

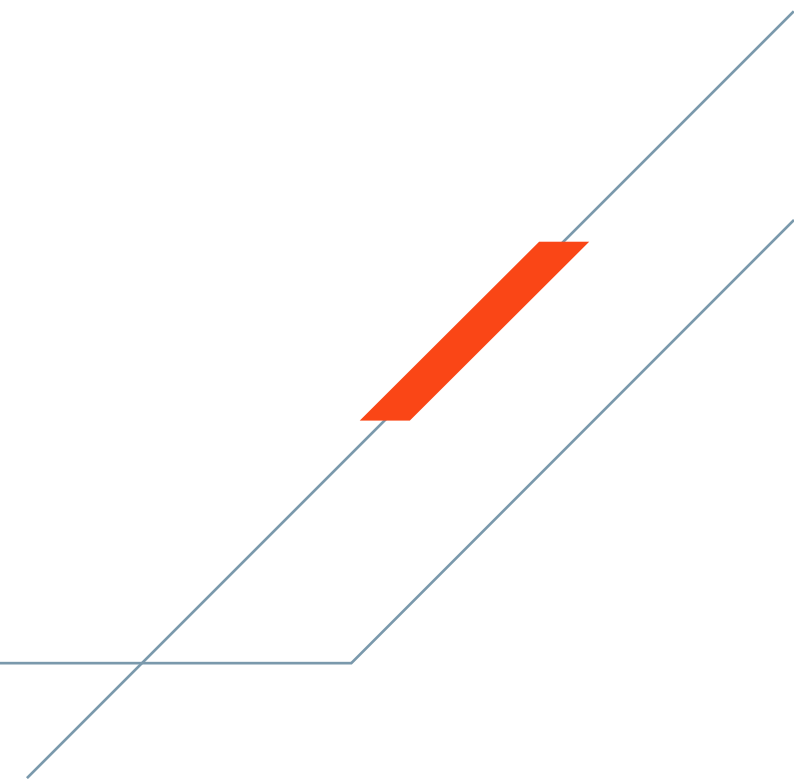


# Viking CCS

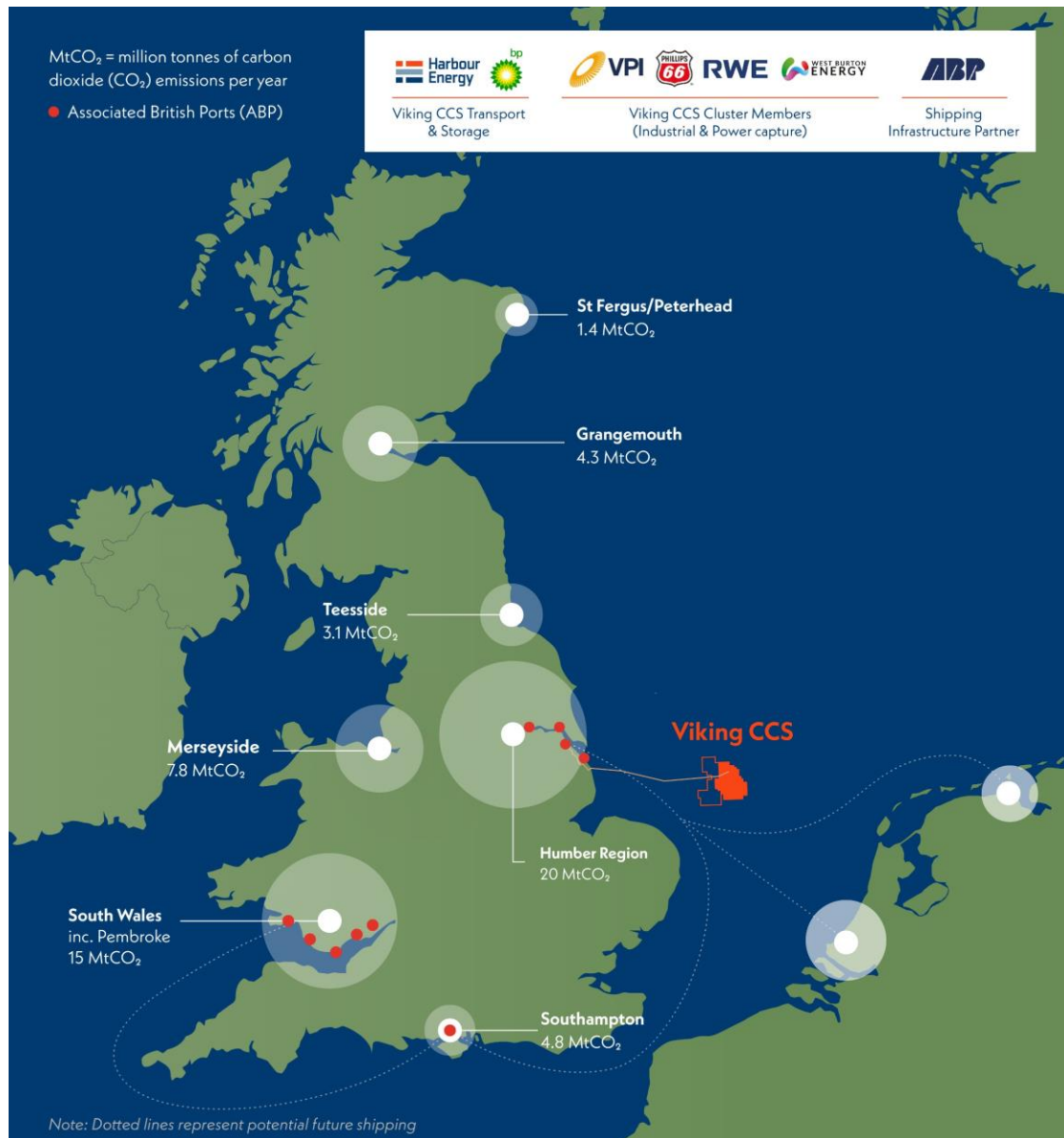
DEVEX - 28 May 2024

Nirmal Jethwa

Lead Reservoir Engineer



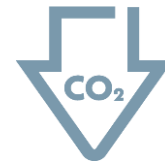
# Viking CCS – overview



**DCO submitted for Examination**



**Credible Humber CO<sub>2</sub> volumes to establish material network**



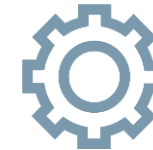
