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Alberta Upstream Petroleum
Research Fund

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Policy Issues & Knowledge Gaps

The Foundation of the Program's Research Planning Process for PTAC's Alberta Upstream Petroleum Research Fund (AUPRF)

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AUPRF research priorities are defined from **policy issues identified by industry** and **knowledge gaps or research questions framed by the AUPRF committees**. Projects are then funded to address those gaps and generate evidence that can inform operations, regulatory decisions, and future policy discussions.

What is a Policy Issue?

A **Policy Issue** is a high-priority challenge, regulatory concern, or emerging issue facing Alberta's upstream oil and gas sector that requires better information to support decision-making.

What is a Knowledge Gap?

A **Knowledge Gap** is the specific scientific, technical, operational, or economic question that must be answered to address the policy issue.

Examples include:

- Understanding the effectiveness of methane detection, quantification, and control technologies.
- Cost-effective treatment technologies for produced water and alternative water sources.
- How caribou, predators, and alternate prey respond to restoration treatments over time.
- Fate and transport of petroleum hydrocarbons, salinity, and metals in soil and groundwater.
- Risks associated with non-zero SCVF thresholds and risk-based well decommissioning approaches.

How PIKGs Are Used in AUPRF

The AUPRF process is essentially:

1. Industry identifies a Policy Issue.
2. Technical committees define the Knowledge Gaps.
3. Research priorities are established.
4. RFPs are developed around the highest-priority gaps.
5. Projects are funded to generate the evidence needed to support industry, government, and regulators.

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ARPC Air Research Planning Committee

AUPRF2026 Policy Issues and Knowledge Gaps

VERSION DATE: April 21, 2026

Guidance (from CAPP)

Explore - What types of research would be valuable to drive efficient policy discussions? Get direction from policy groups on distribution of funding between policy groups.

Align – Understand provincial government's monitoring priorities; are there projects that could support this? i.e. pressure data utilization.

PIKGs

Public Policy Issue	Knowledge Gap(s)
1. Methane Emissions *Federal and provincial regulations require the oil and gas sector to reduce methane emissions by 45% by 2025, and the new proposed federal policy is to continue that duction to 75% by 2030. The industry is focused on meeting the reduction targets and timing in the most cost-effective way possible. Advancements in methane detection, quantification, and control technologies allow the sector to implement solutions promptly.*	**1. Improved regulatory efficiency and outcome-based design**[1] Direct research toward streamlining regulatory design and implementation while maintaining environmental outcomes. Leverage existing data sets to gain insights into regulatory amendments or future design. • What is the relative importance of survey frequency, method measurement error, and method detection limit (e.g., PoD 90%) in achieving real-world detection and reductions? • For each metric, what is the incremental emissions-detection and reduction benefit (and compliance burden) of increased stringency, and where are the diminishing returns? • How could monitoring/response requirements be structured to efficiently address intentional and unintentional releases? 2. Best practice monitoring strategy 3. Risk-based approaches to mitigation • Damage cost estimates • Technical risk, financial risk 4. Methane reduction technology deployment • scale – closer linkage to the technology we are developing and then handing it off to IRAP. 5. Gas migration impacts on potable water *especially for methane and other gases leaking from oil and gas wells*

[1] Addition by LC, CAPP (2/17/26)

Methane Emissions *(Continued)*	*or CO_2 storage sites*[2]. Water/conduit creating a connection. **6.** Optimized methane monitoring and *quantification technologies for different facility types*[1:] Significant advancements have been made in technologies that detect and quantify methane releases, including new OGI cameras, fixed and mobile ground-based sensors, crewed and uncrewed aerial systems, and satellite platforms. **The gap to close is determining a suite of technologies capable of reliably and cost-effectively detecting a methane flux in real-world conditions.** 7. **Inventory application and performance evaluation for cost effective regulation**[3]: There is a need to better understand how different inventory approaches and measurement layers perform relative to one another, and how they can be used most effectively to support outcome based, cost efficient regulatory design and implementation. • **Relative performance of top down and bottom up approaches**: What are the strengths, limitations, and appropriate use cases of top down, bottom up, and hybrid approaches, and under what circumstances do differences between them materially affect regulatory or policy decisions? • **Incremental benefit versus cost and effort:** For different inventory methods, data layers, and reconciliation approaches, what is the incremental decision-making value gained relative to the cost, operational effort, and administrative burden, and where do diminishing returns occur? • **Treatment of uncertain or marginal sources**: How should sources with higher uncertainty or lower expected contribution (e.g., inactive or intermittently emitting facilities) be evaluated in terms of their relative influence on inventories and policy outcomes, and what level of treatment is proportionate to their impact? • **Implications for provincial inventories and industrial reporting methodologies:** Based on relative performance and incremental benefit, should and how might provincial inventories or industrial reporting methodologies evolve to better support comparability, regulatory efficiency, and credible outcomes—without increasing reporting burden where added value is limited?

