

Managing our well stock



Reflections from the IEAGHG Risk Management Network Meeting on Well Integrity in a CCS Project

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- Owain Tucker (Shell)



IEAGHG RMN (formerly Risk Assessment Network)



2005

• Utrecht, The Netherlands



2006

• Berkley, California



2007

• Imperial College, London



2009

• Melbourne, Australia



2010

• Denver, Colorado



2011

• Pau, France



2013 (w/ Modelling)

• Trondheim, Norway



2015 (w/ Environmental)

• Southampton, UK



2018 (w/ Modelling)

• North Dakota, USA



2021

• Webinar

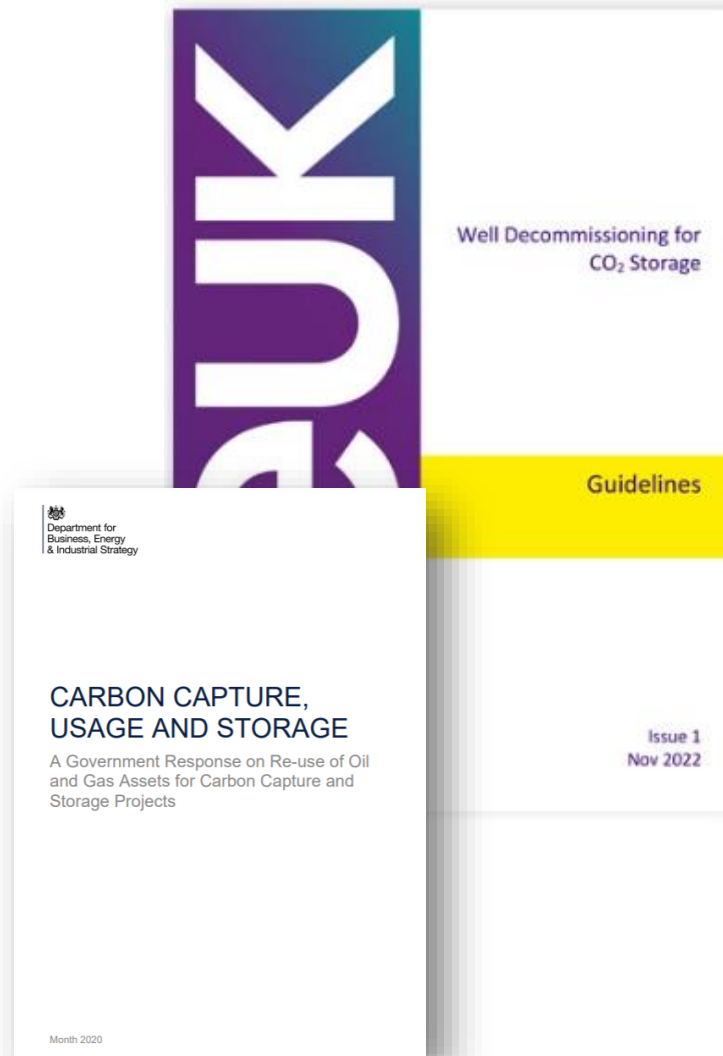


2023

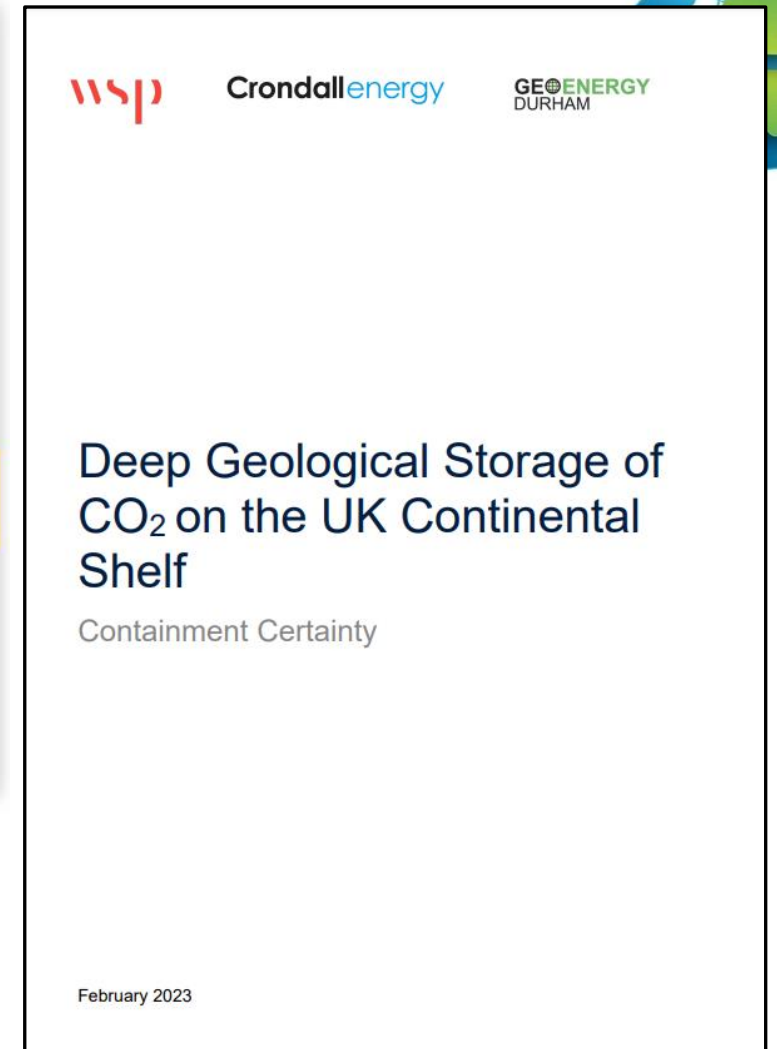
• Edinburgh, UK



Lackey and Dilmore (2021)



BEIS (2020) & OEUK (2022)



DESNZ & BEIS (2023)

