

November 26, 2019

Mr. Luis Urbina
Votorantim Cimentos, St. Marys Cement Inc.
400 Bowmanville Avenue
Bowmanville, Ontario
L1C 7B5

Re: Noise Emissions from Alternative Low Carbon Fuel Operations
Bowmanville Cement Plant, Bowmanville, Ontario
HGC Engineering Project No. 01900631

Dear Mr. Urbina,

As requested, we have considered the information provided by St. Marys Cement regarding the Alternative Low Carbon Fuel (“ALCF”) project at the Bowmanville Cement Plant, with regard to noise emissions. This letter has been prepared to support an ALCF Application pursuant to Ontario Regulation 79/15. We understand that St. Marys Cement proposes to increase the proportion of ALCF used as kiln fuel, which will require increased trucking to deliver ALCFs, and expanded ALCF storage/handling facilities. Based on the acoustical analysis detailed herein, sound from the proposed ALCF operations will be similar to the existing Low Carbon Fuel (“LCF”) operations, and will not contribute significantly to facility-total sound levels offsite, which will remain within the applicable limit of the Ontario Ministry of the Environment, Conservation and Parks (“MECP”).

CONTEXT

HGC Engineering maintains an Acoustic Assessment Report (“AAR”) for the Bowmanville Cement Plant. The AAR details comprehensive acoustical measurements and modelling conducted of the cement plant, identification of noise-sensitive points of reception neighbouring the facility, establishment of the applicable sound level limits of the MECP, and concludes that the sound levels of the facility comply with the MECP limits. The AAR includes noise sources associated with the LCF project in its current form (detailed below), and was reviewed and approved by the MECP with issuance of Environmental Compliance Approval number 0469-9YUNSK. The Approval permits the use of woody materials as an LCF, at a daily throughput of up to 96 tonnes. In late 2018, St. Marys Cement carried out a demonstration project using residuals derived from industrial and/or post-consumer sources including plastic polymers, paper fibres and woody materials as ALCFs, permitted under Approval number 4614-826K9W. The subject ALCF Application proposes the following:

- Add biomass, cellulosic and plastic materials from the recent demonstration project to the approved list of fuels;
- Augment the daily throughput from 96 tonnes of LCF to 400 tonnes of ALCF;
- Increase ALCF storage using enclosed containers and buildings;
- Install new equipment to feed ALCFs into the calciner;



POINT OF RECEPTION & APPLICABLE SOUND LEVEL LIMIT

The nearest noise-sensitive point of reception to the Bowmanville Cement Plant that is most potentially impacted by the changes proposed for the ALCF project is a single-family dwelling located approximately 785 metres northwest of the ALCF storage area, approximately 80 metres south of Highway 401 (labelled in Figure 1). The AAR considers additional homes southeast of the facility; however, at approximately 1.3 kilometres from the ALCF storage area, sound emissions associated with the ALCF project are negligible in this area.

MECP Publication NPC-300¹ is the noise assessment guideline that is applicable to the Bowmanville Cement Plant. The AAR details the derivation of the sound level limit applicable at the nearest home (in accordance with NPC-300), which is 50 dBA.

ACOUSTICAL ANALYSIS & DISCUSSION

The existing acoustical model of the Bowmanville Cement Plant includes approximately 170 unique sources, sound emissions from which have been measured by HGC Engineering during numerous visits to the site since 2010. The model was developed using Cadna/A software, a computer implementation of ISO standard 9613-2², which accounts for reduction in sound level with distance due to geometrical spreading, air absorption, ground attenuation and acoustical shielding by intervening structures (or by topography and/or foliage, where applicable).

