

Report to the Independent Planning Commission (IPC) following the 23 January, 2024 site inspection

General question for consideration:

Does the Springvale Water Treatment Plant make a material difference to the water quality of the Coxs River catchment when the salt from that plant is placed on an unlined Ash Emplacement Area located above where the following image was taken in 2016?

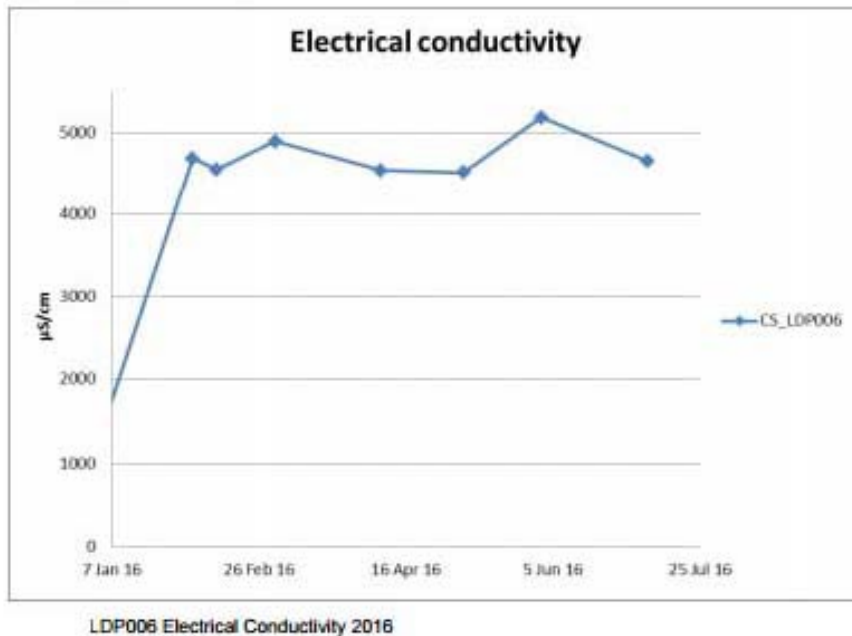
The natural background salinity for the Coxs River headwaters in the upper reaches of Long Swamp is an EC of 30 $\mu\text{S}/\text{cm}$ is [Birch, G., Siaka, M., and Owens, C. (2001), The source of anthropogenic heavy metals in fluvial sediments of a rural catchment: Cox's River, Australia. Water, Air and Soil Pollution 126, pp.13-35. [Reference for background salinity of 30 $\mu\text{S}/\text{cm}$].

Due to Centennial Coal's Springvale and Angus Place mines, and the Mt Piper Power Station, the salinity of the Coxs River downstream is orders of magnitude more saline than the river's natural background salinity.



Salt from groundwater emerging from the Western Coal Services site in 2016. This location is on the Castlereagh Highway, 250m north of where LDP001 crosses the highway [image by K Muir taken 9 April 2016, that is, before the Water Treatment Plant.]

Recall how salt was observed on Tuesday emerging from the near the base of the reject emplacement area (REA) at the Western Coal Services (WCS) site on Tuesday's site inspection. Even the dewatered sediment sludge deposited in the REA does not prevent salt migration from this large, unlined REA that is open to the elements.



Salinity levels of LDP006 (now called LDP001) in 2016 was an EC of 5000 at the WCS site.

