

# 2022-2023

# Annual Report

BRINGING TOGETHER TECHNOLOGY, PEOPLE & IDEAS



PTAC



Alberta Upstream Petroleum  
Research Fund

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# Message from the Chair

The AUPRF program is a multi-year commitment among the oil and gas industry working with governments and regulators to evolve environmental regulatory requirements to greatest effect and efficiency. I am pleased to inform our broad group of stakeholders that we continue to work diligently on numerous environmental challenges, from reducing methane emissions in upstream and midstream activities, improving the protection of species at risk to reducing the long-term impacts of permanently closing sites and wells.

As with any worthwhile endeavour, persistence and focus are key. Some of the current issues we are dealing with, such as determining a replacement for Class G cement, come to the attention of the industry quite quickly and require rapid responses. Others, such as the long-term work we have done to support the improved health of grizzly bears, has been continuous for two decades.

Regardless of it being a new or long-term issue, the AUPRF model continues to work well. Experts from industry and government meet to discuss the highest-priority projects on which to focus. The collaborative nature of those discussions is the AUPRF program's real value, although we often note the program has created more than \$93 million in annual operating savings for producers from a 15-year cumulative investment of approximately \$36 million.

One challenge we face is funding. Our funding participation through the Alberta Well Levy request, administered by the Alberta Energy Regulator, is appreciated but only ranges from 60% to 70%, depending on the year. The AUPRF Oversight Committee (AOC), of which I chair, and our five technical committees create a comprehensive research portfolio but, unfortunately, not all the projects directly responding to policy or regulatory requirements can be funded. This funding challenge creates a risk for producers, as without the information coming from the AUPRF program there is a higher likelihood they will be unprepared to respond to the requirements.

This successful program is based on leveraging funding for the applied research, technology development and field trials that have a track record of responding to industry needs. However, those needs are only increasing. New or more sophisticated policies and regulations are constantly under discussion. One key discussion is the potential for a new methane-reduction regulation to bring down producer emissions by 75%. Some draft expectations require the development of technology or business process solutions, and that takes time and money. The AUPRF committees are doing their best to move projects along through a powerful consensus process. We need every producer to consider the strategic value in working together and contributing funding so we can meet those ever-increasing needs.

On behalf of the Oversight Committee, I would like to thank Dave Lye at Ovintiv for his leadership of the AOC when we embarked on this new governance model in the fall of 2021. Thanks to Dave, the new model is working effectively, and the recent transition of the Chair role was seamless. The 2021 agreement between the Canadian Association of Petroleum Producers, the Explorers and Producers Association of Canada, and the Petroleum Technology Alliance Canada re-invigorated the partnership amongst industry government and regulators to find evidence-based solutions.

I am pleased to note in 2022-23 we launched 20 projects covering methane emissions monitoring and mitigation, nitrous oxide (NOx) emissions reduction procedures, knowledge expansion of species at risk including caribou and migratory birds, and improvements in monitoring and mitigating salt and metal soil containments. We also launched a major multi-party project to evaluate alternative products to cement to improve well closures. We did all this with over 150 volunteers across the six committees and the leveraging (approximately three to one) of the \$2.8 million in funding industry provided.

This year, in 2023-24, we are launching 28 projects with a contribution from industry of \$3.2 million. Contributions are increasing but we are also looking for more producers to participate to improve practices and outcomes more broadly. We also continue to create value through our volunteers' efforts on the committees, discussing issues, prioritizing research, guiding technical requirements, and supporting the application of this knowledge in the field and in smart policies and regulations.

I encourage you to reach out to me or my colleagues on the AOC, any of the many expert volunteers in the different focus areas, or the staff at PTAC, who help keep all the projects moving along. The value we all bring to the sector is clearly established, creating cost savings opportunities and policies and regulations reflecting facts and evidence.

For those volunteers and producer funders to the AUPRF program, thank you. Your contributions continue to be vital to our success.



