VEI CONTRACTING

REMEDIATION & RISK MANAGEMENT

DEWATERING & WATER TREATMENT

Remediation Technologies Symposium 2026

Bridging Remediation and Redevelopment: Lessons Learned from a Large-Scale Multi-Contaminant Brownfield Project

October 16, 2026

RemTech Banff

Kevin French, P.Eng.

VEI Contracting Inc.

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Mind the Gap: Bridging the Loss of Experience in Contaminated Sites Practice

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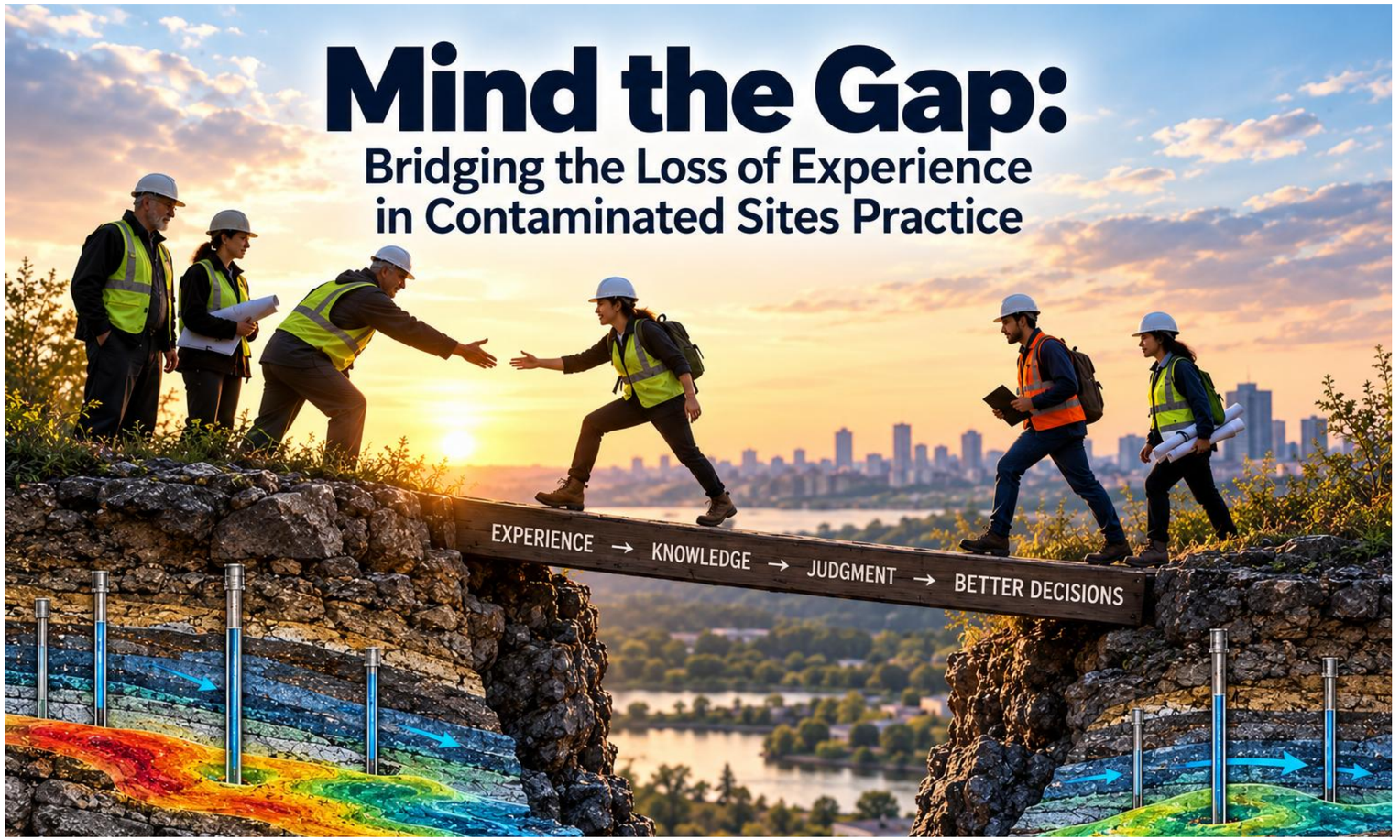
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Agenda:

- Presenter
- What's the Problem?
- Why This is Hard to Fix
- The Missing Pieces
- What Actually Works
- Who Does What
- Final Message
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Presenter

Presenter



Kevin French, P.Eng

- Vice President, VEI Contracting
- B.A.Sc., Civil/Env. Eng., U. Waterloo
- Environmental engineering (consulting and remediation contracting) since 1988

VEI Contracting Inc.

