Protect Big Rivers
PO Box 2140
Katherine, NT, 0850

30 August 2022

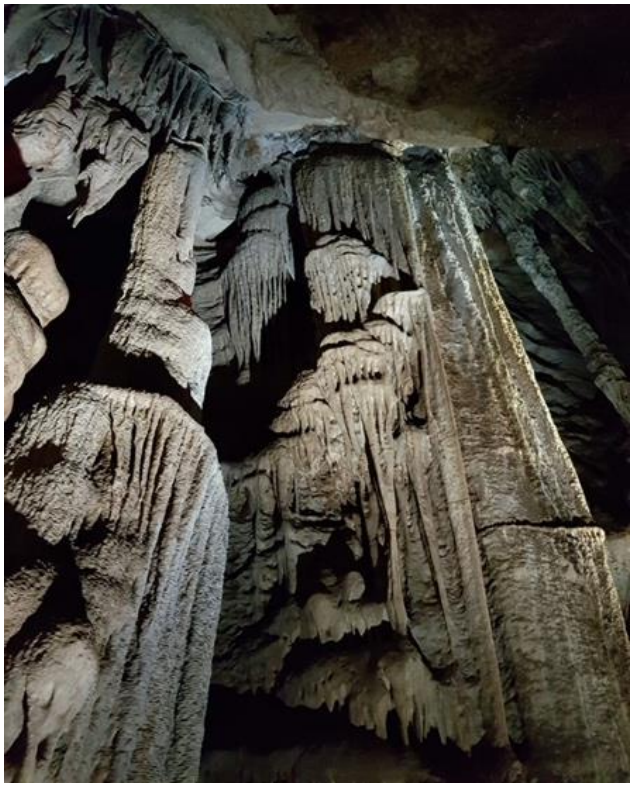
Senate Inquiry - Oil and Gas Exploration and Production in the Beetaloo

Protect Big Rivers (PBR) is a community-based organisation that formed in the greater Katherine Region of the Northern Territory in May 2022. We have not previously submitted or presented to this Senate Inquiry as we did not exist as a group during your previous sittings. We welcome the opportunity to voice our concerns about opening this country and aquifers to multinational gas companies to frack, particularly in relation to water and climate security in our region.

The 'Big Rivers' region of the NT covers the subtropics south of Pine Creek to the Barkly tablelands. It supports, and is supported by, the beautiful free-flowing Victoria, McArthur, Katherine Daly, and Roper River systems. These rivers end in wetlands that are biodiversity resting, feeding, and breeding grounds of national significance. The dry season flows of our Big Rivers are nearly entirely dependent on the underground flows from the Cambrian Limestone Aquifer (CLA) that discharge into our rivers via a multitude of precious and sacred springs. Without adequate throughflow from this enormous, cavernous, interconnected aquifer our spring fed Big Rivers cease to flow during the dry season. It is these aquifers, host to all manner of life, that fracking companies will drill through and take water from, as they seek to access gas in the Beetaloo.

Roper River Floodplain 1

Discharge point for CLA, Bitter Springs 1



Underground cavern of CLA 1

The PBR group currently has around 200 informal members and continues to grow daily. It is currently in the process of incorporating to formalise membership. Members include remote community residents from the length and breadth of the Roper and Katherine Daly catchments, including the underground aquifer catchments as far South as Tennant Creek. We also have residents, landholders, pastoralists, scientists, tourism operators, researchers, and many of the regions' veterinarians and doctors as members. Beyond the current membership base there are many who support the work we do, but for reasons of remoteness or whole of Government contractual 'gag clauses', they are unable to easily join our public activities.

PBR was formed in response to a deep community love of our country, springs, and rivers. We are already feeling the effects of extreme heat where we live, and fear for our region's climate and water security. We seek sustainable development of our region, that now seems targeted in a taxpayer subsidised push for rapid industrialisation - fracking, large scale land clearing and cotton. "Developing the North" is felt by many as another wave of destructive dispossession that threatens to take our water, livelihoods, and lifestyle, leaving us nothing but a parched landscape in return. We can and must create sustainable futures for our region. On shore gas is not that.