**Scott Volk P.Eng, M.Sc.**  
 Director of Emissions & Innovation, Tourmaline Oil Corp  
 Chair - AUPRF Oversight Committee

## AUPRF OVERSIGHT COMMITTEE (AOC) (As of June 30, 2023)

**Scott Volk (Chair)**  
 Director of Emissions & Innovation, Tourmaline Oil Corp

**James Agate (Vice Chair)**  
 Manager - Corporate Liability,  
 Canadian Natural Resources Limited

**Alexandra Robertson\***  
 Principal Engineer, Alberta Energy Regulator

**Jason Brunet\***  
 Director - Technical Science & External Innovation,  
 Alberta Energy Regulator

**Kellen Foreman**  
 Director - Regulatory and Government Relations, Ovintiv

**Mike Fulsom**  
 Director - Provincial Operations,  
 The Explorers and Producers Association of Canada

**Scott Milligan\***  
 Executive Director - Provincial Programs & Operations,  
 Alberta Environment and Protected Areas

**Susan McGillivray\***  
 Manager - Reclamation, Remediation and Pesticides at  
 Alberta Environment and Protected Areas

**Tara Payment**  
 Manager - Alberta Operations,  
 Canadian Association of Petroleum Producers

**Tony Jackson**  
 Senior Emissions Management Engineer, Cenovus Energy

*Non-Voting Members\**



# Environmental Research Projects

  
7  
PROJECTS  
COMPLETED

  
22  
ONGOING  
PROJECTS

  
20  
PROJECTS  
LAUNCHED

  
49  
PROJECTS  
FACILITATED

  
\$2.8 MILLION  
INDUSTRY  
INVESTMENT

## Projects Launched in FY 2022/23

### AIR

- Experimental Design Assessment of Methane Slip of Stationary Engines Analysis
- Quantification of Methane Emission in Stationary Engine Exhaust and Best Management Practices for Mitigation
- Methods for Estimating Emissions from Tanks

### Ecological

- EcoSeis Phase 2
- Using Various Forms of Remote Sensing to Improve our Ability to Manage Risk of Incidental Take for Pileated Woodpeckers

### Remediation Reclamation

- Process Guide for Approaching Salt Contamination
- Evaluation of Soil Chloride Delineation Requirements
- Expanded Correlations Between Hydrometer Data, Sieve Data, and Saturation Percentage Data
- Subsoil Salinity Tool Version 3.0 Technical Manual
- Evaluation of Reclamation Practices on Peatland Wellsites Stage 3, Phase 4B – Research Program
- Agronomic Receptors – Phase 3
- Background Soil and Water Data, Saskatchewan
- GRF Grassland Reclamation Forum Recovery Strategy Updates
- Development of a Chloride Water Quality Guideline Based on Hardness and Consideration for Cation Toxicity

### Water

- Alberta Water Tool – Open Access
- Development or Adaptation of an Existing Sensor Technology to Monitor Leaks in Temporary Surface Pipelines

### Well Closure

- Testing Alternate Products in Place of Cement for Well Decommissioning and Remediation
- Towards Net-Zero Emissions: Mechanics, Processes and Materials to Support Risk-Based Well Decommissioning
- Gas Migration Measurements for Inventory Accuracy and Well Abandonment
- Controlled Methane Injection Pilot Demonstration of a Biocover Concept for Mitigating Leaking Oil and Gas Wells