- Founded in 2003 as Vertex Environmental
- Specializes in Environmental Remediation, Treatment Systems & Construction Dewatering
- Provides services across Canada with staff now in NB and BC!



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What’s the Problem?

What's the Problem?

The Industry Shift – A Structural Transition

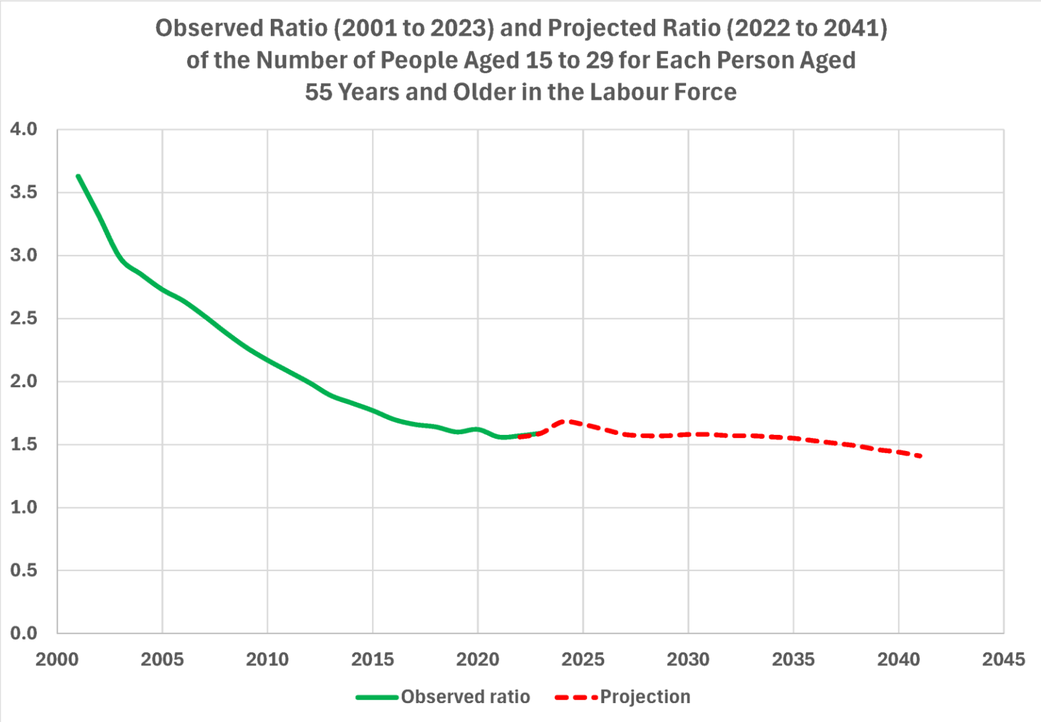
- Senior practitioners → retiring
- Mid-career experience → increasingly difficult to replace
- Juniors → entering with uneven exposure (and widely varying backgrounds)

Transition occurred over decades, exacerbated by COVID

- Loss of **review capacity**
- Fewer people with **full lifecycle experience**

What’s the Problem?

