



Small Footprint Sustainable Wastewater Treatment

By:

Dr. Hamid Salsali, P.Eng.
University of Guelph

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Overview and summary

This presentation focuses on the “Proposed Small Footprint Sustainable Wastewater Treatment Operation” for the Palmerston WWTP.

Wastewater treatment plant (WWTP)

Wastewater treatment or sewage treatment is the process that removes the majority of the contaminants from wastewater or sewage and produces both a liquid effluent suitable for disposal to the natural environment and a sludge.

Constituents Present in Domestic Wastewater

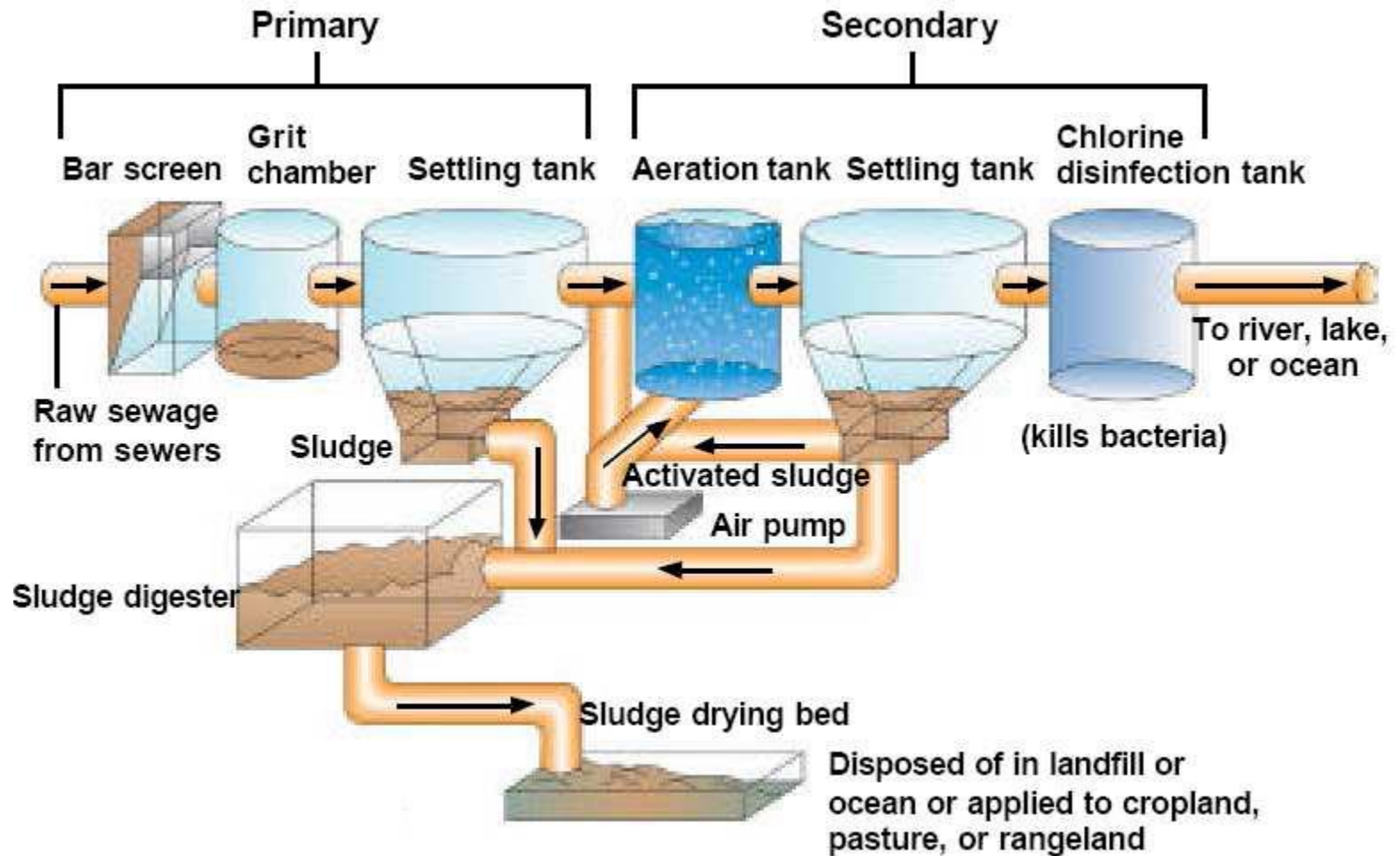
Wastewater constituents		
Microorganisms	Pathogenic bacteria, virus and worms eggs	Risk when bathing and eating shellfish
Biodegradable organic materials	Oxygen depletion in rivers, lakes and fjords	Fish death, odours
Other organic materials	Detergents, pesticides, fat, oil and grease, colouring, solvents, phenols, cyanide	Toxic effect, aesthetic inconveniences, bio accumulation in the food chain
Nutrients	Nitrogen, phosphorus, ammonium	Eutrophication, oxygen depletion, toxic effect
Metals	Hg, Pb, Cd, Cr, Cu, Ni	Toxic effect, bioaccumulation
Other inorganic materials	Acids, for example hydrogen sulphide, bases	Corrosion, toxic effect
Thermal effects	Hot water	Changing living conditions for flora and fauna
Odour (and taste)	Hydrogen sulphide	Aesthetic inconveniences, toxic effect
Radioactivity		Toxic effect, accumulation

