



Date: 4th April 2014
Your reference:
Our reference: DOC14/34247-01
Contact: Liz Mazzer 68835335

Paul Langley
Subsidence Executive Officer
NSW Trade and Investment
PO Box 344
Hunter Region Main Centre NSW 2310

Dear Paul

**RE: Subsidence Management Plan Variation Application for Springvale Colliery
Longwalls 416 to 418: Variation to Longwall Cutting Height**

I refer to your request dated 17th March 2014 seeking comment by the end of March from the Office of Environment and Heritage (OEH) on the proposed variation to the Springvale Colliery Subsidence Management Plan.

In a telephone conversation with you on the 26th March, Conservation Planning Officer Liz Mazzer received your agreement that OEH would have until the 4th April 2014 to provide a submission. Despite this verbal agreement, we understand that a Determination has already been made regarding the Variation.

OEH does not support the direct undermining of Newnes Plateau Shrub Swamp Endangered Ecological Community (EEC) using the longwall mining technique unless there has been a modification to the mining techniques that will ensure that impacts will be prevented.

It is understood that the proposal seeks to vary the current approval for Longwalls 411 to 418 from an average 3.25m to a maximum of 3.5m.

While we understand that the proposal to increase the cutting height is outside the Swamp Buffer Zones, OEH still considers the risk of irreversible damage from such a practice to threaten the integrity of the bedrock base of the swamp, the persistence of the perched aquifer within the swamp and ultimately, the threatened species and community that rely on the natural hydrological and hydrogeological regime of the swamp.

OEH considers that all Newnes Plateau Shrub Swamps (NPSS), as Endangered Ecological Communities, are of high conservation significance. While an assessment of all NPSS has not been conducted, OEH is of the opinion that swamps within the footprint of the Springvale Longwalls, including Broad Swamp, Pine Swamp, Carne West Swamp and Gang Gang East Swamp, are of particularly high significance based on their size, condition and presence of endangered and/or threatened species.

For your records and for future reference of the Department of Trade and Investment, detailed comments regarding some of OEH's main concerns are provided in Attachment A.

If you have any questions regarding this matter please contact Liz Mazzer on 02 6883 5325 or email liz.mazzer@environment.nsw.gov.au

Yours sincerely

A handwritten signature in black ink, appearing to read 'S Ardill', with a stylized, cursive script.

SONYA ARDILL
Senior Team Leader Planning, North West Region
Regional Operations

Attachment A: OEH review for Springvale Colliery Longwalls 411-418 Subsidence Management Plan Variation Application – Variation to Longwall Cutting Height
Attachment B: Report on field inspection of unnamed swamp (herein referred to as Little Sunnyside East Swamp)

ATTACHMENT A

OEH review**Springvale Colliery Longwalls 411-418****Subsidence Management Plan Variation Application****Variation to Longwall Cutting Height**

Acronyms

| | |
|---------|---|
| NSWTI | New South Wales Trade and Investment |
| EEC | Endangered Ecological Community |
| NPSS | Newnes Plateau Shrub Swamp |
| OEH | Office of Environment and Heritage |
| PAC | Planning Assessment Commission |
| THPSS | Temperate Highland Peat Swamps on Sandstone |
| TSC Act | <i>Threatened Species Conservation Act 1995</i> |

1 Undermining of Newnes Plateau Shrub Swamp Endangered Ecological Community

OEH does not support the direct undermining of Newnes Plateau Shrub Swamp (NPSS) Endangered Ecological Community (EEC) using the longwall mining technique unless there has been a modification to the mining techniques that will ensure that impacts will be prevented.

While we understand that the proposal to increase the cutting height is outside the Swamp Buffer Zones, OEH still considers the risk of irreversible damage from such a practice to threaten the integrity of the bedrock base of the swamp, the persistence of the perched aquifer within the swamp and ultimately, the threatened species and community that rely on the natural hydrological and hydrogeological regime of the swamp.