The Industry Shift – A Structural Transition

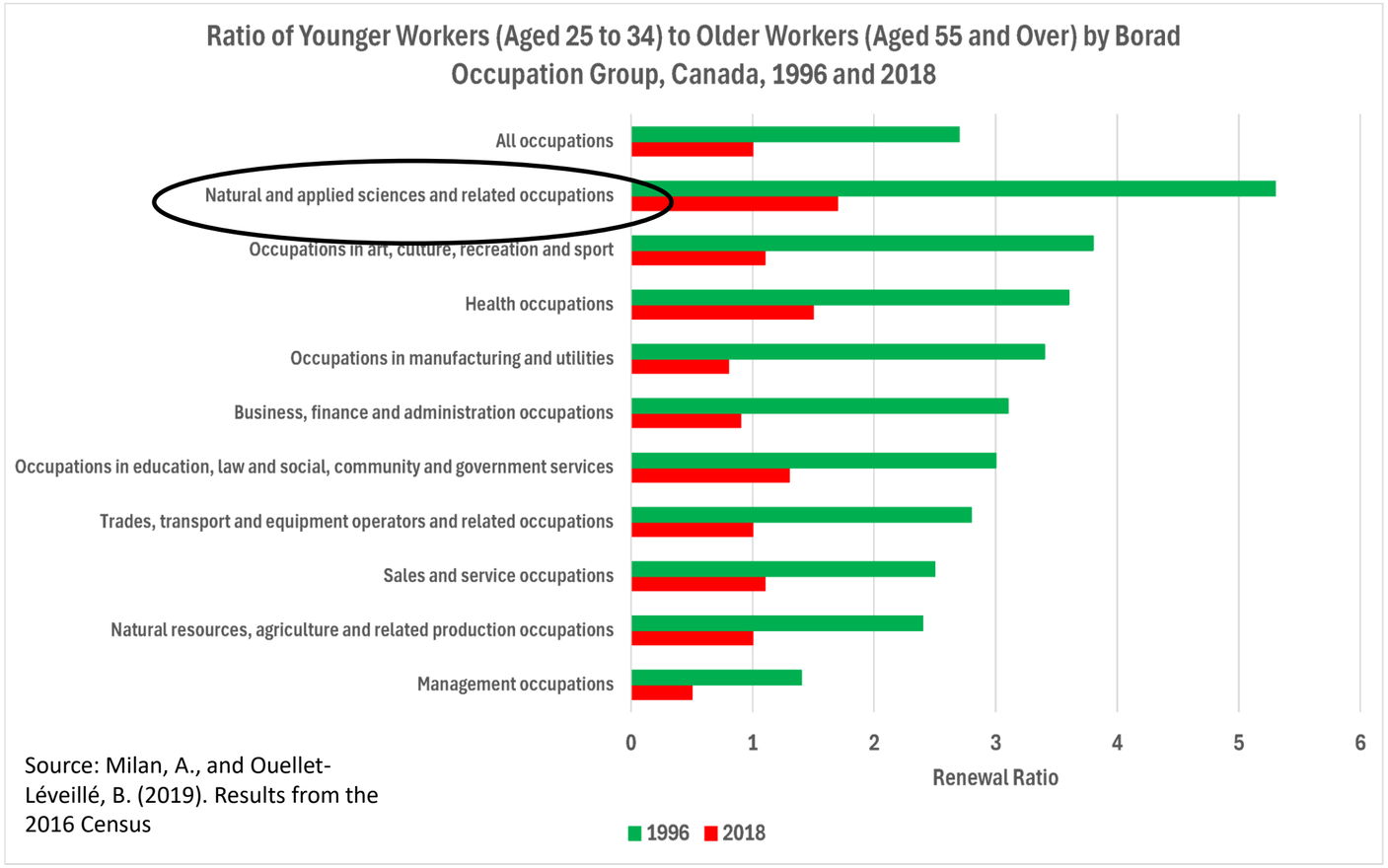


Sources: Statistics Canada, Labour Force Survey, 2001 to 2023, Demoism, 2024

Canada faces record retirements from an aging labour force (like me) – projected to continue across all sectors.

Canada's ratio of younger to older workers has declined sharply, reducing the potential pool of successors to experienced practitioners.

For natural and applied sciences occupations, the corresponding ratio declined from 5.3 in 1996 to 1.7 in 2018.



Source: Milan, A., and Ouellet-Léveillé, B. (2019). Results from the 2016 Census

Many competencies are:

- Experiential
- Apprenticeship-based
- Judgment-driven
- Difficult to transfer quickly.

This trend results in:

- Mentorship gaps
- Succession risk
- Loss of tacit knowledge
- Reduced competency depth

What’s Actually Missing?

From Technical Knowledge to Practical Judgement

- A conceptual site model is a working hypothesis, not merely a report requirement.
- Remediation selection requires understanding site conditions and implementation limitations.
- Experience develops the ability to recognize when assumptions are wrong.

Knowing how to collect data is not the same as knowing how to interpret it, question it, and act on it.

