



Ms Melanie Hollis
Principal Planning Officer
Resource Assessments
Department of Planning, Housing and Infrastructure

By email: melanie.hollis@planning.nsw.gov.au

Dear Ms Hollis

Subject: Metropolitan Mine Mod 4 Longwalls 317 and 318 – Response to Submissions (MP 08_0149 MOD 4)

I refer to your request via the NSW Planning Portal dated 11 November 2025 to the Conservation Programs, Heritage and Regulation Group (CPHR) of the NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) inviting comments on the Response to Submissions (RTS) for Modification 4 of the Metropolitan Coal Mine consent (MP 08_0149).

This Modification is to allow a northern extension of Longwall 317 (LW317) and addition of Longwall 318 (LW318) to the west. The Modification also includes the relocation of the approved (but not yet constructed) Ventilation Shaft 4 and continued development (first workings) of the mine to the west to allow access to a future coal resource. We previously provided comments on the Modification Report in our response dated 2 September 2025 (our reference DOC25/683750).

We have reviewed the Submissions Report, the Niche Response to CPHR Report and the Updated Biodiversity Development Assessment Report (BDAR) in accordance with the *Biodiversity Conservation Act 2016* and the Biodiversity Assessment Method (2020) (BAM). In summary, while numerous matters relating to the BDAR have now been resolved, further avoidance of environmental impacts should be undertaken given the high biodiversity values and location in a sensitive water catchment area.

It appears from the documents submitted that this modification is seeking to open access to a new mine area that is outside the development approval and has the potential to significantly impact on the biodiversity values of Honeysuckle Creek, Swamp 106 and Bee Creek. Honeysuckle Creek and Bee Creek swamp were not assessed in the original development application and impacts on these features may lead to subsidence and cracking which has not been assessed.

In determining whether there will be a Serious and Irreversible Impact (SII) likely to contribute significantly to the risk of a threatened species or ecological community becoming extinct, there are four threatened entities that should be closely considered: Coastal Upland Swamp (CUS), Giant Dragonfly, Large-eared Pied Bat and Littlejohn's Treefrog. In order to reduce impacts and demonstrate further avoidance we suggest the following:

- modify the proposal (mine layout and geometry) to avoid impacts to Coastal Upland Swamps and associated waterways, particularly Swamp 106 and Honeysuckle Creek
- consider our advice on SII (Attachment C)

- biodiversity offsets should be in accordance with the biodiversity offsets scheme
- The Upland Swamps Offset Policy should also be applied
- advice from the Independent Expert Advisory Panel for Mining (IEAPM) may be needed in relation to:
 - impacts to Swamp 92 due to construction of the Ventilation Shaft
 - impacts on S106 and Honeysuckle Creek
 - cumulative impacts to threatened amphibians and CUS across Metropolitan mine approval area
 - CUS that need to be offset, should approval be granted
 - subsidence exceedances across Metropolitan mine approval area
- the proponent should address residual matters raised in this submission, including recommendations which were not adequately addressed in the Submissions Report (**Attachments A and B**)
 - address additional recommendations in our Supplementary Response on adequacy of species polygons and proposed Conservation Measures (**Attachment D**)
 - provide an updated BOAMS case which calculates indirect impacts for review.

Should approval be recommended by Department of Planning, Housing and Infrastructure (DPHI), we request an opportunity to comment on approval conditions including, but not limited to, the above matters. Please note that while we have undertaken a preliminary review of the Adaptive Management Plan (AMP) (required under Section 8.5 of the BAM), this Plan includes details to be addressed in the Extraction Plan and Biodiversity Management Plan. We may have additional comments to make on information provided in the AMP at those stages.

Finally, please be aware that our advice does not incorporate input on heritage matters. If heritage advice is sought, you will need to obtain this via heritagemailbox@environment.nsw.gov.au.

If you have any further questions about this matter, please contact Ms Vanessa Allen, Senior Conservation Planning Officer, South East at Vanessa.Allen@dcceew.nsw.gov.au.

Yours sincerely



12 December 2025

Allison Treweek

Acting Director South East

Regional Delivery

Conservation Programs, Heritage and Regulation

Attachment A – CPHR Residual Recommendations

Attachment B – Review of the Response to Submissions

Attachment C – Updated advice on Serious and Irreversible Impacts

Attachment D – Supplementary response on additional matters (species polygons and proposed Conservation Actions)

CPHR Recommendations following RTS Review

Note: Refer to Attachment B for detail (some recommendations partially met).

- 1.1 The following impacts should be assessed in the BDAR:
 - potential impacts to groundwater aquifer due to the Ventilation Shaft construction, particularly on S92
 - cumulative impacts to Coastal Upland Swamps (CUS) and streams in areas which are above already approved longwalls, including the large swamps S76, S77 and S92.
- 2.3 Further survey is required to determine if the indirect impact area contains breeding Large-eared Pied Bats to inform SAI assessment. Otherwise, breeding must be assumed or an Expert Report prepared.
- 2.4 The BOAMS Case / BAM Calculator Case for indirect impacts be provided for CPHR review.
- 4.1 Consider further avoidance of impacts to CUS and associated streams, in accordance with the BAM.
- 4.2 Identify subsidence thresholds and use these to adjust the mine layout so that impacts to significant biodiversity are avoided and a better balance between coal extraction and environmental protection is achieved
- 5.3 Clarify timeframes for noise and light spill impacts for construction and operation of the Ventilation Shaft.
- 6.1 Provide evidence supporting the statement “there will be minor reductions to habitat connectivity for threatened amphibians” in the BDAR.
- 7.1 Provide a revised mining layout that achieves further avoidance of impacts to CUS.
- 7.2 Refer the proposal to the Independent Expert Advisory Panel for Mining (IEAPM) to advise on adequacy of the impact assessment in relation to:
 - impacts to Swamp 92 due to the Ventilation Shaft 4
 - potential impacts on S106
 - cumulative impacts to CUS across the entire Metropolitan mine approval area.
- 7.3 Assess the cumulative impacts to swamps occurring above previously approved longwalls, particularly swamps S76 and S77, as prescribed impacts in the BDAR, in accordance with Section 8 of the BAM.
- 7.4 Update mapping of swamps to be offset (Figure 12 of the BDAR) to include all swamps that are likely to have a greater than negligible impact, including those swamps which occur above already approved longwalls.
- 8.1 Recalculate CUS offset liability in BAM Calculator in accordance with the BAM and the Upland Swamps Offsets Policy; that is, assuming full loss of the ecological community.
- 10.1 Consider further avoidance of impacts to threatened amphibian habitat in an amended mining layout.

- 10.2 Refer the proposal to the Independent Expert Advisory Panel for Mining (IEAPM) to advise on adequacy of the impact assessment in relation to:
- potential impacts on S106 and Honeysuckle Creek
 - cumulative impacts to threatened amphibians across Metropolitan mine approval area
 - the seepage model and water losses estimated for the Modification application.
- 10.3 Refer to the work of Klop-Toker (2025) regarding impacts of iron flocculant on threatened amphibians.
- 11.2 Review swamp monitoring locations to ensure piezometers have been installed in appropriate locations to monitor impacts to swamps.
- 12.1 Provide further assessment of Serious and Irreversible Impacts, as follows:
- Undertake further survey to rule out the presence of breeding individuals of Large-eared Pied Bat, assume presence or obtain an expert report, in accordance with Section 5.2.4 of the BAM.
- 13.1 Undertake surveys/assessment for additional threatened species mentioned in Issues 2 and 3 above (CUS, Giant Burrowing Frog, Giant Dragonfly, Littlejohn's treefrog, Prickly Bush-pea, Red-crowned Toadlet and Southern Myotis), and if required, update the BAM Calculator to determine any additional offsets that may be required (refer to attachment D).
- 17.1 Refer to recommendations in our previous letter dated 14/4/25 (Attachment D) regarding suggested locations for swamp groundwater monitoring.
- 17.5 Include a section on addressing limitations and uncertainties within the monitoring program. This should include, but not be limited to, adequacy of monitoring data, inconclusive outcomes and application of the precautionary principle in determining impacts.
- 17.7 Include all swamps to be impacted in TARP Performance Indicators, including S74, S75, S106, S117, S119, S130, as well as S76, S77, S91, S113, S114, S115, S139.
- 18.1 Provide information that determines the first workings/gate roads enabling a whole new mine area to the west is "substantially the same development" as that approved and does not warrant a separate new development application and associated assessment.
- 18.2 Clarify the legality of mining in an Exploration Lease in the absence of an approved development application.
- 19.1(a) The quantum of clearing for the Ventilation Shaft is substantial and further consideration to reducing the footprint through design changes has merit**.**
- 19.1(b) Should approval be granted, all swamps potentially subject to indirect impacts as a result of the construction of the Ventilation Shaft should be monitored and protected through mitigation measures. Details should be outlined in the Biodiversity Management Plan and relevant sections of the Extraction Plan**.**
- 19.2 If impacts are possible, and there is a risk that the Performance Measure could be exceeded for S92, relocate the Ventilation Shaft to avoid S92.
- 20.1 Identify subsidence thresholds for impact consequences and use these to adjust mine layouts so that impacts to significant biodiversity are avoided and a better balance between coal extraction and environmental impact is achieved.
- 20.2 Provide clarification on subsidence exceedances. Refer matter to the IEAPM if necessary.

****Denotes new recommendations at RTS stage.**

CPHR Review of the Response to Submissions

Acronyms

Acronym	Full Form
AMP	Adaptive Management Plan
BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method Calculator
BC Act	<i>Biodiversity Conservation Act 2016</i>
BDAR	Biodiversity Development Assessment Report
BOAMS	Biodiversity Offsets and Agreement Management System
CPHR	Conservation Programs, Heritage and Regulation Group
CUS	Coastal Upland Swamps
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DPHI	Department of Planning, Housing and Infrastructure
DPIE	Department of Planning, Industry and Environment
EEC	Endangered Ecological Community
EPBC	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
GIS	Geographic Information System
IBRA	Interim Biogeographic Regionalisation for Australia
IEAPM	Independent Expert Advisory Panel for Mining
LW	Longwall
MNES	Matters of National Environmental Significance
NSW	New South Wales
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water
OEH	Office of Environment and Heritage
PCT	Plant Community Type
RTS	Response to Submissions
SAII	Serious and Irreversible Impacts
SSD	State Significant Development
TARP	Trigger Action Response Plan
TEC	Threatened Ecological Community
VI	Vegetation Integrity

Mod 4 Metropolitan Coal Mine – Longwalls 317-318 – CPHR comments on Response to Submissions (RTS)

Red – inadequately addressed/partially addressed; further action required

Blue – adequately addressed; no further action required / no further comment

Issue no.	Reference		
CPHR Review – Modification Report			CPHR Review- RTS
Stage 1 – Biodiversity assessment			
1	BDAR Section 1.4 Excluded impacts	The BDAR states that no potential impacts resulting from the proposed modification have been excluded. We disagree with this statement. Further information is provided in Issues 19 (potential groundwater effects of Ventilation Shaft 4 on Coastal Upland Swamps) and 20 (subsidence impacts to swamps) below.	CPHR Recommendation 1.1 The following impacts should be assessed in the BDAR: - potential impacts to groundwater aquifer due to the Ventilation Shaft construction, particularly on S92 - cumulative impacts to Coastal Upland Swamps (CUS) and streams in areas which are above already approved longwalls, including the large swamps S76, S77 and S92. <i>CPHR comment:</i> A cone of groundwater depressurisation has potential to form around the Ventilation Shaft hole. It is noted that Water NSW and DCCEW Water also raised similar concerns in their feedback on the Modification Report. The RTS does not acknowledge the cumulative impacts to all CUS as a result of Metropolitan mine. CPHR quantified the cumulative impact to be upwards of 40 hectares. Also refer to Attachment C – Updated SAI assessment.
2	BDAR Section 2.5.3 Field Surveys	<i>Direct impact development footprint (the proposed ventilation shaft)</i> It is unclear why targeted surveys were not undertaken for Glossy Black Cockatoo and Gang-gang Cockatoo as there are many suitable breeding hollows within this area. Amphibian surveys did not meet the minimum survey effort and coverage requirements specified in the NSW Survey Guide for Threatened Frogs (DPIE 2020) or the Commonwealth Survey guidelines for Australia's threatened frogs (DEWHA 2010). <i>Indirect impact area</i>	CPHR Recommendation 2.1 Where surveys have not been carried out in accordance with Guidelines, and suitable habitat exists, assume presence or obtain an expert report in accordance with Section 5.2.4 of the BAM. <i>CPHR comment</i> Adequately addressed. No further action required. CPHR Recommendation 2.2 Undertake targeted surveys for Glossy Black Cockatoo and Gang-gang Cockatoo (breeding habitat) in the direct impact development

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		Surveys efforts for the indirect impacts area were not in accordance with survey guidelines and appear to be mainly done as baseline surveys for monitoring habitat in areas where mining is already approved. Section 2.5.3.2 of the BDAR describes the surveys undertaken within the indirect impact area, that is, the area which may be impacted by prescribed impacts only. It is noted that microbat survey was limited by equipment failure and did not meet minimum requirements (DPIE 2021). Survey effort for threatened flora within some of the swamps was minimal. This section also addresses the survey approach to Giant Dragonfly. Targeted survey was undertaken in S77 and S92. Other swamps do not appear to have been surveyed, although the BDAR states that “visual surveys have been conducted within swamps throughout the study area and surrounds”. It is unclear what this means. The GIS data provided does not indicate that adequate survey was carried out in swamps containing potential habitat for this species. Table 5.7 indicates the species is assumed present. This section states that some species were excluded on the basis of “vagrancy”. These species include Green and Golden Bell Frog and Stuttering Frog. In the BAM, a vagrant species refers to occasional records of species in NSW that are outside their normal distribution or habitat, including escaped animals and planted specimens. It also refers to species that are recorded outside their IBRA region.	footprint, assume presence or obtain an expert report in accordance with Section 5.2.4 of the BAM. <i>CPHR comment</i> Adequately addressed. No further action required. CPHR Recommendation 2.3 Further survey is required to determine if the indirect impact area contains breeding Large-eared Pied Bats to inform SAI assessment. Otherwise, breeding must be assumed or an Expert Report prepared. <i>CPHR comment</i> Further justification has been provided in the BDAR to discount breeding habitat. However, targeted surveys need to be completed to rule out the possibility of breeding individuals. Otherwise, assume presence of breeding individuals. CPHR Recommendation 2.4 The BOAMS Case / BAM Calculator Case for indirect impacts be provided for CPHR review. <i>CPHR comment</i> Inadequately addressed. Further action required. Partial loss has been applied to PCT 3924, with 29.3ha of swamps anticipated to have a low potential risk of greater than negligible impact. We disagree with this approach, as per our original submission. In summary, using a ‘partial loss’ approach does not recognise the unique ecological values swamps contain. It does not comply with the <i>Upland Swamps Offset Policy</i> which states that the offset liability should be assessed as potential maximum (ie. a worst case scenario), which we consider is full loss of all swamps which are predicted to have a risk of greater than negligible consequences. That is, conversion of swamp PCTs to non-swamp PCTs and therefore, full loss of the Coastal Upland Swamps TEC.

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			The BOAMS Case/BAM Calculator Case for indirect impacts has not been provided for CPHR review. The proponent's consultant, <i>Niche Environment and Heritage</i>, has advised they currently have the indirect impacts (prescribed) BOAMS case separate from the development footprint case and have not submitted this case previously as doing so would "lock in an offset liability for prescribed/indirect impacts which may or may not be warranted". The RTS states this is because there are several limitations associated with this case. For example, in dry sclerophyll vegetation zones, even where current condition values were maintained (ie., no observed loss), the calculator generated a credit yield, despite BAM-C indicating no loss in Vegetation Integrity. CPHR recommends that <u>no credit obligation be required</u> for these vegetation zones: 3814_High and 3923_High. Niche provided us with the BOAMS reports for this case, however, we still require submission of the BOAMS/BAM Calculator case for review before we can finalise our response. Providing the BOAMS case for indirect impacts will not lock in a credit requirement, as we can send the case back to the assessor, which will re-open it. Regardless, it is up to the Consent Authority whether credits/other conservation measures will be required for the indirect (prescribed) impacts (NSW <i>Biodiversity Conservation Regulation (BC Reg) 2017</i>, Section 6.1(2)). CPHR Recommendation 2.5 The Green and Golden Bell Frog and Stuttering Frog are not vagrants and are known to occur in the Sydney Cataract IBRA Region. The BDAR should be amended to state these species are excluded based on the Expert Report, not based on vagrancy. <i>CPHR comment</i> Adequately addressed. No further action required.

