08 October 2019

NSW Department of Planning, Industry and Environment
Att: Phillip Neville
Environmental Assessment Officer – Energy and Resources
GPO Box 39
Sydney NSW 2001

Our ref: 21/25109 221109
Your ref:

Dear Phillip

Springvale Water Treatment Project Modification 1
Response to Submissions

1 Introduction

Springvale Coal is seeking Modification 4 to the Springvale Water Treatment Project (SSD 7592) in accordance with Section 4.55(1A) of the *Environmental Planning and Assessment Act, 1979* (EP&A Act) to allow an increase in the volume of water managed as part of the interim water management strategy. Modification 4 seeks to authorise transfer of an additional 3060 ML of filtered water to Thompsons Creek Reservoir during the approved period for operation of the Interim Water Management Strategy to 31st of January 2020.

The potential impacts arising from the proposed design changes have been assessed within a Modification Report submitted to the Department of Planning, Industry and Environment (DPI&E) on 02 September, 2019. The Modification Report was uploaded for viewing on the DPI&E Major Projects website and distributed to key government agencies and community groups to review and provide comment.

Comments on the modification were received from:

- WaterNSW,
- NSW Environment Protection Authority (EPA),
- Lithgow City Council,
- The Colong Foundation for Wilderness,

This letter provides a summary of the issues raised by each stakeholder and a response to clarify any matters raised in the submissions.

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2 Government agency submissions

2.1 WaterNSW

2.1.1 Issues

WaterNSW notes that the environmental assessment predicts a negligible increase in salinity levels in the Coxs River due to the proposed increase in storage of filtered mine water in Thompsons Creek Reservoir compared to the levels predicted in the previously approved modification (Modification 3 approved in May 2019).

WaterNSW acknowledge that the water treatment facility has been partially commissioned and Springvale Mine has ceased discharges from LDP009. On this basis, WaterNSW did not object to the proposed modification considering the overall improvements in catchment water quality being delivered by the project and the temporary nature of any salinity increases associated with the increase in filtered water stored within Thompsons Creek Reservoir.

WaterNSW requests that any water quality results in receiving waters that exceed the modelled predictions be reported immediately to WaterNSW during the period of increased storage of filtered water within WaterNSW and they remain as a stakeholder for the project.

2.1.2 Response

WaterNSW has recognised the overall benefit to water quality being achieved by the project and the need for implementation of the proposed strategy to allow effective commissioning of the water treatment facility.

The applicant will provide any water quality monitoring results exceeding the predictions presented in the environmental assessment and will continue to keep WaterNSW informed of progress in delivery as a key stakeholder for the project.

2.2 NSW Environment Protection Authority

2.2.1 Issues

The EPA notes that the water quality assessment predicts an increase in Electrical Conductivity (EC) and alterations to the pH and phosphate levels within Thompsons Creek Reservoir and the need for ongoing environmental flow requirements of between 0.3 ML/day and 0.8 ML/day.

The EPA queried the environmental assessment which indicated that overflows were not predicted to occur during the implementation of the Interim Water Management Strategy, based upon the relationship between water use and power supply and the current restrictions in power generation due to coal supply issues. EPA notes that Energy Australia's Environment Protection Licence (EPL) 13007 does not include a licenced discharge point downstream from Thompsons Creek Reservoir and that traditionally water within the reservoir had been equivalent in chemical composition to the downstream receiving environment. Concerns were raised that changes in water quality as a result of the proposed modification are increasing to a level that is different from Pipers Flat Creek.

The EPA also note that the transfer volume increase from 24 ML/day to 36 ML/day coincides with the cessation in use of the temporary desalination system at Angus Place Mine. While the Angus Place desalination system was recognised as not being a viable long term solution, further justification for the increase in transfer volume was not provided given the time period of one month.

The EPA therefore recommends the proponent:

1. Develop a contingency strategy to account for potential changes in water volumes at Thompsons Creek Reservoir as a result of its current reduced operations
2. Investigates the requirement for a discharge point on EPL 13007 to authorise discharge of water from Thompsons Creek Reservoir that will have an increased EC and altered pH and phosphate concentrations.

2.2.2 Response

Water modelling results

The geochemical modelling undertaken as part of the environmental assessment indicates the potential for a minor increase in EC (60 µS/cm) within Thompsons Creek Reservoir when the modelled output is compared against the results of modelling for Modification 3. The geochemical modelling also indicates improvements in both pH and Phosphate as a result of the proposed filtered water transfer with the results closer to or meeting DGVs in comparison to both existing 95th percentile reservoir water quality and the modelled results for the conclusion of the Modification 3 transfers. The DGV exceedance for phosphate resulted from the standard LOR for the parameter exceeding the DGV and pH is predicted to fall within the DGV range of 6.5 to 8 pH units.