The State of the Environment Report 2021 declared both the NT Northern Tropical Savannah and NT Arid Zones to be 'collapsing' ecosystems. [1]For those of us with long histories in the region this came as no surprise. Our relative remoteness means that the

[1] https://soe.dcceew.gov.au

strain of climate change that is already being experienced here, is often underappreciated by decision makers.

At current rates of warming the climate threat to the Northern Territory is so great as to render large tracks barely habitable as early as 2040. Yet for the last decade successive Governments have continued to use precious taxpayer funds to support multinational gas expansion. The recent climate election proffered a glimmer of hope that has been quickly dashed in the ongoing pursuit of gas, come hell or high water; and it seems Government policy is committing us to both.

A: The climate change threats in Big Rivers Region:

The speed with which the effects of climate change are being felt is shocking to all but the climate scientists across the globe. As I type tonight, 33 million people in Pakistan are displaced and 1/3 of the country is underwater. The effects felt in our region cannot compare to these monumental disasters yet, but our time will come.

The Big Rivers Region is prone to flood, drought, and extreme temperatures. **Katherine averages 7 days over 40 degrees per year.** In 2004 the CSIRO predicted Katherine may experience 35 days over 40 degrees by 2030. **In 2019 we experienced 54 days over 40 degrees in three months.** Many ground water dependant ecosystems are dying. A global temperature rise of 1.5 degrees is predicted to make 2019 an 'average' year across Australia. If 2019 is 'average' our current ecosystems will not survive. With current Government climate, water and energy policy, the Big Rivers Region, and possibly the whole of the Northern Territory, is fast becoming a sacrifice zone.

Climate scientists now recognise that humans are responsible for almost all the earths warming since 1860.[2] It is clear we need to rapidly reduce net greenhouse gas emissions (GHGE) to create climate stability. **Increasingly the path taken between now and 2030 is recognised as the most critical determinant of global temperatures for our children's and grandchildren's lifetimes.** [3] The 2022 IPCC Report concluded that we needed to reach peak emissions by 2025 if we were to stay close to under 1.5 degrees warming**.**[4] **The International Energy Agency Report 2021 advised that no new oil and gas fields should be approved for development after 2021 if we are to remain under 2 degrees warming.** [5] The difference between 1.5 degrees and 2 degrees of warming on ecological systems as marginal as ours, is significant. Yet here we sit, still typing submissions to Governments who, subjected to strenuous lobbying by gas companies, have refused to hear the scientific communities' warnings for decades. In doing so they have negligently placed every living

[2] WM Gillett, N.P. et al. (2021) Constraining human contributions to observed warming since the pre- industrial period, in Nature Climate Change, https://doi.org/10.1038/s41558-020-00965-9

[3] O (2019) United in Science, Report prepared for the UN Climate Action Summit 2019,https://wedocs.unep.org/bitstream/handle/20.500.11822/30023/climsci.pdf

[4] IPCC Climate Change 2022: Impacts, Adaptation and Vulnerability, SummaryForPolicymakers.pdf

[5] IEA (2021), Net Zero by 2050, IEA Paris

creature on this beautiful planet in jeopardy. We ask what will it take for Governments to assume their rightful responsibility and make the necessary changes, at the speed required?

When we now question NT Government Ministers about global warming in relation to Beetaloo we are told of **'net zero by 2050', as though this is all that is required. However, we now must face the reality that**

- **how emissions evolve between now and 2030,**
- **what tipping points are triggered along the way, and**
- **what the total volume of GHGE will be required to be removed from the atmosphere by 2050 to recreate climate stability**

are now recognised as considerably more important than whether net zero emissions are reached in 2050.