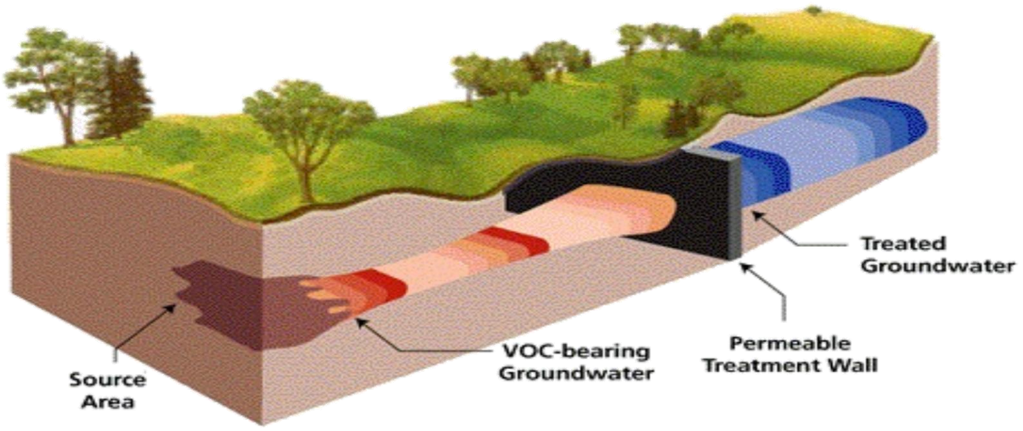
Where it Shows Up

When Experience and Judgment Are Missing:

- Incomplete or incorrect conceptual site models
- Misinterpretation of subsurface conditions
- Inappropriate remediation technology selection or design
- Unanticipated costs, delays, and remedial performance problems

This exposes firms and practitioners to unnecessary risk

When 20% Doesn’t Mean 20%



Project Background:

- A lawsuit involved a client, consultant and contractor
- Goal was to install a 20% dry wt. PRB using zero-valent iron (ZVI)
- Bench-scale testing done, tender documents prepared, field supervision completed, QA/QC testing specified
- PRB failed post-installation testing – why?

When 20% Doesn’t Mean 20%



What actually happened:

- Bench testing by consultant used **25.8%** dry wt. thinking it was 19.9% (used wet wt.)
- Bid team specified **16.6%** dry wt. (ZVI/sand)
- Inexperienced field engineer estimated 3 super sacks ZVI to 7 loader scoops of sand or **4.1% to 9.3%** dry wt.)depending on loader bucket size)
- QA/QC testing of mixtures not completed on-site due to equipment malfunction
- **Lots of left over ZVI at end of job!**

The problem wasn’t just the math: it was the failure to recognize and reconcile conflicting assumptions across the project team.

Breakdown	What should have happened
Different interpretations of the 20% ZVI requirement	Consistent definitions and independent design checks
Poor communication between project teams	Laboratory, design and construction personnel review critical assumptions together
Inexperienced field supervision	Appropriate training, senior oversight and clear escalation procedures
Ineffective QA/QC	Verify the actual mixture before placement, with independent checks

Technical competence is not just knowing the procedure. It is recognizing when something doesn't make sense — and knowing when to question it.

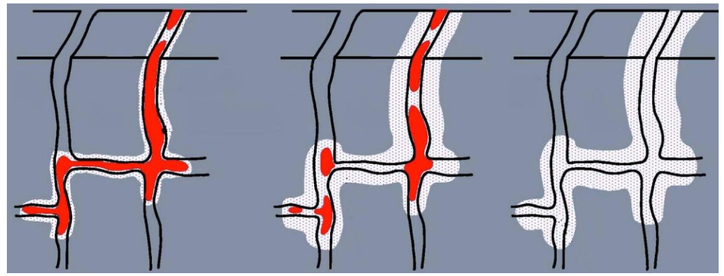
Why Was Contamination Still There After Treatment?

Former retail fuel outlet — petroleum hydrocarbons in fractured bedrock

2015–2017
3 rounds
In-situ chemical oxidation (ISCO)

After treatment:
LNAPL remained
Along with elevated dissolved PHCs

Key question:
Why?
What was the treatment failing to address?



Critical consideration: In fractured bedrock, treating contaminants in transmissive fractures does not necessarily eliminate contaminant mass retained within the surrounding rock matrix.

Why Was Contamination Still There After Treatment?

From repeated treatment to a revised conceptual site model



Earlier Approach:

Chemical oxidation

Repeated ISCO injections targeting petroleum hydrocarbons

Revised Approach:

Hybrid remediation

Excavate LNAPL source areas and treat residual dissolved contamination

Professional judgment: Different contaminant phases and storage mechanisms may require different remedial approaches.

Learning opportunity: Teach practitioners to revisit assumptions, recognize limitations of individual technologies, and adapt treatment to the actual CSM.

