Project Summary, Milestones, Payment Schedule and Quarterly Update Reports

Q4 2023

Project Summary

Project Title:	Controlled Methane Injection Pilot Demonstration of a Biocover Concept for Mitigating Leaking Oil and Gas Wells
Lead Investigator:	Millennium EMS Solutions Ltd
PTAC Managed Funds Award Amount $:	$40,000 (2024 contract) plus $200,000 previous contract
PTAC Committee Sponsor	Wade Hartzell, CNRL
GL #:	AUPRF2022-000126
Other Funding Amounts and Sources:	Innotech Alberta: ~$20,000 discount on lease for site
Start Date:	July 2022
Completion Date:	September 2025
Final Report Due Date:	September 2025

Provide a brief description of the challenges this project aims to address and how industry and others will benefit including what the anticipated impact is. (i.e., cost reductions, improved environmental performance, impact on regulation, enhanced access to resources). (Maximum 150 words or less)

Well integrity failure is an expensive historic and ongoing issue associated with a subset of oil and gas wells. Failure manifests as surface casing vent flow (SCVF; inside casing leakage) and/or gas migration (GM; outside casing leakage) whereby natural gas (comprised primarily of methane) is potentially emitted to atmosphere causing greenhouse gas (GHG) emissions. Remediation of integrity failure is challenging and expensive. Currently, to attain a certificate of restoration, there is no practical alternative to full abandonment or re-abandonment for a well exhibiting integrity failure and emitting where GHG emissions may be minimal with full re-abandonment carrying a greater

potential risk to the environment and generating greater levels of GHG emissions. As a result, there is need for cost effective alternative options for mitigation of leaking oil and gas wells, particularly for marginal leakage, where emissions pose a low risk to the environment and are contributing only minimally to GHG emissions.

List key milestones with invoicing schedule.

	Milestone	Expenditures[1]	Quarter[2] (e.g., Q2 2021/22
1	**Biocover operation and monitoring**	$30,000 (includes $10,000 on existing contract)	Q3 2024 through Q1 2025
2	**Data analysis and modelling**	$10,000	Q1 through Q2 2025
3	**Report, Presentation, Technical Paper**	$10,000	Q3 2025
	Total	$40,000 (new contract only)	

Quarterly Update: e.g., Q3 2022/23

Exception Highlight for the Quarter:

1. Project extended 1 year (separate contract); 2024 funding allocated to biocover operation, maintenance and monitoring with reporting completed in 2025
2. Operation/monitoring additional costs incurred due to equipment issues

Update on scope, key questions, gap analysis and work performed this quarter (include any requests for assistance to PTAC or the committees)

Biocell operation and monitoring being conducted.

[1] All expenditures in Canadian dollars and must include GST and other applicable taxes
[2] Quarters are based on fiscal calendar e.g., Q3 2021/22 is Oct-Dec 2021

Budget Summary Update – original contract

Revenues and Expenditures	Total Budget	Budget to date	Project charges this quarter	Project charges to date	Variance of budget to actuals to date	Forecasted Total Project (no. of quarters of actual plus	Variance of total budget to forecast
Funds received And from whom	$200,000	$200,000	$10,000	$200,000	-	$200,000	-
Expenses							

Budget Summary update – 2024 contract

Revenues and Expenditures	Total Budget	Budget to date	Project charges this quarter	Project charges to date	Variance of budget to actuals to date	Forecasted Total Project (no. of quarters of actual plus	Variance of total budget to forecast
Funds received And from whom	$40,000	$5,000	$15,000	$15,000	$10,000	$40,000	-
Expenses							

Variance analysis (includes changes to invoicing schedule)
1. Additional (2024/2025) funding secured; will spent current funding first then switched to new funding.
2. Significant additional costs incurred due to malfunctioning equipment, are looking at ways to keep cost down over the next few months.