The existing/approved noise sources associated with ALCF system include:

- Highway trucks delivering LCF to the existing storage building (with a total floor area of approximately 1,525 m²) at a rate of one truck per hour;
- One front-end loader operating inside the LCF storage building, feeding materials into a hopper and/or size reduction equipment (the latter of which is not currently employed at the site, but is approved by the MECP);
- The enclosed feed/conveyor system leading from the LCF storage building to the calciner, sound emissions from which are negligible;

The ALCF Application proposes the following modifications and associated noise sources:

- The rate of highway trucks delivering ALCF to the storage area will increase to up to three trucks per hour, travelling the onsite route as depicted in Figure 2;
- The existing ALCF storage building will be expanded to a total floor area of approximately 2,500 m², and a second ALCF storage building (with a total floor area of approximately 2,200 m²) will be added immediately north of the existing building (see Figure 2);
- Up to three front end loaders will operate inside the ALCF storage buildings;
- Expanded ALCF feed/conveyance systems which, like the existing, will be acoustically negligible;

¹ Ontario Ministry of the Environment and Climate Change Publication NPC-300, Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning, August, 2013.

² International Organization for Standardization, Acoustics – Attenuation of Sound during Propagation Outdoors – Part 2: General Method of Calculation, ISO-9613-2, Switzerland, 1996.

The acoustical model was updated to reflect the future state of the ALCF operations; the sound emission levels of equipment associated with the ALCF operations are detailed in Attachment 1. The following table summarizes the sound levels of the ALCF operations, the balance of the Bowmanville Cement Plant and the facility-total sound levels in the existing case and proposed future states, at the nearest receptor:

Table 1: Predicted Sound Levels at Nearest Receptor, dBA

State	ALCF Operations	All Other Cement Plant Sources	Facility-Total	MECP Limit
Existing	33	50	50	50
Future	29	50	50	
Change	-4	--	--	

DISCUSSION & CONCLUSION

From the data in Table 1, it is evident that the contribution of sound from the ALCF operations to the facility-total sound level is not significant in either the existing or future states. Although the total sound emissions of the future ALCF operations will be greater than the existing LCF operations, the net sound level at the nearest receptor is predicted to decrease given the beneficial acoustical shielding that will be afforded by the new ALCF storage building, north of the existing building. (Nevertheless, were the new ALCF storage building not constructed, facility-total sound levels would remain unchanged at the nearest receptor).

In general, the analysis shows that the sound levels of the Bowmanville Cement Plant are dominated by existing equipment/operations unrelated to the LCF/ALCF operations, and will remain unchanged and within the applicable MECP limit with the proposed ALCF operations.

We trust that this information satisfies your current requirements. Should you have any questions or require any additional information, please don't hesitate to give me a call.

