

CL:AIRE & Setting the Context of Contaminated Land in the UK

A Presentation for the Taiwanese Delegation & TASGEP

CONTAMINATED LAND: APPLICATIONS IN REAL ENVIRONMENTS

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- A Brief Introduction to UK Context & Scale of the Problem
- Summary of CL:AIRE & Evaluation System
- Projects and Present Initiatives
- UK Remediation Sector Strengths
- Services

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THE SCALE OF THE CHALLENGE

Environment Agency Report – Indicators for Contaminated Land 2005

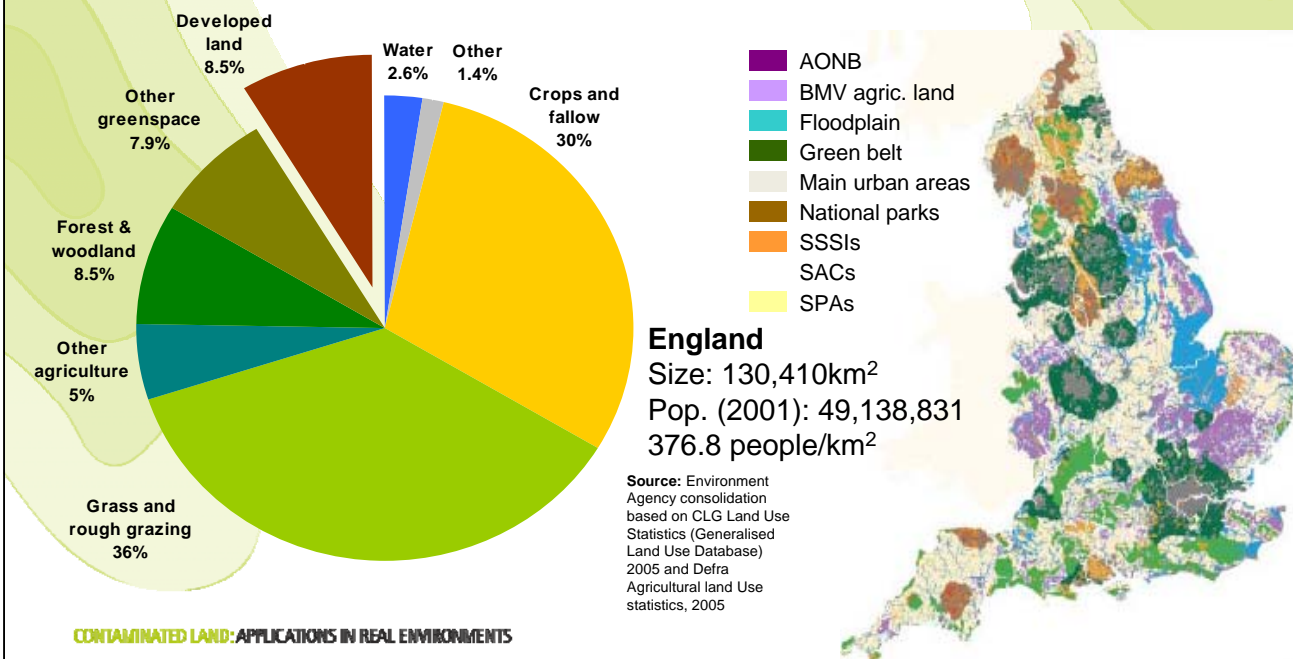
- 292,000 hectares potentially contaminated land on 333,000 sites in England and Wales
- Of which 57,000 hectares might be contaminated on 30,000 sites
- 5-20% of these might require intervention under Part IIA because of unacceptable harm
- This means 5,000 – 20,000 sites in England and Wales requiring regulatory intervention
- 3,500 km river at risk from mine water and 18,000 km² of aquifer at risk

