

From: [debbie.saegenschnitter](#)
To: [DPC:Engineering](#)
Subject: a potential environmental nightmare
Date: Tuesday, 16 January 2018 4:51:38 PM

I am totally opposed to the construction and operation of an In-Situ Gasification (ISG) Demonstration Plant at Leigh Creek. After what happened in Qld I cannot believe our govt is even considering it!

Debbie Saegenschnitter

10 Saltash Avenue

Christies Beach

From: [Marjot, Susan \(DPC\)](#)
To: [DPC:Engineering](#)
Subject: FW: UCG Public Submission
Date: Wednesday, 17 January 2018 3:55:45 PM
Attachments: [image001.jpg](#)

Su Marjot

Team Support Officer

Energy Resources Division

Department of the Premier and Cabinet

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E susan.marjot@sa.gov.au

www.dpc.sa.gov.au

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Adelaide, South Australia 5001

Level 6, 101 Grenfell Street, Adelaide, 5000

Please note that I work part-time and my days of work are Monday-Thursday.

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From: Malavazos, Michael (DPC)

Sent: Wednesday, 17 January 2018 3:54 PM

To: Marjot, Susan (DPC)

Subject: FW: UCG Public Submission

Please add to submissions

Michael Malavazos (FICHEM)

Director Engineering Operations

Energy Resources Division

Department of the Premier and Cabinet

P: +61 401 121 666 | E: michael.malavazos@sa.gov.au | W: www.dpc.sa.gov.au

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From: sarah olijnyk [<mailto:saraholijnyk@gmail.com>]

Sent: Tuesday, 16 January 2018 8:20 PM

To: Malavazos, Michael (DPC) <Michael.Malavazos@sa.gov.au>

Subject: UCG Public Submission

"It's hard to believe, but a highly controversial technology that is illegal in Queensland called 'Underground Coal Gasification' or UCG is set to be trialed here in SA.

This dirty industrial process involves setting fire to buried coal to extract gas.

It went horribly wrong in Queensland, contaminating hundreds of square kilometres of the Darling Downs with harmful gases in an event that Steven Miles, Qld Environment Minister at the time, described as *"the biggest pollution event probably in Queensland's history."* "

If this information received in an email from Conservation SA has any truth at all why is out government thinking of allowing the process to take place here?

What has happened to our status as a state of alternative energy generation? Please disseminate proper information about this process so that we, the voters and public of South Australia can let you know our informed opinion.

Regards, Sarah Olijnyk.

From: [Margaret Henry](#)
To: [DPC:Engineering](#)
Subject: Leigh Creek Energy In-Situ Gasification Demonstration Plant
Date: Tuesday, 16 January 2018 8:16:04 PM

Dear DPC,

I was appalled to read recently about

Leigh Creek Energy In-Situ Gasification Demonstration Plant.

This technology is disastrous to the environment, an environment that our species needs to live with for time infinite into the future and we have no right to put it in peril for future generations.

It is experimental technology that already has a disastrous reputation, so much so that Queensland has banned it and we should learn from that and do likewise.

The future for power on this planet is renewables and we must move in that direction.

Supporting this cause dilutes the focus on developing renewable and adds to environmental damage.

Inland Australia is not a lifeless desert. It is a thriving ecosystem that needs protecting, not abusing. Damage cannot be repaired so let that be enough to deter this hopeless scheme. You cannot guarantee that this will not forever pollute the Great Artesian Basin and affect a great part of Australia as these waters carry pollutants to vast areas.

Please learn from Queensland and Victoria's failed ventures and following wisdom and ban this activity in South Australia.

Margaret Henry
Henley Beach South
South Australia

From: [Malgorzata Schmidt](#)
To: [DPC:Engineering](#)
Subject: NO to "Underground Coal Gasification"
Date: Tuesday, 16 January 2018 5:50:19 PM

Dear Minister Jarrod Spencer,

We do not want any 'Underground Coal Gasification' in SA. This polluting industrial process of setting fire to buried coal to extract gas is detrimental to SA, as well as the entire Planet.

Please, help me to convince the Premier that we interpret his idea as yet another example of his hatred towards South Australia. The other recent ones have been: International nuclear dump; His demolition squad that has paralysed Adelaide public transport and Festival Centre. These actions are against the best interests of the South Australians, as well as the Labour Party in the oncoming election.

I trust that you will put a stop to this initiative.

And with best New Year wishes and kind regards

I remain faithfully yours

Malgorzata Schmidt MD, PhD

2/3 Fife St, Woodville South SA 5011

MRZATA@hotmail.com

From: [Vivonne Thwaites](#)
To: [DPC:Engineering](#)
Subject: Gas
Date: Wednesday, 17 January 2018 5:50:18 PM

Its already known the disaster of this method...see film Gasland which we will b re screening throughout SA...!!!

From: [Burwell Dodd](#)
To: [DPC:Engineering](#)
Subject: Leigh Creek Coal Gasification
Date: Wednesday, 17 January 2018 6:20:18 PM

UCG is not safe. That is simply scientifically wrong. If "experts" say it is, they are not expert in the field. Please don't let this happen.

Burwell Dodd
PO Box 279
Stirling, 5152

From: [Geoffrey Aitken](#)
To: [DPC:Engineering](#)
Subject: Leigh Creek UCG trial
Date: Wednesday, 17 January 2018 5:39:05 PM

Please consider every aspect of the proposed Leigh Creek trial gas exploration plan. Our environment cannot afford anything remotely reckless which I believe this to be. Supporting Queensland evidence recommends great caution. One cannot turn back the clock when the environment is severely damaged. A continuing trial would legitimize a decision to begin full scale mining in my experience. I am a voter and I have friends.

From: [M Lovejoy](#)
To: [DPC:Engineering](#)
Subject: NO to UCG
Date: Wednesday, 17 January 2018 8:17:48 PM

SA is leading the way nationally with renewable energy and storage. It's putting the federal government to shame. So:

Why go backwards to fossil fuels, especially UCG? It is a disaster waiting to happen, as has occurred in Queensland. With an election approaching, the ALP government is jeopardising its future by indulging in such backward thinking.

Please stop immediately and guarantee to voters that all projects undertaken by government will be clean, green and environmentally friendly.

Yours sincerely

Mrs M Lovejoy

SA 5007

Sent from my iPhone

From: [A Heard & M Reardon](#)
To: [DPC:Engineering](#)
Subject: No ucg
Date: Wednesday, 17 January 2018 5:13:14 PM

I am hoping our state government will continue the work of expanding clean energy not go down the path of UCG.

This is a reversal of alternative energy strategies I would have thought- backward steps without the safe future in mind of constituents & in fact everybody on the planet!

Yours sincerely

Meredith Reardon

42 Appelbee cres

Norwood 5067

From: [Jillian Marsh](#)
To: [DPC:Engineering](#)
Subject: No UCG in South Australia
Date: Wednesday, 17 January 2018 4:59:22 PM

As a traditional custodian of the Leigh Creek area i say NO to UCG and ask that it be banned in SA as it has been in Queensland. JILLIAN MARSH

From: [Aura Valli](#)
To: [DPC:Engineering](#)
Subject: RE UCG TRIAL PROJECT AT LEIGH CREEK
Date: Wednesday, 17 January 2018 5:26:41 PM

It was reassuring to have the Weatherill score so many goals with clean renewable energy such as wind farms and solar batteries - and there goes all the good work if the Labor Government allows this project to go through.

Dirty gas has no place in the production of clean energy. Why do they want to foster pollution and environmental damage? Why can't this Govt learn from the mistakes made by the Queensland Govt which ultimately banned UCG in that state?

Wake up South Australia - Green credentials is one of the few things that this Government has managed to achieve over the last tortuous 17 years. Don't ruin this like so many things get ruined in this state.... O-Bahn extension which cuts less than one minute off travel time, a train which can't turn right on onto NorthTce, The Oaken Nursing home imbroglio..... do I need to go on?

Aura Valli
7a Addison Rd
Black Forest
SA

From: [Donella Peters](#)
To: [DPC:Engineering](#)
Subject: Submission opposing Underground Coal Gasification in South Australia
Date: Wednesday, 17 January 2018 11:48:30 AM

Attention: Jarrod Spencer

Department of the Premier and Cabinet

Dear Sir,

In response to the proposed Leigh Creek Energy In-Situ Gasification Demonstration Plant, I object strenuously to any such processing being undertaken anywhere in South Australia.

The experiences with this in Queensland should be enough to convince anyone that it should not be tried. Queensland's Mines Minister Dr Anthony Lynham said in 2016

"Underground coal gasification (UCG) will be banned in Queensland due to its environmental impact. ... The potential risks to Queensland's environment and our valuable agricultural industries far outweigh any potential economic benefits."

QLD Environment Minister Steven Miles said the Linc Energy project near Chinchilla, which released toxic chemicals into the soil, air and groundwater over a six-year period, was "the biggest pollution event probably in Queensland's history".

Linc Energy went into liquidation in 2016, and was committed to stand trial on five charges relating to breaches in Queensland's environmental laws at its UCG site. The state's Environment Department accused the company of willfully causing serious harm at its trial site near Chinchilla on the Darling Downs.

Another example is Cougar Energy's UCG trial which was shut down in 2010 after benzene was detected in nearby water bores. Cougar Energy was also fined \$75,000 in 2013 after pleading guilty in the Brisbane Magistrates Court to three charges linked to its failed UCG project near Coolabunia.

The Government website for this Leigh Creek proposal states: "All regulated activities conducted under the Petroleum and Geothermal Energy Act 2000 (PG&E Act) must have an approved Statement of Environmental Objectives in place with which they comply, prepared on the basis of an Environmental Impact Report."

However, the best Statement of Environmental Objectives in the world cannot prevent accidents from happening, as we have seen again and again with mining companies throughout Australia. And when they do, companies either go into liquidation to avoid paying any fines, or we find we have a situation that simply cannot be cleared up despite our best efforts.

Either way, it would be very foolhardy to believe that such a risky polluting process can be safely carried out anywhere.

I urge you as strongly as possible to reject this idea once and for all.

Sincerely,

Donella Peters

10 Boomerang Cres

Aldgate 5154

From: [Sonia Lancaster](#)
To: [DPC:Engineering](#)
Subject: UCG
Date: Wednesday, 17 January 2018 5:50:16 PM

I would like to express my disapproval of USG and would like to state that I want a clean future for my children. I do not approve trial projects into this type of technology.

Kind Regards

Sonia Lancaster
Sent from my iPad

From: [Weber, Ingo \(Health\)](#)
To: [DPC:Engineering](#)
Subject: Ucg/ gas gasification
Date: Wednesday, 17 January 2018 6:43:09 PM

Dear Sir/Madame

To plan for gasification at Leigh Creek means I will not be voting for you at the next election, and fight your government every step of the way in Oder to protect the health of our community against your irresponsible and reckless action.

Dr Ingo Weber

Sent from my iPhone

From: [Lynne Ewer](#)
To: [DPC:Engineering](#)
Subject: UGC trial project at Leigh Creek
Date: Wednesday, 17 January 2018 8:31:58 PM

To whom it may concern

I am writing in response to the news that the Government has commenced the approval process for a UCG plant in Leigh Creek. I wish to state that I am angered and saddened to hear this. This current Government has done so much for renewable energy in the recent past with the battery at Jamestown and the promotion of solar and wind energy that it makes no sense for it to suddenly be looking at out of dates forms of energy production like underground coal gas mining.

From: [David Harwood](#)
To: [DPC:Engineering](#)
Subject: UNDERGROUND COAL GASIFICATION
Date: Wednesday, 17 January 2018 6:06:03 PM

Dear Sirs & Madams,

As South Australia is now recognised as a leader in renewable energy, why would you even consider UCG power generation.

Queensland has been there , done that, and scotched it for good, don't do it, whatever you do, don't do that, our future childrens health relies on CLEAN energy production.

Regards,

Angela & David Harwood

From: [Jeff Telfer](#)
To: [DPC:Engineering](#)
Subject: Underground coal gasification
Date: Wednesday, 17 January 2018 3:20:35 PM

Mr Jarrod Spencer
Department of the Premier and Cabinet
Energy Resources Division

Dear Mr Spencer

I wish to state my opposition to the proposed UCG pilot project. I have a number of objections to this.

1. I understand that this process has been banned in a number of jurisdictions around the world, on the basis of the risk of environmental degradation and the risk involved in the process.
2. I am opposed to the use of fossil fuels for energy generation because of the urgent need to reduce greenhouse emissions.
3. I understand that there were toxic emissions from the trial which occurred in Queensland.
4. I understand that a number of countries have banned this process for the reasons stated.

Given the increasing competitiveness of renewable energy, I do not see justification for trials of a process with so many drawbacks.

Your sincerely

Jeff Telfer

29 Parsons St

Marion, SA 5043

Phone: 0421 199 162

Email: rjtelfer@internode.on.net

From: [Peter Morris](#)
To: [DPC:Engineering](#)
Subject: Underground coal gasification is a bad idea
Date: Wednesday, 17 January 2018 6:27:13 PM

Dear DPC Engineering,

I would like to draw your attention to this article,
<http://www.abc.net.au/news/2016-04-18/ucg-banned-immediately-in-qld-laws-to-follow-anthony-lynham/7335172>

which reports that an underground coal gasification project was assessed by Queensland Environment Minister Steven Miles as:

"the biggest pollution event probably in Queensland's history".

Yours sincerely,
Peter Morris
Marden, SA

From: [Dave P](#)
To: [DPC:Engineering](#)
Subject: Underground Coal Gasification trial in SA
Date: Wednesday, 17 January 2018 2:07:48 PM

Attention: Jarrod Spencer
Department of the Premier and Cabinet
Energy Resources Division
GPO Box 320, Adelaide 5001

Hi Jarrod,

Please note my strong opposition to UCG trials in SA.

Queensland is very pro resource extraction and if they have banned it the risks are clearly significant and despite the EIS claims are in my mind not worth taking.

The only non-renewable resource extraction should be to establish renewable energy systems that will provide long term solutions rather than a temporary fix.

Kind Regards.

David Pearce.

M: 0467 646 877

E: dgp243@gmail.com

From: [Jan Jacobsen](#)
To: [DPC:Engineering](#); reynell@parliament.sa.gov.au
Subject: WOW and NO
Date: Wednesday, 17 January 2018 5:56:15 PM

We as a state have made so many major world first on renewable energy and ask people to inverters in solar wind and here we now going backwards on been a great state so lets no stuff it up for our kids and the future of our state which make no sense **NO TO UGC**

PS: just look around the world how the people are not liking it

Jan Jacobsen

Email : [Jan Jacobsen](#)

From: [Fiona Blinco](#)
To: [DPC:Engineering](#)
Subject: against UCG trial at Leigh Creek
Date: Thursday, 18 January 2018 9:31:04 AM

Hi,

I write to submit my view against the underground coal gasification trial project at Leigh Creek,

thank you,

Fiona Blinco
4 Paringa Avenue
Marino
South Australia
0400 835 161

From: [Robyn H](#)
To: [DPC:Engineering](#)
Subject: Attn Jarrod Spencer re UCG
Date: Thursday, 18 January 2018 6:21:18 PM

Submission re UCG Demonstration Plant

I just read the article below.

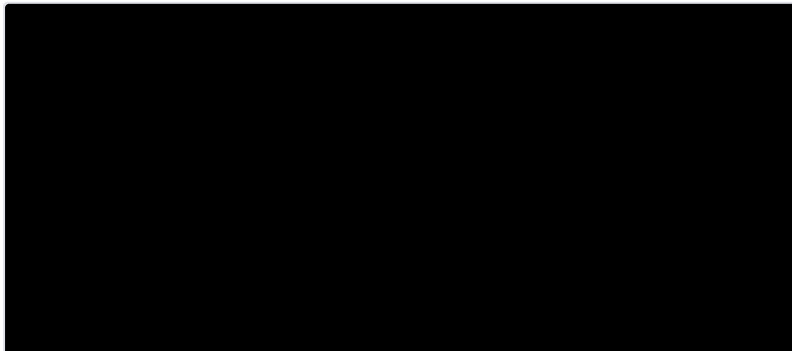
My first question to SA authorities, is how is SA different from Qld? No doubt the authorities in Qld did their homework before approving the project that resulted in "Queensland's worst ever environmental disaster". How can we know that the SA project, or others that may follow, won't be just as damaging? Mining companies cut corners and/or break the law all the time. I don't think a project like this is worth the risk.

Stop the sale of SA's natural gas overseas and we'll have all the gas we need in SA.

Robyn Handreck

Felixstow, SA

[Queensland bans underground coal gasification over environmental risk](#)



**Queensland bans underground coal
gasification over environmental risk**

Ban comes after UCG pilot company Linc Energy, which last week went into administration, was committed for trial...

From: [Marg & Harry Moate](#)
To: [DPC:Engineering](#)
Subject: Ban UCG
Date: Thursday, 18 January 2018 10:46:09 AM

To whom it may concern

Why is the state Government willing to take risks with UCG when the state is a leading the way with renewables? Most thinking citizens understand that Gas is a fossil fuel and is a massive contributor to exacerbating climate disruption.

As a citizen of SA, I (and my family) want the Government (and private industry) to only use/promote clean & safe energy into the future. UCG can not claim to be either. We have seen the evidence from Qld and the dangers are clear.

This seems an unusual time to be promoting the use of an energy source that we know has dire consequences for our people and environment. SA should remain a leader in renewable energy and although I understand we already have some gas already being extracted, our state should neither encourage nor give permission for more.

Yours sincerely

Molly Moate

Peterborough SA

From: [Carolyn Hocking](#)
To: [DPC:Engineering](#)
Subject: clean energy future
Date: Thursday, 18 January 2018 11:00:43 AM

Not a **dirty and dangerous underground coal gasification (UCG) trial project at Leigh Creek.**

--

Kind regards
Carolyn

From: [Ronald Nicholls](#)
To: [DPC:Engineering](#)
Subject: Clean Energy Future
Date: Thursday, 18 January 2018 10:08:58 AM
Attachments: [image001.png](#)
[image002.jpg](#)

Hi

I have just received the news regarding the possible adoption of Underground Coal Gasification (UCG) by the Labor Government. Given the recent implementation of renewable energy and storage and a general focus on a clean and green future for the state it seems ridiculous to now think about going ahead with UCG. I believe that the majority of people in South Australia want a clean energy future and I would urge you to reconsider this technology and continue on the path to restorative and regenerative design thinking and practices. For our children and children's children and beyond. Best wishes!

Regards

Ron

Ron Nicholls

Lecturer and OUA Coordinator

Art, Architecture and Design

Division of Education, Arts and Social Sciences

University of South Australia

City West Campus

Level 3 Kaurua Building (K3-06)

70 North Terrace

Adelaide South Australia 5000

Phone: +61 8 8302 7392

Fax: (08) +61 8 8302 0211

Email: ronald.nicholls@unisa.edu.au

We are the Eairth Dancing

The river that plays

We are breath, the rhythming of life,

And fire, illuminating the way



From: [Yasmin Saunders](#)
To: [DPC:Engineering](#)
Subject: Coal Gasification Leigh Creek or any where ... or fracking on farmland...
Date: Thursday, 18 January 2018 12:42:24 AM

Dear Energy Division SA Govt -(ex-DSD?),

DO NOT involve tax payer money in dirty energy -the old dirty energy companies cannot still have a hold on the government SURELY?

Not on! -renewable is the only way -we are not in 1950's Russia any more even if some people are in the old mentality still -SURELY?

Greenhouse gas is the only thing that matters there is only one planet -who is pushing this? Someone has an agenda and its archaic -....coal cos???

NOT ON !

From Yasmin Saunders -a voter.....Thankyou

From: [Meredith & David Parker](#)
To: [DPC:Engineering](#)
Subject: Leigh Creek Energy In-Situ Gasification Demonstration Plant submission
Date: Thursday, 18 January 2018 2:58:07 PM

Attention: Jarrod Spencer
Department of the Premier and Cabinet
Energy Resources Division
GPO Box 320, Adelaide 5001

Dear Jarrod

I have just heard that the government is being asked to approve the construction and operation of an In-Situ Gasification (ISG) Demonstration Plant at Leigh Creek. I wish to lodge my object to the construction and operation of such a plant for the following reasons.

- 1) It is a dirty process that involves burning coal underground to extract gasses.
- 2) If the demonstration project is successful there will be huge pressure applied to move from the exploration stage to the production stage, and to construct and build a fully operational underground coal gasification plant.
- 3) The process still produces carbon dioxide from the burning of coal, a fossil fuel.
- 4) The process will contribute to global warming, and all the problems that that creates.
- 5) The process will have a negative impact on underground water aquifers, as occurred in the Queensland Darling Downs.
- 6) Whilst In-situ Gasification (ISG) in South Australia is regulated under the Petroleum and Geothermal Energy Act 2000, administered by the Energy Resources Division of the Department of the Premier and Cabinet, a similar regulatory framework in Queensland failed to prevent the environmental problems that occurred in Queensland.
- 7) If the project ever moves to the production stage, then there is the risk of chamber collapse as it not possible to monitor and control the burning coalface.
- 8) South Australia is making great advances in renewable solar power. If the government is wanting to support further developments in the energy sector, then maybe it should consider supporting feasibility studies into pumped hydro for electricity storage.

Kind Regards

David Parker

From: [Fran Hanna](#)
To: [DPC:Engineering](#)
Subject: Leigh Creek Gasification Demonstration Plant
Date: Thursday, 18 January 2018 2:02:54 PM

To whom it may concern,

I am most distressed to see in the Australian today the plan for the construction and operation of an In-Situ Gasification (ISG) Demonstration Plant at Leigh Creek. This process has already failed in Queensland and now you are wanting to set it up in SA. I am a Labor voter but would not be giving Labor my vote if this is approved.

Regards

Fran Hanna

From: [Klaus Frohlich](#)
To: [DPC:Engineering](#)
Subject: No UCG in South Australia
Date: Thursday, 18 January 2018 1:01:12 PM

I am totally opposed to trialing UCG in South Australia.
It an absolutely dirty process and was a disaster in Queensland.
We should invest in clean renewable energy and not burning more coal !
Klaus Frohlich

Sent from my iPhone

From: [m.c](#)
To: [DPC:Engineering](#)
Subject: U.C.G. Plans
Date: Thursday, 18 January 2018 1:45:20 PM

Please ban any UCG>'s in South Australia. It is too polluting and dangerous. Mary.

From: [STASKA, Michael](#)
To: [DPC:Engineering](#)
Subject: UCG
Date: Thursday, 18 January 2018 10:34:35 AM
Attachments: [image001.jpg](#)

To Whom it may concern and the Premier, Jay Weatherill

Underground Coal Gasification (UCG, or in situ gasification) is an extreme fossil fuel technology that was banned in Queensland in 2016 after it contaminated hundreds of square kilometres' of the Darling Downs with harmful, dangerous and toxic gases.

*At the time, the then-Queensland **Labor** Environment Minister Steven Miles described it as "the biggest pollution event probably in Queensland's history."*

A company is now proposing to trial UCG in our state, South Australia – at Leigh Creek.

I cannot understand why you would want to bring UCG here when our state is such a proud leader in renewable energy.

This would place in jeopardy the Great Artesian Basin (GAB) and the surrounding environment, Flora and Fauna.

I implore you to follow Queensland's lead: ban the use of Underground Coal Gasification in South Australia and put a stop to the Leigh Creek Energy project.

Keep SA Beautiful

Kind Regards,

Michael Staska – Environmental Coordinator



Darlington Upgrade Project

Fulton Hogan | Laing O'Rourke | Jacobs | SMEC | KBR

Laffer Drive, Bedford Park, SA, 5042

Phone: 0437614196

Email: Michael.Staska@gatewayouth.com.au

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From: [Matt Makinson](#)
To: [DPC:Engineering](#)
Subject: UCG in Australia
Date: Thursday, 18 January 2018 10:06:17 AM

To Whom It May Concern,

I can't believe anyone is actually thinking of trialing UCG in Australia anymore.

Such a proposition would make all associated with it a laughing stock in the eyes of the world and at the least environmental criminals.

You certainly don't have my vote nor do I give you permission to approve of this on my behalf.

Matt Makinson
CEO - Black and White Photographics
31 George Street Stepney SA 5069
Ph: 08 8363 0224
www.blackandwhitephoto.com.au



From: [Frances Cumming](#)
To: [DPC:Engineering](#)
Subject: Underground coal gasification proposal for Leigh Creek
Date: Thursday, 18 January 2018 4:21:53 PM

Dear Sir , Madam,

I am writing to express my opposition to the proposal to allow a trial of underground coal gasification at Leigh Creek.

I believe that this technology is likely to cause major pollution and environmental damage to the fragile natural environment in the Leigh Creek area. There is a risk that the State Government will be left to fund the clean-up of the mess the company is likely to leave behind it and compensate land holders for the damage done to the local environment.

I believe that the power needs of South Australia can be met by developing renewable resources and would prefer the government to fund projects for clean renewable energy in the future.

Sincerely Frances Cumming

From: [Wendy Egan](#)
To: [DPC:Engineering](#)
Subject: Ban UCG in South Australia
Date: Friday, 19 January 2018 5:11:08 PM

Do not allow a dirty and dangerous underground coal gasification (UCG) trial project at Leigh Creek.

Wendy EGan

From: [CANN, Geoff](#)
To: [DPC:Engineering](#)
Subject: Clean energy future
Date: Friday, 19 January 2018 12:13:20 PM

Simply put

I will not vote for a government that does not support and lead for a clean energy future.

Regards

Geoff Cann

This email has been sent on behalf of one of the following companies within the BAE Systems Australia group of companies:

BAE Systems Australia Limited - Australian Company Number 008 423 005

BAE Systems Australia Defence Pty Limited - Australian Company Number 006 870 846

BAE Systems Australia Logistics Pty Limited - Australian Company Number 086 228 864

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This email and any attachments may contain confidential and legally privileged information. If you are not the intended recipient, do not copy or disclose its content, but please reply to this email immediately and highlight the error to the sender and then immediately delete the message.

From: [Tim Marriage](#)
To: [DPC:Engineering](#)
Subject: Coal seam gas is a bad idea
Date: Friday, 19 January 2018 1:43:31 AM

Hi
I think coal seam gas is a bad idea for sa
Thanks
Tim

From: [Allan Ward](#)
To: [DPC:Engineering](#)
Subject: UCG
Date: Friday, 19 January 2018 10:27:19 AM

To whom it may concern,

UCG is like the habit of smoking - there are NO plus points !! Everything about it is negative.

Anybody who even thinks about this stupid activity should immediately go and see a “shrink”.

There are NO places in the world where this activity has had a positive effect !

Gas is not much better than coal as a combustible product.

The Sun and Wind are free and NON contaminating.

Allan A WARD RFD., ED.

3 Montrose Pl
Beaumont SA 5066

From: [Adrian Watkins](#)
To: [DPC:Engineering](#)
Subject: Underground Coal Gasification
Date: Thursday, 18 January 2018 9:16:46 PM

Dear SA Government

I've just learned about the absurd idea of conducting UCG test near Leigh Creek.

Now I know Leigh Creek is wondering what to do about its future now that the dreaded climate wrecking coal mine has closed. However, replacing one source of greenhouse gases with another is surely rather ridiculous. Where is the logic in such an idea?

No, the SA Government has led the nation in moving towards a cleaner, more modern economy by promoting renewable energy. I sincerely, even desperately, urge you to continue in this vein.

Cheers

Adrian Watkins

From: [Internode](#)
To: [DPC:Engineering](#)
Subject: Please ban underground coal gasification
Date: Saturday, 20 January 2018 10:31:27 PM

Hello,

I am opposed to this practice and request that this proposal be canned.

I am a ratepayer of South Australia,

Trudy-Anne Doyle

9 Tarandi Rd

Mt Gambier 5290



Virus-free. www.avg.com

From: [Lynda Yates](#)
To: [DPC:Engineering](#)
Subject: Underground Coal Gasification (UCG)
Date: Saturday, 20 January 2018 4:14:39 PM

Please don't go down the track of UCG. There is no reason to do this when there is clean renewable energy abundantly available. I strongly oppose any scheme to increase the use of coal as it is a dirty, dangerous, environmentally damaging and unsustainable energy source that will increase greenhouse gases and climate change impacts AND IS NOT NECESSARY!

Lynda Yates
p. 8298 2452
m. 0417 484 717

From: [Dean](#)
To: [DPC:Engineering](#)
Subject: Ban UCG
Date: Sunday, 21 January 2018 9:14:52 PM

What is your (my) Government thinking.

After all the attempts to entrench fossil fuels in our economy, despite business forging ahead with a rapid change to renewables, & the massive reaction of South Australians opposing more fossil fuel idiocy, you come up with the nonsense of UCG just prior to an election?

Political suicide if ever i saw it.

I want the only future we (humans) have, renewables are the fuel of that future.

Lead on this & get in step with business driving renewables or the next non labour government will. Here is where the votes lie, a pledge to do all possible to quickly phase out all fossil fuel energy & drive a speedy conversion to renewables.

Sincerely

Dean Watson

Sent from my Samsung Galaxy smartphone.

From: [Mike Bavistock](#)
To: [DPC:Engineering](#)
Subject: No UCG in SA
Date: Tuesday, 23 January 2018 1:31:09 PM

I am extremely disappointed to hear that you are pursuing an Underground Coal Gasification project at Leigh Creek. The Queensland Government has had a very bad pollution experience with this technology, and I don't want to see the same result in SA.

We don't need it – it's an unnecessary risk.

I don't trust your 'independent experts' to determine if UCG is safe, as documents from the Premier's Department do not take seriously the history of pollution and environmental harm from UCG in Queensland. For due diligence, you must ask why the Queensland Government have banned UCG?

I urge you to abandon the UCG trial at Leigh Creek, and instead focus on clean renewable energy like solar thermal, wind and battery storage. These are the solutions South Australian's want to see.

Cheers,



Mike Bavistock

Tandem Graphic Design - (08) 8351 5875

mike@tandem.net.au - www.tandem.net.au

Submission to

Attention: Jarrod Spencer
Department of the Premier and Cabinet
Energy Resources Division
GPO Box 320, Adelaide 5001

dpc.engineering@sa.gov.au

Underground coal gasification also known as in situ coal gasification

There is more than enough documented evidence that Underground Coal Gasification (UCG) should be banned right across the country, let alone in South Australia. Queensland has banned it following the disastrous poisoning of huge swathes of prime farmland in their state's south-east.

The multi-million-dollar investigation was the largest in the Queensland Environment Department's history. The ABC reported that a Queensland Government investigation found hundreds of square kilometres of prime agricultural land was at risk from a cocktail of toxic chemicals and explosive gases that had allegedly seeped from Linc Energy's UCG site.

The investigation found that soil near the facility had been permanently acidified, with methane, hydrogen, carbon monoxide and hydrogen sulphide alleged to have leaked from the site.

Consequently, the Queensland Government charged Link Energy executives with environmental offences.

Scotland recently banned it following an independent report, which evaluated the technology and the global experience of underground coal gasification. The author of that report was Professor Campbell Gemmell, who was the former chief executive of South Australia's EPA.

His report revealed that many other countries have tried it. There have been projects in Belgium, Bulgaria, Canada, Chile, China, England, France, Germany, India, Japan, Mongolia, New Zealand, Pakistan, Poland, Russia, South Africa, Spain, Tanzania, Ukraine, the USA and Uzbekistan. Just about all the other projects failed within a very short period of time. Some went for a few weeks, but only in Uzbekistan has it been going for any significant time.

Professor Campbell Gemmell found evidence of significant performance failures with UCG, and these included: surface, groundwater and land contamination; containment losses; fugitive methane emissions; seismicity; inadequate liability management; and worker health issues.

The CEO of Conservation SA said, "It's disappointing that the Weatherill Government has allowed it to get this far. We want it stopped and stopped now."

I am in agreement with Conservation SA. The Premier's Department running the consultation should consider Professor Campbell Gemmell's comprehensive report for Scotland exposing the very serious risks this industry poses, and they should also consider Queensland's experience as a stark warning of how unsafe this industry is.

The people of Leigh Creek deserve better than this. Their health and prosperity is as important as every other person's in the SA.