Recommendations

- 1.2 OEH considers that monitoring of longwalls needs to be designed and implemented to enable an unambiguous assessment of impact on the hydrology of these swamps with adequate baseline data and with clear management action should such impacts occur.

2 Subsidence Predictions

OEH questions the relationship between this variation and the Springvale Extension Project SSD 5594 (Centennial Coal, November 2013), particularly with regard to subsidence predictions.

Longwalls 416-418 are currently included in the Springvale Extension proposal (SSD 5594). The Draft EIS states that, "*the cutting height of the coal seam will typically be 3.2m.*" (pg 164). The variation will increase the cutting height to 3.5m in particular areas.

The DgS subsidence assessment (DgS 2014) for the proposed mining height modification to LWs 416-418 at the Springvale Mine, Wallerawang states,

Sunnyside East and Carne West swamps are now predicted to be subsided between 0.59m and 1.16m after mining is completed, with tilts of 5 to 11 mm/m, tensile strains of 3 to 12 mm/m and compressive strains of 5 to 14 mm/m predicted if the mining heights for LWs 416 to 418 are increase (sic) to 3.5m (page 9).

However, in section 9.4 of the Variation Application, it is stated,

Sunnyside East and Carne West swamps are predicted to be subsided between 500mm and 1000mm after mining is completed, with tilts of 4 to 9 mm/m, tensile strains of 2 to 10 mm/m and compressive strains of 3 to 13 mm/m could occur above the 260.9m wide panels. These values have not changed from previous predictions because the area is within the Newnes Plateau Shrub Swamp Buffer Zones and will have extraction continued at the average 3.25m cutting height.

The draft EIS for SSD 5594 (Table 8.1) predicts subsidence of 1,200mm for LW 416 to LW 423, with non-conventional subsidence (for subsidence above lineaments) of 1,450mm. This draft EIS also predicts 1.5mm/m tensile and 2mm/m compressive strains (pg 243).

Geological structures such as faults, lineaments and joint sets can interact with longwall mining to increase subsidence and lead to unexpected outcomes. Section 2.0 of the DgS (2014) report states that,

The presence of Type 1 structural lineaments and moderate topographical relief were identified as key drivers of non-systematic subsidence effects within the valleys.

Three Type 1 structure zones are recognized in the Angus Place Colliery and Springvale Mine existing workings (Kangaroo Creek lineament, Wolgan River lineament and the Deanes Creek lineament). For the current set of longwalls these were mapped by DgS (2014) in relation to NPSS (Figure 1. - Figure 4 from DgS 2014).

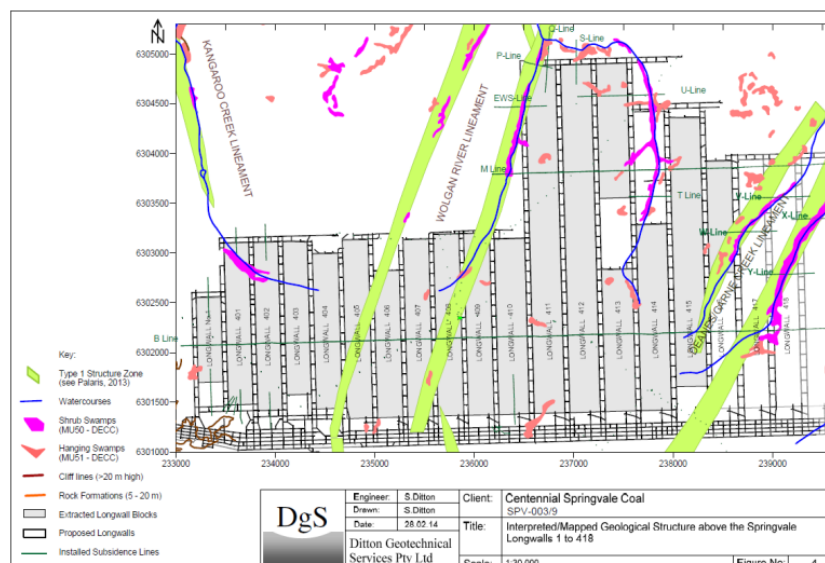


Figure 1. Mapped lineaments and Swamps above Springvale Mine

Structure Type 1 Lineaments are located in the vicinity of the proposal. The Deanes Creek lineament extends directly below Carne West Swamp, running beneath Longwalls 415 to 418. Based on the draft EIS, mining of the lineament area would potentially result in subsidence of up to 1,450mm, significantly higher than the 1,000mm presented in the Variation application.