## Ongoing Projects in FY 2022/23

- Measurement of Associated Gas and Venting Volumes at CHOPS Sites in Alberta and Saskatchewan (CHOPS GOR)
- Plug and Abandon Strategies for Canada's Oil & Gas Wells to stop Surface Casing Vent Flow (SCVF) and Gas Migration (GM)
- Methods for Estimating Emissions from Tanks
- State of Science on Emission Rate Thresholds for Upstream Petroleum Industry Leaks Corresponding to a Range of ppm Concentration Thresholds
- Evaluation of NOx Emission Abatement Technology Options and Best Management Practices
- Evaluation of Current & Emerging Emission Quantification Tools
- Evaluation of Surface Casing Vent Flows at Inactive Wells: Database Analysis and Field Measurements in Alberta
- Environmental Sensor Monitoring – Improving the Processing Efficiency of Acoustic Big Data to Support Alberta's Land Managers
- Finalization of Research and Preliminary Selenium Soil Quality Guideline Derivation
- Data Collection & Analysis of Phase II Environmental Site Assessments (ESA) Associated with Drilling Waste Disposal Locations
- Development of a Chloride Water Quality Guideline Based on Hardness and Consideration for Cation Toxicity
- Plant Uptake of Petroleum Hydrocarbons and Salt (NaCl) and Derivation of Soil-to-Plant Uptake Factors
- Evaluation of Reclamation Practices on Forested Upland and Peatland Well Sites
- Re-Evaluation of F2 and F3 Petroleum Hydrocarbon Management Limits
- Regulatory Approval of Risk Assessment Tools
- Soil and Groundwater Guideline Calculator
- Background Metals and Salinity Database and Analysis Tool
- Standardizing Risk Assessment Approaches Based on Residual Mass vs. Numerical Endpoints
- Remote Sensing Tools
- Testing Alternative Products for Well Remediation and Decommissioning / Abandonment – Phase I
- Minimum Acceptable Emissions and Closure Guidelines for Leaking Abandoned Wells
- Investigate the Potential for Surface Casing Vent Flow/Groundwater Migration Issues

## Projects Completed in FY 2022/23

- Environmental Sensor Monitoring – Improving the Processing Efficiency of Acoustic Big Data to Support Alberta's Land Managers
- Agronomic Receptor Evaluation for Direct Soil Contact
- Standardizing Risk Assessment Approaches Based on Residual Mass vs. Numerical Endpoints
- Plug and Abandon Strategies for Canada's Oil & Gas Wells to stop Surface Casing Vent Flow (SCVF) and Gas Migration (GM)
- Water Use Data Sources and Water Metrics for Canada
- Jurisdictional Review: Alternative Water Transfers Using Temporary Layflat Hose
- Alberta Water Tool - Open Access

## Evaluation of NOx Emission Abatement Technology Options and Best Management Practices

*Accurata has joined forces with ASK Engine Consulting, Spartan Controls and Signet Monitoring to provide this comprehensive study.*

Operators of stationary natural gas fired engines in the oil and gas sector are regulated by increasingly restrictive limits on nitrogen oxide (NOx) emissions. These regulations require mandatory testing and mitigation of fleet emission levels over time. Engine manufacturers and other manufacturers have developed technology solutions to achieve compliance with the regulations. Engines are complicated and the selection of solutions are numerous with varying degrees of effectiveness. Operators are faced with qualifying the solutions and testing requirements in order to ascertain the optimum configuration. Working through the process and the budget implications takes years.

This project developed Best Management Practices that will allow operators to examine the options available for their particular engine model and the life cycle costs associated with the options. Supporting information on testing, regulations and combustion theory was also developed to better understand the effectiveness of the solutions.

Six reports have been produced for operators of stationary natural gas engines. The key message in these reports is “What are the technical or process solutions to improve engine life and health, minimize cost and manage NOx emissions.” The reports describe the background information that every engine operator must understand in managing their engines and engine fleets to be compliant with NOx regulatory requirements. The topics discussed include:

- Combustion theory.
- Influence of aspects external to the engine.
- Regulatory requirements.
- Emission testing requirements.
- Challenges and considerations for testing engines with different combustion styles.
- Best management practices for testing.
- Managing testing programs for engine fleets.

Engines that are configured in a lean burn combustion style will require less frequent testing and lower effort in maintenance and operating expense than engines configured in a rich burn configuration. Rich burn engines require a catalyst to meet NOx regulatory requirements.