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3.	BDAR Section 5 Habitat suitability for threatened species. Table 5-3 Predicted candidate fauna species	Review of the BDAR tables found several inconsistencies within and between the tables. For example: - Table 5-2 states the Thick-leaf Star-hair <i>Astrotricha crassifolia</i> was excluded based on targeted survey in the development footprint. Table 5-6 says targeted survey was done in the direct impact footprint and it was not present. Table 5-8 says there were no surveys completed in the development footprint and has no survey timing information and no development footprint effort values either. The BAM-C says the survey was carried out in October. The data needs to be consistent for us to conclude sufficient or otherwise. This species was identified in the EPBC SEARs and is a SAIL entity. - Table 5-8 and 5-9 have similar errors with several species having no development footprint surveys carried out, however do have person hours allocated to development footprint surveys. See Brown Pomaderris, Slaty Leek Orchid, Glossy Black Cockatoo and Gang-gang Cockatoo. The BDAR states the Giant Burrowing Frog is excluded from the direct impact development footprint as no suitable aquatic habitats to support the species was identified during survey. The NSW Survey Guide for Threatened Frogs states that surveys should be completed along transects running through areas of native vegetation located within 300m of suitable breeding habitat. Suitable habitat exists within 300m of the development footprint within Swamp 92. The Expert Report indicates the species polygon should encompass the direct impact area. The BDAR states the Red-crowned Toadlet is excluded from the direct impact development footprint as no suitable aquatic habitats to support the species was identified during survey. The NSW Survey Guide for Threatened Frogs states that surveys must be completed within areas of potential habitat which includes ephemeral streams or pools located within areas of native vegetation on Triassic sandstones, and native vegetation within 100 metres of suitable	CPHR Recommendation 3.1 Review Tables in Section 5 of the BDAR, and the BAM Calculator to check information is accurate and consistent. <i>CPHR comment</i> Adequately addressed. No further action required. CPHR Recommendation 3.2 Targeted survey, assume presence or Expert Report required for the Giant Burrowing Frog and Red-crowned Toadlet in the development footprint area. Do not exclude species from further assessment and update BAM Calculator accordingly. <i>CPHR comment</i> Adequately addressed. No further action required.

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		breeding habitat. Suitable habitat exists within 100m of the development within Swamp 92 (tributary P). The Expert Report indicates the species polygon should encompass the direct impact area. Table 5-3 says these species were excluded from further assessment in the direct impact footprint. The BAM Calculator indicates that both these species were surveyed but not found in the direct impact footprint.	
Stage 2: Impact assessment			
4	BDAR Section 7 Avoid and minimise impacts	<i>Avoidance of direct impacts</i> The BDAR describes measures taken to avoid impacts including relocation of the ventilation shaft and reduction of the development footprint from 4.2 ha to 3.8 ha, after design refinements. However, the original site was located in disturbed, cleared land which means the new location results in a substantial increase to vegetation clearance of high condition vegetation, inside the Woronora Special Area. <i>Avoidance of prescribed impacts</i> The BDAR states that Longwall 317 has been shortened by 67m at the southern end which will assist in reducing impacts to S106. Wider pillars within the longwall are proposed to reduce the severity of subsidence impacts on swamps, streams, rocky habitats and associated biota. While there has been some avoidance of impacts demonstrated in the BDAR, the proposed development is still likely to result in impacts to important biodiversity within the indirect impact area. Predicted subsidence is likely to drain important swamps (which are an Endangered Ecological Community) and streams and further avoidance is required to adequately demonstrate the proposal meets BAM requirements. This is particularly important for CUS, where subsidence impacts can be irreversible; and streams, where	CPHR Recommendation 4.1 Consider further avoidance of impacts to CUS and associated streams, in accordance with the BAM. <i>CPHR comment</i> The RTS states that some longwalls have been shortened to reduce subsidence effects. For example, the southern ends of Longwalls 312 and 313 have been shortened by approximately 130m and 80m respectively, due to the application of an environmental buffer to Swamp 92. Metropolitan Coal has also ceased mining of Longwalls 303, 304, and 305 early as part of its adaptive management approach to protect the downstream rock bars of Eastern Tributary. This has resulted in reducing 300-series longwalls by a combined total of 1,620 m. The RTS also argues that if Metropolitan Coal took an approach of avoiding upland swamps, the extraction would be uneconomic. Compared to other coal mines, the mine has a conservative geometry. CPHR considers the biodiversity significance of the upland swamps and Honeysuckle Creek (not addressed in the response) which are likely to be impacted by the proposal warrants additional avoidance of impacts.

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		subsidence impacts are difficult to mitigate or repair and can be ongoing (eg. water quality changes caused by increased iron). CUS are also an SAI entity, and assessment of SAI is detailed further at Attachment C. The BAM states that impacts can be avoided by locating the proposal in areas: - lacking biodiversity values - where the native vegetation or threatened species habitat is in the poorest condition (i.e. areas that have a low vegetation integrity score) - that avoid habitat for species with a high biodiversity risk weighting or land mapped on the important habitat map, or native vegetation that is a TEC or a highly cleared PCT. - outside of the buffer area around breeding habitat features such as nest trees or caves. It is noted that panels under the Woronora Reservoir have reduced longwall dimensions (133m longwall widths and 70m wide pillar widths) to protect the dam from subsidence impacts. The BDAR should consider these options to avoid serious impacts to biodiversity (and water resources) in a sensitive water catchment area. Optimally this would include a longwall layout which avoids undermining threatened swamps and other significant features including streams that provide threatened species habitat.	CPHR Recommendation 4.2 Identify subsidence thresholds and use these to adjust the mine layout so that impacts to significant biodiversity are avoided and a better balance between coal extraction and environmental protection is achieved <i>CPHR comment</i> Refer to CPHR response under Recommendation 20.1. CPHR Recommendation 4.3 Assess options to adjust mine layouts to reduce environmental consequences including: - remove LW318 from the proposal altogether (or retain only the northern section) to protect Honeysuckle Creek, S106, and cumulative impacts from multiple longwalls in other swamps (eg. S119) - shorten LW 317 so that it does not go directly beneath S74 and reduce cumulative impacts in other swamps (eg S76) - narrowing the width of the longwall panels - further increasing the width of the longwall pillars lowering the height of extraction. <i>CPHR comment</i> Refer to CPHR response under Recommendation 20.1. The biodiversity significance of the CUS and Honeysuckle Creek (not addressed in the response) which may be affected by the proposal warrants additional avoidance of impacts.
5	BDAR Section 8 Impact Assessment	<i>Residual direct impacts</i> The proposal will result in direct impacts to 3.8 hectares of PCT 3590 Southern Sydney Scribbly Gum Woodland. Table 8-1 of the BDAR states that 13 hollow bearing trees will be removed from the development footprint. The BDAR does not address the avoidance of these hollow-bearing trees.	CPHR Recommendation 5.1 Glossy Black Cockatoo and Gang-gang Cockatoo should not be excluded from further assessment, as stated in Table 5.3 of the BDAR and the BAM Calculator, as suitable tree hollows are present within the direct impact footprint. <i>CPHR comment</i>

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		Candidate species which require tree hollows have been excluded from the direct impact development footprint as ‘no suitable nesting or breeding habitat to support the species was identified during survey’. These include Glossy-black Cockatoo and Gang-gang Cockatoo. <i>Residual indirect impacts</i> The proposal could potentially cause reduced viability of adjacent habitat due to noise and vibration. Drilling is likely to occur 24 hours a day for a period of 14 months. Microbats are particularly susceptible. The proposal also has the potential for reduced viability of adjacent habitat due to light spill. The BDAR indicates “temporary surface works are unlikely to involve extended periods outside daylight hours and are likely to be limited or negligible”, however if light spill is to occur for the same period as drilling, this is unlikely to be negligible.	<i>Adequately addressed. No further action required.</i> CPHR Recommendation 5.2 Determine if species polygons for these cockatoos are required. <i>CPHR comment</i> <i>Adequately addressed. No further action required.</i> CPHR Recommendation 5.3 5.3 Clarify timeframes for noise and light spill impacts for construction and operation of the Ventilation Shaft. <i>CPHR comment</i> <i>Partially addressed. The timeframes for noise and light spill at the Ventilation Shaft construction site have been clarified in the RTS Main Report and will occur 24 hours a day, up to seven days a week, for 18 months. This is a substantial length of time, and it may impact threatened species lifecycles in the normally very quiet remote bushland area.</i> <i>The information provided in Attachment 6 (Construction Noise Assessment) is focused on human amenity, not fauna ecology. The ecological assessment does not provide evidence-based impact assessment for known threatened species. Of particular concern are microbats, but other fauna within the nearby area may also be adversely impacted (eg. Powerful Owl).</i> <i>Should approval be granted, we recommend that the Construction Management Plan (CMP) or Biodiversity Management Plan (BMP) provide detailed mitigation measures, including consideration of the literature on ecological impacts of noise and light pollution. A</i>

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			monitoring program, including collection of baseline data, should be implemented. ¹
6	BDAR Section 8.3 Prescribed Impacts - Connectivity	This section states that hydrological alterations resulting from subsidence will lead to minor reductions to habitat connectivity for threatened amphibians. These impacts may be more severe than described in the BDAR. Changes to hydrological regimes are known to be particularly damaging to persistence of these species, and little is currently known about the extent and resilience of existing populations and how these move across the landscape.	CPHR Recommendation 6.1 Provide evidence supporting the statement “there will be minor reductions to habitat connectivity for threatened amphibians” in the BDAR. <i>CPHR comment</i> The BDAR response concludes that any reductions in habitat connectivity for threatened amphibians within the Indirect Impact Footprint would be minor and localised. This downplays the importance of streams for connectivity of amphibian habitat. It does not consider the impacts of drought (eg. drying of small tributaries), population biology (eg. the population size is already small and of limited genetic diversity) or species dispersal (not all streams have a population of the threatened frogs so impacts to one stream may have serious consequences for the local population). Giant Burrowing Frog spawn in the headwaters of creeks or swamps that have outflow into streams. The streams provide the pools for tadpoles to grow and metamorphose over a one-year period and must remain topped up with water throughout that year. The swamps provide base flow to streams, so that even small pools remain topped up. The streams facilitate dispersal of tadpoles downstream, as evidenced by CPHR over 2024-2025 where tadpoles that were 1 week old were found immediately below swamp¹⁴ in the headwaters of Honeysuckle creek, then subsequently found dispersing downstream for 300m. Any disturbance to these flow pathways will interrupt the metamorphosis of the tadpoles, as well as preventing downstream dispersal.

¹ Suggested references for light pollution: <https://www.neralaus.com/>; <https://australasiandarkskyalliance.org/>

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			Matter addressed further in Issue 4 (avoidance), Issue 10 (prescribed impacts), Attachment C (SAIL assessment), Attachment D (Review of species polygons and conservation measures).
7	BDAR Section 8.3 Table 8-4 Prescribed Impacts- Water bodies, water quality and hydrological processes	<i>Impacts to CUS</i> The total area of CUS within the indirect impact footprint is 68 hectares. The BDAR states there is a “moderate risk of fracturing upper Hawkesbury sandstone and associated water decline” which results in a “low risk of greater than negligible environmental consequences” for six swamps (S74, S75, S106, S117, S119, S130). The total area in this category is 29.3 ha. The BDAR states there will be a “negligible risk” for around 24 swamps which occur within the area. Seven swamps are described as having “negligible risk – no subsurface or hydrological impacts <u>associated with this Modification</u>”. <i>CPHR Comment:</i> While an increase in pillar width will have some effect in reducing total subsidence, the change is insufficient to prevent adverse impacts and consequences to CUS above and to the sides of the longwalls. Based on predicted subsidence, tensile and compressive stress, upsidence and closure, many swamps are still predicted to suffer adverse consequences (i.e. fracture and drainage), including all 4 large swamps S92, S76, S77 and S106. Swamp S106 is predicted to experience 750 mm of subsidence (MSEC 2025), a significant (15-fold) increase on the predicted subsidence in the revised LW311-316 EP (of 50mm). Tilt is now predicted to be 3.5 mm after LW317 & LW318 are extracted, although S106 will potentially experience much higher transitive tilts	Recommendation 7.1 Provide a revised mining layout that achieves further avoidance of impacts to CUS. <i>CPHR comment</i> Refer to CPHR comment in Recommendation 4.1 and Recommendation 20.1. Recommendation 7.2 Refer the proposal to the Independent Expert Advisory Panel for Mining (IEAPM) to advise on adequacy of the impact assessment in relation to: - <i>impacts to Swamp 92 due to the Ventilation Shaft 4</i> - <i>potential impacts on S106</i> - <i>cumulative impacts to CUS across the entire Metropolitan mine approval area.</i> <i>CPHR comment:</i> Matter for the Consent Authority Recommendation 7.3 Assess the cumulative impacts to swamps occurring above previously approved longwalls, particularly swamps S76 and S77, as prescribed impacts in the BDAR, in accordance with Section 8 of the BAM. <i>CPHR comment</i>

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		and tensile and compressive strains as the mining progresses. Upsidence predictions for S106 after the proposed LW317 & LW318 is 50mm. Closure predictions for S106 after the proposed LW317 & LW318 is 20 mm. These upsidence and closure levels appear unrealistically low given the upsidence and closure estimates for other directly undermined swamps and the incision of the drainage line in S106. It is noted that MSEC (2025) did not provide any subsidence estimates for the Honeysuckle Creek tributary that contains/drains from S106. It therefore appears that potential upsidence and closure levels for Swamp S106 have been significantly underestimated. Swamps S76 & S77 are likely to be impacted by both the approved LW311-316 Extraction Plan (EP) and cumulative subsidence effects from the proposed LW317-318 EP (if approved). There remains a potential for S92 to also be impacted (fractured and drained), particularly at its downstream end². If this occurs, water is likely to eventually drain downwards into the fracture network leading to desiccation in Swamp S92. Based on predicted subsidence, tensile and compressive stress, upsidence and closure, swamps likely to suffer adverse consequences include: S74, S75, S76, S77, S91, S92, S106, S113, S114, S115, S119, S130 & S139. Swamps S74, S75, S117, S118, S119, are particularly at risk and were identified as likely impacted swamps by ATC Williams (2025) based on subsidence predictions. The following swamps also have sufficiently high subsidence, tilt and stresses to result in adverse consequences: S116, S117, S118, S121, S128.	The RTS states that the subsidence predictions provided by MSEC (2025) include incremental and cumulative effects (i.e. including previously mined longwalls). However, the RTS does not acknowledge the cumulative impacts to all CUS as a result of Metropolitan mine. CPHR quantified the cumulative impact to be upwards of 40 hectares. Further avoidance of CUS is recommended. Also refer to Recommendation 20.1 and Attachment C – Updated SAIL assessment. Recommendation 7.4 Update mapping of swamps to be offset (Figure 12 of the BDAR) to include all swamps that are likely to have a greater than negligible impact, including those swamps which occur above already approved longwalls. <i>CPHR comment</i> CPHR considers that some swamps above longwalls that are mentioned in our previous submission, and shown on Figure 4-1 of the RTS, should be included on Figure 12 of the BDAR which shows swamps that need to be offset. Further advice from IEAPM is warranted to determine if subsidence impacts to additional swamps will result in a greater than negligible impact and thus should be included in offsetting. CPHR remains concerned about the large number of swamps above longwalls which have not been monitored to assess whether they have been impacted by mining. There has also been no verification of swamp subsidence predictions for a significant number of swamps above the already extracted longwalls.