[2] Addition by YJ, BC Government (2/13/2026)
[3] Addition by LC, CAPP (2/17/26)

	• **Role of site wide (L5) measurements in inventory context**: How can site wide measurements be used to contextualize, benchmark, and stress test bottom up inventories, without creating duplicative monitoring or reporting requirements? 8. **Understanding Routine and non-routine Venting from Tanks:**[4] Efforts to establish an accurate methane emission inventory have identified tank venting as contributing to methane emissions at oil production and processing facilities. In addition, anecdotal information suggests that large, abnormal, episodic events can be a significant contributor to a facility's emissions, but because of their nature, are difficult to detect and quantify. Prior work (e.g., the 2019 Clearstone study) identified that gas carry-through to tanks can occur outside of normal operating expectations, suggesting that non-routine events may contribute disproportionately to emissions while remaining difficult to detect and characterize using conventional approaches. • **Valve leak detection and diagnostic methods:** What leak detection and diagnostic methods (e.g., screening technologies, operational indicators, targeted inspections) are most effective for identifying valves and components contributing to gas carry-through to tanks, particularly for intermittent or episodic events? • **Integration with fugitive emissions management programs:** How can insights on high-risk valves and non-routine venting pathways be integrated into existing fugitive emissions management programs (e.g., risk-based LDAR) to improve emissions identification and mitigation efficiency without duplicating requirements? 9. **Evaluating Methane Control Technologies:** It is important to evaluate near-commercial control technologies with different operators, in different operating conditions and different facility types, and document the capabilities and limitations of each technology transparently so that all operators can determine the applicability of each technology in their unique asset mix. • **The key knowledge gap is no longer centered on technology availability or basic performance, but on understanding and addressing the barriers to broad,**

[4] Uncontrolled Tank Venting was discussed with Regulators at ARPC Meeting (January 2026); BC MERC Study on controlled Tank Venting was mentioned.

	consistent deployment across diverse operators and asset types.[5] • **Role of financial policies and incentives:** Which financial policies, incentive structures, and funding mechanisms (e.g., grants, tax credits, cost-sharing programs, performance-based incentives) are most effective at enabling broad deployment, particularly for smaller operators or marginal assets? • **Scalability and durability of deployment:** What conditions are needed to ensure deployed technologies deliver sustained performance over time, rather than short-term adoption driven solely by compliance deadlines or one-time funding opportunities? 10. **Incomplete Combustion of Methane – Methane Slip:** The industry is observing methane slippage in various monitoring technologies. How can methane slip be minimized using technology or process solutions while still meeting other regulatory emission requirements (e.g. **NOx requirements in MSAPR**)? ○ Reciprocating Engines ○ Boilers ○ Heaters ○ Flares (lit and unlit) ○ Assessment of Flare emissions and mitigation ○ Flare systems, PM, black carbon, NOx, VOCs, methane, flame out, combustion efficiency, and percentage impact from industry. ○ VRUs ○ Use of non-selective catalysts **11. Combustion and destruction performance of methane control technologies:** There is a need to better understand how technology design choices and operational practices influence methane combustion and destruction efficiency across a range of equipment and operating conditions, and how these factors can be optimized while continuing to meet other regulatory emission requirements (e.g., NOx, VOCs, safety). • **Trade-offs across regulatory objectives:** How can improvements in combustion and destruction efficiency be achieved without unintended trade-offs with other regulatory