**Concept Select complete and FEED tender underway**



**Extensive stakeholder support as Track 2 leading T&S provider**



**300MT certified capacity and two new licenses**



**Re-inspection of LOGGS pipeline commissioned**



**bp joint venture partner**



**ABP IGET Jetty DCO accepted for DCO Examination**

**>30%**

of UK's 2030 emissions storage target met by Viking CCS

**30 mtpa**

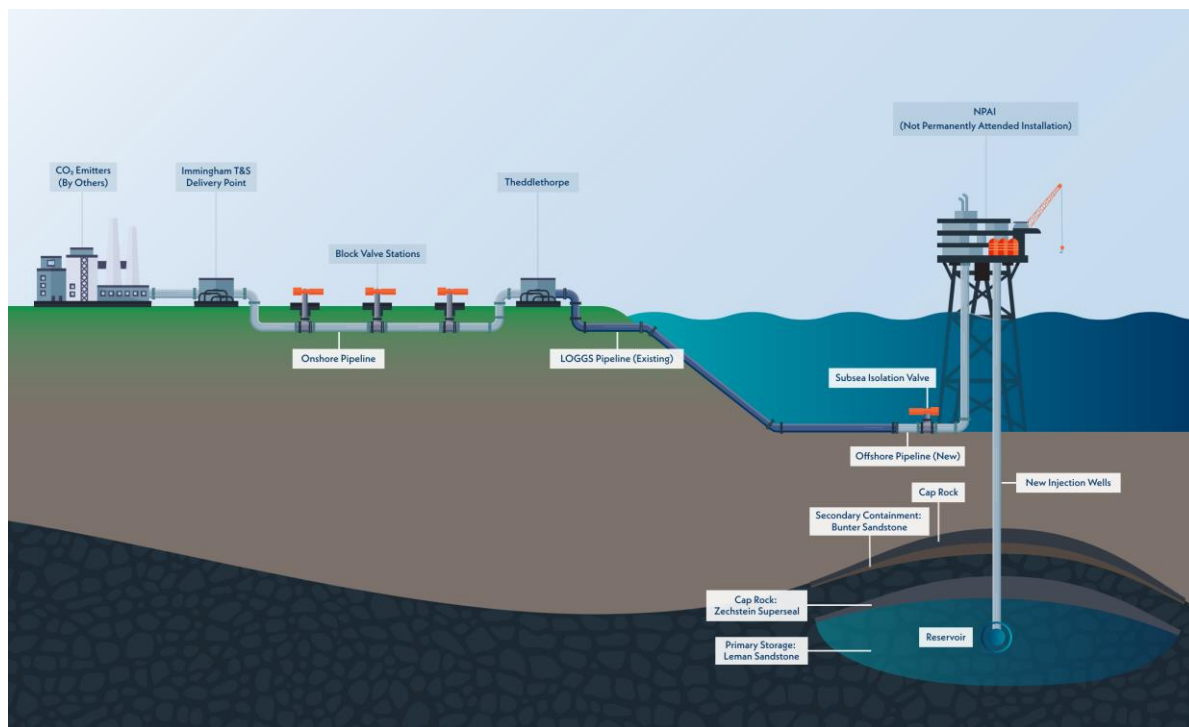
Transport capacity of offshore LOGGS pipeline

