PTAC

Alberta Upstream Petroleum Research Fund

PTAC

26-WDRC-RFP-02

DECISION-SUPPORT SOFTWARE TOOL FOR WELL DECOMMISSIONING IN ALBERTA

BUDGET: $200,000

PUBLICATION DATE: MARCH 19, 2026

PROPOSAL SUBMISSION DEADLINE: MAY 8, 2026 BY 5:00 PM

www.ptac.org
Suite 1550,
520 Fifth Avenue SW
Calgary, AB. T2P 3R7

1. Background & Rationale

In Alberta, well abandonment and decommissioning planning is tightly coupled to Alberta Energy Regulator (AER) requirements and to designated digital submission systems used for approvals, notifications, and reporting (e.g., OneStop and Digital Data Submission (DDS)). Directive 020 sets minimum technical requirements and the objective to protect nonsaline groundwater and isolate/cover porous zones. While this project is Alberta-first, it must be designed to be configurable and extensible to other Canadian jurisdictions without re-architecting the tool.

Producers face recurring challenges that reduce abandonment success rates and increase cost and environmental risk: incomplete well history and integrity evidence; uncertain leakage mechanisms; difficulty matching barrier materials (cement and non-cement alternatives) to pathway geometry and compatibility constraints; placement/access uncertainty; and inconsistent QA/QC evidence capture that limits auditability and learning. A digital tool would provide rapid integration of up-to-the-minute physics-based engineering understanding with targeted data collection and a digital workflow that makes decisions reproducible and auditable.

Producers already use multiple systems, well integrity management systems (WIMS), P&A design/visualization tools, portfolio/project platforms, and regulatory portals. This RFP seeks a decision-support layer that (a) adds engineering intelligence and structured decision logic for decommissioning, and (b) integrates into existing toolchains via exports/APIs rather than requiring wholesale replacement of corporate systems.

2. Key Features and Benefits to Producers

The tool must provide benefits in two phases: planning (front-end design) and operations (execution and verification).

2.1 Planning Phase — Key Features

- Evidence Pack Builder (Profile): guided compilation of well history, integrity tests, SCVF/GM indicators, key intervals (groundwater/porous zones), and explicit data-gap/uncertainty flags.
- Leak Source Identification Support: structured hypothesis of likely leakage pathways with confidence scoring and rationale logging.
- Diagnostics Selector: risk- and uncertainty-based recommendations for diagnostic methods to confirm leak source(s) and inform barrier placement.
- Barrier Material Selector (Products): fit-for-purpose selection of cement and non-cement barrier options matched to pathway geometry, contamination/compatibility limits, temperature/fluid constraints, deployment constraints, and expected failure modes.

- Placement/Access Planner (Placement): recommendations for access strategy and placement design (e.g., annulus access, perforation/tooling strategies, volumes/pressures) with contingency logic where diagnostic resolution is limited.

2.2 Operational Phase — Key Features

- Execution Work Pack Generator (Procedure): standardized work-pack outputs including assumptions, sequence, QC points, evidence capture plan, and contingencies.
- QA/QC Evidence Capture: structured capture for volumes/pressures/returns/holds/tool strings/time-series execution data; supports manual entry and import from common field data formats.
- Verification & Performance Logging (Performance): links acceptance criteria to observed outcomes; separates planned vs executed vs observed results to enable learning and auditability.
- Portfolio Learning Loop: ability to aggregate outcomes across jobs/wells to refine screening logic and update libraries (materials/diagnostics) as new information becomes available.

3. Research Objectives

1. Develop an Alberta-first decision-support tool implementing a decommissioning "5P" workflow (Profile, Products, Placement, Procedure, Performance) across planning and operations.
2. Improve material selection by explicitly linking barrier choices (cement and alternatives) to diagnosed/hypothesized leakage mechanisms and pathway geometries, including applicability limits and failure modes.
3. Improve leak source identification and diagnostics planning to use structured, explainable logic with uncertainty handling and rationale capture.
4. Produce audit-ready outputs (work packs, decision memos, evidence checklists) aligned to Directive 020 requirements and digital workflow awareness (OneStop/DDS) while remaining extensible to other Canadian jurisdictions.
5. Provide a sustainable update pathway: the tool must be maintainable and able to incorporate new engineering understanding, new materials, and new diagnostics as knowledge and practices evolve.