The subsidence assessment for the proposed increase in height for Longwalls 416 to 418 is based on the methodology of DgS (2014). Experience with this methodology in some other areas has identified that this approach can significantly underestimate actual subsidence. For example, OEH notes that subsidence using the same methodology for some longwalls at West Wallsend Colliery predictions underestimated subsidence by up to 30%. The DgS methodology used for this assessment is also based on a mean (and 95% confidence on the mean) and not a maximum. This means that maximum subsidence levels could well be much higher than even the predicted subsidence estimates provided. There are also no specific estimates for upsidence or valley closure provided for the mine plan, but OEH notes the important qualifier attached to DgS (2014) Table 1 that:

Predicted strains are for a surface with a deep soil cover and likely to have 'smooth' profile strains. A surface with rock exposures is likely to cause strain concentrations, which can range between 2 and 4 X mean 'smooth' profile strains. Similar effects can develop in valleys or Type 1 Fault Zone areas.

Since the estimated strains range from 3-7 mm/m compressive strain and 2-5 mm/m tensile strain, actual maximum strains could be as high as 14-28 mm/m compressive strain and 10-20mm tensile strain^a.

Recommendation

- 2.1 That the predicted subsidence for NPSS in the vicinity of Longwalls 411 to 418 be clarified, taking into account the influence of lineaments and the assessment of potential impacts reviewed in light of revised information if required.

3 Conservation values of swamps

OEH considers that all Newnes Plateau Shrub Swamps (NPSS), as EECs, are of high conservation significance. While an assessment of all NPSS has not been conducted, OEH is of the opinion that swamps within the footprint of the Springvale Longwalls, including Broad Swamp, Pine Swamp, Carne West Swamp and Gang Gang East Swamp, are of particularly high significance based on their size, condition and presence of endangered and/or threatened species.

OEH considers that a negligible impact criteria should be applied if mining is underneath or within the angle of draw of these swamps.

In addition, OEH advises that an unnamed swamp to the north of Sunnyside East Swamp, currently mapped as a Hanging Swamp, has been recently surveyed by Doug Benson of the Royal Botanic Garden and Domain Trust and found to meet the description of Newnes Plateau Shrub Swamp (Figure 2 and Attachment B). An area of 3.5m extraction height for Longwall 417 is located directly below this swamp.