**300 mt**

Viking CO<sub>2</sub> storage capacity audited by ERCE, 2C resource

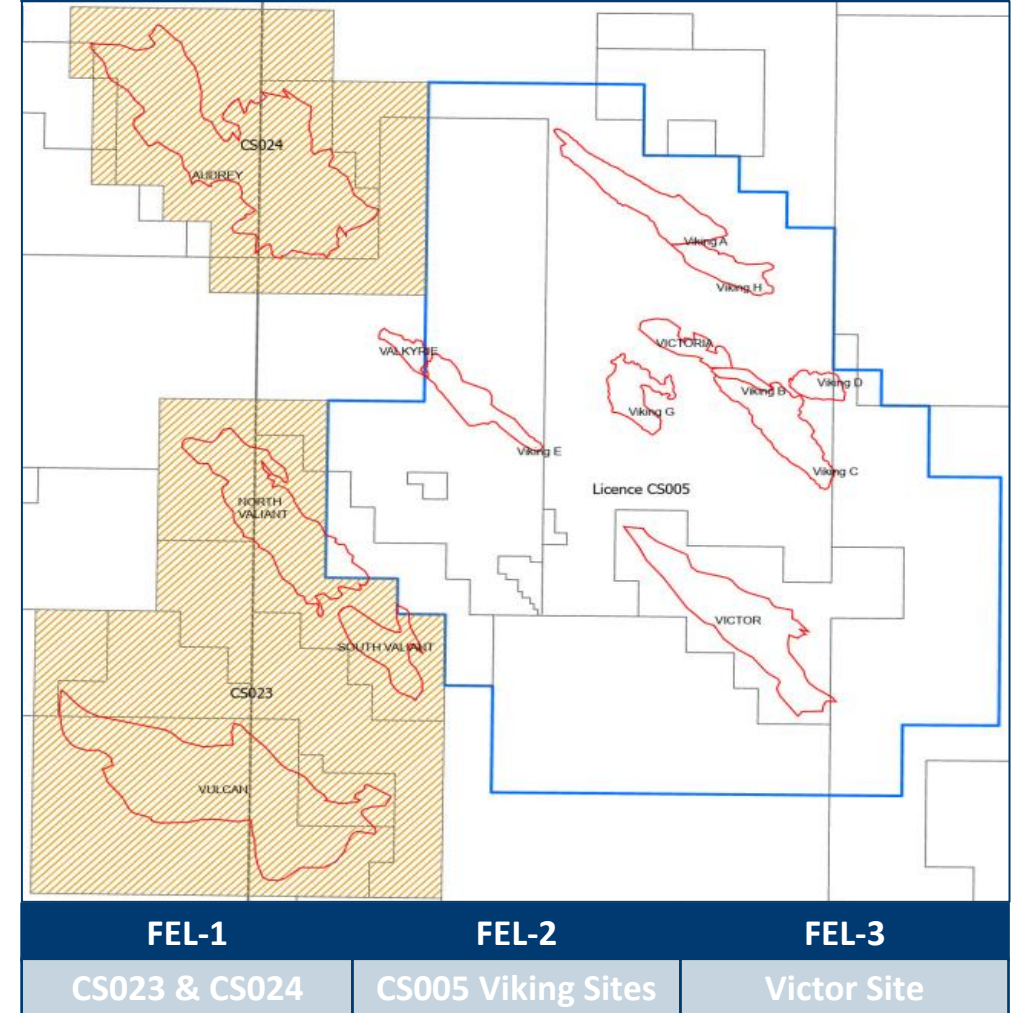
## Well defined storage sites fully utilised by maximising capacity in the onshore pipeline through design pressure