The important thing about tipping points, that seems difficult for policy makers to comprehend, is that once they are tipped recovery is no longer possible, as a cascade of negative and compounding consequences follow. That is the nature of a tipping point, and why they must be treated with the up most respect.

It is now clear that many of the previously considered tipping points are 'in play'.[6] Artic and Antarctic ice sheets are melting at accelerated rates, the great carbon sinks of the Amazon and North American Boreal forests are burning and dying back. The Siberian permafrost is thawing at increased rates. These changes may already be irreversible and if they are it is likely the planet may tip into a 'hothouse state ', incompatible with life sooner rather than later. What happens in the Beetaloo, is our piece of the global responsibility pie. We cannot deny it and we must take responsibility for it.

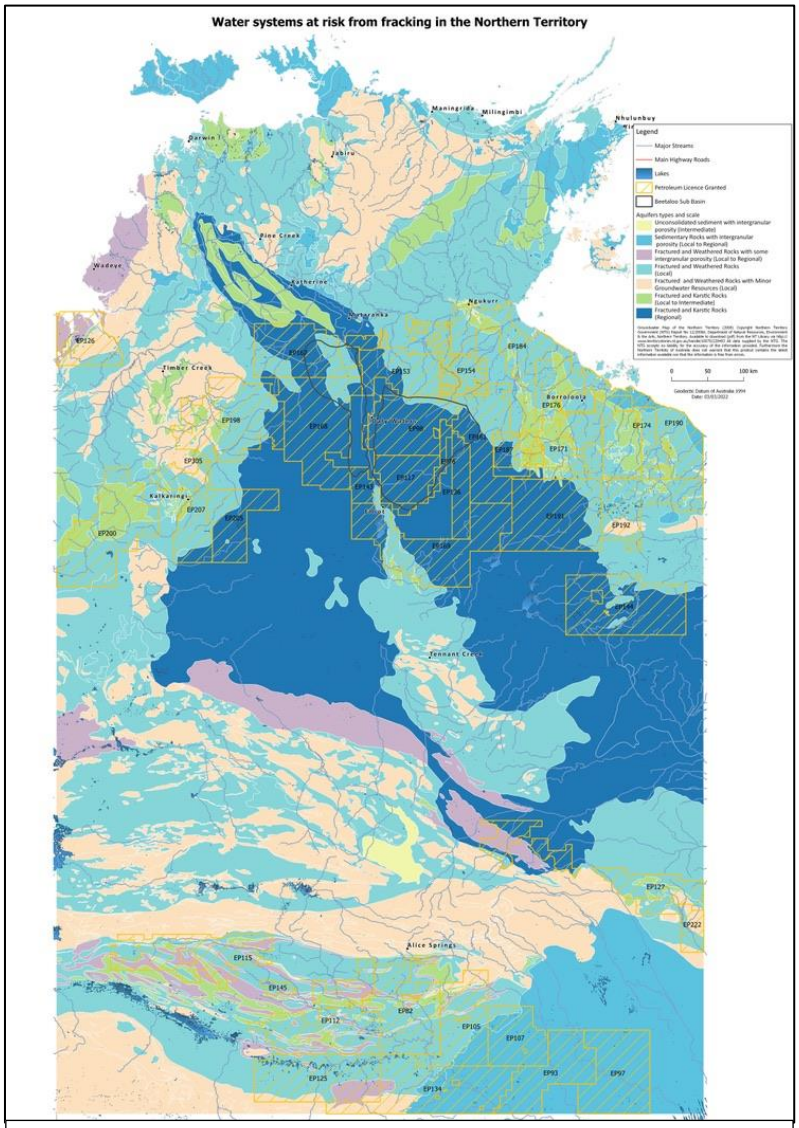
Developing the Beetaloo at a moderate level has been estimated to create 368 million tonnes of CO2 by RepuTex. The puzzle of how to implement Pepper Inquiry recommendation 9.8 *'That the NT and Australian governments seek to ensure that there is no net increase in the life cycle GHG emissions emitted in Australia from any onshore shale gas produced in the NT'* is yet to be resolved by Governments. Dr David Ritchie's latest advice to the Chief Minister on 31 May 2022 stated, **'There is now a clear path to implementing areas of risk - with the exception of the contribution of any onshore shale gas industry to climate change.'**[7] Meanwhile the Government continues to heavily fund subsidized development in the Beetaloo that is already increasing our GHGEs. The recent Origin exploratory well proposal in the Beetaloo, if utilised for beneficial use over a 24-month period will produce over 2million tonnes of GHGE, none offset, none even noticed.