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Why This is Hard to Fix

Why This is Hard to Fix

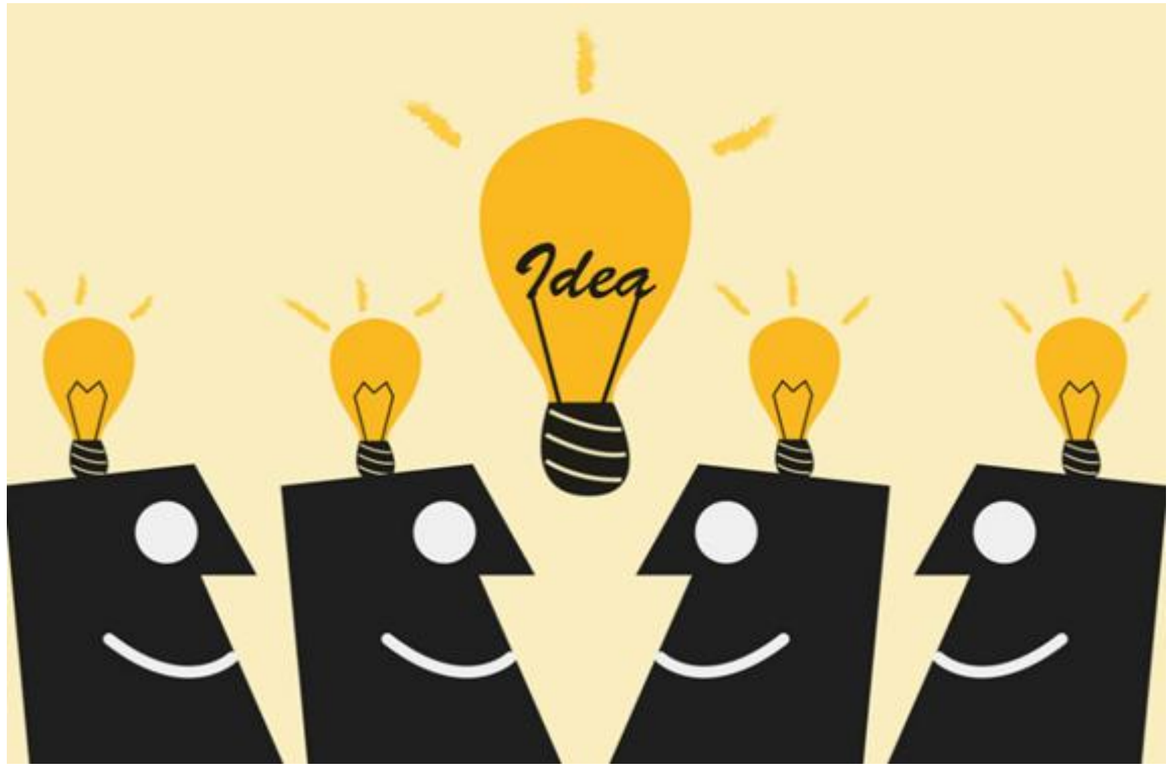
Why Experience Transfer Doesn’t Happen Automatically:

- Billable-hour pressures limit mentoring time.
- Project teams are often lean and geographically dispersed.
- Senior practitioners have competing technical, commercial, and management responsibilities.
- Important lessons are often undocumented.
- Experience requires repeated exposure, feedback, and responsibility.

Do We Need Something New?