10th Risk Management Network Meeting



28th – 30th June 2023

**Heriot-Watt University,
Edinburgh, Scotland**



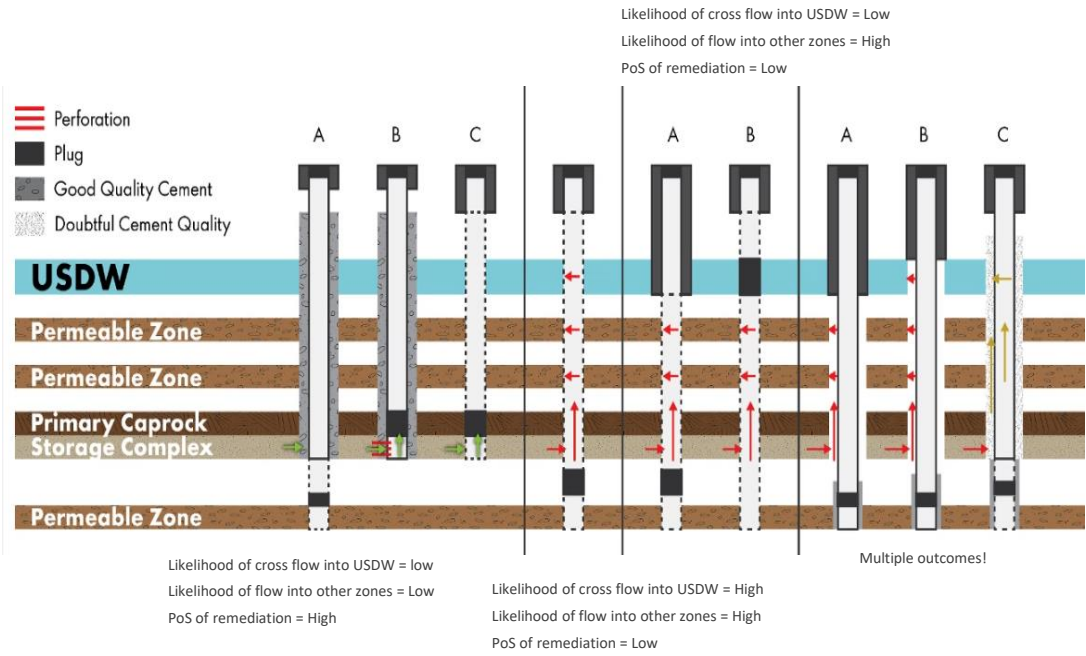
Meeting overview



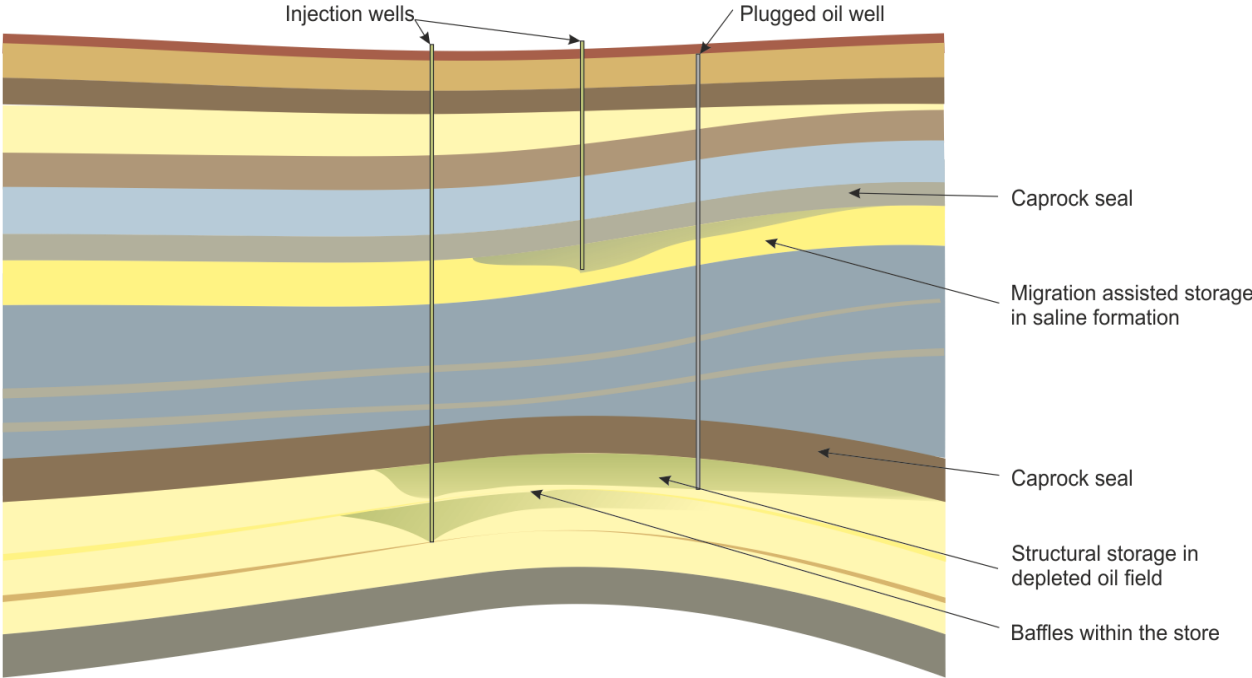
- Diverse Steering Committee, 9 countries, 1/3 women
- 26 presentations and a panel discussion, covering:
 1. Industrial perspective on risk management and legacy well containment
 2. Identifying, evaluating and abandoning well bores for the future
 3. Long term well integrity – performance and risk assessment
 4. Well materials and testing
 5. Monitoring: challenges, quantification and emerging solutions
 6. Communicating well related risk to regulators and other stakeholders
- ~75 attendees, 15 countries
- **Meeting report is in preparation**

What do we need to know about wells?

- Cementation and plug status in relation to formations



Legacy well challenges in historic industrial areas:



