

Impacts and Management of Sewage Disposal in Simcoe County

"We respectfully acknowledge that we are on the treaty and traditional territory of the Michi Saagiig Anishinaabeg. We offer our gratitude to the First Peoples for their care for, and teachings about, our earth and our relations. May we honour those teachings."[1]

Background

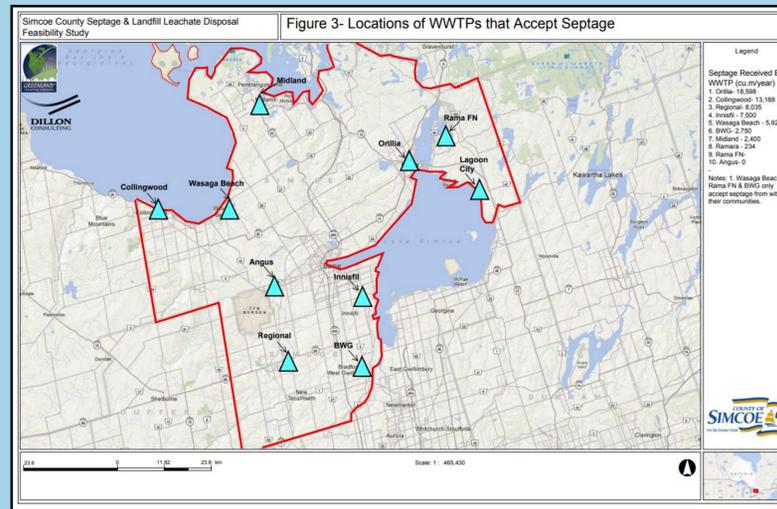
A growing population in Simcoe County has led to some wastewater facilities being at risk of meeting or exceeding their capacity. AWARE Simcoe seeks alternatives to the County's current approach of meeting these needs [2].

Research Questions

- (1) What is the potential impact of current patterns of this activity, with a focus on groundwater degradation?
- (2) What management approaches are or should be employed to effectively manage these activities in the Simcoe region?

Current Management Approaches

Simcoe County disposes of waste through two primary methods, land application and wastewater treatment [3]. Wastewater treatment occurs at one of the 10 locations in Figure 3 prior to either the wastes' release into Lake Simcoe or reuse as fertilizer[3]. Waste is tested prior to disposal and must meet the government's regulatory requirements [3].



Research Methods

A literature review was conducted by utilizing online databases and keywords from the research objective. This was followed by using references from the primary papers.

Potential Impacts of Current Management

As with all waste disposal methods there are several potential environmental and human impacts that could occur as a result of these practices.

- Environmental: eutrophication, groundwater & soil contamination, animal pathogen transfer [4].
- Human: pathogen transfer & re-growth, unknowns due to knowledge gaps [4].

Recommendations

Using existing hydraulic reserve capacity in all facilities without compromising the end result at a low cost:

- Aerobic Digestion - Digests organic matter using oxygen through the addition of a fine bubble diffuser, reducing the quantity of volatile organic compounds [5].
- Anaerobic Digestion - Digests organic matter with the absence of oxygen, improving its stabilization for land application [5].

Technologies that offer cost effective treatments at a higher cost through updating current equipment:

- Membrane Filtration - A thin layer barrier for size differential separation, usually integrated with chemical and biological treatments [6].
- Microalgal Intervention - Optimized microalgal strains have made for use in waste stabilization ponds [7]. These treatments have proven effective at removing heavy metals, organic pollutants, and pathogens from wastewater [7].

