

21 May 2018

Mr David Kitto
Executive Director
Resource Assessments & Business Systems
Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001

Re: Springvale Mine Extension Project – Extraction Plan for Longwalls 424 - 427

Dear Mr Kitto

I write on behalf of the Independent Monitoring Panel (the Panel) for the Springvale Coal Mine in regard to the following draft documents provided by Centennial Coal:

1. *Longwalls 424-427 Subsidence Monitoring Program*, March 2018.
2. *Biodiversity Management Plan for Longwalls 424-427*, March 2018.
3. *Swamp Monitoring Program for Longwalls 424-427*, March 2018.
4. *Water Management Plan of Extraction Plan for LW424-427*, March 2018.
5. *Extraction Plan for Longwalls 424-427: Interim Outcomes from the Groundwater Model*, 26 March 2018.

The Panel's deliberations on these documents have also been informed by a detailed site visit to swamps in the study area on 14 February 2018 and from two meetings with Centennial Coal, the Department and the Office of Environment and Heritage. A number of key issues were discussed on those occasions, including the interim groundwater model, the proposed extraction sequence and potential adaptive management measures (e.g. the stand-off distance of Longwalls 425 and 426 from Paddys Creek Swamp).

The Panel understands that discussions between Centennial Coal, the Department and the Office of Environment and Heritage are ongoing in relation to the calculation of biodiversity offset liabilities. Consequently, the Panel considers it premature to provide advice on this topic at this stage.

Overall Advice

The Panel acknowledges significant progress has been made by Centennial Coal in developing a better understanding of the effects and consequences of mining on local natural features and regional geological structures. The Panel has previously made a number of recommendations for augmenting the monitoring program at the mine, including additional shallow and deep groundwater monitoring in swamp communities. The Panel understands that this additional work is furthering the company's understanding of impacts on swamps and regional water resources.

Notwithstanding this, after having reviewed the draft documents and in the light of the supporting inquiries, the Panel considers that further information is required before the Extraction Plan for LW 424 to 427 can be finalised. This includes the installation of additional monitoring in order to continue to improve the understanding of potential mining induced impacts and inform future decision-making at the mine.

The Panel recommends that the following aspects are addressed in the revised version of the Extraction Plan for Longwalls 424-427 at the Springvale Coal Mine.

Subsidence Monitoring Program

It would be helpful if Centennial Coal provided a more detailed written account of how it has calculated the stand-off distance from Paddy's Swamp and the justification for considering this to be adequate (acknowledging that the company has given the Panel an oral presentation on this topic).

Swamp Monitoring Program

The Panel notes that the drying of swamp sediments can result in changes to porosity and water holding capacity. Therefore, measures to characterise the soil and peat layers within swamps should be included in the Swamp Monitoring Program. This should enable a better understanding of the biotic and abiotic structural and functional components of swamps.

The absence of key fauna species such as Blue Mountains Water Skink and Giant Dragonfly in swamps in the mining domain may be indicative of mining related impacts on shallow groundwater rather than of climate-related changes to flora within the swamp. This issue has previously been discussed in the context of the time sequence between impacts and responses. Consideration should be given to appropriate response triggers for these key fauna species.

The Panel is also concerned that the cease work triggers in the Trigger Action Response Plan in the Swamp Monitoring Program may be impractical to implement. The Panel therefore requests that the cease work triggers are reviewed for their efficacy and are clarified and/or modified accordingly.

Water Management Plan

The Panel considers that a number of techniques may be able to be implemented to further inform the understanding of the effects of mining on groundwater resources. For instance, wireline logs have been installed down hole at Waratah Rivulet in the Southern Coalfield to identify how the surface zone of fracturing/porosity has changed.

The Panel considers that similar technologies, (i.e. wireline geophysics, environmental tracers or high frequency pore pressure analysis) could be used in the shallow piezometers proposed in the weathered zone, if the piezometers are installed as open-holes. This initiative could be related volumetrically to groundwater drawdown to help determine if loss of water could be accounted for within this zone, particularly if time-series geophysical images (e.g. resistivity and/or ground penetrating radar) are carried out across several swamp transects.