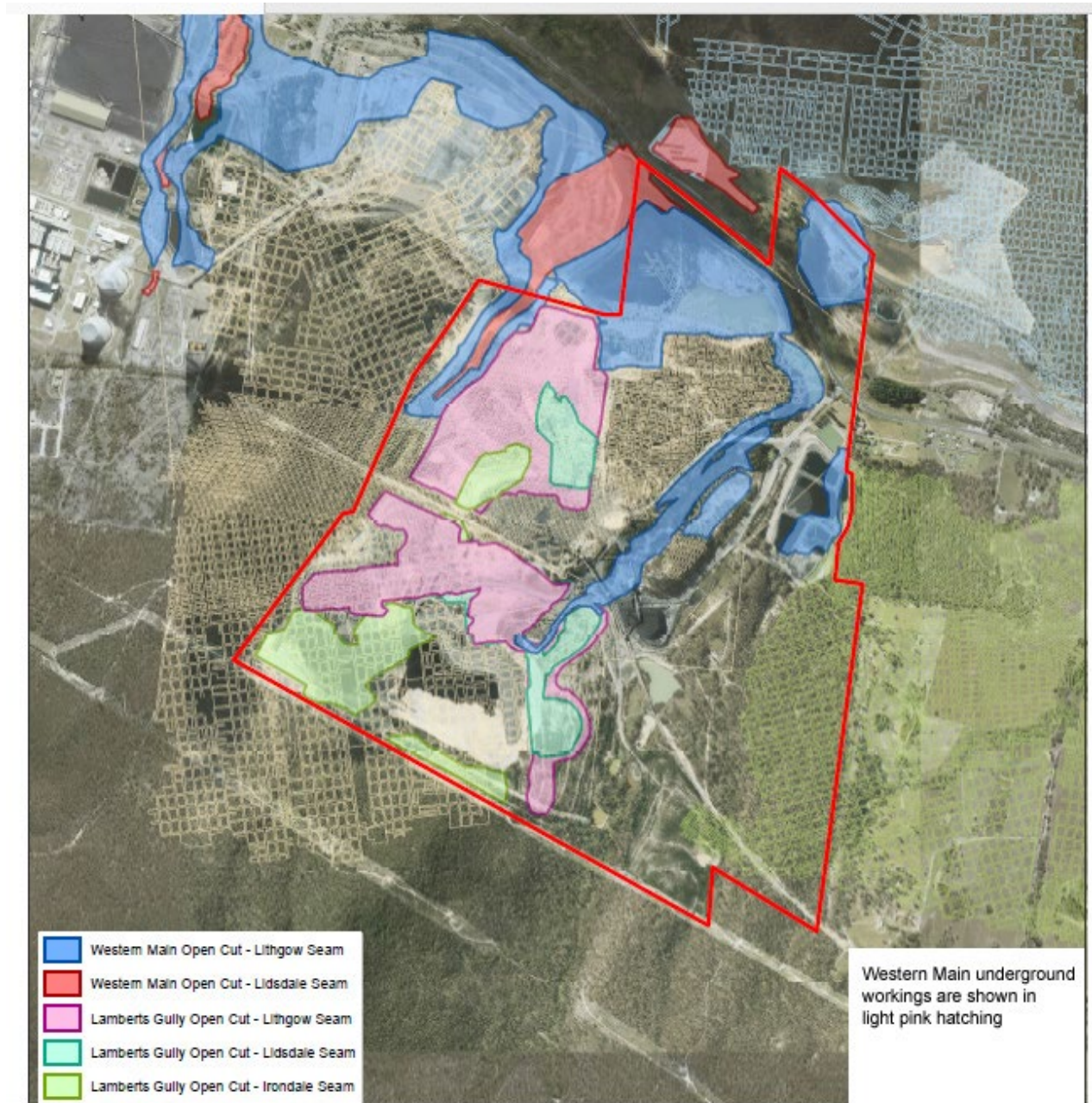
Lithgow Environment Group's Streamwatch program commenced monitoring salinity at LDP001 (formerly LDP006) on 24/10/2006 when it was 1240 uS/cm. Over the ensuing 16 years salinity increased 6-fold to 7,780 uS/cm recorded in August 2018. Springvale Coal Services Environmental Monitoring Reports most recent record for LDP001 is 3,870 uS/cm on 2/11/2023.

In October 2023 Dr Ian Wright modelled that LDP1 released 6,076 tonnes/day under existing conditions based on a current discharge volume of 2.88 ML/day (GHD figures for provided for Water Transfer from Angus Place (SSD-5579-Mod-5) and Water Transfer to Western Coal Services (MP06_0021-Mod-8) proposals). However, GHD claimed salinity was 2,670 uS/cm in Aug 2023 when the WCS Env Monitoring Report stated 3,340 uS/cm in Aug 2023, so the 6,076 tonnes/estimate day could be revised upwards by 20%.

Further, Centennial Coal also claims that placing the salt from the water treatment plant on the ash repository 35 to 40 metres above groundwater reduces risk of groundwater contamination (RTS on the then proposed Water Treatment Plant, December 2016, Section 3.1.12, pages 30 and 31 for the original proposal SSD-7592). Centennial defended its proposed salt emplacement on the fly ash heap by claiming that the Mt Piper Power Plant Consent allows Brine waste from its cooling tower blowdown be placed on the ash emplacement. These are weak justifications as millions of tonnes of salt will continue to accumulate of this emplacement and the adjoining WCS site generally.

Taking the salt from the 42ML/day of mine waste and placing it on an unlined emplacement area is not going to lead to a neutral or beneficial effect on the Coxs River, particularly as the emplacement area lies above former coal mine workings (see figure, following page).

