

## Toby Philp

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**From:** Wayne Jones <wayne.jones@dpi.nsw.gov.au>  
**Sent:** Wednesday, 22 April 2015 2:01 PM  
**To:** Toby Philp; Paul Freeman  
**Subject:** Ulan Continued Operations project Mod 3

Hi Toby/Paul

Please see following draft DPI comments on the above modification. Formal letter should follow shortly. Apologies for the delay.

Regards  
Wayne

Wayne Jones | Land Use Planning Coordinating Officer  
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OUT15/9360

Mr Paul Freeman  
Mining Projects  
NSW Department of Planning and Environment  
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[Paul.Freeman@planning.nsw.gov.au](mailto:Paul.Freeman@planning.nsw.gov.au)

Dear Mr Freeman,

### **Ulan Continued Operations Project (MP08\_0184 Mod 3) Proposed Modification**

I refer to your email dated 18 March 2015 requesting advice from the Department of Primary Industries (DPI) in respect to the above matter.

#### Comment by NSW Office of Water

The NSW Office of Water has reviewed the Environmental Assessment (EA) for the proposed modification to the Ulan Coal Continued Operations Project. The following key comments and recommended conditions of approval are provided to assist in finalising the assessment of the project. Additional information is also requested prior to determination of the project. Further comments are provided in Attachment A and B.

#### **1. Key Comments**

- The Office of Water understands key elements of the proposed activities include the following:
  - Extension of mine life by 2 years.
  - Realignment of Ulan West Longwalls 5 to 12 which includes a reduction of LW 5 by 170 metres and an extension of LW 6-12 by between 900 and 1300 metres.

- Repositioning of the approved 3 dewatering bores and 5 ventilation shafts which are yet to be constructed, and one additional ventilation shaft.
- The EA indicates the groundwater inflow rates are to increase from the current approved maximum of 11.3ML/d in 2022 to 12.5ML/d in 2023. The predicted maximum total inflow for Underground 3 and the modified Ulan West is 28ML/d in 2023.
- The groundwater model predicted a peak annual groundwater take for the Ulan Coal operations of 7660ML in the Sydney Basin MDB groundwater source in 2020 and 6570ML in the Goulburn River catchment in 2017. Based on existing entitlements held by the proponent, an additional 6910ML is required to account for the additional take in the Sydney Basin MDB groundwater source of the Water Sharing Plan for the NSW Murray Darling Basin Porous Rock Groundwater Sources.
- Baseflow losses are predicted to increase by 0.002ML/d in the Talbragar River catchment and no changes in the Goulburn River catchment.
- The main impact to watercourses is subsidence of up to 2.9m in the proposed modification area and an increase in subsidence to watercourses in the Ulan Creek catchment from an approved subsidence of 1.6m up to a revised subsidence of 2.3m.
- An increase in subsidence predictions in some watercourses and the new subsidence affected area in the Cockabutta Creek catchment highlights the potential for reduced surface flow and draining of ponds. Further detail is requested on potential water take from surface water systems and how this is to be accounted for.
- The proposed updating of the Water Management Plan to include adequate monitoring, management and remediation of these areas is critical. Specifically the EA also refers to watercourse monitoring as part of the Surface Water Monitoring Program and subsequent extraction plans.
- The predicted maximum water surplus in Year 13 with an average of 27.7ML/d which requires discharging is within the current approved discharge system limit of 52ML/d for the Ulan Coal complex.

## **2. Information Requests**

The following information is requested prior to determination of the project.

- Clarification is requested on the potential surface water take and downstream impacts following subsidence in first order watercourses and out of channel areas.
- A process and commitment to acquire the additional entitlement in the Sydney Basin MDB groundwater source is requested.
- The water entitlement to be surrendered to offset the long term groundwater take post mining is requested.
- Update Table B1 in Appendix B of the Groundwater Assessment (Appendix 3) due to the extended aquifer depressurisation to demonstrate the peak amount of water level drawdown at the locations and the impact categorised according to the Aquifer Interference Policy (AIP).
- An independent review of the groundwater model.

## **3. Recommended Condition of Approval**

The Proponent shall review the Water Management Plan for the project. This Plan must be developed in consultation with the NSW Office of Water.