These are examples for consideration of technologies that could inform the understanding of mining impacts. The Panel considers that a more in-depth discussion of current technology is required with Centennial Coal to decide which would be best suited to implement for Longwalls 424-427.

The Panel notes that the proposed additional monitoring does not include a multi-level piezometer or vibrating-wire piezometer above or near the longwalls, and that sandstone ridge aquifer monitoring is limited to one piezometer at the end of Longwall 426. Further consideration should be given to the installation of a multi-level piezometer and additional monitoring of the ridge aquifers.

Based on its review, the following inclusions and/or changes to the Water Management Plan are recommended:

- assessment and comparison of the re-emergence of flows between the existing and replacement surface water monitoring site below Gang-Gang swamp;
- bore site elevation should be added (collar ground level in mAHD) to enable interpretation of mbgl monitoring, and details of the length of monitoring screen;
- geological cross-sections of proposed (and existing) ridge and weathered zone piezometers;
- an interim update on swamp water balance models;
- discussion of swamp moisture level trends, to correlate trends with swamp and ridge water level triggers;
- include the dates of establishment of bores listed in Table 5;
- further quantitative information and comparison with field data in Figures 17-21, and discussion on the implications of changes to baseflow in swamps; and
- for 'condition red', the triggers for change in surface water quality (p57) should reference pH and EC.

Surface Water

A flow monitor is proposed to be installed at the confluence of Pine and Nine Mile Swamps. The Water Management Plan should detail how Pine Swamp flow data would be distinguished from this flow monitor.

Biodiversity Management Plan

The Panel considers that monitoring for Red-Crowned Toadlet can be discontinued, considering that a viable population is not evident within the mining domains.

The performance indicator for the Giant Dragonfly in the Biodiversity Management Plan could be modified to include negligible change in 'required' habitat in the areas where baseline data indicates there are viable populations in the swamps.

Interim Groundwater Model

In finalising the interim groundwater model, consideration should be given to:

- whether the ramp function for permeability may need to consider increased changes in the zone between the near ground surface and the depth of fracturing;
- specific storage values that are realistic and physically plausible should be checked, particularly for shale/siltstones;
- addressing model uncertainty, particularly given the very long run times and model complexity; and
- clarifying the recharge value that would be applied on the ridges, in the lower reaches of swamps at rivers/creeks within the larger domain to ensure realistic and unique model scenarios.

Other Matters

The Panel is aware that Centennial Coal has recently notified agencies about potential subsidence impacts to hanging swamps overlying the Angus Place mine. The Panel has not been formally requested to comment on this matter.

The Panel would appreciate an update on the recently installed piezometers (i.e. for Longwalls 420-421), particularly whether their depth is appropriate and if they are interpreting groundwater level drawdown in Gang Gang swamp.

Could you please arrange for the Panel's comments to be provided to Centennial Coal and request that it give due consideration to them in revising the draft Extraction Plan.

I may be difficult to contact at short notice until the end of June as I will be in some remote areas of Australia. However, queries can be directed to other Panel members (Wendy Timms and Barbara Mactaggart).

Yours sincerely



Emeritus Professor Jim Galvin
On behalf of the Springvale Independent Monitoring Panel



Mr James Wearne
Group Manager Approvals
Centennial Coal Limited
100 Miller Road
Fassifern NSW 2283

Dear Mr Wearne

Springvale Mine Extension Project — Extraction Plan for Longwalls 424-427

I refer to your letter dated 12 June 2018 and your email dated 17 July 2018, which attached revised versions of the Extraction Plan documents relating to Longwalls 424-427.

