The Facts
about natural gas and fracture stimulation in South Australia
The South Australian Government is steadfastly committed to unlocking the full potential of our State’s resources, energy and renewable assets.

This commitment is reflected in its number one ranking in our State’s economic priorities.

To optimise the benefit of our abundant resources, we are working hard to position South Australia as a world-leading resources and energy investment destination. Multi-billion dollar exploration programs are underway across 270,000 square kilometres of petroleum exploration licences.

International companies are seeking oil and gas accumulations in deep water in both the Bight Basin and onshore basins – such as Australia’s most prolific hydrocarbon province the Cooper-Eromanga basins.

In 2013-14, the value of South Australia’s mineral and petroleum production smashed the $7.5 billion barrier – an increase of $1.3 billion on the previous year.

An influx of companies, ideas and new technologies have combined to result in a world-class rate of new oil and gas field discoveries and have attracted 20 companies working in seven joint ventures to accelerate production.

This is good for the creation of jobs and it’s good for the economy, but it is essential that evidence-based arguments guide our policy deliberations and the further development of the industry.

Decades of experience in South Australia have shown fracture stimulation can be carried out in our oil and gas fields safely and without harm to social, natural or economic environments.

Our submission to an inquiry by the Parliament of South Australia Natural Resources Committee into Unconventional Gas clearly outlines the strength and success of our world-class regulatory regime.

These controls have ensured exploration and production has not caused significant, perceptible, associated, negative impacts on natural environments, enterprises or the health and safety of people.

It is vital for this State’s continued prosperity that this activity is sustainable and collaborative.

Our world-class regulations continue to ensure South Australia maintains a global reputation for its clean environment.

We will never compromise the livelihoods of our farmers and rural communities.

South Australian has been independently assessed as one of the top three resource regulatory regimes in the world for shale and tight gas.

It is our world-class regulatory framework that ensures exploration and production cannot go ahead unless projects meet our State’s high environmental standards.

Hon Tom Koutsantonis MP,
Minister for Mineral Resources and Energy
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Under South Australia Law, it is an offence for any drilling and well operations to cause contamination of underground aquifers.

**LEGISLATION & REGULATIONS**
- Petroleum and Geothermal Energy Act 2000
- PGE Regulations 2000
- National Parks and Wildlife Act 1972
- Natural Resources Management Act 2004
- Work Health and Safety Act 2012
- Environment Protection Act 1993

**LICENCE**
Risks must be reduced to as low as reasonably practicable using international standards

- Public access to risk management strategies and industry performance outcomes
- Timely notice of entry for all affected stakeholders
- Regular maintenance, sampling, monitoring and reporting
- Fair compensation to affected land-users

**REGULATORY ENFORCEMENT**
- Prevent and stop specific operations
- Request restitution or rehabilitation
- Levy fines
- Cancel licence
- Prosecute
- Inspections for compliance
- Mandatory reporting
The history of fracture stimulation in South Australia

1969
Fracture stimulation has been used safely in South Australia since 1969, in both conventional and unconventional wells.

More than 700* wells have been fracture stimulated in the deep sandstone reservoirs of South Australia’s Cooper Basin.

No fracture stimulation allowed outside the Cooper Basin without detailed assessment to inform stakeholders ahead of consultation.

45 Years
of fracture stimulation (fracking) in South Australia

0 Negative impacts identified

Water resources  Soil  Native vegetation and fauna
Landscape and heritage  Air quality  Health and wellbeing of people and enterprise
The Cooper-Eromanga basins are Australia’s leading onshore oil production basins and generates 17.4% of Australia’s oil production (2013/2014).

Fracture stimulated wells*

700+

200 tcf gas = 200 year supply

Early indications show that the Cooper Basin could potentially produce more than 200 trillion cubic feet. That’s more than two centuries of supply if used in Australia alone.

$42 Billion

The South Australian Cooper-Eromanga basins have produced more than 5 trillion cubic feet of gas and more than 340 million barrels of petroleum liquids since 1969 with a present sales value of $AUD 42 billion*.

* To end June 2014

Santos’s Moomba 191 shale well in the Cooper basin is Australia’s first commercial unconventional gas well, which started flowing gas in October 2012.
Unconventional plays in South Australia

CURRENT GAS PLAYS
1. Cooper Basin

POTENTIAL UNCONVENTIONAL PLAYS
2. Otway Basin
3. Officer Basin
4. Pedirka Basin
5. Arckaringa Basin
6. Warburton Basin
South Australia has vast, prospective natural gas in unconventional reservoirs that could ensure our State’s sustained well-being for decades to come.