Best regards,

Howe Gastmeier Chapnik Limited



Corey D. Kinart, MBA, PEng



Attachment 1: Summary of Proposed ALCF Operations

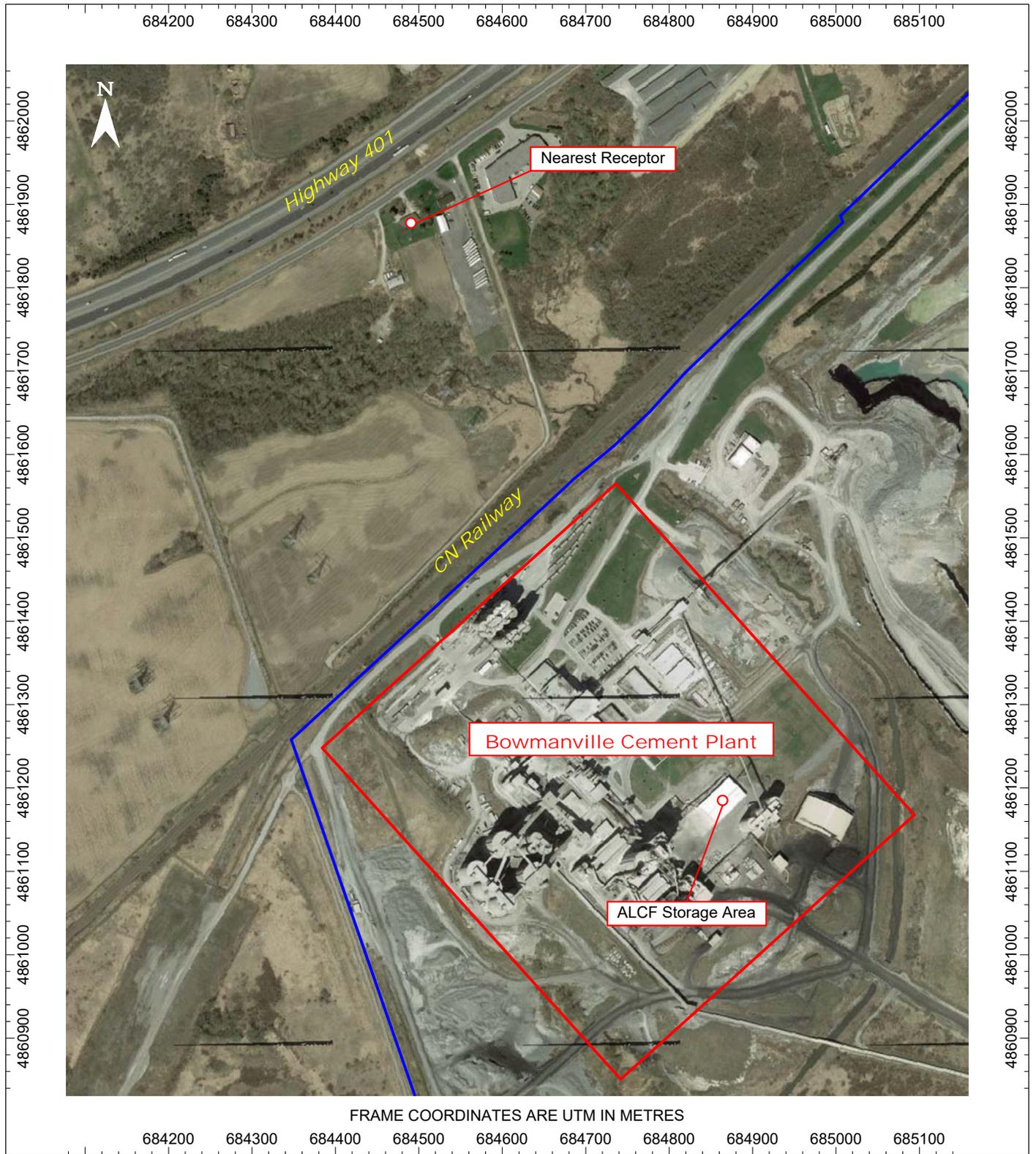


Figure 1: Satellite Image Showing Bowmanville Cement Plant, ALCF Storage Area and Nearest Receptor