Lean burn engines will comply with NOx regulatory limits without additional emissions treatment and provide the added benefit of about 15% less fuel consumption than the same engine model configured for rich burn combustion. The six reports go into detailed operator guidelines for different engine configurations to minimize NOx emissions. For more information, please [click here](#).



"These best management practices help explain operational issues and technological solutions to improve engine life, minimize operating and maintenance costs, and optimize NOx emissions. These documents will help engine operators, regulators, and other stakeholders better understand what is required to manage engine fleets and to be compliant with NOx regulatory requirements."

Milos Krnjaja, Alberta Energy Regulator



# Ecological

## Developing Tools for Improving Pileated Woodpecker Management

Dr. Erin Bayne, University of Alberta

The Pileated Woodpecker (PIWO) is the largest woodpecker in North America. PIWO excavate large cavity nests in trees that are then used to raise their young. After PIWO are done using the cavity for nesting, other species will use the cavities for their own habitat needs. New federal legislation protects these cavities for up to 3 years after they were last used. Thus, to effectively manage PIWO requires an ability to know where to look for cavities cost-effectively. The Bioacoustic Unit at the University of Alberta and the Alberta Biodiversity Monitoring Institute are working with the PTAC AUPRF Ecological Research Planning Committee (ERPC) to develop a toolkit to do this.



1

Starting with the WildTrax system, they have used extensive network of sound recordings created by ARUs to develop searchable habitat maps of where PIWO are likely to be observed at a 1km<sup>2</sup> scale. Recent advances in processing of sound data helped them to find PIWO very efficiently and now they are looking for additional ARU data, particularly from recordings in April and May, to improve the maps. As part of the toolkit they are also trying to find out what it sounds like at PIWO nests; at PIWO foraging locations; and at random locations. This will allow them to use ARUs to map at finer resolution (~1 hectare) exactly where PIWO are likely to be and why. At the same time, they are using LiDAR to see if they can identify the exact trees within PIWO home ranges where nests are located. They are also looking for partners who have ARU data and/or spatial coordinates of known PIWO nests that would be willing to collaborate. If you have such information or would like to discuss the project details, please contact Dr. Erin Bayne at the University of Alberta ([bayne@ualberta.ca](mailto:bayne@ualberta.ca)).

The outcomes of this project will make it easier for industry to locate Pileated Woodpecker nests using remote sensing tools in order to ensure compliance with the Migratory Birds Convention Act and to provide a research basis by which industry could consider manipulation of nests in order to efficacy of various mitigation strategies. For more information or to obtain updates on this project, [click here](#).

"This project builds upon work previously completed and supported by AUPRF, which provides additional value in helping to increase our understanding of ecological issues and inform appropriate mitigations. It is exciting to continue to build upon and utilize the tools developed by the bioacoustic unit as our industry looks to effectively manage Pileated Woodpecker cavities within the context of our activities."

Mark Boulton, Suncor



2

Photo credit: Kyle Taylor<sup>1</sup>  
Photo credit: Emily Swerdfager<sup>2</sup>