In line with the pathway laid out in the IAE Report 2021 It is now critical that policy makers stop any new gas fields developments. It could not be clearer.

[6] https://www.nature.com/articles/d41586-019-03595-0

[7] https://hydraulicfracturing.nt.gov.au/__data/assets/pdf_file/0011/1120205/ritchie-letter-report-nov21-apr2022.pdf

B: Water security threats in Big Rivers Region:



CLA (blue) overlayed with fracking exploratory permits (hatched yellow). The CLA flows North, discharging into the Roper and Katherine Daly systems. This is the only reliable water supply for the Big Rivers Region. Our region completely depends upon it for clean potable water. Courtesy Billee McKinley.

The fragile state of water security in our region is poorly understood to those who live beyond its boundaries. Nationally we hear talk of 'plenty or water' in the Top End. This talk refers to both the periodic rises in our rivers during wet season bursts, and the modelled storage volume of our underground water. Local voices have consistently doubted that the water of the region can support the expansion of this industry without significant ecological damage.

The Big Rivers Region relies entirely on monsoonal rain to replenish our aquifers and fill our floodplains. As our planet warms, our rainfall becomes less predictable, and the trans evaporative depletion of our water resources becomes more significant. Three of the last four wet seasons in this region have been well below average. The 21/22 wet season where

La Nina flooding devastated parts of the East Coast saw the Big Rivers Region receive only 50% of its average annual rainfall.

Throughout our more arid zones, recharge of our aquifers only occurs with significant flooding. The CLA aquifer overlying the Beetaloo gas does not recharge annually, and recharge is very unpredictable.[8] Recharge only occurs with flood events, where the sheeted water flows into hidden limestone sinkholes and fissures across the landscape**. If there are no floods there is no recharge.**

The State of the Environment Report 2021 noted that, despite higher-than-average rainfall for the last 2 decades, 'groundwater levels in the Tindall Limestone Aquifer were the lowest in more than 20 years; and levels in the Oolloo Dolostone Aquifer were the lowest on record (since 2006) in 2020'.[9] These aquifers are the lifeblood of our region. **If throughflow from these aquifers ceases, our Big Rivers will stop flowing for periods every year. This has potentially catastrophic consequences for the region.**

Members of our group recall the drought of 1957-1960. During this time the Roper River ceased to flow over Roper Bar. With the loss of spring flow, salt water moved from the river back down into the aquifer systems. All pastoral production in the area had to cease and the community of Ngukurr was evacuated due to a lack of potable water. This was before significant extractive industry had moved into the region.

In 2019, with Katherine's aquifer already unpotable due to PFAS contamination, all available public servants from across the NT were mobilised on standby to hand deliver bottled water to the township. A blackwater flush event of the dwindling river (the town's only water source since PFAS) was predicted and could have left our 11,000-member community without potable water for up to 1 month.

Residents of the Big Rivers region understand a fragile water supply. The notion that billions of litres of our water is already being *given* to a government subsidised industry, that the community has resolutely and consistently stated it does not want. It is an industry that contributes to the existential threat to humanity. This displays a fundamental flaw in the process of democracy.

