

Comments on St Marys Cement Bowmanville Application to Burn Alternative Low-Carbon Fuel
ERO Registry Number 019-055

August 22nd, 2020

My comments are listed below and are in no particular order. They include serious concerns, issues, errors and omissions with the St Marys Cement Bowmanville Application.

It should be noted that I previously submitted comments following the two public information meetings I attended. I was not satisfied with the responses I received to those comments and my major concerns remain.

- 1. Burning waste is contrary to and competes with best environmental practices and zero-waste initiatives**, perpetuates manufacturing of unnecessary single-use and/or unrecyclable plastics, resource extraction and poor product and packaging design. **With no lifecycle carbon analysis of products burned, the carbon cost to the planet of burning ALCFs was underestimated and the claim of net carbon reduction to the planet remains unsupported.** Yet through their assertion of net carbon dioxide/GHG reduction, St Marys has applied for this major operational change under Regulation 79/15. Regulation 79/15 does not require a full environmental assessment. As part of their application, St Marys completed a very limited assessment titled *Carbon Dioxide Emission Intensity Report, Golder Associates Ltd., January 2020* which can be found at <http://www.stmaryscement.com/Alternative%20Low%20Carbon%20Fuels%20Documents/Carbon%20Dioxide%20Emission%20Intensity%20Report%20-%20Golder%20Associates%20Ltd%20-%20January%202020.pdf>. The conclusions of this study appear to be based on calculations considering only the carbon content and heat value of the specific ALCF blends burned in the trials. The sampling was very limited - only three (3) samples of two blends were analyzed (see page 7 of the report).
- 2. The demonstration study completed was extremely limited in scope and period with only one blend of potential ALCFs analyzed, yet, with 30% thermal replacement, the application is seeking a major long-term operational change contemplating a wide variety of materials with infinite combinations and chemistry.** It is obvious that there was insufficient data collected and analyzed to support this application. Only one of two trials completed were analyzed since, according to St Marys, Trial 1 did not achieve the target substitution rate. Source testing for each of the alternative fuel trials took place over several days (October 11th and 12th for Trial 1, December 4th and 6th for Trial 2). Trial 1 burned woody residuals and post-consumer paper and plastic materials unsuitable for recycling and Trial 2 burned woody residuals from post-consumer sources as well as residual plastic material from an industrial source unsuitable for recycling. I was told at one of the public meetings that plastic water bottles with a blue tint that made them unsuitable for recycling were used in the demonstration tests. I was also told at one of the public meetings that alternative fuels were provided at no cost to St Marys.

3. As the demonstration was insufficient in scope and scale, the potential detriments to the environment and public health through increased emissions/greater toxic burden from burning alternative fuels were not adequately assessed. It is important to note however, that the limited data collected from the demonstration project **did show that kiln stack emission rates increased for roughly 30% of the chemicals of potential concern when the ALCFs were burned.** (see Slide 31 of *Alternative Low Carbon Fuel Use at St Marys Cement Bowmanville Plant, December 17, 2019* handed out at Public Meeting #2 in Appendix C of the Consultation Report found at <http://www.stmaryscement.com/Alternative%20Low%20Carbon%20Fuels%20Documents/SMC-ALCF-Bowmanville-ConsultationReport-March2020-AppendixC-PublicMeetingMaterials.pdf> and *Appendix F, Calculation Sheet 1 – Kiln Stack Emissions* pasted below and found on page 101 of the *Emission Summary and Dispersion Modelling Report in Support of an Alternative Low-Carbon Fuel Application under Ontario Regulation 79/15 to amend and Environmental Compliance Approval (Air) with Limited Operation Flexibility, BCX Environmental Consulting, March 2020*).

I submitted questions to the MECP in 2019 which included a question about how old their current air standards were. I am including their September 2019 responses as an attachment. The MECP supplied the following table in their response which shows how outdated many of the Regulation 419 standards are for many of the heavy metals/toxins and carbon monoxide. This application made conclusions that were based on very dated standards and thereby underestimates impacts and health risks.