Extraction Plan Assessment Process

The Department has undertaken a comprehensive assessment of the Extraction Plan, in consultation with the Independent Monitoring Panel (IMP) and the Office of Environment and Heritage (OEH). A summary of the key steps in the assessment process is provided in the table below:

Document/Meeting	Date	Attendance/Consultation
Site visit of the Springvale Mine and swamps on the Newnes Plateau	14 February 2018	Department, OEH, IMP and Centennial
Draft Extraction Plan submitted to the Department	20 February 2018	Department, OEH and IMP
IMP letter providing initial comments on the draft Extraction Plan	27 February 2018	IMP
Department meeting with OEH and IMP to discuss draft Extraction Plan	27 March 2018	Department, OEH and IMP
IMP letter providing feedback on draft Extraction Plan	21 May 2018	IMP
Centennial letter outlining how the IMP's comments have been addressed and enclosing a revised Extraction Plan	12 June 2018	Department and IMP
Teleconference to discuss updates to the draft Water Management Plan	18 June 2018	Department and IMP
Department meeting with IMP and Centennial to discuss groundwater monitoring bore locations and electrical resistivity tomography proposal	13 July 2018	Department, IMP and Centennial
Centennial letter to the Department outlining how the IMP's comments have been addressed	17 July 2018	Centennial and Department
Department's draft Extraction Plan conditions sent to IMP	20 July 2018	Department and IMP
IMP endorsement of Extraction Plan conditions	24 July 2018	IMP
Department consultation with OEH on final Extraction Plan conditions and swamp offsets	26 July 2018	Department & OEH

Background

In 2014, the Planning Assessment Commission (the Commission) approved the Springvale Mine Extension Project, subject to strict conditions of consent, including a comprehensive Extraction Plan process requiring consultation with the IMP.

Since then, the Department has approved two Extraction Plans (for LW 419 and LW 420-421) in close consultation with the IMP and the relevant agencies. In both instances, the Department has adopted a conservative approach and required a substantial amount of additional monitoring and management measures, particularly in relation to swamp impacts.

In its most recent advice, the IMP acknowledged the considerable amount of work and resources that Centennial has undertaken in recent years, stating that "*significant progress has been made by Centennial Coal in developing a better understanding of the effects and consequences of mining on local natural features and regional geological structures*".

Adaptive Management and Removal of Longwalls

In its 2014 approval, the Commission placed a strong emphasis on avoidance or mitigation of impacts, or adaptive management. Overall, the Department considers that the current Extraction Plan process has resulted in a greater focus on adaptive management and notes that this has resulted in significant changes in the mine plan.

In relation to the current Extraction Plan, Centennial has adopted the following adaptive management measures:

- removing Longwalls 422 and 424 altogether from the mine plan; and
- substantially shortening longwalls 426 and 427.

The Department and the IMP are satisfied that removing longwall 424 would limit impacts to Nine Mile Swamp, and shortening longwalls 426 and 427 would limit impacts to Paddys Creek Swamp. The Department notes that these changes to the mine plan represent around 7.6 million tonnes of coal and would be worth approximately \$100 million.

Swamp Impacts and Offsets

The Department and the IMP now consider that impacts on swamps are likely to constitute greater than "negligible" environmental consequences and are likely to require offsets in the future, in accordance with the development consent.

While further monitoring will be required over time to determine the actual impacts of mining in swamps in accordance with the conditions of consent, it appears likely that a more significant amount of offsets will be required in the future.

Consequently, the Department and the IMP has previously advised Centennial to revise its proposed *Swamp Offset Package* to take into account the most recent understanding of likely impacts and associated offsets.

The Department, the IMP and OEH have reviewed the updated *Swamp Offset Package* which outlines a range of offset mechanisms. This includes some "like for like" offsets, a proposed strategic offset area (which would incorporate areas both inside and adjoining Centennial's mining leases in the State Forest), and a substantially increased commitment to contribute \$2 million for each Newnes Plateau Shrub Swamp that experiences a greater than negligible environmental consequence as a result of mining.

The Department and OEH consider the commitment to contribute \$2 million per affected swamp would assist in the ongoing management costs of any future strategic offset area. The Department has been working closely with other Government agencies to progress the strategic offset area, however given the complexities involved in securing this type of arrangement, it is likely to take some time to finalise.

