WesternWater Centre

RESEARCH THEME

- **Wastewater**
  - ~$60M in funding
  - Current HQP: 24 PhDs, 8 MESc, 7 PDFs
  - 5 state-of-the-art laboratories

1. Wastewater

Water/Wastewater Treatment & Reuse Team

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1. Wastewater

Water/Wastewater Treatment & Reuse Team

- Total lifetime funding : $57.7 M
- Lifetime HQP: 80 PhDs, 147 MSc, 60 PDFs
- Current HQP: 24 PhDs, 8 MSc, 7 PDFs
- Total no. of publications: 681 JP, 579 CP
- Laboratories:

  Environmental Engineering, WW Resource Recovery, Advanced Oxidation, Chemical Reaction & Process Engineering, Nanotechnologies
- Developed Technologies: 8

1. Wastewater

Drinking Water Treatment (MR, AR, JH, MD, HG)

Areas of Expertise

- Micropollutants removal
- Disinfection byproducts from organic matter
- Advanced oxidation processes
- Membrane filtration
- Metal removal
- Contaminants in distribution systems
- Modeling of AOP

Technologies for Process Intensification

- Photocatalytic reactors
- Photocatalytic oscillatory membrane reactor
- Gravity membrane filtration

1. Wastewater

Municipal WWT (MD, GN, MR, AR)

Areas of Expertise

- Biological nutrient removal
- Primary treatment
- Carbon diversion
- Energy optimization
- Process Modeling

Technology Development

- Fluidized Beds
- Membrane aerated biofilm reactors
- Biofilm technologies e.g. biocord, granular sludge, etc.

1. Wastewater

Biosolids Research (MD, GN, MR)

Areas of Expertise

- Stabilization/ pathogen reduction
- AD pre- &post-treatment
- Land application – EDCs/Heavy metals
- Dewatering

Process Innovation / Technologies

- Thermo-alkaline
- Ultrasonication
- Ozonation
- Fluidized bed digester
- Anaerobic membrane

1. Wastewater

Resource Recovery/ Value added (MD, MR, GN)

Areas of Expertise

- Process water recovery
- Biohydrogen
- Biomethane
- Cellulose fermentation products
- Coagulant
- Nutrients – struvite/apatite

Process Intensification

- Adsorption/Membrane separation/AOP
- Two-stage acidification
- Electro-coagulation
- Sieving/Microfiltration

1. Wastewater

Infrastructure

- Pilot/Demo-scale

Fermenter/Digester

Salsnes Filter

Sequencing Batch Reactors (SBRs)

1. Wastewater

Infrastructure

- Pilot/Demo-scale

BioCord Fixed-film Technology

Membrane Aerated Biofilm Reactor (MABR): Process and Technology Development

1. Wastewater

Analytical Capabilities

- Water quality parameters
- Emerging substances (EDC, PHCP)
- Biofilm characterization
- Toxicity testing
- Metal speciation
- Surface characterization