

## **SENATE HEARING INTO THE IMPACTS OF MINING INTO THE MURRAY DARLING BASIN**

The Senate Committee has been travelling throughout the Murray Darling gathering information and community views to enable it to deliberate on issues facing the new mining opportunities of the Murray Darling Basin. This paper outlines recent impacts of mining on water quality in the Bowen Basin in Central Queensland. The Bowen Basin experience sounds alarm bells for the Murray Darling and should act as a warning to the regulators of that system.

The Bowen Basin covers some 60,000km<sup>2</sup> of Central Queensland has some 38 operational mines extracting some 100m tonnes annually, with another 17 in the development and approval process. In 2007-2008 sales from Central Queensland were valued at \$17.8 billion, and 19000 people were employed by the industry in the region. Coal seam methane extraction is rapidly growing across the Fitzroy, with an estimated 10 000 new wells to be drilled in the next ten years, and four LNG plants being built at Gladstone/Curtis Island.

Southern Queensland (Surat Basin) is relatively new to large scale extraction and the Surat Basin has 3.5 b tonnes of thermal coal resources as well, the coal seam methane gas sector is estimated at some 8,500b cu.m.

In the 5 years between 2002 and 2007 Queensland experienced a 129% increase in the number of people employed in mining, a 118% increase in total mining income and a 90% increase in mining output. With this type of growth there are bound to be community issues and environmental impacts. Dealing with these issues has been the challenge for present and previous State Governments.

The agricultural and environment sectors, by their very geographical location are obviously the hardest hit. Rural papers have been full of issues such as :- loss of prime farming land, loss of ecological values, access, loss of water quality in streams, lack of planning, mine levees to name but a few.

### **Fitzroy Basin experience -Ecological values are being eroded**

The Fitzroy Basin in Queensland is Australia's third largest river system behind the Murray Darling and Lake Eyre, and the largest draining to the east coast and Great Barrier Reef lagoon. At 156,000 km<sup>2</sup> it is one tenth the size of Queensland. The majority of the Bowen Basin coal reserves underlay the Fitzroy.

Ecological values and key assets of the region have been highlighted in the Fitzroy Basin Association's *Central Queensland Strategy for Sustainability- 2004 and Beyond*, the regions accredited natural resource management plan. A critical part of this document is taking an "assets based approach to planning" i.e. identifying the main assets of the region and addressing the pressures on these assets". we see this as a fundamental planning process that enhances and protects the regions assets.

The water quality "asset" had a major impact early in 2008 as result of an intense rainfall event and subsequent devastating floods. A number of the basin's coal mines were flooded and were either granted Transitional Environmental Programmes

(TEP's), or operated under normal license conditions, allowing discharge of flood water from mine sites into the river system.

However it was the Ensham coal mine issues that brought attention to the issue. Ensham is an 8 million tonne open cut coal mine facility that operates on the floodplain of the Nogoia River, a 5<sup>th</sup> order stream. Levee banks built to protect the mine from a one-in-hundred year event overtopped, and then failed allowing some 150 GL of water to flood the pit and drown a dragline.

In an effort to get the mine operational as quickly as possible, and to minimise the time flood waters mixed with disturbed soils, the company and the State agreed to the conditions of a TEP. This permit allowed the discharge of 138 GL of water to be discharged back into the Nogoia River, while the parameters of the discharge water remained within some limits and under certain flow conditions. The TEP was subsequently amended. To remain within the set conditions, Ensham purchased water from landholders from their allocations from the upstream Fairbiarn Dam.

Trigger limits proposed by Ensham were based on National Water Quality Guidelines, and were compliant with the standard for safe drinking water. The critical factor in the resulting issues was not so much the permit, nor the boundaries of the permit, but the fact that the discharge was allowed upstream of several storages that provided both stock and domestic, irrigation and town water supplied. The discharge also occurred some 550km above release to the ocean. Discharge water, highly saline and therefore denser than fresh water, pooled behind weirs while freshwater purchased to dilute the discharge "skated" over the top.