4. In Scope

4.1 Engineering and Domain Scope

- Well characterization and integrity evidence capture (construction, history, tests, failures, SCVF/GM indicators, key intervals) with explicit uncertainty representation.
- Leak mechanism/pathway hypothesis support and diagnostic planning to localize leakage sources and guide access/placement decisions.
- Barrier materials selection logic that includes both Portland cement and alternative sealing technologies (e.g., geopolymers, resins/polymers, bismuth-based or metal seals, mineralization approaches), represented as a configurable library.
- Placement/access decision support and procedure/QC design to increase the likelihood of successful barrier formation.
- Verification planning, capture acceptance criteria, and post-job performance logging to support learning.

4.2 Software and Implementation Scope

- Deliver a producer-usable product as either (a) a web application, (b) a desktop application, and/or (c) an analysis engine with a user interface. Proponents must explicitly justify the recommended deployment model(s) based on typical Canadian producer IT environments and constraints (e.g., security, connectivity, identity management, data residency, patching, and offline field use).
- Provide a clear architecture describing where data is stored, how it is secured, and how it integrates/exports to existing systems (WIMS, well history systems, portfolio/project platforms) and to corporate document management.
- Include role-based workflows for planners, integrity engineers, abandonment engineers, and operations staff.
- Support interoperability via standard exports (PDF for work packs; CSV/JSON for data exchange) and optional APIs.
- Reliance on off-the-shelf digital modules rather than customized code. Digital tools must use open-source digital elements to ensure the tool can be widely deployed.

4.3 Pilot and Validation Scope

- Demonstrate the end-to-end workflow on a representative set of cases (real or synthetic) spanning planning and operations.
- Conduct usability testing with producer users and incorporate improvements.
- Provide a documented approach to validating decision logic and updating libraries over time.

5. Out of Scope

- Performing physical repairs, well servicing, construction, abandonment field work, or regulatory submissions on behalf of licensees.
- Replacing AER OneStop or DDS systems; the tool may produce checklists/exports to support producer submissions, but will not submit to AER portals.
- Building a full corporate portfolio cost-estimation platform intended to replace existing A&D portfolio tools; the project may integrate with such platforms via exports.
- Acting as an authoritative regulatory interpreter or providing any recommendations dealing with the regulatory framework. The tool must support configurable, jurisdiction-aware checklists and references.

6. Key Deliverables

- Project workplan with milestones, schedules and dates.
- Operational Software Tool, maximizing the use of generic off-the-shelf and open source elements, with planning and operational workflows that are immediately deployable for field crews.
- Architecture & Deployment Plan: explicit options analysis for web/desktop/engine deployments aligned to typical Canadian producer IT infrastructure, including security model, identity/role management, data residency, and offline/field considerations.
- Decision Logic Documentation: transparent explanation of the tool's recommendations (materials, diagnostics, placement/procedure) and how uncertainty affects outputs.
- Barrier Materials Library: properties, applicability limits, compatibility constraints, and expected failure modes; mechanism to add/update materials as new information becomes available.
- Diagnostics Library: diagnostic methods, use cases, resolution/limitations, evidence value, and selection logic; mechanism to add/update diagnostics.
- Standard Work Pack Templates and Audit Package Outputs.
- Pilot Demonstration Report with results, user feedback, and a prioritized enhancement backlog.
- User Documentation & Training Package enabling producer field staff to use the tool without external modelling support.
- Operations-to-Learning Workflow: guidance for capturing outcomes and feeding them back into library updates and decision-logic refinements.

7. Success Criteria

- A workable and mobile computer tool for oil and gas field crews to guide their decision process dealing with well decommissioning technical requirements.
- Traceability: 100% of tool recommendations include an exportable rationale linking evidence → uncertainty → recommendation.
- Repeatability: independent analysts using the same inputs reproduce the same recommendation class and audit package structure.
- Audit readiness: the tool produces a complete, consistent evidence package suitable for internal audit and regulator-facing documentation.
- Deployment feasibility: proponents demonstrate the tool can be deployed in typical Canadian producer IT environments, including consideration of security controls and field connectivity.
- Workflow efficiency: demonstrated reduction in time to create a complete work pack compared to a documented baseline process.
- User acceptance: positive usability results from target roles, with documented iteration.
- Updateability: the tool includes a governed method to update engineering logic, materials libraries, and diagnostics libraries as new information becomes available, including versioning and change logs.

PTAC, on behalf of the Alberta Upstream Petroleum Research Fund (AUPRF), invites qualified proponents to submit proposals in accordance with the Proponent Standard Instructions below, including a clear workplan with outcome expectations, milestones and deadline dates, the required technical and financial content and the specified submission method (email submission to info@ptac.org). Late submissions will not be considered, and proposals must remain valid for 90 days from the submission deadline.