[5] Added by LC, CAPP (2/17/26)

	requirements, including NOx, VOCs, safety, and equipment reliability? 12. **Virtual Elimination of emissions:** Are there options to consider for the virtual elimination of methane emissions on oil and gas sites? What is the role of planning frameworks such as the Peace River Directive to be applied to other areas? What sort of infrastructure solutions would be needed to enable this aspirational goal? What barriers and opportunities exist to deliver on this aspirational goal?
2. Air Quality Indicators *Ambient air quality objectives are continuously being reviewed and updated, and in- industry is being required to meet more stringent targets. To determine the impact of such policy changes, the industry needs to understand the contribution that upstream oil and gas facilities have to the substances being reviewed.*	1. MSAPR Regulations • **Phase 2 of MSAPR regulations and NOx.** 2. An accurate understanding of the potential release of substances subject to new or revised air quality objectives from the UOG industry is required. Additionally, if the substance is being released in quantities that may be subject to regulatory requirements, reasonable and cost-effective emission control options would need to be developed. 3. **Optimizing NOx testing requirements under MSAPR through data-driven regulatory design[6]:** There is a need to better leverage existing NOx test data, operational experience, and compliance learnings from MSAPR implementation to inform more efficient, risk-based NOx testing requirements. While testing plays an important role in demonstrating compliance, current approaches may not always align testing frequency, scope, and conditions with the incremental regulatory value gained. • What does a Performance Test (3x20-minute samples) accomplish over an Emission Check (1x20-minute sample)? 4. **Optimizing ambient air quality monitoring to support efficient compliance[3]:** There is a need to better understand how existing ambient air quality monitoring data, including historic testing results and long-term monitoring trends, can be more effectively used to characterize background conditions and sector contributions. This includes assessing whether collective data analysis could support reduced testing frequency, targeted testing, exemptions, or alternative compliance approaches, thereby minimizing duplicative monitoring and facility-level assumptions while maintaining air quality outcomes.

[6] Additions by CAPP, LC (2/17/26)

3. Air Emission Inventories *Air emissions inventories are becoming an increasingly important method of monitoring and reporting on industry emissions, for the public, governments, and individual companies. Further, governments are using these emissions inventories to negotiate international treaties, establish air emissions policy measures and targets, and develop emission forecasts. As such, it is important that upstream oil and gas operators report facility emissions using standardized methodologies and realistic emission factors with low uncertainty and also have access to a wide variety of effective emissions monitoring technologies. Inaccurate and/or overly conservative emissions factors can result in an inaccurate portrayal of the emissions profile of the oil and gas industry. This in turn can lead to unnecessary or ineffective regulatory requirements and additional public scrutiny.*	1. The development of technically defensible and effective emission management policies and regulations is reliant upon good quality emissions data and inventory to both identify potential opportunities for emission reductions and to determine industry performance and emissions reductions in future years. There are opportunities to address this knowledge gap by investigating potential improvements to the certainty of quantification (emission factors and measurement technologies and methodologies), monitoring practices, data management, and reporting from the upstream oil and gas sector. 2. Collaboration and coordination as we develop a tool to better understand the Alberta NOx inventory/baseline (using recently collected MSAPR test data), and development of a model that will reveal practical, strategic, and cost-effective options for our sector to achieve AAQOs/CAAQS objectives. Identify other emerging issues among other air contaminants. • CO2 sensors. Standards and accuracy • VOC inventories and mitigation • Tools needed for ambient testing permanently
4. Data Analysis *There is an ever-growing amount of data generated by oil and gas companies and various repositories collecting data. It would be useful to analyze the data into meaningful insights that will help the industry address ongoing challenges.*	1. Data Utilization Strategy • Data analysis aimed at informing and helping the industry to make better, smarter, cost-effective decisions.

2026 ARPC RFPs

The topics identified for ARPC 2026 RFPs are:

26-ARPC-RFP-01	1. Alternative Engine Emissions Testing Methodologies for Regulatory Compliance
26-ARPC-RFP-02	2. MSAPR Cost–Benefit Assessment & Optimization (Data-Driven Design)
26-ARPC-RFP-03	3. Assessment of benefits/costs and emissions considerations for gensets supporting upstream operations – On hold.
26-ARPC-RFP-04	4. Placeholder for Methane-related RFP

2026 RFPs were prepared and distributed to the ARPC for review by **April 10, 2026; Publication aimed for April 22, 2026.**

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ERPC Ecology Research Planning Committee