² And the upstream end if the Ventilation Shaft relocations affects its aquifers.

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		Given S120, S127, and S129 lie directly above either the edges or corners (where stresses are likely to be high) of longwalls 317 & 318, they too are at risk of adverse consequences. If the Modification is approved, Metropolitan Mine operations could potentially see cumulative impacts on CUS up to 40-45 Ha. This number excludes the areas of Flatrock Swamp, to the south of the current mine operation, S92 and S106.	
8	BDAR Section 8.3.4.2 BDAR Table 8-5	This section proposes the application of “partial loss” for Vegetation Integrity scores in the BAM-C to address the requirements of the Upland Swamps Offset Policy. <i>Partial loss</i> Partial loss is described in the BAM, including section 8.1.1 which states that the future value of attributes may be amended to reflect the impacts from partially clearing a vegetation zone, including areas such as asset protection zones and easements. The BAM also states that if it is likely that vegetation will continue to degrade, full loss should be assumed. <i>Upland Swamps Offset Policy</i> The Upland Swamps Offset Policy states that when predicting the offset liability, it is the loss of the upland swamp ecological community, including the threatened species that rely on that community, which must be calculated to determine the offset liability. The loss of swamps is likely to lead to loss of several threatened species populations. The Policy states that “<i>Upland swamps are features of high environmental value that are at high risk of impact from mining related subsidence which, once expressed, are permanent and irreversible.</i>”	Recommendation 8.1 Recalculate CUS offset liability in BAM Calculator in accordance with the BAM and the Upland Swamps Offsets Policy; that is, assuming full loss of the ecological community. <i>CPHR comment</i> We disagree with the response provided in the RTS for the reasons specified in our previous response. Recommendation 8.2 Review and discuss the relatively low VI score for PCT 3924 in the BDAR. <i>CPHR comment</i> Adequately addressed. No further action required.

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		The Policy states that the offset liability should be assessed as a potential maximum (i.e. worst case scenario). This is consistent with the precautionary principle. We consider the worst-case scenario is full loss of all swamps which are predicted to have a risk of greater than negligible consequences. That is, full conversion of swamp PCTs to non-swamp PCTs and therefore, full loss of the CUS TEC. The BDAR states that vegetation within swamps may be impacted to the point that it could transition to a different vegetation type, however, then suggests that partial loss is an appropriate method for addressing the maximum predicted offset liability. This approach does not recognise the unique ecological values the swamps contain, nor the permanent and irreversible damage that can occur as a result of longwall mining. As such, we do not agree with the proposed method of calculating partial loss to determine offsets. The overall Vegetation Integrity (VI) score for PCT 3924 is 58.2. This seems low given the swamp vegetation is in high condition. This may have implications for accurate credit calculations. We have not been supplied with the BAM-C case for indirect impacts, so have been unable review this data further.	
9	BDAR – Prescribed impacts BDAR Section 8.3.1 Karst, caves, crevices, cliffs, rocks, or other geological features	The BDAR provides minimal information on impacts to caves, crevices, cliffs and rocks, all of which occur throughout the indirect impact area. Only Cliff <i>COH19</i> was considered in the prescribed impacts assessment. Rocky areas throughout the subject area provide important habitat for candidate species including the SAIL listed species: Broad-headed Snake, Large Bent-wing Bat, Large-eared Pied Bat.	Recommendation 9.1 Provide more detail on rocky areas and relevant threatened species which use this habitat within the indirect impact area. <i>CPHR comment</i> Adequately addressed. No further action required. Recommendation 9.2 Include an assessment of “likelihood and consequences” for the Large Bent-wing Bat in the indirect impact area in Table 8.8 of the BDAR.

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			<i>CPHR comment:</i> Adequately addressed. No further action required.
10	BDAR - Prescribed impacts BDAR Section 8.3.4.3 Potential impacts to waterbodies Table 8-8 Summary of prescribed impacts	The BDAR states that tributaries R, S, U and Honeysuckle Creek are predicted to experience valley closure and upsidence, particularly where they intersect the proposed LW 317-318 and loss of water and impacts to water quality are anticipated. ATC Williams (2025) states “these effects may result in reduced surface water quality and availability, dewatering of pools, and alterations to local hydrology, with potential downstream ecological consequences.” Smaller tributaries are also susceptible. <i>CPHR comment:</i> <i>Threatened amphibians</i> Giant Burrowing Frog, Littlejohn’s Treefrog and Red-crowned Toadlet have all been recorded within the indirect impact area. Indirect impacts to threatened amphibian habitat are expected through changes to water quality, and hydrology, including loss of water for breeding habitat. Honeysuckle Creek is a 3rd order stream under the Strahler system which joins Woronora Reservoir approximately 1km north of the proposed LW317 & 318. The uppermost reaches of Honeysuckle Creek are contained within Swamp 14. Swamp S106 is in the headwaters of a 1st order tributary of Honeysuckle Creek which, together with Swamp S14, is likely to be the major contributing sources of baseflow to Honeysuckle Creek. Honeysuckle Creek is extremely important for threatened frogs, especially Littlejohn’s Tree Frog, Giant Burrowing Frog and Red-crowned Toadlets which have been recorded in or near the creek. The Giant Burrowing Frog sub-population in the Woronora catchment is significant as the area wasn’t burnt in 2019-2020, while most other known localities in the Sydney Basin were. The sub-population in Woronora is of a large size and currently part of a long-term study being done by DCCEEW and the University of	Recommendation 10.1 Consider further avoidance of impacts to threatened amphibian habitat in an amended mining layout. <i>CPHR comment</i> The matter of mining layout has been addressed previously in Recommendation 4.1. Recommendation 10.2 Refer the proposal to the Independent Expert Advisory Panel for Mining (IEAPM) to advise on adequacy of the impact assessment in relation to: • potential impacts on S106 and Honeysuckle Creek • cumulative impacts to threatened amphibians across Metropolitan mine approval area • the seepage model and water losses estimated for the Modification application. <i>CPHR comment</i> Matter for Consent Authority. Recommendation 10.3 Refer to the work of Klop-Toker (2025) regarding impacts of iron flocculant on threatened amphibians. <i>CPHR comment</i> Partially addressed. The revised BDAR has referred to the work of Klop-Toker et al (2025) and other literature.

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		Wollongong using genetics from frogs found in Honeysuckle and Bee Creeks. Despite having similar median flows to the upper Woronora River, Honeysuckle Creek often provides more water to Woronora Reservoir than the upper Woronora River does. Under the approved layout, Honeysuckle Creek would not have been impacted with subsidence, upsidence and valley closure levels <20mm. Under the proposed LW317 & 318 layout, subsidence in Honeysuckle Creek will increase to 225mm; upsidence in Honeysuckle Creek will increase to 150mm; and closure in Honeysuckle Creek will increase to 350mm. At these very high levels of upsidence and valley closure it is likely that large areas of Honeysuckle Creek will be fractured and drained. It is noted that MSEC (2025) did not provide any subsidence estimates for the Honeysuckle Creek tributary that contains/drains from S106 If the ATC Williams' (2025) reduction in net baseflow contribution figure of 21 ML/year (~0.06 ML/d) is considered, then this represents 8% of the median flow in Honeysuckle Creek. If Cairns et al (2024) figure of 61/ML/year (~0.167 ML/d) is considered a more appropriate estimate of loss, then this would equate to ~24% of the median flow in Honeysuckle Creek. The potential loss of up to a quarter of the median flow in such an important stream as Honeysuckle Creek is likely to lead to a much greater frequency of zero flow days. This will have serious ramifications for the ecology of the creek, especially threatened frogs. It will also likely represent a significant loss of water for Woronora Reservoir. The potential impacts of changes in water quality are mentioned in the BDAR but are understated. The work of Klop-Toker et al. (2025) on impacts of iron flocculant on threatened amphibians is not discussed.	However, we disagree with the statement that no iron flocculation has been detected in the study area. We have observed iron staining at Swamp 21, Waratah Rivulet and Eastern Tributary on multiple occasions.  Photo: Iron-staining on Eastern Tributary, May 2018

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		<i>Giant Dragonfly</i> Giant dragonfly has been recorded in S92 and S77. The BDAR concludes that impacts are likely to be minor and will be addressed through compensatory measures. Given the lack of survey for the dragonfly within swamps in the Modification area, and the potential for swamp drainage (as described above in Issue 7), we disagree with this conclusion. Furthermore, hydrological impacts to the Giant Dragonfly's breeding habitat are irreversible which means compensatory measures will not reduce the loss of local populations, or the risk of extinction for this species. Further detail is provided in Attachment C – SAI Assessment.	 Photo: Iron-staining on Waratah Rivulet, August 2024  Photo: Iron-staining at Swamp 21, August 2024.

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			 Photo: Iron-staining Eastern Tributary, September 2025 In 2016, iron staining in Eastern Tributary extended all the way to stored water and was notified as an exceedance of the iron staining performance measure. CPHR are particularly concerned about potential iron-stain impacts to Honeysuckle Creek which contains significant habitat for Littlejohn's Treefrog and Giant Burrowing Frog.
11	BDAR Table 8-10 Terrestrial biodiversity monitoring and adaptive responses	This table refers to preparation of a Swamp monitoring program and lists swamps S74, S75, S106, S117 and S119. The adaptive management response for the swamp monitoring program states that “proven and effective corrective actions will be implemented in accordance with the trigger response levels outlined in the TARPs”. <i>CPHR comment:</i> There is no evidence that CUS can be remediated once impacted through longwall coal mining. Remediation is not a viable management response in the proposed Swamp monitoring program.	Recommendation 11.1 Existing monitoring required for S76, 77 and S92 as part of the LW 312-316 Extraction Plan approval should be integrated with proposed swamp monitoring for this Modification to assess cumulative impacts to CUS. <i>CPHR Comment</i> Response adequate. Recommendation 11.2 Review swamp monitoring locations to ensure piezometers have been installed in appropriate locations to monitor impacts to swamps.

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		We provided advice to DPHI on swamp monitoring locations for this Modification in our letter dated 14/4/2025, our reference DOC25/297371 (Attachment D). We are unaware of any actions taken to address the concerns in this letter which relate to inappropriate locations where swamp monitoring stations have been set up to monitor the swamps. Piezometer 106b is not actually within Swamp S106 and 106c is on the very edge of the swamp. As stated in our letter, inappropriate site locations for monitoring swamp impacts will result in very poor assessment of hydrological impacts of mining. S130 is missing from this list, despite being one of the swamps at risk of greater than negligible consequences.	<i>CPHR Comment</i> Partially addressed. The RTS refers to one swamp piezometer only (S106B). Our recommendation was that all swamp monitoring locations be reviewed. This is required to ensure all swamp monitoring data is being collected from swamps.
12	BDAR Section 9 Appendix L Serious and Irreversible Impacts	The BDAR assessed one Threatened Ecological Community (CUS), nine threatened flora and three threatened fauna for Serious and Irreversible Impacts (SAIL). The Large Bent-wing Bat was not assessed, despite being a listed SAIL entity which has been recorded in the Modification area. CPHR assessment indicates: • A SAIL is likely for CUS and Giant Dragonfly. • A SAIL is uncertain for the Large Bent-wing Bat and the Large-eared Pied Bat. Further assessment is required. • A SAIL is uncertain for the Eastern Underground Orchid due to lack of information on the species. • A SAIL is unlikely for the Slaty Leek Orchid, however if it is recorded in baseline surveys, monitoring should be established which specifically assesses impacts to hydrology on this species. • A SAIL is unlikely for all other assessed flora species including <i>Genoplesium baueri</i>, <i>Melaleuca deanei</i>, <i>Gyrostemon thesioides</i>, <i>Persoonia hirsuta</i>, <i>Rhodamnia rubescens</i>, <i>Pomaderris adnata</i> and <i>Astrotricha crassifolia</i>.	Recommendation 12.1 Provide further assessment of Serious and Irreversible Impacts, as follows: • Undertake further survey to rule out the presence of breeding individuals of Large-eared Pied Bat, assume presence or obtain an expert report, in accordance with Section 5.2.4 of the BAM. • Revise the BDAR to include a SAIL assessment of the Large Bent-wing Bat, as required by Section 9 of the BAM. • Provide further information to assess the Littlejohn's Treefrog against SAIL Principle 3 (limited distribution) and SAIL Principle 4 (species unlikely to respond to measures to improve its habitat and therefore its members are not replaceable). <i>CPHR comment</i> Partially addressed. Large Bent-wing Bat adequately assessed. Further surveys required to rule out presence of breeding Large-eared Pied Bat, otherwise assume presence and a SAIL is likely. SAIL assessment for Littlejohn's Treefrog adequate. A SAIL is likely for Littlejohn's Treefrog breeding habitat.

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		As per section 7.16(4) of the BC Act, additional and appropriate measures for entities where SAI is likely can be provided at the RTS stage. We can provide further advice on this matter once the additional SAI assessment matters requested below have been provided.	Refer to CPHR comments in Attachment C - SAI assessment. Recommendation 12.2 The Adaptive Management Plan / Biodiversity Management Plan should include a monitoring program for Slaty Leek Orchid, should it be found within the development footprint. <i>CPHR comment</i> Response adequate.
13	BDAR Section 10 Impact Summary	The BDAR states that 79 ecosystem credits will be required for direct impacts to PCT 3590 – Southern Sydney Scribbly Gum Woodland. The Eastern Pygmy Possum generated 105 credits, the Powerful Owl, 105 credits and the Giant Dragonfly, 158 credits for direct impacts. Table 10.1.3 of the BDAR provides a range of options for “additional conservation measures” for indirect and prescribed impacts. These are suggested for CUS, Giant Burrowing Frog, Giant Dragonfly, Littlejohn’s treefrog, Prickly Bush-pea, Red-crowned Toadlet and Southern Myotis. We are reviewing these options with internal experts and will provide further information in supplementary advice.	Recommendation 13.1 Undertake surveys/assessment for additional threatened species mentioned in Issues 2 and 3 above, and if required, update the BAM Calculator to determine any additional offsets that may be required. <i>CPHR comment</i> Refer to Tables 1 and 2 in Attachment D. The BOAMS case for indirect impacts should be submitted to CPHR for review.
14	BDAR Section 11 Biodiversity credit report	We have only reviewed the BOAMS and BAM-C case for direct impacts. We have requested the BOAMS/BAM-C case be submitted for review and will provide any comments in supplementary advice.	<i>CPHR comment</i> Please submit the BOAMS case for indirect impacts.
15	BDAR - species polygons	Some species polygons may change as a result of further assessment. We are reviewing species polygons and will provide	<i>CPHR comment</i> Refer to Attachment D for further information.

