NSW GOVERNMENT

# Bylong Coal Project

*State Significant Development – Final Assessment Report*

*(SSD 6367)*

October 2018



Cover photo

Upper Bylong Valley – Bylong River Crossing, Source Department of Planning and Environment 2017

# Executive Summary

This final assessment report for the Bylong Coal Project has been prepared by the Department of Planning and Environment (the Department) for consideration by the Independent Planning Commission (the Commission). This report should be read in conjunction with the Preliminary Assessment Report (PAR) dated March 2017.

It focuses on the matters identified in the then Planning Assessment Commission's *Bylong Coal Project Review Report* dated 25 July 2017, and responses to that report (Response to PAC Review Report – RtPR) by the Applicant, KEPCO Bylong Australia Pty Ltd (KEPCO) and relevant government agencies including the Heritage Council of NSW (Heritage Council), Department of Industry – Lands and Water (DoI - L&W), the Office of Environment and Heritage (OEH), the Environment Protection Authority (EPA), Division of Resources and Geoscience (DRG), and Mid-Western Regional Council (MWRC).

The overall conclusion of the Commission was that substantial doubt persisted about the potential benefits and impacts on the project, and that further careful weighing up and balancing will be required prior to any decision on the project.

The Commission provided a range of findings covering a number of aspects of the project that in the Commission's view needed further consideration.

The Commission's key findings relate to the aspects referred to in the Minister's terms of reference for the review, namely impacts on water and agricultural resources, social impacts on Bylong village and surrounds, heritage impacts associated with the Tarwyn Park property and justification for the open cut stage of the project.

In particular, the Commission was concerned about the impacts of the project on the heritage values of the Tarwyn Park property and on the broader landscape values of the Bylong Valley. The Commission engaged GML Heritage to provide advice on the heritage values of Tarwyn Park. GML Heritage concluded that the Tarwyn Park property was eligible for listing on the State Heritage Register, based on its assessment against the Heritage Council of NSW heritage assessment criteria.

Based on this review, the Commission recommended that further consultation be undertaken with key agencies on the findings of the GML report. The Department requested the Heritage Council provide further advice on the heritage values of Tarwyn Park, including the impacts of the mine on the landscape setting of Tarwyn Park and the broader Bylong Landscape Conservation Area, a non-statutory listing by the National Trust. The Heritage Council provided its recommendations to the Department in February 2018.

Following careful consideration of the Commission's review report, KEPCO's response to the Commission's report, and the subsequent advice provided by the Heritage Council, the Department advised KEPCO that revisions to the mine plan would be required to further avoid and minimise the potential impacts on the heritage values of Tarwyn Park and surrounding scenic landscape. In particular, the Department considered that:

- no open cut mining or overburden emplacement be permitted on the Tarwyn Park property; and
- overburden emplacement areas should be redesigned to minimise the visual impacts and maximise the integration of the proposed final landform with the surrounding topography.

## Revised Mine Plan

KEPCO provided a report *Bylong Coal Project – Supplementary Information* in July 2018 which provides details and updated impact assessment of a "Revised Mine Plan" (see Figure E1 comparing the EIS Mine Plan to the Revised Mine).

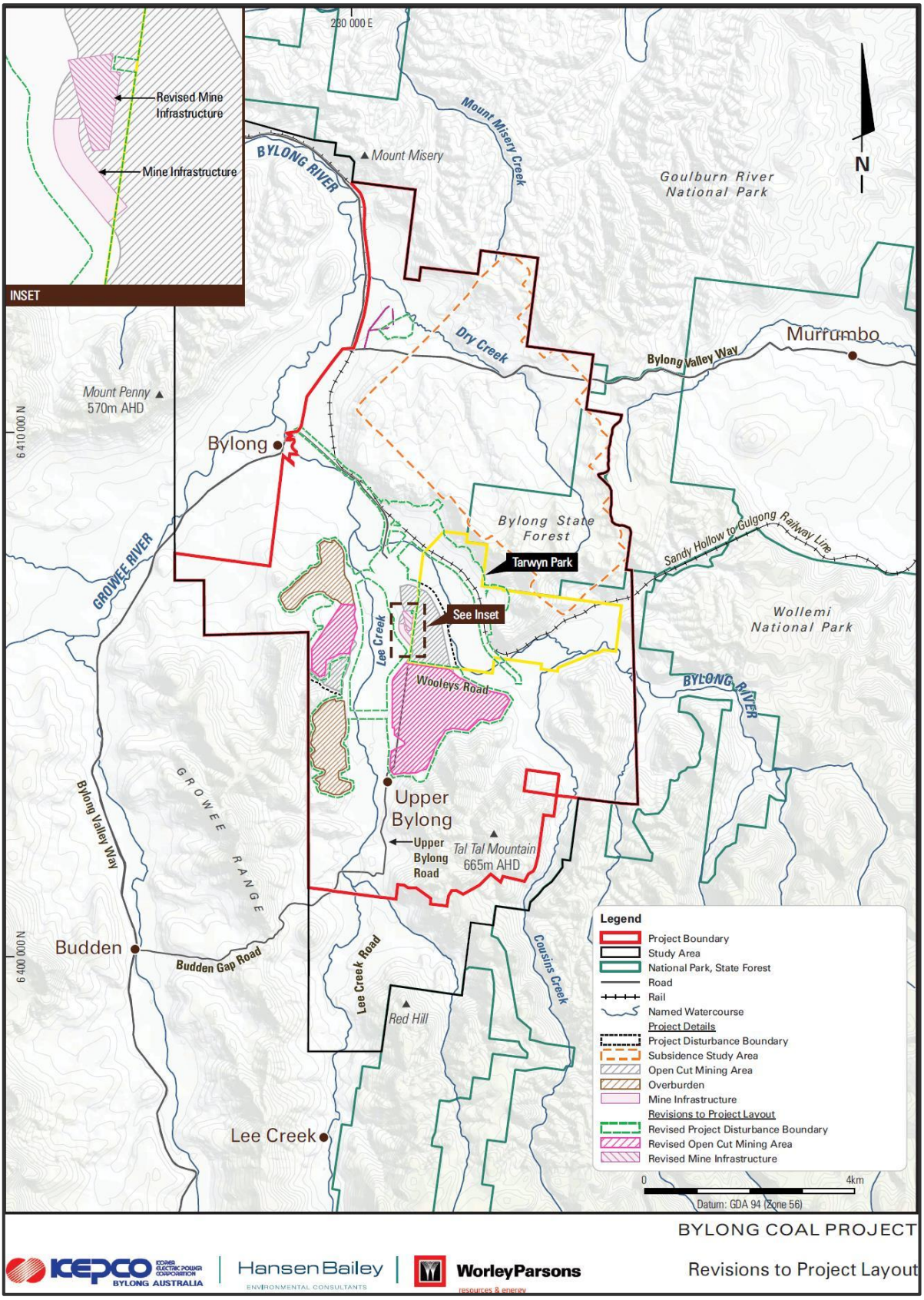



**Figure E1 |** Comparison of EIS Mine Plan to Revised Mine Plan

The Revised Mine Plan includes the following key changes:

- removal of open cut mining and overburden emplacement from the Tarwyn Park landholding;
- reducing the volume of overburden being handled by around 24%;
- reducing the footprint of the western open cut by 22.5 hectares (ha) to maintain a wooded ridgeline and retain the existing views from the Tarwyn Park homestead;
- modifying the north-western overburden emplacement area to incorporate a valley/ drainage line, to minimise visual impacts on Tarwyn Park;
- reducing the height and slope of the south-western overburden emplacement area to integrate with the existing topography;
- avoiding impacts on the former Upper Bylong Catholic Church and cemetery;
- re-establishing the connection between the Upper Bylong Road and Lee Creek Road at mine closure, subject to consultation and agreement with MWRC; and
- incorporating macro relief into the conceptual final landform, consistent with existing landscape elements in the Upper Bylong Valley.

With the reduced open cut mining footprint, the Revised Mine Plan has reduced impacts (see Figure E2), with the more significant changes being:

- ensuring key integrated elements of natural sequence farming across the Tarwyn Park landholding are retained, including its ongoing research potential;
- significantly reducing visual impacts on the Tarwyn Park farm complex and more broadly across Upper Bylong Valley;
- avoiding direct impacts on 2 heritage items:
    - Tarwyn Park horse burials; and
    - the former Upper Bylong Catholic Church and cemetery;
- reducing direct disturbance on 113 ha (or 9.7%) of native vegetation including 69 ha of native vegetation and 4.5 ha of Box Gum Woodland Endangered Ecological Community (EEC);
- reducing direct disturbance 22.7 ha of Biophysical Strategic Agricultural Land (BSAL) (5.4% reduction) and 112.8 ha of Equine Critical Industry Cluster (CIC) (16.1% reduction); and
- reducing peak air emissions from the mining operations.

While there are significant environmental benefits, particularly on the heritage values of Tarwyn Park, agricultural land and scenic landscape values due to the mine design changes, there is a minor 4% reduction in net economic benefits to NSW. This is mainly through a reduction in estimated coal royalties from $290 million to $278 million, due to the 2.5 million tonne reduction in product coal from the open cut stage.

There would also be a 3% reduction in local/ regional economic activity compared to the EIS Mine Plan. However, the Revised Mine Plan would still drive significant regional economic activity due to an estimated:

- $602 million in annual business turnover;
- $386 million in annual regional value added; and
- 805 direct and indirect jobs.

The Department's Final Assessment Report considers both the key findings of the Commission from its merit review of the project following the key areas of concern raised in the Commission's report, and the reduced impacts from the Revised Mine Plan.