AUPRF2026 Policy Issues and Knowledge Gaps

VERSION DATE: February 24, 2026

PIKGs

Public Policy Issue (PI)	Knowledge Gaps (KGs)
Species Recovery: Woodland Caribou *Woodland caribou (boreal and southern mountain populations) are federally listed as a Threatened species under the Species at Risk Act and face declining populations and local extirpation of herds across Alberta. Impacts from anthropogenic features are cited as a leading cause of the decline, with a large focus on oil and gas related linear disturbances. The relationships between oil and gas footprint and caribou, their predators, and alternate prey species require further evidence to support protective or restorative measures taken by the industry.*	1. How do boreal and mountain caribou, predators, and alternate prey respond to restoration treatments over time? • Which restoration treatments will provide the most benefit to caribou, while allowing responsible development to occur? • What techniques allow for greater caribou usage in reclaimed areas, while reducing predator use? • Development of tools/indicators to inform on prioritization of restoration on areas of higher importance in caribou ranges 2. Which systems do not regenerate at acceptable rates naturally and how can this be improved? • What site types have been seen to support the best long-term success? • How do we deviate from the typical reclamation standards and practices to maximize use for caribou?
Migratory Bird Protection: Pileated Woodpecker *In July 2022, the federal government amended the Migratory Birds Regulations and identified pileated woodpecker (PIWO) nesting cavities as having conservation value to secondary cavity nesting migratory birds. Along with this classification is a requirement for a period of 36 months of inactivity to be recorded, through monitoring, before the tree in which the PIWO nesting cavity is found can be removed without requiring a permit to do so.*	3. What migratory bird species reuse PIWO nesting cavities? • Is it necessary to maintain cavity buffers, monitoring period, and RAP timing to achieve the desired outcome, while allowing responsible development to occur? • Are the majority of the migratory species using the cavities those who are known to use nest boxes? 4. How important is the availability of PIWO nesting cavities to migratory birds, based on the species reusing them and the frequency of use? • What is the frequency and duration of reuse, by

As implemented, the amendment has the potential to impose significant delays and costs to operators. Supporting science, to justify the conservation value assigned to PIWO nesting cavities, was not provided and remains inconclusive. Research is required to better understand the relationships between PIWO nesting cavities and secondary cavity nesters to inform appropriate mitigation and monitoring measures.	migratory birds, of PIWO nesting cavities? 5. How does the use of artificially created nesting cavities by migratory birds compare to the reuse of PIWO nesting cavities by those species? • Can these birds use nest boxes in place of PIWO nesting cavities? • Is protection of the nesting cavity a high value for other species?
Habitat Restoration and Reclamation [1] *Restoration and reclamation of oil and gas footprint are integral components to the recovery of habitats, and to the species that inhabit them. Given the vast extent of footprint on the landscape and that there are limits to funding available, restoration and reclamation activities need to be both efficient and effective. An increased understanding of the co-benefits and limitations of restoration and reclamation activities will help to achieve the greatest return of ecological productivity on investment.*	6. When is a disturbance (e.g., seismic line) no longer a disturbance? • Allow for adjustment of current timelines for disturbance accounting to accurately represent state of habitat reclamation. • Prioritization of areas where it is shown to take longer to restore. 7. How does the habitat that results from restoration of disturbances (of various widths and types) compared to habitat gained through natural recovery. • What are the biodiversity benefits of restoration/reclamation activities? • Does scale for specific habitats matter? • Is it more beneficial to restore to a variable endpoint than a monogenous habitat? 8. What is the ecological value of reclaimed habitat (function and hydrology) resulting from application of different reclamation treatments (e.g., natural recovery, progressive reclamation, mounding, full/partial pad removal, small-clustered areas) compared to pre-/un-disturbed habitats? • Outline of reclamation techniques that are best suited for specific sites. e.g. BMP's for industry 9. At what scale (e.g., local/site or landscape) is restoration and reclamation required to be conducted to realize these benefits? • Do small pockets of restored native grasslands create value for biodiversity? (i.e. conversion back to native landscape from impacted landscape) 10. What impact does climate change have on effectiveness of restoration/reclamation treatments?

[1] ERPC Chair suggests PI to be communicated with RRRC; There is likely more targeted RFPs with RRRC engagement through this topic.

	• Planning reclamation to account for areas of change across the landscape to support successful reclamation implementation
Listed Species at Risk *Oil and gas operations and legacy foot-prints often overlap with habitat of SARA listed wildlife. The significance of oil and gas activity impacts varies across the various species' geographical ranges and so an understanding of how at-risk species use disturbed, re-claimed, and undisturbed habitats can influence the industry's role in species recovery by informing management for and mitigation of impacts to habitat.*	11. Determine the response of priority at-risk species, found in Alberta, to oil and gas activities including disturbance footprint, reclaimed areas and restored sites. • Identify techniques and practices to minimize impacts to priority at-risk species while allowing responsible development to occur. • Create BMPs for operators to use in landscape settings. 12. Are there land disturbances/reclamation treatments that priority species at risk have been shown to utilize more frequently than natural surrounding areas, and can these areas be used as habitat improvements for those select species? • Which restoration treatments will provide the most benefit to target species, while allowing responsible development to occur? 13. Where species at risk are more common than they are in Alberta (e.g. across geo-political borders), what mitigation and management plans in those locations allow for work to continue while minimizing impacts to those species? • What information is needed to re-assess mitigation and management plans in place in Alberta, based on species data outside of Alberta? • Are mitigations and management plans needed? 14. How much data is needed for an evaluation/revaluation of a species? To what extent can proponent data be included in these assessments? • Update species status based on updated information, potentially removing mitigation or management plans when appropriate.