The water and salt balance modelling for the broader catchment indicates minimal potential for predicted increases in EC within Thompsons Creek Reservoir to impact upon water quality in the downstream receiving water environment. The assessment notes that the minor increases in EC in the Coxs River at the confluence with Pipers Flat Creek and upstream of Lake Wallace are a function of the underlying assumptions in mine water transfer volumes utilised in the regional water balance model rather than the volume of filtered water directed to Thompsons Creek Reservoir.

Mine water transfers proposed as part of Modification 4 are 24 ML/day and 36 ML/day, which are higher in comparison to the predicted groundwater make in the underlying CSIRO mine inflow model of 22.5 ML/day for the corresponding time period. This results in increased volume of water being filtered at the water treatment facility under the proposed scenario with an associated increase volume of residuals being directed to the Springvale Coal Services site. A higher transfer of residuals will result in an increased displacement of water and increase in discharges from LDP001 (formerly LDP006) at Springvale Coal Services. The minor increases in EC in the Upper Coxs River are attributed discharges from Springvale Coal Services to Wangcol Creek and the impact largely disappears following MOD4 when both the Proposed and Approved models are considered to be filtering the same volumes of mine water. The potential increases in EC associated with environmental flow releases from Thompsons Creek Reservoir to Pipers Flat Creek are considered negligible and the proposed mine water transfer volumes fall well within the 42 ML/day approved as part of SSD 7592.

It should also be noted that the RO (Reverse Osmosis) units at the water treatment facility have been progressively tested and commissioned concurrently with the finalisation of construction of the brine management system. More than half of the transfers during September have passed through the RO units, with 379.7 ML of desalinated water with an average EC of 439 in addition to 240.7 ML of filtered water with average EC of 1256 transferred to Thompsons Creek Reservoir. It is therefore unlikely that the full transfer volume of 3,060 ML of filtered water will be required and the model predictions in the Environmental Assessment are therefore considered conservative and are likely to have overstated actual increases in EC within the reservoir.

Potential overflows

The modelling used to predict the potential for Thompsons Creek Reservoir to spill have been reviewed based upon latest water levels and demand constraints.

The model assumes MPPS demand of 10 ML/day for September, October and November of 2019 to simulate the low coal operating projections at the time of the modelling. The model is configured such that it prioritises Fish River water over Thompsons Creek Reservoir water for use in MPPS. Therefore in low MPPS demand periods all MPPS water is supplied by Fish River and nothing is extracted from Thompsons Creek Reservoir which results in conservative model predictions. The modelled extractions and transfers to Thompsons Creek Reservoir during the time period for Modification 3 and Modification 4 is outlined in Table 1. Following this the water demand at MPPS was assumed to return to the long term average.

Table 1 Modelled extractions and additions to Thompsons Creek Reservoir

Time period	Total modelled extractions for MPPS (ML)	Total modelled transfers of minewater (ML)
21st June 2019 to 31st August 2019	1450	1713
1st September 2019 to 30th November 2019	0	2187
1st December 2019 to 31st January 2020	1200 – 1400	1860
Total	2650 - 2850	5760

To review the risk of spilling associated with continued low MPPS demand, the model was calibrated as part of this response to submissions to account for two factors:

1. the observed water level in Thompsons Creek Reservoir in comparison to the model predictions at the end of September
2. an assumption that the MPPS demand remains so low that no extractions from Thompsons Creek Reservoir are required for the remainder of the Modification 4 period to 31 January 2020.

As of September 2019, the GoldSim model predicted a Thompsons Creek Reservoir storage volume of between 21645 and 21969 ML, compared to the most recent observed data with a storage volume of 22987 ML. Therefore the model is under predicting the storage volume by ~1000-1300 ML which is likely

to be a function of reduced MPPS demand from 21st June to 31st August. The model results have therefore been adjusted to assume the Thompsons Creek Reservoir storage volume to be 22987 ML at the beginning of October.

From 1st December 2019 to 31st January 2020 the GoldSim model also simulated average water demands from MPPS which meant up to 1400 ML would be extracted from Thompsons Creek Reservoir as make-up water for the power station operations. Therefore an adjustment to the GoldSim results of +1400 ML was made to storage volumes to simulate continued low MPPS demand to the end of the January 2020. This is extremely conservative as a range of measures are being currently being undertaken to address coal supply issues prior to the peak summer demand periods.