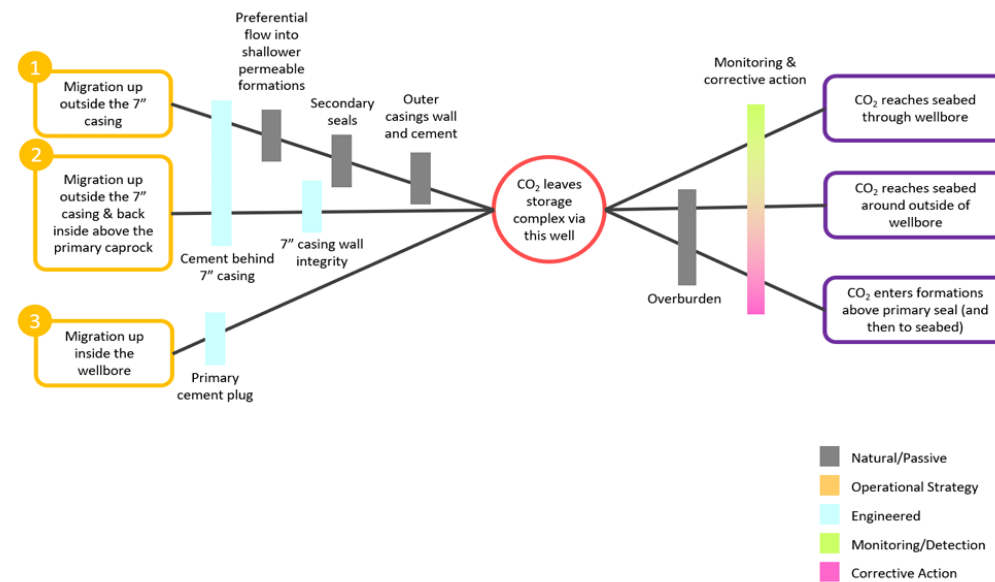
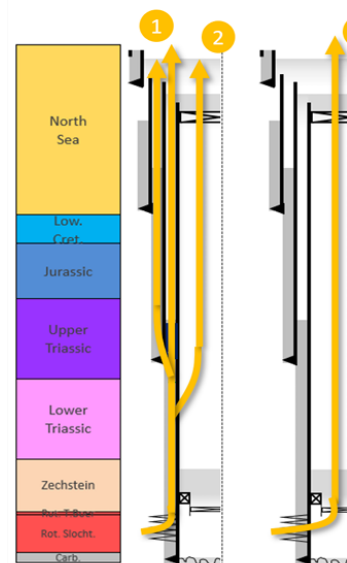
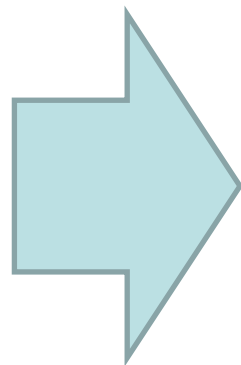
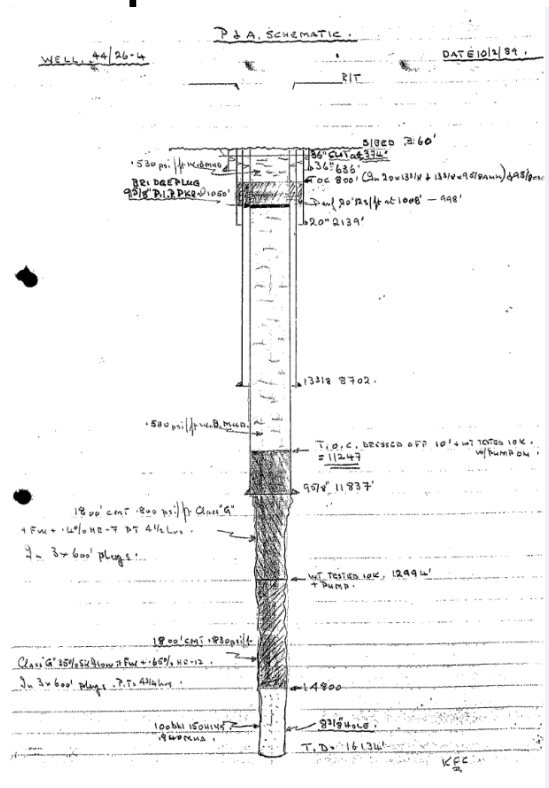
Our participants





Highlights/conclusions I

- Quantity and quality of legacy wells impacts the potential use for CCS and a “no-stone left unturned” approach is necessary for assessing their impact.



Highlights/conclusions II



- Laboratory testing on legacy wells and samples show the effectiveness of Portland Cement as a barrier through time if emplaced correctly.
- Key sound bite
“Alteration is not Degradation”