The matter of salt emplacement in a sealed containment area should be imposed as conditions of consent for SSD-7592 (mods 9 and 10). Alternatively, as the Water Treatment Plant crystallises the brine, it can be easily transported, why not remove that salt out of the water supply catchment? (Note: the Kurnell Desalination Plant disposes of its brine through the off shore diffusers of the Sydney Sewage Treatment Plant system where it ultimately flows into the ocean).



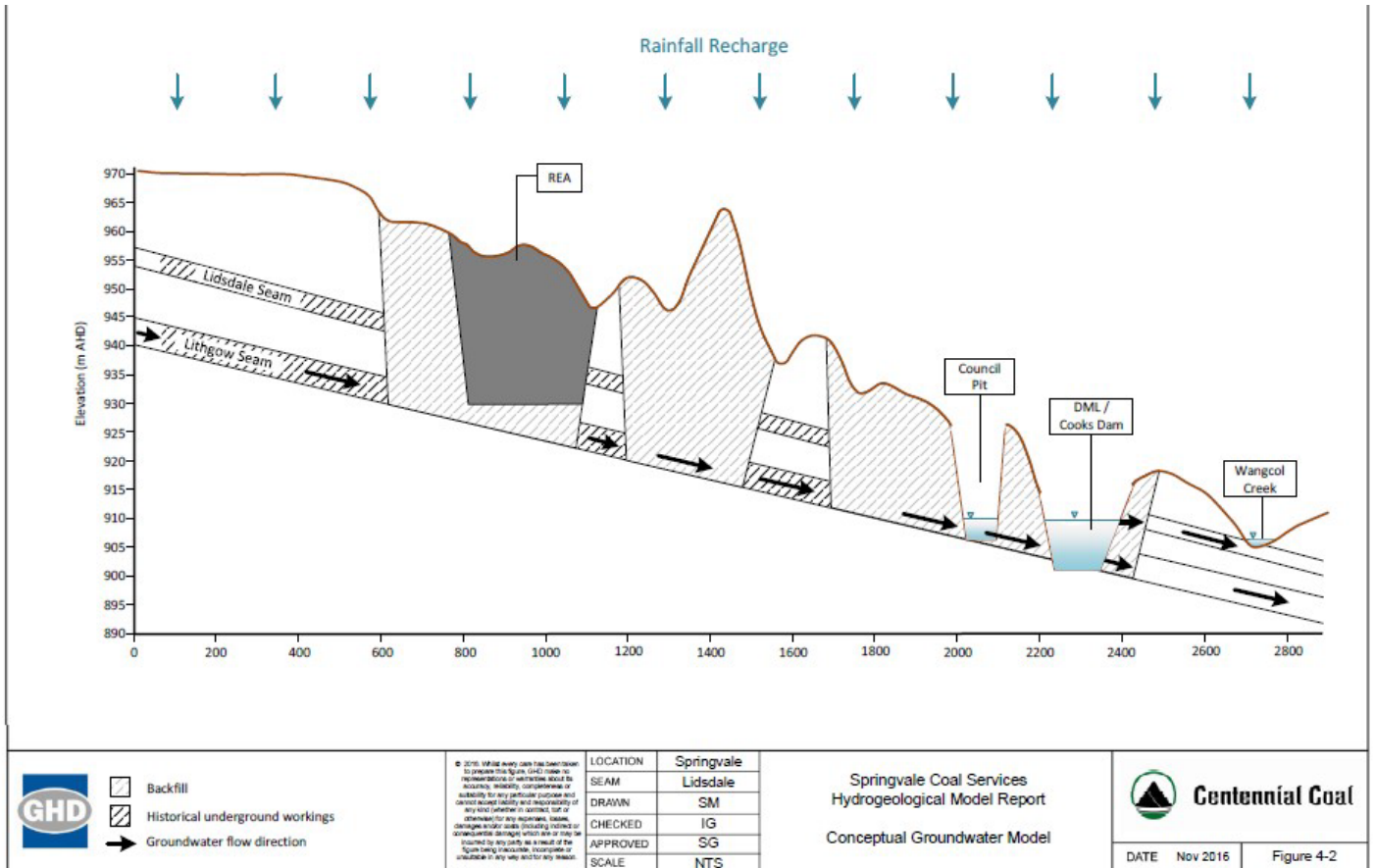
Underground and open cut coal mining covers the Western Coal Services (WCS) site and the fly ash-salt emplacement area. The light cross-hatching indicates the location of the bord and pillar mine workings.

The waste emplacements on WCS site are unlined as are the fly ash-salt emplacement areas.