There is only one conclusion in my view; UCG should be banned in South Australia.

Yours Sincerely,

Sophie Henke
PO Box219
Mt Gambier 5290

22.01.2017

From: [S.Lang](#)
To: [DPC:Engineering](#)
Subject: UCG trial project - No Way
Date: Tuesday, 23 January 2018 10:53:30 PM

Dear Sir/Madam,

It is my understanding the State Government has commenced the approval process for a dirty and dangerous underground coal gasification (UCG) trial project at Leigh Creek.

This is the same type of project that a few years ago resulted in "the biggest pollution event probably in Queensland's history," according to the Queensland Environment Minister at the time.

"Independent experts" will determine whether UCG is safe. UCG is already known to be dangerous, environmentally disastrous and absolutely NOT CLEAN ENERGY.

Why is SA even considering this when we could be world leaders in renewable and clean energy (despite the Federal governments anti-clean energy / pro dirty fuel policy).

My vote goes to a clean energy future, not dangerous and dirty UCG.

Yours sincerely,
Sue Lang
PO Box 405
Torrensville Plaza SA 5031

Michael Malavazos
Director Engineering Operations
Energy Resources Division
Department of the Premier and Cabinet
GPO Box 320, Adelaide SA, 5001

Good Morning Michael,

Please accept the below excerpts from the **LCK EIR Appendix B - Geotechnical Assessment**, and my related queries as my submission re: proposed ISG demonstration facility at the former Leigh Creek Coal mine.

Please note that I do indeed support this project and believe the site to be ideal for the use of ISG technology for the following reasons, to name but a few:

- o the site's long history of coal mining, related activities and contamination;
- o the size of the deposit and coalfield more broadly;
- o groundwater and geotechnical suitability;
- o near zero impact on ground surface considerations such as flora, fauna and culturally significant areas;
- o a responsible corporate citizen in LCK, who have attracted foreign investment to the state;
- o state government royalties for a commercial scale operation;
- o employment opportunities for communities in the north of the state;
- o the general consensus that gas is a transitional fuel to renewable energy; and
- o as a measure to alleviate the crippling pricing of gas and electricity in this state alone.

I believe the hydrogeological assessment of the site is more than adequate in that it clearly identifies the sites suitability for ISG demonstration and operation in terms of:

- o Current state groundwater chemistry, salinity and contamination;
- o groundwater head / water table, and flow direction toward open mining pits;
- o interconnectivity of aquifers in the area (although the term aquifer interchanges between commercially viable for human purposes and simply the presence of groundwater);
- o and perhaps most importantly the assessment quantifies and qualifies the lack of movement of groundwater in terms of hydraulic conductivity and strata permeability.

To that end, my queries below are simply in response to LCK's Geotechnical Assessment (as represented in the LCK EIR Appendix B), in terms of confidence in the potential for localised changes in strata/structure as potential migration pathways for chemicals of potential concern (COPC), given the change in location of siting of the demonstration gasifier.

I am satisfied that LCK's geotechnical assessment adequately quantifies and qualifies strata behaviour under the probable thermal conditions in the assessment carried out, and that these conditions likely persist across much of the site, and at the very least, near the new site for the demonstration gasifier. I would simply like to understand if LCK have adequately assessed the structure in the immediate vicinity of the new proposed gasifier location.

Below I site numerous examples of well 'Playford 5' being 500m to the west of the new gasifier siting, a well which has been used to assess the structure in the immediate vicinity of the old proposed site of the gasifier.

To that end, are you and your team and relevant co-regulatory bodies satisfied that LCK's addition drilling data (as mentioned in LCK's September 2017 quarterly report), has provided you and indeed LCK with the required level of confidence in the geotechnical properties surrounding the new ISG gasifier site?

I would imagine the below queries were similar to those from your team, which necessitated the additional drilling program, and unfortunately the updated EIR doesn't appear to detail the location of the additional wells drilled at your request.

Yours Sincerely

Jeff Ashenden (BSc [Hons], LMCL, MBus, MBA)

1 Geotech

1.1 Project Background (pg 5 & 6)

This report comprises a geotechnical assessment drawing on geotechnical information collected from two completed drill holes: **Playford 5 located 500 m to the west of the demonstration plant;** and Playford 2 located immediately to the east (Figure 1).

Playford 5 was completed as a near vertical hole to collect representative core from the roof, coal, and floor strata for a demonstration gasifier. A total of 84 m of core was collected and was geotechnically logged and field tested. Additional well tests were completed including In situ Stress Tests (IST) and Drill Stem Tests (DST) in the cored section of the drill hole to obtain ground stress and permeability data.

Playford 2 was completed as an angled drill hole to identify and test for the presence of geological structures that could act as fluid flow pathways from the gasifier to the surface. A series of hydraulic packer tests were completed in this drill hole to test the permeability of the rock strata above the gasifier and a geological structure located approximately 150 m north of the demonstration gasifier.



Figure 1. Location of the demonstration plant relative to drill hole Playford 5 and drill hole Playford 2 and inferred (from seismic interpretation) plane of the nearest fault intersection with target coal seam.

3 Site Conditions

3.1 Geological Structures (pg 9)

At the demonstration plant site, the Main Series Coal resource is likely to comprise a 12m thick coal seam with a dip of approximately 25 degrees to the south. **Additional drilling to provide further assessment of the ground conditions at the demonstration plant gasifier site is planned occur prior to construction of surface plant and infrastructure**

Geotechnical assessment of the drill core did not highlight evidence of (for example) weak material or gouge filled joints / structures that could indicate the presence of faults, or migration pathways for gas or fluids, however this data is specific to the area surrounding drill hole Playford 5. Data reliability reduces with increasing distance from the drill hole.

4 Geotechnical Assessment for Demonstration Plant Gasifier

4.1 Siting of the Gasifier (pg 12)

The location of the demonstration plant gasifier relative to the completed reference drill hole Playford 2 is shown below in Figure 4. The drill hole Playford 5 is not shown because it is located approximately 500 m “into” the geological section.

Seismic reflection survey data collected in 1978 and 2016 and reprocessed by Velseis in 2016 was completed close to drill hole Playford 5. This information indicates that the Main Series Overburden comprises “packets” of strata characterised by relatively continuous reflectors, separated by areas showing diffuse / broken reflectors. The latter diffuse areas may represent the influence of structural control such as faulting, however given the distance (500 m) between drill hole Playford 5 and the demonstration plant gasifier, it is unlikely that the existing seismic information is directly applicable, or representative of the geological conditions at the demonstration plant gasifier.

4 Geotechnical Assessment for Demonstration Plant Gasifier

4.1 In Situ Ground Stress (pg 16)

The results of the four successful IST tests indicate that:

- o a relatively consistent (orientation and magnitude) horizontal stress is present within the Main Series Overburden mudstone and the Lower Series Overburden mudstone;
- o the difference between major and minor horizontal principal stress is not overly significant;
- o the major and minor horizontal stress is of a generally low magnitude; and
- o the vertical (overburden) stress is approximately twice the value of the major horizontal stress.

This suggests that vertical stress will govern / influence in the development of the underground void. Further, there does not appear to be a dominant residual horizontal tectonic stress associated with compressional (or extensional) development of the coal basin, because the measured major and minor horizontal principal stresses are relatively similar and are of a low magnitude.

It should be emphasised that these results are from drill hole Playford 5 and are appropriate for a previously assessed gasifier site located 500 m to the west of the current demonstration plant.

From: [Julie and Ken Smith](#)
To: [DPC:Engineering](#)
Subject: ICG
Date: Friday, 26 January 2018 12:07:08 PM

Attn: Jarrod Spencer

In response to the article in the Advertiser as to the pilot ICG plant at Leigh Crk, I'm disappointed this is even got to this point. When the problems of the QLD project is still yet to be resolved. The environment problems there are still on going. As someone with over 20yrs experience in the oil and gas fields in Australia, the problems of drilling into coal seams and loosing circulation of drilling fluids and the stabilization of the coal seam prior to continuing drilling in a common problem. The cementing of the casing and production strings also leads to the same problems. The ignition under ground of the coal and the subsequent watering out of to extinguish the coal seam may not be possible if continuing pumping of water/fluids may frac into water bearing sands above or below the coal seam. This would contaminate the water tables. I also bring to point that all pre test environment results be noted in both air/water and soil sampling independently as to separate any confusion over post analysis. All chemicals to be used would have to be identified by their chemical components as to insure if any of their properties show up in the environment testing after that the company could be held liable. Canada's Swan hills project, I believe has not gone ahead to date,how ever did have the previous provincial gov't approval,however after the tar sands and their environmental record, I would not hold much regard for their findings. I hope this is thought through alot more prior to any go ahead given by the state government.

regards Ken Smith

From: [rosemary.drabsch](#)
To: [DPC:Engineering](#)
Subject: Leigh Creek In-Situ Gasification Demonstration Plant
Date: Wednesday, 31 January 2018 8:46:05 PM

Attention: Jarrod Spencer.

Please do not go ahead with building this demonstration plant.
Why do you need to waste money building this?
There is plenty of evidence available already, that In-Situ Gasification is a really bad idea.
Just ask Queensland, especially the farms adversely affected by contaminated ground water.
Just get on with solar, wind and waves, all in ready supply.

Rosemary Drabsch
4 Benacre Grove
Stirling SA 5152
08 8339 2732/0402 856 436.
rosemary_drabsch@hotmail.com

From: [Anne Wharton](#)
To: [DPC:Engineering](#)
Subject: UCG trial project at Leigh Creek - SA doesn't want this!
Date: Wednesday, 31 January 2018 12:41:53 PM

Dear Premier

I am absolutely appalled to hear that the State Government has commenced the approval process for a dirty and dangerous underground coal gasification (UCG) trial project at Leigh Creek. This is the same type of project that a few years ago resulted in the "biggest pollution event probably in Queensland's history", according to the Qld Environment minister at the time.

The SA Government is achieving great things in renewable energy and storage and I cannot understand why Government thinks that UCG can have any part in our clean energy future.

I understand that your Department is running the consultation and assessment. Documents prepared by the proponent gloss over the Qld disaster and even the Government's own documents fail to acknowledge the sad history of massive pollution, environmental harm, criminal prosecutions and the ultimate banning of UCG in Qld. Where is your due diligence?

I want a clean energy future, not dangerous and dirty UCG. I urge you to ban UCG in South Australia.

Yours faithfully

Anne Wharton

(Flat 2, 80 Cremorne St, Malvern 5061)

--

Email: whartonanne@gmail.com
Phone: 08 8373 2847
Mobile: 0424 425 135

"The tree which moves some to tears of joy is in the Eyes of others only a Green thing which stands in the way"
- William Blake

From: [Teresa Brady](#)
To: [DPC:Engineering](#)
Subject: Re: submission gasification
Date: Thursday, 1 February 2018 9:20:26 PM

Hi Jarrod

How does a community apposed to the planned gasification submit a submission .

Thanks
Teresa Brady
Adnyamathana of Copley
0459779404

From: [David Sutton](#)
To: [DPC:Engineering](#)
Subject: underground coal gasification
Date: Friday, 2 February 2018 11:43:26 PM

Hi

Surely even looking at **underground coal gasification is a ridiculous waste of time – please do not proceed with any “evaluation” of such a dangerous technology – you simply have to look at Queensland.**

Cheers

David Sutton Unley SA

Sent from [Mail](#) for Windows 10

7 February 2017

Att: Jarrod Spencer

Department of the Premier and Cabinet

Energy Resources Division

GPO Box 320

Adelaide SA 5001

Via email: DPC.Engineering@sa.gov.au

Dear Sir,


As a shareholder in Leigh Creek Energy I wish to express my support for the LCEP PCD submitted to your department for approval.

The Leigh Creek Coalfield was chosen as a suitable location for ISG development as it fulfils the important environmental, technical and commercial criteria. The depth of the resources and the geology and hydrogeology of the site enables the ISG process to be safely operated and controlled, in addition to containing the environmental impact. Due to the location of the site, sensitive features such as aquifers, nearby residents or towns, sensitive land uses or sites of high environmental value are avoided.

Subject to the Regulators assessment of the scientific merits of the project, LCEP will have significant economic growth benefits for the state and region. LCK has documented the possible environment impacts of ISG at Leigh Creek in great detail and the Management team are appropriately experienced in ISG operations.

Therefore, your consideration of the approval of the LCEP PCD would be greatly appreciated.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'Scott Flynn', with a long horizontal stroke extending to the right.

Scott Flynn

From: [Tony Lawry](#)
To: [DPC:Engineering](#)
Subject: LCK Public Consultation Phase - Attention: Jarrod Spencer
Date: Friday, 16 February 2018 12:48:35 PM
Attachments: [image001.png](#)
[image003.png](#)

Dear Jarrod

I am writing to add my voice to the Public Consultation phase of the Leigh Creek Energy Project (LCEP).

Whilst I am a long standing employee and shareholder of LCK, I write on the assumption that it is not inappropriate for me to do so because I am internal to LCK.

It is my position that the Pre-Commercial Demonstration phase of the LCEP should be given favourable consideration by the Regulator for the following reasons, in priority order:

1. The site has been specifically selected and is appropriate for ISG operations due to:
 - a. Ideal geology and surrounding environment
 - b. Easily manageable groundwater regime
 - c. Lack of land use conflict
 - i. These parameters must be carefully weighed and differentiated from other ISG projects, some of which I note (eg. Carbon Energy Ltd project in Queensland), were successful
2. Scientific parameters of the impact of the LCEP have been studied and extensively identified through rigorous and expert analysis, which has led to a balanced and independent EIR and SEO being prepared that creates a management and monitoring regime that preserves and enhances environmental (including heritage) values at the site, albeit the LCEP is proposed to be operated on a heavily impacted environment
3. There are very few environmental receptors of the proposed operations, because the site is located within a heavily impacted site due to decades of open cut mining
4. The LCEP is being managed by a highly professional, competent, responsible and experienced team of engineers and scientists
5. The LCEP shows strong commercial outcomes, which will benefit the local towns of Copley and Leigh Creek, the Far north region of SA, and the state in terms of economic development, employment and royalty streams to both the state and indigenous organisations

I trust that you will be able to add my information into your assessment process. Thank you for the opportunity and your time.

Tony Lawry | Corporate and Investor Relations
Leigh Creek Energy Limited
A Level 11, 19 Grenfell Street, Adelaide, SA 5000
T +61 8 8132 9101 | M +61 412 467 160
www.lcke.com.au

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From: [Andy Burmas](#)
To: [DPC:Engineering](#)
Subject: LCKEP Public Consultation
Date: Monday, 19 February 2018 4:13:19 PM
Attachments: [image001.png](#)
[image002.png](#)

Dear Sir/Madam,

I am writing to you to express my support for the Leigh Creek Energy Project (LCKEP), which involves the construction and operation of a Pre-Commercial Demonstration plant (PCD) to extract underground coal via in-situ gasification (ISG) of the existing coal resource at Leigh Creek.

There are several significant positive points to this project, namely:

- The Leigh Creek site is well serviced by local infrastructure;
- The depth of the resource and the geology and hydrogeology of the site ensure that the ISG process can be safely operated and contained;
- The location avoids sensitive features such as aquifers, residents or towns in close proximity, sensitive land uses or sites of high environmental value;
- Subject to the scientific merits of the ISG process being properly assessed by the Regulator, the LCKEP has significant economic development benefits for the state and region;
- The LCKEP will create a significant royalty revenue stream to the state, in terms of amount and long time period (30 years plus);
- Project business options include supplying cheaper electricity, gas, and/or urea fertiliser to South Australia.

Regards

Andy Burmas | Senior Process Engineer
Leigh Creek Energy Limited
A Level 11, 19 Grenfell Street, Adelaide, SA 5000
T +61 8 8132 9156 | M +61 409 519 060
www.lcke.com.au

From: [Nicholas Peters](#)
To: [DPC:Engineering](#)
Subject: Leigh Creek Energy In-Situ Gasification
Date: Tuesday, 20 February 2018 10:02:55 AM

Good morning,

I am writing in support of the Leigh Creek Energy In-Situ Gasification project at Leigh Creek.

The project will create significant economic value for the state over its long life, and, as can be seen from the EIR and SEO, the environmental impact of the project has been considered and the site has been found technically suitable for performing ISG.

Kind regards,
Nick Peters

From: [Paul Triantafyllos](#)
To: [DPC:Engineering](#)
Subject: Leigh Creek Energy In-Situ Gasification Demonstration Plant.
Date: Tuesday, 20 February 2018 10:53:21 AM

Attention: Jarrod Spencer

I approve of this project.

Leigh Creek Energy have shown through the EIR and SEO a high level of diligence & focus. Protecting our environment is key in the long term success of this process and this is very evident in their submission.

The Demonstration Plant and the Environmental Monitoring Program are orientated towards gathering data that will validate and provide inputs into future projects.

The site selection process is sound and will present no adverse effects on the surrounding environment.

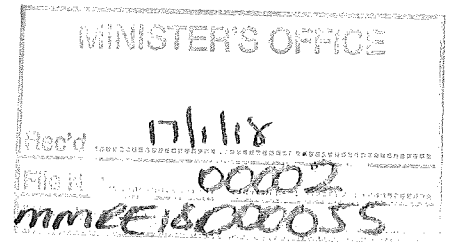
It is a great opportunity for our state not only in employment opportunities but reducing our energy costs.

Regards

Paul Triantafyllos
0419 999 963

Cathro, Vicky (DTF)

From: Trevara <sirpom@internode.on.net>
Sent: Wednesday, 17 January 2018 9:27 AM
To: DTF:Minister Koutsantonis' Office
Subject: UCG and fracking



Minister Koutsantonis

Having been born and lived most of my life in South Australia and having considered returning again in the next 12-24 months, I have a right to protect my state. Therefore I offer the following information.

UCG was banned in Queensland and an excavation caution zone of more than 300 square kilometres was enforced. After Queensland has made it illegal in that state, how can you Minister Koutsantonis still think that it's appropriate for South Australia? Gas technology is blamed for polluting hundreds of square kilometres of Queensland farmland and now you are one step closer to going ahead in South Australia?

This should never be the decision of anyone but the majority of the public who have the Australian land at heart.

To have any other outside body involved is a recipe for disaster. It will not be for the benefit of the land but rather for the increased cash flow for a select few.

If Queensland can ban it, then it is a Governmental decision.

Do you not keep in contact with the many countries overseas who have done all forms of fracking? The USA now have polluted underground water and polluted soil. There is an increase in sinkholes, an increase in land subsidence, an increase in illness of the people by poisoned waters that the Companies refuse to warn the public of the contamination. Take Katherine, Northern Territory that is closer to home. Look to Dalby to Chinchilla Queensland where people can not dig below one metre of the top soil as it's contaminated. The underground water is also affected. All the while this happens, the Companies plead innocent.

Do not be like Malcolm Turnbull who has no backbone, South Australia is taking great leaps in the Solar field, but you are failing on CSG Wells and the population of Australia are fed up with Politicians who are refusing to listen to them, or at the very least, the events of overseas where all this has created more problems.

Every time there is fracking, a scientist will tell you this fact, the earth's crust is being weakened. And to remind you, that's where we all live.

What will you do in 30 years or less? What of your children? or perhaps grandchildren? This is not a legacy to leave them in the future.

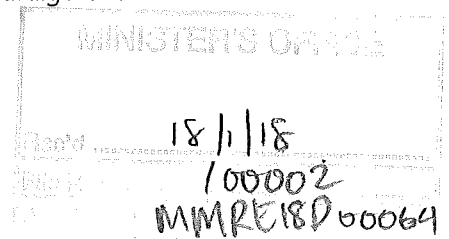
Why is it that some people can not see the writing on the wall, the whole picture not just the one single item? When fracking becomes too common place, when mining becomes too common place, when deforestation becomes too common place, where do we end up? No wildlife, no trees, increased temperatures, contaminated water and soil, and at the very end, a massive disruption to the earth's crust, more volcanoes erupting and they are those that may have laid dormant for many years. Where are you or your family, or the population going to go when there is less land to live on because of lava flows? It's something to ponder, very seriously.

Barb Mason
9 Jensen Street
South Kolan

Queensland 4670
E sirpom@internode.on.net
PH 07 41671185

Cathro, Vicky (DTF)

From: West Torrens EO <WestTorrens@parliament.sa.gov.au>
Sent: Thursday, 18 January 2018 12:17 PM
To: Karen Gray
Cc: DTF:Minister Koutsantonis' Office
Subject: RE: Underground Coal Gasification (UCG)



Good afternoon Karen

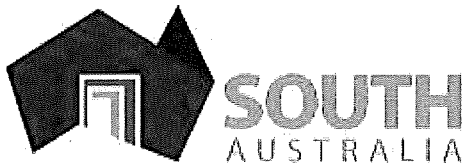
On behalf of the Hon Tom Koutsantonis MP, Member for West Torrens, I would like to acknowledge receipt of your e-mail thank you for it.

Your concerns will be brought to the Minister's attention.

Kind regards

Zoi

Zoi Papafilopoulos JP | Electorate Assistant to the
Hon Tom Koutsantonis MP | Member for West Torrens
229 Henley Beach Road TORRENSVILLE SA 5031
t +61 8 8234 0777 f +61 8 8234 6323
e westtorrens@parliament.sa.gov.au



From: Karen Gray [mailto:kazzag@adam.com.au]
Sent: Thursday, 18 January 2018 11:17 AM
To: West Torrens EO <WestTorrens@parliament.sa.gov.au>
Subject: Underground Coal Gasification (UCG)

Good morning

I absolutely, categorically DO NOT support Underground Coal Gasification (UCG) trials and the inherent risks in our state.

I am incredibly disappointed that a labour government is pursuing this.

My vote will go for a party who cares for our state, is positively environmentally focussed, avoids contamination and pollution and promotes green energy initiatives.

I am Very very disappointed in the labour government approach, first to nuclear power and now this and can assure you this decision WILL impact on my vote in the coming State Election.

Regards
Karen Gray
Maslin Beach SA

From: [Mitchell Baker](#)
To: [DPC:Engineering](#)
Subject: LCK Public Consultation Attention: Jarrod Spencer
Date: Friday, 23 February 2018 4:08:17 PM
Attachments: [image001.png](#)
[image003.png](#)

Dear Jarrod,

I am writing to make clear my position of the Leigh Creek Energy Project (LCEP) Pre-Commercial Demonstration (PCD) during the Public Consultation period.

I am longstanding employee of LCK and I was a geologist for the company in 2015. Since then I have worked predominately in commercial studies.

I believe that my experience working at the company has given me valuable insight of the technical aspects of ISG and the Telford Basin specifically as well as the commercial aspects of the project.

From this experience I believe that the Pre-Commercial Demonstration Phase of the LCEP should be considered favourably by DPC due to the following reasons:

- The Telford Basin is an appropriate site geologically for In-Situ Gasification
- The Leigh Creek Coalfield is a significantly modified landform which has been coal mined for over 50 years, this site will be deemed somewhat useless and abandoned unless another use for it can be found
 - I believe the best use for this site is to harness the high amount of energy left in the ground
 - This land is not appropriate for farming or many other kinds of industry
- There is very low risk of harm to surrounding environment as there are few receptors
- There is local infrastructure which can be used
- I believe that operations on site could be beneficial to Leigh Creek by:
 - Creating jobs for local communities
 - Supporting those communities in times of change and hardship
- I believe that that the Leigh Creek Energy Project could be highly beneficial to South Australians and Australians by:
 - Converting a stranded resource into a useable form of energy which is affordable and accessible
 - Creating jobs and economic wealth for Australians
 - Mitigating the risk of short gas and electricity supplies which led to less affordable energy for Australians and Australian businesses and directly affects job creation in manufacturing industries heavily reliant on affordable and reliable baseload electricity and gas
 - Reducing the reliance on inter-state electricity which has increased due to the closure of the Port Augusta power station
 - Much of the interstate electricity SA imports originates from brown coal fired power stations which are CO2 intensive
 - High transmission losses from this power make electricity prices even less affordable for South Australians
 - Production of petrochemicals from the gas produced at the LCEP could be a GDP

boost to Australia which currently imports high amounts of petrochemicals and fertilisers

I support this project and believe it's success will be highly beneficial to the state and the country.

Please consider my thoughts in your assessment process and thank you for the opportunity to express them.

Kind regards,

Mitchell Baker | Commercial Analyst

Leigh Creek Energy Limited

A Level 11, 19 Grenfell Street, Adelaide, SA 5000

T +61 8 8132 9115 | **M** +61 447 406 556

www.lcke.com.au

From: [Bruce Holman](#)
To: [DPC:Engineering](#)
Subject: Leigh Creek Energy Project - Public Consultation Submission
Date: Sunday, 25 February 2018 4:01:08 PM

Attention: Jarrod Spencer
Department of the Premier and Cabinet
Energy Resources Division
GPO Box 320, Adelaide 5001
Via email at DPC.Engineering@sa.gov.au

Dear Mr Spencer

I have been following the Leigh Creek Energy Project (LCEP) for a number of years and believe that many factors recommend it as a site that is highly suitable for In-Situ Gasification (ISG), as laid out in the Environmental Impact Report. Some of these factors include;

- The coal resource is technically suitable for ISG
- The site is well serviced by local infrastructure which includes rail, a township and excellent airport
- The site is suitable for undertaking ISG in a manner that is safe and minimises environmental impact, in particular, the depth of the resource and the geology and hydrogeology of the site ensure that the ISG process can be safely operated and contained
- The location avoids sensitive features such as aquifers, residents or towns in close proximity, sensitive land uses or sites of high environmental value
- Management are suitably experienced in ISG operations
- Subject to the scientific merits being properly assessed by the Regulator, the LCEP has the potential to provide significant economic development benefits for the state and region
- The project is significant to the towns of Copley and Leigh Creek, the wider northern SA region, the Upper Spencer Gulf and the state in terms of economic and business development and employment opportunities
- The project has the potential to create a significant royalty revenue stream to the state, in terms of the amount and long time period (30 years plus)
- Project business options include supplying cheaper electricity, gas, and/or urea fertiliser to South Australia

I wish to commend the Environmental Impact Report and associated draft Statement of Environmental Objects.

In conclusion I strongly support approval of the project commencing with the Pre-Commercial Demonstration.

Could you please acknowledge receipt of this submission via reply email.

Thank you.

Regards

Bruce Holman

From: [Phil Staveley](#)
To: [DPC:Engineering](#)
Subject: FW: LCK Public Consultation Phase
Date: Monday, 26 February 2018 7:33:47 PM

Dear sir,

I would like to register my support for the development of the Leigh Creek Energy Project.

This is a project that can have a significant and sustainable impact on the South Australian economy. Impacts that are not just short term, but are multi-generational.

Application of a proven technology in a commercial manner in South Australia gives South Australia a first mover advantage.

I have read and understood the EIR and SEO and am happy that the technical and environmental aspects have been adequately dealt with.

In a state with the world's highest energy prices and unreliable electricity supply, it would be completely irresponsible to fail to develop such a large, low cost effective energy resource.

Kind regards,

Phillip J Staveley

From: [Cristian Bolda](#)
To: [DPC:Engineering](#)
Subject: LCK Public Consultation Phase
Date: Monday, 26 February 2018 5:24:50 PM

Dear Jarrod

I would like if is possible to be consider my submissions to the DPC re LCK EIR

- Despite being a new technology, was proven to work and bring benefits for local community without harming the environment- ie Carbon Energy – QLD and not just
- The site was identified as a highly favourable location for ISG development using criteria that covered environmental, technical and commercial aspects
- The site is suitable for undertaking ISG in a manner that is safe and minimises environmental impact
- In particular, the depth of the resource and the geology and hydrogeology of the site ensure that the ISG process can be safely operated and contained
- Management are suitably experienced in ISG operations
- LCK has documented the potential environmental impacts of ISG at Leigh Creek with a high degree of accuracy
- Subject to the scientific merits being properly assessed by the Regulator, the LCEP has significant economic development benefits for the state and region
- The project is significant to the towns of Copley and Leigh Creek in terms of economic and business development and employment opportunities – specially with the FPP mine closure
- The project will create permanent jobs
- The project will create a significant royalty revenue stream to the state, in terms of amount and long time period (30 years plus
- Project business options include supplying cheaper electricity, gas, and/or urea fertiliser to South Australia

Kind regards,

Cristian Bolda

From: [Tammie Salvemini](#)
To: [DPC:Engineering](#)
Subject: Leigh Creek Energy
Date: Monday, 26 February 2018 5:12:38 PM

Afternoon Jarrod,

As a current share holder and employee I wish to state that I am 100% behind the Leigh Creek Energy project. Having been to site myself multiple times I can see the economical benefit & opportunities that it will bring to the local businesses and residents. I have faith in the team that is running this project along side of the executives and board members and I have witnessed first hand their dedication to this project. I have no doubt that this project will bring great economic benefits to our state as a whole.

Kind regards
Tammie Salvemini

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From: [Justin Haines](#)
To: [DPC:Engineering](#)
Subject: Leigh Creek Energy EIR Public Consultation
Date: Monday, 26 February 2018 6:02:23 PM

Dear Jarrod,

I am writing to express my support for the Leigh Creek Energy ISG Demonstration project in South Australia. As an experienced in situ gasification (ISG) or underground coal gasification (UCG) practitioner, I ask you to note the following:

- ISG (UCG) is a controllable process and can deliver appropriate environmental, safety and economic outcomes when undertaken using a risk-based approach by a suitably responsible practitioner operating within the conditions of a robust regulatory framework.
- ISG (UCG) is a carbon-based technology, but one that allows the capture of greenhouse emissions more readily than other technologies. Given the amount of funding available to the petrochemical industry, to my way of thinking it seems appalling that this industry hasn't been asked to do more with regard to carbon mitigation. ISG is a new technology, without the cash-flows of the existing industries, and shouldn't be expected to make up for their poor performance from day one. All ISG practitioners I have worked with are focussed on UCG-CCS etc. but are hamstrung to complete this development due to cash-flow. Given the right regulatory framework this could and should be a reality.
- Poor management practices and operating philosophies exist in every industry, but that is not a reason to set aside that industry. In the ongoing Linc Energy trial, the prosecutor Mr Devlin has expressed several times that it is not the technology on trial, it is that Linc knew how to operate it properly but chose not to. A robust regulatory framework plays a significant role in ensuring unsuitable operators are prevented from causing issues across all industries - this should be no different.
- The Queensland Chief Scientist, despite the Queensland Government banning UCG and initiating court proceeding against Linc Energy, provided an excellent reference to one other UCG proponent, Carbon Energy, for the work they undertook at their Bloodwood Creek facility. While not newsworthy or ever repeated by environmental advocacy groups, his comments show that UCG can be done safely. LCK are following Carbon Energy's management and operating philosophy which includes open and honest dialogue with all stakeholders.
- LCK has had an ideal start to the Leigh Creek Energy project having access to the key learning from multiple recent projects, plus skilled and experienced personnel from the recent trials in Queensland.
- Safety and environmental incidents can and do occur (in all industries) - but these can be managed to achieve best outcomes with the right management practices and operating philosophies.

The LCK EIR shows the Telford Basin to be suitable for ISG, including geological, groundwater, and environmental conditions, and the SEO allows the process to be managed. The project should be approved.

Kind regards,

Justin Haines

Mining Consultant

M +61 418 876 420

E justin@haines.net.au

W www.haines.net.au

From: [Richard Peasgood](#)
To: [DPC:Engineering](#)
Subject: Leigh Creek Energy In-Situ Gasification Demonstration Plant
Date: Monday, 26 February 2018 9:29:01 PM

Dear Jarrod

I am grateful to be given the opportunity to respond to the consultation process for the above project.

I have been involved in this project over the last 7 months and I am pleased to be in a position to say that this project has been undertaken to the highest standards where the integrity of the environment both from an above and below ground perspective has never been compromised.

I feel that this project will contribute towards both employment in the Leigh Creek area and energy security in the short term and long term growth of the region in the longer term.

