarge's submission suggests only two valued environmental/socio-economic components need to be considered: air quality and transportation. There is no mention of water quality, community health, or wildlife in the area, all of which should be considered valued ecosystem components. The limitation in scope results in gaps throughout the submission. No mitigation or response is planned in the case of high emissions. No restoration is suggested in the case of heavy metal contamination. No consideration is given for residual effects on the surrounding ecosystem throughout the entire lifespan of the project.

### **Closing**

This is the second attempt by Lafarge to burn tires for fuel at the Brookfield cement plant. In 2007 the Resource Recovery Fund Board received a similar proposal by Lafarge to burn tires for energy. An advisory committee was created to review and compare used tire processing. They found that there were too many variables related to emissions, and there were several viable alternatives. The result was that the Minister of Environment rejected the

proposal and stated, “We won't be looking at tire-derived fuel any time in the near future.”  
(CBC news, 2007)

It is ten years later and we still have unresolved concerns about the impact of burning tires on air quality and community health. In addition, Nova Scotia does not have a tire accumulation problem; we have a successful recycling program that provides economic benefits to the local community. And there is no overall reduction in greenhouse gas emissions resulting from diverting tires away from recycling in order to burn them. There is no justification for accepting this proposal. Nova Scotia should be aiming to be a leader in recycling and focus on protecting our environment.

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