**Tailings Technology Challenge**

1. **Proposal Information**

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| --- | --- |
| Project Title: |  |
| Applicant Organization (Legal name): |  |
| Project Location(s): |  |
| Project Start Date: |  |
| Project Completion Date: |  |
| Total Project Budget: |  |
| Requested ERA Funding: |  |
| Applicant Contact Name: |  |
| Applicant Contact Email: |  |

**INSTRUCTIONS**:

* **All text in red is provided for your guidance and should be deleted.**
* Complete this application form based on the instructions provided here and in the Call for Expressions of Interest document.
* All sections are mandatory.
* The document must be written entirely in English.
* Do not remove or modify any portions of the template, except where instructed.
* This document must be submitted in PDF format. The PDF document must be converted directly from the response template -- do not print and scan to PDF.
* The final converted PDF document must be no more than twenty (20) pages in length, including first cover page, all graphics, tables, and embedded elements (excluding support letters). Extra pages will not be considered in the review and will be removed.

1. **Technology Advancement**

* **Technology Description**: Clearly describe the proposed solution (e.g., technology, process, or practice) and how it functions. Include diagrams, schematics, or photographs to illustrate the system architecture, process flow, and key components. Highlight how the technology interacts with tailings streams or mine water inputs in the context of the overall site.
* **Relevance**: Explain how the solution addresses key challenges in tailings and tailings water management. This may include but is not limited to:
  + Reduction in tailings volume; extraction of valuable products from waste streams
  + Acceleration of dewatering or consolidation
  + Improved water recovery or recycling
  + Enabling a path to safe water discharge or reuse (e.g., water treatment)
  + Reduction in environmental risks (e.g., seepage, containment failure, methane emissions)
* **Technology Stage and Deployment Scale**: Indicate the current stage of development (e.g., lab-scale, pilot, demonstration, first-of-kind commercial deployment). Describe the scale of the proposed deployment relative to a full commercial system (e.g., 1:10 or 1:3 scale), justify why this scale is appropriate for validating performance in real-world conditions, and quantify the targeted scale for commercial deployment.
* **Process Flow and Inputs**: Provide a clear process flow diagram that outlines the full scope of the solution, including:
  + Tailings and water mass flow
  + Energy and chemical inputs
  + Outputs or byproducts (e.g., treated water, recovered materials)
  + Water and energy balances, where applicable
* **Problem Statement and Market Need**: Describe the specific problem the technology addresses and how it meets a market need. Clearly articulate how the solution represents a transformative improvement over current practices in tailings or mine water management.
* **Competitive Landscape**: Identify existing technologies or practices that serve a similar function. Compare the proposed solution to these alternatives in terms of performance, energy use, cost, scalability, and environmental impact.
* **Novelty and Differentiation**: Highlight the novel aspects of the solution—whether technical, operational, or business model-related—and explain how these contribute to a sustainable competitive advantage.
* **Technology Readiness and Advancement**: Describe the history and current status of the innovation and how the proposed project will advance its readiness. Indicate what technical, operational, or regulatory milestones will be achieved through the project.
* **Success Metrics and Experimental Design: Using the table below, define key success metrics for the project and relate them to the targeted performance at scale. Clearly explain how the project will validate performance against these metrics and what resources, strategies, and methods will be used to verify the data.**

Insert content here (text, figures, tables, etc.).

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| Key Performance Indicator Summary Table | | | | | |
| Category | | **Description** | **Relevant** | **Metrics** |
| Material Productivity | | Innovation to improve the efficiency of material products, reducing waste and optimizing raw resource inputs |  | Amount of raw material inputs saved compared to baseline, waste reduction percentage, etc. |
| Air Pollution | Reduction of air pollution and contaminant release | | . | Reduction in critical air contaminants  **Note:** Applicants must identify which specific pollutants their project is reducing. |
| Water Contamination | Reduction of water contamination and release | |  | Reduction in water contamination levels, in metric unit/yr or unit/functional unit. |
| Soil Contamination | Reduction of soil contamination and release | |  | Reduction in soil contaminants or land disturbance. |
| Energy Efficiency | | Enhancements to energy use and/or energy intensity |  | Energy savings (kWh), reduction in product energy intensity (energy use per unit of output), etc. |
| Water Conservation | | Improvements to water management and reduction of overall usage |  | Water savings (m3/yr), water re-use potential, reduction in freshwater withdrawal |
| Biodiversity & Ecosystem Protection | | Innovation that protects or enriches ecosystem biodiversity |  | Area remediated/reclaimed, improvements in ecosystem health, reduction of footprint (e.g., decrease of pond size, water quality indicators, decrease of fauna contamination, etc.) |
| Other | | Please include any other categories of KPIs where applicable. |  |  |