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		further information in supplementary advice and at the Response to Submissions stage.	
16	BAM Calculator	We have only reviewed the BOAMS and BAM Calculator case for direct impacts. We have requested the BOAMS/BAM-C case for indirect impacts be submitted for review and will provide any comments in supplementary advice. <i>BAM Calculator for direct impacts:</i> • Tab 5, Habitat suitability: Candidate. Gang-gang Cockatoo. It is not clear why the habitat constraints “hollow bearing trees and Eucalypt tree species with hollows at least 3m above the ground and with a hollow diameter of 7cm or larger” were not checked when these occur on site. The Gang-gang cockatoo (Breeding) should be a “confirmed candidate species” in this tab. Clarify if species was surveyed, as per CPHR comments in Issues 2 and 3 above. • Tab 5, Habitat suitability: Candidate. Glossy Black Cockatoo. It is not clear why the habitat constraints “hollow bearing trees and Living or dead tree with hollows greater than 15cm diameter and higher than 8m above ground” were not checked when these occur on site. The Glossy Black Cockatoo (Breeding) should be a “confirmed candidate species” in this tab. Clarify if species was surveyed, as per CPHR comments in Issues 2 and 3 above.	Recommendation 16.1 Review BAM Calculator case and confirm Gang-gang Cockatoo and Glossy Black Cockatoo as confirmed candidate species, and document in an updated BDAR/BAM-C case. <i>CPHR comment</i> Response adequate Recommendation 16.2 Submit the BOAMS/BAM Calculator case for indirect impacts to CPHR. <i>CPHR comment</i> Please submit the BOAMS case for indirect impacts.
17	BDAR Appendix N Adaptive Management Plan	Section 8.5 of the BAM states that an Adaptive Management Plan (AMP) can be used to address impacts that are infrequent or difficult to measure and must be developed to address any remaining impacts where mitigation measures have not been proposed in the Biodiversity Development Assessment Report (BDAR). The BAM also states that the AMP must be in line with the Upland Swamps Offsets Policy.	Recommendation 17.1 Refer to recommendations in our previous letter dated 14/4/25 (Attachment D) regarding suggested locations for swamp groundwater monitoring. <i>CPHR comment</i> The response refers to one swamp piezometer only (S106B). Our recommendation was that all swamp monitoring locations be

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		The AMP provided in the BDAR requires revision, with many aspects unsatisfactorily addressed, or requiring further development. At this stage our key issues are: - The AMP includes details on groundwater monitoring locations. It is noted from previous inspections by CPHR that piezometer 106b is not actually within Swamp S106 and 106c is on the very edge of the swamp. - The AMP states that the swamps at risk of greater than negligible environmental consequences are not swamps that support known occurrences of the giant dragonfly, however no surveys have been undertaken in these swamps. Furthermore, additional incremental increases to subsidence in swamp 77 which contains records of the giant dragonfly is expected. - Table 1, Summary of prescribed impacts, does not describe the potential for water quality impacts to Littlejohn's Treefrog and Giant Burrowing Frog. There is evidence that Littlejohn's Treefrog is impacted by water quality changes resulting from subsidence (Klop-Toker et al 2025) and impacts to Giant Burrowing Frog are unknown. The Independent Expert Advisory Panel for Mining (IEAPM) recommended that iron flocculent deposition in suitable breeding pools be monitored and incorporated into the triggers for the Large Swamp Amphibian Monitoring TARP.³ - Section 4.5 states that water level monitoring will be conducted at pools located along Waratah Rivulet, Eastern Tributary, Woronora Reservoir and Woronora River, but not Honeysuckle Creek which is the most significant creek in proximity to the Modification subject area. - Additional impacts to swamps above approved longwalls 311-316 are expected to occur as a result of this Modification and should be included in Performance	reviewed. This is required to ensure all swamp monitoring data is being collected from swamps. CPHR also notes that many swamps remain unmonitored which means that mining impacts cannot be assessed. Recommendation 17.2 Clarify that surveys for the Giant Dragonfly have not been undertaken in swamps within the Modification Area and assume presence. Should approval be granted, ensure baseline surveys for Giant Dragonfly are undertaken a minimum of two years prior to mining. <i>CPHR Comment</i> Response adequate Recommendation 17.3 Incorporate evidence from previous research at Dendrobium mine on water quality impacts to threatened amphibians. <i>CPHR comment</i> Refer to our response in Recommendation 10.3 Recommendation 17.4 Incorporate advice from the (IEAPM) on amphibian monitoring and TARPS and update TARPS to reflect this advice. <i>CPHR comment</i> Response adequate Recommendation 17.5

³ <https://www.planning.nsw.gov.au/sites/default/files/2025-06/ieapm-metropolitan-coal-mine-20250331.pdf>

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		Indicators to ensure the cumulative impacts of mining are assessed. - The Giant Dragonfly TARP refers to a “relative abundance” parameter. It is not clear that relative abundance is required. - The Giant Dragonfly TARP states that Swamp 92 is outside the Modification area and not subject to potential impact assessment under this Adaptive Management Plan. Further information on the potential for groundwater impacts at S92 as a result of the Ventilation Shaft construction is required before this can be confirmed. - The AMP includes “Swamp Remediation Measures”. There is no evidence that swamp remediation is effective⁴ and is therefore an unsuitable mitigation measure to prevent greater than negligible environmental consequences. The only way of ensuring the integrity and ecosystem processes of CUS is by avoidance of subsidence related impacts in the first place. - Section 9 of the AMP states the AMP will be subject to ongoing reviews and revisions incorporating emerging knowledge, technology and management techniques to inform mitigation, contingency and the TARP process. This section should also include updates to the AMP as a result of statutory changes such as threatened species listing status.	Include a section on addressing limitations and uncertainties within the monitoring program. This should include, but not be limited to, adequacy of monitoring data, inconclusive outcomes and application of the precautionary principle in determining impacts. <i>CPHR comment</i> Partially addressed. The AMP has included a section on limitations, however, this has little detail and does not discuss inconclusive outcomes and application of the precautionary principle. Recommendation 17.6 Clarify if water level monitoring is to be undertaken at Honeysuckle creek, and if not, provide justification. <i>CPHR Comment</i> Response adequate. Ten sites in Honeysuckle Creek will be considered in a water monitoring program which will be finalised at Extraction Plan stage. Recommendation 17.7 Include all swamps to be impacted in TARP Performance Indicators, including S74, S75, S106, S117, S119, S130, as well as S76, S77, S91, S113, S114, S115, S139. <i>CPHR comment</i> Refer to CPHR comments on swamps which may be impacted under Recommendation 7.4 and Issue 20. Recommendation 17.8

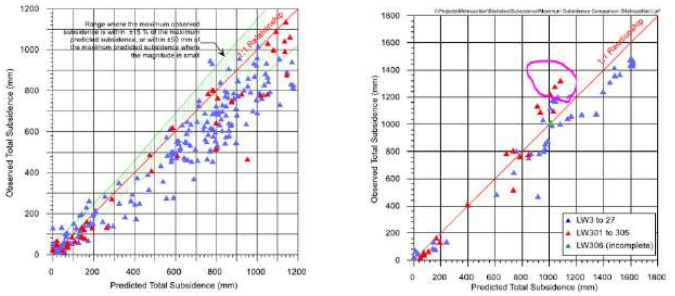
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			Clarify if the Giant Dragonfly measurement parameter of “relative abundance” is necessary, or whether “abundance” is more appropriate, and update if required. <i>CPHR comment</i> Response adequate Recommendation 17.9 Undertake further assessment to determine if the Ventilation Shaft construction will impact S92. <i>CPHR comment</i> Matter dealt with under Issue 1 and 19. Recommendation 17.10 Should approval be granted, the Consent Authority clarify through conditions of consent that changes to listing status of threatened entities is to be considered when assessing Performance Measures and offsetting. <i>CPHR comment</i> Matter for Consent Authority
CPHR Review – additional matters			
18	Modification Report Figure ES-2	The Modification includes first workings for a new mine to the west of the current mine lease without any environmental assessment. It also identifies that the northern end of the proposed longwall (LW) 318 extends beyond the Metropolitan mine approved extraction area and into an Exploration Lease area. The proposed modification must be “substantially the same development” as that approved as required under s4.55 of the EP&A Act. This includes both “quantitative” changes, as in increases or	Recommendation 18.1 Provide information that determines the first workings/gate roads enabling a whole new mine area to the west is “substantially the same development” as that approved and does not warrant a separate new approval and associated assessments. <i>CPHR Comment</i>

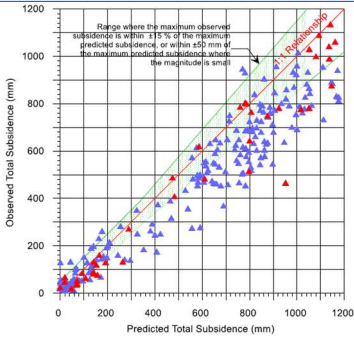
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		decreases to the overall extraction footprint and ROM coal to be extracted, as well as “qualitative” changes relating to the nature of the proposed use (Moto Projects (No 2) Pty Ltd V North Sydney Council [1999] NSWLEC 280). The proposed new longwalls 317 and 318 are generally consistent with the approved mine development in terms of both their location and contiguous extension of the existing mining domain. However, the new first workings/headers proposed by the Modification appear to relate to and facilitate an entirely new mine area development, in an area covered only by Exploration Lease (rather than a mining lease) west of the existing mining domains. It is also noted that Peabody’s letter of 12 October 2023 requesting the Modification states, “<i>The Modification would seek approval for the continued development of the 300-series mains to the west to allow for access to future coal resources subject to separate mine planning, environmental assessment and approval processes</i>”. In the Planning agency reply of 14 November 2023, there was no mention of accessing a whole new mine area being part of the Modification despite identifying three other aspects of the Modification. There was also no response to our further enquiry on seeking to understand this matter in April 2024. Enabling this Modification to access to a large new future coal resource in an area administratively separate to the current approval requires greater transparency as to how it is “substantially the same development”. The proposed first workings for accessing a whole new mine area are considered unrelated to the approved development.	The RTS argument that “the proposed first workings are a continuation of the approved underground mining operation, not the establishment of a new or distinct mining project” is highly questionable. The first workings, according to Peabody’s letter to DPE (dated 12/10/23), is “to allow for access to future coal resources”. CPHR remains concerned that the true intent is for long-term mining that goes beyond a reasonable extension of the current approved mine and that will, over time, extend across a very large area to the west. Enabling access to a whole new mine area is really “substantially the same” only in an operational sense (using the longwall method and existing pit top) when the future mining of a large new area should be assessed separately and under contemporary frameworks and not rely on extending an old consent. CPHR has major concerns in using the approach that utilises the old consent to continue to deliver irreversible impacts, problematic enforcement and unsuccessful remediation given the significant biodiversity features to the west such as Honeysuckle Creek and the large swamps 106 and Bee Creek. Recommendation 18.2 Clarify the legality of mining in an Exploration Lease in the absence of an approved development application. <i>CPHR Comment:</i> Matter for Consent Authority.
19	Modification Report Section 3.4	The 2009 Metropolitan Coal Project Approval (08_0149) included a provision for Ventilation Shaft 4. This was to be located in largely cleared/disturbed land adjacent to the Old Princes Highway. A major component of the Modification is to relocate the approved (but not yet constructed) Ventilation Shaft 4 inside the Woronora Special Areas in close proximity to Swamps S92 and S93.	Recommendation 19.1 Update the Groundwater Report and the BDAR to address potential groundwater aquifer effects of the Ventilation Shaft 4 on CUS S92, S93 and S102. <i>CPHR comment:</i> Matter addressed in Recommendation 1.1

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		This represents a major increase in vegetation impacts compared to the mine plan approved in 2009. The relocated Ventilation Shaft 4 footprint will now be subject to direct impacts (e.g. vegetation clearance) of 3.8 ha of largely pristine native vegetation inside the Woronora Special Areas. The BDAR states that the Development Footprint for Ventilation Shaft 4 had been “<i>reduced</i>” from the original area of 4.2 ha to 3.8 ha (a reduction of 0.4 ha, or approximately 9.5%), however this is misleading as the relocation of Ventilation Shaft 4 is from largely cleared/disturbed land adjacent to the Old Princes Highway to areas which are largely native bushland inside the Woronora Special Areas. The BDAR does not identify that the boundary of the ventilation shaft area is ~35m from Coastal Upland Swamp S92; ~25m from Coastal Upland Swamp S93; and ~100m from Coastal Upland Swamp S102. As identified earlier, S92 is a particularly significant and important swamp which has a performance measure of <i>negligible environmental consequence</i>. There is no assessment or discussion of potential groundwater impacts in relation to the ventilation shaft in the BDAR (Niche 2025) or the Groundwater Report. Mine shafts have the potential to impact aquifers and/or induce cones of groundwater depressions around them, with water from the surrounding aquifers moving down into the shaft voids.	New Recommendation 19.1(a) The quantum of clearing for the Ventilation Shaft is substantial and further consideration to reducing the footprint through design changes has merit. New Recommendation 19.1(b) Should approval be granted, all swamps potentially subject to indirect impacts as a result of the construction of the Ventilation Shaft should be monitored and protected through mitigation measures. Details should be outlined in the Biodiversity Management Plan and relevant sections of the Extraction Plan. Recommendation 19.2 If impacts are possible, and there is a risk that the Performance Measure could be exceeded for S92, relocate the Ventilation Shaft to avoid S92. <i>CPHR comment:</i> A cone of groundwater depressurisation has potential to form around the Ventilation shaft hole. It is noted that Water NSW and DCCEEW Water also raised similar concerns in their feedback on the Modification Report. Matter addressed in Recommendation 1.1
20	Modification Report Subsidence Report (MSEC 2025)	Detailed review of CPHR’s subsidence assessment can be provided at request of DPHI. The following is a summary of our assessment, focusing on likely environmental consequences to swamps. Subsidence impacts to swamps and quantification of impacts <u>Swamp 76</u>	Recommendation 20.1 Identify subsidence thresholds for impact consequences and use these to adjust mine layouts so that impacts to significant biodiversity are avoided and a better balance between coal extraction and environmental impact is achieved. <i>CPHR comment:</i>

Issue no.	Reference		
CPHR Review – Modification Report			CPHR Review- RTS
	Subsidence assessment	Swamp S76 will see an increase in subsidence due to the cumulative effect of LW317 & 318 over and above that approved for the revised LW311-316 EP. At the very high levels of subsidence, upsidence and closure predicted for S76, it is highly likely that the bedrock under S76 will be fractured, and the swamp drained. There are also 3 lineaments mapped as passing through or near S76 which could exacerbate subsidence impact consequences. <u>Swamp 77</u> At the very high levels of subsidence, tilt, upsidence and closure predicted for S77, it is highly likely that the bedrock under S77 will be fractured and the swamp drained. There are also 2 lineaments mapped as passing through the middle of S77 which could also exacerbate subsidence impact consequences. <u>Swamp 92</u> S92 is a particularly significant and important swamp which has a performance measure of <i>negligible environmental consequence</i>. As a result of changes to the proposed mine layout in the revised LW311-316 EP, which removed longwalls from mining directly beneath S92, the environmental outcome for S92 is highly uncertain. Swamp S92 will still experience significantly high tilts, stresses, upsidence and closure. It is therefore possible that the bedrock under the northern end of S92 will be fractured and the swamp drained. There is a lineament mapped as passing directly through/underneath the middle of S92 which could also exacerbate subsidence impact consequences. Swamp S92 is also at risk from groundwater depressurisation as a result of the proposed Ventilation Shaft 4. <u>Swamp 106</u> The environmental outcome for S106 is highly uncertain. S106 is expected to experience relatively high subsidence, tilts, stresses, upsidence and closure. It is possible that the bedrock under S106 will be fractured and the swamp drained. There are also 2 lineaments mapped as passing through the middle of S106	The RTS disagrees with CPHR review of subsidence predictions. CPHR considers that Metropolitan Coal understated the predicted level of subsidence above the longwalls compared to what has occurred. Limited or no impacts to CUS was predicted in the original Environmental Assessment: <i>“Any cracking of the bedrock at the bases of some upland swamps is expected to be isolated and of a minor nature, due to the relatively low magnitudes of the predicted strains and the relatively high depths of cover. The minor cracking within the swamps would generally not be expected to propagate through swamp soil profiles (Page ES-10).”</i> CPHR do not consider the swamp impacts above Metropolitan longwalls to be of “a <i>minor nature</i>”. The proposed mining of LW317 and 318 is likely to lead directly to significant hydrological impacts to CUS. And these impacts are likely to be irreversible. CPHR notes that in assessing the potential adverse consequences for swamps, the PAC (2010) identified that the following criteria should be applied individually to identify swamps that may be at risk of negative environmental consequences: • <i>all swamps subject to systematic tensile strains > 0.5 mm/m.</i> • <i>all swamps subject to systematic compressive strains > 2 mm/m.</i> • <i>all swamps with depth of cover less than 1.5 times longwall panel width.</i> • <i>all swamps subject to tilt (transient or final) > 4 mm/m.</i> • <i>all swamps subject to a predicted valley closure of >200 mm.</i> • <i>all swamps subject to a „maximum observed closure strain“ >7.0 mm/m.</i>