(based on Henze et al., 2001)

Conventional WWTP component

- **Mechanical treatment;**
 - Removal of large objects
 - Removal of sand
 - Pre- precipitation
- **Biological treatment;**
 - Oxidation bed (oxidizing bed) or Aerated systems
 - Post precipitation
- **Chemical treatment**
 - Filtration

Conventional WWTP component - Cont'd

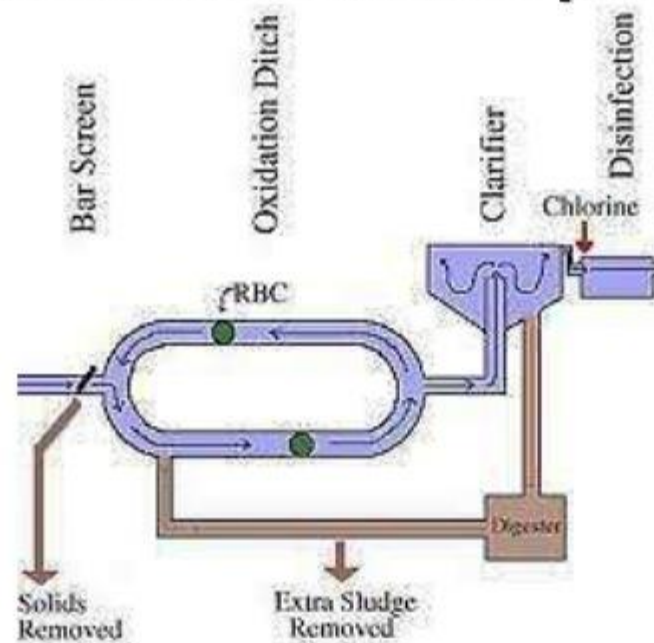


Wastewater Samples



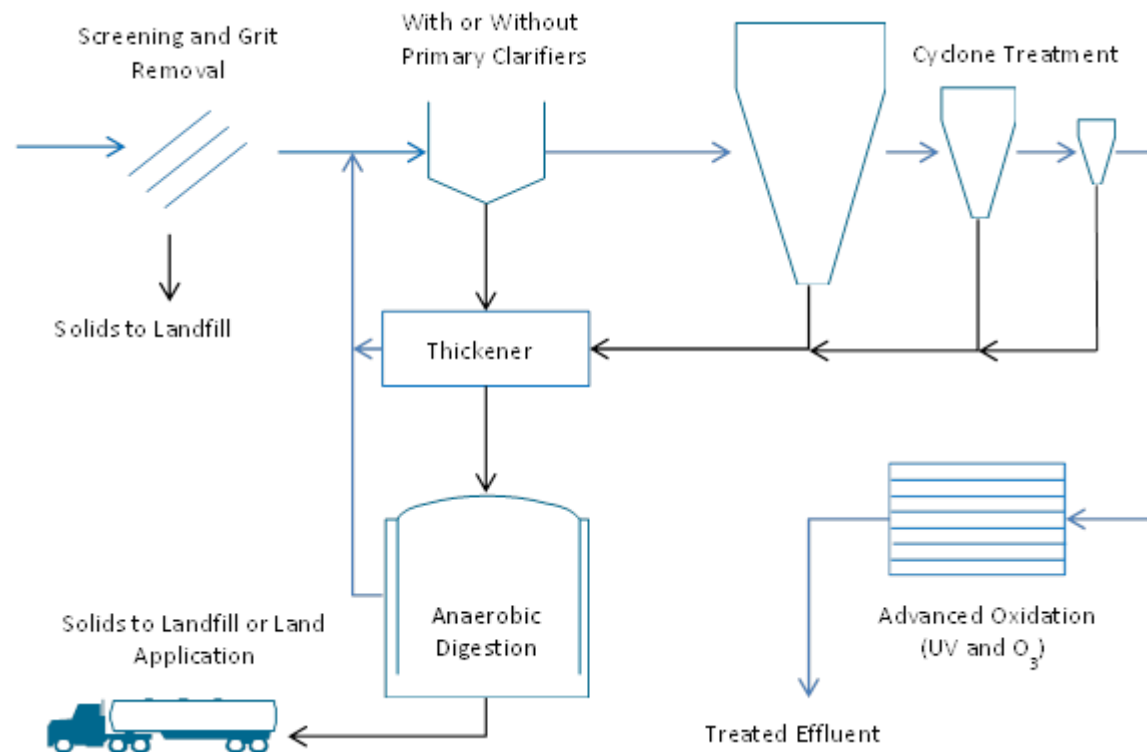
Oxidation Ditches Process (Palmerston WWTP)