1. **Implementation & Readiness**

* **Project Objectives and Scope**: Clearly define the overall objectives of the project, including how the proposed work will advance the readiness of the technology for commercial deployment. Emphasize how the project contributes to reducing tailings volumes, improving oil sands mine water (OSMW) treatment, or enabling safe water discharge or reuse.
* **Project Location(s)**: Identify the specific site(s) where project activities will occur. Indicate whether the site is an active tailings pond, a reclaimed area, or a controlled testbed, and describe the relevance of the site to broader deployment potential.
* **Work Plan and Milestones**: Provide a high-level overview of the project work plan, including major milestones, timelines, and dependencies. Use the Milestone Summary Table to detail key deliverables and their expected completion dates.
* **Budget and Financing**: Present a summary budget aligned with the project milestones. Clearly identify the total project cost, the amount requested from ERA, and the contributions from other sources. Use the provided funding table to list all confirmed and anticipated financial contributors, including their status and timelines for securing funds.
* **Consortium and Execution Structure**: List all organizations involved in the project, including technology developers, site hosts, engineering firms, and academic or Indigenous partners. Describe their roles, status (confirmed, in discussion), and how they contribute to successful execution.
* **Team Expertise**: Identify the core team members responsible for project delivery. Highlight their relevant experience in tailings management, water treatment, technology scale-up, or regulatory engagement.
* **Readiness and Approvals**: Summarize the current status of internal approvals, site access agreements, permitting, and other preconditions for project launch. Describe the line of sight from the current state to the start of major activities. **Clearly demonstrate (with reference to support letters) that the project has senior-level champions with approval authority in both the applicant organization and key project partners.**
* **Risk Management**: Identify key risks that could delay or derail the project (e.g., permitting delays, site access, technology performance) and describe mitigation strategies.
* **Rationale for ERA Funding**: Explain why ERA funding is critical to the project’s success. Describe the specific risks or barriers that ERA funding will help overcome (e.g., de-risking scale-up, enabling field validation, bridging financing gaps), and justify the requested amount.

Insert content here (text, figures, tables, etc.).

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| FINANCIAL CONTRIBUTORS\* | AMOUNT | STATUS |
| ERA (Requested) | $ | Applied for |
| e.g. Alberta Innovates (Requested) | $ | e.g. Applied for |
| e.g. Applicant Organization | $ | e.g. Committed |
| e.g. Partner - Joe Financing Inc. | $ | e.g. In discussion |
| e.g. Partner - Jane Equity Ltd. | $ | e.g. Committed |
|  | $ |  |
| Total Financing | $ | |

1. **Environmental Performance**

* **Tailings and Water Management Benefits**: Clearly articulate how the technology reduces the volume, toxicity, or environmental risk of tailings and tailings water compared to baseline case (business as usual). This may include improvements in water recycling, reduction in solid and fluid fine tailings volumes, acceleration of dewatering or consolidation, or enabling future safe water discharge or reuse. Where possible, quantify the environmental impact at both the project level and per unit of deployment.
* **Water, Air, and Land Benefits**: Identify and quantify any additional environmental benefits beyond GHG reductions. These may include:
  + Reduced land disturbance and improved reclamation potential
  + Lower risk of wildlife exposure and containment failure
  + Reduced air emissions from tailings ponds (e.g., methane, VOCs)
  + Decreased reliance on freshwater withdrawals, including improved water reuse or recycling
  + Enabling a pathway to water release
  + Reduced waste generation or improved waste valorization
* **GHG Emissions Reductions**:
  + Describe how the solution results in direct or indirect GHG benefits, including:
    - Reduced fugitive emissions from tailings ponds
    - Displacement of higher emission intensity processes and/or materials
    - Carbon sequestration or enhancement of carbon sinks
  + Provide a quantitative estimate of the annual and cumulative GHG reductions in Alberta directly attributable to the project.
  + Estimate the broader GHG reduction potential cumulatively by 2030 and 2050 through market adoption, including assumptions on penetration rates and the share of benefits expected within Alberta.
* **Potential Trade-offs or Risks**: Identify any potential negative environmental impacts relative to current practices (e.g., increased energy use, chemical handling risks, or water consumption) and describe how these will be mitigated.

Insert content here (text, figures, tables, etc.).

1. **Economic & Ancillary Benefits**

* **Economic Impact**: Quantify the direct and indirect economic benefits, such as job creation (temporary and permanent), workforce retention, and attraction of investment. Clearly indicate which jobs will be located in Alberta and which are outside the province. Quantify any expected increases in revenues for project participant, increased tax or royalty revenues arising from commercialization, and opportunities for meaningful economic inclusion for Indigenous communities to share in these outcomes via e.g. investment, community funds, etc.
* **Competitiveness**: Clearly describe and quantify the potential for the technology to reduce liabilities and the cost of reclamation at commercial scale.
* **Ancillary Benefits**: Identify additional benefits such as:
  + Improved health and safety outcomes for workers and communities
  + Potential to improve innovation capacity within the applicant, project partners, and Alberta in general, including connections to post-secondary institutions, researchers, and training programs
  + Contributions to economic diversification and market access

Insert content here (text, figures, tables, etc.