*10 story dragline submerged at Ensham. Remains of levee bank top left.*

The facts from this episode were:-

- As a result of the discharges, salt levels rose from a base level of 11 mg/l at Fairbairn Dam outlet to 185mg/l at Bedford and Bingegang weirs (below Ensham mine) to an incredible 485mg/l on the Isaac River. Australian safe drinking water recommendations are 200mg/l.
- An estimated 100 000 tonnes additional salt was contributed to the system, during the dry season where there was very little base flow.
- Water supply to people in the townships of Blackwater, Tieri, and Bluff approached safe drinking standards for sodium. Residents of these and other towns including downstream Rockhampton complained of poor taste. Two mining towns required bottled drinking water for some weeks
- The region's largest coal fired power station near Rockhampton was impacted on because of the water quality, and sought its own TEP to discharge additional water as routine recycling for the cooling tower could not occur.
- Queensland Health reported issues with routine procedures such as use of dialysis equipment and sterilisation of operating equipment
- Graziers reported stock not drinking water
- 80km of Isaac River considered "Dead"
- River water testing was found to be un-coordinated
- Messages from Government agencies were confused and the usual buck passing occurred.
- There was a concern the Environmental Protection Agency (EPA) was withholding data, which led to an erosion of faith in the EPA
- Fitzroy Basin Association finally was forced to do a "snapshot audit" of the river system's water quality
- Community anger resulted in a scientist (Professor Barry Hart) appointed by Premier Anna Bligh to review systems.
- The State government also undertook a monitoring program, and a desktop study into cumulative impact.
- Professor Hart's report and the cumulative impact study can be found here: <http://www.fitzroyriver.qld.gov.au/>

Figure 3 Discharge timetable for Fitzroy mines for 2008.

	Jan				Feb				Mar				April				May				June				July				Aug				Sep				Oct				Nov				Dec			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1 Hail Ck	[Cyan]																																															
2 South Walker	[Cyan]																																															
3 Copabella	[Cyan]																																															
4 Burton	[Green]																																															
5 Goonyella North	[Green]																																															
6 Goonyella Riverside	[Green]																																															
7 Maranbah North	[Green]																																															
8 Broadlea North	[? ? ? ?]																																															
9 Isaac	[Green]																																															
12 Mellenium	[Green]																																															
16 Peak Downs	[Pink]																																															
17 Saraji	[Pink]																																															
19 Norwich Park	[Pink]																																															
20 German Ck	[Purple]																																															
21 Middlemount	[Purple]																																															
22 Forleigh	[Purple]																																															
23 Cahey	[Purple]																																															
24 Lake Lindsay	[Purple]																																															
25 Blair Athol	[Yellow]																																															
27 Gregory Crinum	[Yellow]																																															
29 Ensham	[Yellow]																																															
30 Minerva	[Yellow]																																															
31 Rolleston	[Yellow]																																															
32 Cook Colliery	[Light Blue]																																															
33 Blackwater	[Light Blue]																																															
39 Callide	[Green]																																															

Coloured weeks indicate a discharge for at least on day of that week. Groupings of similar colour indicate same sub-catchment locations (named in column 3, Table 6 on page 33)  
 (?) Specific dates were not provided for discharges during this month.

Ensham coal mine was considered at the time to be the “villain” in the whole debacle. Ensham acted within its TEP, however the sheer volume of water delivered into the river created a cumulative effect that no-one saw. Ensham, being below Fairbairn dam was able to “blend” clean water it purchased from landholders with contaminated which lessened the effect. Mines on the Isaacs River were unable to do this, and not required to under their permit conditions. This resulted in the huge impact in that sub-catchment.

The recommendations of both studies have been considered by parliament, and those that remain relevant were either adopted in whole or in principle. The State government has worked with mining companies to develop consistent conditions, and mines must ‘voluntarily’ amend their EA’s to take into account new water quality standards and conditions for discharge by end December 2009. For some mines, this is unachievable due to the scale of works that must be undertaken in a relatively short period of time to achieve on-site water balance. These companies will have transitional arrangements until such time as they can meet the new conditions. Other recommendations relating to longer term monitoring programs and communication will be implemented over time.

However, what the incident and subsequent reports fail to acknowledge is the question of whether an open cut coal mine should ever have been on the floodplain of a river the size and scale of the Nogoia. Nor does it identify that the Curragh North mine downstream was also within danger of being overtopped as well.



*Curragh North. Levee is holding back Nogoa River <50km downstream of Ensham*

Individually mines are very disruptive to the natural terrain and must go through an approval process by carrying out an Environmental impact assessment (EIS) which then determines the conditions of the Environmental Authority (EA). In short this is a very complex document outlining all the actions the mine will take in order to not have an impact on the environment in which they operate.

Policy failure is evident here however where there are 38 mines on the one catchment (as is the case in the Fitzroy) no-one is legislating for the cumulative effect of 38 EA's on riverine health, ecology, reef, water quality etc. All but two of the mines in the region are permitted to discharge under certain conditions, and at least five TEP's were issued. Water quality discharge is only one of a range of environmental impacts that site by site may not be disastrous, but cumulatively are having noticeable effects on the ecological integrity of the basin. Other issues include multiple stream diversions (150+), soil subsidence over underground operations including subsidence of the actual river bed of the Isaacs, clearing of remnant vegetation, draw down on groundwater supplies.