For further information please contact Tim Baker, Senior Water Regulation Officer (Dubbo Office) on 6841 7403 or at [tim.baker@water.nsw.gov.au](mailto:tim.baker@water.nsw.gov.au).

### **Comment by Crown Lands**

Crown Lands have reviewed the proposed modification application for the Ulan Continued Operations Project (08\_0184 MOD3) and advise no objection to the proposed modifications subject to the appropriate Crown Lands Act approvals being obtained prior to any use and occupation of any Crown land (including Crown roads). It is also recommended that the

proponent apply to close and purchase any Crown Public Roads associated with the proposal in order to avoid restrictions on access and development on these parcels.

Investigations determined that the proposed extension of longwall panels 6 to 12 will impact the remainder of Lot 49 DP750735 and Lot 7302 DP1148421 both of which are held under a Crown Lands Act licence for grazing. Part Lot 49 was included in the original approval area.

For further information please contact Elizabeth Burke, Property Management Services, (Dangar Office) on 6884 2067 or at [elizabeth.burke@crownland.nsw.gov.au](mailto:elizabeth.burke@crownland.nsw.gov.au).

Agriculture NSW and Fisheries NSW advise no issues.

## **Attachment A**

### **Ulan Continued Operations Project Mod 3 (MP08\_0184 Mod 3) Proposed Modification Additional comments by NSW Office of Water**

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#### **Watercourse Impacts**

- Subsidence impacts are predicted in the EA to cause fracturing of exposed rock strata in the beds of minor watercourses in the modification area. This is predicted to result in draining of pools and reduced surface flow however this loss is predicted to be minimal due to the proposed monitoring and remediation activities on second order and higher order watercourses. Impacts to first order watercourses are not proposed to be monitored or remediated.
- No changes to the impacts on springs and seeps in the Ulan West mining area are predicted. Minor impacts to the pattern of remnant ponding within the channels and also local changes to watercourse stability are predicted.
- Baseflow losses to the surface water system due to aquifer depressurisation are predicted to increase from 0.183ML/d to 0.185ML/d in the Talbragar River catchment. This is to be offset through retiring licenses or other means of treated mine water surplus water. No changes are predicted to the baseflow impacts to the Goulburn River catchment.
- The proposal is predicted to result in an increase in the subsidence affected area of the catchments of Mona Creek, Cockabutta Creek and Ulan Creek by 63ha, 326ha and 185ha respectively.
- Two watercourses in the proposed modification area of the Cockabutta Creek catchment are predicted to subside by 2.2m and 2.9m. This is an increase from the predicted 1.5m subsidence to other creeks in the Cockabutta Creek catchment. An increase in subsidence is also predicted for five of the nine watercourses in the Ulan Creek catchment with increases from a maximum of 1.6m to 2.3m.
- Potential changes to the longitudinal gradients of watercourses in the Mona Creek catchment are predicted to be comparable to the approved limits, however localised changes to these impacts may alter the location of erosion and scouring. Maximum modelled velocities and tractive stresses to remain relatively unchanged.
- Minor changes are predicted to the pattern of remnant ponding in the catchments of Mona Creek, Cockabutta Creek and Ulan Creek. Remnant ponding is predicted to remain within the existing channels.

#### **Water User Impacts**

- Impacts to water availability to downstream water users are predicted in the EA to be limited due to the small catchments upstream of the mining areas and the proposed remediation of in channel cracks. It is recognised however in the EA of the potential for loss of surface water between the time of subsidence occurring and remediation works being implemented, however the volume has not been quantified. The monitoring frequency and timing of any remediation works will therefore be critical to mitigate the loss of surface flows. The potential surface water take from first

order streams and out of channel areas has also not been assessed and is not proposed to be within the monitoring program.

- No groundwater works have been identified in the EA to be affected due to the modification proposal.

#### Groundwater Assessment

- An independent review of the groundwater model is required. The groundwater model is yet to be categorised against the National Groundwater Modelling Guidelines 2012 and demonstrated to be 'fit for purpose'.
- A process and commitment to acquire the appropriate 7660 unit shares for peak take of groundwater from the Murray Darling Basin Porous Rock Groundwater System, the prescribed water source being the Sydney Basin – Other zone, is requested.
- Due to extended lateral extent of porous rock aquifer depressurisation associated with UCML, Table B1 of the Groundwater Assessment showing registered bores and wells, should be updated to demonstrate the peak amount of water level drawdown at these locations and the impact categorised according the AIP.
- There was minimal information as to the ongoing groundwater monitoring, accountability triggers and response procedures. It is recommended this be included within revisions to the Water Management Plan in consultation with the NSW Office of Water.
- A detailed review of the project against the Aquifer Interference Policy is provided in Attachment B.