# Remediation Reclamation

## Remote Sensing Tools

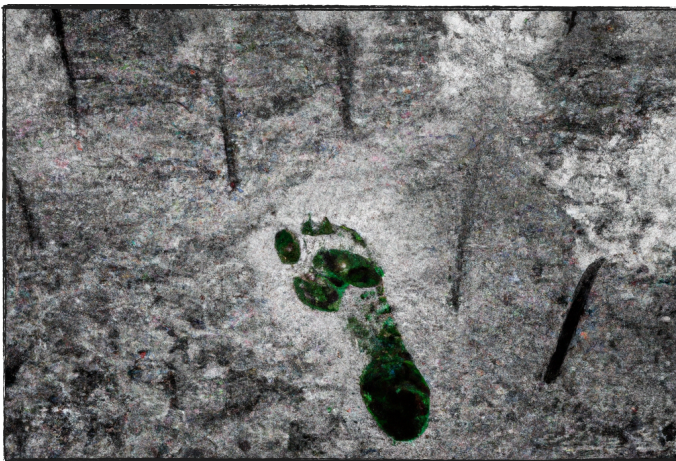
Dean MacKenzie/Eduardo Loos, Vertex

The primary goal of the project is to test, validate, and develop digital tools to monitor terrestrial and wetland environments impacted by oil and gas operations. The project will develop remote sensing tools using Earth Observation (EO) image data and cutting-edge machine learning (ML) and artificial intelligence (AI) technologies to process large volumes of remotely-sensed imagery quickly and efficiently. This will enable Vertex to optimize the way environmental monitoring is currently conducted through improvements provided by the use and analysis of EO imagery and related spatial data.

In contrast to conventional field-based monitoring campaigns, remote sensing analysis of EO imagery can reduce damage to crops and other vegetation because of no direct contact with the surface, and can also reduce the spread of diseases, pathogens, and weeds. The tools developed in this project will showcase the ability of EO data and remote sensing techniques to address environmental monitoring of reclamation efforts by locating abandoned or suspended padded wellsites and non-padded wellsites in the wetland areas of the Green Zone.

Additionally, remote sensing tools will help determine sustainability of forests developing on reclaimed wellsites. The advantage of Vertex's methods relies on the incorporation of the latest ML and AI technologies to process and analyze large-area coverage EO data to ultimately help in reducing wellsite liabilities and the need for field visits for characterizing wellsites and shorten reclamation certificate timelines.

For more information or to obtain updates on this project, [click here](#).



Reclaimed wellsite in the boreal forest <sup>1</sup>

"I am very excited to be continuing the excellent work of the RRRRC where we have highly valuable projects underway. Initiatives such as the Re-evaluation of F2 & F3 Petroleum Hydrocarbon Management Limits and the Evaluation of Reclamation Practices on Forested Upland and Peatland Sites advance the latest science and field practices to influence policy ensuring our remediation and reclamation spending is carried out in the most cost-effective manner."

Jason Desilets, Cenovus Energy, RRRRC Chair

# Water

## Evaluation of Existing Pressure Testing Methods for Low Quality Water Temporary Surface Pipelines

*Kai Lee, Kira Wong and Kofi Freeman Adane, InnoTech Alberta*

The Alberta Energy Regulator (AER) has released an updated “draft” version of Directive 077 which will allow industry to transfer low-quality non-saline and saline waters using temporary surface pipelines (TSP). In Directive 077, AER has grouped water into 3 categories based on its environmental impact. Group 1 is water with negligible effect, Group 2 is water with easily and quickly reversible effect, and Group 3 is water with reversible effect not easily and quickly but low public safety risk. TSPs are typically installed aboveground for periods of 12 months or less and are operated at pressures of no more than 2,000 kPa. In this new directive, a key component will be an assurance that the integrity of these pipeline assets is maintained throughout the operation. Current direction requires surveillance or monitoring to be live supervised, with the use of active surveillance methods such as walking the line when pressurized. However, the integrity of these TSPs can also be confirmed using other methods including physical and aerial surveillance and inline pressure monitoring. The primary objective of this project is to review and evaluate available technologies and/or new or emerging technologies for detecting or monitoring for leaks in TSPs and their connections during water, mainly Groups 1 and 2 transfer operations.

“This project is important as new or emerging technologies for monitoring temporary surface water pipelines could complement or replace visual surveillance methods if proven effective. These approaches have the potential to improve worker safety, enhance leak detection, and support continuous improvement in industry operations.”