The Department has recommended a revision to its PAR conditions to require that KEPCO can only develop open cut stage of the mine generally in accordance with the Revised Mine Plan.

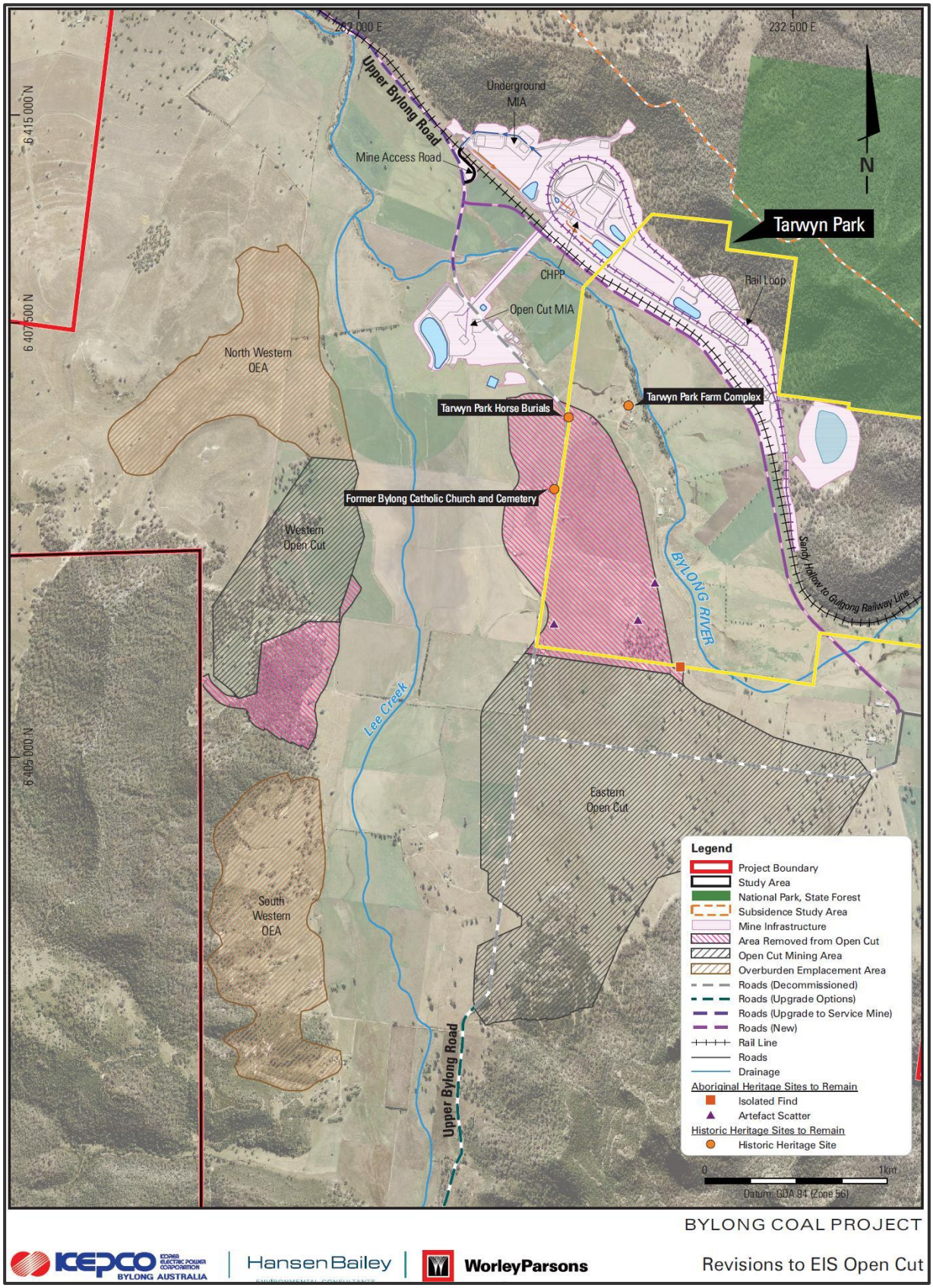



**Figure E2 |** Areas Removed from Open Cut Footprint

## Justification for the Open Cut

The Commission questioned the justification for the open cut stage of the mine and was not persuaded that a more limited development would not be in the public interest. The Commission was concerned about the transparency of the benefit cost analysis and that further economic analysis based on Computable General Equilibrium (CGE) modelling was warranted.

In response to the Commission's findings, KEPCO undertook a further review of the justification for the integrated mine plan, including an assessment of a potential "hypothetical" standalone underground mine option. KEPCO confirmed that it would not proceed with the project without an open cut stage. KEPCO also undertook further economic analysis including CGE modelling to support its conclusions that there would be substantial economic benefits to the region and NSW.

Lock the Gate/ Institute for Energy Economic and Financial Analysis (IEEFA) also provided a further submission questioning the long term viability of the project.

Following consideration of the Commission's findings, the response from KEPCO and the Lock the Gate/ IEEFA submission, the Department accepts that the Revised Mine Plan, incorporating a reduced open cut is reasonable. This is because:

- *Scale of the open cut:* the scale of the open cut resource has been substantially reduced over the last 7 years to two relatively small open cut pits and designed to minimise environmental impacts including:
    - avoiding alluvial floodplain areas and associated agricultural and water resources;
    - minimising impacts on Biophysical Strategic Agricultural Land (BSAL) and higher soil and land capability land outside of the floodplain, including commitments to rehabilitate the land to restore a high capability agricultural land use;
    - reducing the extent of air quality and noise amenity impacts, such that there are no significant impacts at residential receivers;
    - substantially reducing the visibility of the open cut mining operations from public vantage points along Bylong Valley Way, Bylong Village and from private receivers; and
    - the Revised Mine Plan further reduces the extent of the open cut mine and avoids direct impacts from mining operations on the Tarwyn Park landholding and the former Upper Bylong Catholic Church.

- *Economic benefits of the integrated mining project*: if both the open cut and underground components of the project are allowed to proceed, there are significant net benefits in the order of $302 million to NSW and to the regional economy through employment opportunities and significant increase in economic activity, as shown through Input/ Output (I/O) and the Computable General Equilibrium (CGE) economic modelling.

- *Viability of an underground only mine:* further peer review commissioned by KEPCO supported its previous conclusions that an underground only operation would not be financially viable, largely due to the cash flow generated by the open cut mining in the early stage of the project, and there would be a decrease of 93% in net present value compared to the integrated mine plan. KEPCO has advised that it would not proceed with an underground only mine, and therefore the economic and public benefit of the project would not accrue.

- *Resource sterilisation:* the project extracts only 8% of the in-situ open cut coal reserves in the coal authorisation area, while the removal of open cut completely would reduce the coal resource proposed to be mined by 26% which is worth more than $2 billion, based on Division of Resources and Energy (DRG) value of the export value of the total coal resource of $8.7 billion.

  • *Operational requirements:* an integrated open cut/ underground mine is required to effectively manage coal rejects and excess water over the life of the mine in the open cut void. An underground only mine would still require substantial surface disturbance for emplacement of tailings, rejects and mine water storages - estimated at 400 ha. That is, the Upper Bylong Valley landscape would still be modified with an underground mine or with an integrated mine plan.

- *Development application:* finally, the Department is required to assess the integrated mine plan as proposed by KEPCO in its development application. While the Department has recommended mine plan revisions to further minimise impacts on Tarwyn Park, a determination on the integrated mine plan is required by the consent authority.

## Water

The Commission was also concerned about uncertainty related to groundwater modelling predictions, water balance modelling, including management of excess water and water supply to the mine, impacts on agriculture and compensatory water supply.

The groundwater impact assessment has been extensive and carried out over a 7 year period with review and input by a range of independent experts, which has led to refinement of the groundwater model to enhance confidence in the predictions.

This has included uncertainty analysis to inform that assessment and the likely range of impacts. This analysis indicates that the risk of impact to private bores and groundwater dependent ecosystems (GDE) is extremely low and well within the NSW Government's minimal impact criteria as defined in the *Aquifer Interference Policy* (AIP).

Following advice from the Department's independent expert Dr Frans Kalf and DoI - L&W the Department accepts that the groundwater assessment provides a conservative and robust assessment of drawdown impacts.

Despite these low risks, there are contingencies available under the strict regulatory regime in NSW for managing and regulating water in the *Water Management Act 2000* and requirements of Water Sharing Plans.

The Revised Mine Plan further reduces the impacts on water resources through slightly reduced drawdown impacts in the alluvial aquifer, reduced groundwater inflow during open cut operations and a greater buffer distance of the open cut from the alluvium located on Tarwyn Park.

KEPCO has undertaken further sensitivity analysis of its water balance including expert peer review, to demonstrate that there would be adequate water supply for its operations during the shorter open cut mining stage and that it would be able to manage excess water without discharging throughout the mine life.

The recommended conditions include a requirement to provide compensatory water supply to the owner of any privately-owned land whose water supply is adversely affected by the project. Even though the modelling predicts that impacts are extremely unlikely, KEPCO has prepared compensatory water agreements that would be triggered, subject to landowner agreement, if the water supply of landowners are affected by the mine.

At the time of this report, KEPCO has provided copies of the draft agreement to 13 landowners and has met with 10 of these landowners about entering compensatory water supply agreements.

Regardless of whether agreements are entered in to with landholders, the Department's recommended condition requires KEPCO to provide a compensatory water supply if the loss of supply (other than a negligible impact) is due to the mine.

