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United Voice
Submission #314

United Voice thanks the Chair and panel members for this opportunity to present our members' concerns regarding unconventional hydraulic fracturing in the Northern Territory.

United Voice is one of the largest and oldest Trade Unions in the Northern Territory, representing a wide variety of miscellaneous industries in all regional centres as well as most regional towns and communities. A large proportion of our membership identifies as Aboriginal or Torres Strait Islander.

United Voice does not support unconventional hydraulic fracturing or its related activities in the Northern Territory and remains unconvinced by the arguments from APPEA, individual gas and mining companies and local media sources.

Below are detailed some major issues around unconventional hydraulic fracturing and related activities raised by our membership, regarding the potential pollution of aquifers, managing environmental degradation, job creation and mothballing of services.

Potential Pollution of Aquifers

The recent discovery of the contamination of groundwater in Katherine by runoff from firefighting foam containing per- and poly-fluoroalkyl substances (PFAS) has shown firsthand how Commonwealth and Northern Territory Governments deal with groundwater contamination in the Northern Territory.

While the long-term effect of PFAS exposure is currently unknown, PFOA, one of the chemicals used in the firefighting foam is classified as class 2B "*possibly carcinogenic to humans*"¹. More than 40 affected Katherine residents are being supplied with bottled water through a Defence Department offer² while an investigation and further testing is carried out on the groundwater by the NT EPA³ while blood testing offered to affected residents by the Department of Defence is currently delayed⁴.

This contamination incident has highlighted two issues of concern to united voice:

1. The response of the NT Government has been muted. While this appears to be a small-scale issue affecting only a few communities the NT Government has offered no substantial solution to the affected residents.
2. The response from the Commonwealth appears to be a reactive band-aid solution of providing bottled water to affected residents. This solution is unsustainable, expensive and an unreasonable burden on residents.

United Voice believes that the response to the PFAS contamination in Katherine by the commonwealth and NT Government appears to be limited in scope and appears to show no specific interest in the health of residents or the environmental damage that could possibly result from this contamination.

United Voice has serious doubts that the NT Government would be capable of managing the potential contamination of a larger aquifer by unconventional hydraulic fracturing or related activities. Additionally, United Voice does not believe that the NT Government alone would be able to adequately compensate communities and residents who may be affected by this possible contamination.

United Voice expects a fully costed and comprehensive remuneration scheme developed for residents and communities affected by polluted groundwater as a result of unconventional hydraulic

¹See attachment 1

²See attachment 2

³See attachment 3

⁴See attachment 4

fracturing and related activities. It is the belief of United Voice that this scheme should also necessitate a level of funding from gas and mining companies that would undertake unconventional hydraulic fracturing in the Northern Territory, as these organisations would be responsible for any potential contamination.

Managing Environmental Degradation

United Voice has doubts regarding the ability of the Northern Territory and the Commonwealth Governments to effectively prosecute organisations responsible for environmental degradation by unconventional hydraulic fracturing and related activities.

The NT Government has a poor track record in holding corporations accountable for environmentally damaging mining operations. The MacArthur River Mine near Borroloola is an example of such a failing by Government, with the planning and execution of a shutdown planned over 100 years with an additional (and absurdly generous) 1000 year monitoring period⁵.

United Voice is unconvinced that miners seeking to establish unconventional fracturing wells would be deterred by threats to the environment, as Glencore is clearly not deterred by their continued operation of the MacArthur River Mine.

The Commonwealth Government appears to be similarly unable to prevent companies from establishing environmentally damaging projects through the mandatory environmental approval process. One of countless examples in recent history is the 2015 revocation of approval of the Adani Carmichael Mine in Queensland⁶.

The mine site threatening the habitat of the Yakka Skink and the Ornamental Snake required a court order to create proper and effective monitoring guidelines for the two species, which had been overlooked in the initial environmental approval. United Voice feels that this lack of proactive foresight taken by the Commonwealth Environment Minister is indicative of the attitude of the current Commonwealth Government in relation to environmentally damaging mining operations in general.

The Northern Territory Government's poor track record with local environmental issues caused by mining operations and the apparent unwillingness of Commonwealth government to properly examine environmental threats are concerning. United Voice is uncertain that proper monitoring and effective remediation of environmental damage caused by unconventional hydraulic fracturing and related activities will be carried out by either body.

⁵See attachment 5

⁶See attachment 6

Job Creation

United Voice has doubts regarding the quantity of jobs created by unconventional hydraulic fracturing and related activities. The Australia Institute's report *Fracking the Future*⁷ illustrated a disparity between jobs that have been modelled to be created by the CSG industry and the actual jobs created by gas projects and in supporting service industries through establishment and operational phases.

While CSG and Shale gas extraction are two separate processes it would be unrealistic for any stakeholder in the gas industry to state that shale gas extraction would employ substantially more workers than a CSG extraction project.

United Voice took specific issue with the concerns raised in the report that the Gas Industry appears to inflate numbers of jobs created by CSG projects by utilising deceptive or wildly optimistic modelling.

United Voice believes that a similar method of modelling is promoted by the Gas Industry in the Northern Territory. A recent story in the NT News cited "thousands" of jobs at risk through the unconventional hydraulic fracturing moratorium continuing to be in effect⁸.

A recent Northern Territory Government snapshot report entitled *Northern Territory Economy QuickFacts – March Quarter 2017* reports that the mining and energy sector currently provided 4.6% of resident employment in the year previous, somewhere between 6000 and 6500 workers⁹. FIFO workers are discounted in these figures. Based on these numbers and *Fracking the Future* United Voice believes that APPEAs claims of "thousands" of jobs being created by an unconventional fracturing industry in the Northern Territory are exaggerated.

The indeterminate amount of jobs created by the unconventional hydraulic fracturing and related activities appear to be more weighted toward specialists rather than unskilled labour. United Voice is unconvinced that if the moratorium on unconventional hydraulic fracturing is lifted that jobs created would benefit Territory workers, United Voice instead expects that the industry would rely heavily on FIFO labour to meet the inevitable skills shortage that the establishment of the industry would bring.

⁷See attachment 7

⁸See attachment 8

⁹See attachment 9

Mothballing of Services

United Voice has doubts regarding the lifespan of any unconventional hydraulic fracturing projects established in the Northern Territory. Domestic gas production, like all non-renewable resources, is a product with a finite economic lifespan. This finite lifespan and the current global gas production expansion raise concerns about mothballing of the industry due to economic downturn, which the Northern Territory has seen on more than one occasion in the mining industry.

The mothballing of the Gove alumina refinery is a recent example¹⁰, causing a severe backlash for those employed in the refinery and those living in Gove. United Voice does not believe that the NT Government properly managed the process of the mothballing, ultimately damaging the economic prospects of the residents of Gove. If the Gas industry employs even close to the numbers of workers stated by APPEA the economic backlash on those workers would be severe if a downturn occurred.

United Voice also is uncertain that the Northern Territory will be properly buffered against the economic damage of this sort of downturn. Western Australia's handling of iron ore exports following the mining boom is an example of mismanagement of resource driven prosperity¹¹. The downturn resulted in large scale redundancies and sackings, a \$2 billion budget deficit, the stripping of WA's AAA credit rating and wide scale economic devastation for regional areas. United Voice believes that a similar sort of downturn would affect inordinately the much smaller population of the Northern Territory.

Finally, United Voice is unconvinced that the unconventional hydraulic fracturing industry would be able to effectively monitor mothballed services. The NT government must ensure that gas and mining companies effectively manage mothballed services to prevent degradation of fracked wells or leakage in capped wells. Additionally a robust penalty for those companies who are responsible for economic damage related to mothballed wells must be established and enforceable. United Voice believes that if the NT Government allows gas and mining companies to forgo responsibility for mothballed services would cause great damage economically and environmentally to the Northern Territory.

¹⁰See attachment 10

¹¹See attachment 11

In closing, United Voice believe that the NT Government and the Commonwealth Government are unwilling or unable to provide a sufficient level of environmental, industrial or economic scrutiny and protection to allow onshore unconventional hydraulic fracturing to occur in the Northern Territory.

United Voice also believes that the Gas Industry is exaggerating the employment figures that are modelled for a prospective onshore unconventional hydraulic fracturing industry to be established in the Northern Territory.

United Voice believes that if onshore unconventional hydraulic fracturing is allowed to operate in the Northern Territory the potential costs to the economy, environment and employment vastly outweigh the benefits and as such does not support the establishment of an onshore unconventional hydraulic fracturing industry in the Northern Territory.



Voluntary Blood Testing Program for PFAS

ADVICE ON PFAS FOR GPs

What are PFAS?

Per- and Poly-fluoroalkyl Substances (PFAS) are a group of man-made chemicals that have been widely used since the 1950s in household and industrial products that resist heat, oil, stains, grease and water. This included non-stick cookware, food packaging, stain protection applications to fabric, furniture and carpet, and fire-fighting foams¹. Firefighting foams containing PFAS were once used extensively in Australia and elsewhere due to their effectiveness in fighting liquid fuel fires. Their use began in the 1970s.

PFAS have emerged as compounds of interest as they are persistent in the environment in soil and water and can leach into groundwater. They are resistant to breaking down and can accumulate in the food chain. Two of the main substances in the group are Perfluorooctane sulfonate (PFOS) and Perfluorooctanoic acid (PFOA).

Exposure

Most people living in Australia will have measurable levels of PFAS in their blood, due to a range of uses. Outside of the occupational setting, exposure to PFAS can occur from food, water (ground and surface water) and various consumer products. For most people, food is expected to be the primary source of exposure to these chemicals. A number of sites in Australia, including the RAAF Base Williamtown and the Army Aviation Centre Oakey, are being investigated because firefighting foams containing PFAS were used there in the past. People have potentially been exposed at these sites by drinking contaminated groundwater or surface water.

Studies in animals suggest that PFAS are almost completely absorbed from the gastrointestinal tract. There is very minimal transdermal absorption.

Studies suggest that PFAS are minimally metabolised and do not undergo chemical reactions in the body. They are primarily excreted in the urine. The half-life of various PFAS is variable but they can remain in the body for many years.

Reducing exposure to PFAS

Advice will vary with location so please follow the most current advice provided in the Department of Defence's Human Health Risk Assessment for each site and State Government advice.