**Tara Payment, Canadian Association of Petroleum Producers**

The following are the main findings from this study:

- For hydraulic fracturing operations in North America, water is generally conveyed from the surrounding Groups 1 and 2 water sources to the operating site via temporary surface pipelines.
- In Alberta, visual inspection and pressure monitoring are mainly used as leak detection systems (LDS). This satisfies Alberta Energy Regulator’s (AER) guidelines for operating TSPs in Alberta.
- Four existing LDS could be used for Groups 1 and 2 water TSP applications. They include acoustic sensors (stand-alone and smart ball type), pressure sensors, flowmeter sensors, and fiber optic sensing cables.
- A total of 12 new and emerging LDS technologies that could be used for Groups 1 and 2 water TSPs were identified. Out of the 12, 6 of the technologies have the potential to be used for water TSPs. These include the start shut-in method, use of acoustic sensors in conjunction with walking the line, dye injection method, collection tarps underneath pipeline, monitoring upstream pump head performance, and using a single flowmeter.

The following is the recommendation from this study:

- Laboratory and/or field validation of high potential new and emerging LDS technologies identified in this study is needed to determine their ability to monitor for leaks for water TSP applications in Alberta. Environmental factors and operational factors need to be considered during the evaluation.

To view the full report, please [click here](#).

# Well Closure

## Field Investigation of Gas Migration Around a Leaky Petroleum Well

Cathy Ryan, Tiago Morais, and Bernhard Mayer (Geoscience, University of Calgary)

Uli Mayer (Earth and Atmospheric Science, UBC)

Beth Parker (School of Engineering, University of Guelph)

Wells with gas migration are a liability that is challenging for the industry to manage, particularly for 'low-leakers', which are anecdotally notoriously difficult to repair. This research project aims to i) increase knowledge about how fugitive gases migrate in the subsurface, ii) better understand their groundwater quality and greenhouse gas implications; and iii) develop best practices to monitor and guide remediation around leaky wells.

Continuous long-term gas migration surveys at a 'low-leaker' well site indicated that fugitive gas emissions vary by orders of magnitude on hourly to seasonal time frames and are mainly focussed within a metre of the wellhead. The isotopic composition of fugitive methane ( $\text{CH}_4$ ), and the presence of minor ethane ( $\text{C}_2\text{H}_6$ ) concentrations suggest the fugitive gases originate ~350 m below ground surface (bgs). Although these results reflect a single well, the findings are salient to gas migration detection and emission estimation efforts.

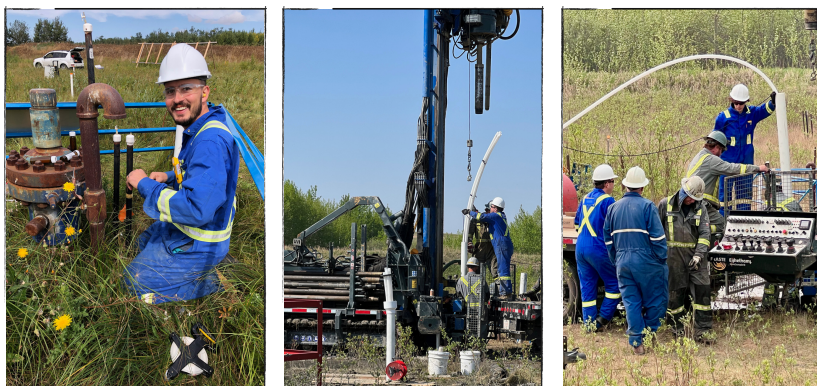
Insight into the shallow subsurface distribution of  $\text{CH}_4$  is proceeding at progressively deeper intervals in stages. Initial groundwater investigations used 15 shallow monitoring wells (1.25 m bgs) to confirm a shallow water table (~0.5 m bgs) and the presence of a plume of dissolved  $\text{CH}_4$  mainly within < 5 m of the wellhead.

The depth of investigation was extended to 6 m bgs in August 2021 by pairing a 'direct push' rig with a membrane interface probe to conduct high resolution  $\text{CH}_4$  profiling to understand of the extent and distribution of the dissolved  $\text{CH}_4$  plume.

