

Re-Thinking a Pathway to Site Closure with In-Situ Remediation (Underperformance in Australia?) 3rd October 2018

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Evaluation



Remediation
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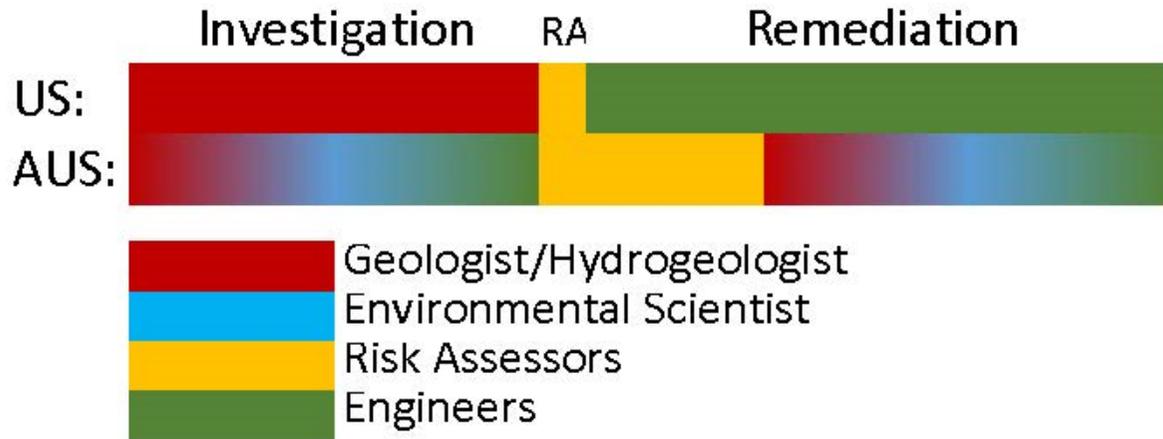
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Presentation Overview

- Potential for Underperformance
- Inheriting failures
- Moving past, past failure
- Industry Impacts



A potential for underperformance



US: Relocation to Landfill \neq Soil Remediation

Soil/GW Remediation = Ex- & In-Situ Remediation

AUS: Soil Remediation = Relocation “Remediation”

Groundwater Remediation = Ex- or In-situ remediation



My Australian experience

- Worked on over 100 Australian in-situ remediation projects in the last 10 years
- 25 of most challenging and interesting projects were inherited with failed in-situ remediation strategies
- 14 of 25 sites have been closed
- Remaining sites are on the pathway to closure



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What is failure?



- Project is stalled:
 - Stuck in investigation phase
 - Stalled in an operational phase with little or no progress
- Best measure of failure – the client changes consultants



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Causes of failure

- Communication:
 - Poor understanding of anticipated results (exaggerated predictions of performance)
 - Poor understanding of costs
 - Inaccurate reporting of performance
- Pre-remediation mistakes:
 - Lack of knowledge about the residual/sorbed contaminant mass
 - Improper well screen placement
 - Poor conceptual design (MNA with LNAPL)
 - Reliance on passive technologies
- Improper implementation of an in-situ technology



Improper implementation of in-situ technologies

- Failure to consider life cycle implications - implementing passive technologies
- Engineering mistakes:
 - Improperly sized equipment
 - Failure to understand vacuum and head loss
- Technology-specific:
 - Pursuing obsolete technologies (P&T)
 - Air sparge screen type and placement
 - Chemistry mistakes (ISCO activation)
 - ISCO – failure to consider sorbed mass



Overcoming a failed approach

- Re-evaluation of existing data (vacuum, LNAPL transmissivity, partitioning, etc)
- Communication about the reasons for being stuck with all the stakeholders
- Remedial investigation vs Characterisation
 - Implementation of MIP/LIF, as appropriate
 - Re-installation of wells to improve characterisation of the source zone while allowing for the implementation of in-situ remediation technologies
 - Performing bench/pilot studies
- Modifying and/or enhancing the existing design (more wells, deeper wells, use of solvent and/or changing equipment)



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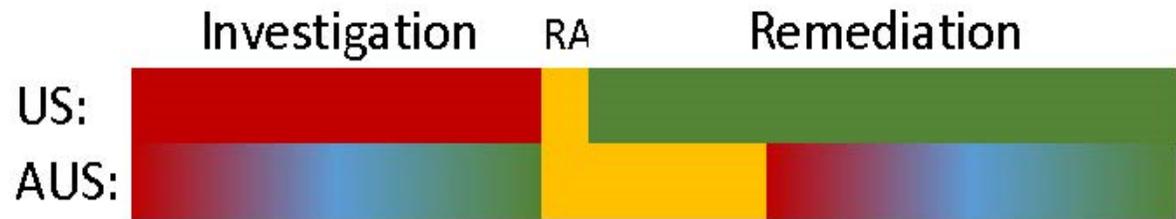


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Impacts on Industry



- Part-time remediation practitioners
- Contractors performing remediation
- Property development drives cleanup, instead of by standards.
- Risk Assessment - more credibility given to risk assessment than the reduction of contamination (AUS 4X US per \$1B)
- Impracticability arguments applied before attempting clean-up
- ITS TOO HARD – perceived lack of cost effective technologies while difficult (chlorinated) plumes are routinely remediated in US
- Misrepresentation of long-term liability in lifecycle cost estimates

Improving performance

- Post mortem of failed projects
- Seek opinions from qualified practitioners
- Polluters need to research approaches (hire internal experts)
- Legislation changes
- Industry awareness



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