

# **Your drinking water is draining away - your water catchments are cracking up**

by Keith Muir

## **A question of our survival**

Pure water is our most precious natural resource. But intensive 'longwall' underground coal mining is now causing cracking of stream beds, with water loss and pollution in several NSW drinking water catchments.

The Woronora Catchment which supplies most of Sutherland Shire's water has begun to be seriously damaged by this longwall mining. And, alarmingly, the damage will greatly increase if the State Government says yes to Metropolitan Colliery's proposal to extend its longwall mining under Waratah Rivulet (which provides a third of Woronora's water) and under the Woronora Dam storage itself.

Further to the south, in other water catchments serving Sydney, this form of intensive mining has resulted in cracking of sandstone riverbeds, draining of rock pools and wetlands, surface subsidence and collapse of hillsides.

Both catchment areas must be preserved in top condition if they are to continue as on-going suppliers of clean drinking water for Sydney and Wollongong, particularly during drought times. These catchments, being the ones closest to the coast, are our most reliable water supply catchments. Moreover, CSIRO has predicted that rainfall in these areas will continue to decline in response to climate change; so even a small reduction in catchment performance will be serious.

Public awareness and determination must be aroused to stop the damage to our water catchments from longwall coal mining by demanding regulation of mining which will ensure that the industry respects the ecological integrity of the water supply catchments upon which 4 million people depend.

### **Longwall mining and its effects explained**

Longwall mining extracts long blocks ('panels') of a coal seam from deep underground. A panel may be three or four metres high, up to 350 metres wide, and several kilometres long! The typical longwall panel can take a year to mine. The longwall panels are located in parallel, separated by coal pillars.

When the coal panel is being mechanically cut, the strata above the advancing machine-cutter are propped up by very powerful roof supports, protecting the operatives. But as the supports are moved forward with the advance of mining operation, the immensely heavy overlying rock collapses into the cavern created by the removal of the coal seam.

Fractured rock may extend to a height above the seam of 25 to 35 times the thickness of the mined coal panel. Above this level, the surface rocks settle and may crack – perhaps in a creek. Cracking and subsequent water loss can result in permanent changes to water catchments and groundwater aquifers.

In addition to cracking, surface subsidence can cause hill slopes to collapse, escarpments to topple, increased erosion and eco-toxic stream pollution. In hilly country, the surface damage may occur as far as 1.5 kilometres from the mined area.

### **Degradation of water resources**

The surface cracking associated with longwall mining degrades streams and groundwater resources. The cracking causes a greater proportion of rainfall and stream flow to sink into the ground, perhaps to be held within porous sandstone rocks. Rock faulting and the common minor faults, known as joints, increase the degree to which water can be lost in these sandstone water catchments; generally, groundwater levels drop.

Cracking and the subsequent water loss can result in a permanent reduction in stream flows and water production from a catchment. The cracks also allow surface water to mix with subsurface water, and the resulting mixture may have eco-toxic chemical properties and be released back to the surface.

### **Sydney Catchment Authority is powerless**

The Sydney Catchment Authority was established in 1998 as a result of that year's Sydney water crisis, when the potentially lethal bugs, *cryptosporidium* and *giardia*, contaminated the city's water supply. Peter McClellan, SC, who led the subsequent inquiry, determined that a separate catchment management authority with teeth should be created because, as he said, "someone should wake up in the morning owning the issue" of adequate management. Yet in regard to coal mining development, which is spoiling our drinking water catchments, the Authority does not have the power to curb the intensity of mining operations or even stop evident mining damage. In other words, the regulatory regime is failing to protect our water supply catchments: the Department of Primary Industries goes on allowing damage as obvious as cliff collapses, drying of swamps, water pollution, cracking of rocky stream beds, and decline of water flows.

### **Current Mining in our catchments is out of control**

There are eight operational mines in the water supply catchments south of Sydney. They have significant potential to cause serious environmental damage to thousands of hectares in these catchments.

Metropolitan Colliery has mined directly under the Waratah Rivulet that provides about 30% of water to Woronora Dam. The dam supplies nearly all the water for Helensburgh and the Sutherland Shire. The Rivulet has

been badly cracked by longwall mining: much of its water is draining away; and Flat Rock Swamp, an important headwater source, has all but dried up. For much of the Rivulet's length, it only flows after heavy rain, and some attempts at remediation to restore flows have failed.

The Colliery is now owned by Peabody Energy, a US-owned company and the world's largest coal mining corporation. Peabody intends to extract a further 27 longwall panels. They will run under remaining undamaged reaches of the Rivulet and its tributary streams and will finish under the Woronora Dam storage area itself. The panels responsible for the damage that has occurred are relatively narrow longwall panels, 158 metres in width and up to two kilometres long, but the proposed new longwall panels are likely to be more extensive and will therefore be more damaging. So the Shire's water supplies are at risk.

### **Lessons from BHP's longwall mines**

Further south, BHP-Billiton has a major new colliery – Dendrobium – with longwall panels up to 305 metres wide which pass under key water supply streams. The damage predicted by BHP-Billiton's own experts include two metre surface movement above mined areas producing to cracking up to 200 mm wide, drainage of streams, draining upland swamps, mining-induced landslides, rock falls affecting 10 per cent of cliffs, death of native vegetation due to methane gas emissions, and water pollution from the emergence of eco-toxic groundwater. The signal from BHP-Billiton's experts is very clear - maximising coal extraction by longwall mining will cause severe damage to essential water supply areas. It is a prediction that has been confirmed by the cracking damage caused in the first area of the catchment mined, which is situated under the two arms of Cordeaux Reservoir.