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		(intersecting each other directly above LW318) which could also exacerbate subsidence impact consequences. MSEC (2025) did not provide any subsidence estimates for the incised Honeysuckle Creek tributary that contains/drains from S106. It appears that potential upsidence and closure levels for S106 have potentially been significantly underestimated. <u>Other swamps likely to be impacted by LW 312-316</u> Based on the predicted subsidence, tensile and compressive stress, upsidence and closure given for swamps in MSEC (2024; original LW311-316 EP), other swamps likely to suffer adverse consequences (i.e. fracture and drainage) as a result of the approved LW311-316 longwall mining include: S78a&b, S79, S80, S81, S82, S83, S86, S89a&b, S90a&b & S91 <u>Other swamps likely to be impacted by LW 317-318</u> Based on predicted subsidence, tensile and compressive stress, upsidence and closure given for swamps in MSEC (2025; see Appendix 1), other swamps likely to suffer adverse consequences (i.e. fracture and drainage) as a result of the proposed mining include: S74, S75, S91, S113, S114, S115, S119, S130 & S139. Six swamps (Swamps 74, 75, 106, 117, 119, and 130) are identified to have a low potential risk of greater than negligible environmental consequences). These swamps collectively comprise 29.3 ha of PCT 3924 and support a range of threatened species. It is noted that Niche (2025) do not define the term “low”. In addition, the following swamps also have relatively higher subsidence, tilt and stresses (see Appendix 1) which also may result in impacts and adverse consequences: S128, S121, S118, S117, S116. Given S120, S127, S128, and S129 lie directly above either the edges or corners of longwalls 317 & 318, they are also considered particularly at risk of adverse consequences due to high stress levels.	ATC Williams (2025) <i>Surface Water Assessment</i> for impacts to swamps (p101) stated: <i>Effects to swamp substrate water level are more likely to occur where moderate upsidence and closure (i.e. 150 mm and 175 mm respectively or greater) occur (or are predicted to occur) and there is a high degree of hydraulic connection between the swamp substrate and shallow upper HBSS.</i> <i>Effects to the shallow upper HBSS are more likely to occur where moderate closure (i.e. 85 mm or greater) occurs (or is predicted to occur).</i> It is important to assess predicted and actual subsidence levels and the resulting subsidence consequences; although it is noted that ATC Williams (2025) did not consider tilts, tensile and compressive strains or maximum observed closure strains as potentially affecting swamp outcomes (as did the PAC 2010). Many of the swamps potentially affected by LW317 and 318 exceed one or more of the thresholds identified above and are therefore at risk of non-negligible impacts. It is noted that subsidence predictions for swamps above previous longwalls have not been validated, including areas where impacts have been identified. Recommendation 20.2 Provide clarification on subsidence exceedances. Refer matter to the IEAPM if necessary. <i>CPHR comment:</i> There are significant discrepancies between the graph of observed versus predicted subsidence values compared to previous MSEC documents (e.g. the Metropolitan Coal Annual Review 2020 and Metropolitan Mine – 2021 Annual Review Report Subsidence Monitoring Results reports). There have been more subsidence

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		<u>Quantification of potentially impacted swamps:</u> If the LW317 & 318 EP is approved, the Metropolitan Mine operations could potentially see cumulative impacts on the Coastal Upland Swamp EEC go up to 40-57 Ha. This number excludes the areas of Flatrock Swamp, S92 and S106. <u>Subsidence exceedances</u> MSEC’s presentation of subsidence exceedances (Fig 3.9) specifically excludes highly relevant subsidence exceedances at Metropolitan mine and therefore could understate the true level of subsidence likely to be experienced for LW317 and 318 in their Subsidence Impact Assessment. The Subsidence Report (MSEC 2025) Section 3.7. <i>Reliability of the Predicted Conventional Subsidence Parameters</i>, includes a graph which provides comparisons between maximum observed incremental subsidence and maximum predicted incremental subsidence for the previously extracted longwalls in the Southern Coalfield. It is noted that there are significant discrepancies between this graph of observed versus predicted subsidence values compared to previous MSEC documents (e.g. the Metropolitan Coal Annual Review 2020 and Metropolitan Mine – 2021 Annual Review Report Subsidence Monitoring Results reports). MSEC Figure 3.9	exceedances than detailed in the LW317 and 318 assessment (see below).  Figure 7. Comparison of subsidence exceedance graphs mapped by MSEC (2025; left) and in the Metropolitan Coal 2021 Annual Review Report Subsidence Monitoring Results (right; note excluded subsidence exceedances in pink circle). The groundwater model used to assess impacts of LW317 and 318 on swamps and other features is poorly calibrated, particularly for swamp aquifers. This is evidenced by the significant underestimation of swamp levels by upwards of 50m (see below image copied from the Groundwater Assessment (AGE, June 2025)). We have concerns about the groundwater model’s ability to assess swamp impacts (or in many cases the Upper Hawkesbury sandstone aquifers which in at least some situations, feed into the swamps).

Issue no.	Reference		
		CPHR Review – Modification Report	CPHR Review- RTS
		 Fig. 3.9 Comparisons between Maximum Observed Incremental Subsidence and Maximum Predicted Incremental Subsidence for the Previously Extracted Longwalls in the Southern Coalfield	

CPHR updated advice on Serious and Irreversible Impacts – Response to Submissions

Note: Updates to previous CPHR advice in red

We have reviewed Appendix L of the updated BDAR (dated 7 November 2025), which contains the applicant's consideration of Serious and Irreversible Impacts (SAIL) for the following SAIL entities within the direct impact development footprint and the indirect impact area.

The BDAR must present information relating to SAIL entities in accordance with section 6.12 of the *Biodiversity Conservation Act 2016* (BC Act) and section 9.1 of the Biodiversity Assessment Method (BAM) 2020. The 'Guidance to assist a decision-maker to determine a serious and irreversible impact' (the Guidance) identifies that it is the role of the decision-maker to determine whether or not a proposal is likely to result in SAIL.

The decision-maker should make a SAIL determination based on the principles at clause 6.7 of the *Biodiversity Conservation Regulation 2017* (BC Reg). Information provided below may assist the decision-maker.

Table 1. Summary of BCS SAIL advice and recommendations

Risk of SAIL as evaluated by CPHR	SAIL Entity	SAIL Principle	Total SAIL (ha)
Likely	Coastal Upland Swamps in the Sydney Basin Bioregion	P4	29.3
Likely	Giant Dragonfly	P4	29.3
Likely	Littlejohn's Treefrog	P3, P4	Breeding habitat area not determined in SAIL assessment. Total area of habitat 418 ha.
Unlikely	Broad-headed Snake		N/A
Likely	Large-eared Pied Bat	P4	To be determined
Unlikely	Large Bent-wing Bat	P4	N/A
Uncertain	<i>Eastern Underground Orchid</i>	P2	41.3
	<i>Rhizanthella slateri</i>		
Unlikely	Flora:		N/A
	• <i>Genoplesium baueri</i>	P2, P3	
	• <i>Melaleuca deanei</i>	P4	
	• <i>Gyrostemon thesioides</i>	P2, P3	
	• <i>Persoonia hirsuta</i>	P2	
	• <i>Rhodamnia rubescens</i>	P1, P4	
	• <i>Prasophyllum fuscum</i>	P2, P3	
	• <i>Pomaderris adnata</i>	P3	
	• <i>Astrotricha crassifolia</i>	P2, P3, P4	

Table 2. SAIL assessment for Coastal Upland Swamps Endangered Ecological Community (CUS EEC)

SAIL Entity: Coastal Upland Swamps Endangered Ecological Community (CUS EEC) P4		
	Steps [as per section 3.2 of DPIE 2019]	Comments and Recommendations
1	Identify relevant entities at risk of SAIL	The BDAR has assessed the risk of a SAIL to CUS EEC against section 9.1.1 of the BAM.
2	Evaluation of the current extinction risk of the impacted entities	The BDAR assesses CUS EEC at risk of SAIL against Principle 1 (community which is currently in a rapid rate of decline), Principle 2 (community with a very small population size), Principle 3 (evidence of restricted distribution) and Principle 4 (evidence that the TEC is unlikely to respond to management). The BDAR states that CUS qualify for SAIL under Principle 4 as it is considered irreplaceable due to its reliance on abiotic habitats (Hawkesbury Sandstone aquifers, waterlogged peat substrates) and uncertainties around its response to management. The BDAR also provides evidence of a swamp which, despite persistent impacts in the substrate water levels, species richness and diversity have improved. Stream remediation activities have been undertaken following longwall mining impacts, with some pools successfully remediated.
3	Detail measures taken to avoid impacts on the entity	The SAIL assessment in the BDAR provides details on the actions the proponent has taken to avoid and minimise impacts within the scope of the proposed project including: • Shortening LW 317 boundaries (75m north, 67 m south) • implementing wider pillars. CPHR acknowledge that without these measures, environmental consequences due to subsidence impacts will be higher. However, these measures do not go far enough, and a number of swamps are expected to be fractured and drained based on subsidence predictions. The BDAR states that <i>“to further minimise impacts, a suite of long-term conservation and management actions have been proposed...including adaptive management, hydrological and ecological monitoring, crack sealing, targeted revegetation, erosion control measures, and collaborative research partnerships”</i>. CPHR considers that none of these will reduce residual impacts as claimed as there is no evidence that impacts can be prevented/fixed once mining has begun/occurred, and several proposed actions do not have a direct connection to the impact or on-ground outcomes. Further information on avoidance measures for CUS can be found in Section 7 and 9.1.1.2 of the BDAR, with detailed CPHR comments presented in Issue 4 of Attachment B.
4	Evaluate the impacts from the proposal	The BDAR states that six swamps, (29.3 ha) have been identified as having a low risk of greater than negligible environmental consequence, and despite the persistence of some flora, the typical character of these swamps may decline over time. The area of CUS that has already been impacted at Metropolitan mine has been estimated at between 5.6 ha (ATC Williams 2025) and 8.7 ha

(Krogh 2024).⁵ Approved mining within the LW 311-316 Extraction Plan area would represent an increase of 24 ha (including large swamps S76 and S77, and smaller swamps above these longwalls) of impacted CUS. Overall, if LW317 and 318 are approved, Metropolitan mine operations could potentially see cumulative impacts on the CUS EEC between 40-57 ha.

S106 is a large swamp (21 ha in size) predominantly above LW318. The importance of the large swamps (including S76, S77 and S92) has been discussed in detail in our previous submission for the LW 312-316 Extraction Plan⁶, IEAPM advice for the LW 311-316 Extraction Plan and by the Planning Assessment Commission (PAC 2009).

Water NSW have estimated that up to 60% of CUS are undermined across their range and almost all CUS on the Woronora Plateau are subject to existing underground mining leases. CUS is subject to uncontrollable threats such as climate change and bushfire (Cairns et al 2025; Keith et al 2010; Krogh et al 2022).

The proposal has the potential to fragment CUS within the landscape. CUS naturally occur in small patches and have a restricted geographic distribution⁷. Loss of one or more of these patches could lead to loss of connectivity that may place component species, including the threatened Giant Dragonfly, Littlejohn's treefrog, Giant Burrowing Frog and Red-crowned Toadlet, at risk of local extinction.

The SAI assessment does not acknowledge there can be a lag between groundwater impacts and vegetation changes. Ecosystem collapse within impacted swamps can occur following catastrophic events such as bushfire or drought (Krogh et al 2022; Mason et al 2020). Furthermore, there is no evidence that any swamp impacted by mining subsidence has ever been successfully remediated (Cairns et al 2024; Commonwealth of Australia 2014).

Given the time-lag between mining and measurable impacts, there is little scope for adaptive management once mining begins.

Impacts from longwall mining can be uncertain. The Swamps Offset Policy and BAM provide guidelines for assessing these types of impacts. This SAI assessment takes the approach used in the Swamps Offsets Policy which refers to a "maximum predicted offset liability".

In this situation, the precautionary principle is also relevant, consistent with the Swamps Offset Policy, Section 1.3 of the *Biodiversity Conservation Act* and the principles of ecologically sustainable development:

"the precautionary principle—namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation." 6(2) Protection of the Environment Administration Act 1991.

⁵ Not including Flat Rock Swamp which is outside the current approval area, this swamp is around 5.5 ha, and severely degraded.

⁶ Our reference DOC24/583146

⁷ EPBC Conservation advice: <https://www.environment.gov.au/biodiversity/threatened/communities/pubs/140-conservation-advice.pdf>

		CPHR consider that the loss of 29 ha may be an underprediction, however even so, it is a substantial area which is likely to significantly contribute to the risk of extinction for this entity. CUS are features of high environmental value that are at risk of impact from mining related subsidence which, once expressed, are permanent and irreversible. If the predicted impacts occur, these will be serious and irreversible. This is based on the extent and type of residual impacts after efforts of avoidance and minimisation have been applied.
5	Determine whether the impacts are SAI	On the basis of the information set out in this table, impacts to CUS could be regarded as serious and irreversible as they are likely to contribute significantly to the risk of the TEC becoming extinct. . Specific advice on “additional and appropriate measures” that could be taken to minimise SAI will be provided at a later stage, however broad avoidance recommendations 4.1, 4.2 and 4.3 in Attachment A should be prioritised.

Table 3. SAI assessment for Giant Dragonfly

SAI Entity: Giant Dragonfly <i>Petalura gigantea</i> (P4)		
	Steps [as per section 3.2 of DPIE 2019]	Comments and Recommendations
1	Identify relevant entities at risk of SAI	The BDAR has assessed risk of SAI to Giant Dragonfly against section 9.1.1 of the BAM.
2	Evaluation of the current extinction risk of the impacted entities	The BDAR sets out the extinction risk against Principles 1-4 in DPIE 2019. This species is listed under Principle 4 of the SAI Guidelines (DPIE 2019).
3	Detail measures taken to avoid impacts on the entity	Further information on avoidance measures for Giant Dragonfly can be found in Section 7 and 9.3.2.2 of the BDAR, with detailed CPHR comments presented in Issue 4 of Attachment B.
4	Evaluate the impacts from the proposal	<i>Direct impacts</i> The proposal will directly impact 3.8 ha of foraging/dispersal habitat. This is unlikely to increase fragmentation, and this habitat would not be used for breeding. <i>Indirect impacts</i> There has been no survey for the Giant Dragonfly within the Modification subject area. The species was recorded in nearby swamps (S77 and S92) by Niche, and eDNA records were obtained from S14 and Bee Creek by NSW DCCEEW. The BDAR states that the swamps which may be impacted are “<i>not likely to support known occurrences of the Giant Dragonfly (dense heath)</i>” without providing evidence. Note the swamps that NSW DCCEEW recently found eDNA evidence of Giant Dragonfly are swamps which contain similar “dense heath” to those which may be impacted. The proposal may have cumulative effects on S77, with subsidence increasing above levels approved for the Longwall 312-216 Extraction Plan.

5	Determine whether the impacts are SAI	The proposal has not adequately assessed impacts to groundwater aquifers in S92 due to development of the Ventilation Shaft. Without survey evidence to rule out the Giant Dragonfly, presence is assumed. 29.3 hectares of potential breeding habitat (CUS) is predicted to be at risk of “greater than negligible impacts”, however CPHR considers this area figure may be underestimated. See Issue 7 in Attachment B for detail. At this stage, impacts to Giant Dragonfly breeding habitat are uncertain (see impact evaluation in the CUS SAI assessment above). If they do occur, they will be serious and irreversible as the swamp hydrology which constitutes the species’ breeding habitat will be permanently altered and unsuitable for the species’ requirements. There is evidence of the loss of breeding habitat and subsequent loss of the species from individual swamps at Dendrobium mine (Invertebrate Identification Australasia 2022). The loss of 29.3 hectares is a substantial loss of breeding habitat which has the potential to fragment populations. Even the loss of one of these swamps could extirpate a local population (or the only population). There is no evidence that swamps can be remediated following drainage caused by longwall mining and given the time-lag between mining and measurable impacts, there is little scope for adaptive management once mining begins.
		On the basis of the information set out in this table, impacts to Giant Dragonfly could be regarded as serious and irreversible as they are likely to contribute significantly to the risk of the species becoming extinct. Specific advice on “additional and appropriate measures” that could be taken to minimise SAI will be provided at a later stage, however broad avoidance recommendations 4.1, 4.2 and 4.3 in Attachment A should be prioritised.

