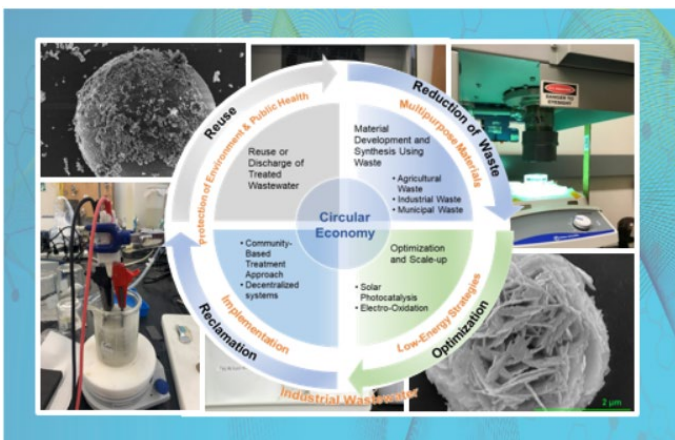


Treatment Strategies for Industrial Wastewater as a Step to Achieve Circular Economy: Technology Development and Implementation

Alberta oil sands mining operations use and recycle large volumes of water for bitumen extraction. While significant progress has been made in remediating oil sands process water (OSPW), there are still crucial gaps in our knowledge about the treatment of OSPW, particularly in implementing low-energy treatment approaches at a pilot-scale. The goal of this research program is to develop effective and low-energy treatment strategies for better managing OSPW for its safe discharge or reuse. This research program centers on the optimization and scale up of solar-based photocatalysis and electro-oxidation processes.



RECIPIENT:

University of Alberta –
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PARTNERS:

NSERC, Alberta
Environment and
Protected Areas,
Pathways Alliance,
EPCOR



TOTAL BUDGET:

\$5,405,000



PROJECT DATES:

OCT 2023 –

OCT 2028



AI FUNDING:

\$375,000

APPLICATION

This research program aims to develop, scale up, and implement innovative approaches that promote the elimination of waste, safe use of natural resources, sustainable use of the water, and recycling and reuse of exiting materials and products. This can accelerate the applications of emerging treatment technologies while promoting circular economy in the wastewater sector.



ALBERTA INNOVATES CLEAN RESOURCES

ENVIRONMENTAL INNOVATION

WATER INNOVATION PROGRAM

PROJECT GOALS

The goal of this five-year research program is to develop effective and low-energy treatment strategies for better managing oil sands process water (OSPW) for its safe discharge or reuse. The long-term objectives, including those beyond the 5-year period covered by the research program, are: (1) train highly qualified personnel with the skills necessary to promote and protect environmental and public health; (2) support current research programs focused on the treatment/remediation of industrial wastewater by facilitating the transfer of knowledge and new discoveries; and (3) integrate the achieved knowledge into actual wastewater treatment operations.

BENEFITS TO ALBERTA

This research is built in alignment with support for the ongoing efforts for the sustainable management of water and land resources, protection of the environment we are living in, thus, to achieve a more sustainable Alberta. The knowledge and approaches developed in this research will enable the OSPW to be remediated and reclaimed properly. Moreover, the comprehensive analytical analyses of the wastewater streams may allow the development of reclamation strategies designed to reduce the risks associated to pollutants and minimize the toxicity of the OSPW. The outcomes derived from this research will assist decision-makers to adopt sustainable development strategies and predict the risks associated to the discharges of treated OSPW into natural ecosystems.



25 Publications



**10 Students
Trained**



2 Patents



**1 Spinoff
Company**

CURRENT STATUS

OCT 2023

Project was executed in October 2023 and Year 1 activities are underway.