Climatic conditions provide another significant influence on the likelihood of Thompsons Creek Reservoir to spill despite the relatively small catchment area of 8.9 km^2. The revisions to the Goldsim modelling scenarios discussed above have been divided into three scenarios including:

- Average rainfall conditions – the water volumes that could be expected in Thompsons Creek Reservoir under average rainfall and climatic conditions
- 1 in 20 year rainfall conditions - the water volumes that could be expected in Thompsons Creek Reservoir under 1 in 20 year rainfall and climatic conditions (very wet)
- Maximum observed rainfall conditions – the water volumes that could be expected in Thompsons Creek Reservoir under the wettest rainfall and climate observed from historical records

The results of the revised modelling are presented in Figure 2-1.

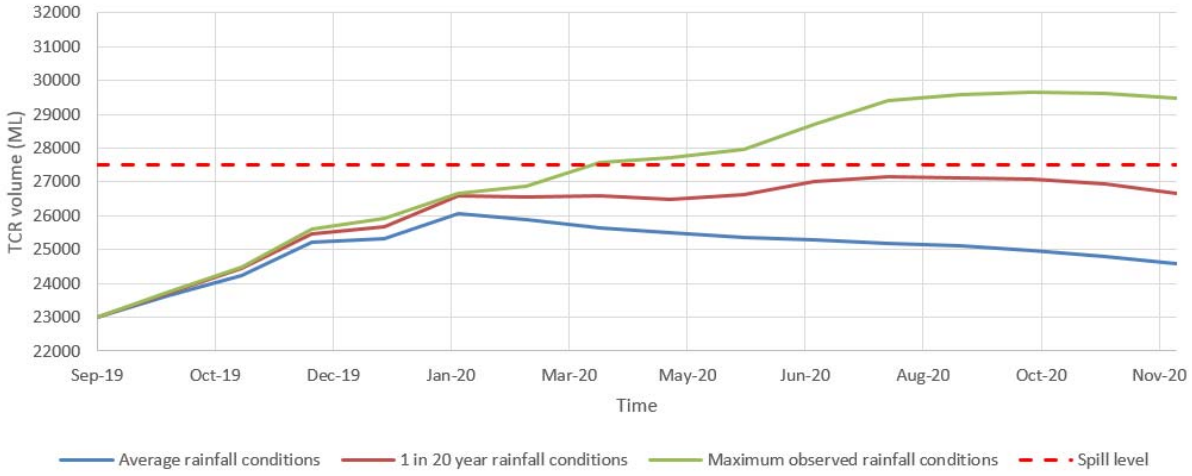

Figure 2-1 Thompsons Creek Reservoir spill probability

The modelling indicates that spilling or additional flow releases from Thompsons Creek Reservoir will not be required during the period of extended operation of the Interim Water Management Strategy to 31st of January 2020. Following this period, the potential for additional flow releases would only be required if maximum observed historical rainfall conditions persisted throughout the modelled period. Spilling is not predicted under either average or 1 in 20 wet year rainfall conditions and with current climate predictions

expecting continued drier than average conditions the risk of spilling in the medium term is considered to be very low.

It should also be noted that the risk of spilling is a function of MPPS make-up water demand, transfer volumes and climate. The primary factors influencing the likelihood for the reservoir to spill is MPPS power generation and make-up water requirements which are not directly linked to the proposed Modification 4.

During periods of reduced power demand, excess water will be transferred to Thompsons Creek Reservoir, regardless of whether the incoming mine water has received primary filtration or full treatment with desalinisation through the RO units. It is acknowledged that is a marginally higher volume of water transferred following filtration only as a result of the volume losses associated with the brine stream in the desalination process, however this will not be a primary determining factor in the likelihood of the reservoir to overflow.

Delays to the final commissioning of the water treatment facility have unfortunately coincided with the coal supply issues for the power station. The proposed modification will have a minor effect on the quality of water with an increase in EC of up to 60 µS/cm within Thompsons Creek Reservoir, but will have no influence on the make-up water demand requirements at the power station. The progressive drawdown in water levels within Thompsons Creek Reservoir in preparation for the Interim Water Management Strategy approved as part of Modification 3 has resulted in additional available storage volume and contingency in comparison to the typical operating scenario of target water level of 98% storage volume.

