

Monitoring & Environmental Research Combined Network Meeting Hosted by the University of Calgary, Calgary, Canada

Monday 19th August 2019: Welcome Reception

Tuesday 20th August 2019: Field trip to the CaMI field research station

Wednesday 21st & Thursday 22nd August 2019: Combined Network Meeting

Friday 23rd August 2019: Fault Workshop

Day 1 – Wednesday 21st August

Session 1 - Welcome & Introduction

IEAGHG

Session 2 - Developments in Sensing including Noise Monitoring and Characterisation

Chair: Don Lawton

- “Recent developments and challenges in soil gas sensing” - Katherine Romanak (University of Texas at Austin)
- Challenges of marine data acquisition: STEMM / Santos project experience - Doug Connelly (NOC)
- Designing an optimum monitoring programme for a marine environment using a cost/benefit analysis - Doug Connelly (NOC) / Jerry Blackford (PML)
- “ENOS: advancing sensors for protection of the environment and groundwater” - Ceri Vincent (BGS)
- “Fingerprinting the stable and noble gas geochemical baseline of Carbon Management Canada’s Field Research Station” - Rachel Utley (University of Edinburgh)
- Discussion

Session 3 - Lessons learned from managing field projects – Panel Discussion

Chairs: Don Lawton and Doug Connelly

- CaMI Facility - Don Lawton (University of Calgary)
- “Lessons learned from the UK GeoEnergy Test Bed pre-injection phase” - Ceri Vincent (BGS)
- STEMM - Doug Connelly (NOC)
- Discussion

Session 4 - Uncertainty in quantification

Chair: Katherine Romanak

- STEMM CCS - Marine Quantification of CO₂ - Anita Flohr - (NOC)
- Atmospheric CO₂ and methane quantification at Ginninderra - Andrew Feitz (Geoscience Australia)
- Quantification of CO₂ from recent geophysical surveys - Andrej Bona (Curtin University)
- Discussion

Session 5 - Monitoring for Storage with EOR compared with DSF requirements

Chair: Tim Dixon

- “Experiences in monitoring CO₂ storage in Saline Formations and CO₂-EOR Settings - Mark Kelley & Neeraj Gupta (Battelle)
- “Geologic Storage in the US - Bruce Hill (Clean Air Taskforce)”
- “CO₂ storage through EOR: An international (ISO) perspective” - Steve Carpenter (University of Wyoming)
- EOR experience in Alberta - Brendan McGowan (Enhance Energy)
- Discussion

Session 6 - Fall-back plans – what to do if primary technique doesn’t work?

Delegate Interactive Session

Chair: Sue Hovorka

3 Hypothetical Cases to be presented on the implementation of MRV plans and how complications were dealt with:

- What are the objectives of monitoring
- How does monitoring meet the requirements of regulators
- What are the proposed monitoring strategies?
- Discussion

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Day 2 – Thursday 22nd August

Session 7 - New Case Studies of real data– Offshore and Onshore

Chair: Jerry Blackford

- STEMM-CCS - Doug Connelly (NOC)
- "Estimation of the extent of injected CO₂ and the reservoir geometry at Tomakomai using 4D seismic data" - Hideo Saito (Japan CCS)
- "Injectivity evaluation and pressure transient analysis for the extended reach injection well with long completion interval at Tomakomai" - Yasushi Yamaguchi (Japan CCS)
- "CarbonNet pre-commercial studies of the shallow water environment and monitoring options for the Pelican storage site" - Nick Hoffman (CarbonNet)
- Offshore Victoria seabed characterisation - Andy Ross (CSIRO)
- Developments at CaMI - Don Lawton (University of Calgary)
- "Characterisation for environmental monitoring at Glenhaven, Queensland" - Katherine Romanak (University of Texas)
- Discussion

Session 8 - Environmental Impacts of Monitoring & Stakeholder Engagement

Chair: Jun Kita

- "Status of the Tomakomai CCS Demonstration Project with emphasis on measures taken in response to recent earthquakes" - Jiro Tanaka (Japan CCS)
- "How do the public and stakeholders engage with monitoring? Learnings from the Tomakomai CCS Demonstration Project and the 2018-19 Hokkaido earthquakes" - Leslie Mabon (Robert Gordon University, Aberdeen)
- "An overview of the potential impacts of anthropogenic underwater noise associated with offshore resource activities" - Dr Andrew Carroll (Geoscience Australia)
- Discussion

Session 9 - Up-Well Leakage

Chairs: Andrew Feitz and Lee Spangler

- "Observations of Up-Well leakage within a monitoring well. Experience from the shallow CO₂ controlled-release experiment at the CSIRO In Situ laboratory" - Ludovic Ricard (CSIRO)
- "Learnings from oilfield challenges in addressing surface casing vent flow" - Lee Spangler (Montana State University)
- Detection of small leakages based on recent field data using fibre optics - Ziqiu Xue (RITE)
- Qinghai leaky CO₂ well research site, China - Dr. Andrew Feitz (Geoscience Australia)
- Discussion

Session 10 - Monitoring Post-Injection for Site Closure (Part A)

Chair: Rob Trautz

- "Post-closure Monitoring of China's First Full Chain CCS Demonstration Project at the Ordos Basin" - Qi Li (State Key Laboratory of Geomechanics and Geotechnical Engineering)
- Adaptive monitoring - Preston Jordon (LBNL)
- Reaching site closure quickly - Steve Bryant (University of Calgary)
- Discussion

Session 11 - Long-Term Monitoring Post-Injection for Site Closure (Part B) Delegate Interactive Session

Chair: Sue Hovorka

Options for setting up long-term (50 – 100 year) monitoring at CO₂ storage sites: positive and negative merits.

- Atmospheric
- Near sub-surface (<500m),
- Deep subsurface (500 – 2,000m)
- Offshore – above seabed
- Discussion

Session 12 - Conclusions and Recommendations

Chair: Tim Dixon