Major problems are evident in the system of water allocation in the NT. Key members of Protect Big Rivers recently met with the Minister for the Environment and the Executive Director of Water Resources as well as other water resources directors to protect our water for future generations. The key concerns Protect Big Rivers have with the allocation of water within the Beetaloo catchment relate to

i. Arid Zone Rules:

The recharge rates of large parts of the CLA are highly unpredictable. Modelling for the region is patchy and of generally low quality due to the nature of the interconnected cavernous limestone aquifer. Until this point there has not been the incentive for the NT

[8] "Meet the Expert' presentation, Simon Cruikshank, NT Department of Water Resources
[9] https://soe.dcceew.gov.au/inland-water/environment/water-sources#tindall-limestone-and-oolloo-dolostone-aquifers-in-northern-australia

Government to invest in learning more about our aquifer system, the recharge, flow rates and direction etc. as the pressure upon it has not been excessive. Fracking, mining, and the push to irrigate crops throughout the Barkly and Larrimah regions is changing that.

In the absence of adequate science or a water allocation plan (WAP), water allocations in the NT are made based on the antiquated 'Northern Territory Water Allocation Framework' where an arbitrary line divides the Top End (green) and Arid zones(orange) and determines the consumptive yields available.

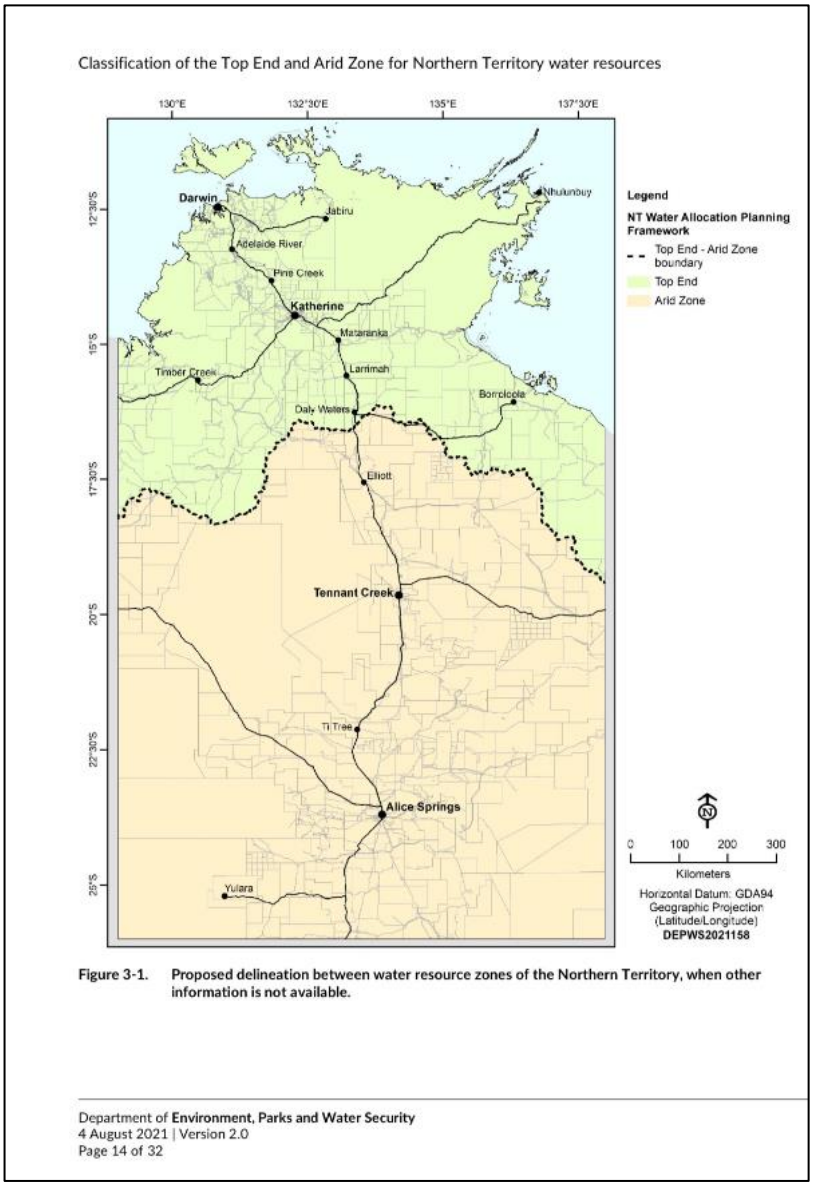


Figure 3-1. **Proposed delineation between water resource zones of the Northern Territory, when other information is not available.**