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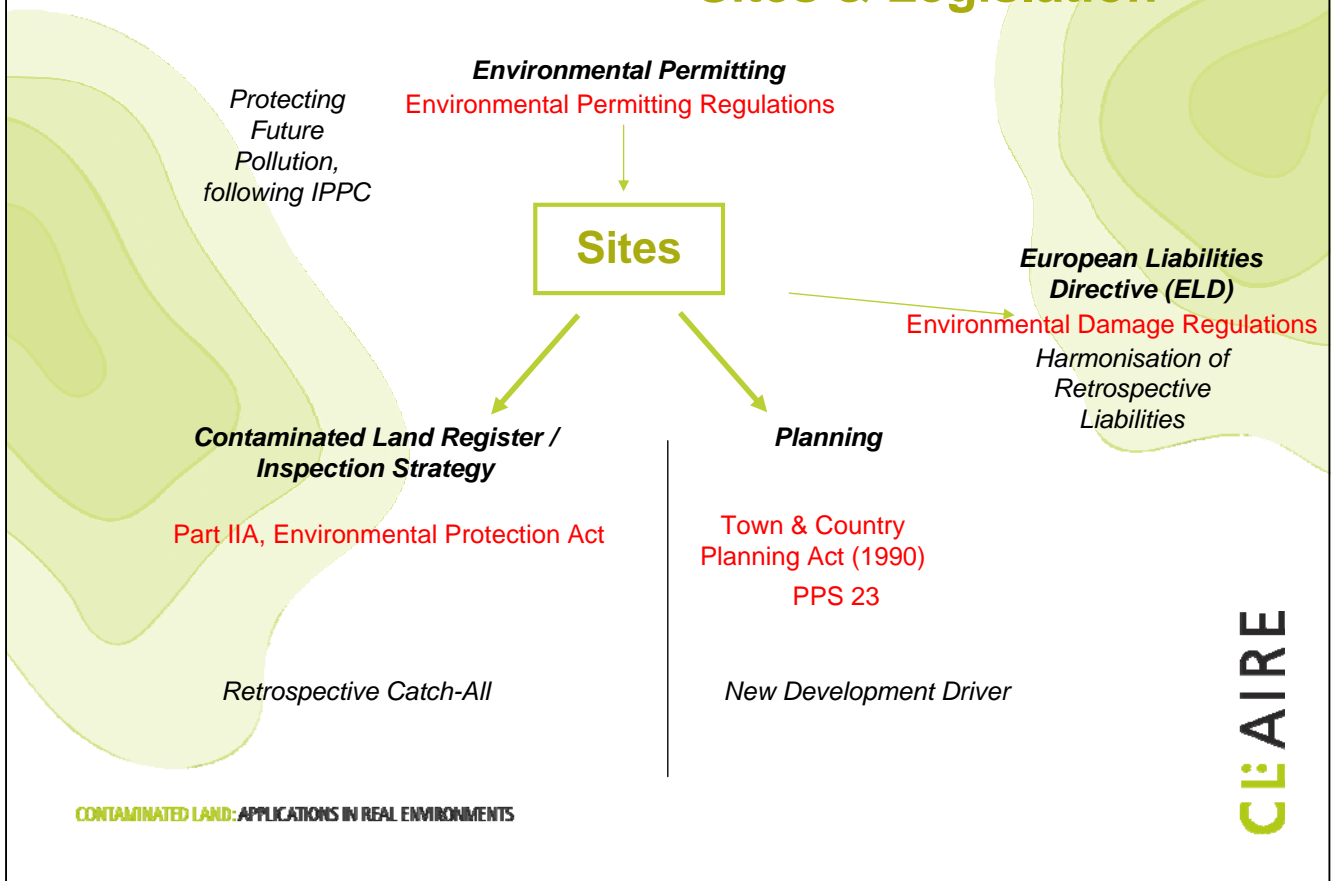
Contaminated Land: A National Asset?