Viking CCS transportation system design

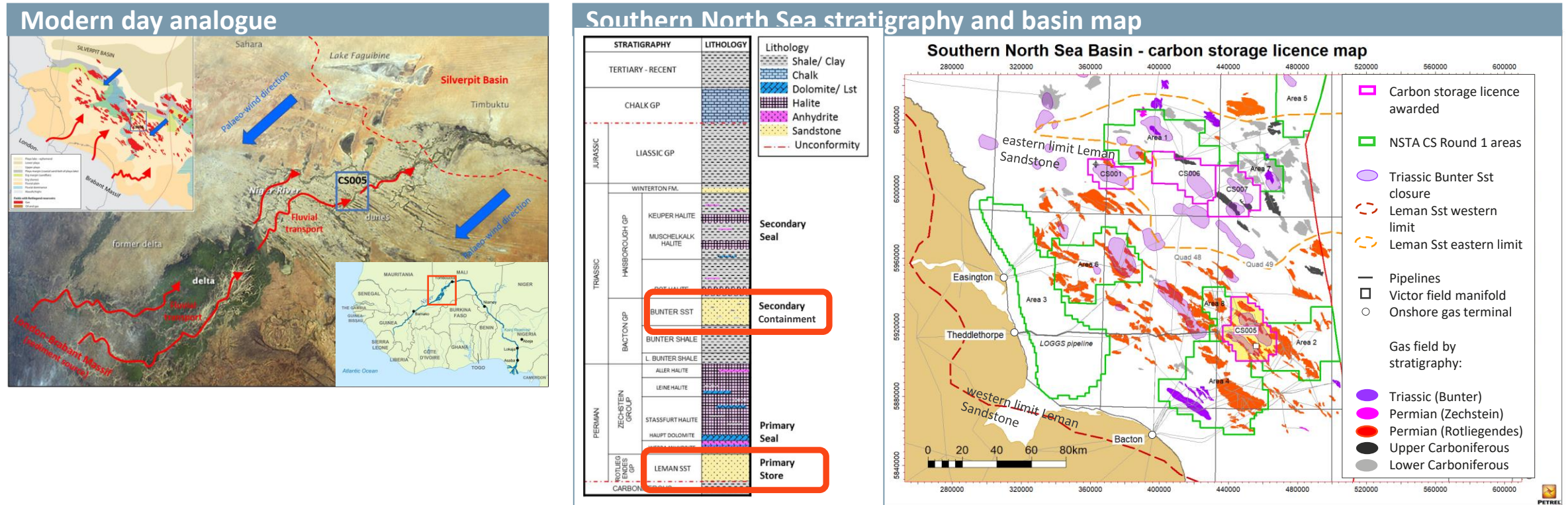


- Simple system design - emitters deliver on-spec, compressed CO<sub>2</sub>.
- New 55km onshore pipeline linking industrial cluster to Theddlethorpe.
- Repurposing of the high-capacity 36" LOGGS offshore pipeline.
- New NPAI installed at injection sites with new injection wells.
- System allows for scalable and flexible expansion as emitter demand grows.