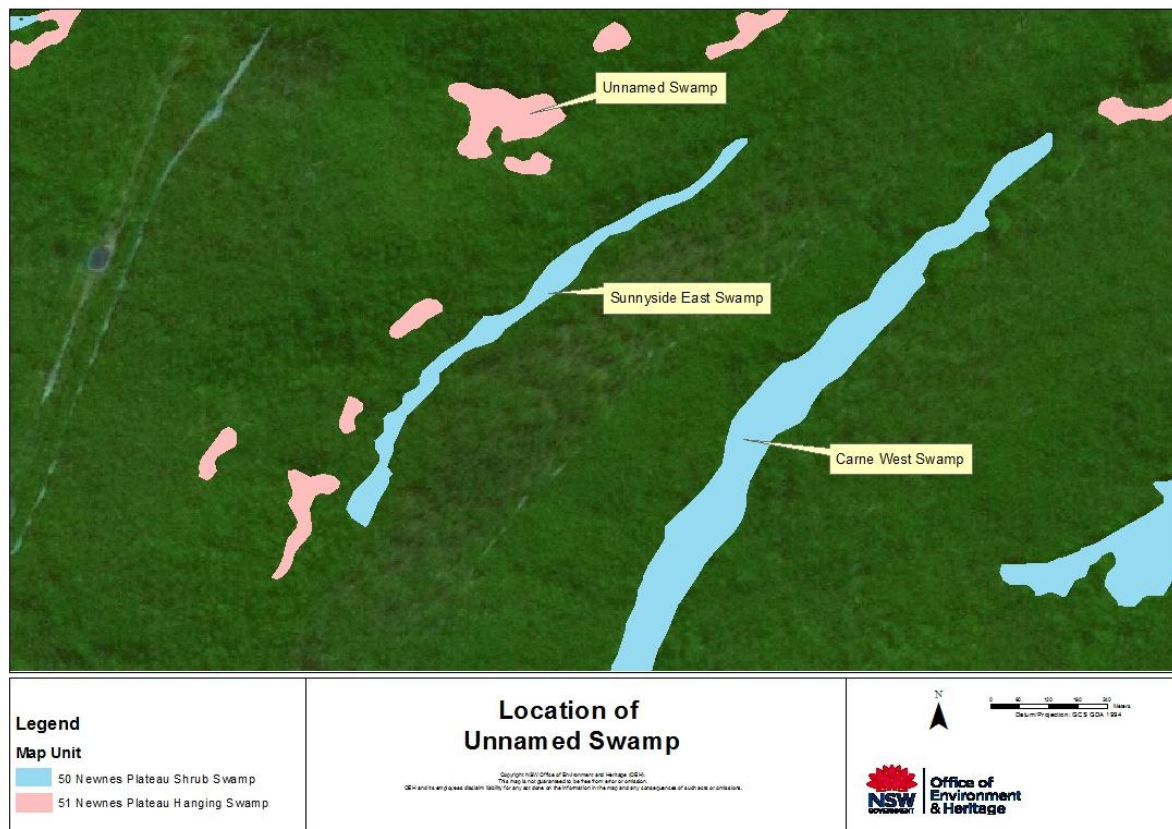


Figure 2 Location of Unnamed Swamp

Recommendations

^a In each case DgS (2014) has stated the lower figure in brackets in their Table 1.

- 3.1 Mining activities that could potentially result in impacts to NPSS should be avoided. A negligible impact criteria should be applied if mining is underneath or within the angle of draw of these swamps, particularly those listed above.
- 3.2 The swamp to the north of Sunnyside East Swamp, described in Attachment B, be recognised as NPSS rather than as a Hanging Swamp. The 3.5m cutting height should not be applied under this swamp.

4 Longwall 418

OEH has particular concerns regarding Longwall 418, which is not included in the Commonwealth Approval EPBC 2011/5949, but is to extend under Carne West Swamp.

The Variation application states that,

At this stage the swamps will be monitored in accordance with the Shrub Swamp Subsidence Management Plan for Springvale longwalls 415 to 417 and the EPBC Approval 2011/5949 "Mining of Longwalls 415, 416 and 417 at Springvale Colliery.

It is noted that this does not include Longwall 418. Effectively, if approved, the current SMP for Longwalls 416 to 418 will become the de facto approval for undermining (and potentially irreversibly damaging) one of the most important Newnes Plateau Shrub Swamps. OEH considers that Carne West Swamp above Longwall 418 should be subject to "negligible impact" criteria in the Subsidence Management Plan and monitored accordingly.

Since the unnamed swamp at the starting end of Longwall 417 and Sunnyside East swamps (both NPSS) will be undermined first (by Longwall 417), it would be prudent to defer a decision on Longwall 418 (under Carne West Swamp, the fifth largest NPSS on the Newnes Plateau) until after water level monitoring confirms upper aquifer integrity following extraction of Longwall 417. Given the uncertainty about potential impacts, a contingency plan should consider a scenario that sees fracturing and drainage of the unnamed swamp and/or Sunnyside East swamp.