BHP Billiton's Appin Colliery has just been approved by the NSW government to mine under the important Upper Cataract River which carries 7% of Sydney's drinking water and acts as a natural aqueduct feeding the Upper Canal. The company's own consultants admit that this pristine river may be cracked and polluted by the extraction of coal from the 350 metres wide longwalls. This colliery has already caused cracks, twisting and bending of the Cataract Tunnel and has also cracked the concrete wall of Broughton's Pass Weir. Yet further damaging coal mining under the open aqueduct of the Upper Canal is planned.

At the BHP Elouera Mine, which underlies Wongawilli and Native Dog Creeks, also in the Metropolitan Catchment, mining has caused extensive and intense cracking of rock beds and draining of all rock pools (small and large) in mined areas. Under normal unmined circumstances the affected streams would be flowing (and this is the case with unmined creeks in the vicinity).

This litany of damage reveals an inversion of priorities where preservation of priceless water catchments and infrastructure delivering pure water to our homes has become secondary to coal production. *Even so, the full extent of damage from mining is unknown.* For many years public access

to these catchments has been strictly prohibited to protect these areas and yet serious damage to our water supplies has occurred due to the double standards applied to intensive longwall coal mining in water supply catchments by the NSW Government.

The damage is unacceptable because water flows are being reduced, flows that cannot be effectively restored by rehabilitation, and water pollution is occurring to the remaining water supplies. In 2000 the Mining Department's experts urged that when the costs of mining damage are large, "safety and conservatism is paramount", but the Department is deaf to the advice of its own experts. Clearly, the mining industry has captured a pro-developer Government, and a new independent regulator is therefore urgently needed.

### **Poor regulatory control of mining in water supply areas continues**

Each longwall panel needs to be given permission by the Department of Primary Industries, but the Department has a conflict of interest, as it is the primary advocate of mining in NSW. It has not imposed adequate mining prohibition zones under the streams nor otherwise guaranteed the ecological sustainability of our essential water supply areas. Rehabilitation techniques are rejected (eg. cement grouting of cracks), as these are experimental, have been only 50 per cent successful at best, and are polluting in themselves.

Further mining will be proposed in the future and, unless there is a change in regulatory controls, preservation of our drinking water supplies will again come a poor second priority to coal production.

The issue of water loss and damage to the catchment was highlighted at the commission of inquiry when the proposed Dendrobium Mine was proposed. The submission from Sydney Catchment Authority said, "There is evidence of pools being drained, reduced flows and a reduction in water quality... (and there is) a potential for cracking beneath swamps to drain a significant amount of water contained in the swamps. This could lead to drying of swamps – adversely affecting their ecological integrity but also reducing water flows downstream. Practical means of remediation are generally not available" (30 July 2001).

In the six years since 2000, intensive longwall coal mining has remorseless continued to damage our catchments.

### **Mining Inquiry is Badly Flawed**

On December 6<sup>th</sup> 2006 NSW Planning Minister Frank Sartor announced an Independent Inquiry into the NSW Southern Coalfields, saying he would impose a new approval process after 2010. But by then many more longwalls will have been granted consent under the current failed regime – thus extending these damaging operations well beyond 2010.

To have any credibility at all, a moratorium on new longwall mines must be imposed until the Sartor Inquiry has handed down its findings. It should also investigate longwall mining in drinking water supply

catchments as a separate term of reference, with clear directions regarding the need to preserve pure water supplies. And the Inquiry should also be further expanded to acknowledge the primacy of water resources and apply the precautionary principle to ensure that no more damage is done to streams across NSW by coal mining.

### **Protecting Sydney's water catchments from coal mining damage**

The need of four million people for adequate supplies of pure water is primary and enduring. By comparison the extraction of coal is a secondary and short term consideration. So the preservation of the Woronora and Metropolitan catchment areas is vital. If coal mining is to continue in these areas then safeguarding the ecological integrity of our water supply catchments, including maintenance of water quality and flow, must be the paramount consideration. A much improved system of environmental regulation has to be developed. To achieve these aims it is necessary to:

- Prohibit, in all current and future mining approvals, high impact coal mining in drinking water catchments and other environmentally sensitive areas; only mining that does not impact upon a catchment's capacity to collect or transmit water and does not cause pollution should be permitted; under no circumstances should mining operations be permitted that cause surface cracking.
- Remove the Department of Mineral Resources as the environmental consent authority for underground mining operations in these areas and replace it with an independent regulatory environment that includes: (i) the ability of both the Sydney Catchment Authority Board and the Environment Protection Authority Board to impose legally enforceable directions to prohibit mining in certain areas and to establish protection zones in other areas to protect catchments; and (ii) an expanded role for the Dam Safety Committee to regulate mining within drinking water catchments and addition of a nominee of the Nature Conservation Council of NSW to the Committee.
- Develop a Protection of the Environment Policy (PEP) under the *Protection of the Environment Operations Act 1997* that makes drinking water catchment preservation the primary consideration for coal mining operations in these areas.
- Review all pollution licensing for underground coal mines in drinking water catchment under the *Protection of the Environment Operations Act* so that companies can be heavily prosecuted for causing any damage to streams and water catchments.
- Provide monthly public internet monitoring reports of mine subsidence damage and advice from the Dam Safety Committee, Environment Protection Authority and Sydney Catchment Authority.
- Establish underground mining prohibition areas of one kilometre around streams, upland swamps and water supply structures, and

mining protection zones for other vulnerable areas like cliffs and rock overhangs, these controls to be made mandatory for all current, as well as future, longwall operations.

- Reserve an area totalling approximately 97,500 hectares in the Woronora and Metropolitan Special Areas, an area exclusive of dam walls and major Sydney Catchment Authority infrastructure, and termed the Woronora State Conservation Area and Metropolitan State Conservation Area respectively.