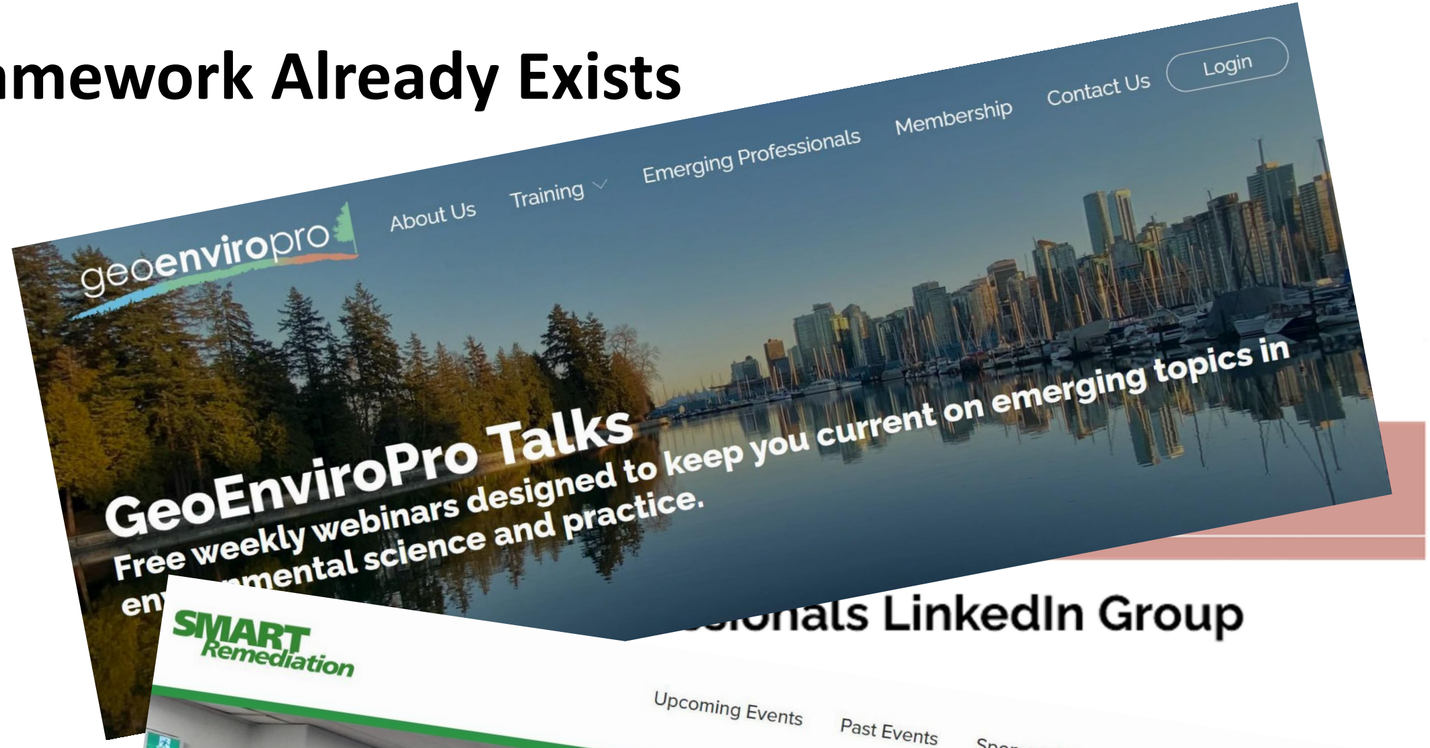
Do we really need another training platform?

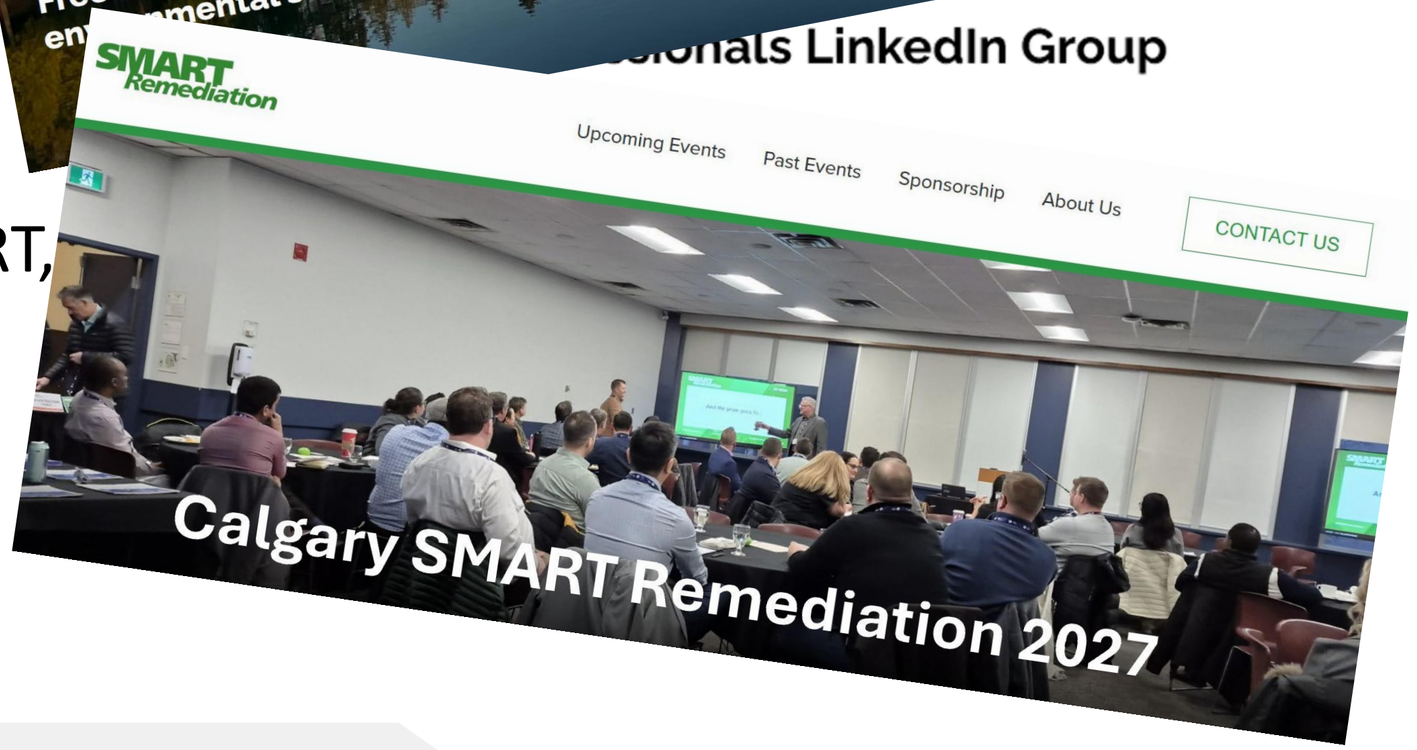
Perhaps the bigger opportunity is connecting and improving what already exists.