- For Williamtown, NSW, refer to the Department of Defence's Human Health Risk Assessment (HHRA) Fact Sheet which can be found on defence.gov.au/id/pfospfoa/default.asp; and the NSW Environmental Protection Agency website (epa.nsw.gov.au).
- For Oakey, QLD, refer to the Department of Defence Human Health Risk Assessment (HHRA) Fact Sheet which can be found on defence.gov.au/id/pfospfoa/default.asp; and the QLD Government website (qld.gov.au/environment).

Health effects of PFAS

There is currently no consistent evidence that exposure to PFAS causes adverse human health effects.

Research into potential health effects of PFAS is ongoing around the world, and further research is required before definitive statements can be made on causality or risk. Animal studies have shown some links with effects on the liver, reproduction, development and benign tumours. Human studies have not provided conclusive results.

No existing studies have found a causal link between exposure to PFAS and cancer in humans. Studies of workers involved in the manufacture of PFAS have looked at prostate, bladder and liver cancer and there have been no consistent findings. Possible effects on cholesterol levels require further investigation.

¹ National Industrial Chemicals Notifications and Assessment Scheme (NICNAS) has made several recommendations on restricting the use of PFAS. This information can be found at nicnas.gov.au

As part of the response to PFAS contamination at Defence sites, the Australian Government has commissioned the Australian National University to undertake an epidemiological study. This study is expected to contribute to our understanding of the effects of PFAS on health in this population.

Anyone who presents with symptoms that they believe could be caused by PFAS exposure should be investigated for the usual causes of these symptoms.

The International Agency for Research on Cancer has classified PFOA in class 2B, "possibly carcinogenic to humans"². This category is used for agents for which there is inadequate or limited evidence of carcinogenicity in humans but there is some evidence of carcinogenicity in experimental animals. PFOS has not yet been classified.

Pregnancy

There is currently no consistent evidence that exposure to PFAS causes adverse human health outcomes in pregnant women or their babies.

Breastfeeding

Although some PFAS have been detected in breast milk, the proven health benefits associated with breastfeeding far outweigh any potential health risk to an infant from the transfer of PFAS through breast milk. Breastfeeding mothers living in or around sites contaminated with PFAS do not need to cease breastfeeding.

Treatment

There is no practical treatment available to remove PFAS from the body. As a precaution, future exposure should be minimised in all people.

Further information

The Department of Health

For further information regarding the Australian Government Department of Health's response to PFAS contamination, including health advice published by the Australian Health Protection Principal Committee (AHPPC) and its subcommittee enHealth, please go to the Department of Health website (health.gov.au/pfas).

Alternatively you can contact the Department of Health by phone on 1800 941 180 or by email (health.PFAS@health.gov.au).

The Department of Defence

For further information regarding the Department of Defence's response to PFAS contamination and site specific information please go the Department of Defence website (defence.gov.au/id/PFOSPFOA/Default.asp).

² Other class 2B carcinogens include petrol, talc-based body powder and chloroform.

ABC NEWS

ADF ships drinking water to Katherine properties affected by contamination

By Sally Brooks

Updated Thu 22 Dec 2016, 6:51pm



PHOTO: A bore on Kirsty Bartlett's property near Tindal where groundwater tested positive for PFAS chemicals. (ABC News: Sally Brooks)

More than 40 properties around an Air Force base near Katherine are being supplied with drinking water by the Defence Department, as residents express shock at discovering they have been drinking from a contaminated supply.

The contamination has been linked to chemicals in firefighting foams previously used at RAAF Base Tindal and at other Defence sites, civil airports and fire stations around Australia.

Kirsty Bartlett lives on a property close to Tindal and says she has been drinking contaminated water from a private bore on her property for the past 13 years.

In early November Ms Bartlett and her family were believed to be the first and only rural residents to start receiving deliveries of drinking water from Defence, but since then the number of water deliveries has been steadily climbing.

Since Monday, Defence has been supplying 44 properties near Tindal with alternative drinking water, a spokesman told the ABC.

The provision of drinking water does not necessarily mean the bore water is contaminated.

"Defence has adopted a precautionary approach and will provide alternative sources of drinking water to eligible residents located in close proximity to RAAF Base Tindal who do not have a town water connection, and who rely on the use of a bore for drinking water," the spokesman said.

RELATED STORY: Katherine town water supply 'contains firefighting chemicals'

RELATED STORY: Defence Department called to explain report on toxic chemicals at NT sites

RELATED STORY: Toxic chemicals found in drinking water near RAAF Base Tindal

MAP: Katherine 0850



Key points:

- 44 Katherine properties now being supplied with alternative water
- Community members say it's 12 years too late
- Residents are concerned about wet season and holiday water supplies

Katherine community in shock: resident

Ms Bartlett said it had been awful to watch friends who paid for tests on their private bores discover the water was contaminated.

"I've had quite a number of friends call me up and say, 'oh my god, I have just got my results, this is what they are'," she said.

"The common emotion (in the community) is shock, shock and disbelief; your whole little reality has just crumbled," Ms Bartlett said.

"Thinking you've lived this idyllic lifestyle on a rural property in the Northern Territory in this pristine environment, you know, what could go wrong?"

"You don't imagine you are going to find out that your bore water is contaminated and you have been giving that to your children from the moment they entered the world."

Ms Bartlett said her family was receiving 30 litres of water per person each week, but that there had been problems with the way the water was being delivered.

"They are choosing to deliver the water bladders in cardboard boxes and they have been left out in the rain because we haven't gotten home in time to put them inside," she said.

"They have also just delivered to everybody three weeks worth of water to last over the Christmas and New Year period.

"So obviously it's really awkward to try and get the water bladders to your home and find somewhere to store them where they are not going to burst."

The water is also being delivered in trucks that carry 10,000 litres of water to fill tanks, but Ms Bartlett said the heavy vehicles were at risk of getting bogged in the dirt during the heavy wet season rains.

"When (a truck driver) came in to deliver water (on Wednesday) he was worried thinking he might be spending Christmas in our back paddock waiting for the ground to dry out," she said.

Ms Bartlett has three children, aged 12, nine and seven. She said if she'd known about the contamination when she was pregnant and when her children were born she could have made different decisions about what water they drank.

"There is also an underlying feeling, (a) sense of betrayal," she said.

"Defence say that they stopped using these chemicals in 2004, that that's when it came to light, that you know they were no good, yet nothing was done, nothing was said, everything seemed to me like it was all kept very quiet," she said.

"To me it's 12 years too late. It would have been really helpful to know back in 2004 that this had happened."



PHOTO: Katherine's drinking supply comes primarily from the Katherine River, blended with bore water. (ABC News: Sally Brooks)

Chemicals found at all three Defence sites in NT



PHOTO: Katherine locals at a recent public meeting to discuss contamination of bore water. (ABC News: Stephanie Zillman)

Last month, Defence released a report into a preliminary sampling program at Tindal, RAAF Base Darwin and at Robertson Barracks in Palmerston, and said year-long in-depth studies for each site would begin in early 2017.

The report confirmed the toxic chemicals had been found at all 12 sites tested nationally by the department.

In the Northern Territory, 16 sites around RAAF Bases Tindal and Darwin as well as Robertson Barracks in Palmerston were sampled, and the chemicals were detected to varying levels on or around all three bases.

Defence said the levels detected in the Northern Territory did not exceed its changed safety guidelines, which were adapted in September.

Had Defence used the previous guidelines, two of the nine sites tested near Tindal, and two of the three sites tested near Darwin's RAAF base, would have exceeded the standards.

Despite Darwin being slated for a more comprehensive investigation, samples of groundwater, which is used for drinking, were not collected for testing.

At RAAF Base Tindal, of seven groundwater sites tested, one returned levels higher than acceptable under the previous guidelines, as well as one of two surface water sites.

At Robertson Barracks, one surface water and four groundwater sites were tested, but the PFAS detected did not exceed interim screening levels.

Government testing is still underway to determine what negative health impacts the chemicals could have.

The International Agency for Cancer Research has classified one of the chemicals, known as PFOA, as a possible carcinogen but there is not yet conclusive evidence that the chemicals cause any specific illnesses.

Topics: water-pollution, water-supply, water-management, water, defence-forces, rural, environmental-health, katherine-0850, nt

First posted Thu 22 Dec 2016, 6:34pm

MEDIA RELEASE**NATASHA FYLES**

MINISTER FOR HEALTH

Natasha Fyles
Minister for Health

Commonwealth Releases PFAS Guidelines**3 April 2017**

Northern Territory Health Minister Natasha Fyles has acknowledged the release of Commonwealth health-based guidelines for tolerable daily intake of Per- and poly-fluoroalkyl substances (PFAS).

Ms Fyles said it was important for communities and Governments to have clear guidelines.

Current research is inconclusive and it's not known if exposure to PFAS causes any significant health problems in people, but the potential for adverse health effects can't be ignored," Ms Fyles said.

"The Commonwealth is taking a precautionary approach to this emerging national issue, introducing some of the most conservative guidelines in the world to ensure Australians minimise their exposure to PFAS."

Per- and poly-fluoroalkyl substances (PFAS) are a class of manufactured chemicals that were used in many domestic and industrial products, including fire-fighting foam used at Commonwealth airports and Defence bases.

PFAS contamination is predominantly an issue around these sites, which is why Defence is conducting detailed national investigations, including Tindal RAAF base in the Katherine region and RAAF Base Darwin.

There are many types of PFAS, with the best known examples being perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA) and perfluorohexane sulfonate (PFHxS).

"The Commonwealth guidelines provide a tolerable daily intake (TDI) for PFOS and PFOA," Ms Fyles said.

"These TDI's are designed to advise Australians on the amount of the chemical in food or drinking water that can be consumed daily over a lifetime, without any appreciable risk to health."

The new national recommended health based guidance values in the form of a TDI are as follows:

- for PFOS, the TDI is 0.02 µg/kg bw/day
- for PFOA, the TDI is 0.16 µg/kg bw/day
- for PFHxS, FSANZ concluded that there was insufficient data to determine a TDI.

Since June 2016 Territorians have been working from an interim national guideline value of 0.5 micrograms per litre (µ/L) for PFOS in drinking water, now under the new Commonwealth drinking water guideline of 0.07 µ/L for PFOS for use in investigating affected sites.