cemented casing sample



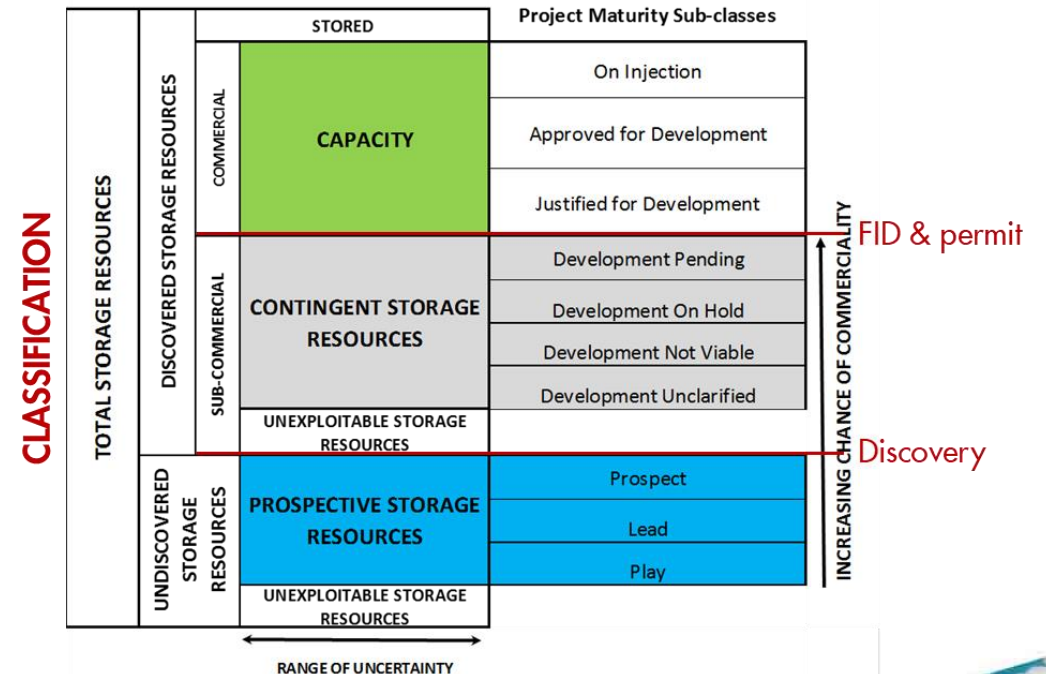
Picture courtesy of Shell, from talk
“A critical review of CO₂-cement interactions and their impact on zonal isolation integrity”

Highlights/conclusions III



- Creaming curve of storage sites which may be unlocked as costs fall and technologies to remediate improve
- Wells are not easy to repair so can affect storage resource estimates
- Maturing according to the SRMS helps to ensure that level of assessment effort commensurate with level of assessment

SPE classification of CO₂ storage resources

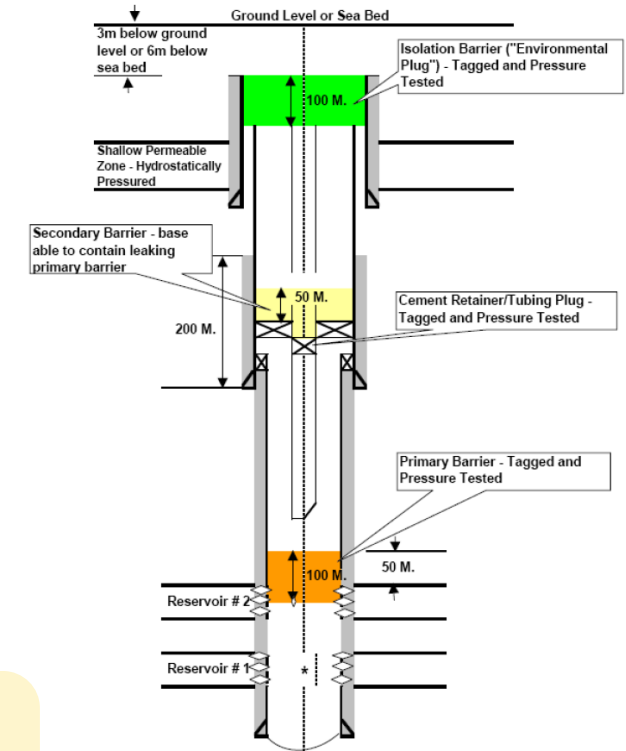


Highlights/conclusions IV



- Challenges

- There are no databases of cement plug depths
- Cost and impact of remediation might be greater than impact of a leak
- Quantifying potential leakage rates in old wells
- Data management of novel monitoring techniques (how to get real-time data from landers or DTS)
- Common lexicon when talking to financiers and insurers regarding risk



Recommendations



- Cross-cutting meeting with insurers and financiers
- Efforts to have 'best-practice' examples of good permit application and streamline process
- Make updated capacity estimates that account for areas currently downgraded by high/old well density
- Cement, what properties do we want in cement? Refocus of speciality cement to consider the properties that matter.
- More case studies on real, leaky wells.