Department of **Environment, Parks and Water Security**
4 August 2021 | Version 2.0
Page 14 of 32

In the 'Top End zone" 20% of the average annual recharge is available for consumptive purposes. The Top End Zone is already fully allocated south of Katherine.

In the 'Arid Zone' the Water Allocation Framework allows for a massive 80% of the entire storage of an aquifer to be used over a 100-year period. Originally Intended to permit water mining to sustain the community of Alice Springs, this contingency ruling has now been used to allocated over 1000ML of CLA water per year to fracking companies, with an additional

1500ML per year currently under assessment when one includes water licence requests for sand mining for 'frac sand'.

At the time of the Pepper Inquiry gas companies forecast their water requirements. Averages of 2500ML p.a. up to 5000ML at peak demand were quoted by industry. Origin forecast an average of 1200ML per year with a maximum of 2500ML p.a at peak demand. [10] **It is notable that for the less than 30 wells currently approved or under assessment, there is a total of 2500ML litres of water per annum already allocated or pending allocation** when one includes sand mining as an ancillary industry. It would appear, that within the Pepper inquiry was a gross underestimate of true water requirements of the industry.

Disturbing is also the recent altering of the framework in the Larrimah area to accommodate extra extraction of water within the once Top End Zone. This aquifer is already fully or overallocated. This **'moving the arid zone North'** has been contested by the Department who claim that 'portions of the Top End zone aquifers are now shown to act more like an arid zone in terms of their recharge'. These systems are interconnected, and all support throughflow to the Katherine, Daly, Flora, and Roper Rivers. Dividing the single basin into portions based on quality of their recharge has resulted in making more water available for industry in an already over allocated system.

Over extraction in this system may result in stopping dry season flows in our iconic rivers.

ii. Establishment of Beetaloo Water Allocation Committees (WAC)

Prior to 2011 water across the Beetaloo, Larrimah and Mataranka was seen as one large CLA. Interconnectivity was assumed. From 2008-2011 the Mataranka WAC had oversight of the planning for the entire CLA Water Allocation Plan (WAP), including the Beetaloo. With the arrival of fracking the area of the Mataranka WAP was shrunk and the CLA was theoretically dismembered into different basins. The SREBA study into Stygofauna, commissioned after Pepper, has now confirmed the interconnectivity of these aquifers. Despite this the basins continue to be treated as discreet bodies of water when it comes to water allocation plans. The Pepper Inquiry recommended the establishment of Water Allocation committees for the Georgina, Wiso and Southern Daly Water Allocation Plan areas.

Of serious concern is that the usual process for establishing water allocation committees for Beetaloo water has been by-passed. A public exhibition period for committee membership has not occurred. Broad representative local membership, including valuable and knowledgeable Aboriginal voices, will not be part of the committee. Instead, the Beetaloo Regional Reference Group, has been appointed as the WAC for the Beetaloo area[11]. The use of this group as a WAC is beyond the original scope of reference for the committee – originally extended to encompass only 'the location-specific SREBA research and baselines studies within the Beetaloo Sub-basin.' [12]

[10] https://frackinginquiry.nt.gov.au/inquiry-reports?a=494293 pg 127
[11] Pers comms Simon Cruikshank and Tim Bond 2022
[12] https://depws.nt.gov.au/__data/assets/pdf_file/0006/976920/Sreba-beetaloo-regional-reference-group.pdf

The committee is largely made up of agency representatives with only one member living in the affected area of the Beetaloo. Protect Big Rivers has members whose family livelihoods, culture and history are inextricably linked to the CLA overlying the Beetaloo. Their families have lived in the region for tens of thousands of years and have valuable observational science that could contribute to decision making about regional water. These valuable voices have been excluded as a result of this process.

iii. Water Allocation Plans to be declared prior to completion of SREBA studies.

