SOUTH AUSTRALIA

Government of South Australia
Department for Energy and Mining

# energymining .sa.gov.au

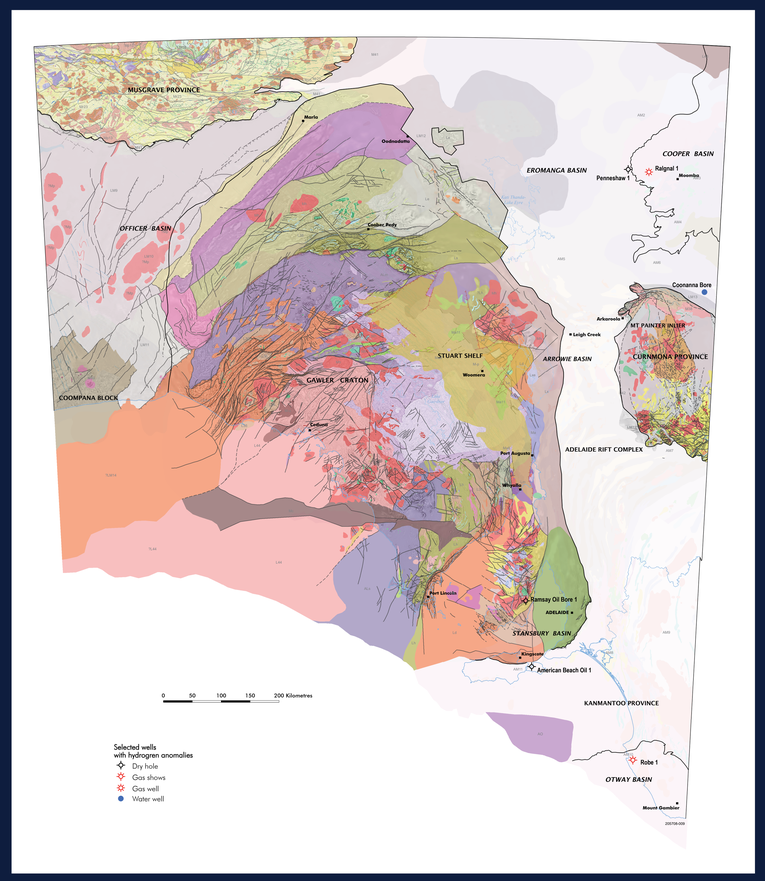
## SUMMARY

### South Australia has taken the national lead in enabling natural hydrogen exploration.

- Effective licensing, regulatory and investment frameworks are in place.
- High level screening reveals that South Australia has prospective geology and evidence of natural hydrogen occurrences.
- Gold Hydrogen has reported hydrogen indication in Ramsay 1.
- Regulatory, licensing and investment frameworks are in place, enabling grant of Australia's first exploration licences targeting natural hydrogen.
- Explorers are also able to apply for licences to store hydrogen underground and licences for the transmission of hydrogen in pipelines.
- Company exploration activity in SA will test a diversity of natural hydrogen plays.

