

## **Climate Change Topic of Interest – Water and Wastewater and the Effects of Climate Change**

Possible speakers and associated information:

### **Drinking Water Quality and Climate Change**

Ausable Bayfield Maitland Valley Source Water Protection – Mary Lynn McDonald

- Examining the efforts already being put forth to further protect ground water and surface water. Risk assessment in relation to drinking water supply and climate change.

Chitra Gowda – Conservation Ontario

- Exploring and quantifying the importance of adaptive capacity as it relates to drinking water protection and quality.
- Exposure: The nature and degree to which a system (people, assets, ecosystem) is subject to significant climate variations. Example: potential for a drinking water source well/intake to be exposed to an increased number of rain events.
- Sensitivity: The degree to which a system is affected by climatic stresses, adversely or beneficially by climate stimuli. Example: Well/intake characteristics such as number of wells/intakes, history of water quality issues due to rain events.
- Impact: The consequences of climate change on systems. Without considering adaption, this is the product of climate exposure and sensitivity. Example: A shallow well intake closer to the shoreline could become severely impacted by more intense rain events. Shallow, unconfined wells will be more responsive to climate change.
- Adaptive Capacity: The ability of a system to adjust to climate change, to moderate potential damages, to take advantage of opportunities, or to cope with the consequences. Example: The water treatment plant is capable of handling a further deterioration of source water quality.
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Lake Huron Primary Water Supply

- This past year (2020) LHPWS experienced significantly high and even record setting lake levels. They also experienced high winds and subsequent wave action on the intake line to the water treatment plant. This has caused increased erosion to the beach shore where the treatment plant is situated.

### **Wastewater treatment and climate change**

- Bacteriological processes are temperature dependent
  - o Increases in temperature reduce the density of settled sludge
- Increased oxygen demand (BOD) to support microorganisms in decomposition by aerobic bacteria
- Wastewater treatments current contribution to CC
  - o Many gases evolve from wastewater treatment that contribute to CC. These include carbon dioxide (CO<sub>2</sub>), methane (NH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O).
  - o Possibility to harness these gasses and convert them to energy

- Stratford is installing a renewable natural gas facility (RNG) to their WWTP. By diverting organic waste from the landfill (including food waste) it can be co-digested with wastewater material to naturally produce gas that can be harnessed.
- The gas that is collected from this will be refined into natural gas and then distributed through the existing natural gas distribution system for use

#### Considerations of Climate Change:

- Increased freeze thaw of pipe and infrastructure leading to more water main breaks and private services freezing
- More water recharging into aquifers
- Increased salt use during snow and ice accumulation and therefore leading to increased sodium content of ground water
- Heat waves impacting wastewater leading to impacts on effluent discharge and odors associated with treatment
- Heat waves associated with drinking water availability and quantity of use during heatwaves
- Increased storms associated with lake water supply leading to increased turbidity and overall increased treatment time and costs
- Increased rainfall events leading to an increased of bypass events
- Great Lake eutrophication and increased algae growth

<https://www.wsp.com/en-CA/insights/ca-can-we-incorporate-climate-change-principles-into-wastewater-infrastructure-design>

#### South Hurons response to Climate Change – Don Giberson

- A look at the efforts already being put forth, the effects of climate change already being felt at a municipal local level and the response from operators and the Municipality