"PFAS is an issue that many Australians are aware of and concerned about - we are taking a whole-of-government approach to answer people's questions and ensure Territorians can take control over their health choices," Ms Fyles said.

The Northern Territory's Chief Health Officer has re-examined water testing across Alice Springs, Mataranka, Katherine, Bachelor, Adelaide River, and Darwin Regions, in light of the new report and has confirmed the public drinking water is within the recommended guidelines and this monitoring will continue.

(http://www.powerwater.com.au/networks_and_infrastructure/water_services/pfas (http://www.powerwater.com.au/networks_and_infrastructure/water_services/pfas))

Initial testing of some private and supply bores in the Katherine region around Tindal RAAF base showed the existence of PFAS and Defence is continuing to provide bottled water to about 50 homes.

"Power and Water carries out an extensive sampling program throughout the year on its drinking water sources, in accordance with Department of Health approval," John Pudney General manager of water services at Power and Water said.

"In Katherine, Power and Water sources between 70% to 90% of its drinking water from the Katherine River and blends it with groundwater from two production bores.

"There may be times during the first rains of the wet season that bacteria levels peak in the Katherine River and it becomes highly turbid and reliance on bore water increases. Monitoring will continue throughout the year."

The Director of Biosecurity and Animal Welfare at the Department of Primary Industry and Resources said the new guidelines should not impact the ability of Territory primary producers to trade produce to markets interstate and overseas.

"Reports from heavily contaminated interstate sites had no detectable levels of contamination for most fruit and vegetables tested. These results give confidence to the horticultural industries in the Katherine area," Michelle Rodan said.

"While the FSANZ Guidelines recommend a small total daily intake of meat from contaminated areas, these results are based on heavily contaminated sites at Oakey and Williamtown.

"The Northern Territory doesn't have any sites with comparable rates of contamination.

The Health Minister Natasha Fyles said the Territory Government is lobbying Defence to fast-track the sampling of more ground water bores for residents between RAAF base Tindal and the Katherine township.

"We have also requested that Defence provide voluntary blood testing and health and welfare services to concerned locals. We want Territorians at affected sites included in the national epidemiological study and we want them given access to the counselling services being offered to residents around RAAF Base Williamstown in NSW and the Army Aviation Centre at Oakey in Queensland," she said.

"Investigations have already begun at RAAF Base Darwin and RAAF Base Tindal with testing at Roberston barracks due to start mid-year.

The NT PFAS interagency working group is continuing to work with Defence to ensure that detailed environmental investigations have local input and that the community is regularly updated.

The proactive monitoring of Rapid and Ludmilla Creeks already undertaken by the interagency group is now being reassessed in light of new guidelines released today and will be updated in April.

The current advice for Ludmilla and Rapid Creeks is that there is a low public health risk associated with eating the long bums and periwinkles from these creeks.

Phase two testing of fish, prawns and crabs is expected to be completed by June.

Defence has rescheduled a public community meeting for Katherine April 12th.

Anyone with any concerns should visit/call the National website/hotline.

Further information is available from www.ntepa.nt.gov.au/waste-pollution/compliance/pfas-investigation (<http://www.ntepa.nt.gov.au/waste-pollution/compliance/pfas-investigation>)

Advice can also be obtained from the Commonwealth Department of Health www.health.gov.au/internet/main/publishing.nsf/Content/health-pubhlth-publicat-environ.htm (<http://www.health.gov.au/internet/main/publishing.nsf/Content/health-pubhlth-publicat-environ.htm>)

Results of PFAS testing in public drinking water by Power and Water can be found here: http://www.powerwater.com.au/networks_and_infrastructure/water_services/pfas (http://www.powerwater.com.au/networks_and_infrastructure/water_services/pfas)

Communications Adviser: Laetitia Lemke 0418 973 602

Prime Minister defends decision to delay blood testing for PFAS in the NT

By Nadia Daly

Updated Sun 16 Jul 2017, 11:24am

The Prime Minister has written to the Northern Territory Chief Minister Michael Gunner defending the Defence Department's decision not to offer voluntary blood tests for NT residents until at least next year.

The Federal Government is already providing free blood tests to residents near the Williamtown and Oakey Defence bases, where PFAS contamination was found.

PFAS are a class of chemicals linked to firefighting foam used on Defence air force bases, and are also found, in lesser amounts, in consumer products like non-stick pans and cleaning products.

Environmental investigations began in the Northern Territory in 2016, after it was discovered PFAS from the Williamtown and Oakey bases had leached into nearby waterways and contaminated drinking and agricultural water supplies.

It lead Defence to offer bottled drinking water to residents who rely on bore water around RAAF base Tindal near the NT town of Katherine.

In a letter to Malcolm Turnbull in June, Mr Gunner said the presence of PFAS at RAAF Base Tindal "potentially exposes residents to this class of emerging contaminants" and he called for affected Territory residents to have access to the same services as those at the two interstate bases.

Mr Gunner noted the \$55 million announced in the 2016 federal budget towards mitigating PFAS including voluntary blood testing and an epidemiological study that were currently only available to residents near the Williamtown and Oakey bases.

"The Northern Territory Government is concerned that similar provisions are not being made available to affected residents in the Northern Territory until the completion of Defence's detailed environmental investigations for RAAF Base Tindal and RAAF Base Darwin, a process that will extend well into 2018," the Chief Minister said.

There have been already calls for the federal government to pay for blood testing for Territory residents who live near bases where PFAS has been detected, but the personal exchange between the two heads of government takes it a step further.

In his reply, also in June, Mr Turnbull said "[the Federal Government] would expect that once a clearer picture of the situation in and around Katherine and Darwin becomes available, Defence will formulate a strategy based on that information".

But Mr Turnbull did not confirm whether voluntary blood testing would then be made available for residents.

He also stated "there is no consistent evidence that PFAS is harmful to human health".



PHOTO: Mr Gunner said he was concerned NT residents were not able to get blood tests. (ABC News)

RELATED STORY: What you need to know about PFAS contamination

RELATED STORY: Defence admits it should have tested Katherine bore water sooner

MAP: Katherine 0850



PHOTO: Some residents in Katherine receive bottled water after their bores were found to contain PFAS. (ABC News: Sally Brooks)

However that is at odds with the position of the United States Environmental Protection Agency, an organisation regarded as the world authority on the issue, which does believe there is a correlation between PFAS consumption and adverse health effects.

A spokeswoman for the EPA told the ABC that "best available peer-reviewed studies of the effects of PFOA and PFOS on laboratory animals" combined with epidemiological studies of human populations that have been exposed to the chemicals indicate "that exposure to PFOA and PFOS over certain levels may result in adverse health effects".

Topics: defence-forces, environment, environmental-management, environmental-health, government-and-politics, local-government, katherine-0850, nt

First posted Sun 16 Jul 2017, 8:20am

Contact Nadia Daly

The purpose of this chapter is to provide a summary of the key features of the Project's closure strategy and to direct readers to other relevant sections of this environmental impact statement (EIS) where important information regarding the potential risks to local environmental values, and proposed mitigation measures to minimize these risks, may be found. As discussed in **Chapter 1 – Introduction**, this EIS has assessed, where relevant, the various natural systems of the Project for up to a 1,000 year period. Therefore, the closure and long-term management requirements of the site are inherently addressed throughout the EIS.

4.2 Definitions

The term 'closure' is used to describe the period of time, and actions taken within this time, following the operational stage of the mine. The closure period is divided into three general stages, the first of which is decommissioning, followed by rehabilitation and monitoring.

- **Decommissioning** is defined as the withdrawal of infrastructure from service and dismantling of this infrastructure.
- **Rehabilitation** is a stage of active management, which may include re-profiling of landforms, soil preparation, planting of vegetation, and control of weeds. Rehabilitation occurs during the adaptive management stage of the Project (rehabilitation is a component of 'Execution' in **Figure 4-1**).
- **Monitoring** is the stage once the land has settled and the site is developing towards its desired final objectives. Some remedial active management may be required within the monitoring stage, but only if monitoring suggests that this is needed to achieve specific completion criteria. The monitoring stage is further divided into proactive monitoring and reactive monitoring (**Figure 4-1**), reflecting changes in the frequency of monitoring and the decreasing requirement for remediation.