It is essential that saline groundwater draining from the WSC site and the fly ash-salt emplacement area are better controlled. Energy Australia's initial salt Interception project for the ash emplacement involved installation of boreholes to intercept that saline groundwater that had migrated off-site and to then pump it back to the ash repository. This approach was apparently unsuccessful. The current approach is to intercept the brine in groundwater below and around the ash repository and pump it to adjoining lined ponds (See [Mt Piper Brine in Ash Co-Placement | EnergyAustralia](#)).

In summary, salt from Springvale and Angus Place mine waste is crystallised by the water treatment plant, remobilised by rain on the ash emplacements, then partly captured from groundwater and stored in ponds. This seems a poor solution to not having lined ash emplacement areas (also called ash repositories in EA reports).

Non-point salinity pollution of Wangcol Creek by the emplacement areas at the WCS site and the fly ash and salt emplacement areas associated with the Springvale Water Treatment Plant is certain to increase over time towards the 2016 salinity levels recorded at LDP001 (LDP006).



G:\22\18391\Visio\2218391_FIGX-X_Conceptual Groundwater Model.vsdX

Figure above indicates the relationship between the reject emplacement area, mined coal seams and Wangcol Creek [from WCS Mod 1 Statement of Environmental Effects, volume 2 Appendix D, figure 4.2 Nov 2015 regarding the groundwater model].

Bord and pillar mine workings extend through in the coal seams indicated in the above GHD figure. These mine workings operate like an underground lake and mix the leachate from the Reject Emplacement Area [and the salt and fly ash emplacement area – not shown] to produce a large saline underground storage feeding Wangcol Creek, bottom right of GHD’s figure.

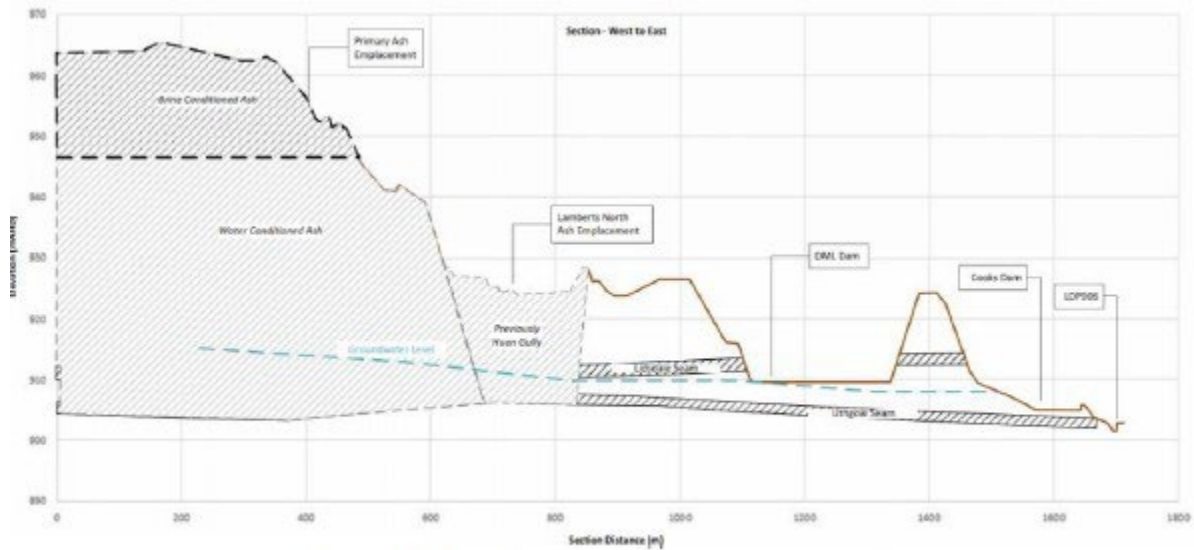


Figure 5-27 Groundwater level cross sections

This figure indicates the relationship between the ash [and salt] emplacement area (left), ground water level in blue and LDP6 (now LDP001) (on right). It is a very poor arrangement.

Aspect	Springvale Mine Extension Project
Water Demand and Supply	<ul style="list-style-type: none"> The largest source of water would be from dewatering in advance of underground mining operations and inflow into underground workings. Mine water make from existing workings is around 12 megalitres per day (ML/day) and this is predicted to increase to around 19 ML/day in 2022 with the proposed extension.

Inflow to Springvale mine is now 31ML/day, when in 2015 it was predicted to be 19ML/day into workings [ref DPE Assessment April for for the proposed Springvale mine extension 2015, pg 7]. It is essential that the amount of mine water does not increase as any increase shall make the Cocks River salinity problem worse. These volumes of saline mine waste are globally very large and probably unprecedented.