Land is a valuable national resource that is in limited supply



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Sites & Legislation



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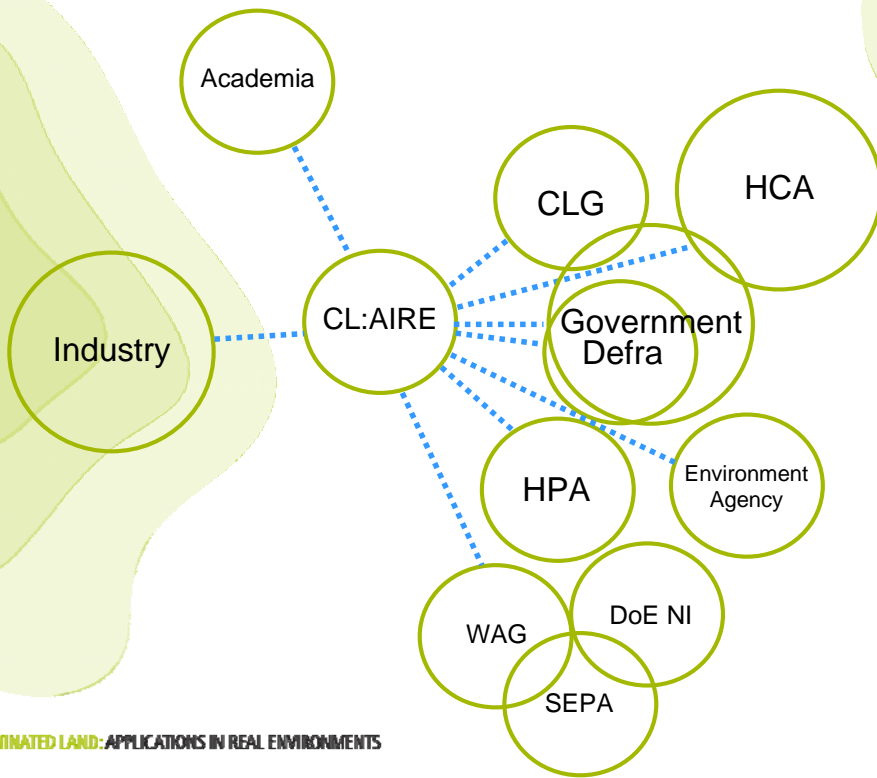
CL:AIRE is an independent not-for-profit organisation

Objectives include:

- to stimulate the *regeneration of contaminated land* in the UK by raising **awareness of**, and **confidence in**, practical and **sustainable remediation technologies**.
- fulfilling a need for **objective, scientifically robust appraisals** of *remediation technologies* and effective methods for monitoring and investigating sites.
- initiation of a Brownfield **Skills Development Framework** for appropriate training

CL:QB is CL:AIRE's Qualifications' Board. This is now a nationally recognised 'Awarding Organisation' with Ofqual.

CL:AIRE's Position



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CL:AIRE PROJECTS

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CL:AIRE System

What:

- Peer Review in Advance
- On Project Specifications / Methodology
- Also reviews Soft Skills, and Benefits to Market
- Generic Questioning
- Reviewing SINGLE APPLICATIONS of a Technology
- Evaluated by Technology & Research Group (TRG)

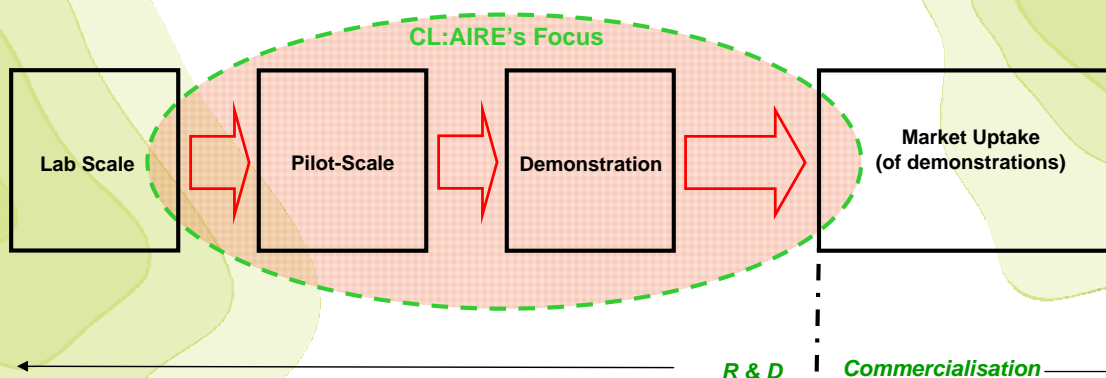
Why:

- Increases Confidence
- Disseminate Good Practice & Lessons Learned
- Raises Standards