*Stream Diversion – Stephen's Creek*

### **Conclusions and considerations**

Given the huge global demand for coal there are a further 17 mines planned for the Fitzroy catchment as at late 2009. Due to a lack of co-ordinated planning we have lost some prime agricultural lands from previous mines. Landholders and the community have had enough. There are several mines planned in the Rolleston area and landholders are agreed to picket these proposed mine areas to stop the loss of these prime farmlands.

Regulators of the Murray Darling basin at the onset of mining activity need to heed the mistakes of the Fitzroy Basin and ensure cumulative impacts of total mining activity is monitored and factored into each individual Environmental Impact Assessment (EIS). Mining impacts on the environment occur both individually and cumulatively.

The Queensland Minerals Resources Act 1989 was written and enacted when resource development in Queensland needed encouragement. The Act needs to be changed to make it more relevant in a climate of development and environmental pressures. Equally important is the lack of provisions in the current act for protection of prime agricultural lands, environment, and adequate landholder rights.

Given the failures of the EPA, now called Department of Environment and Resource Management (DERM) in the instances outlined in this paper and in North-West of Queensland, which had similar issues this year, there are serious concerns that the agency in its current form will have the capacity to manage the huge issues it will confront in the Surat Basin Coal seam Gas (CSG) projects.

The potential water issues in this huge developing region could make the Fitzroy failures minor. Salt water management and the impacts on the Great Artesian Basin are issues that are critical to future generations of Australians.

There are now calls in Queensland for a new independent Environment Agency separated from Government. The South Australian model has an independent board and CEO who operate to the legislation reporting to the minister, but the minister cannot interfere in the working of the agency.

Properly resourced by Government and organizations that use the EPA, it is a model the community can have more confidence in to be independent and deliver better outcomes for the environment and business.

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## Appendix

### Queensland's tenure arrangements

Persons usually hold title over land under two common forms of tenure:

- Leasehold - (Perpetual or grazing homestead, grazing rights on State Forest, mining lease). The State retains ownership of the land, trees and mineral resources under the surface.
- Freehold – The State retains ownership of the mineral resources under the surface, and more recently has amended rights of landholders to deal with vegetation.

A range of acts and policy exist that constrain land use and management.

### Mechanisms to change tenure and management to allow for development

- Under the *Mineral Resources Act 1989*, the State may grant an exploration permit over both freehold and leasehold title. A large portion of Queensland is covered by exploration lease.
- Conditions exist that require permit holders to undertake certain activities, including active exploration, to maintain their permit. Such permits can be sold and may lapse and then be granted to a different company.
- Conditions also exist that require permit holders to operate in a certain way with respect to advising the landholder of their activities etc.
- If and when a company discovers a deposit worthy of further investigation, they may apply and be granted a Mineral Development Lease. More intense investigations will then occur, negotiations with landholder to 'purchase' the property. Such negotiations involve value of improvements and income foregone. Usual practice is outright purchase.
- Companies then prepare a 'case' to be granted a mining lease over the tenement. This process enacts the *Environmental Protection Act 1994*, and an Impact Assessment Statement (IAS) is issued, informing interested parties of the intent to prepare an Environmental Impact Statement (EIS). Draft Terms of Reference for said EIS, follow with opportunity for community and agency comment, followed by Terms of reference, Draft EIS (community and agency comment) and eventual EIS.
- The Commonwealth's *Environment and Biodiversity Conservation (EPBC) Act* may be triggered by actions proposed, and the project may be declined or as is more likely, compliance conditions imposed.
- Company then lodges an Environmental Management plan and Environmental Authority under the EP act, negotiates the EA with the State and is granted a Mining lease under the *Mineral Resources Act*.
- The Environmental Authority governs the conditions under which the operation may carry out activities. They include management of post mine rehabilitation, practices to minimise dust, noise, community impact etc. On site water management is a component of the EA.



- Conditions exist in most EA's that allow for discharge of excess water as part of normal operations. Practices exist for capture and treatment of waste waters. Discharge occurs only when infrequent excess water balance occurs, such as in intense rainfall events. Thus discharge is allowed under permit as a normal part of operations.

### **Transitional Environmental Permit**

If an operation is faced with an "abnormal" situation that requires management outside of the activities permissible under the EA (i.e. they cannot comply with the EA), the company may apply for a Transitional Environmental Permit. Conditions are negotiated with the State, under the EP act. EP's do not need a public consultation period unless they run for more than three years.