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September 14 2020

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Subject: Former General Motors Property

Phillip,

We note the letter sent to you from Michael Spencer on July 16, 2020 with results from surface water samples taken in February of 2020. We appreciate your willingness to engage with us on this important matter and at this time we would like to express our concern with MOECP's findings and the need for the MOECP to take immediate action to clean up this site.

As you stated in your email to us on July 17:

> "As you know this site is classified as a Brownfield site, and Brownfield redevelopment is a proponent driven process and **the Ministry's role at this point is limited to addressing off-site impacts, which to date have not been identified for this site.** "

Based on MOECP testing results and the attached memo from ELM, a respected independent environmental consulting firm, we conclude that contaminants identified below the surface of the GM Property by Pinchin Environmental at the time of the sale to Bayshore, are indeed leaching off the site. In fact, according to the results of your testing, contaminants such as metals and PCBs are entering Twelve Mile Creek at levels many times higher than the acceptable published PWQO anc CWQG guidelines.

We believe it is unacceptable and unsafe to allow industrial contaminants to leak into the Creek and downstream into the Henley rowing area and possibly threatening aquatic species and their habitats in Lake Ontario.

> *"The presence of disturbed/ distressed vegetation along drainage to TMC also indicates these contaminants are likely entering TMC, with unknown consequences on wildlife and human health."* [1]

We also fear that similarly industrial contaminants may be leaving the site at its other boundaries leading to exposure of these chemicals to residents of residential neighbourhoods with homes, a playground, recreational centre and day care centres. Unfortunately, it appears that this possibility was not considered in your sampling plan.

In short, given this evidence it is difficult *not* to conclude that the GM Property is now and for some time been the source of leaking contaminants off site. It is clearly a serious environmental and human health hazard. Further, continued exposure to the surface and subsurface contaminants leaking from the property has and continues to represent an unacceptable risk to the health of the community and the environment.

The PQWOs were designed to protect aquatic life and recreational uses. According to MECP's own policy direction, meeting the PWQOs is the minimum requirement. The policy direction also provides that where water quality does not meet the PWQOs, the water shall not be degraded further and all practical measures shall be taken to upgrade the water quality to the Objectives.

Per your letter we would like to point out some areas of concern:

Taking surface runoff samples at a time when ambient temperatures were above freezing and the ground still frozen represent possibly a 'best case' dilution of contaminants leaving the site.. A more rigorous inspection sampling needs to take into account the migration of contaminants in groundwater and soil especially in the spring when groundwater comes to the surface and runs downslope into Twelve MIle Creek and perhaps also migrates to the surrounding residential community.

> Soil sampling has generally been conducted when riverbank erosion has been identified as a potential pathway of contamination to the waterway. [2]

With respect to your findings we note that you benchmark samples against PWQO, the goals of which are:

> *The water management policies and guidelines supporting Provincial Water Quality Objectives (PWQO's) are the basis for establishing acceptable limits for water quality*

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[1] Review of land near 282 Ontario Street, St. Catharines ON, D.G. Fitzgerald, Ph.D.* (ELM Inc.) and L.S. McCarty, Ph.D. (LSM SR&C)

[2] https://www.researchgate.net/publication/296696824_Tracking_PCB_Contamination_in_Ontario_Great_Lakes_Tributaries_Development_of_Methodologies_and_Lessons_Learned_for_Watershed_Based_Investigations

and quantity, consistent with the protection of the aquatic ecosystem and ground-water. They are equally applicable to local site specific situations, an entire watershed, or the Great Lakes. They establish the limit or the extent to which a water resource can be used without interfering with other uses.[3]

We note with concern the findings of your sampling at the Twelve Mile Creek below the GM Property: TMC 1 and TMC OUT 1 and TMC 2 where samples taken exceeded the PWQO limits:

Aluminium : PWQO guidelines: ug/L 75 sample 167 = 223% over PWQO guidelines
There is extensive literature on the impairment of various aspects of central nervous system function in humans following inadvertent parenteral exposure to aluminum. The most studied aluminum-related syndrome is dialysis encephalopathy, chronic symptoms of which include speech disorders, neuropsychiatric abnormalities and multifocal myoclonus.https://www.canada.ca/content/dam/canada/health-canada/migration/healthy-canadians/publications/healthy-living-vie-saine/water-aluminum-eau/alt/water-aluminum-eau-eng.pdf

Cadmium PWQO guidelines: ug/L = .2 sample: 817 = 409% over the PWQO guidelines.
Chronic exposure to cadmium may cause kidney damage, bone mineral density loss and hypertension. Acute and chronic inhalation of cadmium can cause potentially fatal pulmonary dysfunction. In addition, cadmium has been classified as carcinogenic by the International Agency for Research on Cancer, with exposure being primarily associated with lung cancer. [4] Once it is in the environment it can remain present for a long time. It can be transported from one location to another, in particle forms that are either blown by the wind or washed away by water.[5]

Chromium PWQO guidelines ug/l =1 sample = 2.42 = 242% over PWQO guidelines
There are several known health risks associated with Chromium uses. It has been associated with oxidative stress, cytotoxicity, and carcinogenicity. Contamination of groundwater or soil due to improper handling lead to long term environmental damage.[6]

Cobalt PWQO guidelines ug/l = .9 sample = 2.24 = 250% over PWQO guidelines
Cobalt and its compounds were classified by the International Agency for Research on Cancer (IARC) in 1991 as Group 2B, *possibly carcinogenic to humans*. [7]

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[3] *https://www.ontario.ca/page/water-management-policies-guidelines-provincial-water-quality-objectives*

[4] https://www150.statcan.gc.ca/n1/pub/82-003-x/2008004/article/10717/6500108-eng.htm#:~:text=Chronic%20exposure%20to%20cadmium%20may,mineral%20density%20loss%20and%20hypertension.&text=Acute%20and%20chronic%20inhalation%20of%20cadmium%20can%20cause%20potentially%20fatal%20pulmonary%20dysfunction.

[5] https://www.greenfacts.org/en/cadmium/index.htm

[6] https://pubmed.ncbi.nlm.nih.gov/29458979/

[7] https://www.carexcanada.ca/profile/cobalt/

Copper PWQO guidelines ug/l = 5, sample = 35 = 700% over PWQO guidelines
A review of literature has identified three subgroups of the population that may be at a greater risk of chronic copper overexposure/loading: Wilson's disease patients (hereditary disease), individuals with glucose-6-phosphate dehydrogenase deficiencies, and young children, particularly those under 12 months of age, possibly because of their limited ability to excrete metals (CCME 1997).. Conflicting results from in vivo studies and mammalian system in vitro studies, however, suggest that copper may be potentially mutagenic (CCME 1997).[8]

Zinc: PWQO guidelines ug/l =30, sample = 93 = 311% over PWQO guidelines
Zinc and its compounds have the potential to be released to the environment during industrial activities. Although zinc is an essential element for human health, elevated intake may result in adverse health effects such as headaches, nausea, vomiting, loss of appetite, and abdominal cramps.[9]

Polycyclic aromatic hydrocarbons (PAHs)
PAHs are a group of chemicals that can be harmful to your health under some circumstances. Several of the PAHs, including benz[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[j]fluoranthene, benzo[k]fluoranthene, chrysene, dibenz[a,h]anthracene, and pyrene, have caused tumors in laboratory animals when they breathed these substances in the air, when they ate them, or when they had long periods of skin contact with them. Studies of people show that individuals exposed by breathing or skin contact for long periods to mixtures that contain PAHs and other compounds can also develop cancer. They can enter surface water through discharges from industrial plants and waste water treatment plants, and they can be released to soils at hazardous waste sites if they escape from storage containers. [10]

Benzo A Pyrene PWQO guidelines ng/l =15, sample = 33 = 220% over the PWQO Guidelines
BaP is a human carcinogen, and exposure to any concentration from any medium of exposure, including drinking water, may increase the risk of cancer. [11]