Regards

Richard Peasgood MBA MCIPS

Contracts & Procurement Consultant to LCEP

From: [Brenton Hill](#)
To: [DPC:Engineering](#)
Subject: Leigh Creek Energy Project
Date: Monday, 26 February 2018 10:24:30 PM

Dear Sir or Madam

I am writing to express my support for the Leigh Creek Energy Project ISG Demonstration Plant.

The deep coal at Leigh Creek is a huge resource that could not economically be mined, but the ISG process can extract this resource and turn it into valuable products that South Australia needs, such as electricity or fertiliser (which I'm lead to believe is 100% imported currently).

The demonstration plant will prove the ISG technology can be used safely and without adverse environmental impact, which is a stepping stone toward the development of a full commercial project, and as such should be approved.

The commercial project will be good for South Australia as it will provide long term jobs, and an economic boost for the state and particularly for the northern region including the towns of Copley and Leigh Creek, which are suffering following the closure of the coal mine.

I fully support the approval of the demonstration plant.

Best Regards

Brenton Hill
Bridgewater, South Australia

From: aholman@optusnet.com.au
To: [DPC:Engineering](#)
Subject: Leigh Creek Energy Project SA
Date: Monday, 26 February 2018 3:01:48 PM

Attention: Jarrod Spencer
Department of the Premier and Cabinet
Energy Resources Division
GPO Box 320, Adelaide 5001
Via email at DPC.Engineering@sa.gov.au

Dear Mr Spencer

I have been following the Leigh Creek Energy Project (LCEP) for a number of years and believe that many factors recommend it as a site that is highly suitable for In-Situ Gasification (ISG), as laid out in the Environmental Impact Report.

Some of these factors include:

- The coal resource is technically suitable for ISG
- The site is well serviced by local infrastructure which includes rail, a township and excellent airport
- The site is suitable for undertaking ISG in a manner that is safe and minimises environmental impact, in particular, the depth of the resource and the geology and hydrogeology of the site ensure that the ISG process can be safely operated and contained
- The location avoids sensitive features such as aquifers, residents or towns in close proximity, sensitive land uses or sites of high environmental value
- Management are suitably experienced in ISG operations
- Subject to the scientific merits being properly assessed by the Regulator, the LCEP has the potential to provide significant economic development benefits for the state and region
- The project is significant to the towns of Copley and Leigh Creek, the wider northern SA region, the Upper Spencer Gulf and the state in terms of economic and business development and employment opportunities
- The project has the potential to create a significant royalty revenue stream to the state, in terms of the amount and long time period (30 years plus)
- Project business options include supplying cheaper electricity, gas, and/or urea fertiliser to South Australia

In conclusion I strongly support approval of the project commencing with the Pre-Commercial Demonstration.

Could you please acknowledge receipt of this submission via reply email.

Thank you.

Regards

Amanda Holman

From: [Malavazos, Michael \(DPC\)](#)
To: [Marjot, Susan \(DPC\)](#)
Cc: [Spencer, Jarrod \(DPC\)](#)
Subject: Fwd: Leigh Creek UCG SOE
Date: Wednesday, 28 February 2018 7:21:26 AM
Attachments: [Leigh Creek UCG.pdf](#)
[ATT00001.htm](#)

Su can you please upload these into public submissions

Sent from my iPhone

Begin forwarded message:

From: Tim Kelly <timkellysa@gmail.com>
Date: 27 February 2018 at 11:10:20 pm ACDT
To: Michael Malavazos <Michael.malavazos@sa.gov.au>
Subject: Leigh Creek UCG SOE

Hello Michael,

Please find some comments on the Leigh Creek UCG proposal by Leigh Creek Energy.

Happy to discuss any aspects.

Kind regards
Tim Kelly

27/2/2018

Tim Kelly
Adelaide SA
0419 831 933
timkellysa@gmail.com

Michael Malavazos (FIChemE)
Director Engineering Operations
Energy Resources Division
Department of State Development

Michael.Malavazos@sa.gov.au

RE: Leigh Creek Energy, Draft Statement of Environmental Objectives, ISG Demonstration Plant

Dear Michael.

I wish to provide comments on the statement of environmental objectives.

This proposal is of significant concern, due to the nature of the underground coal gasification process and its atrocious record. For the process to be both environmentally acceptable and financially viable, Leigh Creek Coal will need to overcome many significant challenges.

I understand that Linc Energy in Australia burnt shallow coal underground over 7 years causing a contamination of soil groundwater VOCs and other pollutants at a massive scale. I understand that there was landform subsidence creating further potential oxygen and gas escape pathways that could prove to cause near permanent ongoing risks and problems. Whilst the area within the Telford Basin to be ignited is near ½ km underground, it is also noted that the curvature of the basin means that the coal seams do extend to the surface albeit some distance away.

Comments on Objectives

Objective 3 *No loss of gasification products to the surface or subsurface environment via pre-existing drill holes and/or transmissive geological features.*

To detect any change, first there must be a comprehensive survey across different times to determine the current rate of VOC release, methane and other gases, in order to establish the baseline for comparison. This assessment must be undertaken in a way that gives assurance that it actually describes the current rates across sufficient locations to establish an understanding of fugitive emissions and well characteristics.

A scenario plan should be undertaken to determine the feasibility of fire containment, should fault pathways establish and give oxygen to underground fire. This should be carried out for the trial and projected at full production rates.

Objective 4 *Well integrity is maintained to prevent loss of gasification products to the surface or subsurface environment.*

Identifying the need for well integrity should also be coupled with an objective for maintaining geological stability and seal to prevent movement and escape pathways from falling. Please add that 'Geological integrity is maintained to prevent fugitive gas escape'.

Objective 5. *No gasifier induced subsidence measured at the surface.*

This is an essential objective that really needs to be considered against the total viability of the process in full production (beyond just the trial). There is little point in testing the pilot for geological containment, should the risk not be manageable with the process in full production. If there is sufficient concern that subsidence could occur as when the site is a few years into full production, then an early 'no' would be in order.

Objective 9. *Avoid the introduction or spread of weeds, plant pathogens or pests (including feral animals).*

This task requires a dedicated resource to ensure that the site and access roads are improving continuously rather than worsening. Weed spraying is not sufficient as total weed and soil management is required.

Objective 10. *Air pollution and greenhouse gas emissions reduced to as low as reasonably practical.*

The actions described against this objective are unsatisfactory. The baseline and subsequent monitoring of GHG emissions is essential to quantify and rate of loss caused by the process.

Emissions from flaring need to be measured. This would include flow rates to the flare and chemical analysis of the gas.

Productive capture and storage of syngas produced should be investigated (such as for use in onsite generation).

The reporting of greenhouse gas emissions as described in the following statement is unacceptable: "Greenhouse gas emissions recorded and reported in accordance with NGER requirements where applicable". The obvious shortcomings include that the facility trial is likely to fall below the NGER Threshold and therefore would not be applicable. In addition, NGER does not address fugitive emission escapes away from wells and pipe fittings. Another requirement central to the core purpose of this project is to prove the economic feasibility of the end products. In order to do this there must be a total life cycle assessment of the greenhouse gas emissions associated with the production activities (Scope 1, 2 & 3 as necessary) such that end pre and post combustion greenhouse gas footprint can be understood and compared with other alternatives.

Also under minimising greenhouse gas emissions, there is a reasonable social licence expectation that activities at this scale would integrate the use of an appropriately sized solar power and battery installation to cover most operational electricity needs with generator backup and top up as necessary. To not include this type of initiative in the proposal is surprising.

All scope 1, 2 and 3 emissions associated with this trial should be publicly reported (regardless of any NGER requirements). Under the National Energy Guarantee, where contractual greenhouse gas emissions reporting is envisaged, this type of reporting will be more important.

What is Missing?

Investigation and evaluation of carbon capture and storage

There appear to be a range of risk mitigation actions described or mentioned in the environmental Impact Assessment Report that have not made their way into the SOE Document. For example, the

EIR makes reference to carbon capture and storage for under Future Strategies for Greenhouse Gas Management suggesting that:

LCK holds Gas Storage Exploration Licence 662 (GSEL662) under which it intends to explore for and test the suitability of geological sequestration of CO₂ at the Leigh Creek site. LCK would look to partner with specialist bodies such as the CSIRO, which has a National Geosequestration Laboratory in Perth and/or the Global Carbon Capture Institute in Melbourne.

At the outset this sounds like a very optimistic claim as it would be unexpected for this geological area to be suitable for carbon capture and storage. If it was, what would the additional energy requirements do to the feasibility of the product? Is such a technology feasible at the scale of the gas production and probable reserve?

Such questions should be addressed and it is recommended that the paragraph above be included in the SOE.

Fauna entrapments

All fauna entrapments should be publicly reported

Leigh Creek Energy should establish systems to render assistance for any birds or animals found injured on site or injured by vehicles in travel.

Any turkey nest lined dams should have animal escape mesh or other traction gaining surface materials on all sides on day 1 to prevent the inevitable drownings that occur when such structures are left with slippery sides.

Public and community reporting

It is not sufficient for Leigh Creek Energy to just report to Government agencies. On greenhouse gas emissions, incidents, fauna entrapments, good news stories and key findings, community should be informed as well.

Kind regards

A handwritten signature in black ink that reads "Tim Kelly". The signature is written in a cursive, flowing style.

Tim Kelly

From: [Amy Bolton](#)
To: [DPC:Engineering](#)
Subject: LCK EIR and SEO - public consultation
Date: Tuesday, 27 February 2018 4:34:59 PM

Dear Jarrod,

I am writing in regards to the public consultation of the Leigh Creek Energy Environmental Impact Report and Draft Statement of Environmental Objectives.

In the outset, I am supportive of this project proceeding.

My reasons are simple.

I am a passionate South Australian and want to continue to see a state thriving through multiple industries - I see this as a new and exciting one for SA which could lead to employment and opportunities, especially in the far north communities of Leigh Creek and Copley which I know are doing it tough since the mine closed.

For the record can I please have my name and email address kept private - thank you.

From: [Jan Hole](#)
To: [DPC:Engineering](#)
Subject: LCK public consultation
Date: Tuesday, 27 February 2018 12:30:27 PM

Dear Jarrod,

I'm writing this brief note to inform you that I'm in support of Leigh Creek approval.

This project has a management team which are experienced in ISG and the locations appears to be well suited to this type of operation.

More importantly this project could generate much needed employment and could produce significant royalties over the life of the project.

This project could unlock significant future industry growth in the ISG sector.

cheers
Jan

From: [Tom Mehrtens](#)
To: [DPC:Engineering](#)
Cc: [Spencer, Jarrod \(DPC\)](#)
Subject: Leigh creek EIR/SEO Public Comment
Date: Tuesday, 27 February 2018 3:59:47 PM
Attachments: [image001.png](#)
[image003.png](#)

Hi Jarrod,

As a member of the public I would like to express my support for the ISG project Leigh Creek Energy are proposing at Leigh Creek.

Regards

Tom Mehrtens | Project Coordinator

Leigh Creek Energy Limited

A Level 11, 19 Grenfell Street, Adelaide, SA 5000

T +61 8 8132 9103 | **M** +61 411 333 823

www.lcke.com.au

From: [Scott](#)
To: [DPC:Engineering](#)
Subject: Leigh Creek Energy
Date: Tuesday, 27 February 2018 2:43:46 PM

Dear Mr Spencer,

I recently joined Leigh Creek Energy on a short term contract. This project will see my contract further extended if approved.

The management and Board of Leigh Creek Energy have identified a coal deposit from the previous Alinta site where the insitu gasification does not impede water tables, land users or towns. It will create many needed jobs in a remote regional community which once thrived from this site.

The technology is safe and gas/power is much needed to supply the State and Eastern seaboard to further reduce escalating power costs.

I trust the EIR has identified many positives for the insitu gasification and it will be another good news story for our State.

Yours faithfully,

Scott Blake

Sent from my iPhone

From: [GMAIL](#)
To: [DPC:Engineering](#)
Subject: Leigh Creek Energy ISG Demonstration Plant submission
Date: Tuesday, 27 February 2018 9:29:40 AM

Hi,

I support the approval of Leigh Creek Energy and the ISG Demonstration Plant in Leigh Creek. It will be great for business and jobs in the area. It will be another source of energy for the state. The location at an old coal field is perfect. The legacy government owners and private owners of the coal field did not have environmental issues on their mind when exploiting the coal resource. Leigh Creek Energy have a project with minimal environmental impact and excellent business prospects.

For god sake guys let's get this thing rolling!

Thanks

Richard Twyford

From: [E. Dearlove](#)
To: [DPC:Engineering](#)
Subject: Leigh Creek Energy Project - Attention: Jarrod Spencer Department of the Premier and Cabinet
Date: Tuesday, 27 February 2018 9:16:56 AM

I wish to make a submission regarding Leigh Creek Energy's broader project in relation to the 'Environmental Impact Report and it's associated Statement of Environmental Objectives'.

I believe it is vitally important to support private investment in regional South Australia to foster thriving regional communities. For regional communities to thrive, job opportunities and supporting facilities are required.

Subject to the scientific assessment by the Regulator, the Leigh Creek Energy Project (Project), I believe it is important to recognise the potential of the Project to deliver significant economic development benefits broadly for South Australia and specifically for the Upper Spencer Gulf region.

The direct and indirect jobs/supplier opportunities that would stem from the Project have the potential to be the lifeblood of the region for a 30-year plus period. Furthermore, post the successful 'Pre-Commercial Demonstration' phase of the Project, the substantial private investment in the region and job creation has the potential for further benefits to the region by facilitating further private investment opportunities.

Kind regards

Erica Dearlove

From: [Les Smith](#)
To: [DPC:Engineering](#)
Subject: Leigh Creek Energy Project Submission
Date: Tuesday, 27 February 2018 3:00:31 PM
Attachments: [image001.png](#)

Good afternoon Jarrod,

As a current employee of Leigh Creek Energy and a proud South Australian I would like to express my support for the proposed Leigh Creek Energy Project.

As a person that has been travelling to Leigh Creek and Copley for the last 30 months, I have watched as the two communities slowly wither, due to the closure of the Flinders Power operations.

Leigh Creek Energy is offering, in part, an opportunity to help these communities not only survive, but maybe (in the long term) flourish. This project will bring benefits to the local communities, through direct employment but also through indirect benefits with the utilization of local services, and this is already occurring.

The Leigh Creek Energy Project will also benefit the entire state with the potential to supply cheaper, reliable electricity, gas and or urea/fertilizer products to South Australia.

Leigh Creek Energy staff, executive and board are 100% committed to undertake this project in the safest and most environmentally responsible way possible, based on science, not speculation, and as such employ specialist personnel and consultants to ensure that this commitment becomes a reality.

Thank you for your time in considering my submission.

Regards



Les Smith | Manager – Health and Safety
Leigh Creek Energy Limited

A Level 11, 19 Grenfell Street, Adelaide, SA 5000

T +61 8 8132 9108 | **M** +61 0400 570 005

www.lcke.com.au

From: [Christine Anderson](#)
To: [DPC:Engineering](#)
Subject: Leigh Creek In Situ Gas comment
Date: Tuesday, 27 February 2018 1:58:08 PM

Hi Jarrod

I oppose both the proposed Leigh Creek ISG demonstration plant and the proposed SAPEX PEL 122& 123 fracture stimulation activities.

Regardless of how good your Statement of Environmental objectives, there will always be risks from the proposals, particularly of chamber collapse, and groundwater disturbance and contamination, and gas leakage, and loss of local biodiversity and almost certainly some form of disturbance of aboriginal cultural sites.

All these risks will occur at a time when water resources are under more and more stress, and more erratic climate and loss of habitat are accelerating loss of biodiversity. It is abundantly clear that the world and South Australia needs to dramatically reduce its carbon emissions now, in order to reduce the damage done.

We have the technology now to do this at reasonable cost - SA is already producing about 50% of its stationary energy from renewables now, and is in the middle of an election campaign where the Labor government is promising 75% in 5 years, and would easily be able to produce 100% renewable electricity within that time. Extending the tram line and completing the electrification of the Gawler train would be a great start to reducing fossil fuel usage for transport.

In these circumstances, it is irresponsible to consider any new or expanded exploration or exploitation of any fossil fuel resources. Taking any risks for fossil fuel resources is completely unacceptable.

Chris Anderson

27 Feb 2018

From: [Mark Terry](#)
To: [DPC:Engineering](#)
Subject: Public comment on the proposed Leigh Creek Energy in-situ gasification Environmental Impact Report and draft Statement of Environmental Objectives
Date: Tuesday, 27 February 2018 9:55:06 PM

Dear Sir / Madam

I would like to express my strong support for the proposed Leigh Creek Energy ISG project on the following grounds:

- The thorough investigative process and proposed monitoring program that the Company has undertaken and committed to under the framework and regulation of the DPC
- Recognition that this is an ideal location for an ISG trial and that success at Leigh Creek may be an enabling project for future ISG projects in SA, resulting in the extraction of energy from deep coal projects otherwise highly unlikely to be developed
- The potential to develop a large scale commercial project with significant positive impacts on the economy of SA
- Employment opportunities, both direct and indirect, during the proposed trial, subsequent studies and commercial development
- The opportunity to unlock a significant energy resource in a state that is short energy - electricity, gas or alternative products

Sincerely

Mark Terry

From: [Ana Villa](#)
To: [DPC:Engineering](#)
Subject: Public Consultation Leigh Creek Energy
Date: Tuesday, 27 February 2018 9:56:57 AM

Dear Spencer,

I want to express my support to the Gasification in situ project. I believe that this project it will be significant to Copley and Leigh Creek in terms of economy and business development and employment opportunities. I also think that SA needs more projects that help to supply cheaper electricity and gas.

Ana Villa
1A Fischer Street, Welland 5007, SA.
T- 0420443075

From: [CATHERINE COUZNER](#)
To: [DPC:Engineering](#)
Subject: Attn: Jarrod Spencer - Public comment submission re Leigh Creek Energy
Date: Wednesday, 28 February 2018 2:13:53 PM

Dear Jarrod

Please include this submission in the affirmative for Leigh Creek Energy to proceed with the project. My reasoning is: based on the 'Facts' publication on the 'state development.sa.gov.au' Website, that depp gas targets 2,000 to 5,000m (compared to gas at less than 1,000m in the Surat-Bowen basins, Qld and the same depth for several basins in NSW); the site is remote and separated from potable water resources compared to S-B basins, Qld and several basins NSW where both are in close proximity to potable water resources; modest surface footprint as wells are drilled from pads with a single road and flow-line into multiple wells compared to expansive surface footprint to both Qld and NSW sites; fewer wells required than for shallow coal seam gas compared to thousands of well for the S-B basins Qld and basins in NSW.

Fracture stimulation in South Australia has been proved to be safe and no harm to social, natural or economic environments.

There is no evidence to date that fracture stimulation in Australia has led to any serious environmental contamination or harm despite made-up stories by 'gutter' television journalists to discredit the process.

Leigh Creek Energy site is located is a remote area - there are no geological structures that will be impacted.

Besides all the above, our state needs the project to proceed.

Your sincerely

Michael Robert Couzner
399 The Terrace
Port Pirie SA 5540

From: [Catherine Couzner](#)
To: [DPC:Engineering](#)
Subject: Attn: Jarrod Spencer - re Leigh Creek Energy - submission of public comment
Date: Wednesday, 28 February 2018 2:01:26 PM

Good afternoon Jarrod

Please include my submission in the affirmative for the the above project to proceed. My reasons are:

- * the site location is remote and separated from potable water resources
- * Gas targets are 2,000 to 5,000m deep
- * the surface footprint is modest as wells are drilled from pads with a single road and flow-line into multiple wells
- * the number of well are fewer than for shallow coal seam gas
- * the experience is evidenced by the fact that 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
- * our state needs the project to proceed for the future.

Yours sincerely
Catherine Ellen Couzner
399 The Terrace
Port Pirie SA 5540

From: [Anne Daw](#)
To: [DPC:Engineering](#)
Subject: comment re proposed Leigh Creek Underground Coal Gasification
Date: Wednesday, 28 February 2018 4:28:49 PM
Attachments: [Anne Daw comment on UCG.pdf](#)
[Anne Daw comment on UCG.docx](#)

Dear Jarrod,

Please find attached my comments on the proposed Leigh Creek Underground Coal Gasification.

Kind Regards,

Anne Daw

Anne Daw
Mobile 0435 030 998
annedaw@bigpond.com

I hereby submit my comments in regard to the proposed underground gasification plans for the South Australian Government. The first part shows email exchanges. I believe there are other submissions that go into other areas that I do not need to repeat.

From: Anne Daw [<mailto:annedaw@bigpond.com>]
Sent: Thursday, 23 June 2016 10:17 PM
To: Tony Lawry <tony.lawry@lcke.com.au>
Cc: Goldstein, Barry (DSD) <Barry.Goldstein@sa.gov.au>; Malavazos, Michael (DSD) <Michael.Malavazos@sa.gov.au>; DTF:Minister Koutsantonis' Office <MinisterKoutsantonis'Office@sa.gov.au>; Cheltenham EO <Cheltenham@parliament.sa.gov.au>; Justyn Peters <justyn.peters@lcke.com.au>; steven.marshall@parliament.sa.gov.au
Subject: Re: re ISG - Leigh Creek area - Linc Qld. environment dept.

Dear Tony, Barry, Mike, Tom, Jay, Justyn and Steven,

Please see the report <http://www.abc.net.au/news/2016-06-20/linc-qlld-plant-built-with-'unsafe-and-illegal'-equipment:-orford/7509282>

According to the report, Dennis Orford was the mechanical engineer who oversaw the procurement of above-ground equipment including high-pressure reactor vessels from South Africa and the US in late 2007 as activity at the experimental plant ramped up. He told investigators none of the equipment had complied with Australian standards. But he said that after he complained and refused to install it, Linc Energy had sacked him.

'Mr Orford complained to Linc's senior management, but in January 2008 he was sacked.'

I believe that Justyn Peters was executive General Manager for Linc Energy at the time - his linkedin site states he served in this position from 2006 - 2012. Perhaps the government should take Linc's history into account! <https://www.linkedin.com/in/justyn-peters-65173a46>

Please note, I am also cc'ing in Stephen Marshall. Please see all the emails below, Stephen.

Kind Regards,
Anne

On 5 May 2016, at 10:47 pm, Anne Daw <annedaw@bigpond.com> wrote:

Dear Tony, Barry, Michael, Tom, Jay and Justyn,

I understand that insitu gasification comes under the Petroleum and Geothermal Energy Act 2000

Part 1 Division 3 Definition

Petroleum means a naturally occurring substance consisting of a hydrocarbon or mixture of hydrocarbons in gaseous, liquid or solid state but does not include coal or shale unless occurring in circumstances in which

*the use of techniques for coal seam methane production or in situ gasification would be **appropriate** or unless constituting a product of coal gasification (whether produced below or above the ground) for the purposes of the production of synthetic petroleum; pipeline means a pipe or system of pipes for conveying*

There is no adequate definition of in situ gasification. This process would not be appropriate full stop, in view of Queensland's experience.

Part 6 - 34

(2) A petroleum production licence authorises, subject to its terms—

(a) operations for the recovery of petroleum or some other regulated substance from the ground including—

(i) operations involving the injection of petroleum or another substance into a natural reservoir for the recovery (or enhanced recovery) of petroleum or another regulated substance; and

(ii) if the licence so provides—the extraction of petroleum or another regulated substance by an artificial means such as in situ gasification or the techniques used to recover coal seam methane;

Under this section, there is only authorisation, but no adequate definition of in situ gasification, nor reference terms of what is allowed.

Part 6 - 35 Granting of a license:

(i) in a case where paragraph (b)(i) applies—the exploration licence authorised exploration for a regulated resource of the relevant kind or the retention licence was granted for a regulated resource of the relevant kind;

(ii) in a case where paragraph (b)(ii) applies—the mining tenement authorised operations for exploration for or the recovery of coal and the production licence is to be granted for in situ gasification or coal seam methane production (and

As far as I am aware, there is nothing else added other than what I have copied and pasted in italics as above. There is no mention of the words insitu or gasification anywhere in the Environmental Protection Act. There is no mention or any adequate definition in the Petroleum and Geothermal Regulations. 2013.

Given the Queensland experience with trial gasification, how does the Department of State Development, Energy and Resources division reconcile this with Part 1, Division 2 of the Petroleum and Geothermal Energy Act 2000, 3 (d) which states *to minimise environmental damage from the activities involved in - 1 exploration 4, or the recovery or commercial utilisation of, petroleum and other resources to which this act applies;*

and (g) to protect the public from risks inherent in regulated activities.

It has been banned in Queensland because of widespread, high impact, and in part, irreversible contamination and would be a disgrace for South Australia not to ban this process, as well. Tony, your reply does not adequately address the risks of this environmentally hazardous and damaging process. The science is already out - the process is not safe. <http://www.abc.net.au/news/2015-08-10/linc-energy-key-findings/6681938> An EIR and an SEO will do nothing to stop these occurrences happening again.

It is interesting to note that there are no known precedents for remediation of gas contamination of this type.

Remember, there was also the incident at Kingaroy (Cougar

Energy) <http://www.theaustralian.com.au/news/underground-coal-gasification-plant-near-kingaroy-shut-down-after-cancer-causing-chemical-found-in-bores/story-e6frg6n6-1225892659672> The Cougar Energy

plant was shut down. As I have already stated, ethically, this project should not be allowed to proceed. When processes are approved, with a known history of serious incidents elsewhere, and the government departments and the operator has been warned, both the government and the operator have placed themselves in a **culpable** position.

Anne Daw

On 5 May 2016, at 3:48 pm, Tony Lawry <tony.lawry@lcke.com.au> wrote:

Good Afternoon Anne

Thank you for your email to Justyn Peters, who has asked me to respond to you on his behalf. The approvals for and operations of this project will be governed by both the *Petroleum and Geothermal Energy Act* and the *Environmental Protection Act*. Leigh Creek Energy Ltd (LCK) cannot commence any of its site operations until all legislative requirements have been fully satisfied.

Accordingly, LCK is currently undertaking extensive investigations preliminary to preparing its Environmental Impact Report and Statement of Environmental Objectives, both of which we anticipate will be available for public consultation. In due course, we look forward to receiving your comments and addressing them during this process.

Thank You.

Tony Lawry
Manager – External Relations
Leigh Creek Energy Limited
ABN 31 107 531 822
Level 11, 19 Grenfell Street Adelaide, SA
POSTAL PO Box 12
Rundle Mall Adelaide SA 5000
PHONE 08 8132 9101
MOBILE 0412 467 160
www.lcke.com.au

-----Original Message-----

From: Anne Daw [<mailto:annedaw@bigpond.com>]

Sent: Tuesday, 26 April 2016 9:24 AM

To: Contact Us <contactus@lcke.com.au>

Cc: Goldstein, Barry (DSD) <barry.goldstein@sa.gov.au>; Malavazos, Michael (DSD)

<Michael.Malavazos@sa.gov.au>; DTF:Minister Koutsantonis' Office

<MinisterKoutsantonis'Office@sa.gov.au>; Premier.Jay.Weatherill@dpc.sa.gov.au

Subject: re ISG - Leigh Creek area - Attention Justyn Peters, executive chairman Leigh Creek Energy, executive Chairman TriEnergy Ltd

Dear Justyn,

Why would any company want a suggested insitu gas (also known as underground coal gasification) project at Leigh Creek to be considered, when the Queensland Government have recently banned this process. I am sure you are up to date with what has happened to area around Chinchilla because of Linc Energy. I understand you were formerly executive general manager with Linc Energy. I also understand that you were the investigations manager for the Queensland EPA from 2000 -

2003. <https://www.linkedin.com/in/justyn-peters-65173a46>

<http://www.abc.net.au/news/2015-08-10/linc-energy-secret-report-reveals-toxic-chemical-risk/6681740> <http://www.abc.net.au/news/2016-04-18/ucg-banned-immediately-in-qld-laws-to-follow-anthony-lynham/7335172>

I have contacted DEWNR, and found out that there are small stock supplies (up to 2 Litres/sec) with salinities mostly in the range 2000 - 10,000 mg/L. outside of the mined area. I don't think the station owners would be happy to have their precious and dependent on potable ground water put at risk. There is interconnection as I understand, with most aquifers, including confined aquifers because of breaches in the wall. This proposed project is just south of the GAB. **How can you prove that contamination will not occur eventually with the GAB, nor with the potable stock water nearby?**

As proven with what has happened in Queensland, this process is not safe, and does not have minimum impact to the environment.

I ask that you carefully reconsider this proposed project and possible ramifications. We don't need a repeat in South Australia, of what has happened in Queensland.

Kind Regards,

Anne Daw
member of the Round Table for Oil and Gas, South Australia

<http://www.asx.com.au/asxpdf/20141201/pdf/42v5khwk3rtkc4.pdf>

ROUND TABLE FOR OIL AND GAS, 30th November 2017

LCK - Experienced Executive Team

The Team	Experience
Justyn Peters Executive Chairman	Justyn is a qualified lawyer and has many years' experience in the ISG industry and in senior management positions. Justyn's experience includes working in the mining industry, for industry representative bodies and for various state and federal environment departments and authorities.

Please note Linc Energy is not mentioned in the above, which is part of Leigh Creek Energy slide show shown at the Round Table for Oil and Gas in November 2017.

UPDATE ON LINC ENERGY CONTAMINATION IN QUEENSLAND

The Linc Energy underground coal gasification activities have potentially contaminated over 77,000 hectares of land in the Hopeland and Kogan communities. Excavation cautions still continue. Testing undertaken by the Department, I understand, do not stand up. Farm health assessments were done only to a depth of 30 cm. The earlier testing by the Department The Department of Environment and Science showed that there had been migration of contamination occurring at a depth of between 2 – 8 metres.

A press release by Marland Law, mentions reports done in 2014 and 2015 by recognised scientists, in regard to the groundwater and landform contamination, caused by the Linc Energy underground coal

gasification. The degree of contamination, being widespread, and high impact, in part, is irreversible. The full extent and concentration of the indicator gases had not been confirmed. At that stage, only up to 310 km² of contamination was confirmed. The release of contaminants that were released into the environment included gases in the form of syngas and component gases and by-products.

According to the USA Dept. of Energy, Typically syngas is 30 to 60% carbon monoxide (CO), 25 to 30% hydrogen (H₂), 0 to 5% methane (CH₄), 5 to 15% carbon dioxide (CO₂), plus a lesser or greater amount of water vapor, smaller amounts of the sulfur compounds hydrogen sulfide (H₂S), carbonyl sulfide (COS), and finally some ammonia and other trace contaminants.

Marland Law went on to say in the press release, that gas, in the form of an additional contaminant (biogenic methane) formed as a result of a succession of contaminating events. "There were liquids, in the form of contaminated ground waters and solids, in the form of tars and other petroleum products. There was also a combination of contaminants in the form of gas-liquid mixtures available for further contamination"

According to Marland Law, in the areas of Gilbert, Sutherland and Hopeland situated on prime farming land, the damage was described as "Forcing contaminations off site, through the overburden and into the soil profile, as evidenced by indicator gases such as hydrogen and methane and soil acidification." Preliminary results from the soil analysis indicates acidification within the root zone where the normally alkaline Vertosols have acidified to a degree that renders these soils unsuitable to be classed as Strategic Cropping Land"

The adverse effects had been caused by "Releasing contaminants to the overburden and the soil profile where they are now trapped and risk release during normal land use including agricultural operations. Placing contaminants within the overburden that has and will continue to facilitate the formation of a new contaminant (biogenic methane) as a result of a succession of contaminating events ready for future liberation and causing further changes to the soil atmosphere.

Placing contaminants within the overburden where they will be re-entrained overtime as the groundwater level re-establishes potentially exposing the landholders to these contaminants over time and potentially impacting soil and ecological health and land use."

In January 2018, it was noted that with testing undertaken by the department or its consultants, it is impossible to have identified the extent of potential contamination in the groundwater and landform systems. Examples were given in the Marland Law media release. This included experiments at Hoe Creek Underground Coal Gasification Test site in Campbell County Wyoming in the United States conducted by the US Department of Energy at 3 locations during the period between 1976 and 1979. In 1977, the USA Department of Energy published a report. It showed the long-term nature and serious consequences of the contamination caused by the UCG activities. The impacts included "extensive subsidence caused by the continuous burning of the underground coal seams - emerged some 15 years after the coal seams had initially been lit and apparently decommissioned."