Consequently, the Department has imposed a condition on the Extraction Plan that a \$2 million bond for each swamp is lodged prior to the commencement of the longwall that is likely to cause an impact to that swamp. The imposition of a \$2 million bond per affected swamp is consistent with the two previous Extraction Plans, and is twice the sum that was initially required in the development consent granted by the Commission (which required \$2 million for the two affected swamps).

The Department already holds \$6 million in swamp offset bonds for previous longwalls, and the additional bonds for Longwalls 425-427 would bring the total amount to \$14 million. The Department considers that the provision of \$14 million in bonds, in addition to the provision of some "like for like" swamps (as proposed in the *Swamp Offset Package*), would ensure that the maximum predicted liability can be met.

Independent Monitoring Panel Advice

The IMP has endorsed the latest versions of all Extraction Plan documents that require its consultation under the conditions of consent, subject to the conditions below, including the:

- Biodiversity Management Plan;
- Swamp Monitoring Program; and
- Water Management Plan.

The IMP has also considered and endorsed the most recent update of the Groundwater Model for the mine.

Decision

The Extraction Plan is approved only for Longwalls 425, 426 and 427, subject to the following conditions:

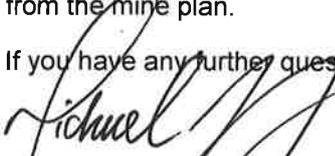
1. A multi-level vibrating wire piezometer above longwall 425 must be installed and commissioned prior to the commencement of longwall 425.
2. Electrical resistivity tomography trials must be commenced in Barrier Swamp (control site) and Pine Swamp (impact site) by 19 August 2018 or prior to the retreat of 250 metres of longwall 425 (whichever is sooner). The trials must involve the installation of one transect in each of the swamps to record time series images (data) across each transect to allow imaging and transient mapping of changes in moisture within the swamps and the shallow subsurface.
3. A final version of the Groundwater Model and associated swamp water balance must be submitted to the Department and IMP at least 3 months prior to the commencement of longwall 426.
4. Additional investigations into the re-emergence of flows observed below Gang Gang Swamp must be undertaken, to track the point of re-emergence and assess whether there is a relationship to flow and/or rainfall events. A report on the analysis of this data must be provided to the Independent Monitoring Panel at least 3 months prior to the commencement of LW426, for comment and any further recommendations for additional work.
5. A report on the analysis of soil moisture trends must be submitted to the Department and the IMP at least 3 months prior to the commencement of longwall 426, for comment and any further recommendations for additional work.
6. The Powerline Management Plan, including a Powerline Subsidence Assessment must be submitted to the Department at least 3 months prior to the commencement of longwall 426.
7. A series of bonds must be lodged with the Department to cover any adverse impacts on swamps from the extraction of Longwalls 425, 426 and 427, including:
 - a \$2 million bond lodged within 3 months of the commencement of Longwall 425, to cover any impacts on Pine Swamp;
 - a \$2 million bond lodged at least 3 months prior to the commencement of Longwall 426, to cover any impacts on Upper Pine Swamp; and
 - a \$4 million bond lodged at least 3 months prior to the commencement of Longwall 427, to cover any impacts on Marrangaroo Creek Swamp and Upper Marrangaroo Creek Swamp.

Please ensure that the seven conditions above are met according to the required timeframes. The Department notes that work has already commenced on two of the seven conditions, including:

- installation of an additional vibrating wire piezometer above longwall 425; and
- establishment of an electrical resistivity tomography trial.

I reiterate that this approval does not allow the extraction of Longwall 424, as it has now been removed from the mine plan.

If you have any further questions, please call Clay Preshaw on (02) 9274 6349.


Mike Young
Executive Director
Resource Assessments and Business Systems
as the nominee of the Secretary
27/7/18.