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Research to Market



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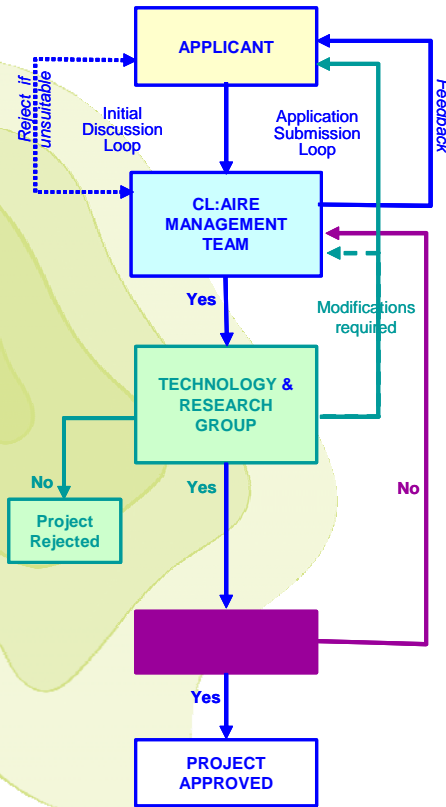
Technology Demonstration Projects, and Research Projects

The project is discussed with the CL:AIRE Management Team (CMT) to ensure fit within CL:AIRE remit and submission of **project application form**.

The TRG will review the application, scoring it against a project evaluation form. The individual reviews and comments are returned to the CMT who collate the comments and circulate them back to all of the TRG. The TRG evaluation will result in:

- Acceptance
- conditional acceptance (modifications required)
- rejection

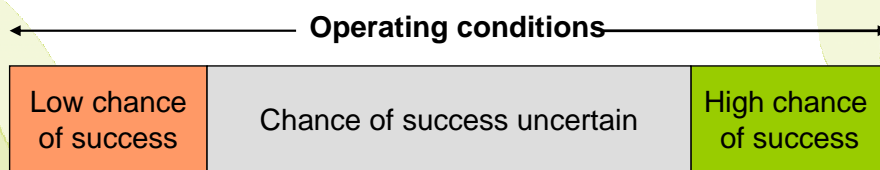
The Board ratifies or rejects a project on a majority vote basis.



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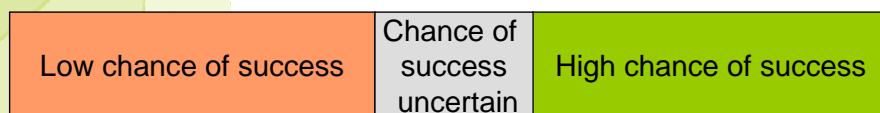
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Defining the operational envelope of site investigation and remediation technologies



Time

Well documented case studies



Increased confidence

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CL:AIRE System

CL:AIRE Technology & Research Group

Mr Mike Pearl - Babcock Ltd (TRG Chairman)
Professor Phil Morgan - Sirius Geotechnical and Environmental
Mr Jonathan Smith - Shell Global Solutions
Professor David Lerner - University of Sheffield
Professor Max Coleman - Caltech USA
Dr Theresa Kearney - Department of Environment, Northern Ireland
Dr John Campbell - Rio Tinto (Retired)
Mr Mike Summersgill - Independent
Dr Brian Bone - Independent
Mr Bob Barnes - Environment Agency
Dr Mike Rivett - University of Birmingham
Professor Mark Hodson - University of Reading

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CL:AIRE

Key Achievements

- Produced over **75 Publications**
- Evaluated and **Approved over 50 Projects** through CL:AIRE's Technology & Research Group
- Dissemination to Contacts Database of **~5000**
- Convened over **150 events**
- Established & **trusted brand** in Technical Publications & Training
- **Leading in delivery** of National Frameworks / Initiatives
- **Excellent reputation** in Europe & Worldwide

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CL:AIRE Evolution Cycle



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Corus Steelworks,
Ebbw Vale



Titanic Quarter,
Belfast



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TDP12: Ex Situ Biopiling at Askern Colliery and Coke Works



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TDP23: Low Temperature Thermal Desorption Plant at Dundee Gas Works



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TDP13: Construction of the Shilbottle permeable reactive barrier to treat acid mine drainage