The amount of coal Linc Energy burnt underground, was way much more than Hoe Creek. Linc Energy burnt the coal underground over more than 7 years. The Marland Law press release went on to say: - "The contaminants that were released at the Linc site are called volatile organic compounds (VOCs). The VOCs have been allowed to escape from the burning coal seam cavities into the surrounding strata and groundwater at the Linc site over a period of more than 7 years. In respect of any contamination of the groundwater systems, our expert advice is that once the 'genie is out of the bottle', that it is not possible to restore the groundwater to its pre-contamination state because each time it rains the underground aquifer is being replenished. The rainwater percolates through the soil profile and landform down to the

aquifer and during that process the rainwater collects and carries any dormant volatile organic compounds that are present in the soil.”

Surely, if the South Australian Government requires wisdom in its decision on underground coal gasification at Leigh Creek, then it needs to heed what I have written here. It would be foolish to allow this proposed project to proceed.

**SUBMISSION BY ADNYAMATHANHA TRADITIONAL LANDS ASSOCIATION
(ABORIGINAL CORPORATION) RNTBC (ATLA) TO STATE OF SOUTH
AUSTRALIA ON LEIGH CREEK ENERGY'S DRAFT STATEMENT OF
ENVIRONMENTAL OBJECTIVES (SEO)/ENVIRONMENTAL IMPACT REPORT
(EIR)**

General Submissions

1. The Adnyamathanha people are the traditional owners and native title holders of the Flinders Ranges, including the Leigh Creek Coal Mine area. Adnyamathanha Traditional Lands Association (Aboriginal Corporation) RNTBC (ATLA) is their representative body as the registered native title body corporate. These submissions are made by ATLA on behalf of the Adnyamathanha people.
2. They are made subject to consideration and approval at the adjourned ATLA Annual General Meeting on 24 March 2018. ATLA also wishes to reserve the right to expand upon these submissions, in particular in relation to Aboriginal heritage issues, following that meeting. To that extent, these should be seen as “placeholder” submissions.
3. ATLA opposes further exploration activities by Leigh Creek Energy Limited and its subsidiary ARP Tri Energy Pty Ltd (LCKE) towards the development of in-situ gasification or underground coal gasification (UCG) within the Leigh Creek Coal Mine area, including the establishment and operation of a Demonstration Plant there.
4. This opposition is primarily based on Aboriginal heritage grounds: the proposed location for the Demonstration Plant and for the potential commercial production of Syngas from the UCG process forms part of an area of land that is of vital significance to us, the Adnyamathanha people, in accordance with our traditions. This area has been “hammered” by years of coal mining. Our *mura* has been bled. We want the coal mining area rehabilitated under our guidance and the healing process for our *mura* put in place. The Government has got a lot out of the Leigh Creek Coal Mine, and we say: “*enough is enough*”. We have our obligations to the land, to our *mura*, to Adnyamathanha people and to the wider Aboriginal community to do the right thing: to ensure the healing of the land and *mura* and the consequential restoration of harmony over time.
5. The establishment and operation of a Demonstration Plant and/or any further development towards potential commercial production of Syngas

within the Leigh Creek Coal Mine area would result in further damage and destruction to and interference with this area of land that is of such great significance to Adnyamathanha people in accordance with our traditions, contrary to section 23 of the Aboriginal Heritage Act 1988.

6. It would also unlawfully interfere with our native title rights and interests, including in particular the right to visit, maintain and preserve sites and places of cultural or spiritual significance to us as Native Title Holders within the determination area: *Adnyamathanha No.1 Native Title Claim Group v the State of South Australia (No 2)* [2009] FCA 359 (30 March 2009) (the 2009 CD).
7. This unlawful interference arises in consequence of the grant of Petroleum Exploration Licence (PEL) 650 to ARP Tri Energy Pty Ltd contrary to the 'Right to Negotiate' provisions in Subdivision P of the Native Title Act 1993 Division 3 of Part 2 (Subdivision P). The act of granting the PEL was invalid to the extent that it affects native title (section 28) and in breach of statutory duty (sections 29 and following).
8. In addition to its opposition to LCKE's proposals on Aboriginal heritage and native title grounds, ATLA has substantial concerns in relation to the draft SEO/EIR on the grounds that they create unwarranted risks to other aspects of the environment, including risks of adversely affecting people, animals, plants, earth, water and air. We identify some of these concerns in 26 and 27 below.

Aboriginal Heritage

9. The Leigh Creek Coal Mine area's great significance to us lies in the context of the Yurlu Ngukandanha *mura*. This powerful creation story tells of Yurlu the Kingfisher starting out from Kakarlpunha (Termination Hill) and travelling south to Ikara to attend a ceremony in the Pound. On his way there, Yurlu stopped at Leigh Creek, where he made a big fire from dry mallee sticks to signal that he was on his way to the ceremony. By this means he created the coal, which Adnyamathanha people have always called Yurlu's Coal.
10. This *mura* is and remains one of the most important creation stories for Adnyamathanha and explains the beginnings of the Flinders Ranges themselves, including the origins of the Cutaways (just south of Copley) and of the spectacular walls of Wilpena Pound.

11. A simple, accessible version of this *mura* is included in “Flinders Ranges Dreaming”: Dorothy Tunbridge (Aboriginal Studies Press, 1988) – see attached.
12. Further details in relation to the *mura* (including deeper aspects relating to the initiation ceremony to which Yurlu was travelling) are included in Volume 2 of the Adnyamathanha Native Title Report (January 2008) prepared by anthropologist Bob Ellis in connection with our native title claim. However, it would not be appropriate to include these details here.
13. The Leigh Creek Coal Mine area manifests and embodies part of the Yurlu story. It has been heavily disturbed by the coal mining activities of the last 60 years. They include the coal mining which commenced in the 1980s on land resumed in 1979 from Leigh Creek Station, now comprising much of PEL 650. Lives of many Yuras and others have been significantly diminished as a result.
14. However, whilst the *mura* has been severely damaged as a result of the mine, it has not been destroyed, but remains of continuing vital importance to us. The mined land must now be fully and properly rehabilitated, and it and the associated *mura* need to be healed under our guidance. They should not be subjected to any further violation.
15. These concerns have been raised on a number of occasions before now, including during heritage surveys. They were, for example, referred to in confidential Work Area Clearance Survey reports and in reports provided to LCKE in relation to the September 2016 and August 2017 clearance surveys. These surveys were conducted by agreement with LCKE, but without prejudice to ATLA’s position, as reflected in these submissions.

Native Title

16. PEL 650 was granted to ARP TriEnergy Pty Ltd, pursuant to the Petroleum and Geothermal Energy Act 2000 (PGE Act), for a period of 5 years, on 18 November 2014. PEL 650 covers approximately 93.4 sq kms of land to the north west of Copley, including in particular the area of the existing Leigh Creek Coal Mine.
17. The vast majority of the exploration activities carried out to date by LCKE within PEL 650 along with the proposed Demonstration Plant lie within land which comprised part of the 42 square kilometres of land surrendered in June 1979 out of Leigh Creek Station Pastoral Lease. In the 2009 CD, non-exclusive native title rights and interests were specifically determined to exist over what remains of Leigh Creek Station, and it is clear that they

also existed in relation to the land surrendered out of that Station in June 1979.

18. That 42 sq kms of land became the subject of Perpetual Lease No 20311 to the Electricity Trust of South Australia (ETSA) granted on 24 August 1981 in perpetuity, under the terms of which ETSA is described as being "at liberty to exercise in relation to the said land and coal hereby demised all or any of the powers conferred upon the Lessee by section 43d of the *Electricity Trust of South Australia Act* 1946 as amended..." Section 43d allowed ETSA to:

"(a) mine (whether by open or closed working) any seams of coal, vested in the Crown or the trust, at or near Leigh Creek;

(b) treat, grade or otherwise prepare for sale, and use, sell or otherwise dispose of any coal so mined."

The section also allowed ETSA to do various other things, including erecting houses, buildings and other improvements etc "for the purpose of carrying the provisions of this Part into effect".

19. As noted in 17 above, prior to the Perpetual Lease being granted, the 42 sq kms of land comprised non-exclusive possession native title land. In light of the Native Title Act 1993 (NTA) and the Racial Discrimination Act 1975, it is apparent that the lease was a "past act" for the purposes of the NTA. Having regard to section 43d of the ETSA Act, ATLA submits that the lease falls within the definition of "mining lease" in section 245 of the NTA, ie "a lease (other than an agricultural lease, a pastoral lease or a residential lease) that permits the lessee to use the land... covered by the lease solely or primarily for mining". Further, if there was any doubt otherwise that the Perpetual Lease was "primarily for mining", this is resolved by clause 8, which provides that "if in the opinion of the Lessor... the said land should cease to be used or required for the purpose of working and getting coal or purposes incidental thereto... then... it shall be lawful for the Lessor... to determine this lease and resume possession of the said land...".
20. As a "mining lease" under the NTA, the Perpetual Lease was a "category C past act" (and was not a "previous exclusive possession act"¹). The effect of Division 2 Part 2 of the NTA (in conjunction with the Native Title (South Australia) Act 1994) was to validate that category C past act and to provide that "the non-extinguishment principle applies to [it]". Accordingly, whilst

¹ except where any houses or other buildings may have been constructed prior to January 1994.

native title rights and interests may have been suppressed to the extent of any inconsistency, they were not extinguished and remain in existence (section 238 NTA). Further, ATLA submits that any suppression is only "in relation to the act" (ie the grant of the perpetual lease) and does not operate for the benefit of third parties such as LCKE: see, for example, the Explanatory Memorandum to the Native Title Bill 1993 with reference to what became section 238, including the following:

"the effect of the reference ... to native title 'having no effect in relation to the act' is that the native title holders are not prevented from exercising the rights given to them by this Bill (such as the right to negotiate set out in subdivision B [now subdivision P] of Division 3 of Part 2 of the Bill), in the event ... [of] an application ... by a person unrelated to the holder of [in this case, the Perpetual Lease] for the grant of [a new tenement]..."

21. In spite of our subsisting native title rights and interests over the area of the "mining lease", the State failed to comply with its obligations under Subdivision P of the NTA (Right to Negotiate) in relation to the grant of PEL 650. In particular, the State did not give notice to ATLA under section 29 and, as a result, ATLA and the Adnyamathanha people were denied the benefit of its statutory rights under section 31 (normal negotiation procedure), including the opportunity to make oral and written submissions to the State, and sections 33 and following, including the provisions for arbitral body determination (by the National Native Title Tribunal).
22. The State granted PEL 650 in breach of statutory duty, and the grant was "invalid to the extent that it affects native title": section 28.
23. I note that my letter to the Executive Director of the Energy Resources Division of the Department of State Development dated 20 July 2016 raised the substance of these assertions regarding the effect of the NTA in relation to PEL 650. That letter has not been responded to, nor have the assertions ever been challenged by the State or by LCKE, including at the meeting which ATLA lawyer Richard Bradshaw and I attended with the State's and LCKE's representatives (including their respective legal advisors) on 25 January 2017.
24. If the State had acted lawfully in accordance with Subdivision P, ATLA would have taken full and proper advantage of its statutory rights, including by being more proactive (rather than responsive) in the protection of Adnyamathanha heritage and native title rights.
25. ATLA reserves its rights to take legal action in light of the breach of Subdivision P.

Environment

26. ATLA has concerns that 'chemicals of potential concern' (COPC) resulting from UCG operations will, over time, adversely affect the environment, including soil, water and air. Our concerns are based on LCKE's acknowledgment (whilst asserting that the risk is very low) that COPC may move away from the gasifier chamber during and after the period of the Demonstration Plant. The movement of COPC through sub-surfaces e.g. rock/aquitards/aquifers may result in COPC permeating fragile surface, subsurface and water source areas around the Demonstration Plant and potentially causing irreversible damage to the environment in those and surrounding areas.
27. When considering the draft SEO/ EIR as well as the responses by LCKE to Johnston Withers' informal questions, ATLA notes that the potential movement of COPC away from the gasifier chamber, arguably during both operational and decommissioning phases, will likely only occur after many years. Therefore, any adverse impacts on the environment would only become apparent in the longer term future, making it difficult, if not impossible, to identify and quantify with any precision the future environmental impact UCG would have. ATLA maintains that these potential future risks and impacts on the environment are unacceptable.
28. The PGE Act includes a definition of "regulated resource", which for this purpose means "a naturally occurring underground accumulation of a regulated substance" where "regulated substance" includes "petroleum". "Petroleum" is relevantly defined to mean "a naturally occurring substance consisting of a hydrocarbon or a mixture of hydrocarbons in gas, liquid or solid state but does not include coal... unless occurring in circumstances in which the use of techniques for ... *in-situ* gasification would be appropriate..." (emphasis added). ATLA submits that the circumstances are not appropriate.

28 February 2018



Vincent Coulthard
Chief Executive Officer
Adnyamathanha Traditional Lands Association (Aboriginal Corporation) RNTBC

From: [Mark Dayman](#)
To: [DPC:Engineering](#)
Cc: [Tim Reynolds](#)
Subject: Invitation for Public Comment - Environmental Impact Report (EIR) and accompanying Statement of Environmental Objectives (SEO) - Leigh Creek Energy In-Situ Gasification Demonstration Plant
Date: Wednesday, 28 February 2018 6:47:39 AM
Attachments: [image001.png](#)

Attention: Jarrod Spencer
Department of the Premier and Cabinet
Energy Resources Division
GPO Box 320, Adelaide 5001
Dear Jarrod

RE: Invitation for Public Comment - Environmental Impact Report (EIR) and accompanying Statement of Environmental Objectives (SEO) - Leigh Creek Energy In-Situ Gasification Demonstration Plant

Thank you for the opportunity to provide comment on Leigh Creek Energy's EIR and accompanying SEO for the In-Situ Gasification Demonstration (ISG) Plant located in the Leigh Creek Coalfield in northern South Australia.

I am making my comments as Managing Director of Fyfe. Fyfe is an Adelaide headquartered consultancy providing Engineering, Environmental, Planning and Survey Services to Infrastructure, Property and Energy and Resources sectors across Australia. Fyfe has more than 20 years experience in the provision of engineering, environmental and survey services to the oil and gas industry throughout Australia and has maintained a permanent presence in the Cooper Basin for all of that time. Fyfe has been involved in the provision of engineering advice and services to Leigh Creek Energy for the detailed design of parts of the ISG Pre-Commercial Demonstration Plant.

I believe that the Leigh Creek Energy ISG Demonstration Plant has merit for the following reasons:

- Leigh Creek Energy and its advisors have researched and documented the potential impacts of ISG on the environment at Leigh Creek in a thorough manner and appear to have consulted broadly taking into consideration feedback from the community.
- Subject to the scientific merits being properly assessed by the Regulator, the final Leigh Creek Energy ISG Plant will have significant economic development benefits for the region and potentially for the state.
- The location appears to be ideal for such a project as it utilises an already disturbed area (being a disused coal mine) so as to avoid sensitive features such as aquifers, residents or towns in close proximity, sensitive land uses or sites of high environmental value.

In summary, on review of the EIR and accompanying SEO, I support the project's approval.
regards

Mark Dayman | Managing Director



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Follow Fyfe Pty Ltd on [LinkedIn](#)

From: [Matt Walsh](#)
To: [DPC:Engineering](#)
Cc: [Tony Jawry](#)
Subject: Leigh Creek Energy - A World Class Opportunity
Date: Wednesday, 28 February 2018 7:33:52 AM

Attention: Jarrod Spencer
Department of the Premier and Cabinet
Energy Resources Division

Dear Mr Spencer,

I am writing as a supporter of the Leigh Creek Energy development, and as a South Australian keen to see sensible development of our resources for the betterment of the State, in particular energy security. One of the reasons I am highly supportive of this development is the strong scientific evidence and fact base that support the proposed ISG operations at Leigh Creek.

Factually, the Leigh Creek Energy development is very sound. In many ways this proposal is an attractive package of features and benefits - with an establish coal resource highly suitable for ISG, served by existing infrastructure, in a location and with an ore body that ameliorates any attendant risks of nearby residents, aquifers, environmentally important or sensitive land, at a depth with geological and hydrogeological features that ensure safe ISG operation.

The failure or poor environmental outcomes in so-called 'fracking' sites in Australia and elsewhere should not be conflated with this proposal nor bias the opportunity for this development to be a world-class example of how to successfully and intelligently implement and operate ISG in terms of site location, coal resource geology, and technical quality. I believe that the Leigh Creek Energy team have developed an impressive opportunity to show how coal resources with the unique characteristics of Leigh Creek can be utilised the "right way" technically, commercially, environmentally, and socially. South Australia has the chance to lead the world in this case.

As a South Australian I am a direct investor in several local SA companies, ranging from food production and innovative additive manufacturing, as well as companies such as LCK innovating in the energy market. It is highly encouraging to see such quality opportunities that have passed the due diligence of many local investors and a significant international investor. Future capital flows into all such developments are dependent on scientific rigour and evidence and it would be a great shame to diminish confidence to invest in this state just because of a vocal, populist, mis-informed opposition.

The highly experienced and qualified management team of Leigh Creek Energy have spent considerable time with shareholders explaining the efficacy of their proposal, in particular their attention to minimising any environmental and social aspects, and I hope their submission meets with your endorsement.

Regards,
Matt Walsh
Athelstone SA 5076
041 811 3878

From: [Patrick Riordan](#)
To: [DPC:Engineering](#)
Subject: Leigh Creek Energy
Date: Wednesday, 28 February 2018 7:21:33 AM

1/46 Edward Street

Bondi NSW 2026

28 February 2018

Dear Sir/Madam

Re: Leigh Creek Energy Project ISG Demonstration Plant

My wife and I write in support of the Government approving the establishment and operation by Leigh Creek Energy (LCE) of the Demonstration Plant at Leigh Creek, SA.

I disclose that we are “mum and dad” shareholders of LCE.

However among the reasons for our investment in LCE was its credentials, the technical expertise of its team and the potential of ISG technology to deliver synthesised natural gas, which we see as an important transition fuel to support our country’s shift toward a clean energy future.

We believe that the proposed demonstration site, already having supported a coal mine and being far away from incompatible land uses, is ideal for the demonstration of a new potential gas supply. ISG is not a new technology and South Australia will benefit from lessons learnt from attempted implementation of similar technologies in other areas of Australia. Naturally the demonstration plant will, if approved, guide successful implementation of a potential full scale plant in the future.

South Australia is Australia’s leading jurisdiction in terms of innovative energy policy. We urge the State to continue its support for innovative energy projects by approving the LCE Demonstration Plant.

Yours sincerely,

Patrick Riordan and Hanna Henniker Heaton

From: nigel@williamlightfoundation.org
To: [Spencer, Jarrod \(DPC\); DPC:Engineering](#)
Cc: [Goldstein, Barry \(DPC\); DTF:Minister Koutsantonis" Office; cheltenham@parliament.sa.gov.au](#)
Subject: Leigh Creek Energy (LCK) In-Situ Gasification Demonstration Plant Submission in Response to Invitation for Public Comment
Date: Wednesday, 28 February 2018 9:07:45 AM
Attachments: [180228 - Ltr to DPC FINAL.pdf](#)
[ATT00001.htm](#)
[Questions to Regulator - URGENT - LCK EIR Review Dec 2017 V-WLF-FINAL.pdf](#)
[ATT00002.htm](#)
[LCK EIS - questions for LCK, DPC Gov SA Feb27, 2018.pdf](#)
[ATT00003.htm](#)

Good morning Jarrod,

Please find attached:

1/ Cover letter to *Leigh Creek Energy (LCK) In-Situ Gasification Demonstration Plant Submission in Response to Invitation for Public Comment*. Response sought by **March 16 2018** given the gravity of concerns again raised.

2/ Questions to Regulator specific to 1/ and remaining unanswered.

3/ Private submission by Di Starick of Copley - She was assured that a Mr Stephen Batten (LCK) would visit her on February 26th, 2018, to assist her submission, however this failed to occur, hence she has requested submission via the WLF.

Kind regards,

Nigel Carney
Chairperson
William Light Foundation



**WILLIAM
LIGHT
FOUNDATION**

Nigel J Carney
Chairperson, William Light Foundation
PO Box 33, Leigh Creek SA 5731
nigel@williamlightfoundation.org

28 February 2018

Attention: Jarrod Spencer
Department of the Premier and Cabinet
Energy Resources Division
GPO Box 320, Adelaide 5001

Via email: DPC.Engineering@sa.gov.au; barry.goldstein@dpc.sa.gov.au

Dear Sir,

**Leigh Creek In-Situ Gasification Demonstration Plant
Submission in Response to Invitation for Public Comment**

The William Light Foundation (“WLF”) acts to protect local community interests in the Flinders Ranges area.

As you are aware, WLF submitted a detailed list of questions to your office dated 7 December 2017 in response to an invitation from Minister Koutsantonis in correspondence dated 30 November 2017. In lieu of an itemised reply by end of January 2018, as initially advised, you invited us to review the proponent’s Environmental Impact Report latest revision 3 and make further submissions within the rubric of the public consultation process by 28 February 2018.

Whilst the opportunity to formally put submissions is encouraging, our constituents remain highly anxious as to the integrity and transparency of the process, in light of the following.

1. DPC’s consultation flowchart does not indicate whether a substantive response will be forthcoming, so we are concerned that the same will not be provided. I note further that various issues have been raised at recent public meetings without adequate response (some of these are included with these submissions). Please confirm whether and when a substantive response will be provided.
2. WLF is concerned that the hydrology assessment and groundwater modelling done by the proponent is not reliable. I again refer to the agreed Minutes of Meeting of 9 September 2016, when Director Malavazos admitted that information about aquifers is needed, and agreed to the provision of an independent mining hydrologist

nominated by the community. WLF has identified an independent hydrologist with expertise and requests confirmation of DPC procedure for approval of quotation.

3. DPC officers have made previous representations that the government would await the outcome of the Linc Energy (in liquidation) litigation in Queensland before making any decision. I understand that prosecution is now underway, and that you are carefully considering the Queensland experience. Please confirm that the government's commitment is firm in this regard.
4. WLF has applied to the Queensland government for the scientific report into the Chinchilla disaster and will apply to SA authorities for groundwater data. This information will assist with independent review and play an important role in testing the proponent's risk assessment. Accordingly, we ask that the government commit to not make any decision to approve testing pending an opportunity for an independent expert to report, having taken this data into account.
5. Finally, I note that Mr Goldstein's letter to me dated 31 January 2018 confirms that DPC has been in regular contact with Commonwealth government authorities. It is WLF's preferred position that the project be referred to external independent experts for thorough review. Is a referral to the Commonwealth IESC or other body planned or in process?

Given the havoc wrought by the UCG experience in Queensland and elsewhere, the local communities reasonably consider the proposal as a significant threat to life, health and the environment. Accordingly, it is not a matter to which uncertain, evasive or obfuscatory answers will be acceptable. I therefore look forward to your reply to the above by **16 March 2018**, and confirmation that fulsome responses to each question in the submissions will also be provided, as per the Mr Goldstein's commitment in his email of 12 January 2018.

Yours sincerely,

Nigel Carney
Chairperson
William Light Foundation



**WILLIAM
LIGHT
FOUNDATION**

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December 6, 2017

RE: Community Concerns - LCK Announcement and Draft EIR

Dear Mr Goldstein,

At the invitation of the Minister, the Hon Tom Koutsantonis (November 30, 2017), the community now seeks an urgent response to a number of dire concerns regarding the proposed Leigh Creek Energy Project UCG trial gasification.

Statements by the Leigh Creek Energy Project (the proponent) in November indicate substantial investment in infrastructure and personnel now being deployed at the mine site.

In summary, the draft Environmental Impact Report (EIR) presented to you, is regarded as grossly insufficient and deficient to allay the already expressed concerns of the local communities .

The EIR is viewed as speculative, high risk and reckless, even from the lay persons perspective, in the absence of the independent hydrological community review by now anticipated (at proponents cost) and to date not responded.

The record of the proponent as the *Marathon Resources* company and the damage remaining to this day to the *Arkaroola Wilderness Sanctuary* necessitates further a most urgent response to the potential damages which may result from this companies actions today.

1. ***At what stage of the DSD / PGE Act and regulations process will this stated commitment to independent hydrological review become available?***

Several areas of the report are arguably *misrepresentative* and *misleading* in relation to facts and situations of actual occurrence - omitting information of evident and key relevance to potentially impacted stakeholders



Source: [Meeting of the Roundtable for O & G Projects, December 2016](#)

Before proceeding with matters of substance, a quick lexicographic scan of the proponents EIR demonstrates an alarming lack of certainty expressed regularly throughout what is thus seen as a *non scientific, incomplete and unreliable report*:

Lexicographic Review of the LCK EIR:

Word occurrence	Word count
Likely/Unlikely	133
Expected	90
Estimated	29
Anticipated	15
Total of uncertain words cited	267

It would appear from this review that the authors and their agents of this report lack certainty themselves, prompting and explaining the extraordinary regular occurrence of such reservations in a document designed to offer certainty; no such certainty presents itself.

Potentially impacted communities are unlikely therefore to have any faith in this document nor should any reasonable person be expected to do so.

The anticipation of risk is too great for any community to consider in light of the Queensland Chinchilla disaster precedent and other Coal Seam Gas (CSG) calamities in Australia and worldwide.

We understand and have been informed further information regarding extensive UCG disasters in Russia exists and will enter at some time the public domain.

2. Does the regulator have any information to date in relation to this and if not would the regulator be seeking such information relevant to the decision making process now underway?

The selected parts of the EIR following are of most concern, particularly in relation to the potential of harm to occur in relation to local water, air and soil resources critical for wildlife habitat, flora and fauna, and the regional human population.

The risk extends to the sites and story of the traditional owners Adynamathanha - high level significance on a site where Native Title is extinguished and yet the valid concerns of the relevant and proper Heritage Association have not been responded to, or addressed by the relevant Minister, the Hon Kyam Maher. (copied)

3. Has the Minister listened to the recent concerns of the Adnyamathanha community who do not believe their views have been regarded?
4. Will the Minister listen and will the regulator take regard of these views or are these views regarded as meaningless under the PGE Act and related legislation?

Camp Law Mob Call to Stop UCG Mining on Sacred Country

The provisions of the Aboriginal Heritage Act 1988, allow only the Minister to cause damage to an area of Aboriginal Heritage, and yet the Minister has arguably allowed the commencement of such damage without express statement of his intention to do so under the powers and provisions of the Act.

5. An explanation of why this is occurring and how it has occurred, is now seen as relevant, clearly as a response to the proponents EIR?

The risk also extends to the Cultural Heritage concerns now expressed as a nomination for State Heritage and the lack of a response concerning serious issues of loss that may already have occurred and yet have not been confirmed as yet by the government.

6. Given that the proponents plans and current actions impact the pending nomination can the government respond now to the outstanding questions in relation to this?

Already the community has expressed its concerns regarding the perceived invalidity and flawed nature of the community consultation process and serious aspects of complaint regarding these remain unanswered by the government.

7. Will these concerns be addressed, particularly the serious concerns relating to the August 2017 consultation with members of the Copley Community and concerns expressed regarding the initial LCK consultation copied to the government and the local representative (Liberal) stating clearly that the consultation was knowingly

misleading in light of known facts not disclosed and not then public, in relation to prosecutions then underway by the QLD government in relation to Linc Energy and Carbon Energy?

8. *Does the government now understand and agree that such knowingly misleading statements to the community by a company executive is arguably in breach of the Corporations Act and will the government now respond to that concern delivered then by the community?*

Non response to outstanding questions relating to the communities is seen as prejudicial to any outcome of the EIR and Statement of Environmental Objectives (SEO) draft statements and the community already has reserved its rights to compensation for the perceived assault upon its safe future, time, opportunities lost, and the failure of this response, which persists as evidence via the non-response of concerns presented over the past three years.

In relation to the critical natural resource of water, the *meaning and definition* of words is seen as critical and is deemed expediently skewed in self favor of the proponent and therefore requires further close scrutiny with respect to the public consultation communications recorded and per the meanings of these words found within the legislative framework, state and federal, impacting directly upon the perceived quality and final outcome of the regulatory framework process, the stated objects of which exist in part purportedly to maintain the best interests of the public and the environment.

9. *Is the government going to continue to ignore the objects of the relevant Acts which protect the communities or does the government view the fundamental rights of the communities extinguished via Acts (or other regulations or instruments or covenants) of the government and if this is so, can this situation be presented clearly now in the interests of the communities that may be ignorant of the loss of residual fundamental rights assumed but not known otherwise to be lost?*

A significant though not isolated example of this (*prejudicial skewing of words and their definition*) is the regular use of the terms *Aquifer* and *Aquitard* which is described by the AWE/Greencap consultants as:

Aquifer

Typically the groundwater that is of interest, and targeted for use, is that which is found within rock types that have a high hydraulic conductivity, that is water can move easily/rapidly through these rocks and sufficient quantity of water for sustained pumping. These rocks are collectively termed aquifers.

Aquitard

Where the rock types have low hydraulic conductivity, that is where water is trapped within poorly connected voids or there is very little void space, these rock types cannot yield groundwater at a rate that makes them suitable to use as a water supply and often form a barrier to the movement of groundwater. These rocks are collectively termed aquitards.

The proponent again has its own definition of these key and critical groundwater terms:

aquifer	A permeable geological formation or group of formations that is able to receive, store and transmit significant quantities of groundwater
aquitard	A rock type with low hydraulic conductivity that cannot yield groundwater at a rate that makes it suitable for use as a water supply. Often used in the context of a confining bed that retards the movement of water to or from an adjacent aquifer.

Whereas the *UNESCO glossary of hydrology* interpretation is more simple and arguably more valid and equitable in terms of the interests of scientific observation, certainty, and fairness of outcome reliant upon such definitions for potentially impacted stakeholders:

1. aquifer

Geological formation capable of storing, transmitting and yielding exploitable quantities of water.

2. aquitard

Geological formation of low hydraulic conductivity which transmits water at a very slow rate.

http://www.wmo.int/pages/prog/hwrr/publications/international_glossary/385_IGH_2012.pdf

10. *Will the DSD/DPC now clarify and publish in the interests of the public its own glossary of terms relevant to the EIR to ensure clarity, consistency and a level playing field in the interests of all stakeholders?*

Distortions of this nature are seen as prejudicial and mischievous in relation to known science and agricultural practices that meet land rehabilitation and plant cropping opportunities - all well documented, for example:

Salt Tolerance and Crop Potential of Halophytes

While the proponents statement recognizes the unknown nature of the Telford Basin which is quoted and argued poorly as a closed containment system of the proposed trial gasification site, incorrectly indeed on the basis of information contained within the report.

The absence of reference to the adjacent basin also containing what are clearly aquifers is also misleading via omission to the reasonable interpretation of hydrological risk extending upon the experimentation of ISG/UCG mining practice adjacent pastoral leases, native flora and fauna habitat and the population centers of Copley and Leigh Creek.

In the absence of reference or investigation of the adjacent Copley Basin which arguably has hydrological connectivity via the conductivity of coal seam layers and other porous geological strata - the EIR is drastically deficient at a most basic and fundamental level which could have dire impact for the stakeholder communities now expressing such concerns and witnessing a draft EIR of apparent limited scope and low quality.