KEPCO has also prepared a draft Water Management Plan providing details on its management and monitoring of its impacts.

Following consideration of the Commission's findings and the response from KEPCO, the Department considers that:

- KEPCO has designed the project to avoid significant impacts, including open cut mining undertaken outside a 150 m buffer from the alluvium, and locating bores to minimise impacts on GDEs;
- the predicted impacts on water users and GDEs would comply with the minimal impact criteria as set out in the NSW Government's *Aquifer Interference Policy*;
- KEPCO holds sufficient water licences to account for its predicted water take in the alluvium; and
- while KEPCO has not acquired all its entitlement in the Permian aquifer, with a further 1,596 units (39%) of the required 4,099 units to be acquired, there is sufficient depth in the water market with 67,794 units currently allocated, noting also that the take from the Permian aquifer would not exceed its entitlement until Year 19 of the project;

The Department has recommended the following changes to its PAR conditions:

- **Compensatory Water Supply:** Revisions to compensatory water conditions to make it clear that the burden of proof about loss of water supply rests with the Applicant, that is KEPCO must ensure that its water monitoring network and investigation/ action triggers provides sufficient evidence that the mine operations has not caused a loss of water supply.

- **Water Management Performance Measures:** Performance measures for mine water storages to make it clear that the consent does not permit discharge of mine water from the site.

- **Water Management Plan:** Additional requirements for a detailed validation and peer review of the site water balance every 3 years, including a review of the life of mine water balance and (if necessary) identify and implement measures to ensure mine water storage capacity is retained to ensure commitment to no discharge of mine water off-site.

- **Rehabilitation Management Plan:** Additional requirement for a detailed final void management strategy to optimise the size of the final void required for reject emplacement and water storage, with an annual review based on verified data.

### Agriculture

The Commission was concerned that there would be a fundamental shift in the valley in favour of mining as opposed to agricultural pastoral pursuits, and that the water security on which agricultural activities depend, may be jeopardised, particularly during an extended dry period.

The Commission also raised concerns about the impacts on BSAL, the ability to successfully rehabilitate the land back to equivalent productivity and commitments and conditions on maintaining agricultural productivity on KEPCO-owned land.

While the Department acknowledges that there would be an impact on agricultural resources as a result of the project, it is mainly limited to the 7 year open cut mine stage. Further, the Department considers that the project as proposed, with stringent conditions, could represent a good example of co-existence of these important industries, consistent with the strategic objectives of the Department's *Central West & Orana Regional Plan*.

The Department considers that these impacts would not cause a fundamental shift from agriculture to mining in the Upper Bylong Valley. This is because:

- there would be no significant impact on water resources used for agricultural production, with water diverted to mining operations considered in the overall economic impacts of the project;

- the reduction in the value of agricultural production as mining progresses is a small percentage of the production in the region, that is only a relatively small area is temporarily impacted by mining;

- agricultural production would continue within the proposed disturbance areas prior to mining and following progressive rehabilitation over the 7 year open cut mining stage;

- while there is a permanent loss of agriculture in offset areas, these are in areas that retain significant biodiversity values and are used for grazing, not higher value production such as cultivation;

- the economic assessment undertaken for the project indicates that the economic benefits of the project (with a net benefit of around $300 million to NSW) far outweighs the loss of agricultural production (with a loss of gross value of production over the life of the project of $26.9 million and a net value of $12.6 million);

- the Revised Mine Plan further reduces direct impacts on BSAL, high-moderate Land and Soil Capability (LSC) land and Equine CIC land, with commitment by KEPCO and recommended conditions requiring the impacted land to be restored to its pre-mining agricultural capability;

- rehabilitation bonds are required under the Mine Lease requirements to ensure there are sufficient funds to meet rehabilitation objectives;

- mine infrastructure is required to be decommissioned at the end of the mine life, including rehabilitation of mine infrastructure areas and the rail loop / load out facility;

- agricultural production associated with natural sequence farming on Tarwyn Park is further protected with the Revised Mine Plan design, with KEPCO committed to ongoing research and education associated with soil hydrological principles on Tarwyn Park;

- MWRC supports the development, recognising that the development would provide further resilience to the regional economy with co-existence between mining, agriculture and tourism industries; and

- KEPCO is committed to ongoing management of agriculture on its landholdings and has prepared a draft Farm Management Plan outlining its approach to maintaining agricultural production on its landholdings.

The Department considers that KEPCO has sought to avoid impacts on the most important agricultural land and water resources that support agricultural production and is committed to continuing to maintain and enhance agricultural enterprises on its landholdings.

The Department has recommended the following changes to its PAR conditions:

- **Rehabilitation Objectives**: To reflect the Revised Mine Plan reduction in impacts to BSAL, the rehabilitation objectives have been revised to restore at least 400 ha of BSAL-equivalent land/ Class 3 land.
- **Rehabilitation Management Plan**: In preparing the Rehabilitation Management Plan, an additional requirement is recommended to further optimise the final landform design towards integration with the existing landscape (macro and micro-relief) and restoration of higher capability agricultural land (BSAL/ LSC Class 3).
- **Agricultural Productivity**: Maintaining or enhancing agricultural production - the condition has been revised to clearly identify the land available for agricultural production and require that reasonable and feasible steps are undertaken to maintain or enhance production, in line with the commitments made during the assessment of the project, including the draft Farm Management Plan.

### Heritage and Landscape Values

The Commission was concerned that there would be significant impacts on the heritage values of Tarwyn Park and on its landscape setting within the Bylong Landscape Conservation Area (BLCA), and that the mine would transform the valley from an agricultural landscape, and that these values would be difficult to restore.

The Commission also recommended that the proposed ochre study and assessment of Aboriginal cultural heritage values within offset areas be further developed with input from OEH. In response, KEPCO and OEH have agreed on a minimum scope that would be further developed in consultation with the Aboriginal stakeholders in preparing the Aboriginal Heritage Management Plan. This scope has been incorporated into the recommended conditions for the project.

The Department and the Heritage Council consider that the Revised Mine Plan provides a significant reduction on the impacts of the project on the heritage values of Tarwyn Park, the landscape values of the Upper Bylong Valley and the BLCA and other heritage features associated with the Upper Bylong Valley including:

- avoiding direct impacts of the open cut mine on Tarwyn Park, including retaining the use of the entire property and research potential for the application of soil hydrological principles, such as natural sequence farming;
- avoiding direct impacts on 2 heritage items – the former Catholic church and cemetery, and the Tarwyn Park horse burials;
- significantly increasing the distance of blasting from the Tarwyn Park complex (from 107 m to 1.4 km);
- retaining the valley form across the broader Bylong River and Lee Creek catchments, with the removal of the overburden emplacement from Tarwyn Park;
- retaining views of key landscape features across the Upper Bylong Valley from Tarwyn Park and from vantage points along Upper Bylong Road to the south/ south east;
- improving integration with existing landform by retaining forested ridgelines and incorporating macro and micro relief in the rehabilitated final landform;
- retaining key cultural landform features, such as the former Upper Bylong Catholic Church, and potential for the future reinstatement of the road connecting to Upper Lee Creek catchment; and
- avoiding direct impacts on 4 Aboriginal heritage sites.

Following consideration of the Commission's findings and KEPCO's response, the Department has recommended the following revisions to the PAR conditions in relation to heritage:

- **Terms of Consent:** Revised condition to require KEPCO to develop the open cut stage of the mine generally in accordance with the Revised Mine Plan.
- **Blast Management Plan:** Revision to the Blast Management Plan to manage blasting to meet blast criteria for heritage items on Tarwyn Park and the former Upper Bylong Catholic Church and cemetery.
- **Aboriginal Heritage Management Plan:** Requiring the minimum scope of the Aboriginal heritage ochre study and assessment of values of Aboriginal heritage items in offset areas to be consistent with advice from OEH.
- **Historic Heritage Management Plan:** Removal of the requirement for a Burials Management Plan and a Horse Burials Management Plan.
- **Rehabilitation Objectives and Rehabilitation Management Plan:** Rehabilitation objectives and the Rehabilitation Management Plan requirements revised to reflect the Revised Mine Plan proposed landform design and commitments.

### Social Impacts

The Commission was concerned that social impacts have not been fully recognised, that the severity of the social impact cannot be adequately determined, and therefore mitigation measures may not be sufficient to address social impacts. The Commission also considered that there was no certainty that funds from the Voluntary Planning Agreement (VPA) would be used for local community projects in Bylong Valley, and that a decision on the proposed Workforce Accommodation Facility (WAF) should not be deferred to post approval.

To address the concerns of the Commission, KEPCO has undertaken additional consultation with the local community, MWRC and service providers and prepared a detailed preliminary Social Impact Management Plan (SIMP) for the project. The preliminary SIMP includes KEPCO's commitments to manage social impacts including mitigation actions and monitoring programs over the life of the project. If the project were to be approved, a final SIMP would be prepared and implemented with further consultation with the Bylong Valley community, Community Consultative Committee (CCC) and MWRC.

KEPCO has also removed the WAF from the project to reduce potential social impacts in the local Bylong Valley community during the construction period. This would also increase economic activity in the regional area through use of services and facilities, particularly in Mudgee, Rylstone and Kandos.

The Department acknowledges that social impacts have already occurred due to the acquisition of land by KEPCO in the Bylong Valley with loss of social cohesion and loss of connections in the local farming community. This has followed a slow decline in the population in the Valley, particularly since the construction of the Sandy Hollow to Gulgong railway in the area in the 1980's, with consolidation of landholdings occurring in the area over the last 20 years.