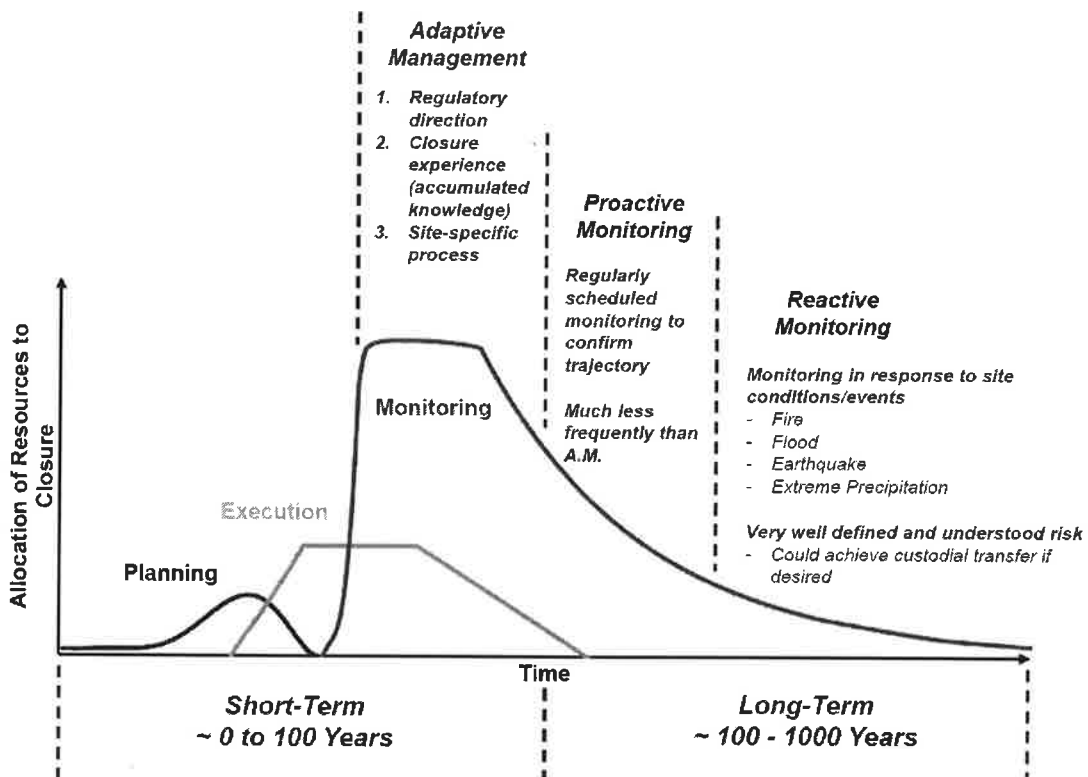


Figure 4-1 Proposed Staged Approach to Operations and Management

4.3 Rehabilitation Management Units

In order to tailor rehabilitation methods to the specific risks and characteristics of each mine component, mine components have been divided into rehabilitation management units. Rehabilitation management units possess similar geophysical characteristics, risks, and rehabilitation objectives and approaches. **Appendix S – Conceptual Mine Closure Plan** adopts the term ‘domain’ for these rehabilitation management units, in accordance with several Australian mine closure guidelines. However, to avoid confusion with the domains discussed in **Chapter 3 – Project Description and Justification**, in this EIS the term ‘domain’ is reserved for the three broad operational areas (the North Overburden Emplacement Facility (NOEF), the open cut and the Tailings Storage Facility (TSF)) of MRM.

Appendix S – Conceptual Mine Closure Plan divides the MRM into nine rehabilitation management units:

1. open cut;
2. Overburden Emplacement Facilities;
3. Tailings Storage Facilities;
4. infrastructure areas;
5. borrow pits;
6. water dams;
7. roads;
8. exploration; and
9. Bing Bong infrastructure area.

The locations of these rehabilitation management units are shown in **Figure 4-2**.

The ninth rehabilitation management unit concerns port facilities that are not affected by the proposed Project and are, therefore, outside the scope of this EIS and will not be considered further in this chapter. The Bing Bong infrastructure area will be decommissioned and rehabilitated in accordance with the rehabilitation strategies proposed in **Appendix S – Conceptual Mine Closure Plan**.

4.4 Timing

The planned schedule of the Project is described in detail in **Chapter 3 – Project Description and Justification**. It is summarised as follows, to provide context for the timing of rehabilitation activities:

- the operational phase of the Project will commence in 2018, following EIS approval and authorisation of an associated mine management plan;
- open cut mining operations will cease in 2037, 19 years after the commencement of the Project;
- construction of the NOEF will be completed in 2032, five years prior to the completion of open cut mining operations; and
- tailings will be reprocessed and moved the open cut over ten years (2038-2047) following the cessation of open cut mining.

From 2048 onwards, all rehabilitation management units will be in the process of closure, although some units (e.g., overburden emplacement facilities (OEFs)) will have commenced closure prior to this time. The timing of closure for each rehabilitation management unit is described in **Sections 4.10.1 to 4.10.8**.

Rehabilitation, which involves active management, will continue throughout the adaptive management phase of the Project. The duration of this phase is informed by on-going monitoring, which demonstrates that rehabilitated areas are self-sustaining with no further need for active management. The duration of this phase will likely vary depending on rehabilitation management unit, but it is anticipated that all rehabilitation management units will have completed this phase by 2100.

Monitoring, with decreasing intensity and regularity, will continue throughout the proactive management and reactive management phases of the Project (see **Section 4.2**). These are anticipated to last until 3017.

4.5 Closure Objectives

The closure objectives presented below follow the *National Strategy for Ecologically Sustainable Development*, especially in relation to intergenerational equity, the polluter pays principle, protection of biodiversity and maintenance of essential ecological processes. These closure objectives are consistent with those outlined in the opening statement of the Department of Mines and Energy (DME) *Northern Territory Draft Guidelines for Mine Closure Plans* (the NT Draft MCP Guidelines) (DME 2016).

The overall goal for rehabilitating the McArthur River Mine is to create a site that achieves the following ten closure objectives:

- Post-mining landscape will be left in a condition safe and secure for humans and animals:
 - safe and secure for short term (0-100 years); and
 - safe for long term (100-1,000 years).
- Landform stability:
 - Geotechnical stability will be maintained at these standards:
 - NOEF: Long-term static drained Factor of Safety (FoS) of 1.5; Maximum Design Earthquake (MDE) – 1 in 1,000 year event;
 - open cut walls: Probability of Failure (Pf) for inter-ramp slopes of <5%; and
 - TSF: as per ANCOLD (2012) guidelines.
 - Erosional stability; maintainable for these aspects:

ABC NEWS

Approval of Adani's \$16 billion Carmichael coal mine in Queensland's Galilee Basin set aside by Federal Court

Updated Thu 6 Aug 2015, 12:42pm

The approval of Adani's Carmichael coal mine in central Queensland has been set aside by the Federal Court because of a bureaucratic bungle over two vulnerable species.

The \$16 billion open cut and underground coal mine and 189-kilometre rail link was approved by the Federal Government in July 2014.

The approval was set aside by the court after it was found Federal Environment Minister Greg Hunt had not properly considered advice about the yakka skink and the ornamental snake.

The Mackay Conservation Group launched a challenge to the mine project earlier this year over the vulnerable species.

Today's court ruling has been consented to by Indian company Adani and the Federal Government.

Mr Hunt denied it was a major problem.

"What the department said is 'look, we have a sense that the court might find something new as a new standard and so it might be better to remake the decision'," he said.

In a statement, the Federal Department of the Environment said the ruling was taken at the request of "all of the parties to the court proceedings".

It said the entire approval process would not have to be reconsidered.

"This is a technical, administrative matter and to remove this doubt, the department has advised that the decision should be reconsidered," the statement said.

"Without pre-empting a final decision about the project, the department expects that it will take six to eight weeks to prepare its advice and the supporting documentation, and for the Minister to reconsider his final decision."

Environmental Defenders Office principal solicitor Sue Higginson, who represents the Mackay Conservation Group, said the coal mine, which would be the biggest in Australia, was now in a state of legal uncertainty.

She has written to Mr Hunt with further information to consider for the mine's application, namely "exaggerated" job figures included in Adani's environmental impact statement.

"What can happen from here is the Minister can re-make his decision, and of course in re-making that decision he can approve the mine again following the proper legal procedures, or he can refuse the mine; that is the legal power open to the Minister," Ms Higginson said.

"What our client says is that if the Minister wants to reconsider approving the mine there is a plethora of new evidence and information about that mine, so it will be no simple task to simply re-approve that mine."

Adani said it was committed to ensuring its mine, rail and port projects in Queensland are developed, and complied with environmental conditions.



PHOTO: The yakka skink, which is listed as a vulnerable species. (Supplied: Federal Government)

RELATED STORY: Adani rejects claims restructure means it can't pay for Queensland project

RELATED STORY: Climate Council calls for Galilee Basin coal to be left in the ground

RELATED STORY: Abbot Point approvals process rebooted in plan to preserve wetlands

MAP: Gladstone 4680

Legal loopholes are paving the way for anti-coal activists to delay billions of dollars in investment and thousands of jobs in Queensland.

Qld Resources Council CEO Michael Roche

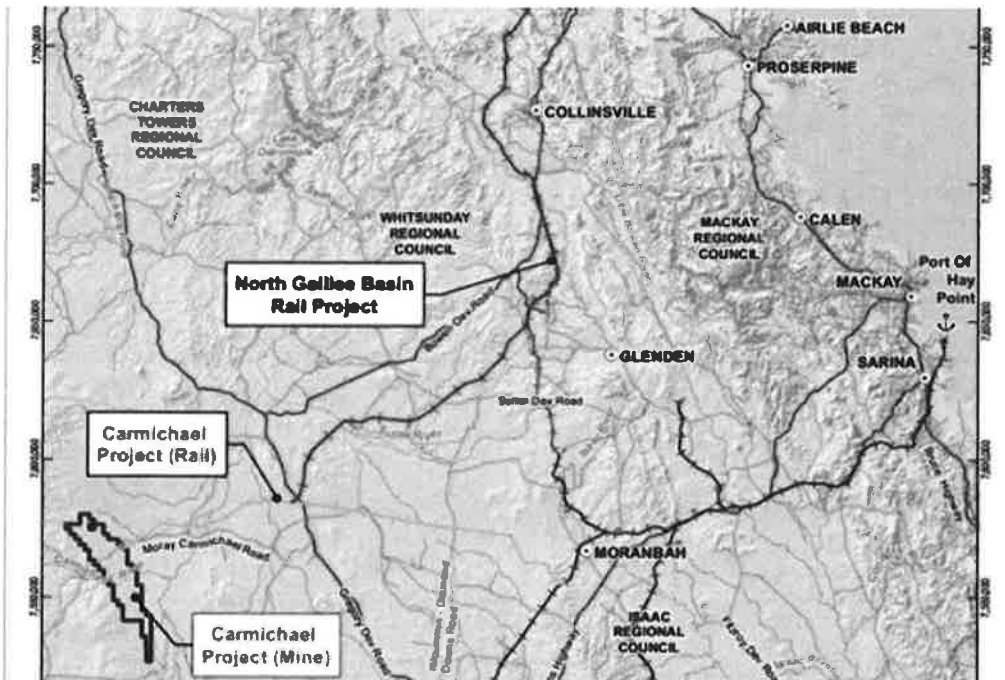


PHOTO: A map showing the Adani Group's \$16-billion Carmichael coal mine and rail project. (Sourced: adanimining.com)

"It should be noted the approval did include appropriate conditions to manage the species protection of the yakka skink and ornamental snake," it said.

"However, we have been advised that, because certain documents were not presented by the Department in finalising the approval, it created a technical legal vulnerability that is better to address now.

"Adani is confident the conditions imposed on the existing approval are robust and appropriate once the technicality is addressed."

Queensland Resources Council chief executive Michael Roche said "legal loopholes" had paved the way for anti-coal activists to delay billions of dollars in investment and thousands of jobs.