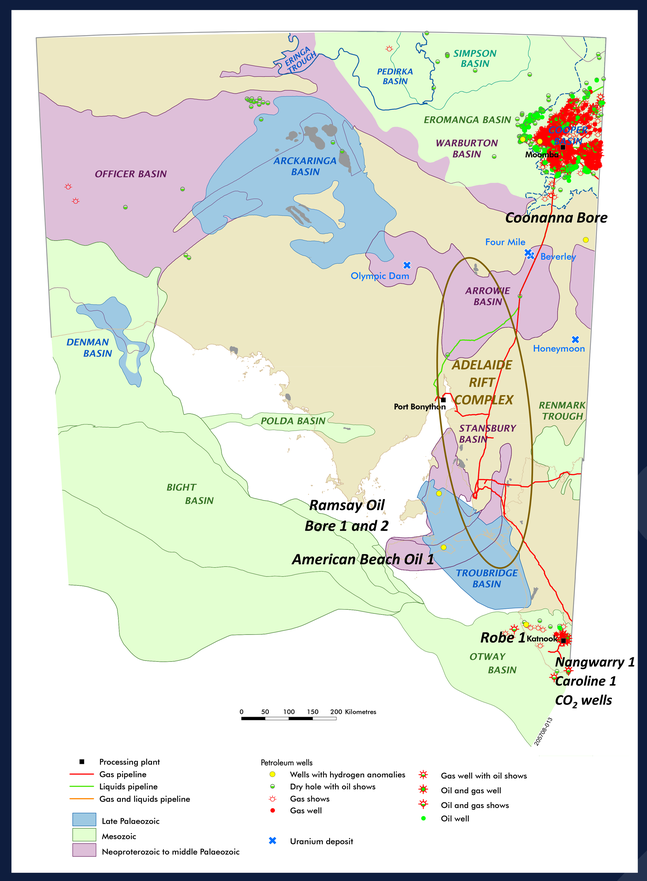
## PROSPECTIVITY

### Screening basement provinces




*Bendall 2022 energymining.sa.gov.au/industry/geological-survey/mesa-journal/previous-feature-articles/current-perspectives-on-natural-hydrogen-a-synopsis*

### Screening basins

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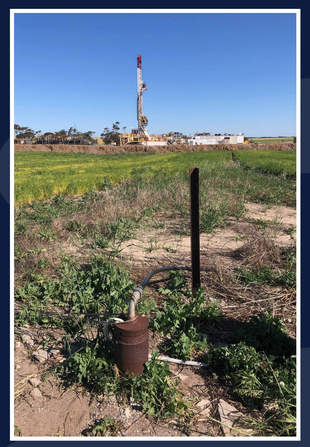
## GOLD HYDROGEN RAMSAY PROJECT

- Ramsay 1 spudded on 11 October 2023, close to the Ramsay Oil Syndicate Bore which was drilled in 1931 and recorded up to 84% hydrogen.
- On 31 October, Gold Hydrogen reported
  - "Testing and laboratory results measured air-corrected hydrogen at 73.3% at 240m below ground level, consistent with the 76% air-corrected concentration of hydrogen reported in the Ramsay Oil Bore 1 in 1931. These measurements validate historical results and confirm the presence of a hydrogen play at shallow depths in the Ramsay Project area.
  - Helium was also detected with an air-corrected content of 3.6% at 892mMD depth."
- The well has also encountered faults and fractures which Gold Hydrogen indicate may form pathways for migrating hydrogen.
- Ramsay 2 spudded on 17 November 2023.



*The old and the new - Ramsay 1 from the original Ramsay Oil Bore (Courtesy Gold Hydrogen).*

*Gold Hydrogen well locations.*

## H2EX UPDATE

- On ground exploration is underway in PEL691.
- H2EX reported hydrogen indication from a CSIRO soil gas survey in May 2023.
- Currently undertaking a 3D Amient Noise Tomography Survey using Adelaide-based Fleet Space Technologies - ExoSphere by Fleet®.

*CSIRO team undertaking soil sampling - H2EX PEL 691, Eyre Peninsula.*

*ExoSphere by Fleet® Geode.*

## Province

| HYDROGEN PLAY ELEMENTS | COOMPANA | MUSGRAVE | GAWLER | CURNAMONA & MT PAINTER INLIER | KANMANTOO FOLD BELT |
|---|---|---|---|---|---|
| Gabbros, mafics, ultramafic intrusives | | | | | |
| Iron-rich granitoid/ intrusives | | | | | |
| Uranium-rich rocks | | | IOCGU* | | |
| Banded iron formations | | | | | |
| Ferruginous duricrusts | | | | | |
| Structural complexity/deep active faults | | | | | |
| Hydrogen shows | | | Ramsay Oil Bore | | American Beach Oil Bore 1 |

** Iron Ore Copper Gold Uranium deposits*

## Basin

| HYDROGEN PLAY ELEMENTS | NEOPROT ADELAIDE RIFT COMPLEX/ ARROWIE BASIN | OFFICER BASIN | STANSBURY BASIN | COOPER/ EROMANGA/ WARBURTON BASINS | OTWAY BASIN |
|---|---|---|---|---|---|
| Mafic intrusives/extrusives (source and seal) | | | | | |
| Iron stones | | | | | |
| Salt/anhydrite, aquifers (seal) and potential reservoirs | | | | | |
| Deep Faults | | | | | |
| Over-mature source rocks | | | | | |
| Hydrogen shows | | | Ramsay Oil Bore 1. | Coonana 1, Ralgnal 1 etc. | Robe 1 (mantle derived CO2 in Caroline 1 and Nangwarry 1) |

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