Chrysene: PWQO guidelines ng/l =.1, sample = 93 = 930% over the PWQO Guidelines
Chrysene (CAS-218-01-9) is a polycyclic aromatic hydrocarbon (PAH) and one of the natural constituents in coal tar. It is produced as smoke during incomplete combustion of coal, gasoline, garbage, animal, and plant materials. Even though, there are no direct

[8] http://ceqg-rcqe.ccme.ca/download/en/263

[9] https://www.canada.ca/en/health-canada/services/chemical-substances/fact-sheets/chemicals-glance/zinc-compounds.html

[10] https://www.atsdr.cdc.gov/phs/phs.asp?id=120&tid=25

[11]

evidence of chrysene as a carcinogen in humans, but, PAHs are potent carcinogens and chrysene is one of the PAHs. Chrysene caused increased incidence of liver tumors in male and female mice. [12]

Fluoranthene: PWQO guidelines ng/l =.8, sample = 210 = 26,250% over the PWQO
On the basis of available results of carcinogenicity bioassays, the 5 PAHs considered in this assessment [benzo(a)pyrene, benzo(b)fluoranthene, benzo(j)fluoranthene, benzo(k)fluoranthene and indeno(1,2,3-cd)pyrene] have been classified as "probably carcinogenic to humans".The major hazards encountered in the use and handling of fluoranthene stem from its toxicologic properties. Toxic by all routes (ie, inhalation, ingestion, dermal contact), exposure to this pale yellow, crystalline substance may occur from its presence in coal tar products used in coatings for pipes and storage tanks, in roofing materials, and asphalt. [13][14]

Phenanthrene PWQO guidelines ng/l = 30, sample =130 exceeds PWQO guidelines by 433%
Pyrene PWQO guidelines ng/l = 25, sample =180 exceeds PWQO guidelines by 720%
Health effects from long-term or chronic exposure to PAHs may include decreased immune function, cataracts, kidney and liver damage (e.g. jaundice), breathing problems, asthma-like symptoms, and lung function abnormalities. Meanwhile, repeated contact with skin may induce redness and skin inflammation. [15]

The evidence presented here clearly rejects any claim that contaminants are not leaving the site. These contaminants likely have been leaking off the site for many years and cumulatively represent a source of chronic exposure to hazardous chemicals far beyond guidelines set by the Province. For this reason we demand that:

The GM Property must be considered a contaminated "brownfield" and subsequently the surface must be made free of debris, half demolished buildings cleared from the site and land and drainage must be secured against off-site transport of soil via air and water.

Moreover we believe there is a clear basis for action by the Province per Ontario's Environmental Protection Act.

> **14** (1) Subject to subsection (2) but despite any other provision of this Act or the regulations, **a person shall not discharge a contaminant or cause or permit the**

[12] https://www.sciencedirect.com/topics/nursing-and-health-professions/chrysene
[13] https://pubchem.ncbi.nlm.nih.gov/compound/Fluoranthene#section=Fire-Potential
[14] https://www.tandfonline.com/doi/abs/10.1080/10590509409373459
[15] .https://www.sciencedirect.com/science/article/pii/S1110062114200237#:~:text=Health%20effects%20from%20long%2Dterm,induce%20redness%20and%20skin%20inflammation.

discharge of a contaminant into the natural environment, if the discharge causes or is likely to cause an adverse effect.

17 *Where any person causes or permits the discharge of a contaminant into the natural environment, so that land, water, property, animal life, plant life, or human health or safety is injured, damaged or endangered, or is likely to be injured, damaged or endangered, the Director may order the person to,*

(a) (a) repair the injury or damage;

(b) (b) prevent the injury or damage;

We will be applying to the EBR and seeking other remedies to ensure that these actions are taken. However should MOECP continue to believe that there is no cause for concern, then they may respond appropriately to these actions..

Thank you once again for sharing your findings and for keeping us up to date on your observations.

Sincerely,

Dennis Van Meer
Coalition for a Better St. Catharines.