Record of Decision

Springvale Mine Extension Project – Extraction Plan for Longwalls 424-427

On 26 July 2018, the Secretary approved the Extraction Plan for Longwalls 424-427 at the Springvale Mine Extension Project, subject to the following conditions:

- The Extraction Plan is approved only for Longwalls 425, 426 and 427.
- A multi-level vibrating wire piezometer above longwall 425 must be installed and commissioned prior to the commencement of longwall 425.
- Electrical resistivity tomography trials must be commenced in Barrier Swamp (control site) and Pine Swamp (impact site) by 19 August 2018 or prior to the retreat of 250 metres of longwall 425 (whichever is sooner). The trials must involve the installation of one transect in each of the swamps to record time series images (data) across each transect to allow imaging and transient mapping of changes in moisture within the swamps and the shallow subsurface.
- A final version of the Groundwater Model and associated swamp water balance must be submitted to the Department and IMP at least 3 months prior to the commencement of longwall 426.
- Additional investigations into the re-emergence of flows observed below Gang Gang Swamp must be undertaken, to track the point of re-emergence and assess whether there is a relationship to flow and/or rainfall events. A report on the analysis of this data must be provided to the Independent Monitoring Panel at least 3 months prior to the commencement of LW426, for comment and any further recommendations for additional work.
- A report on the analysis of soil moisture trends must be submitted to the Department and the IMP at least 3 months prior to the commencement of longwall 426, for comment and any further recommendations for additional work.
- The Powerline Management Plan, including a Powerline Subsidence Assessment must be submitted to the Department at least 3 months prior to the commencement of longwall 426.
- A series of bonds must be lodged with the Department to cover any adverse impacts on swamps from the extraction of Longwalls 425, 426 and 427, including:
 - a \$2 million bond lodged within 3 months of the commencement of Longwall 425, to cover any impacts on Pine Swamp;
 - a \$2 million bond lodged at least 3 months prior to the commencement of Longwall 426, to cover any impacts on Upper Pine Swamp; and
 - a \$4 million bond lodged at least 3 months prior to the commencement of Longwall 427, to cover any impacts on Marrangaroo Creek Swamp and Upper Marrangaroo Creek Swamp.

DEPARTMENT OF THE ENVIRONMENT AND ENERGY

Our reference: 2013/6881

Mr James Wearne
Group Manager Approvals
Centennial Coal
100 Miller Road
FASSIFERN NSW 2283

Dear Mr Wearne

Springvale Mine Extension Project, New South Wales (EPBC 2013/6881)

Thank you for your email dated 29 May 2018 to the Department, seeking approval of the swamp monitoring program and biodiversity management plan, in accordance with conditions 6, 9 and 12 of the approval decision dated 4 June 2018.

Officers of this Department have considered both plans and are satisfied that they meet the requirements of conditions 6, 9 and 12 of the approval for this project. On this basis, and as a delegate of the Minister for the Environment, I have decided to approve the *Biodiversity Management Plan for Longwalls 424-427, July 2018* and the *Swamp Monitoring Plan for LW424 to LW427, May 2018*. These plans must now be implemented.

I note that in advice provided to the Department, Centennial Coal has indicated that the Glow Worm Swamp does not meet the criteria for consideration as a Temperate Highland Peat Swamp listed as an endangered ecological community under the *Environment Protection and Biodiversity Conservation Act 1999*. As the approval holder, Centennial Coal is required to ensure that all swamps protected under this listing are monitored as required by Condition 6 of the approval. In order to be compliant with Condition 6, if at any time the Glow Worm Swamp or any other swamps are identified as part of the endangered ecological community a revised Swamp Monitoring Plan would be required for approval by the Minister.

Condition 20 allows you (under certain circumstances) to implement revised plans without seeking the Minister's approval. If you require any advice on whether or not to submit a revised plan for approval, please contact the Department. I have also attached a fact sheet providing guidance on 'new or increased impact' relating to changes to approved management plans under the *Environment Protection and Biodiversity Conservation Act 1999*.

Should you require further information please contact Hagen Ganahl, Post Approvals Section, on (02) 6274 1699 or by email: post.approvals@environment.gov.au.

Yours sincerely



Greg Manning
Assistant Secretary
Assessments (WA, SA, NT) and Post Approvals Branch
Environment Standards Division

27 July 2018