**Exploration growth**

Wells drilled and fracture stimulated from 1969 to 2014

![Graph showing wells drilled and fracture stimulated per year from 1969 to 2014.](image)

- **Wells drilled per year**
- **Wells fracture stimulated per year**

**Investment growth in oil and gas exploration**

![Bar chart showing investment growth in oil and gas exploration from 2009-10 to 2013-14.](image)

- **2009-10**: $180.4 million
- **2010-11**: $81.1 million
- **2011-12**: $173 million
- **2012-13**: $385 million
- **2013-14**: $533.4 million

Several unconventional reservoir plays are being actively explored for gas/oil by more than 20 companies in South Australia.

There is a high probability for two or more being profitably developed in coming years.
How is a licence approved?

Under the *Petroleum and Geothermal Energy Act 2000*, approval will only be granted once the community is satisfied that all risks to the environment, other land users and the precious water resources are manageable.

- **14 Years**
  - No petroleum operations are allowed without stringent assessment.
  - Operators must give timely notice of entry to affected landholders.

- **14,000 notices of entry issued for operations**

- **0 legal objections from people or enterprises**
The approval process

- Draft Statement of Environmental Objectives (SEO)
  Identify how environmental objectives will be achieved

- Draft Environmental Impact Report (EIR)
  Identify potential risks and how they will be managed

- Petroleum licence granted if determined that applicant has financial and technical capabilities to be compliant

- Extensive consultation with relevant stakeholders, including authorities, local councils, land owners and the general public

- Stakeholder concerns adequately addressed

- Draft SEO sent to Minister for approval

- Detailed activity notification prepared and submitted, which includes an activity-specific environmental assessment against the approved SEO

- Compliant Notices of Entry provided to affected landowners

- All information has been provided to affected landowners and any land entry issues resolved

- Approval to commence activities

- YES

- NO
How is natural gas extracted from unconventional reservoirs?

Fracture stimulation in South Australia

The hole drilled in the ground is equal to the width of a standard A4 page.
**Deep gas targets Vs Shallow coal seams**

<table>
<thead>
<tr>
<th>Cooper Basin in SA and Qld</th>
<th>Surat-Bowen basins, Qld</th>
<th>Several basins, NSW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shales, siltstones, tight sandstones and deep coals</td>
<td>Shallow coal seams</td>
<td>Shallow coal seams</td>
</tr>
<tr>
<td>Deep gas targets 2,000 to 5,000m</td>
<td>Gas at less than 1,000m</td>
<td>Gas at less than 1,000m</td>
</tr>
<tr>
<td>Remote and separated from potable water resources</td>
<td>Close proximity to potable water resources</td>
<td>Close proximity to potable water resources</td>
</tr>
<tr>
<td>Modest surface footprint as wells are drilled from pads with a single road and flow-line into multiple wells</td>
<td>Can be an expansive surface foot-print</td>
<td>Can be an expansive surface foot-print</td>
</tr>
<tr>
<td>Fewer wells required than for shallow coal seam gas</td>
<td>Associated with thousands of wells</td>
<td>Associated with thousands of wells</td>
</tr>
<tr>
<td><strong>Land access enabled with risks well managed</strong></td>
<td><strong>Land access enabled with risks well managed</strong></td>
<td><strong>Land access very limited with manageable risks</strong></td>
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Fracture fluids are sometimes needed (using a mix of water, sand and additives) to improve movement within the pipes, stop the growth of bacteria, clean the well and remove oxygen to prevent corrosion.

Operators monitor the containment of wells using high-tech monitoring tools during the fracture stimulation process and ongoing integrity testing.

Casing and cement are pressure tested for leak-tightness before wells are put to use.

Recognised industry best practice for facility integrity and safety must be adhered to in well design, construction, maintenance, and monitoring to minimise cross-flow from petroleum-bearing reservoirs including between the stimulated reservoir into water-bearing aquifers.
Is fracture stimulation safe?

There is **no evidence to date** that fracture stimulation in Australia has led to any serious environmental contamination or harm.

Since 1969, fracture stimulation in South Australia has been proved to be safe and without harm to social, natural or economic environments.

Over 100 oil and gas exploration wells have been drilled over the last 100 years in the Limestone Coast region which successfully co-exists within a strong agricultural area.

Risks associated with fracture stimulation are considered to be similar to conventional drilling.
What is in fracture fluids?

Water and sand \(99.51\%\)

Additives \(0.49\%\)

Commonly found in
- Household cleaning products
- Hair products
- Food additives
“Decades of experience in South Australia have shown fracture stimulation can be carried out in our oil and gas fields safely and without harm to social, natural or economic environments.”

Hon Tom Koutsantonis MP, Minister for Mineral Resources and Energy