They impact on the Greater Blue Mountains World Heritage Area and Sydney's drinking water catchment.

Warns from the past

The original Springvale mine water transfer was to the Wallerawang Power Station:

Springvale Coal - Delta Electricity Water Transfer Scheme

This case study outlines an initiative which has saved over 3 billion litres of water for Sydney's drinking water catchment.

Springvale Colliery is a longwall coal mining operation located near Lithgow in the Western Coalfields of NSW. The mine is 50% owned by Centennial Coal and 50% by SK/Kores. It supplies Delta Electricity's Western Power Stations with approximately three million tonnes of coal each year.



Springvale Colliery in foreground, Mt Wallerawang Power Station in middle ground and Mt Piper Power Station in background.

The Springvale mine extracts around 15 ML of water each day from dewatering bores to remove excess runoff and groundwater seepage into the mine, and this amount is expected to increase in the future.

forms part of Sydney's drinking water supply catchment. Extracting this water reduces the amount of water reaching Warragamba Dam, Sydney's major water storage facility. Delta has also identified potential shortages of water for power generation in the future.

Springvale recognised the potential water savings and worked with the power generators to develop the "Springvale Coal – Delta Electricity Water Transfer Scheme". Under the Scheme, water from the mine's dewatering bores is pumped to a 500 KL storage tank at Springvale Colliery. From the storage tank, the water is transferred by gravity through a 10km pipeline to Wallerawang power station.



Pipeline being laid between Springvale Colliery and Wallerawang Power Station.

The Scheme has a capacity of 30 ML per day,



Wallerawang cooling tower collapse shown below. Water salinity may have been factor. [The cooling towers for Mt Piper Power Station are understood to be made of more durable materials.]

Despite a ruling by the Supreme Court of NSW regarding Springvale mine water management, and a large water treatment plant costing hundreds of millions of dollars, the management of salt from Springvale mine waste has scarcely improved.

Coxs River, part of Sydney's drinking water catchment, continues to decline due to the salt from the Springvale and Angus Place mines via the poor management of the WCS emplacement areas and the ash/salt emplacements used by the Springvale Water Treatment Plant.

The discharge points from Thompson's Creek Dam are, in effect, Angus Place and Springvale mines' discharge points into the Coxs River (assuming MOD5 and 8 don't subsequently permit mine waste discharge from LDP001 into Wangcol Creek after the discharge has flowed over the surface of the WCS site!).

Waste management at the WCS site must be significantly improved with continuous rehabilitation practices, and consent conditions ensure that salt from the water treatment plant is prevented from entering the environment. Otherwise what is the point of such an expensive water treatment plant?

There has been a failure on the part of Centennial Coal and Energy Australia to deliver good environmental outcomes despite significant funds expended on the water treatment plant. The failure to deliver good environmental outcomes rests with these companies. Failure to effectively manage mineral salt extracted from so much mine water is breathtaking. Why is the extracted salt from the mine waste not safely sealed from off from Sydney's drinking water catchment?

The WCS site and the fly ash and salt emplacement areas are toxic sites accumulating waste in Sydney's drinking water catchment. The Independent Planning Commission must stop the growth of salt waste by limiting the amount of mine waste produced at 42ML/day and develop conditions that mitigate the damage already being done to the drinking water catchment.

Serial modifications (also called "salami slicing" development applications) appears to have obscured the issues and frustrated effective regulation. In these circumstances the IPC and regulatory authorities should use these modification proposals to establish effective consent conditions that address the underlying issues. The operational areas of the waste heaps at the WCS site and the ash/salt heaps at Mt Piper must be reduced in size to as small as practicable. The non-operational waste heaps areas should be immediately sealed off from the environment, well before the coal mines and power plant closure.

The IPC should also ask the Environment Protection Authority to consider declaration of the WCS site and adjoining ash emplacement areas at Mt Piper power plant as significantly contaminated land under the *Contaminated Land Management Act 1997*.

Nearby Kerosene Vale ash repository area for the former Wallerawang Power Plant was recently declared a significantly contaminated site (NSW Gov. Gazette on 26 August 2022), but only after that site has passed to a NSW Government owned company called Generator Property Management. The IPC should ensure a similar transfer of responsibility for highly contaminated sites is pre-empted for the WCS site and the Mt Piper Power Plant ash emplacements.

The Coxs River flows through the Greater Blue Mountains World Heritage Area and is part of Sydney's drinking water catchment. It should be better protected from mine waste.

Yours sincerely,

A large black rectangular redaction box covering the signature area.

Monday 29 January, 2024