The profiling showed discrete  $\text{CH}_4$  plumes, with the highest concentrations typically occurring below low hydraulic conductivity (i.e., fine-grained) lenses in the shallow groundwater zone. Although the highest  $\text{CH}_4$  concentrations were measured within ~5m of the well casing, elevated  $\text{CH}_4$  concentrations observed up to 10 m from the wellhead were attributed to fugitive  $\text{CH}_4$  migration as free-phase gas beneath the sub-horizontal lenses. These findings support previous research both at experimental injection sites and laboratory experiments that demonstrated that although wellbores are primary pathways for buoyant migration of  $\text{CH}_4$ , transport also occurs both in dissolved phase along the groundwater flow and laterally as free phase below fine-grained layers.

Drilling, coring, and installation of a groundwater monitoring network was completed with our industry partner in June 2023. Three multilevel groundwater monitoring wells (13 total sampling points) were successfully installed. As soon as well development is complete, a year-long monitoring program will be initiated. The monitoring will be supported by mathematical modelling. This work should provide good insight into the geochemical implications of methane invasion of a shallow aquifer.

For more information or to obtain updates on this project, [click here.](#)



"A successful year was realized with AUPRF continuing to support several outstanding projects, each project striving to improve environmental outcomes, manage risk and prioritize asset integrity. Many projects require graduate research students, supporting education and the experience of future professionals."

Shawn Forster, Cenovus Energy

# Technical Steering Committees

## Air Research Planning Committee (ARPC)

Andrea Zabloski	Canadian Natural Resources Limited
Andrew Cattran	NuVista Energy
Carolyn Ussher	Alberta Energy Regulator
Colin Hennel	Bonavista Energy
Don McCrimmon	Canadian Association of Petroleum Producers
Filiz Onder	Ovintiv
Gerald Palanca	Alberta Energy Regulator
Graham Noble	Saskatchewan Ministry of Energy and Resources
Jacob Bayda	Saskatchewan Ministry of Energy and Resources
James Beck	Suncor
Koray Onder	TC Energy
Moruf Aminu	Encana
Nuczki Mathurin	TC Energy
Peter Kos	BC Energy Regulator
Randy Dobko	Alberta Environment and Protected Areas
Sean Smith	Environment and Climate Change Canada
Yaomin Jin	BC Energy Regulator

## Ecological Research Planning Committee (ERPC)

Agnes Wajda-Plytta	Alberta Energy Regulator
Ben Hale	Cenovus Energy
Carol Engstrom	Independent
Devon Versnick-Brown	Canadian Natural Resources Limited
Jennifer Shalagan	Cenovus Energy
Jeremy Reid	Canadian Natural Resources Limited
Krista Phillips	Canadian Association of Petroleum Producers
Mark Boulton	Suncor
Shane Patterson	Alberta Environment and Protected Areas
Sherry Becker	Imperial Oil
Tara Bernat	Ovintiv

## Remediation Reclamation Research Committee (RRRC)

Christopher Boyd	Shell
Debbie Tainton	Canadian Natural Resources Limited
Devin Scheck	BC Energy Regulator
Elise Neumann	Alberta Environment and Protected Areas
Jason Desilets	Cenovus Energy
Jeff Mills	Orphan Well Association
Jennifer Thompson	Revitalize Energy
Jonas Fenn	WhiteCap
Linda Eastcott	Imperial Oil
Lisa Warren	Cenovus Energy
Lori Neufeld	Imperial Oil
Marci Jacula	Revitalize Energy
Nadia Cruicshank	Alberta Energy Regulator
Paul Hartzheim	Canadian Association of Petroleum Producers
Rick Rohl	ARC Resources
Sara Blacklaws	Alberta Energy Regulator
Shawn Glessing	Cenovus Energy
Sheldon Exner	Crescent Point Energy
Sonia Glubish	Canadian Natural Resources Limited
Tom Knapik	Plains Midstream
Tyrel Hemsley	Alberta Environment and Protected Areas