Condition 6 of Schedule 2 of SSD7592 requires all excess treated water to be directed to Thompsons Creek Reservoir and includes provisions for emergency situations, subject to approval from the Secretary. An emergency situation may include any event where overtopping of Thompsons Creek Reservoir is likely to occur. The existing consent therefore already includes provisions for situations which may lead to a potential overtopping of Thompsons Creek Reservoir and the potential will not be increased through approval of Modification 4.

Temporary desalination at Angus Place

The EPA submission notes that the transfer volume increase from 24 ML/day to 36 ML/day coincides with the cessation in use of the temporary desalination system at Angus Place Mine and that further justification for the increase in transfer volume is required given the limited time period of one month.

Operation of a temporary desalination plant at Angus Place Colliery was approved as Modification 5 to PA 06_0021 on the 14th of September 2018. The modification allowed for operation of a temporary desalination system to increase the discharge from Angus Place LDP001 from 2ML/day up to 10 ML/day with a limit of 350 µS/cm up to 31st of December 2019. The modification was required to manage underground mine water within Angus Place prior to the commissioning of the Water Treatment facility approved as part of SSD 7592.

Brine from the temporary desalination unit is returned to the mine in the 800 panel area resulting in a progressive increase to the salinity concentrations in the underground workings. In order to predict the likely salinity of water stored in the 800 Panel Area, a mass balance equation has been used to consider

average daily flow volumes and concentrations between different sources within the underground workings. The assessment considered three key dates for EC within the 800 panel area including:

- 10th May 2019 – 1855 µS/cm (EC known from monitoring).
- 30th June 2019 – 1968 µS/cm (EC known from monitoring).
- 30th December 2019 – 2505 µS/cm (EC predicted based on linear trend outline in Figure 2-2)

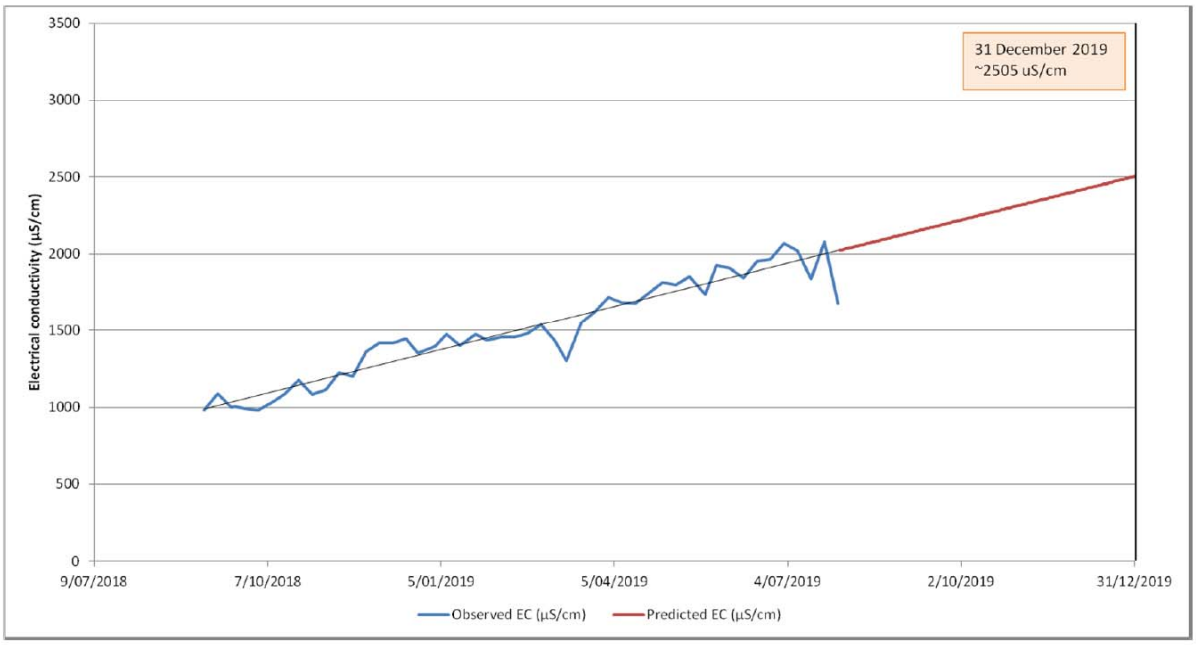

Figure 2-2 EC Levels in 800 Panel Area (Source: Centennial Coal)

The desalination system being developed as part of the Springvale Water Treatment Project has been designed to provide effective treatment of water with chemistry reflective of the naturally occurring groundwater of the western coalfields. The operation of the plant includes a series of limits to ensure effective ongoing treatment can be achieved throughout the operation of the facility and includes the following limits for EC:

1. Normal operations EC <1300 µS/cm.
2. Out of envelope EC 1300 to <1400 µS/cm
3. Materially out of envelope EC 1400 to <1500 µS/cm.
4. Unacceptable EC >1500 µS/cm.