"It is preposterous that a technical administrative hitch could hold up billions of dollars in investment and thousands of desperately needed jobs," Mr Roche said.

Mr Roche said Mr Hunt should be able to quickly sort it out.

"The great irony of this is that minister has put conditions in his approval for the mine that cover the two species - a skink and a snake - but on some technical basis he can't demonstrate that all the right documents were in front of him at the time," he said.

State Mines Minister Anthony Lynham said he hoped the court's decision would not delay the project for too long.

"I'm extremely disappointed this has happened," he said.

"There's been a judicial review and I believe it's a technical error, but we're asking the Federal Government, we're asking the Federal Environment Minister to sort this out as quickly as possible."

However, Greens senator Larissa Waters said Adani should now walk away from Carmichael mine in the wake of the Federal Court decision.

"This is a chance now for Adani to walk away and if they do seek a fresh approval from the Minister, Minister Hunt needs to not only consider the conservation advices he forgot about the first time but he also needs to consider the fact that Adani corrected the record about the claims they made about jobs," she said.

Topics: mining-rural, mining-environmental-issues, federal---state-issues, courts-and-trials, coal, regional, regional-development, community-development, industry, business-economics-and-finance, gladstone-4680, mackay-4740, rockhampton-4700

First posted Wed 5 Aug 2015, 10:09am

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4 Will increasing gas production bring more jobs?

The gas industry is relentless in its claims about job creation. It commissions modelling,⁵³ creates dedicated websites⁵⁴ and runs national multi-million dollar advertising campaigns that focus on the potential for the industry to create huge numbers of jobs. It is not surprising then that 39 per cent of the August survey respondents nominated more jobs as a benefit of CSG.

While the industry is busy claiming it creates many jobs, the reality is that the gas industry is a relatively small employer. While figures for the CSG industry are not published by the ABS, job numbers for the oil and gas industry are, and the CSG industry is a part of this sector. In August 2013 the entire oil and gas industry employed 20,700 people,⁵⁵ which is 0.2 per cent of the workforce. To put this figure into context, the hardware retail company Bunnings employs 33,000 people.⁵⁶

Figure 3: Employment in Oil and Gas extraction



Source: ABS (2013a).

Claimed employment benefits

The economic benefits that the industry has claimed in its most recent advertising campaign, 'our natural advantage', are quite extraordinary. On the campaign

⁵³ CIE (2013) *Benefits of natural gas for NSW*.

⁵⁴ APPEA (2013d) *Our natural advantage*.

⁵⁵ ABS (2013a), Table 06.

⁵⁶ Bunnings (2013) *About Us: Who we are*.

website it claims: "The natural gas industry was responsible for an estimated 100,000 Australian jobs last year."⁵⁷

To fully appreciate this claim we need to put an additional 100,000 jobs in context. Last year, according to the ABS, the Australian economy added an additional 173,537 jobs.⁵⁸ If the APPEA's claims are true, 58 per cent of all the additional jobs created in the economy last year were in the gas industry. This would be an amazing achievement if it were true and at the same time it would probably show that growth in the Australian economy was extremely narrow, being focused almost entirely in the gas industry.

Fortunately we can check such a claim. The ABS does not publish employment statistics just for the gas industry as it is too small, but it does collect statistics for the oil and gas industry. From the available data it can be calculated how many additional jobs were created in the oil and gas industry, but this number is likely to overestimate additional gas jobs since it will also include additional oil jobs. According to the ABS, 9,372 additional jobs were created in the oil and gas industry.⁵⁹ This is somewhat smaller than the 100,000 claimed by the industry.

This is not the only time that the gas industry has made incredible claims about jobs creation. In September 2013, at the same time that the gas peak body was making the 100,000 additional jobs claim, James Baulderstone, Santos vice-president for Eastern Australia, wrote about job dependence on gas in NSW:

*[CSG mining] can secure the more than 15,000 industrial jobs which are dependent on gas supply as a feedstock, and the further of 2.5 million people who are employed by those companies who use natural gas for power. However, it will require putting in place solutions today and not waiting for tomorrow.*⁶⁰

Data from the Bureau of Resources and Energy Economics⁶¹ show that 91 per cent of gas consumed by businesses in Australia is used by the mining and manufacturing industries. Census data from the ABS show that these industries employ around 300,000 workers in NSW.⁶² The businesses employing the other 2.2 million workers account for less than nine per cent of gas consumption.

So, of the 2.5 million jobs the gas industry is claiming to support, 2.2 million are employed in businesses that use gas only in a very minor way – for example for the heating of work spaces. The idea that these businesses would no longer employ people if gas prices rose dramatically is highly unlikely. It is far more likely

⁵⁷ APPEA (2013b) *Did you know natural gas is a leading player in Australia's economic story?*

⁵⁸ ABS (2013a).

⁵⁹ ABS (2013a).

⁶⁰ Baulderstone (2013) *NSW must secure its energy future and restore investor confidence.*

⁶¹ BREE (2012b) *Energy in Australia 2012.*

⁶² ABS (2011) *2011 Census Community Profiles.*

that these businesses would substitute gas with other forms of energy such as electricity.

Even the 300,000 jobs in manufacturing and mining would not all be lost if those industries were forced to pay more for gas. Some businesses, particularly in manufacturing, may struggle and lay off workers. But in the very profitable mining industry it is unlikely to have a large impact on employment. Many businesses in manufacturing and mining may also have the option of substituting different energy sources for gas.

With the industry relying so heavily on these claimed benefits – and its propensity to exaggerate those benefits – it is important to examine more closely the industry's economic claims.

The gas industry in context

Before we look at the industry's claimed economic benefits it is important to put the CSG industry into context. The amount of political noise an industry makes is not necessarily a good indicator of its relative economic importance.

The gas industry is spending an unprecedented amount on investment projects. According to the Bureau of Resources and Energy Economics (BREE) major project listing there is \$203 billion of gas projects at the committed stage.⁶³ The committed stage of the investment pipeline includes all projects that have passed all approvals and final investment decision and, in most cases, have already begun construction.⁶⁴ The vast majority of these projects are LNG export facilities. These facilities make up \$189 billion of the \$203 billion of new projects. With world LNG prices, and particularly the Asian price, having risen substantially in recent years it is not surprising that gas companies are keen to export Australian gas.

Large investment projects have the potential to generate jobs during the construction phase. These jobs are not ongoing, but are short term in nature. This can create the potential for the industry to exaggerate jobs created by claiming very temporary construction employment.

While investment in the gas industry is currently high, other measures of its economic importance show it to be relatively small. As shown above, the oil and gas industry is a relatively small employer. This does not stop the industry from claiming far larger employment figures. The APPEA claims on its website that the CSG industry employs 27,300 people in Queensland and NSW.⁶⁵ Curiously this

⁶³ BREE (2013b).

⁶⁴ BREE (2013b), piii.

⁶⁵ APPEA (2013a) *Creating jobs*.

figure is higher than the ABS count of 20,700 for all of the oil and gas industries across the entire country.

Economic modelling

Economic modelling has, for many people involved in Australian policy debates, become synonymous with the process of serious policy development. Proponents of policy change that are armed with economic modelling are often taken more seriously than those with 20 years' experience working on the same problem. The modelling result that suggests tens of thousands of jobs will be lost or created often trumps logic or experience that suggests such claims are nonsensical. This is because model results are presented as objective outcomes of a scientific study. Experience, by contrast, is highly subjective.

This is not to suggest that modelling has no role to play in policy debates. It can and it does often make a useful contribution, but the fact that it sometimes can should not be confused with the conclusion that it always will.

An economic 'model' is not a physical thing, like a model car. Rather, it is a mathematical representation of the linkages between selected elements of the economy. For example, an economic model of the link between economic growth and commonwealth tax revenue would usually be based on the historic relationship between economic growth and the amount of tax collected. A simple model might distinguish between the impact of changes in economic growth on income tax, goods and services tax and the tax on company profits, whereas a more complex model might distinguish between different types of economic growth – for example, growth in exports, growth in consumer spending, growth in business investment – on a wider range of commonwealth taxes such as capital gains tax, mining taxes and fringe benefits tax.

The two most common types of economic modelling used in Australia are input-output modelling and Computable General Equilibrium (CGE). The gas industry has used both types of modelling in the past but tends to favour CGE modelling and has used it in a number of reports that show the alleged benefits of CSG projects in Australia. For more information about how input-output and CGE modelling are used, as well as their limitations, please refer to the box 'Input-Output and Computable General Equilibrium modelling'.

Input-Output and Computable General Equilibrium modelling

Input-output modelling looks at the relationships between different sectors in the economy.⁶⁶ These relationships are calculated by the ABS and published in its 'input-output' tables. These tables show how the output of one sector is used as an input into another sector. For example, the output of the steel industry is an input into the car industry. If the car industry were to expand the input-output tables it would show us how much extra steel would be required (as well as all the other inputs in the car industry).

The input-output tables are useful for those interested in understanding the impact of a change in one industry on other 'upstream' and 'downstream' industries. The input-output tables can also be used to calculate multipliers that show the flow-on effects that can occur if one sector of the economy expands or contracts. For example if the car industry were to expand by \$1 million, multipliers can show how much upstream and downstream industries would benefit.

Multipliers can be used to reveal connections with the economy but they can also be misused. They are often used to exaggerate the importance of an industry and in doing so they ignore the limitations of the input-output tables. Because of the fixed nature of the links between industries, input-output tables work better when the change in one sector of the economy is not large enough to cause major change in other sectors of the economy. Put simply the larger the change being studied the more that input-output modelling will overestimate the change in a sector. This is a flaw in the modelling that some lobby groups find very appealing.

Another limitation of input-output modelling is that it overestimates increases in employment. As the ABS warns:

The implicit assumption is that those taken into employment were previously unemployed and were previously consuming nothing. In reality, however, not all 'new' employment would be drawn from the ranks of the unemployed; and to the extent that it was, those previously unemployed would presumably have consumed out of income support measures and personal savings. Employment, output and income responses are therefore overstated by the multipliers for these additional reasons.⁶⁷

So for example if input-output tables were used to determine the impact of a doubling of the size of mining output they would find that employment would double, regardless of the ability of the economy to provide twice as many suitably qualified employees at the wage rate that prevailed when the input-output tables were constructed.