Contaminant	CAS #	Basis	Year
Arsenic and compounds	7440-38-2	Health-based air guideline	1981
Lead and Lead Compounds	7439-92-1	Health-based air standard	2007
Nickel and Nickel Compounds	7440-02-0	Health-based air standard	2011
Zinc	7440-66-6	Particulate-based air standard	1974
Copper	7440-50-8	Health-based air standard	1974
Mercury (Hg)	7439-97-6	Health-based air standard	1974
Lithium (other than hydrides)	7439-93-2	Health-based air standard	1974
Ozone	10028-15-6	Health-based air standard	1974
Particulate matter	N/A	Visibility; air standard	2005
Carbon monoxide	630-08-0	Health-based air standard	1974

4. There are serious concern regarding the alternative fuel demonstration results.

Table 3-2 -Target Values for Alternative Fuel Operational Specification of the Alternative Fuel Demonstration Summary Report, May 2019 by HDR identifies the criterion for Total Halogen Content in the alternative fuels as $\leq 1\%$ and states that this criterion is “*Similar to regulatory guideline in other jurisdictions for similar alternative fuel materials (materials including wood, plastic, paper and textiles)*”.

Yet *Table 3-4 Comparison of Alternative Fuel Test Results to the Target Values for Alternative Fuel Specifications* of the same document reports the Total Halogen Content of the ALCF burned in Trial 2 (the trial which proceeded) was 1.36%. This result well exceeds the 1% criterion.

Furthermore, *Table 3-5 Comparison of Alternative Fuel Test Results to the Target Values for Alternative Fuel Specifications* of the same document reported the **ALCF fuel** for Trial 2 had much higher **% weights for Total Halogen Content, Chlorine, and Sulphur** than Trial 1 (differing by factors of 7.56, 8.25, and 1.15 respectively).

The halogen content of the fuel burned is very significant. Chlorinated, fluorinated and brominated organic compounds pose major health risks. These toxins can be adsorbed on to the ultrafine particulate emitted from incinerators and cement kilns which ferry the compounds into human tissues and organs.

While % weight for Chlorine is given, the values for the other halogens are not stated and they should have been given that the Total Halogen Content exceeded the set criterion.

Table 3-5 Comparison of Alternative Fuel Test Results to the Target Values for Alternative Fuel Specifications also shows that the **mass ratios ($\frac{\mu g}{g}$) of numerous heavy metals/toxins are much higher in the ALCF burned in Trial 2. Much higher mass ratios were reported for antimony, barium, chromium, cobalt, iron, and manganese.** (Trial 2 values greater by factors ≥ 184.75 , 1.46, 1.48, ≥ 9.5 , 1.62, 1.93 respectively). The heavy metal/toxin content of the fuel burned is very significant. Heavy metals pose major health risks and are carcinogens.

While, when emission rates are modelled and maximum Point of Impingement (POI) concentrations are calculated and not be found to be in excess of Regulation 419 standards (many outdated) for most of these pollutants, it must be understood that these types of assessments do not take into account the number and size of the particulates and that those particulates which critically affect their health risk, and that the ultrafine particulates provide are the ferry for these heavy metals and other toxics (including dioxins/furans) when these fuels are incinerated.

Furthermore on page 15 of the *Alternative Fuel Demonstration Summary Report, May 2019* by HDR, the following statement is made: “*Total halogens and total chlorine content for Trial 2 were likely impacted by a shift in one of the loads of delivered material as described in section 3.4.1. It is unclear why there is a difference in levels of some trace metals in the Trial 2 fuel material.*” (emphasis added)

The above statement is clear evidence that concerns about the variability and safety of the fuel are legitimate and well-founded and that more study/trials/analysis is needed. It would be completely unacceptable to allow a six-month acceptance period to study this further – this application cannot be accepted. In fact there it is not enough to do such a

period as there will always be these variability problems and testing will not be frequent enough to catch them in real time.