The progressive increase in concentration within the 800 panel area has resulted in the current measured water quality being unacceptable to be transferred directly to the Springvale water treatment facility. Mixing with other underground water sources (eg. Springvale Mine and Angus Place 900 Panel) is currently required to reduce the overall salinity to within the normal operating range for the water treatment facility.

The projected linear trend for EC within the 800 panel area is predicting an increase in EC to around 2505 µS/cm, which results in combined water transfers not being able to meet the EC limit of <1300 µS/cm required for normal operation of the plant. Any further increase in the EC of incoming mine water to the Springvale water treatment facility will compromise the potential to effectively treat mine water into the future and is not considered a viable option even for a limited period of one month.

It is noted that any extension to the discharge from LDP001 at Angus Place beyond 31st of December 2019 would also trigger a further modification to consent for PA 06_0021.

Contingency strategy and licencing

The EPA submission recommends the proponent:

1. Develop a contingency strategy to account for potential changes in water volumes at Thompsons Creek Reservoir as a result of its current reduced operations
2. Investigates the requirement for a discharge point on EPL 13007 to authorise discharge of water from Thompsons Creek Reservoir that will have an increased EC and altered pH and phosphate concentrations.

Both EnergyAustralia and Centennial Coal are actively developing strategies to ensure coal supplies to allow a return to normal operations at MPPS, with the associated increased demand for make-up water in power station operations. Whilst overflows or additional spills from Thompsons Creek Reservoir are not predicted to be required for the period related to the proposed modification, a range of contingencies and operating protocols to manage water levels within Thompsons Creek Reservoir is subject to ongoing development. As stated above the existing consent includes provisions for emergency situations such as potential overtopping of Thompsons Creek Reservoir and all potential options will be developed in consultation with DPIE, EPA and WaterNSW.

Investigations into the requirement for a licenced discharge point for any releases will be based upon the selected strategy for managing water levels in Thompsons Creek Reservoir when or if required in the future. The need for a licenced discharge point associated with either the Springvale Water Treatment Plant operations or EnergyAustralia's existing EPL for MPPS will be subject to ongoing liaison with EPA.

It should be noted that the water quality modelling to support the proposed modification indicates only a minor potential increase in salinity within the reservoir improvements in pH and phosphate concentrations in comparison to DGVs. In the medium to long term water quality within Thompsons Creek Reservoir is expected to improve as water transferred from Lake Lyell is no longer influenced by mine water discharges from LDP009 and excess water transferred from the water treatment facility will be fully treated.

2.3 Lithgow City Council

2.3.1 Issues

Lithgow City Council considered the environmental assessment adequately highlights the relevant issues and has no objection to the project, subject to Council's original conditions remaining on the consent.

2.3.2 Response

No response required.

2.4 The Colong Foundation for Wilderness Ltd

2.4.1 Issues

The Colong Foundation for Wilderness Ltd submission highlights a number of issues associated with the management of salinity levels in the Upper Coxs River Catchment including discharges from Springvale Coal Services, the operation of the Mount Piper ash repository and recorded EC levels within receiving waters.

The submission states that the predicted impacts associated with Modification 4 are insignificant and query whether water from Clarence Colliery can be directed to the Springvale Water Treatment project.

2.4.2 Response

Issues raised in the submission are primarily related to broader issues associated with water management within the Upper Coxs River catchment. Specific issues were raised in relation to a variety of operations with respective consents and were not directly related to the proposed Modification 4 to the Springvale Water Treatment Project. The submission did acknowledge that the potential impacts associated with the proposed modification were insignificant in terms of the broader catchment considerations.

There is currently no intention for water from Clarence Colliery to be transferred to the Water Treatment Plant as part of the project.

3 Conclusions

The majority of submissions were generally supportive of the proposed modification. Issues raised are considered suitably able to be addressed through implementation of the required management plans in accordance with SSD 7592 consent conditions.

Do not hesitate to contact me if you require any further clarification on issues raised in submissions.

Sincerely

Karl Rosen