⁶⁶ For a more detailed discussion of these modelling techniques see Denniss (2012) *The use and abuse of economic modelling in Australia*.

⁶⁷ McLennan (1990) *Information Paper ANA Introduction to Input-Output Multipliers*, p.24.

Input-output tables are useful for conducting what economists call 'partial equilibrium analysis', that is, analysis of a change in one sector that is sufficiently small that it is considered safe to assume that 'all other things remain equal'. For that reason, when big changes that affect other industries are being considered it is necessary to rely on some form of macroeconomic model that explicitly considers the way that industries both respond to changes in relative prices and are competitors with each other for scarce resources.

The most commonly used models for evaluating major policy decisions are Computable General Equilibrium, or CGE models. These models are an extension of the input-output type models described above, with one of the most significant differences being that CGE models allow for prices to change the relative use of different factors of production in the production of a good or service. While input-output models are an attempt to explain how much wheat, energy, labour and capital is used to make bread, a CGE model might be used to estimate the impact of a wage rise on the amount of labour used in bread production.

CGE models are built on the input-output tables but combine these models with a wide range of equations designed to simulate the structural and behavioural relationships that shape economic activity. In addition to the data from the input-output tables on the linkages between different industries, CGE models need to include estimates of the 'elasticity', or sensitivity, of a wide range of variables.

These sensitivities include things like how much exports will change when the exchange rate changes; how much employment will change when wage rates change; and how much a change in tax rates will change people's desire to work.

It is important to remember that if a model assumes that a small increase in tax will lead to a large reduction in the willingness of people to work then the model will inevitably 'find' that a small increase in tax will lead to a large reduction in the willingness of people to work. It is, therefore, essential that those who are using macroeconomic modelling results are fully aware of what assumptions have been made by the modeller otherwise models can simply become a vehicle for converting assumptions into conclusions.

One of the most important, and least understood, features of CGE models is that they assume that, in the long run, the economy will be in full employment and that the path that the economy follows has no impact on its long-run destination. It is hard to overstate the significance of this assumption – put simply, it means that if the economy experiences a deep policy-induced recession, the model assumes that the recession will cause a sufficiently strong recovery that the final destination is no different from what it had been had no such recession occurred. In other words, CGE models are programmed to show that there was no long-run harm from the high interest rates that caused the 'recession we had to have'.

Modelling case study 1: Santos and the North West New South Wales CSG project

How economic modelling is presented is very important. A good report on economic modelling should contain the critical assumptions made and discuss any limitations that the modelling may have. Bad economic modelling hides the assumptions made and makes no mention of limitations of the modelling. A good example of this was modelling commissioned by Santos on the benefits of a CSG project it had proposed in North West NSW. The results of this modelling were quite curious.

Santos was planning to mine the coal seam gas reserves of North West New South Wales and, as elsewhere with coal seam gas projects, has encountered substantial local opposition. Action groups such as Save Liverpool Plains and the Lock The Gate Alliance have initiated lobbying and protest action. Santos released a report entitled 'The economic impacts of developing coal seam gas operations in North West NSW' undertaken by the Allen Consulting Group (the Allen Report). The Allen Report was commissioned and released by Santos and in an accompanying press release Santos' Vice President Eastern Australia, James Baulderstone, took the Allen Report to say that:

Allowing the natural gas industry to develop in NSW will deliver once-in-a-generation economic opportunities for the state, especially in regional areas.⁶⁸

But despite the claim that the development of CSG will create a 'once in a generation' economic opportunity, a careful reading of Santos' own economic modelling shows that, on the contrary, the benefits to the local economy of the planned development will be quite small and that the major beneficiaries will be the owners of Santos who predominantly reside outside of the development area.

The modelling showed that only 30 new gas jobs are expected to be created in the operational phase of the development and that 570 new public sector jobs would be created.

Due to the fact that the Allen Report does not provide a clear outline of the critical assumptions it made, readers are at a disadvantage in trying to understand how such a small increase in direct employment could create 570 new public sector jobs.

The Allen Report is a good example of how economic modelling can be used to create results that are nonsensical. Good economic modelling should present all the economic impacts so that a balanced view of the project can be reached. This means that even when economic modelling is done well, if the positive results are

⁶⁸ Santos (2011) *Santos NSW CSG investment promises substantial benefits for state.*

highlighted and the negative results downplayed or ignored then the purpose of the modelling is wasted.

Modelling case study 2: Arrow Energy's Gladstone LNG plant

Another example of the misuse of economic modelling is presented by Arrow Energy on its Gladstone LNG plant. As part of its environmental impact statement (EIS), Arrow was required to conduct an economic impact statement that involved economic modelling of both the positive and negative impacts of the project.

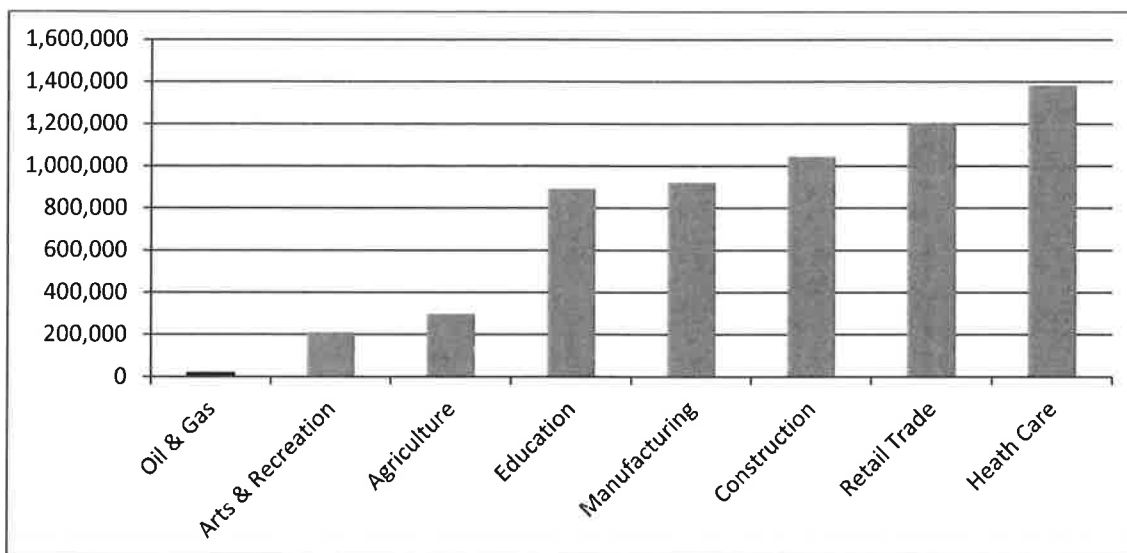
While the economic benefits were regularly mentioned in the report, including on multiple occasions in the executive summary, the negative economic impacts were harder to find. They were finally spelt out, not in the main report but in Appendix 21. For those with the stamina to read that far, the appendix spells out both the positive and negative impacts.

While the executive summary is keen to highlight the jobs created, it makes no mention of the 1,600 jobs across Queensland and Australia that will be destroyed, 1,000 of those in manufacturing.

The gas industry has in the past used economic modelling as a way of highlighting the benefits that its proposed resource projects may create while at the same time downplaying or ignoring the negative effects. This is a misuse of economic modelling. Good economic modelling shows all the benefits and costs as well as discussing critical assumptions and limitations. Bad economic modelling focuses attention only on a subset of outcomes and hides critical assumptions and limitations.

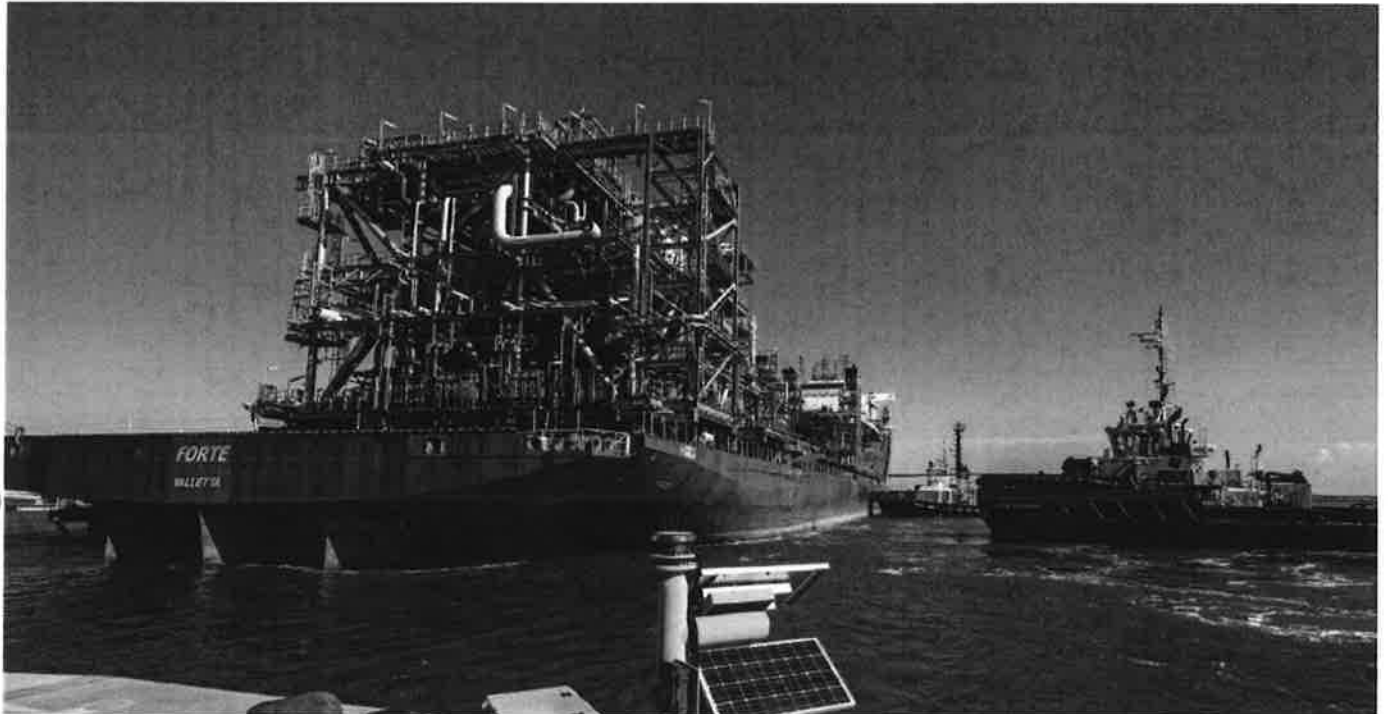
Does the CSG industry create lots of jobs?