11. Will the government request an investigation into the relevant adjacent basin not included in the proponents EIR?
12. Given the overlay of PEL 650 extends proximate to the Copley Basin (fig 3.1 AWE/Greencap) and given the stated (EIR - Greencap/AWE) unknown nature of both basins, would not the potentiality of breach and hydrological connectivity be an assumed necessity of the EIR and is not its omission potentially damaging to concerned and potentially impacted stakeholders?
13. Anecdotal evidence (several local sources) relays historic information of such connectivity in relation to the commencement of the Playford Coal Era related to the mining of Lobe B, and therefore, is not such anecdotal evidence (cause and effect) deserving of supplementary investigation in the interests of understanding the complete extent of potential groundwater and surface water potential damages extending from ISG/UCG experimentation?
14. Will the DSD/DPC now investigate this and insist upon further analysis?
15. For example, in relation to wells located between the two basins is there adequate information related to the source of aquifer/aquitard flow direction and recharge?
16. Also conspicuous by its absence is the relevance of sources of disturbance to the geological layers presented as sound per se in the context of the ISG/UCG trial/experiment? Please explain?
17. Can the proponent present case scenarios for the safety and integrity of its well casings (integrity) in scenarios outside of its control and can further detail be provided of process shutdown procedure (absent) to mitigate environmental risk in the event of these?
18. Does not the proponents record of discarding without care radioactive tailings in the Arkarroola Wilderness chapter dictate a need for a **HIGH level of surveillance**?
19. Has **HIGH level surveillance** of a HIGH risk mining practice in light of the proponents history and the record of CSG mishaps now been activated under the provisions of the PGE Act and its regulations and the requirement within the PEL650?

The PGE Act Regulations 2013 states:

19—Activity notification—high level official surveillance

1. (1) For the purposes of section 74(3) of the Act, an application for the Minister's approval for activities requiring high level official surveillance is to be given to the Minister at least 35 days before the proposed commencement of the activities or within such shorter period as the Minister may, in a particular case, allow.
Administrative penalty.
(2) A notice under subregulation (1)—

1. (a) must include, or be accompanied by, detailed information on the licensee's proposals in respect of the operator assessment factors; and
(b) must comply with the requirements of regulation 20.

20. *In particular reference to the proponent and given its poor record of on site activity can a full explanation be made of the definition of HIGH level surveillance and what form this surveillance manifests itself in relation to the current drilling activity?*

21. *Can a record of the operator assessment factors please be provided*

22. *Does the public liability insurance of the proponent and its contractors cover unforeseen and foreseen externalities to the communities impacted and for losses of heritage values and wildlife?*

In the event of well casing breach or geological layer breach, impacting faults stated as being proximate to the gasification chamber, deprivation of air to the inlet well is a highly optimistic solution to catastrophe, and arguably fails the assurance test in relation to seismic or tidal disturbance (for example) which is well documented as impacting the integrity of CSG operations abroad, and which would reasonably be expected to be known in advance by the expert consultants engaged by the proponent, particularly in a seismically active region.

23. *Will the regulator query the proponent re the absence of information regarding these potential risks and question them now rigorously regarding the absence of these known and obvious risks?*

24. *In relation to the inward pressure expectations upon the gasification chambers (cited in the EIR) has the proponent addressed the barometric pressures forced upon water bodies under the conditions of King Tides that have substantial upward incline pressure upon artesian basin water resources and hence will they have similar instance upon the aquitards/aquifers of the Telford/Copley Basins?*

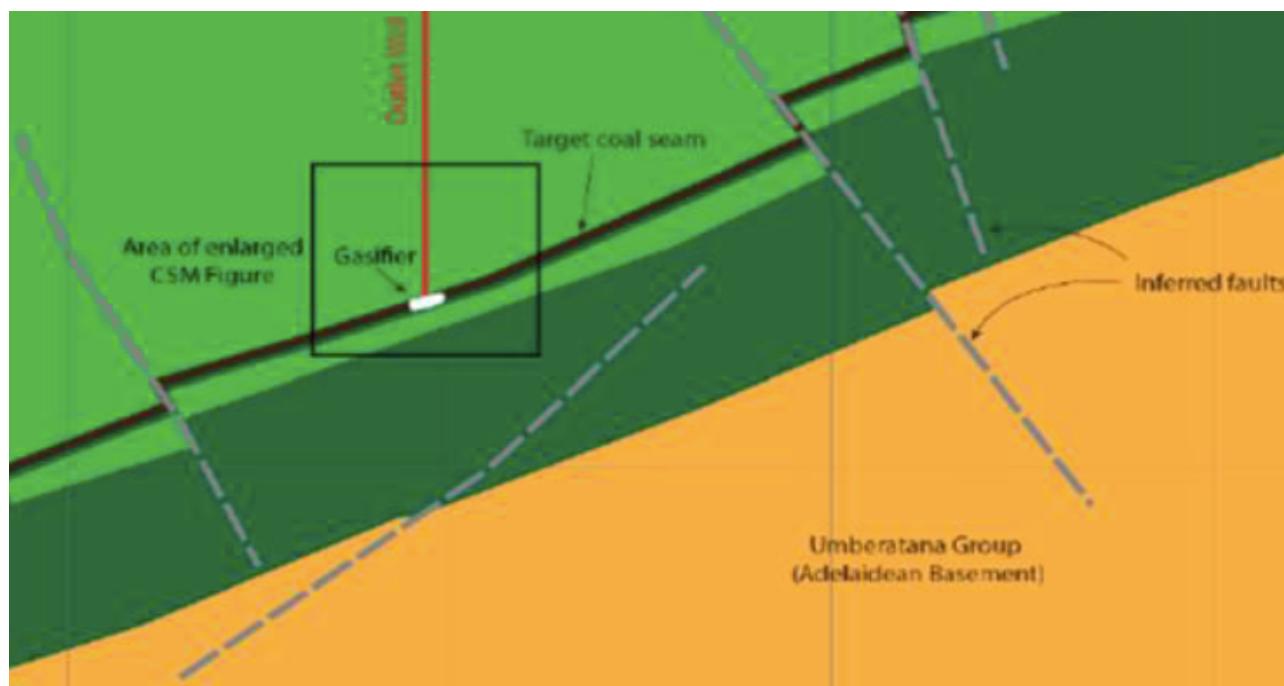
25. *Will the regulator stipulate further conceptual modeling to anticipate any negative outcomes that may arise under these conditions and will the regulator query the proponent regarding the omission of seismic and tidal events that are already well documented on the public domain and PIRSA information resources and experience abroad?*

26. *Clearly seismic disturbance is well documented in relation to unconventional gas mining in the US, begging the question of why the proponent has not anticipated such scenarios in what is well known as a seismically active region?*

27. *Can we trust the proponent in relation to the information of key risk when such omissions are apparent to a lay person?*

From their own statements contained in the EIR evidently not.

In relation to the publication of information related to the DPE/DPC review of the PEL650 and the [information published](#) in relation to this:

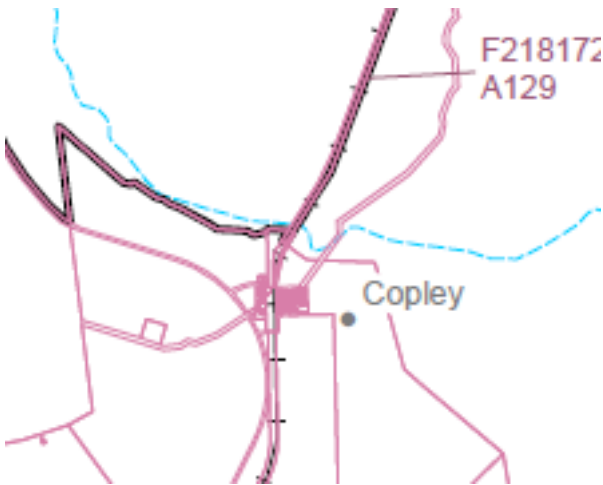


Coal seam capped by impermeable rock.	✓ ?	Coal seam is capped by approx. 500 m thickness of low permeability carbonaceous mudstone, an aquitard with respect to groundwater.
Target coal located so that there is sufficient thickness between the target coal seam / measure and any valuable aquifer higher up the geological succession.	✓	There are no aquifers within 500 m of the Demonstration Plant.
Sufficiently distant from rivers, lakes, springs and seeps to avoid contamination should chemical escape the cavity.	✓	No rivers, lakes, springs and seeps are located near the demonstration plant site (refer to Section 4.7). Pre-mining creek alignments across the broader mine site have been blocked by earthen walls, waste rock stockpiles and mine pits.
Absence of faulting or intrusions in the vicinity of the site. This is dependent on the size of the cavity.	?	Site is located approximately 100 m south of inferred fault, which does not penetrate the full depth of the Main Series Overburden and is likely closed with respect to potential for movement of gas or groundwater.
Sufficient distance from the nearest town and / or intensive surface infrastructure, e.g., irrigation or feedlots, and areas of significant environmental value, e.g., world heritage forests or wetlands, to avoid contamination should chemicals escape the cavity and to minimise impacts of odours.	✓	Site is over 8.5 km from Copley and 12 km from Leigh Creek township. No sensitive land-use or areas of significant environmental values are present at or near the site. (Site is within the former Leigh Creek Coalfield).

28. Why has one **single** community stakeholder only been presented information derived from the Lawrence Livermore Laboratory consulted by the DSD/DPC?
29. In reference to the excerpts of diagrams shown above from this why is the information per se different from the proponents presented information and chosen descriptions of information derived from supposedly the same data/source?

30. Why within the information presented to this **single** stakeholder is there discrete information of a nature contradicting itself per the words in the Camp and White UCG safety checklist, 'likely closed with respect to to potential for movement of gas or groundwater'?
31. In relation to the AWE/Greencap statement page 3 of appendix 'these faults do not penetrate the full sequence of strata, terminating in the carbonaceous mudstone **above** the coal...and are **likely closed**.' and in relation to the information relating to potential well casing breach scenario described, should not the scenario of risk presented by such a breach have been presented as a known risk in the proponents EIR?
32. Are not the complete lines of breach (AWE/Greencap) fig 4.6, three in total proximate to the intended UCG trial site **below** the gasification representing a risk of some magnitude?
33. Is there a potential conflict of interest for the State Government of South Australia's independent expert being the same key consultant of the proponent?
34. While the consultation referred to makes the statement 'Upper series overburden contained the **only** aquifers in the Telford Basin' (Section A-A) Is this statement not at variance with AWE/Greencap statements '**No** comprehensive studies of the Telford Basin groundwater systems are **known**. It is 'understood' localized groundwater investigations supporting the management the management of mine pit (geotechnical) stability were undertaken by mine operators?' (p.2) ?
35. With reference to the EIR matrix of risk and in light of the inconsistency of statements contained within the EIR in relation to knowledge of the Telford Basin, is the predominance of low and medium risk outcomes realistic from the viewpoint of the regulator in the light of the global record of UCG/CSG failed trials?
36. In relation to the presentation by Professor J.Campbell Gemmell to the SA Parliament, 29 November 2016, 'A Review of Underground Coal Gasification for Scottish Government', and with due regard to the global scope of the review and the results, and with specific reference to The Results#2, Basic technology elements - syngas collection, fugitive releases, cavity collapse et al, is the low risk probability seen as a realistic scenario in light of the global study?
37. Did the proponent and or the DSD/DPC draw upon the resource provided to the South Australian Parliament and if so is the risk of Syngas release via mishap as documented in the review , to water resources and associated ecological systems rank seriously in the current review conducted by DSD/DPC?
38. In relation to the conclusion in the report that 'no successful decommissioning worldwide' has occurred how will this conclusion impact upon the optimistic and simplistic statements in the EIR be considered to the satisfaction of the communities that appear not to have sufficient recourse in light of the liability and insurance issues outlined?

As a publicly gazetted town the boundary of is the extent of the 'commons' a well used recreational aspect of the town. To say the PEL650 is 1 km proximate to the town is to ignore the commons of the town which is a basic and traditional aspect of it.



39. *Is part of the proponents and governments plan to extinguish the Copley Commons, a **flora and fauna sanctuary** and recreational reserve?*
40. *Urgent clarification of the definition and proximity of the PEL 650 and the current meaning of 'Commons' in relation to land use and the Crown Lands Acts and related legislation, relevant to the Copley township is now urgently requested.*

The proponent states the southern boundary of the PEL650 is 1 kilometer approximate from Copley while the viewpoint and perspective of the residents of Copley would arguably be that the PEL650 footprint steps within the boundary of the township.

41. *If an obvious error, oversight or convenient interpretation of this magnitude is found in such a basic and critical aspect of the EIR, how does this reflect upon other estimations of likely and anticipated outcomes elsewhere in the statement?*

While the DSD has information (sub-judice) related to the extent and causation of damage in relation to the Darling Downs/Chinchilla (Linc Energy) disaster now extending beyond the 300km square exclusion zone, the Flinders Communities, unfavorably to themselves, do not.

42. *Will the department be sharing this information to the concerned stakeholders and does the access of this information portend a decision under the Act or any other instrument of the South Australian Government, prior to the official outcome of the willful negligence case QLD EPA v Linc Energy, so obviously connected to the proponent via its technical and financial capabilities and the current management of the LCK?*
43. *Why has the same information, sought by the Queensland EPA, for the benefit of the concerned communities been not forthcoming and does this not place the communities seeking to respond equally, fairly and intelligently to the government at a disadvantage?*
44. *If not, can the DSD/DPC explain the specific purpose of the visit to Chinchilla and the relevance of the sub-judice information sought and acquired?*

This would, for instance be seen as prejudicial and potentially damaging to the community presented 'Safe alternative to UCG' which has anticipated groundwater salinity and the aspects of land rehabilitation and horticultural opportunity available, documented within the unsolicited bid, *Playford Heritage Park*, presented to and now before the government of South Australia.

The South Australian government has now so far ignored a request for information pertaining to such by *Clemens Haskin Legal*, acting on behalf of the *William Light Foundation* and the communities.

Please note the Safe Alternative to UCG was presented to the government **prior** to the issue of the PEL650 and **after** what was viewed as a false and misleading first initial consultation by the proponent.

45. *Given the overlap of concerns, will the government that has not responded within the reasonable and generous timeframe requested be responding and if so, when?*

The recent response from Minister Brock for DPTI (copied), negates the original approach of the communities and the response then, from Minister Kyam Maher, indicating the aspirations of the communities as per the stated recommendations of the *Leigh Creek Futures Report*, be best served by the vehicle of an unsolicited bid (William Light Foundation), hence acted upon and presented but not responded properly or addressed.

A community directed approach, driven by explicitly stated policy and now revealed in light of Minister Brock's response to have been misled expensively and wastefully in a direction now quoted by a Minister of a different folio of a different viewpoint from the advice of the Minister (Maher) who originally directed the community in what is now stated to be the completely wrong direction?

46. *A sad collection of letters and emails demonstrating confusion by the Ministers of their own folio responsibilities. Is the cost of this confusion now to be worn by the communities who acted in good faith that Ministers of the Crown understood their responsibilities?*

47. *Clarification from the Government of South Australia is now sought as to the reason behind the changed circumstance of advice which directed the efforts of the community in in this direction, in the genuine interests, stated clearly in a meeting with the Minister Maher in 2015 of finding a fair and reasonable and safe alternative to the known then to be dangerous, experimental mining practice known variously as ISG, UCG or CSG.*

48. *Requests via Clemens Haskin Legal acting for the William Light Foundation in relation to this are outstanding and a prompt response to this is now urgently requested.*

Upon completion of this promised community surety, then and only then can there be information of perceived integrity and reasonable reliance from the viewpoint of the communities potentially impacted.

Deriving definitions of convenience to meet the requirements of the regulator is patently obvious in this example and extends to other definitions expressed in such a manner of

convenience and expediency and yet is not necessarily expressed rigidly in the public interest.

Beneficial Uses for example is a prescribed term of convenience relating to 'salinity' as measured by TDS and without resort to the mineral composition and therefore wider *Beneficial Use* - for instance salinity tolerant horticulture and revegetation.

49. *Therefore, your assistance to have these questions addressed is most urgent and necessary given the apparent fast track developments and stated recent optimism of the proponent.*

Guarantees sought via earlier consultations with DSD have not produced any satisfactory outcomes in terms of the 'what if' reasonable scenario presented via other CSG incidents and disasters and the PEL 650 gazetted appears to limit the extent of liability of the proponent and the government.

50. *Does the government agree that the PEL650 license gazetted offers no satisfactory solution to the communities that may reasonably be expected to evacuate and does the DSD/DPC offer any further solution in the event of calamity as reasonably anticipated in light of the Chinchilla experience and CSG outcomes elsewhere?*

51. *Regarding PEL650, in light of the Linc Chinchilla experience and the impact of risks on the community and environment: Why did the DSD require only a \$50,000 security bond? Why did the DSD require only a \$20M public liability (including sudden and accidental) insurance?*

The reasonable request of information relating to a damages scenario has not been addressed.

What would be a reasonable pecuniary response in terms of real estate, relocation and costs and associated trauma for an estimated local impacted population of say 300 individuals. On a conservative basis of compensation for 150 households (average 2 persons per household) at \$600,000 per such, to find new location and lifestyle and to compensate for loss of what was, a sum of \$90,000,000 presents itself.

52. *Prior to any further application process or process advancement at Ministerial discretion via the PGE Act (or other instruments) , will the government of SA at least promise surety at this level to enable any future need for community evacuation?*

53. *Did the DSD investigation of the Chinchilla disaster (sub-judice) extend to this aspect of the public interest and if not the request now in consideration of the statements and actions of the proponent is for an extension of it in the interests of the region should the proponent proceed with the trial which is indicated as a fait accompli via the investment now made and the statements forthcoming from the proponent.*

54. *In relation to the Chinchilla disaster is the total clean-up bill currently known, and what amounts have been spent to date, and who will be paying per the liquidated status of Linc Energy.*

55. *Can we (public) trust the proponent in relation to its contracted services and the limitations of liability that would under the statutory regime prohibit the resort of costs on account of the statements of limitation contained within the EIR and the PEL650?*
56. *Will the state government meet any deficit should the judgement or the decisions of the regulator, as per the example of the failed actions of the regulator in Queensland, result in such an adverse situation for the landholder/resident interests of the regional population?*
57. *The non response to this question is of a **major concern** and can the State Insurance Office now confirm if its coverage extends to the circumstance of loss resulting from any decision made by the regulator or the actions of the proponent, should the result be adverse for the communities, which have expressed these concerns in advance?*
58. *Can the state now clarify the limits of its liability in the interests of the local communities potentially impacted?*

Clearly the public impacted now by the Chincilla QLD disaster have not been compensated due to the liquidation of the company (LINC) and their failed but unresolved attempts to escape liability via the Corporations Act.

59. *Given the documented reliance of technology upon Linc Energy and Carbon Energy failed process does this mean the requirements of such oversight have already failed in relation to the actions impacting the site and the Ministers requirements to observe such under the provision of the PGE Act?*

From this sad lesson quoted (Chincilla) and the sad departure of George Bender via suicide after his failure to find rhyme or reason for the loss of his family assets through persistent and failed calls to the Queensland regulator.

[Pam Bender breaks down outside court as Linc Energy ordered to stand trial](#)

60. *Did the DSD meet with any of the members of the Bender family to ascertain information of the potential damages in SA or other people in the Darling Downs district impacted directly or indirectly by the CSG industry?*
61. *Can you, as the regulator, please clarify the scope and purpose of the investigation, (sub - judice), in the public interest?*
62. *In relation to the meeting of the stakeholder with DSD/regulator and in relation to the regulatory status update (below) and last bullet point - DPC decision is expected 1ST Quarter 2018, is the current understanding of the commitment given to the communities, via the responses of the Minister and the agreements made at public meeting, that no approval progress would proceed until an outcome of the Chincilla v QLD EPA negligence case, now be deemed a misunderstanding or has the circumstance now changed in relation to the sub-judice information now at hand following the DSD investigation at Chincilla?*

Regulatory Assessment Status

- Leigh Creek Energy (LCK) submitted its Environmental Impact Report (EIR) to DPC in late September
- Preliminary review of document by DPC completed
- DPC visited Queensland EPA to review evidence related to Linc Energy allegations
- DPC consulted with its US independent expert on 28th September
- DPC identified need for additional information to complete its review
- Next 3 wells LCK will drill will focus on geotechnical data to supplement EIR
- EIR will be resubmitted once data from wells is analysed
- DPC will review prior to releasing for stakeholder consultation
- DPC decision expected 1st Quarter 2018

Confidentiality-1#-A#



Government of South Australia
Department of the Premier
and Cabinet

Source: [Update on the Leigh Creek Energy SEO submission](#)

The perceived failure of specific undertakings made to the communities is a key theme of this response to the proponents EIR. Inherent perceived failures within the EIR which have potential to limit or eliminate the capacity of the communities to seek redress, should the report deficits potentiate future damage, is therefore seen as relevant to the response.

The body of the EIR is seen as reliant and dependent upon the consultants of the proponent and yet the consultants absolve themselves from liability within the report.

63. *Under the provisions of the PGE Act and its regulations are you as the regulator satisfied with the technical resources sourced and utilized by the proponent and forming the basis of this draft EIR?*

64. *Will the state government bridge this gap of liability or does this exemption have standing from the viewpoint of the Government of South Australia?*

Disclaimer of *Camp and White* as cited by Greencap/ AWE:

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This very brief and cursory review of the proponents EIR reveals it to be a low quality document portending huge disaster for a region celebrated worldwide for its biodiversity, archeology, geology and cultural heritage values.

Opportunities to capitalize on these and other aspects of the region were presented to Minister Maher personally in 2015. He failed to respond then and the response later has now been disregarded.

Instead the issue of exploration license PEL650 was issued by yourself, presenting drama and lost opportunities for the *Safe Alternative to UCG*, presented in good faith prior to this.

The Adelaide media has recently reported the failings of the governments *Leigh Creek Futures Report* and the failings of the transition process which has already arguably caused loss and promises more loss in the absence of a formal enquiry and actions to address the failure of policy and the actions of public servants made responsible for the task and who in evidence have at hand have failed the most basic provisions of SA Public Service Act, in regular and dramatic fashion, to the detriment of the communities.

The communities are now led to believe that approval of the LCK PCD is imminent. To quote from the LCK ASX announcement, 28/11/2017:

Plant Fabrication Update

Above Ground Plant

Ottoway Engineering (Ottoway) is nearing completion of the fabrication of the Above Ground Plant modules in its Adelaide facilities.

Ottoway has a long history of oil and gas and other engineering fabrication in South Australia, and is one of Australia's leading mechanical fabrication and installation contracting companies and provides specialised services to the petro-chemical, mining, defence and water industries. Ottoway has successfully completed a range of projects throughout Australia and maintains a permanent presence in the Cooper Basin servicing its long-term customers in the oil and gas industry.

Valves and Equipment

The majority of valves and equipment have been delivered to Ottoway ready for incorporation into the Above Ground Plant modules. This includes isolation valves, pressure control valves and pumps.

Thermal Oxidiser and Cold Vent

Gasco Pty Ltd has now completed the fabrication of the Thermal Oxidiser and Cold Vent with Factory Acceptance Testing finalized ready for delivery.

Well casing

Marubeni Itochu Tubulars Oceania (MITO) and BOMA are suppliers of Oil Country Tubular Goods (OCTG) and have been selected to provide casing for the PCD wells.

MITO's Australian branch is providing generic casing from standard stock used by most onshore oil and gas operators. BOMA is providing 'premium threaded casing' through its Perth branch via Dubai which has enhanced properties to withstand the high temperatures from the gasifier to the PCD. All casing has been ordered and is awaiting delivery to site.

Wellheads

Cactus Wellhead Pty Ltd manufactures and services pressure control equipment for onshore and offshore oil and gas drilling, completion and production and is an international expert and leader in wellhead design, manufacture and installation. Its branch in Brisbane has been selected as the preferred supplier for this design and supply contract. Final design is completed and fabrication is underway.

Electrical and Control Systems

ATSys Pty Ltd has completed the electrical design of the plant in their Adelaide office with construction and Factory Acceptance Testing of the electrical panels now complete and have been delivered to Ottoway for installation. Factory Acceptance Testing is underway for the Programmable Logic Controller (PLC), Human Machine Interface (HMI) and Supervisory Control and Data Acquisition (SCADA).

Gas Analysis and Instrumentation packages

The ABB supplied instruments have been delivered to Ottoway ready for incorporation into the Above Ground Plant modules. This includes pressure, temperature and flow measurement instruments.

Summary

With the funding for the construction of the PCD secured and approval documents substantially completed, the driving focus of the LCK Operations team is towards making of demonstration gas in the first quarter of 2018. The LCEP is accelerating rapidly. Current and expected progress is represented in the following graphic:

65. *In relation to the further 3 test bore holes requested to be drilled by the regulator can the regulator please disclose the location of these bore holes and the reason these extra test bore holes were requested?*

Is it a standard practice for a proponent to begin advanced construction of plant and equipment and to deliver it to a site prior to the completion stages of approval and prior to the submission of a production license?

66. *Is it unreasonable for the communities to infer from this that approval is a forgone conclusion, regardless of the statements made by the Minister?*

Barry, to quote Bob Dylan, the cited basis of this dangerous proposed trial is looked upon as a '[pig-circus](#)' and should it proceed on the basis of the information presented by the proponent, the communities are not given a chance.

In relation to the unresolved issue of independent hydrogeological review by the communities at the proponents cost and in relation to the [Agreement of Coal Seam Gas Large Coal Mining Development](#)

67. *Does the DSD/DPC understand the nature and the urgency for the community stakeholders need to have initiated the process of independent hydrological review in particular reference to the matter of aquifer connectivity and the real potential of loss in relation to this, particularly in light of the inconsistencies highlighted in this brief review of the proponents EIR?*
68. *Has or will the government refer the project to the Australian Government Minister for the Environment and Water Resources for a decision as to whether the project constitutes a controlled action under the provisions of the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)?*

Barry, the failures of this technology are well [documented](#) around the world and the global trend is for this experimental mining practice to be banned.

The unsatisfactory nature of both government and proponent key stakeholder consultations has been well documented as poor and indeed intentionally misleading for reasons of approval expediency.

The quality of this EIR is regarded as shoddy and populated with assumptions and uncertainties which run parallel to the Linc Energy UCG trial in Queensland, resulting in the biggest disaster in that states history.

69. *Are you satisfied to the extent that this technology is safe or worthwhile given the risks, and given the obvious weaknesses in the report and the history of the proponent?*

The Flinders Ranges is a world renown region of biodiversity, including sites of Aboriginal Significance and water systems hosting unique local and migratory species of birds and other flora and fauna which is at risk should this trial be considered for approval.

70. *To ensure that all risks are addressed and robust consultation is conducted, an undertaking is now sought from the government (by December 11, 2017) to assure the community that it will not approve any part of the project until:*

- I. an independent hydrology report has been submitted and any issues raised satisfactorily resolved*
- II. the EIR and SEO have been reviewed by an independent expert and any issues raised satisfactorily resolved*
- III. heritage nominations have been determined*
- IV. Aboriginal heritage concerns have been properly resolved*
- V. risks identified through the Linc Chinchilla experience have been addressed.*

In receipt of the acceptance of (70), a response to the questions raised here (by 5pm, **January 29, 2018**) to the EIR is acceptable and seen as a reasonable timeframe for the concerns to be addressed fully and comprehensively by the regulator.

Kind regards,

Nigel Carney
Chairperson
William Light Foundation

26th Feb (~~Midwest Mountains~~ ^{M.}) - [NB: No contact for any meeting]
LCKE - 2 Reps -

① Water allocation - as coal mine.

② Human Rights Tribunal - Health Impacts / Studies re UCG
Disease clusters - cancer, lung #, asthma, stroke, HD, kidney
No studies done, no stats available → exported to Adelaide
All mine personal - flown out to Adelaide - almost impossible to
trace Disease status / outcome
x I suggested a delay in continuance until results of tribunal.
#1

③ NT Fracking Tribunal

Company & Gov. complicity in hiding problems with casing.
Can we trust {LCKE} re accountability + transparency on reporting
{or Gov}

④ Hydrologist (Independent Report) ? Promised but not delivered.

• Water flow mistake (as with Perilya) Nth ^{1E} → Sth/W.
• Bonep NthE → Sth/W

• Hydrologist map by M. Poynder - stream bed identified
(dousing)

Concerns re water aquifer pollution.

⑤ Air Pollution Monitoring

• Base line study yet to be conducted. ? At drill site but not
to Copley or LC.

⑥ Self combusting coal fires - impact ?

⑦ Storage of compressed air (change from O_2) as igniter.

• ? what else

• 97% air

• 3% water / sand / (other substance to keep separation)

• ? chemical reaction with "air"

⑧ Waste:

- Water from well? - bursts? settlement ponds? reaction to coal.
- Other particulates created on separation of gas? Nitrogen
- Thermal oxidiser to be used to burn any excess/waste product.
Stated there will be no pollutants from this burning. ↑ temp.
to vaporise particulates / carbons, sulphides.

⑨. Deep concerns re 'worst case scenario' as with Chinchilla -
◦ Land prices / 'home' - loss of homes, safety, lifestyle, future
◦ Compensation - ? from tax payer / gov. or from company?
◦ Company responsibility to community, environment
Doubts / lack of trust in LCKE + Government (being lied to)
Dismissal of community concerns - "No" to drilling.

⑩ Asked them to explain / discuss my understanding of the process
◦ its differences to 'fracking' using diagram of "NT Tribunal" #1 & #2.
◦ discussed absurd suggestion of leaving pillars in the void
created by removal of gas etc., to prevent collapse of above ground /
rocks.

⑪ Suggested by ? Peterborough person to write a submission -
- Ph # given to Michael to call me. He is visiting on 26 Feb.
Verbal submission to him.

D. STARICK

P. RICHARDSON.

Attach # 1

Australian Tribunal into the Human Rights impacts of unconventional gas

HUMAN RIGHTS IMPACT OF UNCONVENTIONAL GAS • THURSDAY, NOVEMBER 16, 2017

During the week of May 14-18, 2018, the unconventional gas industry – CSG, fracking - goes on trial for its impact on our human rights to *health, life, safe and sustainable environment, water, privacy, property, information, free and informed consent, and participation.*

During that week the Permanent Peoples' Tribunal Session on the Human Rights Impacts of Fracking will ask its judges to apply the standards of international human rights law to six subcases. They will address the experiences of individuals and communities around the world who are being impacted by unconventional oil and gas extraction and usage, and by its resulting climate effects.

Today we are launching the Australian Tribunal into human rights impacts of unconventional gas website that will host the contribution Australians will be making to the tribunal. This website is our resource and gives us a chance to tell our story. It will help us have our experiences heard and to contribute to an international tribunal in a way that is achievable and effective.

Our government has failed us by not implementing suitable policy and regulations that monitors, investigates, enforces and redresses situations that enable such abuses to occur.

Our government has failed us by allowing profit to come before people, multinationals to come before the people of the nation, and by allowing our process of governing to be influenced and manipulated.

Today we invite you to hear our story. Today we invite you to tell your story.

[Like](#)[Comment](#)[Share](#)[Save](#)

50 Shares

13 Comments

View 5 more comments



Caroline Reid Ok I found this. Am I the only person who doesn't know about this? Must have been asleep one month! <https://www.tribunalonfracking.org/what-is-the-permanent.../>



What Is The Permanent Peoples' Tribunal? – Permanent Peoples'...

TRIBUNALONFRACKING.ORG

Like · Reply · 2w

1



Eric Oppel It appears that this "tribunal" has no actual legal powers?

Like · Reply · 2w



Human Rights Impact of Unconventional Gas Hi Eric, See response below. thanks.,,

Like · Reply · 2w



Human Rights Impact of Unconventional Gas "Human rights norms represent a moral minimum for behavior of governments and non-state actors, a moral floor beneath which policy and state regulated behaviors must not sink.

This Tribunal has No formal status in so far as it had not been granted any... See More

Like · Reply · 2w · Edited

2



Daniel Ferra Right On Charging On Hell and High Water

Like · Reply · 2w

1



Daniel Ferra What we have now, is a Broken Up Jet Stream,

That has been Pierced, and Lobed, ... See More

Like · Reply · 2w



Daniel Ferra Isostatic Rebounding of Greenlands Tectonic Plate, affecting (Gakkels Rift), causing Earthquakes in the Arctic, as well as Venting Mantle Methane.

This is the main driver of past extinctions, Mantle Methane Venting along Fault lines, we had an episod... See More

Like · Reply · 2w



Daniel Ferra We Our Baked in To 10C. to ? Temp Rise Right Now ! Even if We Stopped emitting Today.