Recommendations

- 4.1 That commencement of Longwall 418 not occur unless water level monitoring confirms upper aquifer integrity following extraction of Longwall 417.
- 4.2 That a contingency plan is developed in the event that fracturing and drainage of the unnamed and/or Sunnyside East swamps occur. This should include options to avoid direct undermining of Carne West Swamp.

References

Centennial Coal (2013). *Springvale Mine Extension Project. State Significant Development SSD 5594. Environmental Impact Statement – Volume 1 Report.* Draft document for adequacy assessment November 2013.

DgS (2014). *Subsidence Assessment for the Proposed Mining Height Modification to LWs 416 – 418 at the Springvale Mine, Wallerawang.* Report No SPV-003/9.

Attachment B

Report on field inspection of unnamed swamp (herein referred to as Little Sunnyside East Swamp (lat -33.373763 long 150.193100), north of Sunnyside East Swamp, March 2014

Doug Benson Botanist/ Plant ecologist
 Honorary Research Associate
 Royal Botanic Gardens and Domain Trust

Description

The small unnamed swamp north of Sunnyside East Swamp and about 500 m east of Sunnyside Road, herein referred to as Little Sunnyside East Swamp, was inspected on 27th Mar 2014 to determine its main swamp features. It has been previously mapped as a Newnes Plateau Hanging Swamp but its location and size suggested that this was inappropriate.

Little Sunnyside East Swamp (Location lat -33.373763 long 150.193100) is located in the major catchment of Carne Creek and makes up part of its westernmost catchment. The swamp outflow flows northeast to join with the creekline draining from the adjacent Sunnyside East Swamp, the join being about 300 m below Little Sunnyside swamp and 200 m below Sunnyside East Swamp. It therefore occupies a subcatchment separate from Sunnyside East Swamp but adjacent to it .

Little Sunnyside Swamp is a small bowl - shaped perched swamp about 50m long and up to 20m wide. Its upper margins align with the 1100 m contour that is a characteristic feature of most of the Newnes Plateau Shrub Swamps particularly those in the Carne Creek catchment. Its geomorphological features fit with that of a Newnes Plateau Shrub Swamp.

Vegetation for Little Sunnyside East Swamp recorded in the field indicated a sclerophyllous shrub and sedge cover to 2m with main species including *Baeckea linifolia*, *Gleichenia dicarpa*, *Lepidosperma limicola*, *Leptospermum grandifolium*, *Baumea* sp., *Epacris obtusifolia*, *Gahnia sieberiana*, *Grevillea acanthifolia*, *Xyris ustulata*, *Pultenaea divaricata* and *Banksia marginata*. Smaller less common species included *Baloskion australe*, *Schoenus* sp, *Acacia obtusifolia*, *Gonocarpus micranthus* and *Olearia quercifolia*. This is not a complete species list but indicates that the main species are similar to those found in adjacent Newnes Plateau Shrub Swamps. *Olearia quercifolia* is confined to swamps in the upper Blue mountains and is rare in the area.

Probe measures of the swamp substrate showed depths of 3.0 – 4.2 m with layers of sand over clay over peat, relatively deep sediments for Newnes Plateau Shrub Swamps

Discussion

Features for identifying Newnes Plateau Hanging Swamps (MU51) are:

1. A low, dense, fern-dominated community usually perched on a hillside, often with a small drop immediately below the community.
2. Few trees, with those present often stunted.
3. Groundwater dependent – needs to have continuous seep of water from the rock to sustain the community

In contrast to Point 1 above, Little Sunnyside East Swamp is essentially a shrub/ sedge dominated community rather than fern-dominated and is situated in an upper valley rather than perched on a steep hillside unlike Newnes Plateau Hanging Swamps .

Points 2 and 3 above, few trees and groundwater dependency, apply to both Hanging and Shrub swamps.

Conclusion

The geomorphic and vegetational characteristics of Little Sunnyside East Swamp support the view that it should be classified and treated for subsistence impact monitoring as a Newnes Plateau Shrub Swamp rather than a Newnes Plateau Hanging Swamps