5. **There are serious concerns regarding the use of very dated Regulation 419 standards to evaluate air impacts** in the *Emission Summary and Dispersion Modelling Report* referenced above and in the *Air Quality and Cumulative Effects Assessment in Support of an Application under Alternative Low-Carbon Fuels Regulation (O.Reg. 79/15)*, BCX Environmental Consulting, January 2020, found at <http://www.stmaryscement.com/Alternative%20Low%20Carbon%20Fuels%20Documents/SMC%20Bowmanville%20ALCF%20Application%20-%20Air%20Quality%20and%20Cumulative%20Effects%20Assessment-February2020.pdf>), especially when some of these standards have recently been amended (one comes into effect in 2023) or are expected to be updated in the very near future, and **in particular when the use of the updated, more stringent standards would have identified St Marys in exceedance of the updated criteria.** This is the case for both sulphur dioxide and nitrogen oxides. St Marys is by far the main contributor of these pollutants to the local air shed.
6. **With respect to sulphur dioxide (SO₂) emissions from St Marys**, Table 7 of the *Emission Summary and Dispersion Modelling Report in Support of an Alternative Low-Carbon Fuel Application under Ontario Regulation 79/15 to amend an Environmental Compliance Approval (Air) with Limited Operation Flexibility*, BCX Environmental Consulting, March 2020 states the 1-hour SO₂ maximum POI concentration is **487 $\frac{\mu g}{m^3}$** which is 70.6% of the old standard of 690 $\frac{\mu g}{m^3}$, however the predicted concentration is **487% of the new amended Regulation 419 standard of 100 $\frac{\mu g}{m^3}$ effective in 2023.** It is clear sulphur dioxide emissions are problematic at this facility.

In a 2007 report done by Dr. David Pengelly (credentials: Ph. D., P.Eng.) for the Municipality of Halton at the time they were considering an incinerator titled *Review of a Document for the Regional Municipality of Halton: Step 4a: Identification and Description of Potential Health and Environmental Effects (May 14, 2007)*, which can be found at http://www.durhamenvironmentwatch.org/Incinerator%20Files/Pengelly_PeerReview.pdf, Dr. Pengelly states in part: "... one cannot rely on the statement: "The air standards as presented in O.Reg. 419 are risk-based standards derived by the MOE as being protective of environmental and human health." Dr. Pengelly further states "**The SO₂ standard is based on a study published in 1966, and the CO standard is based on studies in the 1960s as well.**"

The conclusions regarding SO₂ in this study are based on a very old Reg. 419 standard based on a 1966 study – that is over fifty (50) years ago yet they are not using the new amended Regulation 419 standard that comes into effect less than three (3) years from now (July 2023). This is outrageous and unacceptable especially when that new standard is invoked this application would be in exceedance.

Furthermore, the demonstration kiln stack emissions table on *Calculation Sheet 1- Kiln Stack Emissions* in the same *Emissions Summary and Dispersion Modelling Report* show **the emission rate of SO₂ was greatest when the ALCF fuel was used**. The emission rate for ALCF was 169 g/s which was **48.2% higher than the emission rate for the conventional fuel** (which was 114 g/s).

Furthermore, **the modelled SO₂ emission rate was also understated as it was not prorated to reflect the maximum tonnages St Marys has applied for in this application**.

Calculation Sheet 1- Kiln Stack Emissions in the *Emissions Summary and Dispersion Modelling Report, March 2020* gives the expected future maximum fuel tonnage burned to be 830 tonnes/day (with ALCFs comprising 400 tonnes/day of that amount), and also gives the total actual Trial 2 demonstration tonnage burned was 777 tonnes/day (with ALCFs accounting for 287 tonnes/day). It also shows that the **modelled emission rates were also not prorated for PM, NO_x, CO, and ammonia while rates were prorated for other pollutants**.