Table 4. SAI assessment for Broad-headed Snake

SAI Entity: Broad-headed snake (P4)		
	Steps [as per section 3.2 of DPIE 2019]	Comments and Recommendations
1	Identify relevant entities at risk of SAI	The BDAR has assessed risk of SAI to Broad-headed Snake against section 9.1.1 of the BAM.
2	Evaluation of the current extinction risk of the impacted entities	The BDAR sets out the extinction risk against Principles 1-4 in DPIE 2019. This species is listed under Principle 4 of the SAI Guidelines (DPIE 2019).

3	Detail measures taken to avoid impacts on the entity	Further information on avoidance measures for Broad-headed Snake can be found in Section 7 and 9.3.1.2 of the BDAR, with detailed CPHR comments presented in Issue 4 of Attachment B.
4	Evaluate the impacts from the proposal	The proposal will directly impact 3.8 ha of Scribbly Gum Woodland (PCT 3590) which contains a number of tree hollows that may be used by the species during warmer months. This is not key habitat as it does not include rocky areas and is not a preferred vegetation type. A large number of hollows occur in adjoining areas, including sandstone gully forest (PCT 3595) which is preferred habitat for the species when utilising hollows (Bionet TBDC). The species was recorded in the mid-western (above LW 317) and north-western section (180m NW of LW 318) of the indirect impact area. The BDAR states that predicted subsidence is not likely to change the risk of rockfalls in the area where the species was recorded. While impacts to the abiotic habitat of this species may occur, it is unlikely they would result in the actual loss of those features. The dispersed nature of these impacts would not be of a magnitude that would have a serious and irreversible impact on the species within the subject area, or broader local area.
5	Determine whether the impacts are SAI	On the basis of the information set out in this table, impacts to Broad-headed Snake are not regarded as serious and irreversible as they are unlikely to contribute significantly to the risk of the species becoming extinct. .

Table 5. SAI assessment for Large-eared Pied Bat

SAI Entity: Large-eared Pied Bat (<i>Chalinolobus dwyeri</i>) (P4)		
	Steps [as per section 3.2 of DPIE 2019]	Comments and Recommendations
1	Identify relevant entities at risk of SAI	The BDAR has assessed the risk of a SAI to Large-eared Pied Bat against section 9.1.1 of the BAM.
2	Evaluation of the current extinction risk of the impacted entities	The BDAR sets out the extinction risk against Principles 1-4 in DPIE 2019. This species is listed under Principle 4 of the SAI Guidelines (DPIE 2019).
3	Detail measures taken to avoid impacts on the entity	Further information on avoidance measures for Large-eared Pied Bat can be found in Section 7 and 9.3.3.1 of the BDAR, with detailed CPHR comments presented in Issue 4 of Attachment B.
4	Evaluate the impacts from the proposal	The BDAR states that the Large-eared Pied Bat was not recorded within the direct impact area and no direct impacts to habitat are likely. CPHR considers that the direct impact area may be used for foraging only. Direct impacts to non-breeding habitat are not likely to be serious or irreversible.

		The indirect impact area contains suitable breeding habitat, including caves, scarps, cliffs and rock overhangs⁸. Subsidence impacts to these features could occur, resulting in the loss of breeding habitat which would constitute a 'prescribed impact' (BAM s6.1.1). The loss of breeding habitat could also be serious and irreversible. No individuals of this species were recorded within the study area, and no maternity roosts have been identified. CPHR notes that bat survey was limited; two bat detectors were established in Honeysuckle Creek with one failing. Only 16 detection nights were recorded (out of an attempted 64 nights) in the indirect impact area (which is 472 ha in size). The survey effort does not meet NSW DCCEEW Threatened Bat Survey Guidelines which require 16 hours per ≤50 ha for passive acoustic detection. Furthermore, in accordance with survey guidelines, if only bat detectors are used to survey the species, then all records derived must assume the species is breeding. The Large-eared Pied Bat has been recorded in the nearby Royal National Park. Microbat surveying in the Water Catchment is likely to be limited due to lack of development pressure and inaccessibility. This means there is insufficient information to confirm if the species is present in the area. MSEC (2025) found that cliff COH19 is likely to experience rockfall as a result of mining induced subsidence. The BDAR states this cliff does not appear to provide suitable roosting habitat for the Large-eared Pied Bat. CPHR considers that other suitable maternity roosts may occur in the rocky areas elsewhere within the Modification area. Further surveys are required to rule out the presence of breeding bats. Alternatively, assume presence or obtain an Expert Report.
5	Determine whether the impacts are SAI	On the basis of the information set out in this table, CPHR considers that SAI is likely for direct impacts to the subject area. From the information provided, it is difficult to conclude the area does not contain breeding individuals as potential breeding habitat is present. Based on the precautionary principle, and in the absence of appropriate surveys or an Expert Report to conclude otherwise, CPHR considers that breeding individuals could be present and breeding habitat could be impacted through subsidence. Impacts to Large-eared Pied Bat breeding habitat could be regarded as serious and irreversible as they are likely to contribute significantly to the risk of the species becoming extinct. . Specific advice on "additional and appropriate measures" that could be taken to minimise SAI will be provided at a later stage, however, broad avoidance recommendations from our previous response should be prioritised.

Table 6. SAI assessment for Large Bent-wing Bat

SAI Entity: Large Bent-wing Bat (*Miniopterus orianae oceanensis*) (P4)

⁸ NSW DCCEEW (2021) 'Species credit' threatened bats and their habitats. NSW guide for the Biodiversity Assessment Method.

	Steps [as per section 3.2 of DPIE 2019]	Comments and Recommendations
1	Identify relevant entities at risk of SAI	The BDAR has assessed the risk of a SAI to Large Bent-wing Bat against section 9.1.1 of the BAM.
2	Evaluation of the current extinction risk of the impacted entities	The BDAR sets out the extinction risk against Principles 1-4 in DPIE 2019. This species is listed under Principle 4 of the SAI Guidelines (DPIE 2019).
3	Detail measures taken to avoid impacts on the entity	Further information on avoidance measures for Large Bent-wing Bat can be found in Section 7 and 9.3.3.1 of the BDAR.
4	Evaluate the impacts from the proposal	The BDAR states that the Large Bent-wing Bat was recorded in very low numbers within the development footprint and was not recorded in the indirect footprint area. CPHR considers that the direct impact area may be used for foraging only. Direct impacts to non-breeding habitat are not likely to be serious or irreversible. CPHR notes that bat survey was limited; two bat detectors were established in Honeysuckle Creek with one failing. Only 16 detection nights were recorded (out of an attempted 64 nights) in the indirect impact area (which is 472 ha in size). The NSW DCCEEW Threatened Bat Survey Guidelines require harp traps to be placed close to the exits of caves, mines or tunnels identified as potential habitat. The BDAR states these features are not present in the Indirect Impact area. CPHR accepts this finding.
5	Determine whether the impacts are SAI	CPHR requires assessment of the Large Bent-wing Bat to determine if a SAI is likely. CPHR acknowledge that the area does not contain suitable breeding habitat for Large Bent-wing Bat and therefore impacts are not regarded as serious and irreversible as they are unlikely to contribute significantly to the risk of the species becoming extinct. .

Table 7. SAI assessment for Littlejohn's Treefrog

SAI Entity: Littlejohn's Treefrog (<i>Litoria littlejohni</i>) (P3 and P4)		
	Steps [as per section 3.2 of DPIE 2019]	Comments and Recommendations
1	Identify relevant entities at risk of SAI	The BDAR has assessed the risk of a SAI to Littlejohn's Treefrog against section 9.1.1 of the BAM.
2	Evaluation of the current extinction risk of the impacted entities	The BDAR sets out the extinction risk against Principles 1-4 in DPIE 2019. This species is not listed under the SAI Guidelines (DPIE 2019).
3	Detail measures taken to avoid impacts on the entity	Further information on avoidance measures for Littlejohn's Treefrog can be found in Section 7 and 9.3.3.1 of the BDAR.

4

Evaluate the impacts from the proposal

Approximately 3.8 ha of non-breeding habitat would be cleared for the construction of the Ventilation Shaft, while 413.9 ha of potential habitat occurs within the Indirect Impact Footprint.

Within the Indirect Impact Footprint, 29.3 ha of vegetation associated with upland swamps (S74, S75, S106, S117, S119, S130), and associated streams, may be affected by subsidence-related impacts. Potential impacts include bedrock cracking, dewatering of ephemeral breeding pools, and degradation of hydrophilic vegetation across swamps and riparian systems, including Honeysuckle Creek where Littlejohn's Tree Frog has been recorded.

The species has a restricted distribution across a few threat-defined locations, with populations prone to extreme fluctuations due to reliance on upland and riparian habitats. Although recent captive breeding success has been achieved, empirical evidence of successful reintroduction or sustained population recovery is not available. The Modification longwall layout implements narrower panel voids and wider pillars which reduces subsidence impacts. Nevertheless, given the species' reliance on discrete riparian and ephemeral habitats, even minor changes to hydrology or habitat structure could have ecological consequences for local populations. Breeding and non-breeding suitability may be reduced, with the risk of local population declines or extinction.

The BDAR states that impacts would be mitigated through monitoring programs, sediment and water quality controls, retention of native vegetation buffers, avoidance of direct disturbance to ephemeral pools and habitat assessments. CPHR considers none of these would improve the impact of water loss and hydrology changes from subsidence.

Swamp remediation is not a feasible mitigation measure. There is evidence that stream remediation works have had some success at Waratah Rivulet and Eastern Tributary within the Metropolitan mine area. Similar actions could be adopted at Honeysuckle Creek if pools are drained. However, it is unknown whether Littlejohn's Treefrog would persist once impacted, particularly if iron-staining/other water pollution has further affected the stream.

Littlejohn's Tree Frog is unlikely to respond readily to management interventions due to its specialised ecological requirements and life history traits. Successful breeding requires ephemeral, slow-flowing, unpolluted water bodies and intact native riparian vegetation, which cannot be easily restored if degraded. The species is also highly sensitive to indirect threats, including chytrid fungus, altered hydrology, and fire-related changes to water chemistry, which are difficult to control or mitigate at the landscape scale.

The population of Littlejohn's Treefrog within the Metropolitan mine area is expected to be low and impacts to important habitat such as Honeysuckle Creek is likely to cause decline or extinction of the local population.

5

Determine whether the impacts are SAI

Given the species is showing evidence of continuing decline and could be considered to inhabit only three locations in New South Wales (Woronora Plateau, Blue Mountains, Watagan Mountains), it meets SAI Principle 3.

Given the species relies on habitat components that cannot be re-created (swamps and streams with intact hydrology), it meets SAI Principle 4.

On the basis of the information set out in this table, impacts to Littlejohn's Treefrog breeding habitat could be regarded as serious and irreversible as they are likely to contribute significantly to the risk of the species becoming extinct. for Direct impacts to the subject area (non-breeding habitat) are unlikely to be serious and irreversible.

The area of SAI has not been determined but should be based on breeding habitat.

Specific advice on "additional and appropriate measures" that could be taken to minimise SAI will be provided at a later stage, however broad avoidance recommendations from our previous response should be prioritised.

Table 8. SAI assessment for threatened flora

SAI Entities: Flora (SAI principles, in accordance with DPIE 2019 listed in brackets) - *Genoplesium baueri* (P2,P4), *Melaleuca deanei* (P4), *Rhizanthella slateri* (P2), *Gyrostemon thesioides* (P2, P3), *Persoonia hirsute* (P2), *Rhodamnia rubescens* (P1, P4), *Prasophyllum fuscum* (P2, P3), *Pomaderris adnata* (P3), *Astrotricha crassifolia* (P2, P3, P4)

	Steps [as per section 3.2 of DPIE 2019]	Comments and Recommendations
1	Identify relevant entities at risk of SAI	All of the above flora species.
2	Evaluation of the current extinction risk of the impacted entities	The BDAR sets out the extinction risk against Principles 1-4 in DPIE 2019.
3	Detail measures taken to avoid impacts on the entity	None of the above species were recorded in the direct impact area. The SAI assessment describes measures to avoid direct and indirect impacts. Further detail on avoidance measures can be found in Section 9.2 of the BDAR.
4	Evaluate the impacts from the proposal	None of the species were recorded within the direct impact area. All of the species were assumed present in the indirect impact area, however <i>Genoplesium baueri</i> , <i>Melaleuca deanei</i> , <i>Gyrostemon thesioides</i> , <i>Pomaderris adnata</i> , <i>Rhodamnia rubescens</i> , and <i>Astrotricha crassifolia</i> are unlikely to be impacted by longwall mining as they do not have specific hydrological (or other abiotic) habitat requirements. For the Slaty Leek Orchid <i>Prasophyllum fuscum</i> , minor impacts may occur. However, these are unlikely to be of a magnitude that would cause a serious and irreversible impact and the species would be able to tolerate the predicted changes to local hydrology. While this species is associated with moist environments, it has also been recorded in dry sclerophyll forest (AVH Record: NSW 1124323). This species should be included in monitoring studies, should it be recorded during baseline vegetation surveys.

The Eastern Underground Orchid (*Rhizanthella slateri*) may be impacted through reduced soil moisture loss as a result of hydrological changes. There is insufficient information known to evaluate impacts on this species.

5 Determine whether the impacts are SAI

On the basis of the information set out in this table, impacts are unlikely to be serious and irreversible for *Genoplesium baueri*, *Melaleuca deanei*, *Gyrostemon thesioides*, *Pomaderris adnata*, *Rhodamnia rubescens*, and *Astrotricha crassifolia*.

Given the lack of information about the Eastern Underground Orchid, it is uncertain whether impacts are likely to be serious and irreversible for this species. **Should approval be granted, CPHR recommends that further surveys be undertaken to determine if the species is present. No further action is recommended.**

SAI is unlikely for *Prasophyllum fuscum*, however if it is recorded in baseline surveys, monitoring should be established which specifically assesses impacts to the species through changed hydrology.

CPHR – Supplementary response on additional matters (species polygons and proposed Conservation measures)

Our previous correspondence relating to the Metropolitan Mine, Modification 4 for Longwalls 317-318 (our reference DOC25/683750) advised we would provide information on additional matters in a supplementary response including review of the Biodiversity Assessment Method (BAM) Calculator assessment for indirect (prescribed) biodiversity impacts, adequacy of species polygons, and proposed conservation measures within the Biodiversity Development Assessment Report (BDAR).

1. BOAMS / BAM-C case for indirect impacts

The proponent's consultant, *Niche Environment and Heritage*, has advised they currently have the indirect impacts (prescribed) BOAMS case separate from the development footprint case and have not submitted this case previously as doing so would "lock in an offset liability for prescribed/indirect impacts which may or may not be warranted". Niche provided us with the BOAMS reports for this case, however, we still require submission of the BOAMS/BAM Calculator case for review before we can finalise our response. Providing the BOAMS case for indirect impacts will not lock in a credit requirement, as we can send the case back to the assessor, which will re-open it. Regardless, it is up to the Consent Authority whether credits/other conservation measures will be required for the indirect (prescribed) impacts (NSW *Biodiversity Conservation Regulation* (BC Reg) 2017, Section 6.1(2)).

2. Adequacy of species polygons

The BAM requires species polygon be prepared for each species credit species if:

- a. *survey, expert report or important habitat map confirms that the species is present or is likely to use suitable habitat on the subject land, or*
- b. *the species is assumed to be present (except for a proposed biodiversity stewardship site).*

Species polygons are also used to calculate credit obligations in the BAM-Calculator. A detailed review of species polygons for the proposal is provided in **Table 1** below.