The CSG industry clearly employs people but the number it employs is far lower than many of its exaggerated claims suggest, including those made by economic modelling it has commissioned. The whole oil and gas industry employs 20,700 people. Table 4 puts this level of employment in context by comparing it to other industry employment in Australia.

Figure 4: Employment by selected industry

Source: ABS (2013a).

The gas industry may be profitable and able to afford to pay consultants to exaggerate the size of employment within the industry, but the simple fact is that the arts and recreation industry employs more than 10 times as many people. Perhaps we would be as keen to see the arts and recreation industry expand if it could afford to spend as much on public relations as the gas industry does.



📷 The final three modules arrive in Darwin to complete construction of the Ichthys LNG Project's onshore processing facilities. Picture: SHAANA McNAUGHT

Business

NT gas industry, thousands of jobs at risk

GARY SHIPWAY, NT News

May 17, 2017 12:00am

🛡️ Subscriber only

The Northern Territory is at serious risk of missing the chance to secure thousands of new jobs and the NT's future in the lucrative on shore gas industry.

That's one of the key messages for the Territory Government at Australia's largest oil and gas exploration conferences in Perth this week.

More than 3000 people from 30 countries, including, for the first time, a large delegation from Russia, are attending the Australian Petroleum Production and Exploration Association conference.

APPEA chairman Bruce Lake has warned that Australia is fast approaching the tipping point of becoming a high risk country for overseas investors and singled out the Northern Territory as one of the growing examples.

“If there is a simple statement that captures APPEA’s concerns about the pressures on our industry, it is this: Australia has succeeded as a high-cost, low-risk country,” he told delegates attending the Perth conference.

“Australia will fail if we become a high-cost, high-risk country. We seem to be approaching a tipping point.”

Mr Lake warned that while the global demand for Australia’s products continues to grow, so does its competition.

“We are only one of 18 countries exporting LNG ... the largest LNG exporter today — Qatar — has just lifted its moratorium on new gas projects in its North Field, the world’s largest natural gas field. The US may have only supplied one per cent of global LNG trade in 2016.

“But it will soon add 50 million tonnes in capacity to become the third largest LNG exporter.”

He also pointed to Russia’s exploration ambitions in the Asia region.

Mr Lake said policies that restricted access to the nation’s resources and create sovereign risk were eroding Australia’s key competitive advantage — a stable operating environment.

“Explorers are not readily intimidated by risk, but a steady escalation of regulatory costs and risks ... has led to an unsustainable situation.”

“It is easy to complain about how our political culture is obsessively focused on the moment rather than long-term policy.

“That confidence in markets is eroding ... that the expectations of the community, the media and the political class about our industry are impossibly contradictory — not in my backyard; zero-risk; lower prices; and more tax.

“In response, APPEA has been advocating long-term policies to protect a sustainable operating environment for the industry.

“We have concentrated on three overlapping themes: access to resources; competitiveness; industry reputation.

“Access to resources has to be the starting point for any extractive industry. The obvious challenge occurs onshore, where projects must coexist with traditional rural industries. But offshore developments are also being targeted.”

Mr Lake hit out at dishonest activist campaigns capturing the minds of state governments and “producing a bipartisan race to the bottom”.

“Activists are striving to create the same situation in the Northern Territory,” he said.

“Fear campaigns can prevail when activists’ alternative facts are not contradicted by the lived experience of a safe industry, decent local jobs and new infrastructure.

“Cookie-cut campaigns are being rolled out, with the same theatrical touches, merchandise and social media cheer squad.

“APPEA’s response has been to mobilise local industry to fight local campaigns. In the process, we have discovered independent science and factual debate is necessary but not sufficient to counter fear campaigns. It is essential that communities can turn to impartial, independent agencies which can inform people, mediate any frictions and build trust.

“The successful models are the Queensland GasFields Commission and the Gas Industry Social and Environmental Research Alliance.

“We have urged states to create the same infrastructure.

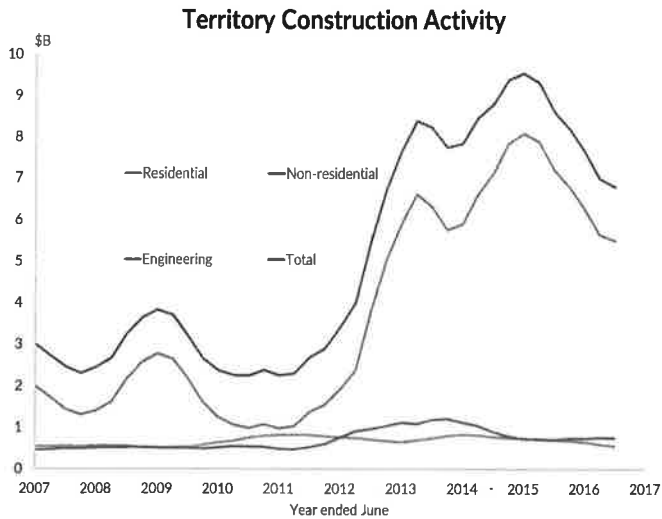
“In the NT, APPEA has helped pastoralists and indigenous people talk about their experiences with our industry.”

Mr Lake said while there was the potential for sovereign risk if costly investments in exploration were lost because of unexpected policy changes, he said APPEA was pleased that South Australia and the Federal Government had announced programs to pull forward near-term gas projects.

South Australia has incentivised the extraction of more gas for use in SA power stations, through a taxpayer-backed exploration fund.

The South Australian Government has committed an additional \$24 million to bring on new gas reserves, both conventional and unconventional.

It has previously committed \$24 million to encourage gas companies to explore for new gas fields but interest has been so great, the SA Government has increased the funding.



Source: ABS Cat. No. 8755.0

- The Construction industry remains the largest industry sector of the Territory economy.
- The gross value added of all industries was \$22.6 billion in 2015-16, 95.5% of GSP.

Construction Sector

- In 2015-16, the Construction sector contributed \$4.186 billion to NT GSP, with an industry share of total output of 17.7%. The construction industry accounted for 10.7% of the Territory's resident employment.
- The value of the Construction sector is above historical levels largely due to the development of major resource projects such as INPEX LNG gas project.
- In 2016, construction work done decreased by 21.2% to \$6.8 billion. Engineering work done decreased by 23.8% to \$5.5 billion, residential construction decreased by 21.3% to \$552 million and non-residential construction decreased by 5.5% to \$745 million, reflecting construction of the INPEX LNG plant winding down and fewer apartment complex construction.
- Over the next few years, growth is forecast to further moderate with the completion of the construction phase of some resource projects.

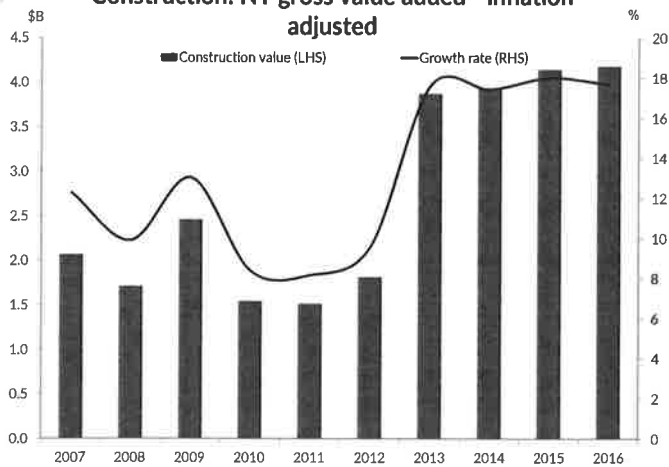
Mining and Energy Sector

- Mining and energy sector contributed \$3.046 billion (gross value-added) or 12.9% to NT GVA in 2015-16.
- The main minerals produced and processed in the Northern Territory are bauxite, gold, manganese and zinc/lead concentrate. Key energy commodities are oil, natural gas, uranium, and the production of LNG.
- Although the sector is the second largest contributor to NT GSP it employed around 4.6% of the resident employment in the year to February 2017 as it is capital-intensive and a portion of its FIFO workers are residents of other jurisdictions.
- The value of Mining and energy will increase strongly when the LNG production from INPEX's LNG plant commences, which is scheduled in 2018-19.

Manufacturing Sector

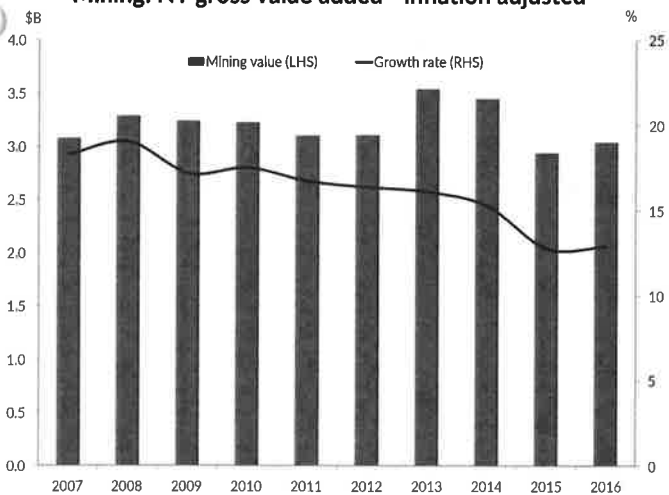
- In 2015-16, the Manufacturing sector accounted for 3.0% of the Territory's GSP.
- Manufacturing in the Territory consists mainly of small scale production of various products for export and domestic consumption, and mining-related processing.
- This sector employs around 3400 people, 2.5% of the Territory's total resident employment in the year to February 2017.

