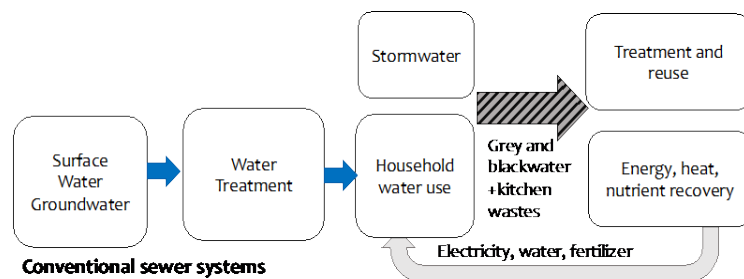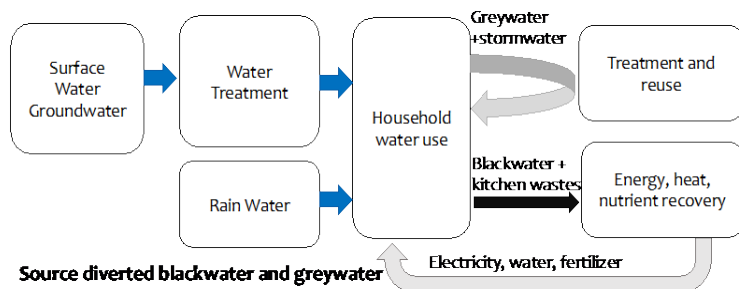**FUNDING DETAILS**

NSERC Associate Industrial Research Chair in Sustainable Urban Water Development

Given the context of current Canadian urban wastewater management, this associate IRC program focuses on the selection, evaluation and optimization of emerging municipal wastewater service options that can carry out resource-recovery (energy, nutrients and water), leading to an energy neutral or energy positive wastewater treatment within the urban water service system. This IRC is expected to demonstrate real-world feasibility of resource-recovery based wastewater treatment, alleviate technical concerns, generate confidence in the overall treatment system performance, and help guide future urban wastewater management practices in Canada.

RECIPIENT:
University of Alberta

PARTNERS:
NSERC, EPCOR

TOTAL BUDGET:
$1,600,000

AI FUNDING:
$250,000

PROJECT DATES:
2017 – 2022

APPLICATION

The IRC program will integrate gained knowledge into applied water and wastewater management practices/processes for wastewater service providers and regulators, in order to provide safe water management with reduced energy, nutrient and economic footprints across Canada. Technologies and operation knowledge developed are expected to benefit not only industrial partners who are providing substantive support to this project, but also various municipalities concerned with new more sustainable water service opportunities.

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PROJECT GOALS

- Develop resource-recovery processes for decentralized and centralized wastewater treatment plants
- Develop source-diverted blackwater and greywater treatment processes that are based on energy and nutrient recovery and water reuse
- Provide Canadian-relevant data and decision-support tools to determine resource recovery processes and operational parameters for energy and fertilizer generating wastewater treatment systems, and to estimate reductions in drinking water demands and energy consumption via local water reuse

BENEFITS TO ALBERTA

- Reduction in energy consumption for conventional wastewater treatment via the utilization of bioenergy (in the form of biomethane) recovered from domestic wastewater collected from convention sewers and source-diverted systems using treatment processes developed in this project
- Improvement of wastewater treatment efficiencies to safeguard public and environmental health and ensure Albertans' access to fit-for-purpose, secure and reliable water resources
- Development and real-world validation of sustainable alternatives in wastewater management, further promoting Alberta (and Edmonton) as a hub for environmentally sustainable development
- Creation of decision-supportive tools for the development of a common regulatory framework and plumbing codes to support the technological transition of municipal wastewater treatment processes and facilitate the expansion of potential market users in Alberta

33 Publications

25 Students Trained

0.14 kg CO_2 Reduction per m^3 of Wastewater Treated

CURRENT STATUS

APRIL 2020

The characterization of feedstock from various sources is complete and options (beyond original scope) to better utilize feedstocks for improved resource recovery efficiencies of blackwater, greywater and conventional collected sewage have been identified. Over 32 laboratory-scale reactors for process optimization have been operated, each representing a different process. Three successful processes were identified, one each for blackwater, greywater and conventionally collected sewage treatment, and pilot-scale bioreactor evaluation has been initiated.