Listed Species at Risk: Greater Sage Grouse *Greater Sage-Grouse are listed as endangered under the Species at Risk Act and an emergency order for their protection (EPO) came into force in 2014.*	15. What are the best reclamation management practices, mitigation, and treatments for reclaiming areas to maximize usability for Sage Grouse? • What practical changes can be made to operations, based on updated information, to allow for additional development within the Sage Grouse range? • Can reclamation outcomes target Sage Grouse preferences to allow for further responsible development? 16. What low-disturbance operational practices allow for minimal impact to sage grouse in continued operational areas, with opportunities for additional development? • Do new technologies and operational measures meet the mitigation intent to allow for further develop? 17. Are the same mitigation measures required in all sage grouse EPO areas? E.g. about habitat features, across geographies within their range? • Different operational outcomes in different habitat areas.
Listed Species at Risk: Sharp-tailed Grouse	18. To what extent are anthropogenic disturbances (cleared, open areas) having on enhancement of life history? • Are STGR leveraging anthropogenic disurbances for their own benefit? 19. Are the current leak buffers and mitigation timing appropriate to achieve the desired outcomes, while allowing responsible development to occur? • Reduction in current buffers and mitigations based on evidence from current operations and effective variances.
Listed Species at Risk: Greater Short-Horned Lizard	20. Assessment of the short-horned lizards lifecycle. • Can updated information provide areas where responsible development can occur within their ranges? 21. Development of an EDNA kit for short horned lizards. • Potential to allow confirmation/presence in survey areas outside of designated survey timing to alleviate current timing restrictions.

Multispecies Approach *Increasingly governments and land managers are proposing and/or applying multispecies approaches to achieve environmental and cultural objectives in complex environments.*	22. What meaningful and constructive multispecies approaches are being applied successfully in Canada, in terrestrial and aquatic environments? 23. What management, monitoring, measurement, and evaluation features and tools are critical to a successful multispecies approach? 24. What is the appropriate size of waterway buffers from activities? • Opportunity for responsible development to occur within areas adjacent to waterbodies 25. Can mitigation and management plans be implemented across Families, rather than at a species-specific level, and remain effective? (e.g., can a general snake or toad mitigation and management plan be used and be just as effective species-specific plans for each?) • Simplified mitigations to meet needs of species at a family/order/class level. 26. Are there models from reclamation/early successional programs that can be applied across operational areas for the determination of multispecies targets? • Utilization of trajectory models to meet desired outcomes for expedited reclamation certification.
Data and Monitoring Tools: Utilization Strategy *There are likely to be opportunities to leverage existing research and create tools for easier deployment and implementation that can improve practices for oil and gas operators.*	27. Can long-term management of data and analysis show meta-observations? • Development of standards to support new efficient and effective methodology/data collection for regulatory objectives. • Regional or long term information analysis to provide information not previously available. 28. Can a review and assessment of tools and approaches identify the best opportunities to be incorporated and leveraged by oil and gas operators? • More efficient and effective processing of historical and newly collected data for various aspects of operations.

Supplementary Resources for PIKGs Discussion

Listed projects related to the currently listed knowledge gaps: 2026 ERPC Policy Issues and Knowledge Gaps (PIKGs) Discussion and Projects Tracker.xlsx

This is a non-exhaustive list. Suggestion is to create a column for historical projects to ensure they are not forgotten but keep the current work/points addressed manageable.

2026 ERPC RFPs

The topics identified for ERPC 2026 RFPs are:

1. Woodland Caribou Habitat enhancements
2. Exploring disturbance monitoring and assessments, particularly focusing on remote sensing and other digital tools for active management.