Construction: NT gross value added - inflation adjusted



Source: ABS Cat. No. 5220.0

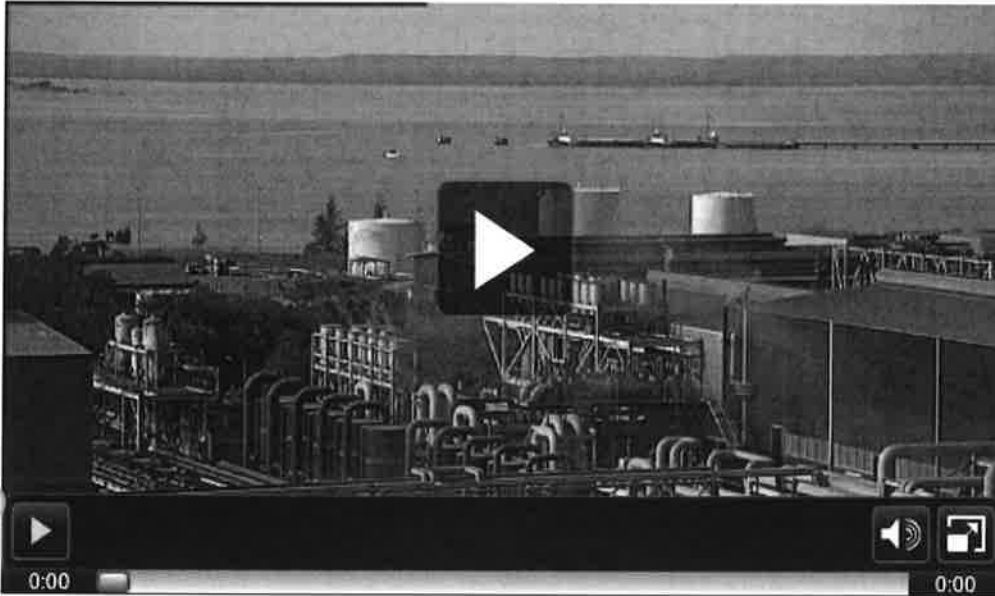
Mining: NT gross value added - inflation adjusted



Source: ABS Cat. No. 5220.0

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Rio Tinto pulls plug on Gove alumina plant



Australian Broadcasting Corporation

Broadcast: 29/11/2013

Reporter: Sue Lannin

Arnhem Land workers and their families shed tears over mining giant, RioTinto's, decision to mothball it's Gove alumina refinery.

Transcript

STEVE CANNANE, PRESENTER: There's been anger and tears in the Northern Territory tonight after mining giant Rio Tinto announced it would moth-ball its Gove alumina refinery in Arnhem land.

Around 1,000 people will lose their jobs in the mining town of Nhulunbuy, a blow to the region's fragile resources economy.

Resources reporter Sue Lannin reports.

SUE LANNIN, REPORTER: The decision to close the refinery prompted community anger aimed at both the company and the Northern Territory Government.

NORTHERN TERRITORY RESIDENT: You're going to go down as the Chief Minister that killed the goose that lays the golden eggs, mate.

SUE LANNIN: The refinery is the life blood for Nhulunbuy. Most of the 1,000 workers who'll lose their jobs call it home. Other job wills be hard to find.

DJWALPI MARIKA, TRADITIONAL OWNER: The Northern Territory Government has some responsibility to help the growth of the region's economic and social and cultural.

SUE LANNIN: Bauxite mining on the Gove Peninsula sparked one of Australia's most significant land right cases which the traditional owners lost. Nhulunbuy was set up to service the bauxite mine and alumina refinery.

In 2011, the refinery's new owner, Rio Tinto, signed a 40-year agreement with native titleholders. Now the future of services in the town is also under threat. Public servants, including teachers, may only have jobs until March. Many

people living in Rio Tinto-owned homes aren't sure what will happen.

NORTHERN TERRITORY RESIDENT 2: We come here with nothing, with three kids later, 20 years later, and got no job. Gotta go. How would you be?

NORTHERN TERRITORY RESIDENT 3: The parents won't be able to work if the childcare centre doesn't operate.

SUE LANNIN: Rio Tinto says the refinery is being moth-balled because of the high Australian Dollar, low price of aluminium and big after-tax losses.

JO-ANNE SCARINI, RIO TINTO: There is absolutely nothing more that could have been done by the Northern Territory Government or the Australian Government to change the outcome.

ADAM GILES, NT CHIEF MINISTER: The issue around gas has been resolved from our point of view but we now await Rio Tinto to make a decision about the future of the refinery. What I'm hoping, though, is this broad Australian company ensures that it puts people, Australians, Territorians, before profits on the balance sheet.

SUE LANNIN: In a statement, Rio Tinto boss Sam Walsh said it was a sad day and the company recognised it will have a significant impact on our employees, the local community and the Northern Territory.

The Prime Minister, Tony Abbott, says he's concerned for the businesses and workers who will be hit hard.

TONY ABBOTT, PRIME MINISTER: I think these are the people who Rio does have a moral debt to, if not necessarily a legal debt.

SUE LANNIN: Production at Gove will start to wind down in the first few months of next year.

PETER STRACHAN, FINANCIAL ANALYST: Sam Walsh has had a review of their operations globally and the aluminium business has been really the sick man within the Rio Tinto stable.

SUE LANNIN: Rio says 350 people will continue working at the bauxite mine. It's not clear yet who will be the lucky ones. Some staff may be redeployed to other Rio mines.

PETER STRACHAN: They're going to need additional people in the Pilbara to undertake that work so there may be plenty of opportunity for people who are willing to move to go and, you know, they could even offer to fly them in and fly them out from Nhulunbuy across into the Pilbara.

SUE LANNIN: It's cold comfort for the people of Nhulunbuy.

Sue Lannin, Lateline.

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Iron ore downturn puts WA in the doldrums

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Further job cuts are expected from Western Australia's resources sector as the depressed iron ore price forces miners big and small to slash spending.

Perth-based recruitment veteran Debbie Cozart, a partner at executive search firm CTPartners, said there were few fresh jobs on the horizon that could soak up the losses.

"It is really tough, there is no question about it," Ms Cozart said.

"The companies are having to react to the downturn in commodity prices and be as efficient as possible to minimise losses or maximise revenue. That is going to mean continued pressure on hiring ... we don't see it stopping any time soon."

Hundreds of jobs were shed from Western Australia's iron ore sector this week as iron ore prices crashed below \$US70 (\$83.30) per tonne, leaving many miners struggling to turn a profit on the ore they are producing.

The iron ore price has plummeted almost 50 per cent this year and some analysts forecast it will fall further in 2015, possibly dipping as low as \$US50 per tonne.



The falling iron ore price has punched a \$2 billion hole in the WA state government's budget. Photo: Philip Gostelow

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Miners are reacting to the downturn by trimming boards, cutting senior management and culling workforces in their hundreds. The knock-on effects are being felt throughout Perth.

The falling iron ore price has punched a \$2 billion hole in the state government's budget, forcing drastic cost-cutting action that includes sacking 1500 public servants.



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For months the market has been fearful about the impact of the ore price rout on smaller miners. How long could they hang on?

Atlas Iron on Thursday took a knife to its costs, culling 10 per cent of its workforce by sacking 30 on-site and 50 Perth-based employees.

Managing director Ken Brinsden said the cuts were inevitable because of the sharp losses in the iron ore price.

"It's imperative Atlas maintains a competitive cost base in light of current market conditions," Mr Brinsden said.

"We regret to see many good people leave our business. However, these changes are necessary and will help ensure our longer-term sustainability."

The cuts at Atlas follow 30 made in June and 70 in September.

"The majority" of the 360-strong workforce at Koolan Island was made redundant on Friday but not because of the iron ore price. The mine, located on an island off the coast of the state, has flooded with seawater and has been closed pending a decision on whether it is economic to repair it.

Unlike the previous iron ore price rout in 2012, this price slump has been sustained and the predictions are that it is going to continue this way for at least another year.

Fortescue sacked 1000 people in 2012 and was forced to put expansion plans on ice but by Christmas it was all back on. This Christmas isn't expected to be as merry.

Last month, Citigroup moved to slash its forecasts for the commodity for the next two years to \$US65 a tonne, from an average \$US80. ANZ added fuel to fears for the industry, predicting the commodity is unlikely to breach the \$US100 mark again, period.

UBS analyst Glyn Lawcock said with iron ore prices to remain depressed next year, miners need to cut costs.

"Everyone is shedding staff from BHP, Rio to the juniors. You have to

modify your business."

BHP Billiton began cutting staff earlier this year, shedding 500 jobs from its iron ore business, including 170 positions at its Mount Whaleback iron ore mine in the Pilbara and 100 roles at its iron ore division headquarters in Perth.

BHP Billiton iron ore head Jimmy Wilson said in October that he took "no joy" in firing staff. In the past, some employees had been moved to other areas of its business, he said.

"We take no joy in having to let people leave our business who have absolutely done nothing wrong. So we are trying to minimise that number as much as possible."

Iron ore is the nation's biggest export, accounting for 22 per cent of Australia's total exports in 2013.

Most of it comes from Western Australia so the twin effects of a sharp drop in mining construction and a 40 per cent slump in the iron ore price have ignited concern about the outlook for the economy.

The state has been stripped of its AAA credit rating, debt is ballooning and, on current prices, the iron ore price slump is set to punch a \$2 billion hole in government revenue from mineral royalties.

Within a few weeks the state government has to release its mid-year economic forecast. It currently has the iron ore spot price forecast to average \$US122.70 a tonne this fiscal year.

A frustrated Mr Barnett has lashed out at the mining companies and blamed falling iron ore royalty income and lower GST revenue for forcing deep cuts to the state's public sector, including 1500 voluntary redundancies.

Ms Cozart said the board cuts at Atlas and BC Iron, which cut its board from eight directors to five directors and slashed their fees last month, are aimed at reducing costs but are predominantly a message to shareholders.

"It is largely for shareholder impact ... the idea that we recognise as a company we have to respond at all levels," she said. "But it is not a trend we are seeing across the industry."

Australia's third force in iron ore showed three senior executives the door this week but Fortescue's spokesman denied that this was a reaction to the current environment.

BRW rich-lister Peter Meurs is taking time away from Fortescue for a two-month sabbatical. Mr Meurs oversaw Fortescue's massive expansion, which is now largely complete.

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