ALBERTA INNOVATES

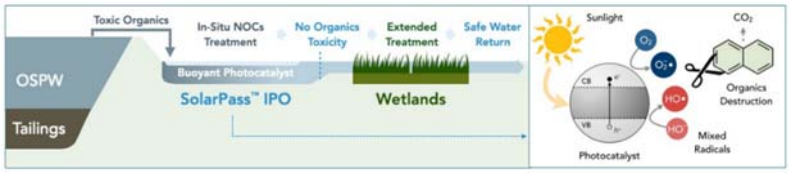
CLEAN RESOURCES

ENVIRONMENTAL INNOVATION

WATER INNOVATION PROGRAM

Hybrid Passive Solar-Wetlands Water Treatment Process for Energy Industry Effluents

H2nanO proposes a first-of-its-kind scaled field pilot of hybrid passive photocatalytic-wetlands OSPW (oil sands process water) treatment with Imperial Oil Ltd., with the goal to advance this technology to commercial readiness. The proposed project will be executed in 2 phases: 1) SolarPass OSPW treatment, and 2) hybrid SolarPass-wetlands treatment; each phase will include tasks related to knowledge mobilization and utilization. This project is anticipated to establish the hybrid SolarPass treatment as a leading treatment option for OSPW and provide critical research outcomes related to commercial-scale deployment.



FUNDING DETAILS

RECIPIENT:
H2nanO Inc.

PARTNERS:
Alberta Innovates, Imperial Oil

TOTAL BUDGET:
$4,053,300

AI FUNDING:
$750,000

PROJECT DATES:
MAR 2023 – MAY 2025

PROJECT TRL:
Start: 7
End: 9

APPLICATION

The key value proposition of H2nanO's technology is high-quality water treatment at a low operating cost and input, capable of achieving treatment strength equal to conventional advanced oxidation processes (AOP). This enables significantly cheaper water treatment using less energy and chemicals compared to advanced membrane technologies and AOPs.

ALBERTA INNOVATES

CLEAN RESOURCES

ENVIRONMENTAL INNOVATION

WATER INNOVATION PROGRAM

PROJECT GOALS

The objectives of the project are to:

- Advance a photocatalytic wetland water treatment technology for OSPW from TRL 7 to 9
- Evaluate the integrated benefits and broader impacts of a hybrid passive treatment system
- Develop the science of passive technology integration and system engineering
- To realize these objectives, H2nanO will execute a two-year (2023-24) project integrating a novel modular process design for the SolarPass treatment stage coupled to a scaled field pilot constructed treatment wetland.

BENEFITS TO ALBERTA

H2nanO projects a total of 16 full-time jobs across Canada will be supported by the project, including up to 12 new hires in Alberta, along with internship and graduate research trainees. In commercializing the technology, SolarPass provides a made-in-Canada clean technology solution that reduces emissions, chemicals and waste residuals from the wastewater treatment process. The technology will provide value to end users including local communities, regulators, and industry by achieving high quality treatment for environmental and public health using natural processes and energy sources for treatment. Remediation of OSPW using SolarPass may also promote accelerated land reclamation for habitat re-development and be applied to long-term maintenance of water quality in closure landscapes after mine operations have ceased.

10 Publications

6 Students Trained

2 Patents

7-12 Project Jobs

1 New Product/Service

50-100 Future Jobs

50-100 kt/yr Future GHGs Reduced

CURRENT STATUS

MAR 2023

Project initiated and field deployment preparations are underway for 2023.