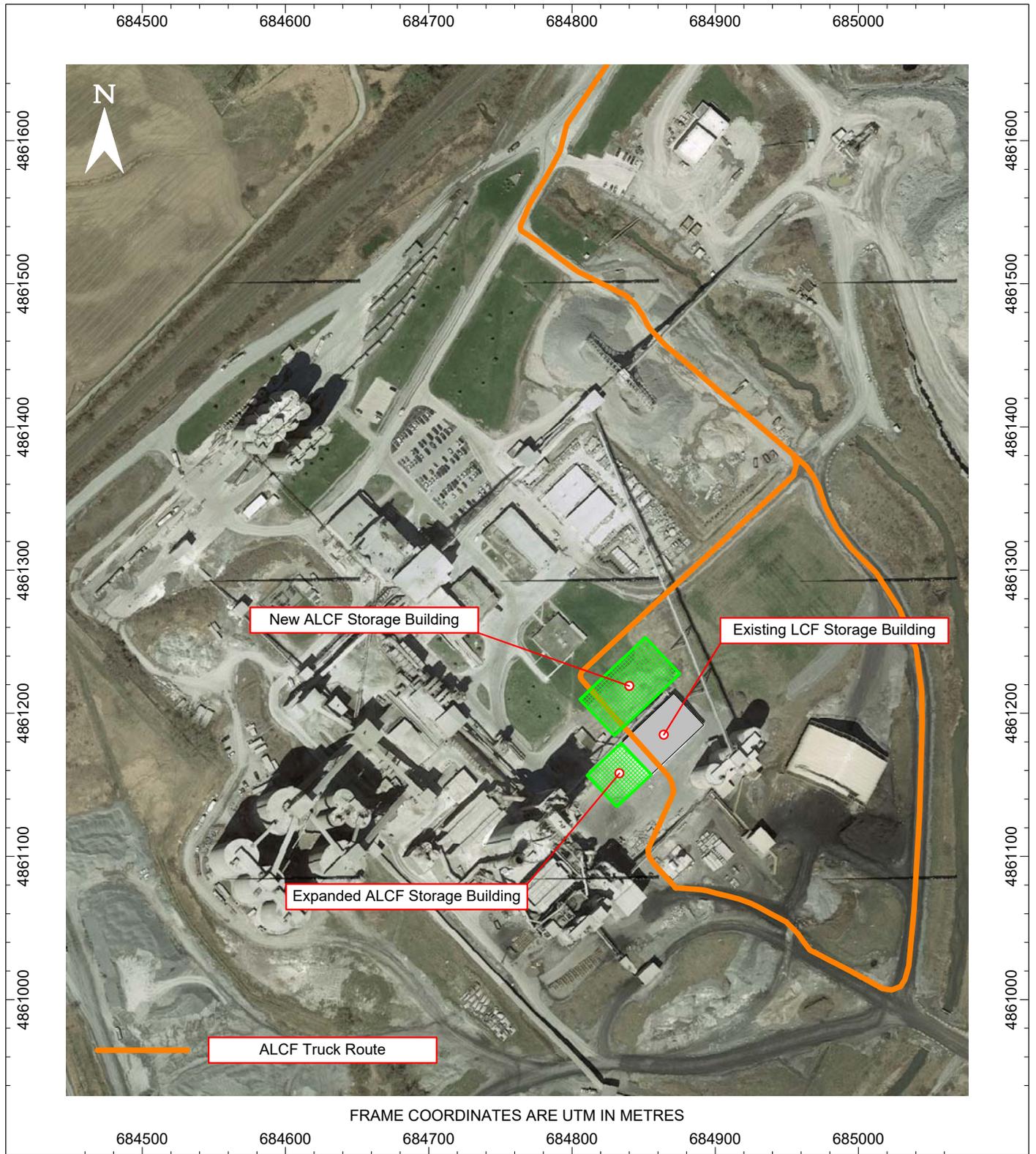


Figure 2: Satellite Image Showing Bowmanville Cement Plant, ALCF Storage Area and Onsite ALCF Trucking Route

ATTACHMENT 1

Table A1: Summary of Proposed ALCF Operations

Source	Sound Power Level, dB re: 10 ⁻¹² W									Qty. or Operating Time/Hr
	Octave Band Centre Frequency, Hz								A	
	63	125	250	500	1k	2k	4k	8k		
Front End Loaders (qty. 3)	106	102	102	102	100	97	90	83	105	60 min/hr
ALCF Size Reduction Equipment	113	120	116	116	112	109	104	98	117	60 min/hr
ALCF Trucks	101	100	94	96	97	95	91	86	101	3 @ 40 km/hr

Note: The ALCF front end loaders and size reduction equipment (if employed) will be located inside the ALCF storage building(s), the walls and roofs of which are/will be constructed of prefinished metal cladding; a modest 10 dBA of acoustical attenuation has been applied to sound emissions from equipment operating within the ALCF storage buildings, which is not included in the above.



ACOUSTICS



NOISE



VIBRATION