However, there is community support in the broader region for the proposed mine, particularly in the larger regional towns of Mudgee, Rylstone and Kandos where positive social impacts of the project are predicted to occur through additional employment and economic stimulus, as shown through the assessment of net benefits and local effects analysis, including a petition from 459 Kandos, Rylstone and surrounding community residents in support of the project.

To ensure that the broader regional benefits of the mine are distributed to the Bylong Valley area to address the social impacts, both KEPCO and MWRC propose a range of mitigation measures to mitigate the social impacts at the Village and Bylong Valley during the mine life and at closure. This includes:

- clear commitment by MWRC to prioritise Voluntary Planning Agreement (VPA) funding to projects in the Bylong Valley;
- implementing a Bylong Valley Action Plan as a component of the SIMP to monitor and mitigate social impacts including actions to:
    - attract and retain Bylong Valley residents, including promoting opportunities for employees to reside in the Bylong Valley;

- enhance Bylong Village, including funding for enhancement works in the Village including the Bylong Hall and sporting grounds, and maintaining the Bylong General Store;
- improve social cohesion, through hosting community events, promote opportunities for new residents to participate in volunteer roles (for example with the RFS) and local community groups; and
- maintain and/or enhance agricultural productivity on KEPCO landholdings, promoting the co-existence in the Valley for mining and agriculture.

Following consideration of the Commission's findings and KEPCO's response, the Department has recommended the following revisions to the PAR conditions in relation to social impacts:

- **WAF:** The consent does not permit the construction of a WAF.
- **Maintaining or enhancing agricultural production**: The condition has been revised to clearly identify the land available for agricultural production and require that reasonable steps are undertaken to maintain or enhance production, in line with the commitments made during the assessment of the project, including the draft Farm Management Plan.
- **Social Impact Management Plan**: A specific requirement to prepare a Construction Workforce Accommodation Strategy to manage the social impacts associated with construction stage(s) of the project has been included in the SIMP.

### Subsidence

The Commission raised concerns about the potential subsidence impacts on cliff lines and on Bylong Valley Way.

As outlined in the PAR, the Department accepts that the subsidence associated with the project can minimised, managed, or at least compensated for to an acceptable standard. There are no residences located within the subsidence area and the subsidence assessment predicted there would be no impacts on adjoining National Parks, with subsidence largely confined to woodland, including associated cliff lines, and agricultural areas. The key infrastructure asset that would be impacted is Bylong Valley Way.

Impacts on the most prominent cliffs in the project area (Cliffs C1-C4) have been avoided through shortening the long wall panels. The Department and OEH also recommended that longwall panel LW106 be shortened to protect a further large cliff line C5 and nearby Cliff 24312, which would be managed through subsidence monitoring and adaptive management, consistent with standard practice for managing subsidence impacts. The Department's recommended conditions include performance measures that there must be negligible environmental consequences on these cliffs, that is impacts of less than 0.5% of the total cliff face due to longwall mining.

To reduce any uncertainty about protection of these 2 cliffs the Department has revised the recommended conditions to ensure that no longwall mining can occur within 150 m of these cliffs (based on the angle of draw and depth to the coal seam), unless updated subsidence modelling and impact assessment is undertaken based on validated data to show that the performance measure would be met. Any longwall mining undertaken closer than this would require approval by the Department through the Extraction Plan process.

KEPCO has undertaken further consultation with MWRC on how the subsidence on Bylong Valley Way would be monitored and managed, in accordance with standard practice and procedures. MWRC has confirmed that it is satisfied with the proposed measures to ensure the road remains safe and serviceable.

In the PAR, the Department recommended that comprehensive Extraction Plans be prepared and implemented in consultation with key Government agencies and property owners, including a specific plan and performance objectives for the Bylong Valley Way to ensure the road remains safe.

Following consideration of the Commission's findings and KEPCO's response, the Department has recommended the following revisions to the PAR conditions in relation to subsidence impacts:

- **Subsidence Impacts on Cliffs:** New conditions restricting longwall mining from within 150 m horizontally of cliffs C5 and 24312 unless a revised subsidence impact assessment report is submitted demonstrating that the performance measures can be met. Mining closer than 150 m would require approval through the Extraction Plan process.

### Lighting – Dark Sky Region

The Commission raised concerns about potential lighting impacts on Siding Spring Observatory and consideration of the *NSW Dark Sky Planning Guideline* (Dark Sky Guideline).

The Dark Sky Guideline was published in June 2016 after the development application and EIS was lodged for the project. The Dark Sky Guideline identifies the Dark Sky Region as land within 200 km distance of the Siding Spring Observatory, located near Coonabarabran.

Under Clause 92 of the EP&A Regulation 2000, the consent authority must consider the Dark Sky Guideline for State significant development where the project is located less than 200 km from the observatory. The Bylong Coal Project is located around 170 km from the observatory so therefore the Dark Sky Guideline must be considered by the consent authority.

In the PAR, the Department recommended a condition to ensure that all external lighting complies with *Australian Standard AS 4282 (INT) 1997 – Control of Obtrusive Effects of Outdoor Lighting.* This requires lighting to be designed and installed to minimise direct and diffuse lighting impacts, consistent with the design principles of the Dark Sky Guideline.

The recommended conditions also require KEPCO to implement all reasonable and feasible measures to minimise the visual and off-site lighting impacts.

Following consideration of the Commission's findings and KEPCO's response, the Department has recommended the following revisions to the PAR recommended conditions:

- **Visual and Lighting Impacts**: Additional requirement to implement all reasonable and feasible measures to minimise off-site lighting impacts with consideration of the good lighting design principles identified in the *NSW Dark Sky Planning Guideline.*

- **Dark Sky Lighting Management Strategy**: Additional requirement to prepare a strategy prepared in consultation with the Siding Spring Observatory Director by a suitably qualified and experienced person to identify and implement measures to minimise the upward spill of light.

### Biodiversity

The Commission noted that the finalisation of a significant area of biodiversity offsets (i.e. the areas in Offset Area 5 impacted by subsidence) would occur after the commencement of the project and that the appropriateness of this approach should be considered in any future decision about the project.

The proposed land-based offsets for the project incorporates 7 separate offset areas comprising 3,806 ha of land, including Offset Area 5 (OA5). The offset areas other than OA5 provide credits well in excess of the offset liability for the majority of the vegetation communities and threatened species for the project, with OA5 only required for:

- one of the 6 vegetation communities impacted by the project, *Grey Box – White Box grassy open woodland on basalt hills in the Merriwa region, Upper Hunter Valley* with 13% of the total credits required to be retired in OA5; and

- one of the 5 species credit species impacted by the project, Regent Honeyeater with 37% of the total credits required to be retired in OA5.

Even accounting for a conservative 10% reduction in biodiversity values due to subsidence in OA5, there are excess credits available in OA5 to offset the impacts on the Grey Box vegetation community and the Regent Honeyeater, with only 19% and 76% for these communities/ species of available credits in OA5 required to retire the residual offset liability.

While the other 6 offset areas would be secured within 2 years of the commencement of the project through Biodiversity Stewardship Agreements, the mechanism for securing OA5 would not be finalised until after underground mining is completed. OEH advised that a Biobanking Agreement (now a Stewardship Agreement under the *Biodiversity Conservation Act 2017)* would be a suitable mechanism for securing the offset, but only following the completion of underground mining beneath OA5.

This is due to statutory considerations about the eligibility of land subject to active underground mining to be used as a biobanking site which was a consideration under the now repealed *Threatened Species Conservation Regulation 2008*, and has been transferred into the *Biodiversity Conservation Regulation.*

In the interim, the Department has recommended that OA5 be secured through an alternative mechanism, such as positive and restrictive covenants under the *Conveyancing Act 1919*, and offsets managed through the

Extraction Plan and Biodiversity Management Plan required for the project and that a conservation bond be provided for OA5.This is a valid approach for securing offsets used for mining projects used elsewhere in NSW, including in the nearby Western Coalfield mines, which were approved by the Commission.

Following consideration of the Commission's findings and the response from KEPCO, the Department confirms its and OEH's view that OA5 is a suitable offset area and that, with the recommended conditions there is sufficient certainty that the offset area would be appropriately managed and secured for biodiversity conservation.

The Revised Mine Plan reduces the direct impacts on native vegetation by around 62 ha (from 753 ha to 691 ha), including 25 ha of native woodland. This also includes a reduction of 4.4 ha in the threatened Box Gum Woodland. KEPCO however proposes to offset the project's impacts based on the original EIS Mine Plan offset requirements.

OEH has reviewed the Revised Mine Plan and commitments made by KEPCO and welcomed the reduction of impact to biodiversity and Aboriginal heritage, noting that the offset package already proposed by KEPCO would be retained.

As concluded in the PAR, KEPCO has sought to avoid, mitigate, manage and/or offset the residual impacts of the project in accordance with NSW and Commonwealth requirements, so that biodiversity values would be enhanced or maintained over the medium to long term.

Following consideration of the Commission's findings and KEPCO's response, the Department has recommended the following revisions to the PAR conditions in relation to biodiversity impacts:

- **Rehabilitation Objectives:** The area of rehabilitation to woodland in the mining area be increased from 33 to 65 ha as identified in the draft Rehabilitation Management Plan.

### Transport and Traffic

The Commission raised concerns that KEPCO's road funding commitments were not finalised and that KEPCO's commitments around commuter safety and haul road usage remain uncertain, noting that there was potential for higher traffic from the Upper Hunter along Bylong Valley Way from the east. The Commission also raised concerns about traffic associated with school bus routes.