**End of Attachment A**

#### Attachment B

### **Ulan Continued Operations Project Mod 3 (MP08\_0184 Mod 3) NSW Office of Water Assessment Against the Aquifer Interference Policy**

**Table 1:** Has the proponent:

	<b>AIP Requirement</b>	<b>Proponent response</b>	<b>NOW Comment</b>
1	Described the water source (s) the activity will take water from?	Two plans are relevant to UCML operations: (i) The Hunter Unregulated and Alluvial System (ii) The Murray Darling Basin Porous Rock Groundwater System, the prescribed water source being the Sydney Basin.(i) The 'Macquarie- Oxley' zone which includes all porous water bearing strata excluding Permian and Triassic Rocks which have been relegated to the	Required entitlement identified in Table 6 of the Groundwater Impact Assessment.

AIP Requirement		Proponent response	NOW Comment
		'Other' zone and (ii) Other zone which includes Permian and Triassic age rocks.	
2	Predicted the total amount of water that will be taken from each connected groundwater or surface water source on an annual basis as a result of the activity?	<p>Peak inflow of 12.5 ML/d in 2022. An increase of 2.1% from approved mining operations. Drawn almost entirely from the Permian.</p> <p>7660 ML from the MDB water source and 6570 ML for the Goulburn River catchment (Water Act)</p> <p>The total water make is estimated to peak at about 28ML/day in 2023.</p> <p>.039 ML/day baseflow losses Goulburn River catchment and 0.185 ML/d Talbragar River catchment.</p>	Volumes Identified.
3	Predicted the total amount of water that will be taken from each connected groundwater or surface water source after the closure of the activity?	<p>At the close of mining the predicted (baseflow) losses .039ML/d from Goulburn River catchment and 0.185 ML/d Talbragar River catchment.</p> <p>More than 300 yrs will pass before groundwater levels and pressures within the depressurised strata, substantially rebound</p>	Volume loss in baseflow is provided but not the continued take of water that would need to be surrendered.
4	Made these predictions in accordance with Section 3.2.3 of the AIP? (refer to Table 2, below)		Independent assessment of the groundwater model not submitted. Steady state calibration NRMS at 9.7% is at upper boundary of acceptable criteria. No NRMS provided for Transient calibration. No categorisation against the groundwater modelling guidelines. Minimal sensitivity analysis.
5	Described how and in what proportions this take will be assigned to the affected aquifers and connected surface water sources?	Identified in Table 6 of the Groundwater Impact Assessment.	Identified in Table 6 of the Groundwater Impact Assessment.
6	Described how any licence exemptions might apply?		Not described.
7	Described the characteristics of the water requirements?	UCML proposes to maintain a neutral site water balance by utilising existing and approved discharge facilities. There is sufficient capacity within the	The mine will have more than enough water to meet demands. Discharge limitations will relate to water quality which is

AIP Requirement		Proponent response	NOW Comment
		existing approved system (52 ML/d) based on 100% utilisation of the water discharge facilities.  Maximum modelled surplus of approx 10,106 ML per year. 27.7 ML/d.	regulated under EPL 394.
8	Determined if there are sufficient water entitlements and water allocations that are able to be obtained for the activity?		Not described for take of water from the Murray Darling Basin Porous Rock Groundwater System - Other Zone
9	Considered the rules of the relevant water sharing plan and if it can meet these rules?		Not described.
10	Determined how it will obtain the required water?		Not described
11	Considered the effect that activation of existing entitlement may have on future available water determinations?		Not described
12	Considered actions required both during and post-closure to minimize the risk of inflows to a mine void as a result of flooding?	N/A	Modification is underground operation. N/A.
13	Developed a strategy to account for any water taken beyond the life of the operation of the project?		Not described.
	<i>Will uncertainty in the predicted inflows have a significant impact on the environment or other authorized water users?</i>  <i>Items 14-16 must be addressed if so.</i>		Minimal model sensitivity analysis undertaken.
14	Considered any potential for causing or enhancing hydraulic connections, and quantified the risk?		Proponent's mapping depicts no alluvial water sources within the Modification and no increased hydraulic connection between different water sources predicted.
15	Quantified any other uncertainties in the groundwater or surface water impact modelling conducted for the activity?	Sensitivity simulations for the model have not been conducted in a rigorous manner	Minimal sensitivity analysis undertaken. Model will need to be deemed 'fit for purpose' by independent assessor
16	Considered strategies for monitoring actual and reassessing any predicted take of water throughout	Water levels in the goaves and discharge volumes from underground dewatering pumps are currently monitored and	Recorded via an electronic data capture systems is appropriate.