7. Furthermore, with regards to St Marys' **nitrogen oxide (NO_x)** emissions, *Table 7* of the *Emission Summary and Dispersion Modelling Report, March 2020* states the 1-hour NO_x maximum POI concentration is **280 $\frac{\mu\text{g}}{\text{m}^3}$** which is 70.1% of the dated standard of **400 $\frac{\mu\text{g}}{\text{m}^3}$** , but this POI concentration **greatly exceeds (is close to three times) the updated relevant Canadian Ambient Air Quality Standard (CAAQS) of 60 ppb**.

I submitted questions to the MECP in 2019 which included a question about how old their current NO_x standards were and I am including their September 2019 responses as an attachment. The MECP stated in their response that ***"The air standards for nitrogen oxide (NO_x) were developed in 1972 as Ambient Air Quality Criteria (AAQC)."***

I also asked if they would be updating those standards to reflect the new CAAQS which were recently updated by the Canadian Council of Ministers of the Environment (CCME). In their response to that question, the Ministry made the following statements:

- ***"The Ministry as a member of the CCME contributed to the development of the CAAQS for nitrogen oxides (NO_x) and sulfur dioxide (SO₂)."***
- ***"The Ministry is not currently updating Ontario's Air Standard for NO_x but should an update occur, the ministry would consider the scientific information obtained through the CAAQS process."***
- ***"The ministry also expects to use the new CAAQS to monitor ambient air quality and evaluate long-term trends and to identify areas that may have local air quality concerns due to pollution from transportation, industry and other sources."***
- ***"The new CAAQS could also be considered as part of the evaluation of the human health risk assessment (HHRA) if submitted as part of an Environmental Assessment"***

(EA). It is important to note that a HHRA carried out as part of an EA is not used as a compliance tool.”

Clearly, with the modelling for this application showing predicted 1-hour NO_x concentrations described above greatly exceeding the relevant CAAQS, there is a need for the Ministry to give this application the consideration/evaluation they described in their response to me (last bullet above). Risk must be assessed against up to date standards and the proponent, St Marys Cement Bowmanville, should not be immune to this just because they are applying under Regulation 79/15 thereby avoiding an Environmental Assessment. Potential health risk concerns are legitimate - the current standard is almost 50 years old, there is a glaring difference between it and the CAAQS, and the high concentration results in the application documents described above – and they demand evaluation against up to date CAAQS standards, regardless of whatever regulation is invoked in the application.

8. In addition, **ambient particulate and fine particulate matter levels are also high in our area** and *Calculation Sheet 1- Kiln Stack Emissions* in the *Emissions Summary and Dispersion Modelling Report, March 2020* shows that the **particulate (PM) stack emission rate was highest when the ALCF fuel was burned.**

Furthermore particulate matter PM₁₀, and fine particulate PM_{2.5} emission rates also increased when the ALCFs were burned. This is documented on pages 207, 214, 221, 228 of the *Alternative Fuel Demonstration Project Summary Report (BCX, May 2019)*.

Fine particulate matter (PM_{2.5}) is considered by Health Canada to be a non-threshold pollutant meaning there is no safe level of exposure. Government regulations have not kept up with the well established and well accepted science that fine and ultrafine particulate pose unique and significant health risks. The St Marys application does not assess nor even acknowledge ultrafine particulates as a pollutant of concern and a potential health risk, but they may indeed impose the highest risks.

9. In summary, the ambient concentrations of numerous respiratory irritants are high at the site, we are concerned about the total respiratory burden current operations impose on the public and are now further concerned about the additional burden this ALCF application raises, especially given that modern standards were not used and accepted science was ignored when St Marys assessed air quality for a number of these key pollutants.
10. As well, the **current ambient air monitoring program at St Marys is extremely limited with only PM₁₀ monitored.** This is woefully inadequate given the great impact St Marys emissions change background concentrations for numerous other pollutants (documented in *Air Quality and Cumulative Effects Assessment in Support of an Application under Alternative Low-Carbon Fuels Regulation (O.Reg. 79/15), BCX Environmental Consulting, January 2020*) and also given the need for increased ambient monitoring given that the

variability of the emissions are very likely to increase with ALCF coming from multiple, changing sources and composed of varying materials.