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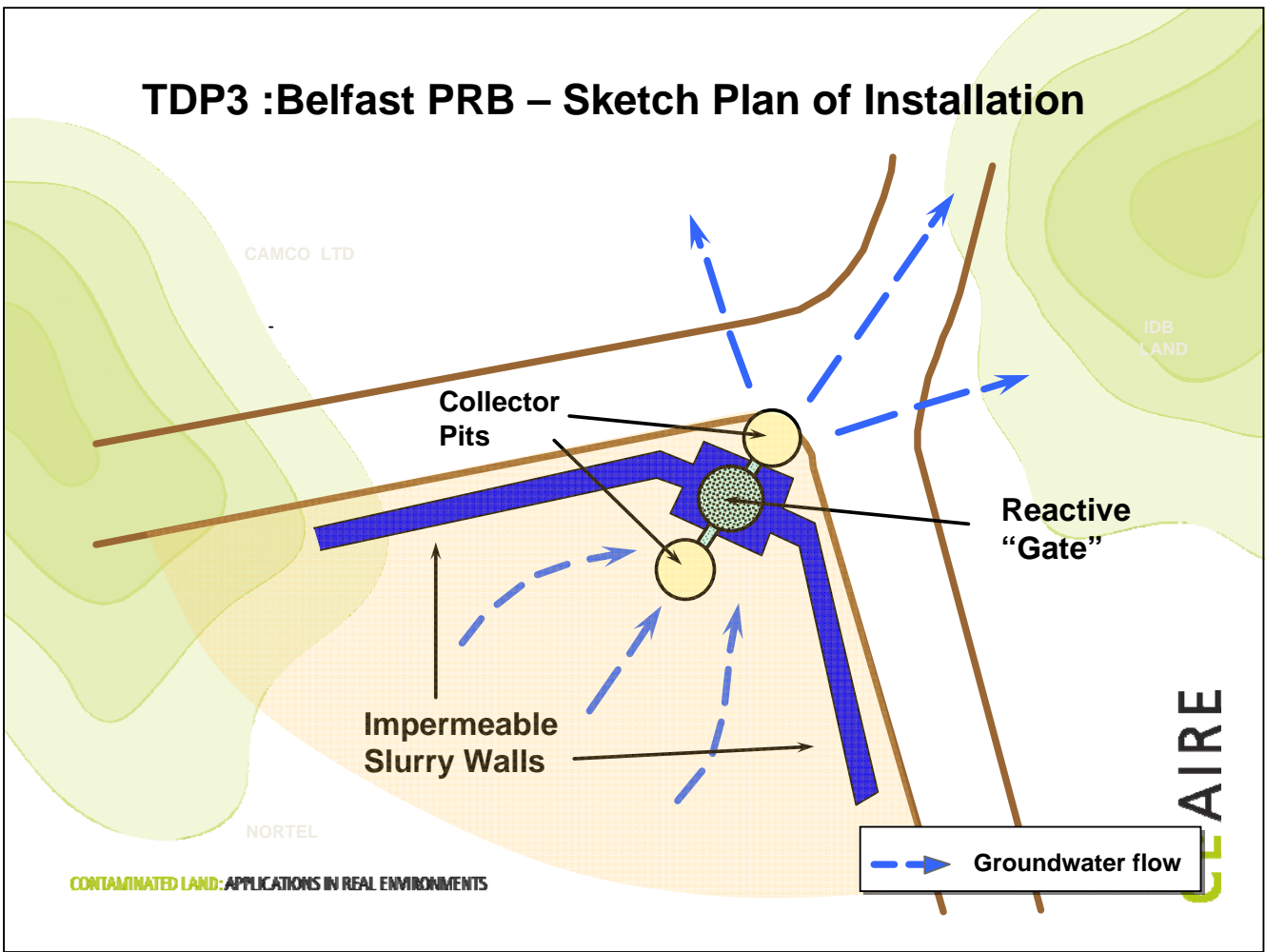


TDP20: Installation of a PRB for the treatment of carbon disulphide contaminated groundwater using zero valent iron.