The Framework Already Exists

- University and college programs
- Firm-level training
- Emerging professionals groups
- Webinars (GeoEnviroPro, etc.)
- Technical newsletters
- Conferences (RemTech, BEST, SMART,





We don't have a lack of resources – we have fragmentation

What Works & What Doesn’t

Platform	Strength	Limitation
University / college programs	Strong theoretical foundation	Limited exposure to real-world complexity
Firm training / field days	Practical, directly applicable	Quality and availability vary
Professional groups	Networking, peer learning and mentoring	Participation-dependent; uneven technical depth
Webinars / newsletters	Accessible, scalable and inexpensive	Limited interaction and practical application
Conferences	Expert insights, case studies and networking	Cost and limited reach

No single solution works in isolation

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The Missing Pieces

The Missing Pieces

What is missing is a consistently connected, experience-based learning pathway.

Particularly for developing judgment in interpretation, decision-making and remediation.



This is the core diagnosis

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What Actually Works

What Actually Works

1. Use existing learning opportunities more deliberately

- Internal programs, webinars, conferences

2. Turn project experience into shared learning

- Share case studies
- Present lessons learned
- Mentoring
- Project life cycle experience – field, data interpretation, reporting, recommending

Build on what works. Make it routine.

3. Connect people, organizations and learning opportunities

- Cross-platform participation – multiple media/events to reach different audiences
- Industry associations, networking events / socials, etc.
- Shared audiences

A Practical Experience-Transfer Model

Turning experience into capability — and keeping it in the organization

1 CAPTURE

Real-world experience and lessons learned



- Project debriefs
- Case studies
- What worked, what didn't, and why

2 TRANSLATE

From experience to practical guidance



- Plain-language notes
- Checklists and decision tools
- Context and "watch for" items

3 TEACH

Build understanding and judgment



- Project examples
- Discussion and scenario-based learning
- Mentoring and job shadowing

4 APPLY

Use in real projects with support



- Start with lower-risk tasks
- Senior review and feedback
- Encourage questions and escalation

5 REINFORCE

Continuous learning and improvement



- Reflect on outcomes
- Update guidance and tools
- Build organizational knowledge

SUPPORTING CONDITIONS



Leadership support



Open communication



Time and resources for mentoring



A culture that values questions and learning

FEEDBACK LOOP

Real projects inform better guidance, teaching and tools

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Who Does What

Who Does What (Humans)

Participant	Specific Commitment
Employers	Allocate mentoring time and include learning in project closeout
Senior Practitioners	Share one substantive case or lesson annually
Developing Practitioners	Participate actively in case discussions and seek feedback
ESAA, BCEIA, ONEA, etc.	Facilitate practitioner exchanges, promote existing resources, and connect interested members
Existing Learning Platforms	Offer follow-up discussions and reusable educational content