1. **Stakeholder Engagement**

* **Engagement Approach**: Outline how you have engaged **and** plan to engage with local communities, including Indigenous peoples, throughout the lifecycle of the project—from concept to implementation. Describe the nature of the engagement (e.g., consultation, co-development, partnership) and how community input has shaped or will shape the project.
* **Respectful Collaboration**: Highlight any formal partnerships, MOUs, or collaborative agreements with Indigenous communities or organizations and other relevant stakeholders. Describe how these relationships are built on mutual respect, transparency, and shared benefit.
* **Capacity Building**: Detail how the project will support local capacity building, such as through training, education, or employment opportunities for community members, including youth and underrepresented groups.
* **Cultural and Environmental Stewardship**: Explain how the project aligns with community values, including stewardship of land and water, and how it incorporates Traditional Knowledge or Indigenous perspectives in technology development or deployment.
* **Long-Term Benefits**: Describe how the project will contribute to long-term community resilience and well-being.
* **Regulatory and Policymaker Engagement: Describe how the project will provide meaningful and actionable insights to regulators and policymakers.**

Insert content here (text, figures, tables, etc.)

1. **Commercialization & Market Fit**

* **Target Market in Alberta**: Define the primary market for your solution within Alberta’s oil sands sector. Quantify the number of tailings ponds, volume of tailings water, or mine water inventory that could benefit from your technology. Include estimates of the number of applicable sites, scale of installations, and potential installed capacity.
* **Market for Technology Outputs**: If your solution generates a product (e.g., treated water, recovered bitumen, or value-added materials), describe the market for these outputs. Include potential buyers, market size, and pricing assumptions.
* **Export and Broader Market Potential**: Discuss the potential for your solution to be deployed beyond Alberta, including other Canadian provinces and international jurisdictions facing similar tailings or mine water challenges. Highlight any regulatory or environmental drivers that support adoption in these markets.
* **Cross-Sector Applicability**: Briefly describe how the technology could be adapted or applied to other sectors (e.g., mining, wastewater treatment, industrial water reuse) and what modifications, if any, would be required.
* **Commercial-Scale Economics**: Provide a high-level overview of the economics at commercial scale, including capital and operating costs, payback period, and return on investment. Where possible, compare to current practices or competing technologies.
* **Pathway to Commercialization**: Outline the next steps following project completion, including scale-up, demonstration, regulatory approvals, and partnerships. Identify key milestones and timelines for achieving commercial readiness.
* **Barriers and Enablers**: Identify challenges to commercialization such as high capital intensity, site access, regulatory uncertainty, or lack of demand-pull. Discuss how these will be addressed and what supports (e.g., policy, funding, partnerships) are needed.
* **Knowledge Sharing and Dissemination**: Describe how you plan to share project results and learnings. This may include technical reports, workshops, conference presentations, publications, or data sharing with industry, researchers, regulators, and the public. Indicate any limitations due to intellectual property or confidentiality.

Insert content here (text, figures, tables, etc.).

**Required Attachment: Milestone Summary Table**

* Please fill in the table below with as much detail as possible and to the best of your knowledge.
* **This milestone table does NOT count towards the 20-page EOI limit.**
* Please refrain from appending additional information or attachments as these will be removed and not considered as part of the review.
* Do not modify the format of this template. Modifications may result in this portion of the proposal being disqualified from a review.

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| --- | --- |
| **Milestone Summary Table** (add milestones as necessary, instructions in red should be deleted) | |
| **Milestone 1** | |
| Start Date |  |
| Completion Date |  |
| Milestone Costs | Total milestone cost: [Insert dollar value in CAD]  ERA contribution: [Insert dollar value in CAD] |
| Milestone tasks and completion deliverables | Describe the key activities and tasks to be completed during the milestone and the deliverables/outcomes that signal the completion of the milestone. Identify the specific location of key tasks and what project partner(s) will be involved, where applicable.  Enter text here. |
| **Milestone 2** | |
| Start Date |  |
| Completion Date |  |
| Milestone Costs | Total milestone cost:  ERA contribution: |
| Milestone tasks and completion deliverables | Describe the key activities and tasks to be completed during the milestone and the deliverables/outcomes that signal the completion of the milestone. Identify the specific location of key tasks and what project partner(s) will be involved, where applicable.  Enter text here. |