At the time of the PAR, MWRC and KEPCO had reached an agreement on ongoing maintenance contributions and road upgrades that were committed as a component of the project but had not agreed on funding for road safety upgrades to the Wollar Road (Munghorn Gap), and pavement and intersection upgrades for the Bylong Valley between Wollar Road and the Upper Bylong Road. MWRC and KEPCO have now reached an agreement on these upgrades with KEPCO contributing an additional $3.64 million.

While MWRC is satisfied with these arrangements, Muswellbrook Shire Council (MSC) retains concerns about the traffic impact assessment completed for the project and considers that there would be higher project-related traffic from the Upper Hunter than assumed in KEPCO's assessment.

However, KEPCO has completed a comprehensive traffic assessment which was updated to consider the no-WAF option and additional sensitivity analysis assuming higher traffic from the east along Bylong Valley Way. The assessment was informed by extensive consultation with MWRC and social assessment/ demographic data on potential operational and construction workforce locations.

MSC has provided no evidence that the traffic impact assessment for the project cannot be relied upon, and KEPCO is committed to utilising existing accommodation, mining services, the existing employment pool within the Mid-Western Region local government area, including initiatives to encourage employees to relocate to the area.

Further, the Department has imposed conditions restricting heavy vehicles (more than gross vehicle mass of 10 tonnes) travelling to the site from Bylong Valley Way east of the mine site to minimise safety risks and pavement damage. The heavy vehicle usage along key routes within the Mid-Western Region local government area has been accounted for in the road maintenance contributions.

KEPCO has made a substantial offer increasing its contribution from $40,000 to $267,700 to upgrade road safety barriers along Bylong Valley Way within the Muswellbrook local government area, undertake pre and post construction and decommissioning road dilapidation, and monitor traffic flows to validate the EIS assumptions.

Apart from requiring these commitments to be implemented by KEPCO, the Department does not consider additional conditions are required to address the issues raised by MSC.

In regard to school buses, KEPCO proposes to consult with local bus companies and adjust mine associated travel with the school bus timetable. KEPCO has advised that currently there are two school buses operating along the Wollar Road between Wollar and the Ulan Road, with one bus from Wollar and one from Totnes, which turns off the Wollar Road. There are no school bus services that currently run between Wollar and Bylong.

In the PAR, the Department recommended conditions to address the Commission's concerns about school bus services including requiring KEPCO to schedule production shift changes on site to occur outside of school bus hours and prepare a Traffic Management Plan to include measures that would be implemented to minimise traffic impacts on school bus routes.

The Department has strengthened these recommended conditions by requiring KEPCO to schedule construction shift changes to avoid school bus hours and that relevant school bus service providers be consulted when preparing the Traffic Management Plan for the project. An additional requirement has been included in the Traffic Management Plan that requires measures to be implemented to minimise and manage heavy vehicle interaction during school bus hours, for example, school bus routes and hours to be documented in the proposed heavy vehicle Journey Management Plans.

Following consideration of the Commission's findings and KEPCO's response, the Department has recommended the following revisions to the PAR in relation to traffic and transport impacts:

- **Shift Changes and School Bus Routes:** In addition to production shifts, the applicant must schedule construction shift changes to occur outside of school bus hours.
- **Roadwork Upgrades:** Inclusion of all agreed road funding upgrades between MWRC and KEPCO and the proposed increase in funding from $40,000 to $267,700 to MSC for road safety measures along Bylong Valley Way within MSC local government area
- **Road Maintenance:** Additional requirement for pre and post dilapidation surveys and make good requirements around construction and decommissioning stages for Bylong Valley Way within the MSC area.
- **Traffic Management Plan:** Additional requirement to consult with school bus service providers in preparation of the Traffic Management Plan, including measures to minimise and manage heavy vehicle interaction during school bus hours, and for monitoring of traffic to determine the contribution of the development to road dilapidation rehabilitation or make good requirements.

### Air, Noise and Blasting

The Commission raised concerns about residual uncertainty related to the low frequency (LF) noise assessment and that a cautious approach to the application of affording mitigation and acquisition rights under the *Voluntary Land Acquisition and Mitigation Policy* (VLAMP) may be warranted. The Commission also raised concerns about minimising diesel emissions to meet emission targets proposed by the EPA, background air quality and blast impacts on Tarwyn Park heritage items.

At the time the PAR was prepared, a total of 9 privately-owned receivers (owned by 6 landowners) were predicted to experience noise levels above the noise criteria of 35dB(A) during the open cut stage of the project, with one receiver (Eagle Hill property) predicted to have significant impacts over 40dB(A) such that acquisition rights were recommended by the Department.

Following further property acquisitions/ agreements and noise reductions associated with the Revised Mine Plan, a total of 5 privately-owned receivers (owned by 3 landowners) are now predicted to exceed the noise criteria, with no landowners predicted to be significantly impacted under the VLAMP, and two landholdings moderately impacted, such that mitigation rights (for example acoustic treatment at the residence), would be afforded.

The Commission was concerned that there was some uncertainty as to whether a LF noise penalty would apply and therefore this may change the noise impact, such that additional mitigation or acquisition rights would apply.

The EPA in its advice on the RtPR Report advised that it was satisfied with the proponent's assessment of LF noise. The assessment showed that no LF noise penalty would apply at private receivers. However, the EPA considered that KEPCO should make contingency arrangements if a LF noise penalty applied post approval, if the project were to proceed.

The recommended conditions require KEPCO to strictly comply with strict noise criteria, inclusive of any noise penalties. This includes requirements to incorporate real time noise monitoring, including investigation and action

triggers to modify or cease operations as necessary to ensure compliance. This is a standard proactive management approach used effectively at mining operations in NSW.

In the unlikely event that during attended noise monitoring a noise penalty applied that caused an exceedance of noise criteria at a private receiver, then KEPCO would be required to undertake actions to ensure compliance. That is, there is no uncertainty about KEPCO's obligation to comply with the noise limits and enforcement of these conditions.

Following consideration of the Commission's findings and KEPCO's response, the Department has recommended the following revisions to the PAR in relation to air, noise and blasting impacts:

- **Acquisition/ Mitigation Rights:** Property ID 60 (Eagle Hill) to be afforded mitigation rights with strict noise limits to apply.
- **Noise Criteria during open cut stage:** Changes to the noise limits to reflect recent property acquisitions and agreements since the PAR, and the predicted noise reduction at property Eagle Hill.
- **Noise Criteria during underground stage:** Changes to the noise limits to reflect recent property acquisitions by KEPCO since the PAR.
- **Blast Management Plan:** Revision to the plan to reflect reduction in impacts with the removal of the open cut from Tarwyn Park and the former Upper Bylong Catholic Church.
- **Air Quality Criteria:** Revised to adopt the current EPA approved methods ambient air quality criteria for $PM_{10}$ and $PM_{2.5}$.
- **Air Operating Conditions:** Additional requirement included to address EPA's advice to apply Tier 4 USEPA standards for non-road diesel for equipment commissioned into service after 30 June 2020.

### Summary

The Department has considered the Commission's findings from its review of the Bylong Coal Project, KEPCO's response and additional information provided by key agencies and special interest groups, in its assessment of the project. A significant change to the project is the removal of mining from Tarwyn Park. The Department has recommended the open cut mine stage be developed generally in accordance with the Revised Mine Plan.

The Bylong Coal Project would result in significant social and economic benefits for the Mid-Western Regional Council local government area, the Central West and Orana Region and the State of NSW. The project would employ up to 450 persons at full production, 665 during the peak construction period.

It would also create a substantial number of indirect employment opportunities in related industries and economic contributions to the State through royalty and local tax revenues.

Throughout the assessment of the project, KEPCO has provided extensive additional technical assessment and prepared detailed draft management plans in response to issues raised by the Department's experts, agencies and the Commission. This additional information further clarifies and provides greater certainty about how KEPCO would manage its operations to meet NSW Government policy and guidelines, community expectations and the recommended conditions for the project.

While there would be residual impacts on the local environment and community, acknowledging that social impacts have already occurred during the exploration and assessment stage of the project, KEPCO through its iterative mine design has avoided, minimised, mitigated and/or offset impacts in accordance with NSW Government policy, statutory requirements and guidelines.

Based on its assessment, the Department believes its revised recommended conditions of consent provide a comprehensive, strict and precautionary approach to ensuring the project can comply with relevant performance measures and standards, and that the predicted residual impacts can be effectively minimised, mitigated and/ or compensated.

Consequently, the Department considers that the benefits of the project outweigh its costs, and that the project is approvable subject to stringent conditions.

# Contents

# 1. Introduction

## 1.1 Background

KEPCO Bylong Australia Pty Limited (KEPCO) is seeking consent to develop an open cut and underground coal mine near the village of Bylong. The Bylong Coal Project (SSD 6367) (the project) comprises the development of two open cut mining areas and underground mining using longwall mining methods. The project would operate for up to 25 years.

The project also includes:

- infrastructure to support the mine including a coal handling and preparation plant, rail spur line and loading facility;
- realigning and upgrading local road infrastructure;
- car parking, first aid and administration facility; and
- a water supply borefield.

The Final Assessment Report for the project and revised recommended conditions have been prepared for the consideration of the *Independent Planning Commission* (the Commission). This report should be read in conjunction with the Preliminary Assessment Report (PAR) dated March 2017.

The PAR includes a detailed consideration of the impacts of the project, including a consideration of concerns of the local community, independent expert reviews of the project's groundwater, economic and social assessments, and the economic benefits to the region and NSW as a whole. Following this assessment, the Department considered that the benefits of the project outweigh its costs, and that the project is approvable subject to conditions.