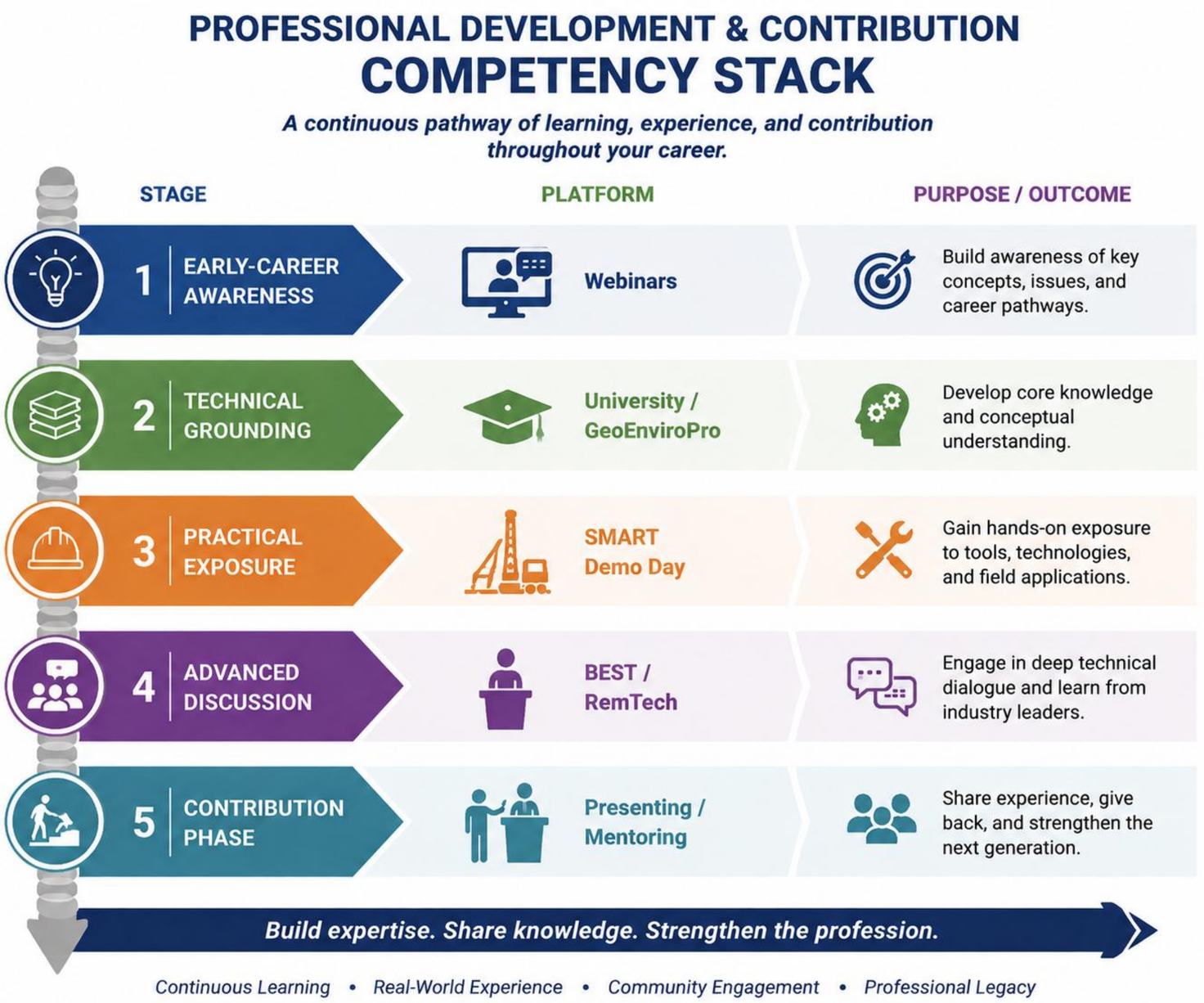
Who Does What (AI)

Potential benefit	Limitation
Rapid access to technical references	May provide inaccurate or unsupported answers
Simulated site-characterization exercises	Cannot reproduce all real-world consequences
Interactive questioning and feedback	Requires technically sound training material
Summarizing historical project lessons	May miss undocumented context and tacit knowledge
Comparing remediation alternatives	Does not assume professional accountability

AI: An Accelerator, Not a Substitute for Experience

The Competency Stack:

- Competency develops cumulatively through different kinds of learning and experience.
- No single platform can provide every component.
- Presenting, mentoring and sharing lessons are themselves part of professional development.



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Final Message

Mind the Gap: Three Commitments

- **Make mentoring deliberate.**
  - Set aside time to explain not just what decisions were made, but why.
- **Turn project experience into shared learning.**
  - Capture and discuss the assumptions, surprises, failures, and successes.
- **Use and strengthen the existing industry network.**
  - Connect people with educational opportunities, case studies, and experienced practitioners.



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Questions?

Thank You for Your Time!



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