Draft RFPs will be prepared and distributed (by March 2, 2026) to the RRRC for review by **March 13, 2026.**

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RRRC Reclamation Remediation Research Committee

AUPRF2026 Policy Issues and Knowledge Gaps

VERSION DATE: April 21, 2026

PIKGs

Public Policy Issue	Knowledge Gap(s)
1. Regulatory, Guidelines, Directives, Policies, & Criteria *Current regulatory guidelines may be overly conservative. How can risk- and science-based studies help protect the environment while cutting remediation costs?*	1. Data Utilization Strategy • Maintain imagery in-house to support current and future research projects. 2. Organics (PHC) Remediation • **Fill gaps re: the 2022 Reassessment of F2/F3 Management Limits PTAC project**[1] • Fate and transport mechanisms (e.g., GW-based soil guidelines) • Understand appropriate protection of various exposure pathways • Clarity on AB Guideline assumptions (e.g., continuous source) • Best management practices 3. **Inorganics (salinity, metals) Remediation**[1] • Fate and transport mechanisms (e.g., GW-based soil guidelines) • Understanding background concentrations (including regional variations) of metals and salts • Understand appropriate protection of various exposure pathways • Clarity on Soil Contamination Assessment and Remediation • Guidelines (SCARG) criteria (e.g., EC, SAR) • Outcome-based soil quality guidelines for in-organics (surface/subsoil) • Best management practices 4. **Effectiveness review of Alberta's Contaminated Sites Framework and Alternatives for Returning Medium/High Risk Sites to Productive Use with administering long-term liability**[1] • AER Database Evaluation based on publicly available data. Objective: Assess the Alberta Energy Regulator (AER) database to quantify the number and magnitude of contaminated sites that have been closed and returned to productive reuse. Purpose: Establish the scale of the issue and identify trends or gaps in site closure and reuse outcomes.

[1] Selected for 2026 RFPs

	• Low-Severity Closure Evaluation. Objective: Develop consistent guidance to define what constitutes a "low-severity" site closure—i.e., sites that do not require long-term monitoring or exposure controls. Purpose: Provide a clear and standardized target for achieving closure and facilitating the return of sites to productive use. • Regulatory Closure Alternatives Review. Objective: Examine regulatory programs in other jurisdictions to understand how long-term liabilities are administered, particularly in the context of site closure. Purpose: Identify best practices and opportunities to enhance Alberta's framework, with the goal of increasing the number of site closures and enabling productive reuse. 5. Other • Understand Phase I ESA calculations for Drilling Waste (link to soil/GW guidelines) • Understand the appropriateness of using regional/multi-site assessments and develop a set of expectations/requirements for use • Develop expectations/requirements for the use of software tools/numerical modelling • Desalinization • Use of AI in creating reports.
2. Risk Assessment *Identify areas for broad application of risk assessment strategies that protect the environment and reduce the required management and/or remediation efforts.*	1. Understanding risk assessment of receptors 2. Standardized approach of risk assessment based on residual mass vs numerical endpoints. 3. Software tools to aid in the standardized application of Tier 2 guidelines using appropriate site-specific data. 4. Comprehensive assessment versus assessment of individual contaminants 5. Ecological Pathway Risk Assessment for Closure Qualification: Define criteria and guidance for evaluating ecological exposure pathways to determine whether a site poses negligible risk to ecological receptors and qualifies for closure. 6. Data gaps assessment
3. Reclamation and Remediation Technology Advancement *Technology improvements and finding new applications of existing and new technologies to reduce reclamation and remediation costs and timelines.*	1. Bioremediation 2. Remote sensing for reclamation monitoring and reclamation certification • Understand the net environmental benefits • Gap analysis of management approaches in different jurisdictions • Use of remote sensing in reclamation to: a. Reduce sampling intensity for field-level data collection b. verify plant community's indication of the target ecosite/ecosite phase c. confirm or verify disturbances d. inform wetland indicators/success of reclaimed borrows e. assess site at different stages (soil replacement, vegetation monitoring) 3. Petroleum hydrocarbon, salinity, and metals: effective remedial technologies and methods (including small volumes and longer

	timeframes), associated risks, assessment effectiveness, and relevance to environmental risk • Fractured bedrock • Wetlands • In-situ and ex-situ groundwater 4. Native Grassland Reclamation BMP development • Techniques for meeting infill requirements on problem sites • Managing Type 3 and 4 species on historical grassland sites constructed/reclaimed pre-2010 • Techniques for management of crested wheatgrass • Preventing problem native grassland reclamation sites – education tools 5. Forested Reclamation BMP Development • Understand weed trajectories in the reclaimed landscape • Techniques for management of grasses on forested lands.