This report considers the findings made in the Planning Assessment Commission's[1] *Bylong Coal Project Review Report*, dated July 2017. It also considers additional information received from KEPCO Bylong Australia Pty Ltd (KEPCO) in response to the Commission's merit review report, requests from the Department, further input from Government agencies and submissions from stakeholders.

The two reports together comprise the Department's environmental assessment for the project (SSD 6367) and have been prepared to satisfy the requirements of the *Environmental Planning and Assessment Act 1979* (EP&A Act). They have also been prepared to satisfy the requirements of the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act), in accordance with the bilateral agreement between the Commonwealth and NSW Governments.

## 1.2 Commission's Review

On 9 January 2017, the Minister for Planning asked the Commission to carry out a review of the Bylong Coal Project. The terms of reference for the Commission's review are set out below (see Table 1).

The Commission held a public hearing on 11 May 2017 in Mudgee. Forty-four verbal submissions mainly in support of the project were received from individuals, local businesses, consultants engaged by KEPCO and employees of KEPCO. The Commission received a total of 1,123 written submissions, including 943 pro-forma type submissions sent from the Do Gooder website.

[1] On 1 March 2018, the Independent Planning Commission of NSW was established as a standalone agency under Part 2, Division 2.3 of the EP&A Act and replaced the Planning Assessment Commission.

**Table 1** | Terms of Reference for the Commission's' Review of the Bylong Coal Project

1. Carry out a review of the Bylong Coal Project, and:
   a) consider the EIS for the project, all issues raised in public and agency submissions, and any other information provided on the project during the course of the review;
   b) assess the merits of the project as a whole having regard to all relevant NSW Government policies, paying particular attention to:
      - the impacts on the water and agricultural resources of the Bylong Valley;
      - the social impacts on the Bylong village and surrounds;
      - impacts on heritage values associated with the Tarwyn Park property, including natural sequence farming;
      - the justification for the open cut stage of the project, and if necessary;
   c) recommend appropriate measures to avoid, minimise, and/or manage significant impacts of the project.
2. Conduct public hearings during the review as soon as practicable after the Department of Planning and Environment provides its preliminary assessment report to the Commission.
3. Submit its final report on the review to the Department of Planning and Environment within 12 weeks of receiving the Department's preliminary assessment report, unless the Secretary agrees otherwise.

## 1.3 Applicant's Response to the Commission's Review Report

In January 2018, KEPCO provided a detailed response *Response to PAC Review Report* (RtPR Report) to the findings of the Commission's review (see **Appendix A**).

In addition to providing further clarification and information based on the extensive studies completed to date for the assessment, the RtPR Report included additional expert studies and draft management plans to address concerns raised by the Commission. This additional information is summarised in Table 2 and shows that KEPCO has made substantial effort to address the Commission's findings and recommendations through further expert review and assessment.

**Table 2** | Additional Information

| **Integrated Mine Plan Justification** |
|---|
| • Peer review of the mine plan (John T Boyd)<br>• Expert advice – Economic evaluation/ cost benefit analysis (Gillespie Economics)<br>• Computable general equilibrium (CGE) Modelling (Cadence Economics) |
| **Water Management** |
| • Revised water balance modelling (WRM)<br>• Peer review of water balance modelling (HEC-Lindsay Gilbert)<br>• Review/ summary groundwater modelling and uncertainty analysis (AGE)<br>• Draft Water Management Plan<br>• Compensatory Water Supply Agreements |
| **Heritage** |
| • Draft Historic Heritage Management Plan including:<br>- updated significance assessments<br>- Horse Burials Management Plan<br>• Draft Conservation Management Plan – Tarwyn Park and Iron Gate including:<br>- Blast management strategy<br>- Landscape and visual analysis / landscaping treatments<br>• 3D visualisation and video animations and additional photo montages<br>• Peer review of the heritage management and conservation plans (Chris Betteridge) |

| Agriculture and Soils |
|---|
| • Draft Rehabilitation Management Plan<br>• Farm Management Plan<br>• Expert advice – Biophysical Strategic Agricultural Land (BSAL), Land and Soil Capability (LSC) and rehabilitation (SLR Consulting)<br>• Expert advice – agricultural productivity/ farm management (Scott Barnett & Associates) |
| **Social Impacts** |
| • Draft Social Impact Management Plan including:<br>- Bylong Valley Preliminary Action Plan<br>- Housing Accommodation Preliminary Action Plan<br>- Workforce Management Preliminary Action Plan<br>- Local Content and Economic Development Preliminary Action Plan |
| **Other** |
| • Subsidence: expert advice - subsidence management Bylong Valley Way (MSEC)<br>• Aboriginal heritage: clarification of scope for ochre study and heritage investigations in offsets (OEH) |

## 1.4 Applicant's Supplementary Response and Revised Mine Plan

A key concern of the Commission was the impact of the project on the heritage values of the Tarwyn Park landholding, including the scenic/ landscape values across the Upper Bylong Valley.

The Commission engaged GML Heritage to provide advice on the heritage values of Tarwyn Park, with GML Heritage concluding that the Tarwyn Park property was eligible for listing on the State Heritage Register, based on its assessment against the Heritage Council of NSW heritage assessment criteria.

The Commission recommended that further consultation be undertaken with key agencies and the public on the findings of the GML report.

The Department requested the Heritage Council of NSW (the Heritage Council) to provide further advice on the heritage values of Tarwyn Park, including the impacts of the mine on the landscape setting of Tarwyn Park and the broader Bylong Landscape Conservation Area (BLCA), a non-statutory listing by the National Trust.

The Heritage Council of NSW engaged Hector Abrahams Architects (HAA) to provide expert advice and provided its recommendations to the Department in February 2018 (see **Appendix B**).

In May 2018, following careful consideration of the Commission's review report, KEPCO's response to the Commission's report, and the subsequent advice provided by Heritage Council of NSW on the heritage values of Tarwyn Park, the Department advised KEPCO that revisions to the mine plan would be required to further avoid and minimise the potential impacts on the heritage values of Tarwyn Park and surrounding landscape.

In particular, the Department considers that:

- no open cut mining or overburden emplacement be permitted on the Tarwyn Park property; and
- overburden emplacement areas should be redesigned to minimise the visual impacts and maximise the integration of the proposed final landform with the surrounding topography.

Importantly, the Department advised KEPCO that it would recommend conditions to meet these outcomes and requested that KEPCO provide additional assessment on a revised mine plan.

In July 2018, KEPCO provided a report *Bylong Coal Project – Supplementary Information, July 2018* (see **Appendix C**) which provides details and updated assessment of a "Revised Mine Plan" to address the Department's request. This is referred to in this report as the Revised Mine Plan Supplementary Report.

KEPCO in its response advised that it is still seeking consent for the mine plan as identified in the Environmental Impact Statement (the EIS Mine Plan), but has provided further details and assessment of the Revised Mine Plan, given the Department's intention to recommend this condition to the Commission.

To be clear, the Department recommends that if the Bylong Coal Project was approved by the Commission, it should only be on the basis of implementing the Revised Mine Plan as identified in the Revised Mine Plan Supplementary Report.

Table 3 below provides a summary of the key changes of the EIS Mine Plan against the Revised Mine Plan. These changes are also shown in Figures 1 and 2 below. The Revised Mine Plan Supplementary Report includes Appendix C. This provides a detailed summary of changes to key components of the project, along with other technical Appendices providing supporting information about the reductions to impacts associated with the Revised Mine Plan.

At the Department's request, KEPCO has undertaken an updated assessment of changes to environmental impacts as a result of the Revised Mine Plan. A summary of these changes is provided in Table 4 below, with further discussion of the Department's consideration of the Revised Mine Plan provided in Section 2 below.

The Revised Mine Plan Supplementary Report includes Appendix D, providing a detailed summary of the revised environmental impacts.

**Table 3** | Summary of Mine Plan Revisions

| Aspect | EIS Mine Plan | Revised Mine Plan |
|---|---|---|
| *Project Life* | 25 years, including:<br>- a 2 year construction period;<br>- 4 years of open cut mining only;<br>- 4 years of concurrent open cut and underground mining; and<br>- 15 years of underground mining only | 25 years, including:<br>- a 2 year construction period;<br>- 4 years of open cut mining only;<br>- 3 years of concurrent open cut and underground mining (with open cut mining reduced by 1 year); and<br>- 16 years of underground mining only |
| *Mining and Reserves* | Extraction of 124 million tonnes of run-of-mine coal (ROM) to produce about 90 million tonnes of product coal comprising:<br>• 33 million tonnes of ROM coal by open cut methods; and<br>• 91 million tonnes of ROM coal by longwall mining methods from 15 longwall panels. | Extraction of 120 million tonnes of ROM coal (4% reduction) to produce about 87.3 million tonnes of product coal, comprising:<br>• 28.3 million tonnes by open cut methods (14% reduction);<br>• 91 million tonnes by longwall mining methods from 15 longwall panels (no change). |
| *Extraction Rate* | Up to 6.5 million tonnes of ROM coal a year during concurrent open cut and underground mining operations with extraction of up to 6.3 million tonnes during underground only operations. | No change. |
| *Coal Processing & Transport* | Coal would be processed on site in the Coal Handling and Preparation Plant (CHPP). Product coal would be transported by rail to the Port of Newcastle for export, via the Sandy Hollow to Gulgong Railway Line. The project would require an average of 2.1 laden trains each day during peak operations. | No change. |
| *Overburden and Waste Management* | Up to 152 million bank cubic metres (Mbcm) of overburden material would be moved from the open cut operation and 14 million tonnes of coal reject would be generated from processing of ROM coal. Coarse and fine coal reject from the CHPP would be dewatered and co-disposed in the overburden emplacement areas during open cut mining operations. During underground mining, these materials are proposed to be emplaced in a final void within the Eastern Open Cut mining area. No tailings dam would be required. | Up to 116 Mbcm moved through open cut (24% reduction).<br>Approximately 12 million tonnes coal rejects generated (14% reduction).<br>No other changes to processing. |