Viking CCS carbon storage licence map



## Regional perspective is key when assessing suitability of storage sites



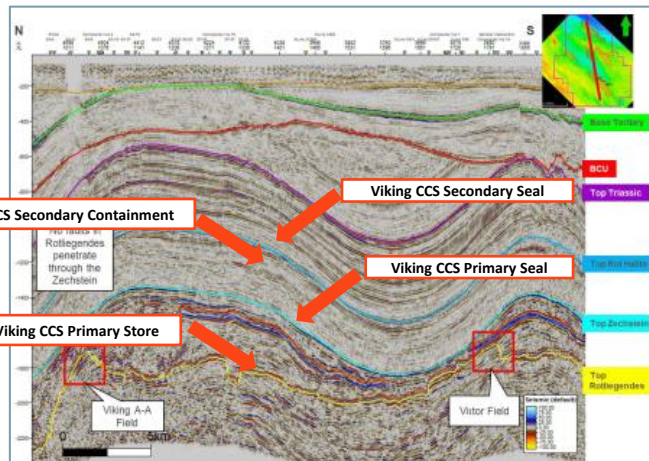
- Viking CCS relies on deep storage with the laterally and extensive Zechstein “Superseal” acting as a cap rock.
- The depth of Viking CCS stores allow for CO<sub>2</sub> storage in the super-critical condition.
- Bunter Sandstone reservoir qualified as secondary containment relying on the Haisborough Group cap rock.
- >40 years of data including seismic, well logs, core, production history and decommissioning records allow for characterisation.
- The availability of data and organisational knowledge enables development of storage permit in ~4 years.

# Subsurface storage and injectivity

## Favourable storage sites, supported by independent academic review, with mature technology programme in place

### Favourable storage sites

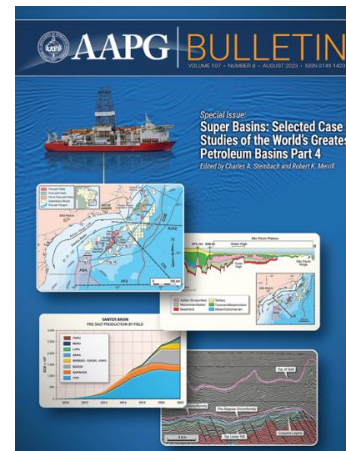
- Geomechanics studies show depletion and repressurisation will have negligible impact on identified rock properties.
- Negligible geochemical impacts over 1000s years timescale.
- Thick Leman Sandstone units to inject across (typically 400+ ft thick).
- History-matched reservoir model shows good mobility and connectivity.
- CO<sub>2</sub> injection models calibrated against production and decommissioning data.



Seismic cross-section of CS005 licence

### Independent review

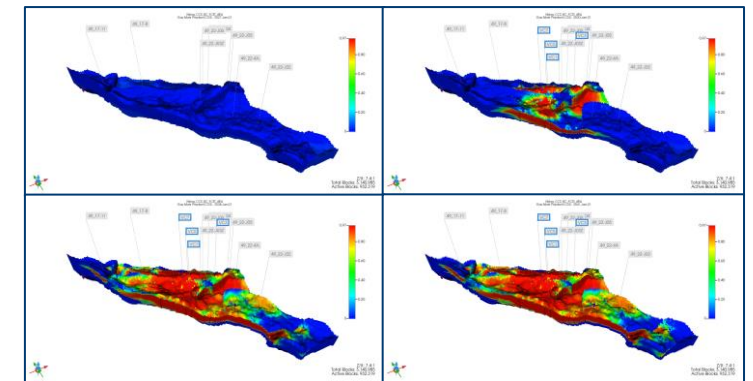
- CPR deems Viking's 2C storage resource of 300MT to be "fair and reasonable".
- Licence storage potential technically endorsed through independent review by leading CCS academic expert.
- Multiple academic papers identify this regional area as "sweet-spot" for CO<sub>2</sub> injection.
- Well progressed NSTA licence milestones on CS005, robust Risk Assessment in place.



*"Use of exploration methods to repurpose and extend the life of a super basin as a carbon storage hub for the energy transition", Underhill et al, AAPG August 2023, Volume 107, Number 8*

### Injectivity in depleted gas fields

- Mature well design and equipment qualification work programme.
- Subsurface safety valve and cement design qualification to complete in FEED.
- Lack of global analogues for CO<sub>2</sub> injection into depleted fields, residual risk sets well injectivity range.
- Injectivity mitigations offered through well count compared to initial CO<sub>2</sub> demand and commissioning in gas phase.



Victor Field CO<sub>2</sub> Gas mole fraction 2027-start of injection (top left); 2030 (top right); 2038 - injection up to virgin reservoir pressure (bottom left) and 2041 end of injection up to 5,500 psi.