Methane is the Not Clean Natural Gas, it is a Abrupt Global Warming Molecule That Holds Lots Of Water Vapor and Heat. ... See More

Like · Reply · 2w



Daniel Ferra "Last June, not long after a catastrophic thunderstorm swept through southern Ontario, bringing a month's worth of rain in just a few hours, a group of seventy-five architects, engineers, and policymakers from sixteen countries gathered in the city of ... See More

Like · Reply · 2w



Michael Roski You think all your hurricanes and change of climate is natural haha go check out HAARP and thank your government for that

Like · Reply · 1w



Write a comment...



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Air Pollution and human health hazards: a compilation of air toxins acknowledged by the gas industry in Queensland's Darling Downs

Geralyn McCarron

Pages 1-15 | Published online: 08 Jan 2018

Download citation <https://doi.org/10.1080/00207233.2017.1413221>

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Abstract

The paper offers an attempt to determine whether emissions from the unconventional gas industry are associated with hospitalisations in the Darling Downs, Queensland, Australia. Hospitalisation data were obtained from the Darling Downs Hospital and Health Services (DDHHS) and Coal Seam Gas (CSG) emissions data from the National Pollutants Inventory (NPI). Hospital admissions for circulatory and respiratory conditions, controlled for population, increased significantly from 2007 to 2014 ($p < 0.001$). Acute circulatory admissions increased 133% (2198–5141) and acute respiratory admissions increased 142% (1257–3051). CSG emissions increased substantially over the same period: nitrogen oxides (489% to 10,048 tonnes), carbon monoxide (800% to 6800 tonnes), PM10 (6000% to 1926 tonnes), volatile organic compounds (337% to 670 tonnes) and formaldehyde (12 kg to over 160 tonnes). Increased cardiopulmonary hospitalisations are coincident with the rise in pollutants known to cause such symptoms. Apparently, controls to limit exposure are ineffectual. The burden of air pollution from the gas industry on the wellbeing of the Darling Downs population is a significant public health concern.

Keywords: Queensland, unconventional, gas, emissions, cardiorespiratory, hospitalisation

Introduction

The Darling Downs (Figure 1) west of the Great Dividing Range in Southern Queensland, Australia has long been noted for its robust, diversified agricultural industry and natural beauty [1]. The Darling Downs Hospital and Health Service (DDHHS) covers an area of approximately 90,000 sq km with catchment population ca. 277,000 [2]. There has been rapid development of the resources industry (CSG, underground gasification, coal), superimposed on pre-existing rural, farming and small town communities in the area now often known by its geological name, 'the Surat Basin'.

Figure 1. Map DDHHS catchment showing Local Government Areas. Source: Author.





[Display full size](#)

Outdoor air pollution, especially in an industrial context, has demonstrated multiple negative human health effects [13]. Air pollution increases risks for a wide range of diseases including respiratory [14] and cardiac [15,16], and is a leading environmental cause of cancer deaths [17]. Some effects are long-term and causation can be difficult to prove. For instance, a heart attack or stroke resulting from exposure during a day of high ambient PM concentration may be a consequence of chronic disease progression associated with long-term exposure [18]. Emissions acknowledged by the CSG industry can be linked to both acute and chronic health effects (see Table 1, summary of air toxins/related health effects).

Table 1. Air toxins and associated health effects.

CSV Display Table



The unchecked expansion of unconventional gas companies into what was previously an agrarian area of the Darling Downs has led to the generation of extra emissions attributable to a single industry.

Concurrent with the rapidly expanding CSG developments, residents in Queensland's Darling Downs reported impairments to their health [23,24]. As acknowledged by the Darling Downs Public Health Unit (DDPHU) health impacts associated with Coal Seam Gas have been a major community concern. Since 2008 DDPHU has received a variety of health complaints related to this industry (including headaches, sore eyes, nosebleeds, rashes, respiratory symptoms, paraesthesia) [25].

Yet there has been a remarkable lack of substantive investigation into potential human health impacts of the CSG industry in the Darling Downs. No baseline environmental studies, human health risk assessments or health studies were undertaken before large-scale extraction took place. State-based research organizations expected to be active in the space have disclosed little research investigating the possible physical health impacts of unconventional gas emissions. The significant 2010 Australian Research Council linkage project 'A Human Health Risk Assessment for developing CSG water resources in Queensland' [26] was not pursued, purportedly because the industry partner, Santos, withdrew funding. A notable exception is the work of Werner et al. [27] reviewing hospitalisation data up to 2011 for 3 areas in Queensland, with the finding that certain hospital admissions rates (neoplasms and blood/immune diseases) increased more quickly in the CSG area than the other study areas, after adjusting for key sociodemographic factors. In other jurisdictions, specifically the USA, increased rate and severity of asthma attacks [28], increased hospitalisation [29] for asthma, cardiac, neurological and skin conditions, increased incidence of congenital heart defects [30], childhood leukaemia [31], low birth weight [32],

and early infant death [33] correlated with the presence of the unconventional gas industry. International researchers have documented significant declines in air quality correlating with gas industry activities [34–36].

Despite appeals from health professionals to improve oversight, state and federal regulatory bodies have failed to act. In 2013 the Australian Medical Association (AMA) issued a policy statement warning: 'Despite the rapid expansion of CSG developments, the health impacts have not been adequately researched, and effective regulations that protect public health are not in place' [37]. In 2013 also, the Queensland Government undertook a limited investigation into health complaints of Darling Downs residents [38]. The report, while unable to determine whether reported health effects were clearly linked to exposure to CSG pollutants, acknowledged that there was 'some evidence that might associate some of the residents' symptoms to exposure to airborne contaminants arising from CSG activities.' The critical recommendation from Queensland Health was that the regulator, the Department of the Environment and Heritage Protection (DEHP) monitor overall CSG emissions and the exposure of local communities to those emissions. DEHP acknowledged that they did not have access to data to allow for comparisons to the air quality objectives set out in the Environmental Protection Policy (EPP) (Air) to protect environmental values (including health and wellbeing). Despite this, DEHP determined that they found no cause to expand monitoring, thereby blocking Queensland Health's recommendation that overall gasfield emissions and the exposure of the community to those emissions be monitored [39]. The rejection by the regulator of these recommendations is of serious concern.

The anecdotal reports of health effects related to CSG industry activity [23], coupled with the dearth of available research in the Australian context, motivated this investigation. This paper seeks to compile available reported emissions from CSG installations in the Darling Downs area and determine whether such activity is coincident with an increase in acute health effects. It brings together data on air pollutants as reported by the industry to the National Pollutant Inventory (NPI) [40], population data from the Australian Bureau of Statistics (ABS) and hospitalisation data from the Darling Downs Hospital and Health Services (DDHHS).

Method

Population data

Estimated resident population by local government area (LGA), Queensland, 2007–2014 (Queensland Government Statistician's Office) was sourced from ABS 3218.0, Regional Population Growth, Australia, 2015–2016 and Queensland Treasury estimates where Geographies were based on the 2016 edition of the Australian Statistical Geography Standard (ASGS) [41].

Air toxics data

Reported emissions to air were obtained from the Commonwealth Department of the Environment's National Pollutant Inventory Website [40]. Above a defined threshold, the Australian Government requires polluting industries to self-report to the NPI their calculated, estimated emissions of 93 toxic substances, identified as important owing to their possible effect on human health and the environment.

Hospital admission data

Inpatient admissions were obtained for DDHHS and South West residents treated within all acute public hospital facilities interfaced to the Transition 11 clinical benchmarking system. This included all Activity Based Funding (ABF) facilities and the majority of satellite facilities within each HHS, but excluded the Brisbane Mater Adult, Mothers and Children's Hospitals. Hospitalisation of residents from South West has been separated from the main DDHHS data, as with such a large, sparsely populated area (310,000 km², population approximately 26,000) it is difficult to draw inferences regarding activity and effects. Data on hospital admissions were provided by DDHHS for the years 2006–2015. Data for 2006 were partial (01/07/06 to 31/12/06) and data for 2015 was also incomplete (01/01/15 to 18/08/15) and were excluded.

Statistical analysis

Acute hospital admission data (circulatory and respiratory) were controlled for population increases in the DDHHS catchment. Linear regression analysis was performed using SPSS.

Results

In the DDHHS region, in 2015 there were 3521 registered births and 2353 registered deaths. In 2011, 2.4% of the population (2763) in the region was employed in mining.¹ Statistics from the ABS indicate population increase from 252,785 to 276,723 [41]. The region with regard to Queensland regional statistics means the area serviced by the Darling Downs Hospital and Health Service as shown by their maps; including Cherbourg, Goondiwindi, South Burnett, Southern Downs, Toowoomba and Western Downs, and Taroom.^{2, 3}

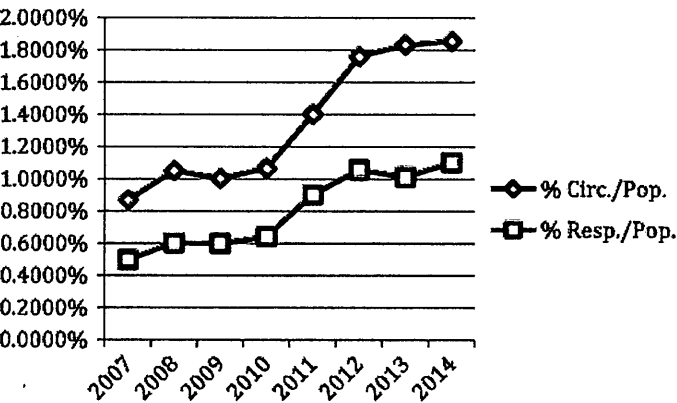
Linear regression analysis was performed on the hospital admissions data, controlled for population, versus time (Table 2 and Figure 2). Admissions for circulatory conditions significantly increased over the period from 0.87% in 2007 to 1.86% in 2014 ($R^2 = 0.908, p < 0.001$). Respiratory admissions also significantly increased from 0.50% in 2007 to 1.10% in 2014 ($R^2 = 0.913, p < 0.001$).

Table 2. DDHHS acute hospital admissions by residence and year.

CSV Display Table



Figure 2. DDHHS acute circulatory and respiratory hospital admissions as a percentage of population from 2007 to 2014.

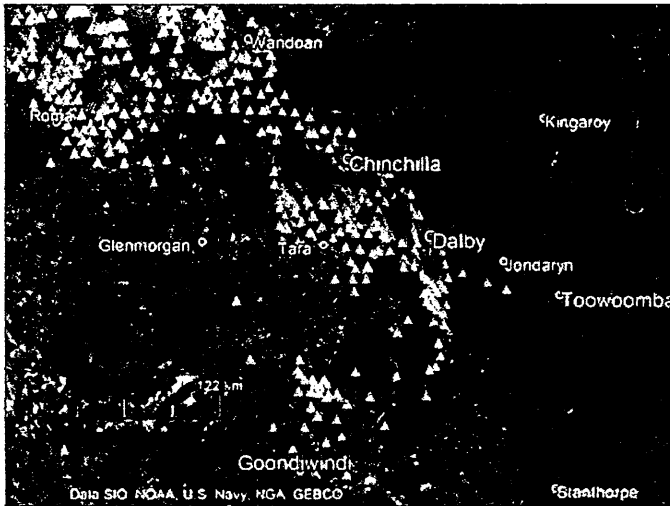


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Figure 3 shows a map of the Darling Downs showing towns, gas wells and gas facilities. Table 3 is a compilation of emissions reported to the NPI by QGC, Origin, Santos, and Arrow facilities in the DDHHS catchment (2005/06–2015/16). Figures 4 and 5 graph selected emissions (2007–2014).

Figure 3. Map: gas wells (triangles), CSG emission reporting sites (flame). Source Google Earth Pro, overlay Landstat/Copernicus. (cited 2017 August 4).





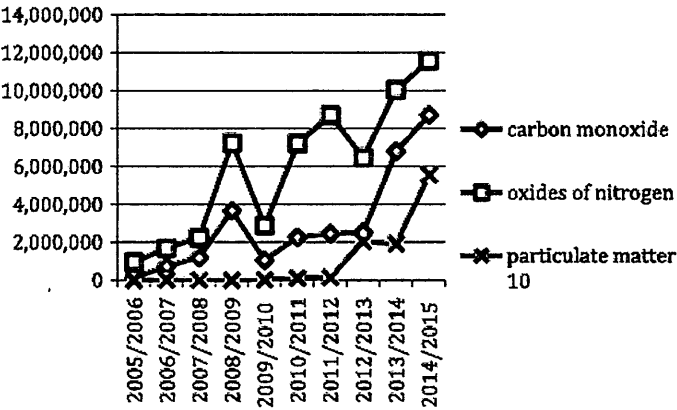
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Table 3. Compilation NPI data, self-reported emissions (kilograms) QGC, Origin, Santos, Arrow facilities DDHHS Western Darling Downs catchment 2005/06–2015/16.



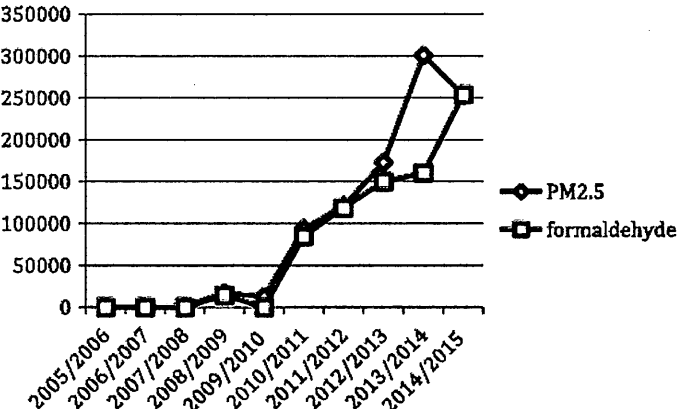
CSV Display Table

Figure 4. Selected emissions: carbon monoxide, oxides of nitrogen, particulate matter 10, (Kilograms) Western Darling Downs, reported by CSG companies QGC, Origin, Arrow, Santos.



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Figure 5. Selected emissions: Particulate matter 2.5, formaldehyde (Kilograms) Western Darling Downs, reported by CSG companies QGC, Origin, Arrow, Santos.



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Limitations

There are limitations to the data available for consideration. For instance it was not possible to break down admissions into demographics (age/gender) and times/dates of admission. Factors for which data are unavailable are the change, if any, in the population rates of cigarette smoking and obesity, and the prior health status of residents who may have moved into (and out of) the area between 2007 and 2014. The contribution to ill health of viral epidemics is unknown (e.g. swine flu 2009, but the expected peak and return to baseline in the following year did not occur (Table 2).

NPI reporting of emissions is annual, with no data available on times/dates/durations of peak emissions, and no data available on the prevailing weather conditions. The difficulty in correlating lower volume pollutants to chronic (cancer, neurodevelopmental) health conditions is recognised, hence the need to rely on high volume pollutants and acute health effects. An assessment of the cumulative load of air toxins such as phenol, n-hexane, PAHs and heavy metals was impossible as reporting was inconsistent. Other resource developments (coal/underground gasification), and possible changes in agricultural practices have not been studied.

It is also notable that the gross emission values provided by the NPI are industries' estimates of their releases to air. As these are total annual estimates, it is impossible to calculate the resulting concentration of pollutants, either individually or combined in the airshed at any given time with any confidence. Nor can the results be used to compare air emissions against any relevant national or state air quality guidelines or standards, given as concentrations. Estimates of the aggregate pollutant load and concentration do not capture spatial or temporal conditions, which may lead to dangerous exposure and therefore acute or chronic health effects (point emission, low air temperature, etc. See below).

Discussion

There are noted anomalies in the industry NPI data. In 2008/2009 across all Arrow projects, there was detailed reporting of a wide range of toxins, yet many were not reported previously or since. During that year, levels of carbon monoxide and oxides of nitrogen were significantly higher than recorded in the preceding/following year. No explanation is apparent. After 2009/2010 several projects across the Darling Downs and South West no longer reported benzene, though previously reporting significant volumes. Despite undertaking comparable activities, Santos consistently failed to report formaldehyde emissions while QGC reported up to 219 tonnes per year. Although reporting is a statutory requirement, data are self-calculated (estimated, not measured) and are not reported below a threshold. It is difficult to know how such reporting could be audited. It is plausible that emissions have been substantially underestimated.

Emissions reported by the CSG industry to the NPI have escalated since expansion of CSG from 2006 onwards. Toxins include particulate matter *with over 6,000% increase* in reported emissions of PM₁₀ between the years of 2006/2007 and 2013/2014 (29.19–1926.9 tonnes). Reported emissions of PM_{2.5} increased from zero to 301 tonnes. Emissions of oxides of nitrogen *increased by 489%*, (1704–10048 tonnes) VOCs by 337%, (153.4–670.6 tonnes) CO *by 801%*, (754–6,800 tonnes) SO₂ *by more than 1000%* (1.14–12.97 tonnes) and, remarkably emissions of the known carcinogen formaldehyde *increased from 12 kg to 160.42 tonnes* over the same time period. Further escalation in emissions is noted in the reporting periods 2014/2015, and 2015/2016 (Table 3).

Between the years of 2007 and 2014, hospitalisations of DDHHS patients for respiratory conditions increased by 142%, and hospitalisations for circulatory conditions increased by 133%. Hospitalisations from DDHHS areas fluctuated between 2007 and 2010 with significant rates of change apparent in 2010/2011 (circulatory conditions increased 32%, respiratory conditions 42%) and 2011/2012 (circulatory conditions increased 27%, respiratory conditions 18%). Increases were evident across all DDHHS areas including areas relatively distant from intense gas field industrialisation such as Goondiwindi and Inglewood.

Interpretation of individual changes in these very low population centres is made more difficult by the number of drive in/drive out gasfield workers from across the Darling Downs.

Changes are not explicable by the modest population increase of 9.46% during the same time period, or the change in median age, which over the longer time frame of 2005–2015 increased by 2.4 years. They do however give weight to the community's perception that there has been an adverse change in their health status. It is noted that these changes were not commented on in the Queensland Government 2013 CSG investigation. This may relate to the limits of their terms of reference and/or lag time with data compilation.

There is international acknowledgement of the serious adverse impacts on human health of air pollution in general, and the toxicity of the specific air pollutants reported by the gas industry to the NPI (see Table 1, summary of air toxins/related health effects). Many families, including young children are, for up to 24 h a day, living, breathing and sleeping in the midst of point emission sources in Queensland's gasfields. They are exposed to acute peaks and chronic, lower concentrations of mixtures of harmful chemicals. Air dispersion throughout the regional airshed means the broader population is likely to be repeatedly exposed to lower doses of the same toxins.

Although the quantity of emitted pollutants is notionally 'within guidelines,' there does not appear to be a level of emissions unacceptable to industry or the regulator. Former Queensland Premier Campbell Newman stated: 'Emission limits are not prescribed for each gas well or the broader reticulation system but rather, emissions from this infrastructure must not cause nuisance or environmental harm' (Letter from The Hon. Campbell Newman, Premier of Queensland, to Dr McCarron, 7th November 2012).

Currently, production facilities act with the assumption that emitted pollutants will be dispersed in the surrounding airshed to 'safe' levels (Dilution is assumed to be the solution to pollution) [42].

Since there is an unexplained rise in hospitalisations for health conditions associated with exposure to CSG emissions coincident with the expansion of the industry, it is questionable whether this management strategy is effective. Such a method for the neutralisation of harmful wastes largely ignores local environmental effects: large-volume point emissions, wind strength/direction and day/night temperature differences which could lead to adverse levels of exposure.

Australia has National Air Quality Standards with defined maximum limits for the aforementioned pollutants (CO, NO₂, Ozone, SO₂, Lead, PM₁₀) over specified averaging periods [43]. Yet without real-time 24 h monitoring, there is no way to know whether such standards have been exceeded. Additionally, deleterious health effects have been noted to occur at levels below current air quality guidelines, and for many pollutants it is not clear whether a safe threshold exists [3]. The Queensland Government has an ambient air-monitoring network [44], but before February 2015 there was not a single air monitoring station sited in the expanding gas fields, with no station west of Jondaryan (see Figure 3, operated March 2014–Aug 2016). Air monitoring has been infrequent, ad hoc, episodic and reactive [45]. Often, air monitoring did not occur until weeks after the local community reported extreme pollution events such as intense flaring. Monitoring and reporting practices for air quality appear inadequate to protect public health [46]. Drinkwater (2015) noted the limited monitoring data received through the RTI process, and queried whether there is a shortfall in the process or whether monitoring data simply do not exist [47]. Both considerations point to regulatory failure.

In this study the limitations of reporting requirements to the NPI were such that it was not possible to calculate the cumulative load of low volume highly toxic pollutants (phenol, PAH, BETX, heavy metals, etc.). Nevertheless, the need to monitor and restrict emissions of such pollutants is critically important, as they may be associated with future chronic health conditions, including cancer [48] and neurodevelopmental abnormalities [49].

DDHHS hospitalisation data for acute respiratory and circulatory conditions appear consistent with short-term health impacts of air pollution. Of concern is the future health of a population subject to chronic exposure. Long-term, real-time 24-h exposure monitoring to capture the temporal and spatial variability of a wide range of key environmental toxins *is necessary to assess exposure*. Average ambient levels do not give an adequate assessment of the health risks to vulnerable subgroups of the population [50]. This applies particularly to children, pregnant women, the ill, including those with pre-existing cardiac and respiratory disease, and the elderly. It applies to those living in close proximity to infrastructure, who are exposed to spikes of multiple air toxins, with increased risks on still nights during temperature inversions. These are the populations also at most risk to high volume pollutants. Children, with their high ventilation rates per body weight and increased activity and play

outdoors, are particularly susceptible to the adverse effects of air pollution [51]. When exposed to mixtures of toxic chemicals they have heightened risk because of the immaturity of their immune and metabolic responses and their potential to live long enough for latent illnesses to develop [52]. It is increasingly recognised that even current air standards properly applied provide suboptimal protection for the most vulnerable in our society. Monitoring by the regulatory bodies has been ineffectual and inadequate to protect public health. Over the past decade, an unmistakeable and significant change in the life of residents of the Darling Downs has related to the arrival and activities of the CSG industry. There has been an escalation in health impairment correlating with, and potentially attributable to, the escalating air pollution from this heavy industry. This is demonstrated by acute respiratory and circulatory hospitalisation. Hospitalisation is an extreme indicator of morbidity and does not take into account the potential full spectrum of health harms experienced by the community.

Conclusion

Health impacts from Coal Seam Gas have been a major community concern since the introduction of CSG industries in Queensland. For almost a decade the community has recognised and reported concerns about their changed health status.

Whilst the full range of factors underlying the escalating hospitalisation of Darling Downs' residents for acute respiratory and circulatory conditions is unknown, the DDHHS statistics are significant and warrant full investigation as to causal factors. Communities in the Darling Downs have been exposed to significant pollution associated with the rapid and extreme industrialisation by the gas industry and with toxins directly attributable to that industry. The considerable growth in hospitalisations for acute respiratory and circulatory conditions concurrent with the increase in toxic pollutants in the local airspace suggests that controls to limit exposure are ineffectual.

A growing body of published research on the industry's emissions and resultant adverse health impacts supports the decisions by other jurisdictions (France, Ireland, Bulgaria, New York State), to impose bans on unconventional gas development. Acute hospitalisation data from the Darling Downs raise a red flag. It is urgent that there should be a comprehensive investigation of the health impacts from the unconventional gas industry in Australia.

Disclosure statement

No potential conflict of interest was reported by the author.

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Notes

1. 'Mining' includes coal mining, oil and gas extraction, metal ore mining, non-metallic mineral mining and quarrying, exploration and other mining support services.
2. <http://www.qgso.qld.gov.au/index.php>.
3. For reasons of space, the author is not including supplementary material in the paper, but it can be provided upon request.

References

1. Queensland Government, 2012, *The Queensland plan regional snapshot darling downs*. Available online at: <http://www.queenslandplan.qld.gov.au/resources/assets/regional-fact-sheets-darlingdowns.pdf> (accessed 21 July 2017). [Google Scholar]
2. Queensland Government, Queensland Health, 2016, *Darling Downs hospital and health service annual report*. Available online at: https://www.health.qld.gov.au/__data/assets/pdf_file/0017/431045/ddhhs-annualreport1516.pdf (accessed 24 June 2017). [Google Scholar]
3. World Health Organization, 2013, *Review of evidence on health aspects of air pollution – REVIHAAP Project: final technical report*. Available online at: <http://www.euro.who.int/en/health-topics/environment-and-health/air-quality/publications/2013/review-of-evidence-on-health-aspects-of-air-pollution-revihaap-project-final-technical-report> (accessed 24 June 2017). [Google Scholar]
4. Guarnieri, M. and Balmes, J.R., 2014, *Outdoor air pollution and asthma Lancet*, **383**, 1581–1592. doi:10.1016/S0140-6736(14)60617-6.[Crossref], [Google Scholar]
5. Brook, R.D., Rajagopalan, S., Pope, C.A., Brook, J.R., Bhatnagar, A., Diez-Roux, A.V., Holguin, F., Hong, Y., Luepker, R.V., Mittleman, M.A., Peters, A., Siscovick, D., Smith, S.C Jr., Whitsel, L., and Kaufman, J.D, 2010, Particulate matter air pollution and cardiovascular disease: an update to the scientific statement from the American Heart Association. *Circulation*, **121**(21), 2331–2378.10.1161/CIR.0b013e3181d8e11e[Crossref], [PubMed], [Web of Science ®], [Google Scholar]
6. EPA, 2009, *Integrated Science Assessment (ISA) for particulate matter (final report)*. Washington, DC: United States Environmental Protection Agency. Available online at: <http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=216546#Download> (accessed 21 July 2017). [Google Scholar]
7. IARC (International Agency for Research on Cancer), 2013, PRESS RELEASE No 221. Available online at: https://www.iarc.fr/en/media-centre/iarcnews/pdf/pr221_E.pdf (accessed 4 August 2017). [Google Scholar]
8. Hime, N., Cowie, C., Marks, G., 2015, Review of the health impacts of emission sources, types and levels of particulate matter air pollution in ambient air in NSW Produced for the NSW Environment Protection Authority and NSW Ministry of Health, Environmental Health Branch. Available online at: http://www.carcre.org.au/images/content/Health%20impacts%20of%20PM%20report_final%20for%20web.pdf (accessed 4 August 2017). [Google Scholar]
9. Queensland Government, 2011, Department of Employment, Economic Development and Innovation. Health effects of nitrogen oxides. Available online at: https://www.dnrm.qld.gov.au/__data/assets/pdf_file/0020/212483/2-health-effects-of-nitrogen-dioxide.pdf (accessed 4 August 2017). [Google Scholar]
10. EPA, 2016, *Basic information about NO2*. United States Environmental Protection Agency. Available online at: <https://www.epa.gov/no2-pollution/basic-information-about-no2> (accessed 2 July 2017). [Google Scholar]
11. Kleinerman, J., 1997, Some effects of nitrogen dioxide on the lung. *Federation Proceedings*, **36**(5), 1714–1718. PMID 844614. Available online at: <http://europepmc.org/abstract/med/844614> (accessed 2 July 2017). [Google Scholar]
12. Gauderman, W.J., Avol, E., Gilliland, F., Vora, H., Thomas, D., Berhane, K., McConnell, R., Kuenzli, N., Lurmann, F., Rappaport, E., Margolis, H., Bates, D., and Peters, J., 2004, The effect of air pollution on lung development from 10 to 18 years of age. *New England Journal of Medicine*, **351**(11), 1057–1067.10.1056/NEJMoa040610[Crossref], [PubMed], [Web of Science ®], [Google Scholar]

13. Halonen, J.I., Lanki, T., Yli-Tuomi, T., Kulamala, M., Tittanen, P., and Pekkanen, J., 2008, Urban air pollution, and asthma and COPD hospital emergency room visits. *Thorax*, **63**(7), 635–641.10.1136/thx.2007.091371
[Crossref], [PubMed], [Web of Science ®], [Google Scholar]
14. EPA, 2008, *Integrated science assessment for oxides of nitrogen – health criteria (final report)* (Washington, DC: United States Environmental Protection Agency). Available online at: <http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=194645#Download>. (accessed 2 July 2017). [Google Scholar]
15. Raub, J.A., 1999, Health effects of exposure to ambient carbon monoxide. *Chemosphere – Global Change Science*, **1**, 331–351.10.1016/S1465-9972(99)00005-7[Crossref], [Google Scholar]
16. Brauer, M., Hoek, G., Smit, H.A., de Jongste, J.C., Gerritsen, J., Postma, D.S., Kerkhof, M., and Brunekreef, B., 2007, Air pollution and development of asthma, allergy and infections in a birth cohort. *European Respiratory Journal*, **29**(5), 879–888.10.1183/09031936.00083406[Crossref], [PubMed], [Web of Science ®], [Google Scholar]
17. Karr, C.J., Lumley, T., Schreuder, A., Davis, R., Larson, T., Ritz, B., and Kaufman, J., 2007, Effects of subchronic and chronic exposure to ambient air pollutants on infant bronchiolitis. *American Journal of Epidemiology*, **165**(5), 553–560.
[Crossref], [PubMed], [Web of Science ®], [Google Scholar]
18. Brunekreef, B. and Forsberg, B., 2005, Epidemiological evidence of effects of coarse airborne particles on health. *European Respiratory Journal*, **26**(2), 309–318.10.1183/09031936.05.00001805[Crossref], [PubMed], [Web of Science ®],
[Google Scholar]
19. Lin, S., Liu, X., Le, L.H., and Hwang, S-A., 2008, Chronic exposure to ambient ozone and asthma hospital admissions among children. *Environmental Health Perspectives*, **116**(12), 1725–1730.10.1289/ehp.11184[Crossref], [PubMed], [Web of Science ®],
[Google Scholar]
20. Australian Government Department of the Environment and Energy, 2014, *National pollutant inventory. Sulfur dioxide* (Internet). Available online at: <http://www.npi.gov.au/resource/sulfur-dioxide> (accessed 5 June 2017). [Google Scholar]
21. U.S. Department of Health and Human Services National Cancer Institute, 2011, *Formaldehyde and cancer risk*. Available online at: <http://www.cancer.gov/about-cancer/causes-prevention/risk/substances/formaldehyde/formaldehyde-fact-sheet#q4> (accessed 5 June 2017). [Google Scholar]
22. U.S. Department of Health and Human Services, 2016, *National toxicology programme. Report on carcinogens fourteenth edition*. Available online at: <https://ntp.niehs.nih.gov/ntp/roc/content/profiles/formaldehyde.pdf> (accessed 4 August 2017).
[Google Scholar]
23. McCarron, G., 2013, *Symptomatology of a gas field* (Internet). Available online at: <http://www.ntn.org.au/wp/wp-content/uploads/2013/05/Symptomatology-of-a-gas-field-An-independent-health-survey-in-the-Tara-rural-residential-estates-and-environs-April-2013.pdf> (accessed 26 July 2017). [Google Scholar]
24. McCarron, G. and King, D., 2014, Unconventional natural gas development: economic salvation or looming public health disaster? *ANZJPH*, **38**, 108–109. doi:10.1111/1753-6405.12196.[Crossref], [Google Scholar]
25. Queensland Government Queensland Health DDPHU, 2013, *Coal seam gas in the Tara region: Summary risk assessment of health complaints and environmental monitoring data*. Appendix 1. Available online at:
<http://www.tandfonline.com/doi/full/10.1080/00207233.2017.1413221>