| Aspect | EIS Mine Plan | Revised Mine Plan |
|---|---|---|
| *Infrastructure* | Key infrastructure includes[1]:<br>• mine infrastructure areas (MIA) including the CHPP;<br>• rail load out facility and rail loop;<br>• water management infrastructure, including a water supply bore-field and associated pumping stations and pipelines; and<br>• power and communications infrastructure | No new infrastructure. |
| *Roadworks* | Key road upgrades/ changes include:<br>• upgrade to the Upper Bylong Road to access the mine and intersection with Bylong Valley Way;<br>• realignment of Upper Bylong Road/ Lee Creek Road;<br>• new access road from Upper Bylong Road to access properties to the east of the mine; and<br>• upgrade to intersections in the local area. | No change except a commitment to reinstate a link road from Upper Bylong Road to Lee Creek Road as part of mine closure, subject to consultation and agreement of Mid-Western Regional Council during mine closure stage. |
| *Employment* | Up to 470 persons at full production during concurrent operations. This would reduce to 275 persons during the underground only stage. Peak of 665 construction workers (during the initial 2- year construction period). | Up to 450 persons at full production during concurrent operations.<br>No other changes. |
| *Hours of operation* | 24 hours a day, seven days a week (construction and operation). | No change. |
| *Agricultural Land* | The project would directly disturb around 423 ha of Biophysical Strategic Agricultural Land (BSAL) and 700 ha of Equine Critical Industry Cluster (CIC) land. There is a further 288 ha of BSAL and 515 ha of CIC within proposed offset areas. Rehabilitation of the site would include reinstating 423 ha of BSAL (or equivalent). | Direct disturbance of 400.4 ha of BSAL (5.4% reduction) and 587.2 ha of Equine CIC (16.1% reduction)<br>No changes to offset areas with rehabilitation of the site to reinstate 400.4 ha of BSAL (or equivalent). |
| *Rehabilitation and Biodiversity Offsets* | The project would directly disturb 1,160 ha of land through clearing associated with the open cut mining operations and surface infrastructure. Of this area, about 753 ha comprise native vegetation communities, including 251 ha of endangered ecological communities (EEC).<br>There is an additional area of 1,714 ha where subsidence impacts are predicted to occur, ranging from around 20mm up to 3.3m.<br>The biodiversity offset strategy would ultimately provide for the long-term conservation of some 3,806 ha of land, including 2,212 ha of EEC. In addition, there would be rehabilitation of around 33 ha within the disturbance boundary to woodland community adjacent to remnant woodland adjoining the south-western overburden emplacement area and western open cut. | The project would directly disturb:<br>• 1,047 ha, a reduction of 113 ha (9.7%)<br>• 691 ha of native vegetation, a reduction of 69 ha (8.2%), including a reduction of 4.5 ha impact of EECs (Box Gum Woodland).<br>No changes to subsidence impacts or to the proposed biodiversity offset strategy.<br>Increase in the area of rehabilitation to woodland from 33 ha to 65 ha. |

(1) The Workforce Accommodation Facility was originally proposed in the EIS, but KEPCO subsequently removed this infrastructure as proposed in the February 2018 Response to Commission report, retaining some infrastructure for parking, administration and first aid facilities.