Species polygons were reviewed for the following species which have been recorded within the direct impact area, or for which the consent authority may impose an offset (credit obligation/conservation measures) as they are subject to prescribed impacts: Large Bent-wing Bat, Large-eared Pied Bat, Eastern Pygmy Possum, Powerful Owl, Broad-headed Snake, Giant Dragonfly, Giant Burrowing Frog, Red-crowned Toadlet, Littlejohn's Treefrog, Southern Myotis, Prickly Bush-pea and Eastern Underground Orchid.

A list of species that a species polygon was prepared for, but do not require offsetting as they are unlikely to be impacted is provided below Table 1.

3. Proposed offset measures for prescribed impacts

The *BC Regulation* (Clause 6.1(1)) lists impacts that are "prescribed", and Clause 6.1(2) states that additional biodiversity impacts may be taken into account in the determination of the biodiversity credits required to be retired (or other conservation measures). Table 10-3 of the BDAR provides a summary of proposed additional conservation measures for the residual indirect and prescribed impacts.

We have reviewed these proposed measures and provide recommendations in **Table 2**. In summary, we recommend that a credit obligation or conservation measures be imposed to offset prescribed impacts resulting from the proposed modification, as per Clause 6.1(2) of the BC Reg.

4. Offsets for prescribed impacts

The BAM (section 8.5) states that an adaptive management plan can be used to address uncertain impacts and can include the retirement of biodiversity credits or any other conservation measures as offsets. The adaptive management plan for swamp impacts related to subsidence and upsidence resulting from underground mining should be in line with the *Addendum to NSW Biodiversity Offsets Policy for Major Projects: upland swamps impacted by longwall mining subsidence* and include:

- a. measures to secure biodiversity credits to fulfil the maximum predicted offset liability*
- b. a strategy for monitoring changes to groundwater and secondary environmental consequences*
- c. a strategy for delivering offsets that are commensurate with monitoring results*
- d. any other measures proposed to mitigate potential impacts.*

In accordance with the Policy, monitoring data will need to be considered 12 months after mining. We will make appropriate recommendations to the consent authority regarding conditions of consent to secure offsets, in line with the Policy, if required.

Table 1 – CPHR review of species polygons

We have reviewed the species polygons based on information provided in the BAM, Species Survey Guidelines and Bionet. Only those species which are likely to be impacted by direct or indirect (prescribed) impacts are included below.

Species/ Type of impact to be offset	Modification report <i>Red text = inconsistent credit number between BDAR and BOAMS/BAM-C Reports</i>	CPHR comment (Modification Report)	CPHR comment (Response to Submissions) Has matter been resolved in RTS BDAR? Pink – inadequately addressed Green – adequately addressed
Large Bent-wing Bat prescribed	Detected in development footprint and prescribed impact area (Figure 9). No species polygon in BDAR.	Dual credit species. Ecosystem credits for foraging; species credits for breeding. Adequate surveys not undertaken to determine if bats are breeding. Recommendation: Breeding habitat is present so without surveys, breeding should be assumed and a species polygon prepared. Or, BDAR needs to clearly justify why breeding habitat is not present. Draft Guidelines to prepare species polygon state: <i>All breeding habitat including the cave, or other features, used for breeding and the area immediately surrounding this feature must be mapped. Species polygon boundaries should have a 100m radius buffer around an accurate GPS point location centred on the cave/feature entrance.</i>	Yes CPHR accept the area does not contain breeding habitat for this species. The site does not contain caves, tunnels or mines which are specified in the Survey Guidelines.

Species/ Type of impact to be offset	Modification report Red text = inconsistent credit number between BDAR and BOAMS/BAM-C Reports	CPHR comment (Modification Report)	CPHR comment (Response to Submissions) Has matter been resolved in RTS BDAR? Pink – inadequately addressed Green – adequately addressed
Large-eared Pied Bat prescribed	Not detected in development footprint or prescribed impact area. Presence assumed. Area of potential breeding habitat recorded in the BDAR: 4.5ha (pg84). No breeding habitat present in the direct impact footprint. Field surveys discounted breeding habitat within indirect impact footprint. The species polygon for foraging covers a large proportion of study area subject to indirect impacts. The species polygon for breeding habitat only covers a small proportion of the area subject to indirect impacts, in proximity to COH19. No biodiversity credits proposed.	Species credit species, therefore foraging habitat needs to be included in offset calculations. The BDAR notes that approximately 371.2 ha of potential foraging habitat for the Large-eared Pied Bat occurs within the Indirect Impact Footprint and foraging habitat will not be directly impacted by the Modification. This statement is accurate. The BDAR needs to clarify whether there is or isn't potential breeding habitat for this species within the study area. There are contradictions regarding the presence of breeding habitat associated with cliff overhang COH19 - see page 84. The "'Species credit' threatened bats and their habitats – NSW guide for the Biodiversity Assessment Method" requires a minimum of 4 nights of passive acoustic detection per < 50 hectares of potential habitat. This has been complied with for the area of habitat within the direct impact footprint (vent shaft site) but not the indirect impact area. Breeding polygon: consistent with the guidelines - 100m buffer applied to habitat surrounding cliff (COH19). However, s9.3.3.2 of the BDAR states "During habitat surveys, it was determined that Cliff	No Further justification has been provided in the BDAR to discount breeding habitat, however targeted surveys to be completed to rule out the possibility of breeding individuals. The BDAR should include an image of COH19.

Species/ Type of impact to be offset	Modification report Red text = inconsistent credit number between BDAR and BOAMS/BAM-C Reports	CPHR comment (Modification Report)	CPHR comment (Response to Submissions) Has matter been resolved in RTS BDAR? Pink – inadequately addressed Green – adequately addressed
		COH19 was not considered to provide suitable breeding habitat for this species." This is contradictory and requires clarification. Recommendation: Ensure species is adequately surveyed or assume breeding individuals are present. Review habitat assessment and determine if other areas of suitable breeding habitat occur. Prepare species polygon and associated credit calculations based on information above for breeding habitat.	
Eastern Pygmy Possum direct	Detected in direct impact area. Presence assumed in indirect (prescribed impact) area. Species polygon covers whole direct impact and indirect impact area. 105 biodiversity credits required for direct impacts, as per Credit Report dated 28/10/2025.	Species credit species Species polygon and credit calculation accurate. Credits only required for direct impact area.	-
Powerful Owl direct	Detected near direct impact area. Presence assumed in indirect (prescribed impact) area. Species polygon covers direct impact area and associated buffer.	Species credit species Species polygon and credit calculation accurate. Credits only required for direct impact area.	-

Species/ Type of impact to be offset	Modification report Red text = inconsistent credit number between BDAR and BOAMS/BAM-C Reports	CPHR comment (Modification Report)	CPHR comment (Response to Submissions) Has matter been resolved in RTS BDAR? Pink – inadequately addressed Green – adequately addressed
	105 credits required for direct impacts as per Credit Report dated 28/10/2025.		
Broad-headed Snake prescribed	Species polygon covers suitable habitat and 100m buffer. No biodiversity credits proposed in BDAR. Credit Report says 56 – however Credit Summary Report says 54	Species credit species Recommendation: Species polygon is consistent with the requirements of the guidelines, however, more information is required on the initial stage of identifying suitable habitat features and listing the known PCT associations that are present within the footprint, which ultimately make-up the species polygon. Determine species credits for species polygon within indirect impact area	Yes
Giant Dragonfly direct and prescribed	Detected in Swamp 77 and Swamp 92. Other suitable swamps within the subject area have not been surveyed. Species polygon covers entire direct and indirect impact area. 158 credits required for direct impacts 259 credits proposed for indirect impacts (BDAR) 236 credits proposed in the Biodiversity Credit Report	Species credit species Species polygon and credit calculation accurate for direct impact area. Recommendation: Clarify species credits for species polygon within indirect impact area.	Yes Confirm that the credit offset obligation for prescribed impacts in the BDAR (259 credits) are the same as that stated in the BAM-C report once received. Should approval be granted, ensure baseline surveys for Giant Dragonfly are undertaken for a minimum of two years prior to mining.
Giant Burrowing Frog (GBF) direct and prescribed	Detected in indirect (prescribed) impact area.	Species credit species	Yes

Species/ Type of impact to be offset	Modification report Red text = inconsistent credit number between BDAR and BOAMS/BAM-C Reports	CPHR comment (Modification Report)	CPHR comment (Response to Submissions) Has matter been resolved in RTS BDAR? Pink – inadequately addressed Green – adequately addressed
	Species polygon covers entire indirect impact area. Does not cover direct impacts area. 130 credits proposed for indirect impacts (BDAR and Credit Summary Report). 119 credits proposed in the Biodiversity Credit Report	The survey effort did not meet the requirements of the NSW Survey Guide for Threatened Frogs. The Guidelines require aural-visual searches to be completed as transects running through areas of native vegetation located within 300 metres of suitable breeding habitat. The methodology included an Expert report combined with 'opportunistic habitat-based surveys' (aural-visual) along waterways within the indirect footprint between August and September. Expert report outcome: Mapped the entire study area within the species polygon. "Within the study area, the species has been specifically identified along Honeysuckle Creek, Swamp 14, Swamp 106 and Swamp 77 but is also known more widely from the catchment based on long term monitoring. Consequently, the species polygon provided here has taken all these factors into account rather than strictly apply 'textbook' buffers to mapped streams. The polygon developed herein amounts to an area of 418.3ha." Figure 10.15 - Giant Burrowing Frog species polygon presented by Niche is different to that published in the expert report. This figure excludes the direct	Niche's response: "the Giant Burrowing Frog species polygon has been updated to encompass the Development Footprint. As such, 3.8 ha of dry sclerophyll habitat will now be attributed as potential habitat for this species, requiring additional offsetting. Niche has revised the species polygons for the Giant Burrowing Frog to ensure species expert advice is accurately captured. The BAM-C inputs have also been reviewed and updated in accordance with the revised species polygons." The proposal will now result in 79 credits for direct impacts to GBF, compared to 0, originally. Confirm that the credit offset obligation for prescribed impacts in the BDAR (259 credits) are the same as that stated in the BAM-C report once received. Minor note: Tables 5-3, 5-11, and 5-12: will need to be updated in the BDAR for GBF.

Species/ Type of impact to be offset	Modification report Red text = inconsistent credit number between BDAR and BOAMS/BAM-C Reports	CPHR comment (Modification Report)	CPHR comment (Response to Submissions) Has matter been resolved in RTS BDAR? Pink – inadequately addressed Green – adequately addressed
		impact footprint (vent shaft). Justification provided is: "Giant Burrowing Frog is excluded from the Development Footprint as no suitable aquatic habitats to support the species was identified during survey." Suitable habitat as described in the Guide consists of any area of PCT that is located within 300m from breeding habitat. Breeding habitat is ephemeral flowing streams that have permanent pools, or in upland swamps, and are located within native vegetation. Most typically breeding occurs in streams with a bed width of up to five metres (e.g. 2nd order and 3rd order streams) and upland swamps located on suitable geologies. Swamp 92, within 300m of the direct footprint, provides suitable breeding habitat. Recommendation: The species polygon be updated to include the entire study area. Species credits be calculated for both direct and indirect impact areas.	
Red-crowned Toadlet (RCT) direct and prescribed	Detected in indirect (prescribed) impact area. 82 credits proposed for indirect impacts (BDAR). 82 from Credit Summary Report 84 from Biodiversity Credit Report	Species credit species The survey methodology consisted of an Expert report combined with 'opportunistic habitat-based surveys' (aural-visual) along waterways within indirect footprint between August and September.	Yes Niche's response: "the Red-crowned Toadlet species polygon has been updated to encompass the Development Footprint. As such, 3.8 ha of dry sclerophyll habitat will now be attributed as potential habitat for this species,

Species/ Type of impact to be offset	Modification report Red text = inconsistent credit number between BDAR and BOAMS/BAM-C Reports	CPHR comment (Modification Report)	CPHR comment (Response to Submissions) Has matter been resolved in RTS BDAR? Pink – inadequately addressed Green – adequately addressed
		RCT detected in adjacent Swamp 92, greater than 100m away from the subject land as well as along Honeysuckle Creek, also >100m from subject land, but within indirect footprint. BDAR states that further survey is required for RCT impacts within indirect footprint. <u>Species polygon:</u> BDAR: While guidelines suggest a 100-m buffer from the top of the bank, the species has been observed at greater distances from breeding habitats. Therefore, a 150-m buffer from mapped streams, along with mapped upland swamps within the study area, has been used to define the polygon boundary. The species polygon published by Niche (Fig 10.48) is different to that included in the expert report. The species polygon provided in the expert report includes an area within the development footprint (vent shaft site). Additionally, the species polygon in the BDAR (fig 10.48) includes a small slither (0.48ha) of habitat within the development footprint (vent shaft site). This area will	requiring additional offsetting. Niche have revised the species polygons for both the Red-crowned Toadlet to ensure species expert advice is accurately captured. The BAM-C inputs will also be reviewed and updated in accordance with the revised species polygons”. The proposal will now result in 79 credits for direct impacts to RCT, compared to 0, originally. Confirm that the credit offset obligation for prescribed impacts in the BDAR (82 credits) are the same as that stated in the BAM-C report once received. Minor note: Tables 5-7 and 5-11 will need to be updated in the BDAR for RCT.

Species/ Type of impact to be offset	Modification report Red text = inconsistent credit number between BDAR and BOAMS/BAM-C Reports	CPHR comment (Modification Report)	CPHR comment (Response to Submissions) Has matter been resolved in RTS BDAR? Pink – inadequately addressed Green – adequately addressed
		need to be included in credit offset calculations for direct impact. Recommendation: Clarify which species polygon is accurate. Ensure credit liability is consistent with species polygon.	
Littlejohn's Treefrog (LJ) direct and prescribed	Detected in indirect (prescribed) impact area. Species polygon covers entire indirect impact area. Does not cover direct impacts area. 173 credits required for indirect impacts (BDAR). 173 credits from Credit Summary Report 158 credits from Credit Report	Species credit species Similar to RCT, based on the buffer requirements, the species polygon (fig 10.45) includes a small slither of habitat within the development footprint (vent shaft site). This area will need to be included in credit offset calculations for direct impact. The species polygon includes all land within the indirect impact footprint. This is based on known records of this species as per the expert report. Figure 10.45 - species polygon published by Niche is different to that included in the expert report. Similarly to GBF, the expert report also includes land within the direct impact site. However, with LJ, based on nearby records, they are greater than 300m away from the direct impact site. Recommendation: Clarify which species polygon is accurate. Ensure credit liability is consistent with species polygon.	Yes Niche's response: "Updates to amphibian polygons have been undertaken to incorporate the Development Footprint in lieu of adequate survey effort and in line with species expert advice." The proposal will now result in 105 credits for direct impacts to LJ, compared to 0, originally.
Southern Myotis prescribed	Not detected. Presence assumed.	Species credit species.	No

Species/ Type of impact to be offset	Modification report Red text = inconsistent credit number between BDAR and BOAMS/BAM-C Reports	CPHR comment (Modification Report)	CPHR comment (Response to Submissions) Has matter been resolved in RTS BDAR? Pink – inadequately addressed Green – adequately addressed
	Species polygon created in accordance with guidelines (buffered habitat features and associated PCTs). 126 credits required for indirect impacts.	Guidelines for creating species polygon are provided in the <i>Species credit threatened bats and their habitats – NSW guide for the Biodiversity Assessment Method</i>. Species polygon appears to be clipped to the indirect impact area. Recommendation: Clarify whether the polygon should extend into the direct impact area and if so, determine credit obligation.	Comment remains relevant.
Prickly Bush-pea prescribed	Detected in indirect (prescribed) impact area. Species polygon covers large proportion of indirect impact area. Does not cover direct impacts area. 171 credits required for indirect impacts from BDAR. 171 credits from Credit Summary Report 107 credits from Credit Report	Species credit species. The species unit of measure is area. BDAR states "This species was found in swamp 119 and 117 within the Indirect Impact Footprint. Hydrological changes which cause drying of peat substrate in the swamps may impact the longevity of the species." The BDAR also states "Historical monitoring (Eco Planning 2024), such as at Swamp 20, has shown that while mining-related hydrological changes have occurred, the species can continue to persist." The species polygon is clipped to the indirect impact area. Recommendation:	No Comment remains relevant.