- <https://www.health.qld.gov.au/research-reports/reports/environmental-health> (accessed 4 August 2017). [Google Scholar]
26. University of Queensland. *Centre for coal seam gas* (Internet). Available online at: <http://research.ccsq.uq.edu.au/projects/human-health-risk-assessment-developing-csg-water-resources-queensland> (accessed 24 June 2017). [Google Scholar]
27. Werner, A.K., Watt, K., Cameron, C.M., Vink, S., Page, A. and Jagais, P., 2016, All-age hospitalisation rates in coal seam gas areas in Queensland, Australia, 1995–2011. *BMC Public Health*, **16**, 125. doi:10.1186/s12889-016-2787-5. [Crossref], [PubMed], [Web of Science ®], [Google Scholar]
28. Rasmussen, S.G., Ogburn, E.L., McCormack, M., Casey, J.A., Bandeen-Roche, K., Mercer, D., and Schwartz, B.S., 2016, Asthma exacerbations and unconventional natural gas development in the Marcellus Shale. *JAMA Internal Medicine*, **176**(9), 1334–1343, 1 September. doi:10.1001/jamainternmed.2016.2436[Crossref], [PubMed], [Web of Science ®], [Google Scholar]
29. Jemielita, T., Gerton, G.L., Neidell, M., Chillrud, S., Yan, B., Stute, M., Howarth, M., Saberi, P., Fausti, N., Penning, T.M., Roy, J., Probert, K.J., and Panettieri, R.A., 2015, Unconventional gas and oil drilling is associated with increased hospital utilization rates. *PLoS One*, **10**(8), e0137371. doi:10.1371/journal.pone.0137371.[Crossref], [PubMed], [Web of Science ®], [Google Scholar]
30. McKenzie, L.M., Guo, R.Z., Savitz, D.A., Newman, L.S. and Adgate, J.L., 2014, Birth outcomes and maternal residential proximity to natural gas development in rural Colorado. *Environmental Health Perspectives*, **122**, 412–417. doi:10.1289/ehp.1306722.[Crossref], [PubMed], [Web of Science ®], [Google Scholar]
31. McKenzie, L.M., Allshouse, W.B., Byers, T.E., Bedrick, E.J., Berrin, S. and Adgate, J.L., 2017, Childhood hematologic cancer and residential proximity to oil and gas development. *PLoS One*, **12**(2), e0170423. doi:10.1371/journal.pone.0170423. [Crossref], [PubMed], [Web of Science ®], [Google Scholar]
32. Stacy, S.L., Brink, L.A., Larkin, J.C., Sadovsky, Y., Goldstein, B.D., Pitt, B.R., and Talbott, E.O., 2015, Perinatal outcomes and unconventional natural gas operations in southwest Pennsylvania. *PLoS One*, **10**, e0126425. doi:10.1371/journal.pone.0126425.[Crossref], [PubMed], [Web of Science ®], [Google Scholar]
33. Busby, C. and Mangano, J.J., 2017, There's a world going on underground – Infant mortality and fracking in Pennsylvania. *Journal of Environmental Protection*, **8**, 381–393. doi:10.4236/jep.2017.84028.[Crossref], [Google Scholar]
34. Edwards, P.M., Brown, S.S., Roberts, J.M., Ahmadov, R., Banta, R.M., deGouw, J.A., Dube, W.P., Field, R.A., Flynn, J.H., Gilman, J.B., Graus, M., Helmig, D., Koss, A., Langford, A.O., Lefer, B.L., Lerner, B.M., Li, R., Li, S-M., McKeen, S.A., Murphy, S.M., Parrish, D.D., Senff, C.J., Soltis, J., Stutz, J., Sweeney, C., Thompson, C.R., Trainer, M.K., Tsai, C., Veres, P.R., Washenfelder, R.A., Warneke, C., Wild, R.J., Young, C.J., Yuan, B., and Zamora, R., 2014, High winter ozone pollution from carbonyl photolysis in an oil and gas basin. *Nature*, **514**(7522), 351–354. doi:10.1038/nature13767.[Crossref], [PubMed], [Web of Science ®], [Google Scholar]
35. McDuffie, E.E., Edwards, P.M., Gilman, J.B., Lerner, B.M., Dube, W.P., Trainer, M., Wolfe, D.E., Angevine, W.M., deGouw, J., Williams, E.J., Telvin, A.G., Murphy, J.G., Fischer, E.V., McKeen, S., Ryerson, T.B., Peischi, J., Holloway, J.S., Aikin, K., Langford, A.O., Senff, C.J., Alvarez, R.J., Hall, S.R., Ullmann, K., Lantz, K.O., and Brown, S.S., 2016, Influence of oil and gas emissions on summertime ozone in the Colorado Northern Front Range. *Journal of Geophysical Research: Atmospheres*, **6**, 8–9. doi:10.1002/2016JD025265.[Crossref], [Google Scholar]
36. Vinciguerra, T., Yao, S., Dadzie, J., Chittams, A., Deskins, T., Ehrman, S., and Dickerson, R.R., 2015, Regional air quality impacts of hydraulic fracturing and shale natural gas activities: evidence from ambient VOC observations. *Atmospheric Environment*. <http://www.tandfonline.com/doi/full/10.1080/00207233.2017.1413221>

110, 144–150. doi:10.1016/j.atmosenv.2015.03.056.[Crossref], [Web of Science ®], [Google Scholar]

37. Australian Medical Association, 2013, Webpage. Available online at: <https://ama.com.au/ausmed/if-doubt-turn-csg-ama> (accessed 30 June 2017). [Google Scholar]
38. Queensland Government Queensland Health, 2013, *Coal seam gas in the Tara region: Summary risk assessment of health complaints and environmental monitoring data*. Available online at: <https://www.health.qld.gov.au/research-reports/reports/environmental-health> (accessed 4 August 2017). [Google Scholar]
39. Right To Information Documents. 2013/2014. Available online at: http://www.lockthegate.org.au/further_reading (accessed 26 July 2017). [Google Scholar]
40. Australian Government Department of the Environment and Energy. National Pollutant Inventory (Internet). Available online at: <http://www.npi.gov.au/about-npi> (accessed 24 June 2017). [Google Scholar]
41. Queensland Government. Statistician's office (Internet). Available online at: <http://www.qgso.qld.gov.au/products/tables/erp-lga-qld/index.php?region=mackay> (accessed 24 June 2017). [Google Scholar]
42. Strnisa, D., 2017, *Dilution* (internet). Available online at: <http://www.pollutionissues.com/Co-Ea/Dilution.html> (accessed 21 July 2017). [Google Scholar]
43. Australian Government. Department of the Environment and Energy. Air quality standards (Internet). Available online at: <http://www.environment.gov.au/protection/air-quality/air-quality-standards> (accessed 15 July 2017). [Google Scholar]
44. Queensland Government. *Air monitoring network* (Internet). Available online at: <https://www.qld.gov.au/environment/pollution/monitoring/air-monitoring/swq/> (accessed 4 August 2017). [Google Scholar]
45. Australian Senate Select Committee on Unconventional Gas Mining Interim Report 2016. submission 275. Available online at: http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Gasmining/Gasmining/Interim_Report (accessed 15 July 2017). [Google Scholar]
46. Doctors for the Environment Australia, 2016, Policy. Air pollution (Internet). Available online at: https://www.dea.org.au/images/general/DEA_Policy_-_Air_Pollution_v12-16.pdf (accessed 8 July 2017). [Google Scholar]
47. Drinkwater RT, 2015, *Understanding environmental risks associated with unconventional gas development in Australia*. Australian Senate Select Committee on Unconventional Gas Submissions. Submission 45. Attachment 2. Available online at: http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Gasmining/Gasmining/Submissions [Google Scholar]
48. Zeliger, H., 2004, Unexplained cancer clusters: common threads. *Archives of Environmental Health*, **59**(4), 172–176. doi:10.103200/AEOH.59.4.172-176[Taylor & Francis Online], [Web of Science ®], [Google Scholar]
49. Grandjean, P. and Landrigan, P.J., 2014, Neurobehavioural effects of developmental toxicity. *The Lancet Neurology*, **13**, 330–338. doi:10.1016/S1474-4422(13)70278-3.[Crossref], [PubMed], [Web of Science ®], [Google Scholar]
50. Brown, D.R., Lewis, C. and Weinberger, B.I., 2015, Human exposure to unconventional natural gas development: a public health demonstration of periodic high exposure to chemical mixtures in ambient air. *Journal of Environmental Science and Health, Part A: Toxic/Hazardous Substances and Environmental Engineering*, **50**(5), 460–472. doi:10.1080/10934529.2015.992663. [Taylor & Francis Online], [Web of Science ®], [Google Scholar]

51. Allen, J. 2002, *The ozone we breathe*. NASA Earth Observatory, featured articles. Available online at: <https://earthobservatory.nasa.gov/Features/OzoneWeBreathe/> (accessed 4 August 2017). [Google Scholar]
52. Australian Government Environmental Health Risk Assessment Guidelines for assessing human health from environmental hazards, 2012. Available online at: <http://www.eh.org.au/documents/item/916> (accessed 4 August 2017). [Google Scholar]



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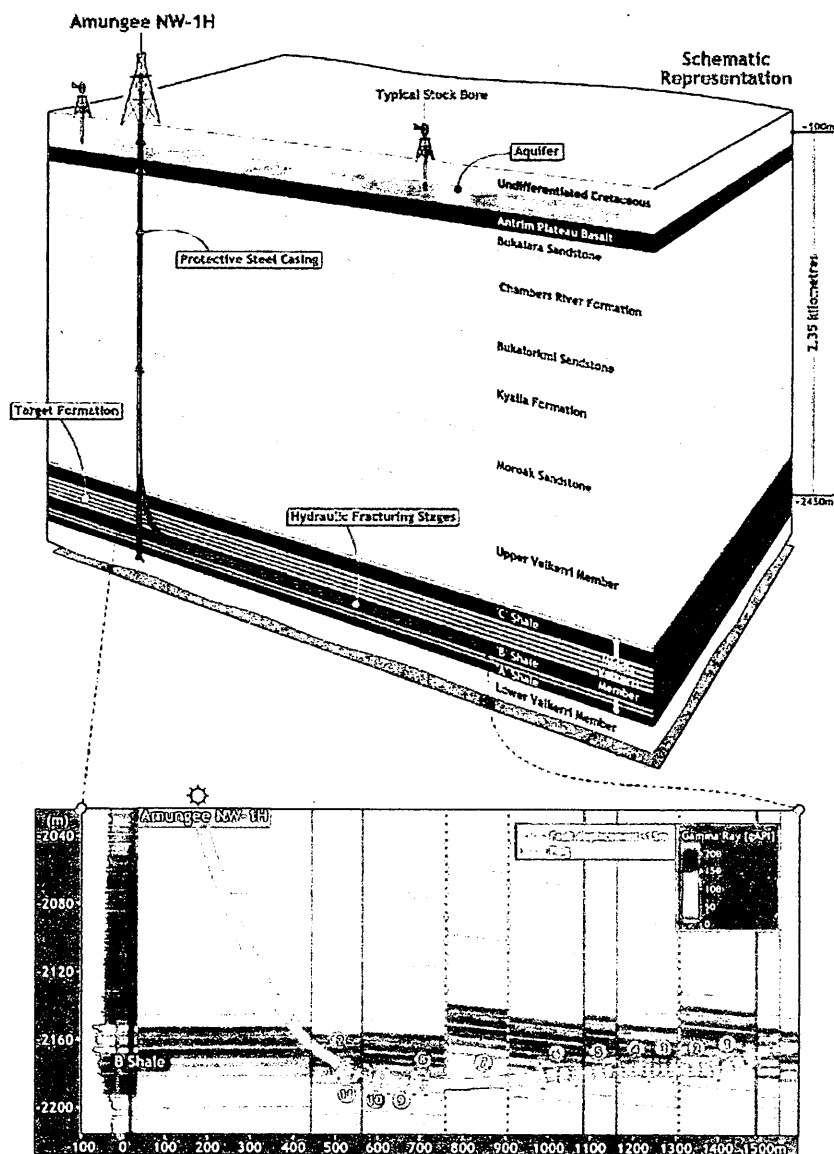
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DIAGRAM 1 BELOW: Page 81, NT Inquiry into Hydraulic Fracturing, Draft Final Report, December 2017

This diagram supplied by Origin to the in submission #153 to the NT Fracking Inquiry, dated 30 April 2017, has no reference to any 'casing deformation'. This is endorsed with NT Govt logo.

Figure 6.5: The Amungee NW1H well lateral section was landed and drilled through the 'B Shale' of the middle Velkerri approx. 2.3 km below the Cambrian Limestone Aquifer. Source: Origin.¹⁸



¹⁸ Origin submission 153, p31.

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DIAGRAM 2 BELOW: Page 6 of Submission #283 Attachment 1, supplied by Origin with a letter to Justice Pepper and the NT Fracking Inquiry, dated 25 May 2017.

The Origin report clearly outlines a casing deformation, shown below.

Beetaloo JV

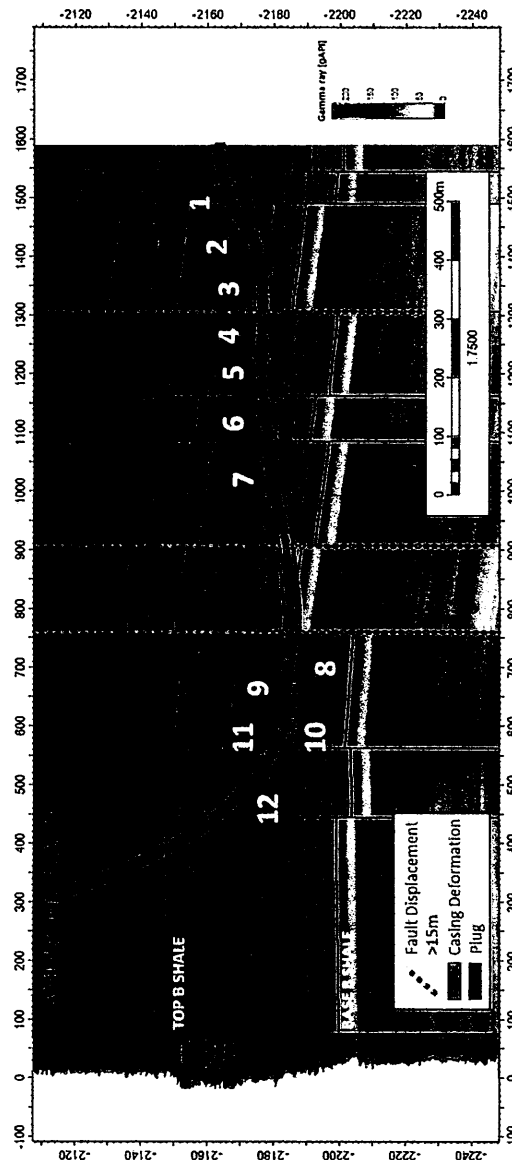


Figure 2. Location and distribution of fracture stimulation stages along Amungee NW-1H well cross-section. Background colour follows the gamma ray property values from the vertical well Amungee NW-1 as propagated across Origin's geosteering model over the B Shale interval.

Below: On page 5 of Origin's Amungee NT-1H Discovery Report, the following paragraphs give further insight into the problems with the well and the problem with the failed attempt to undertake a 12th frac stage.

2.2 Completion and Fracture Stimulation

Completions activities at Amungee NW-1H began in July 2016, preparing the wellbore for hydraulic stimulation operations. A Cement Bond Log (CBL) was conducted to confirm the cement integrity behind the 4.5" casing along with a 10,000 psi pressure test of the production casing to verify wellbore integrity.

An AbrasiJET perforation was performed on the toe stage, after the toe sleeve failed to shift open to gain access to the reservoir. A Diagnostic Fracture Injection Test (DFIT) was pumped on the first interval prior to the main stimulation treatments. In August 2016, a total of 11 stimulation stages were pumped, effectively placing 2.5 million lbs of proppant and 67,000 bbls of fluid (Figure 2). After the 7th stimulation treatment interval, a casing deformation at 3111.6 mMDRT was discovered during the pump down operation. After some diagnostics with coiled tubing, it was decided to shift the remaining 5 frac stages along the wellbore to provide a greater standoff distance between the fracture initiation point and potential bedding planes. A 12th stage was attempted on the well; however formation breakdown was not achieved and the frac treatment was terminated early without placing any proppant.

This submission from Origin is available at:

<https://frackinginquiry.nt.gov.au/submission-library?a=452658>

Questions:

- Although I am aware of the differences between the process of fracking & the process proposal of LCKE, the differing depth of coal seam to be affected, is there any guarantee that a similar fault in manufacturing of well casing will not fail, as this did.
- And, if it does occur ① What will be the effect to the geology & hydrology of the area exposed
- ② Will this cause problems, if occurs, to the very near township of Copley, its ground stability, water activity, or air pollutants.
- ③ Will the company of LCKE disclose any problems, spills or changes in water, soil or air? ~~had~~ OR will there be a similar 'cover up' by the company & government oversees AS HAPPENED IN THE ABOVE CASE.

D-Statiek

The NT Government also had a copy of the figure from Origin with the casing deformation included.

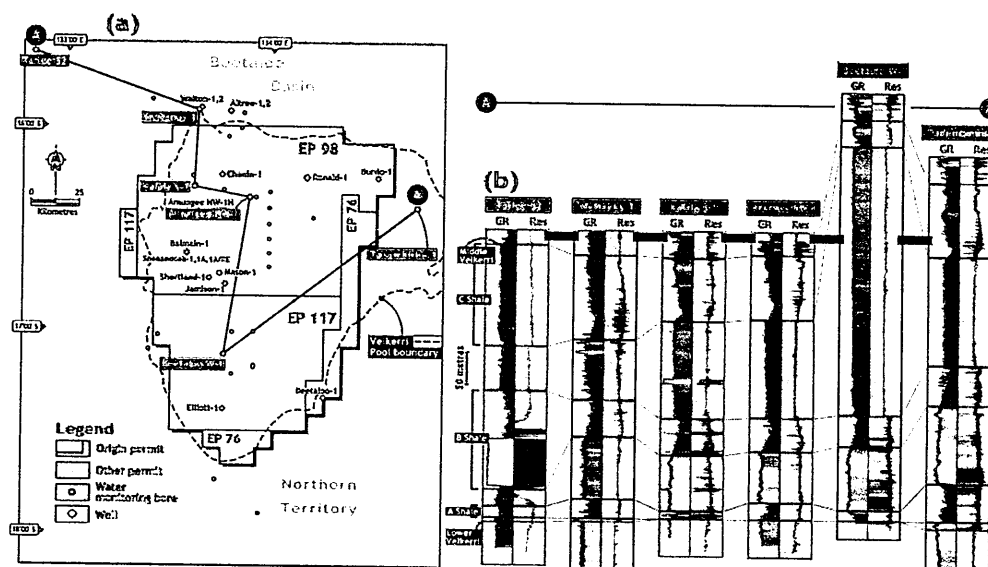


Figure 3. (a) Permit boundaries and Velkerri Formation B Shale Pool limits with exploration well and water monitoring bore locations. (b) Approximately east-west well cross-section over the middle Velkerri illustrating the continuity of the middle Velkerri and the B Shale in particular.

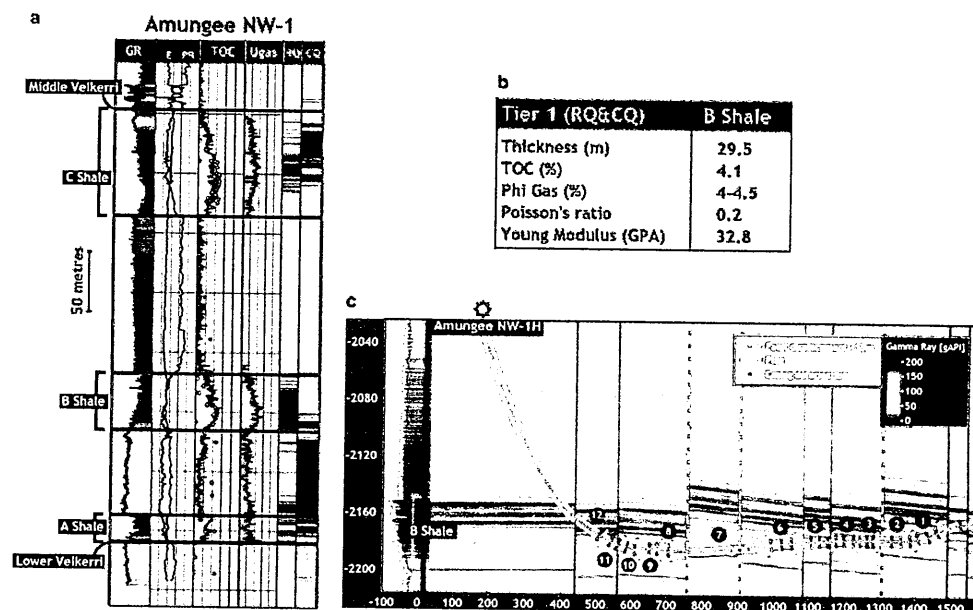


Figure 4. (a) Composite log of petrophysical data from the Amungee NW-1 well highlighting the three source rock intervals within the middle Velkerri. Tracks read from left to right: gamma ray (GR), Young Modulus (Γ_{sp}), Poisson's ratio (PR), total organic carbon (TOC), gas-filled porosity (Ugas), reservoir quality (RQ), and completion quality (CQ). (b) Summary of key parameters for the B Shale interval. (c) Amungee NW-1H horizontal well with fracture stimulation stages and geosteering curtain section of gamma-ray values projected from the vertical pilot (Amungee NW-1).

Attach # 3.

1/ Will LCK respect the legal process underway in QLD and with due respect to the technologies borrowed from refrain from trial until the outcome of the case (pretty sharp)

2/ Can LCK elaborate on the issue of shareholder David Shearwater and the unresolved court case relating to China New Energy Investment in LCK (more sharp)

3/ Will LCK as a responsible corporate citizen provide an undertaking to relocate any negatively impacted locals in the scenario the trial goes wrong with reference the failed Chinchilla trial? (really sharp, actually blunt)

4/ Is LCK confident that it understands the nature of the Telford Basin and inter-relationship with the Copley Basin re potential adverse ground water impact? (a set up - they already say in the EIR they don't)

5/ Will LCK pursue compensation from tax payers if the proposal is rejected by SA government (reference to TOM K 5 \$M gift post arkaroola

6/ What arrangements have LCK made with SA Water and what is the rate of costing for water useage in relation to the project and anticipated volumes over the lifecycle of the project?

Coproducted.

Thermal oxidizer

Attachment: 4

Sites of videos available for viewing concerning the subject UCG

<https://vimeo.com/253606678>

<https://www.peopletribunalongas.org/session-one/>

https://www.facebook.com/HRTribunal/?hc_ref=ARSB8EaRau2Y3f23ASaRfMJFJebJnu4axXc2PvtuCeJlrggOft_ek-3UGChHflUBKrM&fref=nf

<https://www.peopletribunalongas.org/session-five/>

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Mark Parnell MLC

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Nick Xenophon hasn't yet outlined his policy on whether his party supports the dirty and dangerous gas extraction technology that was banned in Queensland - underground coal gasification (also called insitu coal gasification) - that is proposed for Leigh Creek. Turns out that one of his candidates is the lawyer for the proponents of this project. Could this be why he's keeping quiet? If not, what's your policy Nick?

by John Weekes

POLLUTION trial jurors have been shown internal Linc Energy memos and emails between company bosses.

Linc, in liquidation, is not in court to defend five counts of wilfully and unlawfully causing serious environmental damage at Chinchilla.

The company operated an underground coal gasification facility.

The Crown alleges Linc used its underground wells in ways that made them fail.

One email discussed on Friday appeared to show two operators reported feeling unwell after working in a wellhead in late 2007.

Well construction materials were also discussed in documents shown to jurors.

One document revealed concerns that cement used in well construction was inadequate, incapable of withstanding operating temperatures.

Brisbane District Court jurors were shown a document about "unexpected problems in maintaining operator pressure within the generator" noticed in late 2007.

A Linc executive wrote in 2008: "There is still some smouldering in the generator even though we flooded the generator with water for many weeks and the process has been isolated from the surface for approximately 5 months."

The executive said the gasification process was "being driven some considerable distance from the wells" due to high pressure air injection while "no escape path" existed for the air and gas.

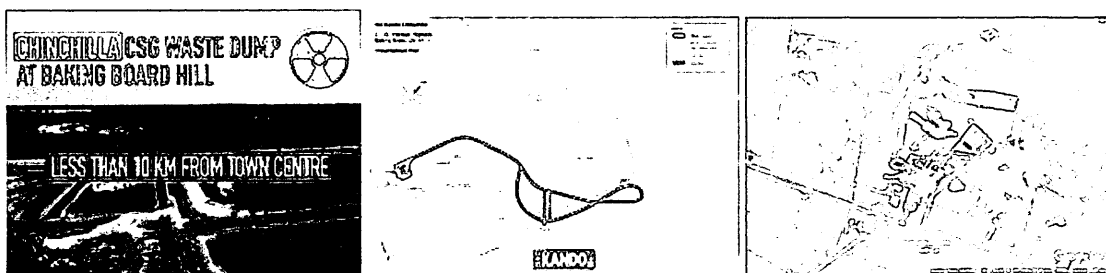
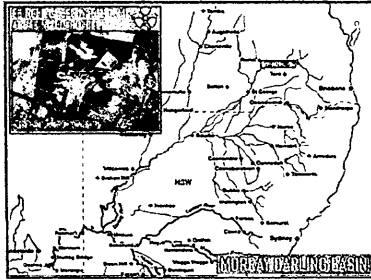
"The air and gas eventually broke through to the surface..." he added.

Five not guilty pleas were entered on Linc's behalf when the trial started last month.

Prosecutors' say Linc's alleged failures created subterranean pathways for toxins to escape far way.

The trial is expected to last several more weeks and involve dozens more witnesses. -NewsRegional

TOPICS: [BRISBANE COURT](#) [CHINCHILLA](#) [COAL](#) [CONCRETE](#) [ENERGY](#) [FRACCRING](#) [LINC](#)
[ENERGY](#) [LIQUIDATION](#) [UCG](#) [UNDERGROUND COAL GASIFICATION](#)



Jo Holden added 4 new photos.
6 hrs ·

The coal seam gas industry in Australia has NO SOLUTION for it's toxic waste except to dump it.

A company called 'We Kando Pty Ltd' has approval for a 15 million tonne CSG Workshop Waste Dump and Commercial Salt Storage Facility on Baking Board Hill near Chinchilla.

The dump is above the local flood plain and is in an area just 50m from Stockyard Ck, which is a tributary of the Condamine River in the headwaters of the Murray Darling Basin, a sensitive discharge area and Priority Agricultural Land on both the eastern and southern sides.

<http://www.queenslandcountrylife.com.au/.../farmers-fight-sa.../>

The 'Salt Storage' approval is broken into:

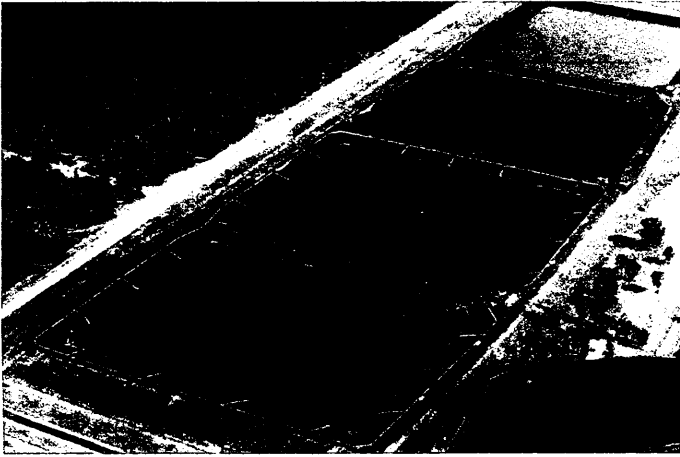
1. 4.5 million tonnes of Product Salt from the reverse osmosis water treatment plant at 900,000 tonnes p.a. for 5 years.
2. 900,000 tonnes of Waste Landfill Salt at 45,000 tonnes p.a. for 20 years. This material will contain Arsenic, Cadmium, Chromium, Lead, Thalium, Selenium, Thorium and Uranium along with BTEX chemicals (benzene, toluene, ethylbenzene and xylene)

NSW Gas Ban

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All the cells which are broken into 2 ponds. It's not clear what system Santos have in place to keep the rejected brine waste separate from the other waste stream that is being sent to the reverse osmosis treatment plant. Are they aerating the brine waste (bottom of image).

Toxic waste



QUESTIONS:

- Is this what we can expect? Salt residue trucked out after osmosis process...to where?

On the question of toxic waste from the process:

We were told last Wednesday that what comes out after the extraction of the usable gas and nitrogen? Is stored, will be burnt in a super heated furnace which will eliminate all toxic waste. I stated that it is impossible to burn something and end up with nothing which was what he intimated. He had no answer to that.

From: [Anthony Maney](#)
To: [DPC:Engineering](#)
Subject: Leigh Creek Energy In-Situ Gasification (ISG / UCG) : My (member of public) submission
Date: Wednesday, 28 February 2018 4:42:53 PM
Attachments: [LCK submission spread-sheet v1.pdf](#)

When considering making a submission to DPC ERD for proposed ISG (UCG) by Leigh Creek Energy I realised I didn't have the technical expertise to do a submission about the technology. I figured that others would have this and that you would receive submissions accordingly.

When I am doing research, I like to use spread sheets. I figured that the proposed project wasn't just about the technology but also about the people who would be required to make it work.

Please find attached a PDF copy of a spread sheet showing my research.

From this at least four points are very evident to me

1. When UCG was used in Queensland, environmental and human health damage reached a point where the Queensland government prohibited existing UCG activities from continuing and considered putting a moratorium in place prohibiting future UCG activity.
2. Surely South Australia can learn from Queensland's disastrous experiences with this technology
3. The Executive Chairman at Leigh Creek Energy (Mr Justyn Peters) was (according to Reuters) in the thick of things at Linc Energy when that company allegedly did a huge amount of environmental and human damage in Queensland
4. Information currently on Leigh Creek Energy website about (COO) Justin Haines seems to be at somewhat of a variance to information on a Queensland government website.

I believe that I have identified and brought to your attention enough RED FLAGS connect to this project for it NOT to go ahead.

Thank you

Anthony Maney

Name	Position	Qualifications / Experience	Additional relevant information	RED FLAGS	Hyperlink for information
Justyn Peters	Executive Chairman	qualified Lawyer and has many years' experience in the ISG industry and in senior management positions.	Mr Peters is a Director and Shareholder of Allied Resource Partners Pty Ltd (ARP) which is a substantial shareholder of Leigh Creek Energy.	In his 6 years at Linc Energy Mr Peters held the positions of General Manager Environment and Government Relations, General Manager Business Development, Executive General Manager Nth Asia and finished as Executive General Manager of Investor Relations.	https://www.reuters.com/finance/stocks/company-officers/LVT.BE
Phil Staveley	Managing Director	qualified Accountant			http://www.lcke.com.au/About/Board-of-Directors
Greg English	Non-executive Independent Director	qualified Mining Engineer and Lawyer	partner of Piper Alderman Lawyers		http://www.lcke.com.au/About/Board-of-Directors
Murray Chatfield	Non-Executive Independent Director	Economics and Marketing			http://www.lcke.com.au/About/Board-of-Directors
Zhe Wang	Non-Executive Director	Chinese based Energy and Thermal Physics Engineer	sits on the Board of Beijing Raise Mind Technology Ltd.		http://www.lcke.com.au/About/Board-of-Directors
Zheng Xiaojiang	Non-Executive Director	senior finance executive	responsible for facilitating the investment in LCK by China New Energy, LCK's largest shareholder.		http://www.lcke.com.au/About/Board-of-Directors
Ms. Jordan Mehrtens	Company Secretary	qualified Lawyer, and has a Bachelor of Commerce (Finance) and a Graduate Diploma in Urban and Regional Planning.			http://www.lcke.com.au/About/Board-of-Directors

Name	Position	Qualifications / Experience	Additional relevant information	RED FLAGS	Hyperlink for information
Justin Haines	Chief Operating Officer	SEE BELOW FOR INFORMATION ABOUT Mr. HAINES AS SHOWN ON LCK WEBSITE & INFORMATION SHOWN ON QLD GOVERNMENT SITE.			http://www.lcke.com.au/About/Executive-Team
Mark Terry	Chief Finance Officer	CPA	Mr Terry is responsible for advancing the commercial aspects of the development of the LCEP through the feasibility study phases to project execution.		http://www.lcke.com.au/About/Executive-Team
Noreen Byrne	Human Resource Manager		Prior to moving into the field of Human Resources, Noreen started her career as a Geologist in exploration and underground mining.		http://www.lcke.com.au/About/Executive-Team

INFO FOR CONSIDERATION : MR JUSTIN HAINES (COO)

<p>Most recently, Justin Haines worked as Technical Manager for Carbon Energy Ltd, an In Situ Gasification (ISG) technology developer who successfully operated a demonstration facility in Queensland under the direction of the Queensland Government's UCG Trial Policy. In the Chief Operating Officer role, Justin is responsible for all technical and operational aspects of the development of the Leigh Creek Energy Project through to commercial production.</p>	http://www.lcke.com.au/About/Executive-Team
<p>By comparing the information supplied by LCK above with that supplied by QLD website it may be possible for you to answer theses questions related to Mr Haines. Does a time lapse of about 22 months constitute "Most recently" ? Does the LCK information give an impression of success and continuance?</p>	
<p>All UCG activities were prohibited in Queensland following a policy decision announced by the Queensland Government on 18 April 2016. At the time this webpage was last updated, (26th July 2016) the Queensland Government proposed to introduce a moratorium on all future activities relating to UCG through the <i>Mineral Resources Act 1989</i>.</p>	https://www.ehp.qld.gov.au/management/impact-assessment/eis-processes/bloodwood-creek-underground-coal-gasification-project.html

From: [Malcolm Koch](#)
To: [DPC:Engineering](#)
Subject: Leigh Creek Energy In-Situ Gasification Demonstration Plant
Date: Wednesday, 28 February 2018 10:09:28 AM
Attachments: [MKD_logo_s5_140307.jpg](#)

Hello Jarrod,

Department of Premier and Cabinet
Energy Resources Division
GPO Box 320, Adelaide 5001

Below is my submission regarding the public consultation for the Leigh Creek Energy In-Situ Gasification Demonstration Plant.