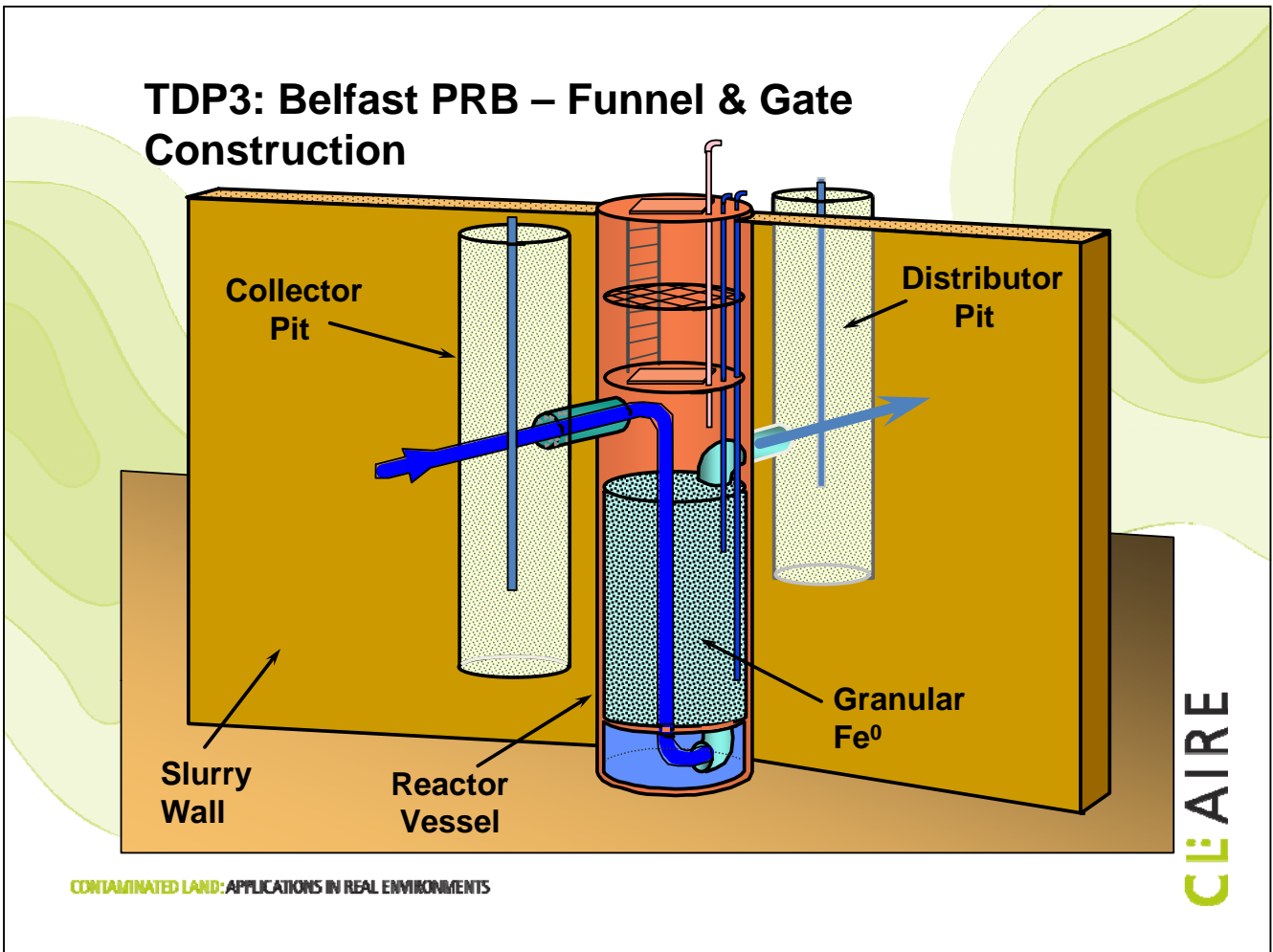
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TDP3 :Belfast PRB – Sketch Plan of Installation



TDP3: Belfast PRB – Funnel & Gate Construction



Independent Audit / Value Consulting

- Provision of Independent 3rd Party Review
- Review against:
 - Cost, Sustainability, Continuity, Technology & Application
- Particularly relevant for:
 - Large Remediation Projects
 - Publicly Financed Projects
- Example: The Avenue
 - Coking Works, Chesterfield
 - Review between remediation trials & main works