2026 RRRC RFPs

The topics identified for RRRC 2026 RFPs are:

26-RRRC-RFP-01	1. Evidence-Based Review of Contaminated Site Closure Tools and Opportunities for Improved Outcomes
26-RRRC-RFP-02	2. Assessment of Risk-Based F2/F3 Petroleum Hydrocarbon Management Levels in Soil for Alberta Land-Use Settings
26-RRRC-RFP-03	3. Drilling Fluids Catalogue
26-RRRC-RFP-04	4. Chloride and Salinity Management in Remediation, Reclamation, and Closure Phase 2

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WDRC Well Decommissioning Research Committee

AUPRF2026 Policy Issues and Knowledge Gaps

VERSION DATE: April 21, 2026

PIKGs

Public Policy Issue (PI) [1]	Knowledge Gap(s)	Projects
1. Cut and Cap Policy for Low-Risk SCVF Wells	• Risks associated with a non-zero threshold for SCVFs. Processes to facilitate site closure/progress sites to re-certification under this policy. Options in consideration of existing policies and regulations.	Methane Emissions – Risk Tool – Site Prioritization and Emission Closure Guidelines Towards Net-Zero Emissions: Mechanics, Processes and Materials to Support Risk-Based Well Decommissioning *(Moved from PI 4)*
PIKG 1 ***AER Feedback*** • *The AER recognizes that* ***continued research may influence future changes to policies and legislation****.* • *REDA, EPEA, and associated legislation currently do not support an option to entertain the cutting and capping of wells identified to be leaking. Legislative amendments required for this purpose will involve not only the AER, but potentially also other agencies such as AEPA and Municipal Authorities.* • ***The AER is actively considering pilot projects to evaluate Well Leakage Risk*** *and assess surface and sub-surface risks related to well leakage, aiming to determine the viability of abandoning wells with ongoing leakage. The plan includes a phased evaluation to facilitate a targeted and methodical approach.* • ***Opportunities may exist to ensure alignment with any research project on this topic and AER pilots****.*		

2. Understanding Surface Casing Vents in Thermal Operations	• Best practice monitoring strategy.
	• Alignment about when to test for SCVF and GM in thermal wells and methods/devices to be used for accurate determination of flow characteristics such as:
	  ◦ Flowrate
	  ◦ Methane levels
	  ◦ Hydrogen Sulphide levels
	• Identify risk associated with shallow and production zone emissions to determine the need and methods for
		Best-practices to measure, monitor, and regulate source-attributed methane and hydrogen sulfide presence in thermal operations
		
		Quantitative and source-attributed characterization of greenhouse gas emissions from GM/SCVF from thermal operations

[1] Feedback from AER has been documented for each PI and Knowledge Gap.

	proper characterization of Methane and Hydrogen Sulphide. • Risk assessment requires environmental impact analysis.	
PIKG 2 ***AER Feedback*** *This topic is in* ***alignment*** *with fugitive emissions reduction objectives of the AER for active and inactive wells.*		
3. Evaluate Cement Alternatives for SCVF/GM Repair *PIKG 3* ***AER Feedback*** *This topic is in alignment with public interests as it works towards improving the* ***repair success metrics.***	• Evaluate acceptable cement alternatives for SCVF/GM repair that meet or exceed established regulatory requirements for cement properties. • Improve repair success metrics. • Assess the bond quality behind the pipe for cement alternatives.	Evaluation of Cement-Resin Mixtures for Enhanced Well Remediation and Closure Material Testing of Cement Alternative Products for Well Remediation and Closure Evaluation of Cements to Replace Class G Portland Cement – Acidic Environments Experimental Investigation of Casing Plug Performance with Dump Bailing Placement Testing Three Alternate Products for Sealing Impaired Wellbore Cement Comparing Gas invasion into Oilwell Cement Slurry Versus Five Other Wellbore Sealing Product Longevity Testing of 5 Alternative Materials for Wellbore Remediation & Closure
4. Identify Long Term Monitoring & Management Solutions	• Identify a cost-effective long-term monitoring solution (i.e. continuous and semi-routine). • Identify options for managing non-serious SCVF/GM before abandonment. • Cost-effective quantitative measurement of SCVF (emission calculation). • There are regulatory instruments that provide industry options for active and inactive wells with non-serious SCVF/GM that are cost-effective.	Field Demonstration of a Biocover for Mitigating GHG Emissions from Oil and Gas Wells