AIP Requirement		Proponent response	NOW Comment
	the life of the project, and how these requirements will be accounted for?	<p>recorded via an electronic data capture systems.</p> <p>The model is currently reviewed biennially.</p> <p>Section 7 - Impact Verification</p> <p>Continued measurement of regional network</p> <p>Continued measurements of groundwater seepages and water quality</p> <p>Compliance monitoring and measurement of any surface water discharges</p>	<p>Noted that 2yr review of the model verification is a recommendation.</p> <p>Minimal description provided in Section 7 - Impact Verification. This concern plus defining triggers could be considered within the WMP.</p>

**Table 2: Determining water predictions in accordance with Section 3.2.3 of the AIP.**

AIP Requirement		Proponent response	NOW Comment
1	For the <i>Gateway</i> process: Is the estimate based on a simple modelling platform, using suitable baseline data, that is fit-for-purpose?		N/A
2	<p>For <i>SSD</i> or <i>mining</i> or <i>CSG production</i>, is the estimate based on a complex modelling platform that is:</p> <ul style="list-style-type: none"> <li>Calibrated against suitable baseline data, and in the case of a <i>reliable water source</i>, over at least two years?</li> <li>Consistent with the Australian Modelling Guidelines?</li> <li>Independently reviewed, robust and reliable, and deemed fit-for-purpose?</li> </ul>	Modflow Surfact	<p>Model software is appropriate. Baseline data available but the number of calibration targets was not clear and NRMS statistic borderline acceptable.</p> <p>Independent review is required and model categorised to clarify if model is via an experienced modellers view assessment deemed 'fit for purpose'.</p>
3	<p>In all other processes, estimated based on a desk-top analysis that is:</p> <ul style="list-style-type: none"> <li>Developed using the available baseline data that has been collected at an appropriate frequency and scale; and</li> <li>Fit-for-purpose?</li> </ul>	Regional Groundwater monitoring network consists of 45 observation points.	Long history of mining available to collate background data.

**Other requirements to be reported on under Section 3.2.3 of the AIP**

**Table 3: Has the proponent provided details on:**

AIP Requirement		Proponent response	NOW Comment
1	Establishment of baseline groundwater conditions?	104 groundwater samples collected between 2002 and 2013 and analysed for pH and electrical conductivity.	EC Data for Ulan seam mean and standard deviation appears skewed.
2	A strategy for complying with any water access		Not discussed