Oxidation Ditches process

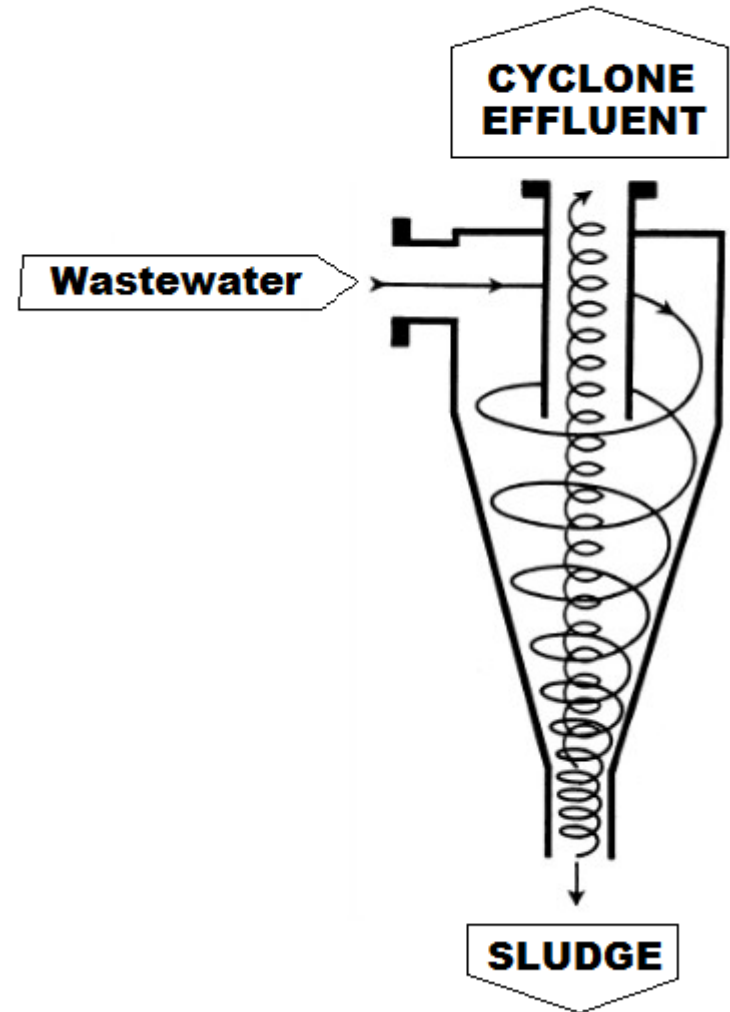


Source : <http://water.me.vccs.edu/concepts/oxidation.html>

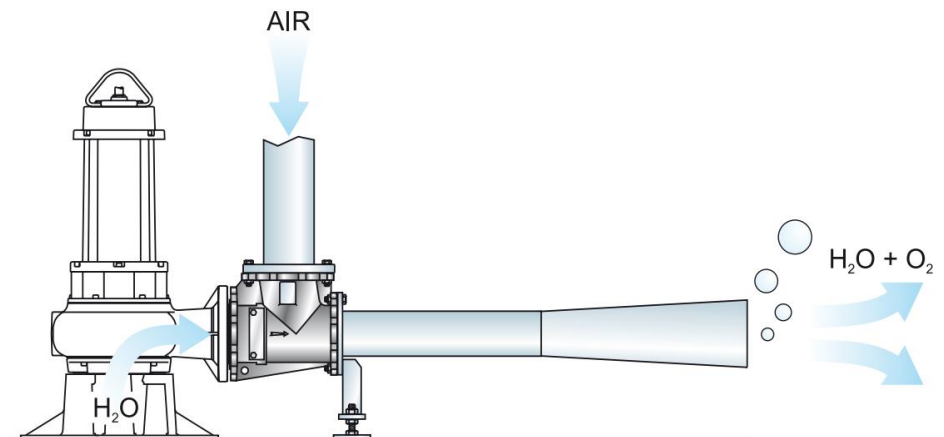
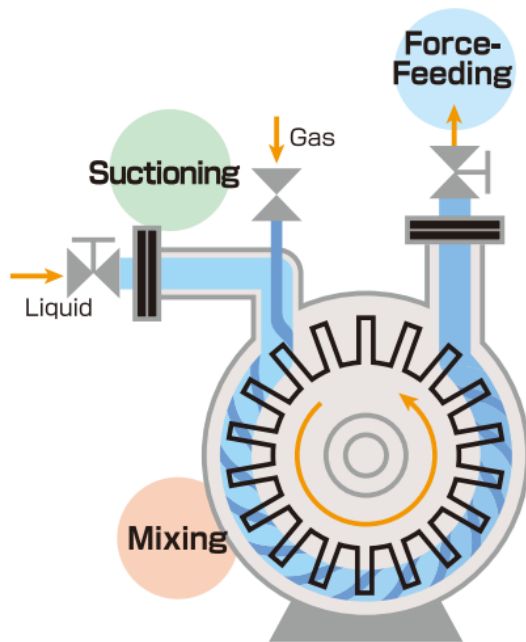
Proposed Treatment System