## Water Innovation Planning Committee (WIPC)

Geoff Webb	Canadian Natural Resources Limited
Jarred Anstett	Murphy Oil
Kristi Stucklschwaiger	Encana
Matt Mclean	Cenovus
Michael Bevan	Alberta Energy Regulator (AER)
Michelle Morris	Alberta Environment and Protected Areas (AEPA)
Natasha Rowden	MEG Energy
Neil Fricke	Suncor
Paul Martin	ConocoPhillips
Rodney Guest	Suncor
Sarah Belak	Tourmaline Oil
Scott Hillier	Cenovus
Scott Rayner	MEG Energy
Tara Payment	Canadian Association of Petroleum Producers

## Well Closure Research Committee (WCRC) formerly Well Abandonment Research Initiative Committee (WARI)

Alexandra Robertson	Alberta Energy Regulator
Ben Fraser	Imperial Oil
Cassidy Juhasz	Crescent Point
Claudette Fedoruk	Canadian Association of Petroleum Producers
Dave Samuelson	Cenovus
Jennifer Thompson	Revitalize Energy
Leah Davies	Imperial Oil
Marci Jacula	Revitalize Energy
Rajan Varughese	Alberta Energy Regulator
Richard Wong	Cenovus Energy
Ryan McDowell	Crescent Point Energy
Shawn Forster	Cenovus Energy
Wade Hartzell	Canadian Natural Resources Limited



# Financial Reporting



*This financial report shows the revenues and expenses since the 2019/2020 fiscal year. Expenses in a given year do not equal revenues due to the timing of multi-year projects and some leveraged funding being managed directly by Petroleum Technology Alliance Canada (PTAC).*

		2022/2023		2021/2022**		2020/2021		2019/2020	
		AUPRF	Leveraged*	AUPRF	Leveraged	AUPRF	Leveraged*	AUPRF	Leveraged*
<b>Air Emissions</b>	ARPC	\$ 600,573	\$ 870,000	\$ -	\$ -	\$ 997,001	\$ 8,389,021	\$ 1,156,265	\$ 1,400,000
<b>Ecological</b>	ERPC	\$ 371,500	\$ -	\$ -	\$ -	\$ 115,000	\$ 207,500	\$ 176,000	\$ 875,800
<b>Reclamation</b>	RRRC	\$ 633,836	\$ -	\$ -	\$ -	\$ 777,000	\$ 927,300	\$ 622,697	\$ 393,025
<b>Water</b>	WIPC	\$ 98,000	\$ -	\$ -	\$ -	\$ 56,800	\$ -	\$ 297,200	\$ -
<b>Wells</b>	WCRC	\$ 396,938	\$ 2,100,000	\$ -	\$ -	\$ 780,929	\$ 1,199,000	\$ 283,750	\$ 157,000
		\$ 2,100,847	\$ 2,970,000	\$ -	\$ -	\$ 2,726,730	\$ 10,722,821	\$ 2,535,912	\$ 2,825,825
	% of Collection	70%		0%		59%		65%	
	Revenue	\$ 2,849,094		\$ -		\$ 4,426,168		\$ 2,468,046	
	Expense	\$ 1,115,562		\$ 2,385,453		\$ 2,175,257		\$ 3,780,000	

\* Includes funds PTAC leveraged from TIER, CanERIC, SK MER, CRIN, NZTC, and other

\*\* No well levy collection



"Economy and environment are the same thing. That is the rule of nature."

– **Mollie H. Beattie**, Conservationist & 1st Female Director of the United States Fish and Wildlife Service



# PTAC



## Alberta Upstream Petroleum Research Fund

For more information about **AUPRF**  
visit our website at: [www.auprf.ptac.org](http://www.auprf.ptac.org)

or

Contact PTAC at:

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