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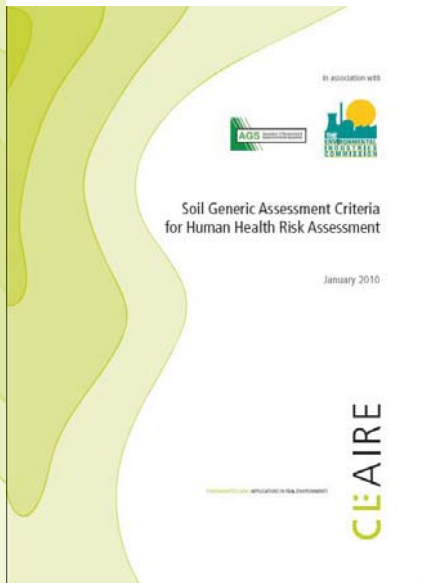
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INITIATIVES

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Generic Assessment Criteria for Human Health



- Human health screening criteria relevant to:
 - Defined land uses
 - Defined range of contaminants
- A collaborative initiative
 - CL:AIRE / AGS / EIC
- A part of wider coordination



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CL:AIRE

- Sustainable Remediation Forum
- UK-based (also a SURF US)
- Cross Sector Representation
- Mission Statement:

To develop a framework in order to embed balanced decision making in the selection of the remediation strategy to address land contamination as an integral part of sustainable development.

- Framework issued with regulatory recommendation

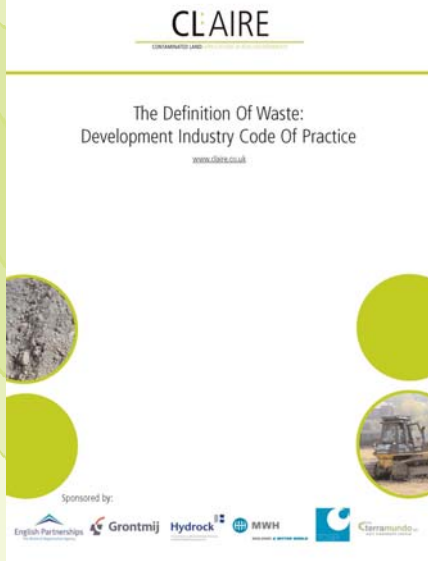
www.claire.co.uk/surfuk



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Waste CoP



www.claire.co.uk/CoP

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- Provides greater clarity over what is waste and what is not
- Greater clarity leads to consistency and certainty
- Improved efficiency
- Supports diversion from landfill
- Supports reduction in primary aggregate use
- Supports reduction in haulage costs

“This risk based approach offers potential for fundamental change to remediation economics and sustainable use of materials”

David Oram, National Grid and SAGTA

Version 2 Launched: 30th March 2011

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CL:AIRE TRAINING

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CL:AIRE Training

- CL:AIRE regularly runs training courses for the sector and has run the following within its portfolio :

- **Remediation Technology Training Programme**

- Options Appraisal & Risk Assessment
- Permeable Reactive Barriers
- Monitored Natural Attenuation
- Air Sparging & Soil Vapour Extraction
- Ex Situ Bioremediation
- Chemical Oxidation
- Stabilisation/Solidification
- In Situ Bioremediation
- Soil Washing
- In & Ex Situ Thermal Treatment

- **CL:AIRE Definition of Waste Code of Practice**

- **Environmental Risk Communication**

- **Waste and Brownfield Reuse**

- **Risk Assessment Programme**

- QRA for controlled waters
- Statistical Analysis for Robust Site Investigation Design
- Waste & Surplus Soil Characterisation, Classification and Pre-Treatment
- A Practical Guide to Vapour Intrusion
- CLEA Software for Risk Assessment
- Detailed Quantitative Risk Assessment for Human Health
- Toxicology

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Particular UK Strengths

- Thermal treatments including: Thermally Enhanced Soil Vapour Extraction, Steam Injection; Six Phase Electrical Heating (pioneering use of Radio Frequency Heating & Electrokinetics)
- Permeable Reactive Barriers (e.g.. World 1st to treat Carbon Disulphide (CS₂))
- Risk Assessment
- Real-time gas-monitoring probes
- Good UK practitioners (consultant/contractors) have an excellent & broad understanding of a variety of technologies and “treatment-trains”

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Future Collaboration with CL:AIRE?

- TASGEP & CL:AIRE Memorandum of Understanding for the undertaking of *ad hoc* activities
- First activity, *Brownfield Reuse/Contaminated Land Training ?*
- *Brokering the introduction of contaminated land specialists & researchers?*

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