- 11. Dioxin and furan emissions are pollutants of great concern with burning municipal waste and any fuel that contains plastics.** We are very concerned about the levels of dioxins and furans in our ambient air currently as we have both the Durham/York incinerator and St Marys here. An ambient air exceedance for dioxins and furans occurred in May 2018 at a Durham incinerator monitoring station and there have been several stack exceedances for dioxins/furans at the Durham/York incinerator over its short operational history. St Marys presently has significant dioxin and furan emissions (NPRI data shows St Marys emissions were 4 times higher than the Durham/York incinerator in 2017) and, with the new ALCF application, St Marys proposes to burn more plastics, yet St Marys presently only monitors dioxins/furans for a few hours a year during their annual source test.

Demonstration data shows that dioxin and furan stack concentrations for the Trial 1 alternative fuel, which included post-consumer paper, were 20% higher than conventional fuel and more than double those for the Trial 2 alternative fuel which contained no paper (Slide 8 of the handout titled *Alternative Low Carbon Fuel Annual Source Testing and Demonstration Trial Results, September 5, 2019* found in Appendix C of the Consultation Report at

<http://www.stmaryscement.com/Alternative%20Low%20Carbon%20Fuels%20Documents/SMC-ALCF-Bowmanville-ConsultationReport-March2020-AppendixC-PublicMeetingMaterials.pdf>).

This is more evidence that there has been inadequate testing and analysis completed to support their application which seeks to burn a wide range of alternative low carbon fuels. Further, more monitoring (including long-term continuous sampling for dioxins and furans) would be necessary for any such undertaking.

- 12. There are numerous concerns regarding the consultation process.** There were only two public meetings with the second meeting taking place December 17th, 2019. Many of the major documents were released after the second meeting had taken place, including the *Carbon Dioxide Emissions Intensity Report (January 2020)*, *Air Quality and Cumulative Effects Assessment (January 2020)* and the *Emission Summary and Dispersion Modelling Report in Support of an Alternative Low-Carbon Fuel Application under Ontario Regulation 79/15, March 2020*. The latter (ESDM report) is not even posted to the St Marys website and we were only provided it last week after contacting Sarah Schmied directly at sarah_schmied@golder.com. There is also a Fuel Handling document that she provided which we have not been able to review yet. Details about the Alternative Fuels application are also not visible/obvious on the main St. Marys website <http://www.stmaryscement.com/> - the Alternative Fuels Demonstration Project is the last item of a long list found under the Sustainability tab.

The HDR Report identifies ECA condition 44 that was not met.

5 Compliance with ECA (Waste Disposal Site) 1255-7QVJ2N

The following section outlines how the Demonstration Project was completed in compliance with ECA 1255-7QVJ2N (the Certificate).

Condition 44 - Public Information Meeting

SMC will hold a public information meeting to update the local community regarding the operation of the Facility no later than 7 months after the completion of the demonstration period for alternative fuel.

At a minimum SMC will present the results of the testing carried out during the demonstration, and shall report on compliance issues relating to the use of alternative fuel at the Site. SMC will place notices in two local newspapers at least one week in advance advising the local community of the date, time and location of this meeting.

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Alternative Fuel Demonstration Project

Condition 45 - Complaint Response

Two notices of the Demonstration Project were published on SMC's Community Relations webpage on September 19th and 20th, 2018, respectively and the trial was announced at the SMC Community Relationship Committee (CRC) meeting on September 11th, 2018.

Did not meet Condition 44 – meeting took place September 5 2019 which is more than 7 months after!