Cyclone

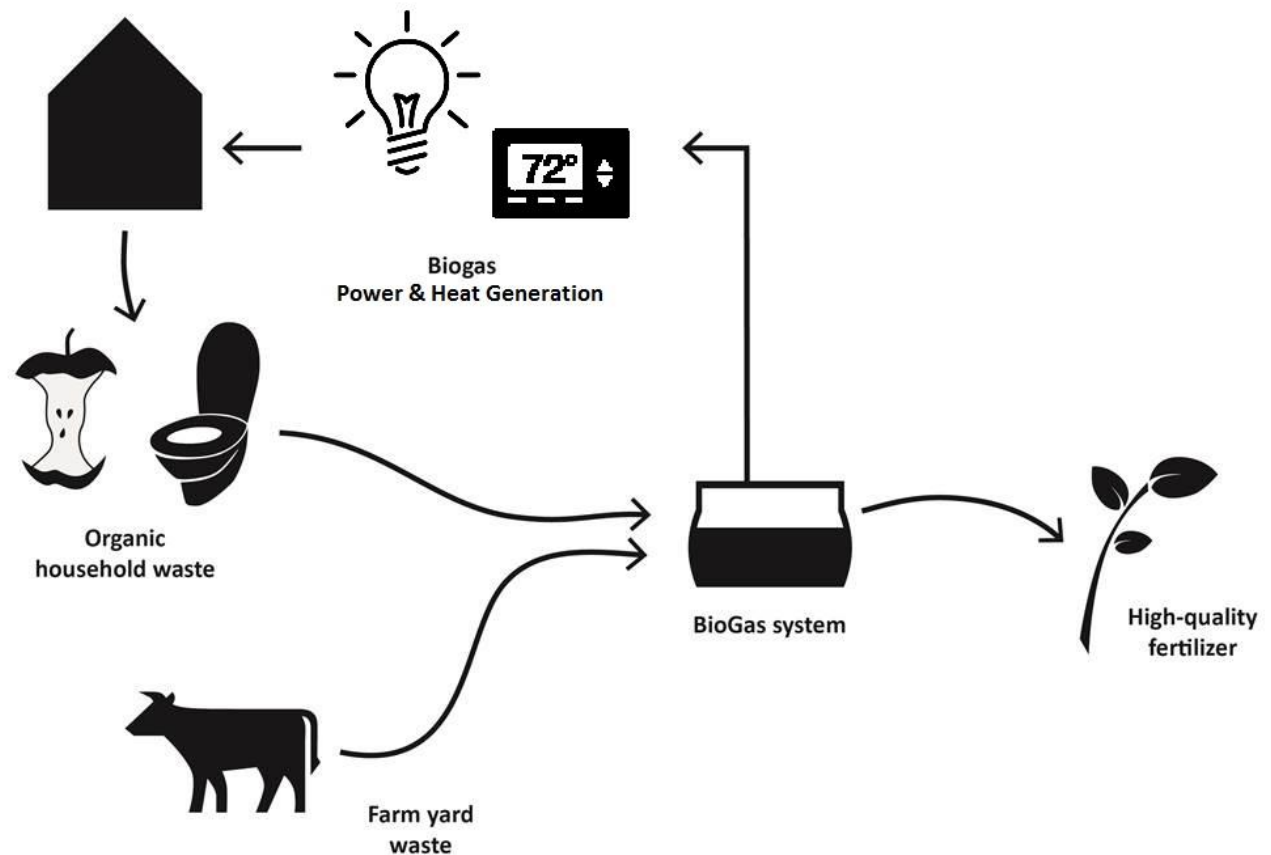


Advanced Oxidation Process



Opportunities

- Biogas Production



<http://www.simgas.com>

Opportunities Cont'd

- Smaller Footprint
- Simpler Process
- More Stable Process
- Emerging Contaminants Management



Thank you!