PIKG 4 ***AER Feedback*** *Currently, there are regulatory instruments that provide industry options for active and inactive wells with non-serious SCVF/GM that are cost-effective.* *This initiative could serve as a complement to topic 1. The* ***Well Leakage Risk Pilot(s)*** *aim to evaluate the feasibility of cutting and capping leaking wells under appropriate conditions. So, suitable long-term monitoring and management strategies may be required as mitigation should this scenario be feasible. However, as noted, these changes would necessitate legislative and policy changes beyond the scope of the AER.*		
5. Data Analysis *PIKG 5* ***AER Feedback*** *This topic is in alignment with public interests as it works towards* ***improving the repair success metrics****.*	• Data utilization strategy. i.e. Carbon isotope database – improve accessibility and transparency for industry use. • Regulatory data – improve availability of public data related to well remediation activities (certain data may only be available by request or datasets are incomplete, the outcome would be to improve data usability and improve quantity of information available). • Data analysis aimed at informing and helping the industry to make better, smarter, cost-effective decisions.	
6. Diagnostic tools and source identification and flow path *PIKG 6* ***AER Feedback*** *This topic is aligned with public interests as it works towards* ***improving the repair success metrics****.*	• How to improve the confidence in source identification of vent flow and GM diagnostics. • Understanding of flow path and origin vs storage zones within the diagnostic work. • Understanding the applicability of logging tools on multi-annular vent flow problems. • Post treatment monitoring tools.	Evaluating the Usage of Noble Gases to Better Understand Fugitive Gas Source in Surface Casing Vent Flow Understanding and Mitigating Leakage Pathways in Oil and Gas Well Cements *(Moved from PI 3 "Evaluate Cement Alternatives for SCVF/GM Repair")*

2026 WDRC RFPs

The topics identified for WDRC 2026 RFPs are:

26-WDRC-RFP-01	1. Ground-truthing the decommissioning risk tool - Sole-sourced
26-WDRC-RFP-02	2. Decision-Support Software Tool for Well Decommissioning in Alberta (Closure APP)
26-WDRC-RFP-03	3.Source and Leak Pathway Identification Processes and Tools
26-WDRC-RFP-04	4. Integrated SCVF/GM Remediation Success and Verification
26-WDRC-RFP-05	5. Thermal Operations Gas Measurement and Source Attribution for SCVF/GM (CH_4/H_2S)

PTAC
Alberta Upstream Petroleum Research Fund

WIPC Water Innovation Planning Committee

AUPRF2026 Policy Issues and Knowledge Gaps

VERSION DATE: April 21, 2026

PIKGs

Public Policy Issue	Knowledge Gap(s)
1. Safeguarding groundwater and surface water quantity and quality	• Public drought concerns, how we can prepare for those events, and what the impacts might be. More specific concerns in Oil and Gas Operations. *Committee notes that this may not affect regulatory change but could help companies to establish guidance for drought planning.*
2. Enabling the use of alternative water sources to high-quality non-saline water **(Identified as Top Gap to address)**	• Cost-effective treatment technologies for produced water to reduce risks associated with its conveyance through temporary surface pipelines. *Committee notes that this work could help inform both operators and AER, resulting in 'smoother' authorization reviews for TSPWs.* • Solutions to reduce costs associated with storage/containment of produced water. • Structural and operational performance assessment of Aboveground Walled Storage Systems (AWSS) under longer-term deployment conditions, to inform regulatory and operational considerations. • Risk characterization of Groups 2 and 3 water (per Directive 077) to inform risk-aligned regulatory requirements for conveyance, storage, and release management.
3. Improving the operational business environment by generating efficiencies and cost savings in water management	• Area-based wave studies to inform evidence-based freeboard requirements. • Ongoing open access to the Alberta Water Tool.

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2026 WIPC RFPs

The topics identified for WIPC 2026 RFPs are:

26-WIPC -RFP-01	1. Water Tool Update - Sole-sourced
26-WIPC-RFP-02	2. Drought management: Regional water availability forecasting and scenario planning tool to support drought preparedness for upstream operations
26-WIPC-RFP-03	3. Produced water transport and storage assessment
26-WIPC-RFP-04	4. Long-term Above-ground Water Storage Systems (AWSS): Structural and operational assessment framework for longer-term above-ground walled storage systems
26-WIPC-RFP-05	5. Freeboard (i.e. wave height) Determination: Evidence-based assessment of freeboard requirements (wave/wind considerations for storage reservoirs)