	rules?		
3	Potential water level, quality or pressure drawdown impacts on nearby basic landholder rights water users?	There are no boreholes located within proximity to the proposed Modification area that could be affected by mining induced drawdowns.	Map and list of private bores provided but potential drawdown to these bores from the UCML not presented. There are deep hardrock bores within depressurisation extent for hardrock aquifers.
4	Potential water level, quality or pressure drawdown impacts on nearby licensed water users in connected groundwater and surface water sources?	There are no boreholes located within proximity to the proposed Modification area that could be affected by mining induced drawdowns.	Map and list of private bores provided but potential drawdown to these bores from the UCML not presented. Should be completed for completeness.
5	Potential water level, quality or pressure drawdown impacts on groundwater dependent ecosystems?	<p>There are no identified groundwater dependent ecosystems within the Modification area.</p> <p>Unidentified local springs might be present that could be affected by cracking of the subsurface.</p> <p>Depressurisation of Triassic strata in the area of the Drip has already occurred as a result of historical mining operations at UCML and no impacts on the perched groundwater system have been observed to date. No impacts are likely as a result of future Ulan West operations which are moving northward and westward away from the Drip.</p> <p>37 vegetation communities delineated. Layout of surface infrastructure altered to avoid areas of White Box Woodland Threatened Ecological Community</p>	<p>It is not demonstrated what observation data supports this statement. Proponent should describe any ongoing monitoring and consideration of potential long term effects.</p>
6	Potential for increased saline or contaminated water inflows to aquifers and highly connected river systems?	It is unlikely that any regional change in groundwater quality will be observed in hard rock strata. Similarly, it is unlikely that any measurable change in water quality will be observed in the shallow unconsolidated alluvial aquifer system since these are either remote from the Modification and/or they are frequently recharged by rainfall.	The long term downward flux would imply a minor risk for water quality degradation provided the model is deemed fit for purpose.
7	Potential to cause or enhance hydraulic connection between aquifers?	Localised change in salinity at depth may be observed as groundwaters contained within different stratigraphic horizons, as is already evident.	Interconnection generated by goaf fracturing is within same water source. Water quality is not significantly between aquifers and 300+ year



			downward flux predicted giving a reduced salinity at depth.
8	Potential for river bank instability, or high wall instability or failure to occur?		N/A
9	Details of the method for disposing of extracted activities (for CSG activities)?		N/A

### Addressing the Minimal Impact Considerations

**Table 4: Minimal impact considerations – example tables**

<b>Aquifer</b>	Porous rock or fractured rock		
<b>Category</b>	Less productive		
<b>Level 1 Minimal Impact Consideration</b>		<b>Assessment</b>	
<u>Water Table</u> Less than or equal to a 10% cumulative variation in the water table, allowing for typical climatic “post-water sharing plan” variations, 40 m from any: <ul style="list-style-type: none"> <li>(a) high priority groundwater dependent ecosystem; or</li> <li>(b) high priority culturally significant site;</li> </ul> listed in the schedule of the relevant water sharing plan. <p><b>OR</b></p> A maximum of a 2m water table decline cumulatively at any water supply work.		There are no high priority GDEs or high priority culturally significant sites identified in the impacted area.  There are no water supply works within or in proximity to the Modification area.	
<u>Water pressure</u> A cumulative pressure head decline of not more than a 2m decline, at any water supply work.		A pressure head decline will exceed 40% on the Triassic Sandstones. Permian strata will be dewatered. However, there are no water supply works within or in proximity to the area that will be affected.	
<u>Water quality</u> Any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40m from the activity.		No long term adverse change in salinity is predicted since subsided areas will essentially reflect unsubsided conditions with respect to aquifer material properties and rainfall recharge.  There are no highly connected water sources within or in proximity to the area that will be affected.	

#### 1. Proposed remedial actions where impacts are greater than predicted

Point 3 of section 3.2 of the AIP provides a basic framework for considerations to consider when assessing a proponent's proposed remedial actions.

**Table 5: Has the proponent:**

	<b>AIP Requirement</b>	<b>Proponent response</b>	<b>NOW Comment</b>
1	Considered types, scale, and		Minimal sensitivity analysis.

	likelihood of unforeseen impacts <i>during operation</i> ?		Possibility of 2yr model review and verification.
2	Considered types, scale, and likelihood of unforeseen impacts <i>post closure</i> ?		Not described.
3	Proposed mitigation, prevention or avoidance strategies for each of these potential impacts?		Not described.
4	Proposed remedial actions should the risk minimization strategies fail?		Not described.
5	Considered what further mitigation, prevention, avoidance or remedial actions might be required?		Not described.
6	Considered what conditions might be appropriate?		Not described.

## 2. Other considerations

**Table 6:** Has the proponent:

	<b>AIP Requirement</b>	<b>Proponent response</b>	<b>NOW Comment</b>
1	Addressed how it will measure and monitor volumetric take? (page 4)	Water levels in the goaves and discharge volumes from underground dewatering pumps are currently monitored and recorded via an electronic data capture systems.  The model is currently reviewed biennially.	Recorded via an electronic data capture systems is appropriate if combined with groundwater model review and verification.
2	Outlined a reporting framework for volumetric take? (page 4)		Not described.

## End of Attachment B

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