The security blueprint needed for Australia's energy supply grid was foreshadowed in 2002 by Beach Energy in the 'Energy News Bulletin (June 17, 2002). In it, Reg Nelson stated that one of the most important issues facing Australia during the first 20 years of this century was energy for electricity and transport fuels. He went on to say, "If additional diversified energy sources are not found within this period, Australia will then have an energy crisis as a result of a rapidly emerging shortfall in liquid hydrocarbons and looming gas shortages, particularly in south eastern Australia ..."

So here we are, almost twenty years later, and there is still no decisive 'National' blueprint!

Recently (February 2018), the Grattan Institute's energy Program Director, Tony Wood, urged for real political commitment and leadership, backed-up by industry, on this matter - explaining how our climate change obligations can be met in a globalised economy while we transition to renewables. Video: <http://www.lcke.com.au/news/videos>

Therefore, I urge you to allow the Leigh Creek Energy Project (LCEP) to be able to fully demonstrate its ISG development potential. It ticks all the boxes for its environmental, technical and commercial criteria, and appears to be the right kind of gas, in the right location, that is well-served by infrastructure.

As one of the potential solutions to Australia's south east gas crisis LCEP should at least be given the opportunity to demonstrate this.

Yours sincerely,
Malcolm Koch
Creative Director

—
Malcolm Koch Design Pty Ltd
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www.mkdesign.com.au



From: [Pam Hill](#)
To: [DPC:Engineering](#)
Subject: Leigh Creek Energy Project
Date: Wednesday, 28 February 2018 10:03:28 AM

We support the Leigh Creek Energy Project because it will -

be good for the economy of the State and region

good for the surrounding towns, including Leigh Creek Copley

good for employment opportunities

create jobs in the State, and the region

minimises environmental impact

reduce gas and electricity prices

YES we do support this project

Pamela Hill and Colin Hill

Balaklava South Australia

Arid Lands Environment Centre, Inc.



Office	90 Gap Rd, The Gap PO Box 2796 Alice Springs
Mail	NT 0871 Australia
Phone	+61 (08) 8952 2497
Fax	+61 (08) 8953 2988
E-mail	info@alec.org.au
ABN	50 100 640 918

The Arid Lands Environment Centre (ALEC) is central Australia's peak environmental organisation that has been advocating for the protection of nature and ecologically sustainable development in the arid lands since 1980.

ALEC regularly makes submissions on resource projects that pose significant environmental and climate risks, and actively engages stakeholders over significant development proposals in the arid lands.

Underground Coal Gasification: environmental catastrophe

Underground Coal Gasification (Insitu Gasification) is a contentious and fraught industrial process. The Leigh Creek In-situ Gasification Demonstration Project Environmental Impact Report (EIR) has not acknowledged the Queensland experience of UCG, which lead to a permanent ban on coal to gas in that state.

The EIR does not include expert independent scientific information on the environmental problems associated with the demonstration UCG plants in Queensland which is problematic as it is not considering the significant risks identified from these operations..

Following an independent scientific report, an ombudsman report, unprecedented criminal environmental litigation and evidence of severe environmental contamination the Queensland Government amended the Mineral Resources Act to permanently prohibit UCG.

The Minister's response to a question on notice was that:

“This uncertainty, along with the issues associated with the trial projects to date, has led the government to the decision that the potential risks of allowing projects to grow to commercial scale are not acceptable”¹

The lack of confirmed financial viability of UCG (or ISG) should be of grave financial concern for the state of SA. The rehabilitation cost of an ISG project in the event of bankruptcy, which is what has occurred in Queensland, will place significant financial strain on the government and thus tax payers.

Since UCG operations in Chinchilla a 300km² exclusion zone has been established preventing land holders from excavating below 2m. An expert report into the environmental disaster has shown permanent degradation of prime agricultural land from the acidification of the soil and water.²

¹ Minister for State Development and Minister for Natural Resources and Mines, Question on Notice, No. 928, 25/05/2016 Parliament of Qld

<[http://www.parliament.qld.gov.au/documents/TableOffice/questionsAnswers/2016/928-2016.pdf#search=%22underground coal gasification%22](http://www.parliament.qld.gov.au/documents/TableOffice/questionsAnswers/2016/928-2016.pdf#search=%22underground%20coal%20gasification%22)>

² ABC News <<http://www.abc.net.au/news/2015-08-10/linc-energy-secret-report-reveals-toxic-chemical-risk/6681740>>

This resulted from fracturing of the overburden, which also released carcinogens into the environment such as benzene. The disaster was described by the Queensland Environment Minister as “the biggest pollution event probably in Queensland’s history”.³

Queensland was confident of robust environmental laws to properly assess the environmental impact of the project but those laws were unable to predict and prevent the catastrophe. There is the question whether the laws of South Australia can regulate a threat of this magnitude. As the process is unprecedented in SA, regulators have no prior experience to draw from.

Uncertainty

The cause of the environmental contamination of Australia’s only In Situ Gasification plant in Queensland was the process of vertical fracturing that breached the combustion chamber and compromised the integrity of the overburden.

Increasing permeability of surroundings by mechanical stress is noted in the EIR to be a risk. The conclusion that this risk is low is not sufficiently grounded in robust scientific evidence. The EIS states, ‘Any increase in permeability above the coal seam is expected to be constrained within this fracture zone above the gasifier’⁴.

ALEC questions the basis of this *expectation*. If the containment is a matter of hypothetical expectation this inspires little confidence in a risk rating of low.

It is simply scientifically inaccurate for the EIR to list the majority of risks for this project to be low at the same time as criminal charges for environmental negligence are progressing against operators of the same process in another state.

UCG was undoubtedly an environmental catastrophe in Queensland. Pilot programs in other countries have also caused significant contamination, including benzene contamination in Wyoming and a methane explosion in Spain. There is therefore a very real possibility that the Leigh Creek In Situ Gasification project could cause significant harm to the environment and human health in South Australia.

The project is inconsistent with the principles of ecologically sustainable development. It is also inconsistent with South Australia becoming national leaders in renewable energy policy

This industry is highly risky, politically contentious and untested. As of result of the significant risk of harm and the uncertainty around the process, the precautionary principle should be applied and consent for the development should be refused.

References

Queensland Ombudsman, ‘The Underground Coal Gasification Report’ (2012)

<<http://www.parliament.qld.gov.au/documents/TableOffice/TabledPapers/2012/5412T1124.pdf>>

³ The Australian, <<https://www.theaustralian.com.au/life/weekend-australian-magazine/linc-energys-ucg-plant-at-chinchilla-a-smart-state-disaster/news-story/89096454ced60874c5d8e2e967fb9c1c>>

⁴ Leigh Creek EIS at 5.2.2.5

From: [Edward Styles](#)
To: [DPC:Engineering](#)
Subject: Leigh Creek Process Demonstration Plant
Date: Wednesday, 28 February 2018 4:39:25 PM
Attachments: [image001.jpg](#)

Attention: Jarrod Spencer
Department of the Premier and Cabinet
Energy Resources Division

Dear Jarrod,

I am writing to express my support for Leigh Creek Energy and their proposed process demonstration project. This project is a significant opportunity for the state to securing additional gas resources and will provide valuable jobs to South Australians.

Ottoway have worked closely with Leigh Creek in fabricating the demonstration plant and look forward to assisting with its construction onsite. Leigh Creek have approached the design and construction of this plant in a very professional manner.

Regards,

[Edward Styles](#)

Edward Styles | Project Engineer

Ottoway Engineering Pty Ltd

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Description: cid:image001.jpg@01CE376C.3FE17960



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From: [Noreen](#)
To: [DPC:Engineering](#)
Subject: Support for LCK
Date: Wednesday, 28 February 2018 7:58:44 AM

DPC.Engineering@sa.gov.au

To whom it may concern,

I am writing to support the LCK project.

I understand this project will create new roles in the region in the mining sector, which is critical for our state. Everyone knows how the effect of gainful employment has a positive effect for families and the wider community.

When I graduated in the early 90,s I like many others had to leave the state to gain employment. This is not something that I wanted to do but their was no other choice.

I would love more opportunities for young grads and others to gain long term employment in this state and help the state be a success. I know this project has the potential to assist with this.

Kind regards

Noreen

Sent from my iPhone

From: Parnell
To: [DPC.Engineering](mailto:DPC.Engineering@sa.gov.au)
Cc: [Malavazos, Michael \(DPC\)](mailto:Malavazos.Michael(DPC)@sa.gov.au)
Subject: Underground Coal Gasification at Leigh Creek
Date: Wednesday, 28 February 2018 1:44:32 PM
Attachments: [image001.jpg](#)

Attention: Jarrod Spencer
Department of the Premier and Cabinet
Energy Resources Division
GPO Box 320, Adelaide 5001
or via email at DPC.Engineering@sa.gov.au

Dear Jarrod,

I am responding to the Minister's call for public comment on the proposed in-situ gasification demonstration plant at Leigh Creek.

My submission can be summarised quite simply – the Minister should say “No!”

I appreciate that the proponent has prepared an Environmental Impact Report and Draft Statement of Environmental Objectives, but in my submission, they simply can't be trusted or relied on to properly assess the enormous environmental risks associated with this dirty and dangerous technology.

Your counterparts in the Queensland Government went through similar processes in relation to UCG projects in that State and we all know how that ended up. The proponents of those projects provided impressive consultants' reports, gave confident assurances around environmental safety and they fooled regulators into allowing them to proceed. Linc Energy is now in liquidation. It is being prosecuted in the criminal courts for damage to the environment. A number of its senior executives are also being criminally prosecuted.

No doubt you are well aware of the comments from then Queensland Environment Minister Steven Miles. He said: "What we have in Hopeland, near Chinchilla, is the biggest pollution event probably in Queensland's history...certainly the biggest pollution investigation and prosecution in Queensland's history."

Most importantly, Minister Koutsantonis should pay close attention to the fact that the Queensland Government has now BANNED underground coal gasification in that State. Queensland is not a State that is hostile to energy or resource projects, so if they have moved to ban UCG, then South Australia should pay close attention. In my submission, the evidence is clear and we should Queensland's lead.

My opposition to this technology and this particular project is well-known to the Minister and the Department.

- In July 2016 I moved a motion: "That this council calls on the government to follow the lead of their counterparts in Queensland and ban the practice of underground coal gasification in South Australia."
- In November 2016, I introduced a Bill to ban the practice of UCG in South Australia.

Hansard extracts are included below as attachments. These form part of my submission.

You would also be well aware that the former CEO of the South Australian Environment Protection Agency, Professor Campbell Gemmell, has undertaken a comprehensive study of UCG around the world. On the basis of his report, the Scottish Government has now banned UCG.

The Scottish Government response is here: <https://news.gov.scot/news/underground-coal-gasification-blocked>

Professor Gemmell's report can be downloaded here: <http://www.gov.scot/Publications/2016/10/2704>

Finally, I would submit that this project is completely at odds with South Australia's growing reputation as a renewable energy and storage powerhouse. This reputation could be irredeemably harmed if dirty and dangerous climate-damaging projects such as this are permitted in our State. There is a growing call in the community for "No More Bad Investments" including massive fossil fuel investments such as this.

I urge the Minister to refuse the application by Leigh Creek Energy for this demonstration plant and all subsequent applications around underground coal gasification.

Yours faithfully,

Mark Parnell MLC, LLB, BCOMM, MRUP

Parliamentary Leader, Greens SA

Environmental & Planning lawyer

PS. As you know, Leigh Creek Energy is the new name of the company formerly known as Marathon Resources Limited. That company succeeded in securing a substantial ex-gratia payment of \$5 million from the State Government following the cancellation of their tenements following their appalling environmental record in the Arkaroola Wilderness Sanctuary. The company might now be under a new name, with new owners and a new management, but the lessons are clear – the further you let this ill-conceived and dangerous project advance, the greater the risk to SA taxpayers. Rejecting this project at this stage on solid environmental grounds poses no risk.

Mark Parnell MLC

Parliamentary Leader, Greens SA
Parliament House, North Tce, Adelaide SA 5000
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www.sagreens.markparnell.org.au | Follow Mark on [Facebook](#), [Twitter](#) & [Instagram](#)

Attachment 1 – Speech to Legislative Council 27th July 2016

Speech

Legislative Council

GREENS MOTION: Ban Underground Coal Gasification in SA

July 27th, 2016

On the 27th of July 2016, Mark moved a motion to call on the the South Australian Government to follow the Queensland Government's lead in banning the practice of underground coal gasification in South Australia.

The Hon. M.C. PARNELL: I move:

That this council calls on the government to follow the lead of their counterparts in Queensland and ban the practice of underground coal gasification in South Australia.

Like a bad zombie movie, the undead have come back to haunt us. Members will remember Marathon Resources Limited. That is the cowboy mining company that was sent packing from the Arkaroola Wilderness Sanctuary five years ago after trashing the natural environment. They are back. Quietly rebranded as Leigh Creek Energy Limited, they now want to get into the UCG business, that is, underground coal gasification. It is nasty, polluting and dangerous, which is why it has been banned in Queensland.

Over the last few weeks, I have been asking questions in parliament of the Minister for the Environment and also the Minister for Aboriginal Affairs about the proposal by Leigh Creek Energy to commence underground coal gasification in and around the former Leigh Creek coal mine. I think it is fair to say that this is a project that has flown under the radar so far, but it does represent a huge risk to our climate and also to the local environment.

I will need to get a little bit technical here to describe what underground coal gasification is. It is a technology that gasifies coal seams in situ underground creating syngas (or synthetic gas), which is mainly a mixture of hydrogen, methane, carbon dioxide and carbon monoxide, to be used for either electricity production or industrial chemical processes.

UCG involves drilling two wells, some distance apart, directly into an underground coal seam. The wells are connected through the coal seam, usually through directional drilling techniques. The injection well is used to pump oxygen, along with an ignition catalyst, into the coal seam. The coal is ignited and then partially combusts with the injected oxygen. Water in the coal seam or the surrounding strata flows into the cavity and is essential for the series of chemical reactions that take place to produce raw syngas which, as I have said, is a mixture of carbon dioxide, hydrogen, methane, carbon monoxide and other contaminants, including sulphur and trace metals.

The gas mixture travels through the production well to the surface gas plant where it is treated and cleaned. As the coal is gasified, the gasification cavity expands and moves along the coal seam. Eventually, this causes the cavity roof to collapse. Pyrolysis, which is high temperature decomposition without oxygen, of the coal also takes place as the coal is heated. Syngas can be used as the base feedstock for a whole variety of chemical products or processes or combusted to produce electricity.

This week, an important international report was released by Friends of the Earth International. The report is entitled 'Fuelling the fire: the chequered history of underground coal gasification and coal chemicals around the world'. Large sections of the report are devoted to Australia, including sections on Queensland and South Australia. In fact, the summary description of underground coal gasification that I outlined a few seconds ago is taken from that report. The foreword to the report commences with the following statement:

"In the wake of the celebrated Paris Agreement we are entering the last decade with any possibility of acting to keep global temperature rise below 1.5 degrees Celsius and to avoid some of the most devastating impacts of climate change. These impacts—floods, droughts, storms and rising sea levels—will hit the world's poorest people hardest. To have any hope of keeping within our global carbon budget one thing is very clear: we cannot burn our remaining reserves of fossil fuels, let alone the vastly larger resource. We must keep them in the ground."

The foreword concludes:

"To invest in and open up a new frontier of fossil fuels at this critical stage in the fight against climate change is not just a crime against our planet, but a crime against humanity."

That is the foreword from Jagoda Munic who is the Chair of Friends of the Earth International.

The motion refers to the experience in Queensland. There are a number of case studies we can refer to but the one that has been in the news most recently is Linc Energy's underground coal gasification program in Queensland. That program

resulted in a major contamination incident where the contaminants migrated across and beyond the reaction zone during the gasification process. These contaminants included syngas and its by-products, additional gases that were formed as the result of a succession of contaminating events, liquids in the form of contaminated groundwater, solids in the form of tars and oils and also energy and odours, and a combination of liquid and gas mixtures. Hydrogen and hydrogen sulphide have migrated through underground pathways away from the UCG test site.

Now an exclusion zone of 314 square kilometres has been put in place and farmers in the area are not allowed to dig more than two metres deep without notifying the Queensland environment department. The cost of clean-up is estimated at many millions of dollars; however, the fear is that Linc Energy may never pay this clean-up bill as it has now gone into administration.

Australia has been home to three principal UCG projects. They were all in Queensland and they have all ended in charges of environmental damage. As well as the Linc Energy project, there was Cougar Energy's Kingaroy pilot project in 2010 and Carbon Energy's Bloodwood Creek site in the Surat Basin which operated from 2008 to 2012. The Linc Energy project I referred to operated between 1999 and 2013.

If we fast forward to this year, in April 2016 the Queensland government permanently banned UCG in response to the major groundwater and soil contamination that resulted from one of the Linc Energy trials. The Carbon Energy incident involved that company being charged with disposing of processed water by irrigating it to land without approval. They were fined \$60,000 and a further \$40,000 in legal and investigation costs.

In Queensland the political reaction to these incidents has been a ban on underground coal gasification. The Australian Associated Press report on 18 April states:

"The Queensland government has immediately banned underground coal gasification in the state, arguing the environmental risks outweigh economic benefits."

Natural Resources Minister Dr Anthony Lynham says the ban, which would apply immediately as government policy, would be made official by the end of the year through legislation introduced into parliament.

The ban came after UCG pilot company Linc Energy, which last week went into voluntary administration, was recently committed for trial in the District Court on five counts of wilfully and unlawfully causing serious environmental harm.

The quote from minister Lynham in the report states as follows:

"The potential risk to Queensland's environment and our valuable agricultural industries outweigh any potential economic benefit from the particular industry."

He went on to say:

"We have to send a clear message...that this industry has not been successful here in Queensland."

Referring to the ban, he said:

"This is a sensible step for the Queensland government [and] it's a sensible step forward for the resources sector."

The other minister who was quoted extensively in this period in April when the Queensland government announced its ban was the environment minister Steven Miles. He was quoted as saying:

"What we have in Hopeland, near Chinchilla, is the biggest pollution event probably in Queensland's history... certainly the biggest pollution investigation and prosecution in Queensland's history."

This is not something that is minor or trifling. This is a seriously dangerous and polluting industry that has been banned in Queensland, and my motion is calling for it to be banned in this state as well.

I will not read further quotes, but it will be of no surprise to you that the quite vibrant Lock the Gate movement in Queensland, whilst they are focusing on coal seam gas deposits, have also reacted positively to the Queensland government's move to ban UCG in that state. Despite the warning of these three failed Queensland projects, there are now two projects planned for South Australia. There is the Leigh Creek Energy Project to which I have referred. That project is looking to produce commercial quantities of gas by the 2018-19 financial year, and the company says it could be operational for 30 years and produce 80 petajoules per annum.

The company already has a gas storage exploration licence, which, if progressed to a gas storage licence, would enable the project to store gas on site. The company has said that it hopes to be flaring gas by the end of the year.

The other project in South Australia is the Arckaringa underground coal gasification project, which is a joint venture between Sino-Aus Energy Group and Altona Energy. Their plan is to have gas being produced in the second half of 2016. I think that might be quite ambitious, but that is the second of the projects.

In terms of the community reaction, I have referred earlier in question time to the reaction of the Adnyamathanha people, who are unhappy with the way the Leigh Creek project is progressing. They are particularly unhappy that the Aboriginal Heritage Act may well have been breached, hence their call for the Aboriginal affairs minister to investigate that situation. The South Australian reaction has been interesting. Certainly, Minister Koutsantonis, after the Queensland decision was made, was asked for his response. He provided a response to the online journal RenewEconomy. That journal quotes minister Koutsantonis as saying:

'There is no need to politicise the process—the approval or otherwise of the proposed coal gasification project at Leigh Creek should be based on science,' energy and mineral resources minister Tom Koutsantonis said in a prepared statement for RenewEconomy.

Leigh Creek Energy will need to pass rigorous environmental impact assessments overseen by expert scientists if this project is to go ahead. We have a very effective regulatory framework in South Australia and the merits of the Leigh Creek Energy project will be assessed against that framework, not this decision in Queensland.

My plea to the South Australian minister is to indeed look at the science, but also to look at the track record of the industry so far. I do note that the Leigh Creek project does involve people who are involved in the Queensland Linc Energy project.

For example, if you look at the Leigh Creek Energy statement to investors, their investor presentation, which is on the Australian Stock Exchange website, they refer to their board of management and top of the list is Mr Justyn Peters, whose title is executive chairman. His profile includes that he was a former experienced senior manager with Linc Energy. Whilst I do not want to suggest that Mr Peters is being prosecuted—certainly his former company Linc Energy is being prosecuted; I do not know whether Mr Peters is—the South Australian government needs to pay attention not just to what companies claim they are going to achieve and what they claim is their environmental performance, but have a look at who they are, what they have done, and have a look at how these projects have ended up interstate, because they have ended up in tears.

In relation to this motion, I would expect that there will be more to report once the Queensland prosecutions of Linc Energy have progressed and also once the Queensland government has introduced its legislation to ban underground coal gasification, which is expected later this year. In the circumstances, I would now seek the leave of the council to continue my remarks at a later date.

Attachment 2 – Speech to Legislative Council 30th November 2016

Speech

Legislative Council

GREENS BILL: Ban Underground Coal Gasification in SA

November 30th, 2016

On the 30th of November 2016, Mark introduced his Greens Private Members Bill - *Petroleum and Geothermal Energy (Underground Coal Gasification) Bill 2016* - which bans the practice of underground coal gasification in South Australia.

The Hon. M.C. PARNELL: Underground coal gasification is one of those technologies that, having been embraced by various jurisdictions around the world, more often than not ends in tears. That is certainly the case in Queensland and it risks being the case here if we do not knock it on the head quick smart. What is at risk is not just our environment and public health but also our state finances. Underground coal gasification projects put out their hand for millions of dollars in state government subsidies, so there is a lot at risk.

The process of underground coal gasification and the problems it caused I referred to in some detail in an earlier contribution back on 27 July, and I do not propose to repeat all the things I said back then. That motion on that day called on the South Australian government to follow the lead of their counterparts in Queensland and ban the practice of underground coal gasification in South Australia. Having given the government a chance to take action itself, it seems clear that they will not, which is why I have introduced this bill.

I want to briefly put on the record some things that have happened in this area since I last spoke about this topic in July. On 1 September, the ABC reported that the Queensland government may end up being liable for a \$150 million class action over the Linc Energy UCG trial project, which damaged farmland near Hopeland on the Darling Downs. The ABC report states:

Solicitor Tom Marland said it was 'more than likely' Linc Energy's insurance policy would not cover the claim.

'If we're unable to find any fruit in relation to the insurance policies, we'll just endeavour to continue our action against the State Government,' he said.

That shows that the risk might be well beyond just the immediate vicinity. It can also be a major hit to state revenue.

In a statement to the Stock Exchange on 14 October this year, Leigh Creek Energy said that it was pleased to announce that 'environmental drilling [had] resumed at the Company's in-situ coal gasification project at Leigh Creek, South Australia', and it was anticipated that drilling would finish in five weeks' time. I think the phrase 'environmental drilling' is the mining industry's equivalent of 'friendly fire' because there is nothing of benefit to the environment in underground coal gasification.

On 8 November, the Queensland government introduced legislation into parliament to ban underground coal gasification. This was something that had been foreshadowed earlier, in fact the policy had been announced on 18 April. The Queensland government's Department of Natural Resources and Mines website states:

...the Queensland Government introduced legislation into the Parliament which seeks to place a moratorium on all future activities relating to UCG through the Mineral Resources Act 1989. The moratorium will also apply to the in situ gasification of oil shale.

It goes on:

After careful consideration of the results of these trials, the Queensland Government concluded that the potential impacts of UCG activities and the issues associated with the trial projects to date, the risks associated with allowing future commercial-scale UCG operations are not acceptable and currently outweigh the foreseeable benefits.

There are many parallels to the debate that we had before the dinner adjournment in relation to unconventional gas. Whilst this is a very different process we are talking about, underground coal gasification, you will see that many of the same themes emerge.

On 14 November this year, the ABC reported that an increasing number of mining executives were being charged with criminal offences. The report states:

The Queensland Government has charged five former executives of Linc Energy with environmental offences over the failed company's alleged contamination of huge swathes of prime farmland in the state's south-east.

They are: Peter Bond, who is facing two further charges since September; Donald Schofield, former Linc Energy general manager, on two charges; Stephen Dumble, former chief operating officer, on two charges; Jacobus Terblanche, former chief operating officer, on one charge; and Daryl Rattai, former general manager, on one charge.

At this point, I note that none of those listed executives who are facing charges are, in fact, executives or directors of Leigh Creek Energy, or its predecessor, Marathon Resources. The point that I make is that it is a company that was undertaking exactly the same activity that Leigh Creek Energy now seeks to undertake. The ABC report continues:

The ABC revealed last year that a Queensland Government investigation found hundreds of square kilometres of prime agricultural land was at risk from a cocktail of toxic chemicals and explosive gases that had allegedly seeped from Linc's UCG site.

The multi-million-dollar investigation was the largest in the Queensland Environment Department's history.

It found that soil near the facility had been permanently acidified, with methane, hydrogen, carbon monoxide and hydrogen sulphide alleged to have leaked from the site.

These are not claims or allegations being made by me. This is the Queensland government, having undertaken the largest ever environmental investigation in its history, and it is all to do with underground coal gasification.

On 18 November this year, Leigh Creek Energy made another statement to the Stock Exchange and in it they refer to all the public subsidies they are going to be receiving—the public handouts. According to the statement:

Innovation Australia grants R&D 'Advance Finding' for Leigh Creek Energy Project

Australian Government determines the Leigh Creek Energy Project eligible for Research and Development tax offset

The total estimated eligible expenditure is \$21 million. The statement also says that the company was applying for South Australian government PACE grants to accelerate investment in gas projects, and they point out that the maximum application amount is \$6 million.

It is a risk to the environment, a risk to health, a risk to taxpayers from the liability of having to fund damages claims, and also a direct hit to our state budget as we hand money to these companies in the form of direct grants or tax offsets. That brings us up to the present. I refer to a comment made by the Hon. Tom Koutsantonis in that important journal of record, The Transcontinental newspaper. The article states:

State Energy Minister Tom Koutsantonis said the approval or otherwise of coal gasification projects should be based on science and determined by 'expert regulators, not politicians'.

The direct quote from the minister is:

Politicians are not qualified to make these assessments. We trust the scientists and independent regulators, and proponents need to prove to these regulators that they will do no harm to the environment.

Let's find an independent regulator and hear what they have to say to help us make the assessment. That brings us to Scotland. A month ago, Scotland banned underground coal gasification. It did so

following an independent report which evaluated the technology and the global experience of underground coal gasification. The author of that report was one Professor Campbell Gemmell, who members would realise is the former chief executive of South Australia's own EPA.

When I found out about the Scottish government decision and I found out about the report, I contacted Professor Gemmell in Scotland, and, as it turned out, he was coming back to Australia in November for a holiday and to do some consultancy work for the Victorian EPA. So, I ran past him the idea that if he happened to be in Adelaide on a sitting day, he might see his way clear to providing a lunchtime briefing to members of Parliament. I was delighted that it turned out that he was able to do it, and he gave that briefing to members on Tuesday. A number of members attended. For those who did not, I am happy to circulate his PowerPoint presentation, because it is quite telling.

It is entitled 'A review of underground coal gasification for Scottish government', and he highlighted the main messages and offered some lessons for South Australia. After describing how the underground coal gasification project works, he described the parameters of his study. Effectively, he looked at this industry everywhere in the world that it had been carried out. As well as the global literature review, they interviewed 35 people from 23 stakeholder bodies and they made sure they talked to industry, community regulators and also NGOs. They also had the ability to rely on some other independent European scientific work that had been done.

The professor described how he had looked at projects in Australia, Belgium, Bulgaria, Canada, Chile, China, England, France, Germany, India, Japan, Mongolia, New Zealand, Pakistan, Poland, Russia, South Africa, Spain, Tanzania, Ukraine, the USA and Uzbekistan. As it turns out, it is only Uzbekistan where the project has lasted any period of time. Just about all the other projects failed within a very short period of time. Some went for a few weeks, but only Uzbekistan has been going for any significant time. I understand it is about 50 years that that project has been going.

Maybe it is to do with the regulatory regime in Uzbekistan, but the professor found it very difficult to find information about any environmental monitoring that had been undertaken. Having done all that work, the results of the professor's independent study showed that there were very few cases where the results of the underground coal gasification had been written up, there were no published environmental licences that were available, and there was very little verified, peer reviewed, or openly-reported performance data. In other words, it was an incredibly secretive industry.

What he did find was evidence of significant performance failures, and these included: surface, groundwater and land contamination; containment losses; fugitive methane emissions; seismicity; inadequate liability management; and worker health issues.

The results also showed that one of the inevitable consequences of setting fire to a coal seam under the ground is that, once that coal seam has burnt out, a cavity remains and those cavities have a habit of collapsing, so subsidence was a serious issue in many of the examples.

The approach that Professor Gemmell took was that he thought there were five considerations that needed to be taken into account before you could go ahead with something like UCG. He looked at the impact on climate and found that it was overwhelmingly negative because there is no capture of fugitive emissions and no offsets. He pointed out that public or community consent was essential, and that brings us back to the debate we have been having on fracking. He said that did not exist in Scotland.

You have to look at the operators. Are they credible? Are they competent? Are they fit? Are they using the best available technology? You need to look at the regulation. Is it a clear system? Is it coherent? Is it effective? Is it robust? You also have to look at long-term issues, not the least of which is post-mining closure. What do you do once you have finished extracting the gas? How do you put out the fire? Does putting out the fire stop the gasses from coming to the surface?

His conclusion was that these tests could not be met in Scotland. He points out that, where it has been tried in Australia, it has led to prosecutions. The operators exit. They exit leaving contamination behind and the state is left to pick up the tab.

The activity of underground coal gasification has been banned, as I said, in Scotland. It has also been banned in Wales, France, Germany and, most recently, Queensland, and the question before us in this bill is: should it be banned in South Australia as well? The professor basically left that decision to us, as is appropriate, but, having put all that information on the table, I think it is pretty clear that he has not found too much to recommend this industry.

Let's take Minister Tom Koutsantonis at his word. He wants to hear from independent regulators. I have found one for him who was the top regulator of the environment in South Australia until fairly recently. He has handed down his verdict and I think that mining Minister Koutsantonis needs to pay close attention to it.

With those remarks, I commend the bill to the chamber.

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