In meetings with Department of Water Resources executive 26/6/22 Protect Big Rivers was advised that the SREBA study modelling for water would not be complete prior to the declaration of the Water Allocation Plan for the Beetaloo. We were advised that the science of the SREBA would be integrated at the 2- and 5-year review points in the Water Allocation Plan. [13]This decision effectively creates a 2-year period where the value of the Pepper commissioned SREBA science is not integrated into the WAP for the region. This seems a gross negligence, given Pepper states 'During the course of the Inquiry, it became apparent to the Panel that there was not enough information for most of the onshore shale gas regions in the NT to be able to estimate the sustainable groundwater yield for any onshore shale gas industry.'[14]

It would seem prudent to not rush this process and to wait until all the available science is finalised prior to the declaration of the WAP.

iv. A lack of water quality protection

It is not just volume of water for the environment, existing industry, and human consumption, that concerns members of Protect Big Rivers. It is also the quality of the water. The NT has no legislated safe drinking water standards. Fracking by its nature contaminates water. Many of the chemicals used in the process are highly toxic, bio accumulate and react with each other and the ground environment in unpredictable ways. Ingestion of these chemicals can poison animals or create a residue effect contaminating meat and preventing the sale of stock.

Since the lifting of the deep shale gas moratorium Territorians have watched a gradual erosion of the Pepper Inquiry recommendations designed specifically to prevent water contamination events.

Notable alternations in recommendations have been

- the persistent use of open evaporative ponds for produced and frack water, as opposed to the recommended closed tank inventory of all water recommended by Pepper. Wildlife have access to these open ponds. In arid areas under drought conditions these ponds become attractive water sources. The addition of evaporation rates to the inventory also creates the possibility illegal discharge of wastewater during flood events going unnoticed. Many of these open evaporative ponds of exploration have now sat for years over the CLA.
- the intention to stop real time telemetry and mutli level arrays of sensors. Water Resources have advised Protect Big Rivers that 'fouling of the sensors was a common

[13] Meeting record of conversation 26/6/2022, Simon Cruikshank, Tim Bond.

[14] https://frackinginquiry.nt.gov.au/__data/assets/pdf_file/0011/494327/Summary-Report__April-2018_WEB.pdf

problem', and that 'managing sensors in these remote environments was very difficult' and concluded that they had 'recommended against the Pepper recommendation' of continuous real time multi-level sensor arrays being a requirement of the water monitoring program.[15] This approach is manifestly inadequate and requires immediate intervention, given the serious potential consequences.

Aerial view of a single Beetaloo frack pad showing open evaporative ponds. SecureWatch2022 Maxar Technologies

Federal Government Assistance Required to Manage NT Water:

There is little faith in the Big Rivers Region that the Government Regulator is capable of effectively allocating, regulating, and protecting our water supply. As some measure of protection, the Pepper Inquiry recommended the EPBC Act be amended to have the water trigger apply to the onshore petroleum industry. This became a Federal Labor election commitment in 2022. However, reform to the EPBC Act may not come into effect prior to the issuing of further water licences to gas companies, with a cumulative effect that could be quite large. Exploration creep is already using significant amounts of water, and the NT Government is talking of production licences being issued as early as next year. **It is therefore critical that the water trigger amendments be made prior to the allocation of water for further deep shale fracking in the NT.**

Protect Big Rivers would welcome the opportunity to address the Senate Inquiry at another public hearing, preferable in the NT. It is important voices from our region are heard on this matter. Further development of on shore gas now unequivocally threatens our long-term survival in this region. Our region is too precious to sacrifice.

[15] Meet the Expert Evening, June 2022, Gondiymayin Centre Katherine