Species/ Type of impact to be offset	Modification report Red text = inconsistent credit number between BDAR and BOAMS/BAM-C Reports	CPHR comment (Modification Report)	CPHR comment (Response to Submissions) Has matter been resolved in RTS BDAR? Pink – inadequately addressed Green – adequately addressed
		Clarify whether the polygon should extend into the direct impact area and if so, determine credit obligation.	
Eastern Australian Underground Orchid prescribed	Assumed present in indirect (prescribed) impact area. Species polygon covers areas of mapped PCT 3595. Does not cover direct impact area. No credit retirement proposed in BDAR or Credit Summary Report.	Species credit species. The assessment in the BDAR (Table L-4) states “Although the species was not detected, it has been assumed present for assessment purposes due to the suitability of the habitat in the Indirect Impact Footprint. Subsidence from Longwalls 317 and 318 is predicted to impact Honeysuckle Creek and Tributaries R, S, and U, primarily through valley closure and upsidence. These processes may cause bedrock cracking, pool leakage, and water loss, leading to reduced surface water availability, dewatering of pools, and altered local hydrology. Such changes could lower soil moisture levels in the gully, potentially affecting the microhabitat required by <i>R. slateri</i>.” The species polygon is clipped to areas of PCT 3595 within the indirect impact area. The species unit of measure is area. Recommendation:	No Comment remains relevant.

Species/ Type of impact to be offset	Modification report Red text = inconsistent credit number between BDAR and BOAMS/BAM-C Reports	CPHR comment (Modification Report)	CPHR comment (Response to Submissions) Has matter been resolved in RTS BDAR? Pink – inadequately addressed Green – adequately addressed
		Clarify if species is to be affected by subsidence. If so, determine credit obligation.	

The following species were assumed to be present in the study area, but unlikely to be subject to direct, indirect or prescribed impacts. They have been assigned species polygons in the BDAR: *Acacia baueri* subsp. *aspera*, Bargo Geebung, Bauers Midge Orchid, Brown Pomaderris, Bush Stone-curlew, Bynoe's Wattle, Camfield's Stringybark, Deane's Paperbark, *Deyeuxia appressa*, Eastern Bristlebird, Eastern Ground Parrot, *Epacris purpurascens* var. *Purpurascens*, Gang-gang Cockatoo, *Grevillea raybrownii*, *Gyrostemon thesioides*, Hairy Geebung, *Hibbertia puberula*, *Hibbertia stricta* subsp. *furcatula*, Koala, Leafless Tongue Orchid, Maroubra Woodland Snail, Masked Owl, Needle Geebung, Netted Bottle Brush, Scrub Turpentine, Slaty Leek Orchid, Small-flower Grevillea, Sooty Owl, South-eastern Glossy Black Cockatoo, Southern Greater Glider, Southern Brown Bandicoot (eastern), Squirrel Glider, Sublime Point Pomaderris, Thick-leaf Star-hair, Villous Mint-bush and Woronora Beard-heath.

We recommend that no offsets be required for these species.

Table 2 - CPHR review - Proposed conservation measures

(BC Regulation 2017 Clause 6.1(2)); (Review based on BDAR, Table 10-3)

Blue= potential SAI and may also need “Additional and Appropriate Measures” in addition to residual prescribed impacts offsets. In some cases, conservation measures described in “CPHR comments” column could also be incorporated into the Additional and Appropriate measures, subject to the measures meeting Consent Authority requirements.

Species / TEC	Conservation measures (as per Table 10-3 in BDAR)	CPHR comment
Coastal Upland Swamps	165 credits or equivalent conservation contribution for Prescribed Impact (used a partial impact scenario). <u>Potential conservation measures:</u> - Prioritise conservation measures, such as peat and hydrology rehabilitation and stabilisation. - Collaborate with research groups to perform long-term studies on Coastal Upland Swamps and associated biodiversity within the Study Area.	Conservation measures proposed are highly unlikely to have tangible benefit to conservation of upland swamps. Peat and hydrology rehabilitation and stabilisation has not been successful anywhere in Coastal Upland Swamps to date. It is not a suitable conservation measure to offset the loss of residual prescribed impacts to this TEC and should not be relied on unless successful techniques are proven with evidence-based, peer reviewed research. Keith <i>et al</i> 2022⁹ and Mason <i>et al</i> 2023¹⁰;2025¹¹ have already done long term studies that provide evidence for ecosystem collapse due to impacts from subsidence due to longwall mining. While research has potential to be valuable, it is not considered an adequate way of offsetting loss of the TEC. Recommendations: Prescribed impacts to CUS could be offset using one, or a combination of the following: <i>Retire credits</i> 1. Purchase and retire biodiversity credits, as per cl6.1(2)(b) of the <i>BC Regulation</i>. Credit calculation needs to be based on a full impact scenario and should be done in accordance with the <i>Addendum to NSW Biodiversity Offsets Policy for Major Projects: Upland swamps impacted by longwall mining subsidence</i> (OEH 2016). 2. Make a payment to the Biodiversity Conservation Fund (BCF).

⁹ David A. Keith, Doug H. Benson, Ian R. C. Baird, Laura Watts, Christopher C. Simpson, Martin Krogh, Sarsha Gorissen, Jose R. Ferrer-Paris, Tanya J. Mason <https://conbio.onlinelibrary.wiley.com/doi/10.1111/cobi.13995>

¹⁰ Tanya J. Mason, Gordana C. Popovic, Maeve McGillicuddy, David A. Keith (2023) <https://besjournals.onlinelibrary.wiley.com/doi/full/10.1111/1365-2745.14078>

¹¹ T.J. Mason, G. Popovic, S.D. Mooney, Wang, S. Xing, G. Yeoh, D.A. Keith (2025) Conserving mire ecosystems: linking flammability and moisture content of peaty substrates. *Science of the Total Environment* v.1004. <https://doi.org/10.1016/j.scitotenv.2025.180747>

Species / TEC	Conservation measures (as per Table 10-3 in BDAR)	CPHR comment
		<i>BSA + potentially retire credits</i> - Purchase of adjacent private property with similar vegetation (eg. Maddens Plains/Darkes Forest/Southern Helensburgh area) for application of a Biodiversity Stewardship Agreement (BSA) or dedication to NPWS. If appropriate sites cannot be found in close proximity to Metropolitan mine, consider similar swamps elsewhere in the bioregion. - Facilitate the establishment of a BSA on land owned by Metropolitan mine or other private land containing Coastal Upland Swamps. A combination of the above methods may be used to offset prescribed impacts to CUS. For example, purchase and retirement of a portion of the credits generated for the offset obligation, with the shortfall made up by payment to the BCF.
Large Bent-wing Bat	No biodiversity credits proposed.	Recommendation: Additional biodiversity credits (species credits) are not required.
Large-eared Pied Bat	No biodiversity credits proposed.	Recommendation: Undertake, or provide a monetary contribution to, suitable "Priority research actions": https://savingourspecies.environment.nsw.gov.au/project/1328 Refer to recommendations for Coastal Upland Swamps.
Broad-headed Snake	No biodiversity credits proposed in BDAR. <i>Credit Report says 56? Credit Summary says 54?</i>	Recommendation: Undertake, or provide a monetary contribution to, suitable "Priority research actions": https://savingourspecies.environment.nsw.gov.au/project/30 Refer to recommendations for Coastal Upland Swamps.
Giant Dragonfly	259 credits proposed for indirect impacts (BDAR). <i>Credit summary report says 236?</i> 158 credits required for direct impacts. <u>Potential conservation measures:</u> – Prioritise conservation measures, such as peat and	Peat and hydrology rehabilitation and stabilisation has not been successful anywhere in Coastal Upland Swamps to date, despite it often being used as a mitigation measure to justify impacts. It is not a suitable conservation measure to offset the loss of residual prescribed impacts to this TEC and should not be relied on unless successful techniques are proven with evidence-based, peer reviewed research. It is unclear how swamps 77 and 92 can be protected and enhanced, particularly S77 which will be undermined as part of the LW311-316 Extraction Plan. Further research on the Giant Dragonfly in the Metropolitan mine lease and surrounding areas is supported as a conservation measure.

Species / TEC	Conservation measures (as per Table 10-3 in BDAR)	CPHR comment
	hydrology rehabilitation and stabilisation. – Protect and enhance swamps 77 and 92 as known breeding habitat for species – Collaborate with research groups to perform long-term studies on Coastal Upland Swamps and Giant Dragonfly – Facilitate research to understand the species dispersal ecology.	Recommendations: <i>Retire credits</i> 1. Purchase and retire biodiversity credits, as per cl6.1(2)(b) of the <i>BC Regulation</i>. 2. Make a payment to the Biodiversity Conservation Fund (BCF). <i>BSA + potentially retire credits</i> 3. Purchase of adjacent private property with similar vegetation (eg. Maddens Plains/Darkes Forest/Southern Helensburgh area) for application of a Biodiversity Stewardship Agreement (BSA) or dedication to NPWS. If appropriate sites cannot be found in close proximity to Metropolitan mine, consider similar swamps elsewhere in the bioregion. 4. Facilitate the establishment of a BSA on land owned by Metropolitan mine or other private land containing Coastal Upland Swamps (GD habitat). <i>Other conservation measures</i> 5. Undertake further research on the abundance, distribution, dispersal and breeding ecology of the giant dragonfly within the Metropolitan Coal lease and surrounding water catchment areas. This work should be carried out by an ecologist with expertise in the species. 6. Undertake further research on management interventions at swamps within the IBRA region which contain known populations of the species. Research management interventions such as midstory canopy management and weed control. Refer to “Activities to assist this species”: https://threatenedspecies.bionet.nsw.gov.au/profile?id=10600
Giant Burrowing Frog (GBF)	130 credits proposed for indirect impacts (BDAR and Credit Summary Report). 119 credits proposed in the Biodiversity Credit Report. <u>Potential conservation measures:</u>	The proposed conservation measures are unlikely to adequately offset the species. Chytrid is considered to be ubiquitous in the landscape now. While there may be some inherent value in chytrid studies, this is not considered appropriate as a conservation measure to offset the loss of breeding habitat for the species. Tissue samples have already been collected from the study area by DCCEEW. Collaboration with University of Wollongong is ongoing with DCCEEW threatened species team to investigate genetics and biogeography, especially the two subspecies where they are split to further clarify taxonomy and any inbreeding. This work is funded by Biodiversity Conservation Trust (BCT).

Species / TEC	Conservation measures (as per Table 10-3 in BDAR)	CPHR comment
	– Collect and analyse samples for chytrid fungus as part of the monitoring program, to detect its presence and enhance understanding of disease distribution across the Giant Burrowing Frog's distribution range – Collaborate with research groups to assess population size and collect tissue samples from the species' southern population for genetic analysis to clarify taxonomy"	Recommendation: Additional biodiversity credits (Species credits) be required, in accordance with comments provided above in Table 1, and calculation of credits. Refer to recommendations for Coastal Upland Swamps.
Red-crowned Toadlet (RCT)	82 credits proposed for indirect impacts. 82 from Credit Summary Report 84 from Biodiversity Credit Report <u>Potential conservation measures:</u> – Environmental education and awareness: Raise awareness among residential communities with a bush interface (e.g. Helensburgh, Maddens Plains, Otford and Stanwell Tops) of potential impacts of bush-rock collection and pollutants in stormwater and run-off on the potential to impair water quality flowing from ridges into adjacent Red-crowned Toadlet habitat.	Recommendations: Environmental education is best led by organisations currently involved in this field. It would be up to the proponent to negotiate a project and sufficient funding with such an organisation. We are supportive of this action if a suitable project can be organised. Additional biodiversity credits (Species credits) be required, in accordance with comments provided above in Table 1, and calculation of credits. University of Wollongong are conducting research on this species (Phil Byrne) and could be supported to do more. Refer to recommendations for Coastal Upland Swamps.
Littlejohn's Treefrog (LJ)	Does not cover direct impacts area. 173 credits required for indirect impacts.	The proposed conservation measures are unlikely to adequately offset the species. Chytrid is considered to be ubiquitous in the landscape now. While there may be some inherent value in chytrid studies, this is not considered appropriate as a conservation measure to offset the loss of breeding habitat for the species.

Species / TEC	Conservation measures (as per Table 10-3 in BDAR)	CPHR comment
	173 credits from Credit Summary Report 158 credits from Credit Report <u>Potential conservation measures:</u> – Collect and analyse samples for chytrid fungus as part of the monitoring program, to detect its presence and enhance understanding of disease distribution across the Littlejohn's Treefrog's distribution range. – Collaborate with research groups to assess population size and collect tissue samples from the species' southern population for genetic analysis to clarify potential genetic bottlenecks or inbreeding in the population.	Tissue samples have already been collected from the study area by DCCEEW in an ongoing study to inform the breeding program funded under the SOS program in accordance with the NSW Conservation Strategy. Collaboration with University of Newcastle, Symbio, and Sydney Zoo is current with DCCEEW threatened species team and address inbreeding with genetic rescue at impacted sites across its range. Recommendations: Additional biodiversity credits (species credits) be required, in accordance with comments provided above in Table 1, and calculation of credits. A monetary contribution to a breeding program at Symbio for this species with re-introductions into nearby National Parks. Refer to recommendations for Coastal Upland Swamps.
Prickly Bush-pea	Species polygon covers large proportion of indirect impact area. Does not cover direct impacts area. 171 credits required for indirect impacts from BDAR. 171 credits from Credit Summary Report 107 credits from Credit Report <u>Potential conservation measures:</u> – Ex-situ conservation: Collect and store seeds in seed banks and establish ex-situ populations in	The first option, ex situ conservation, is not considered warranted at this stage. The second option can be achieved by extracting data from Bionet and is not a conservation action of sufficient value given the extent of possible impact. Recommendation: Additional biodiversity credits (species credits) be required, in accordance with comments provided above in Table 1, and calculation of credits. Refer to recommendations for Coastal Upland Swamps.

Species / TEC	Conservation measures (as per Table 10-3 in BDAR)	CPHR comment
	botanic gardens as an additional safeguard – Provide map of known occurrences to Rural Fire Service and seek inclusion of mitigative measures on Bush Fire Risk Management Plan(s), risk register and/or operation map(s).	
Southern Myotis	Species polygon created in accordance with guidelines (buffered habitat features and associated PCTs). 126 credits required for indirect impacts. <u>Potential conservation measures:</u> – Conduct annual (Summer) microbat surveys (deploy ultrasonic detectors in proximity to waterways and rocky habitats) to identify the presence/activity of threatened microbat species, namely Southern Myotis.	Surveys for the microbats have already been carried out as part of this BDAR. Surveys were not in accordance with the Threatened Bat Survey Guidelines and the species was assumed present in indirect impact area and not recorded in direct impact area. Additional surveys are not likely to make any further contribution to conservation of the species in the area and adaptive management is unlikely to be effective once mining begins. Recommendation: Additional biodiversity credits (Species credits) be required, in accordance with comments provided above in Tab 1, and calculation of credits. Refer to recommendations for Coastal Upland Swamps.
Eastern Australian Underground Orchid	No potential conservation measures have been proposed. This species has not been included in Table 10-3 of the BDAR.	Recommendation: Undertake targeted surveys using trained conservation detection dogs or by carefully and systematically removing leaf litter within areas of suitable habitat to determine if species is present in Metropolitan mine lease area. This should be undertaken by an ecologist with expertise in this, or similar species.