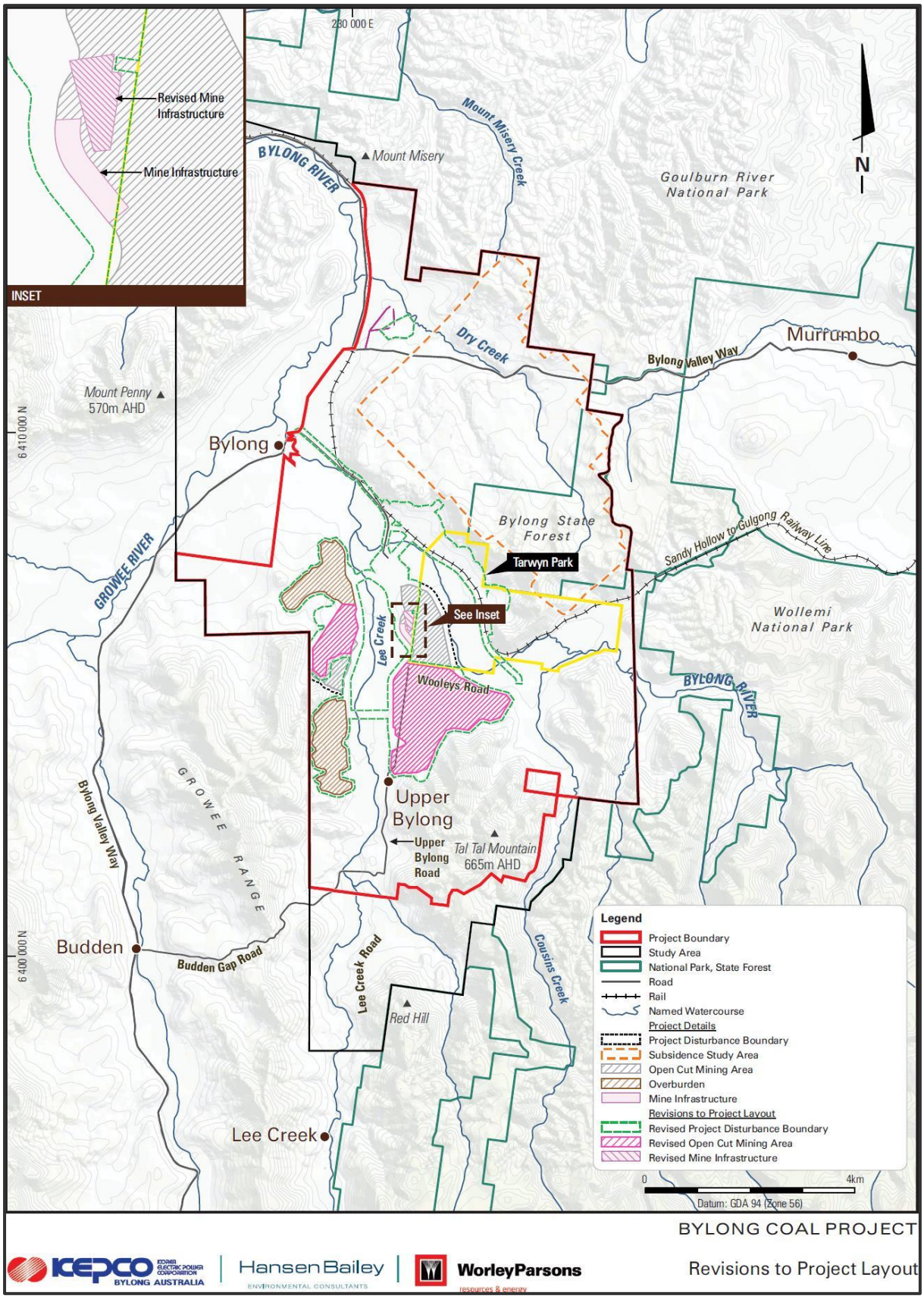



**Figure 1** | Comparison of EIS Mine Plan to Revised Mine Plan

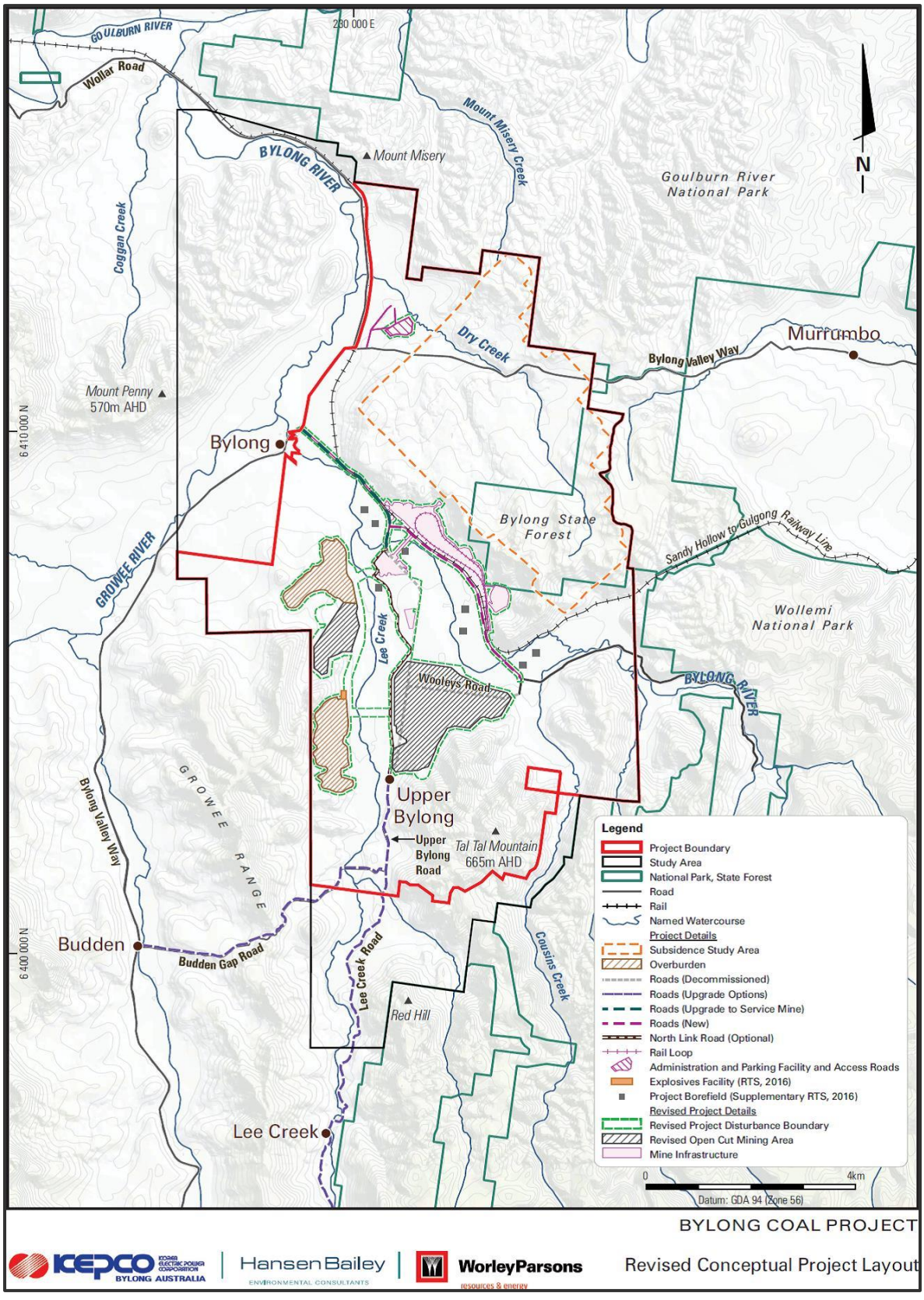



**Figure 2** | Conceptual Revised Mine Plan

***Table 4*** | Summary of Key Reductions in Environmental Impacts

| *Aspect* | *EIS Mine Plan* | *Revised Mine Plan* |
|---|---|---|
| Historic heritage | • Six items to be directly impacted.<br>• Open cut mining and emplacements within Tarwyn Park landholding, including farmland used for natural sequence farming.<br>• Exhumation of graves required from former Upper Bylong Catholic Church. | • Avoidance of direct impacts on 2 heritage items including:<br>  ○ Tarwyn Park horse burials<br>  ○ former Upper Bylong Catholic Church<br>• No mining activities on the Tarwyn Park landholding.<br>• No exhumations of graves required from former Upper Bylong Catholic Church. |
| Visual and Landscape | • Low visual impacts in Bylong Village<br>• High visual impacts for one receptor, now acquired by KEPCO<br>• Moderate to high visual impacts for limited views from Bylong Valley Way and Wollar Road<br>• Impacts of the eastern overburden emplacement area on Tarwyn Park viewsheds to Growee Range and Upper Lee Creek valley. | • Significantly reduced visual impacts for views across the Upper Bylong Valley/ Lee Creek Valley from the Tarwyn Park farm complex<br>• Improved integration of overburden emplacements with existing forested ridgelines and landscape features<br>• Open cut mine disturbance reduced by one year. |
| Agriculture and Soils | • 423.1 ha of BSAL directly disturbed.<br>• 171.8 ha of BSAL within subsidence area indirectly impacted.<br>• 700 ha of Equine CIC directly disturbed. | • 400.4 ha of BSAL directly disturbed (5.4% reduction).<br>• No change to BSAL impacted by subsidence.<br>• 587 ha of Equine CIC directly disturbed (16% reduction). |
| Aboriginal heritage | • 102 Aboriginal heritage sites located within the project disturbance area requiring salvage. | • Avoidance of 4 sites (3 artefact scatters and one isolated find). |
| Biodiversity | • 753 ha native vegetation directly impacted including:<br>  ○ 251.1 ha Box Gum Woodland<br>  ○ 232 ha remnant woodland<br>  ○ 521 ha native grassland<br>• Biodiversity offset strategy comprising 3,801 ha of native vegetation. | • 691 ha vegetation directly impacted (8.2% reduction) including:<br>  ○ 247.7 ha Box Gum Woodland (4.4% reduction)<br>  ○ 207 ha remnant woodland (10.7% reduction)<br>  ○ 484 ha native grassland (5.9% reduction)<br>• No reduction in the proposed biodiversity offsets. |
| Surface Water and Flooding | • Open cut mine outside the Bylong River floodplain, including avoiding the main Natural Sequence Farming (NSF) activities.<br>• Maximum loss of catchment area during mining:<br>  ○ <1.3% Bylong River catchment at project boundary;<br>  ○ 5.8% of Lee Creek catchment;<br>  ○ <0.1% of Growee River catchment, at confluence with Bylong River.<br>• Nil discharge of mine water. | • Avoidance of direct impacts on all NSF areas from mining operations.<br>• Maximum loss of catchment area during mining:<br>  ○ <1.1% Bylong River catchment at project boundary;<br>  ○ 4.2% of Lee Creek catchment;<br>  ○ <0.1% of Growee River catchment, at confluence with Bylong River.<br>• Nil discharge of mine water |
| Groundwater | • Peak inflow of 4,099 ML/year into underground workings.<br>• Peak Inflow into open cut of 106ML/year.<br>• Peak baseflow loss in Bylong River of 994 ML, mainly due to alluvial borefield pumping.<br>• No impacts on private bores exceeding the minimal impact criteria under the *Aquifer Interference Policy*. | • No change to peak inflow from underground workings<br>• Peak inflow into open cut of 76 ML/year (30% reduction)<br>• Marginal reduction (0.1m) in maximum drawdown on the alluvial aquifers on KEPCO owned land, due to borefield pumping<br>• No change to minimal impact predicted at private bores |

| Aspect | EIS Mine Plan | Revised Mine Plan |
|---|---|---|
| Air Quality and Greenhouse Gases | • No exceedances of air quality criteria.<br>• Annual average Scope 1 greenhouse gas emissions of 0.09 Mt $CO_{2-e}$.<br>• Annual average Scope 2 greenhouse gas emissions of 0.05 Mt $CO_{2-e}$.<br>• Annual average Scope 3 greenhouse gas emissions of 7.90 Mt $CO_{2-e}$. | • No exceedances of air quality criteria.<br>• Reduction in peak particulate emissions of 40% for $PM_{10}$ and 48% for $PM_{2.5}$.<br>• Scope 1 $CO_{2-e}$ reduced by 3.9%.<br>• Scope 2 $CO_{2-e}$ reduced by 1.4%.<br>• Scope 3 $CO_{2-e}$ reduced by 2.7%. |
| Noise | • One landowner with significant (>40dBA) noise impacts.<br>• One landowner with moderate (>37dBA) noise impacts.<br>• One landowner (three residences) with negligible noise impacts (>35dBA). | • No landowners with significant (>40dBA) noise impacts (i.e no residences in acquisition zone[1]).<br>• Two landowners with moderate (>37dBA) noise impacts.<br>• One landowner (three residences) with negligible noise impacts (>35dBA). |
| Blasting | • No exceedances.<br>• Tarwyn Park homestead and stables within 107 m of blasting, requiring specific blast management strategy to manage impacts. | • No exceedances.<br>• Tarwyn Park homestead and stables more than 1.4 km from blasting.<br>• Impacts monitored and managed through a Blast Management Plan. |
| Traffic and Transport | • Construction stage has the highest traffic impacts, however no material capacity performance or constraints.<br>• Road safety upgrades and maintenance contributions. | • Marginal changes only as only small changes in peak construction and operational workforces. |
| Economic | • Net benefits of $315 million to NSW including $290 million in royalties.<br>• Economic benefit to regional economy of $5.16 - 5.34 billion Gross Regional Income. | • Net benefits of $302 million to NSW, including $278 million in royalties (4% reduction).<br>• Economic benefit to regional economy of $4.76 - 4.95 billion Gross Regional Income. |
| Social | • Key positive and negative social impacts as described above.<br>• Social cohesion, local impacts on Bylong Valley community. | • Reduction in negative social impacts associated with removal of mining on Tarwyn Park.<br>• Minor reductions in amenity impacts. |

(1) The *Voluntary Land Acquisition and Mitigation Policy* (VLAMP) identifies the significance of noise levels and the noise criteria for triggering acquisition and mitigation rights.

## 1.5 Other relevant changes

The development application included a Workforce Accommodation Facility (WAF) during the construction stage. Following further consultation with the Department and Mid-Western Regional Council, KEPCO has now removed the WAF from the project. KEPCO propose to still use the WAF site area for car parking, first aid and administration offices. Further discussion on the removal of the WAF is provided in Section 2.7 of this report.

KEPCO has also completed further acquisitions of properties surrounding the project and reached an acquisition agreement with one additional landowner, subject to approval of the mine. Figures 3 and 4 show the current landownership status. There are no landowners remaining in the acquisition zone as defined in the *Voluntary Land Acquisition and Mitigation Policy* (VLAMP).

These additional acquisitions/ agreements include all remaining landholdings in the Upper Lee Creek catchment. The acquisition of these properties removes the need for a public road access to these properties from Bylong via the proposed North Link Road during the life of the mine.

However, the potential to retain public road access from the north from Bylong to Lee Creek Road as part of the final rehabilitation of the mine has been recommended by the Heritage Council. This recommendation is to return key aspects of the historical and scenic context of the Bylong valley into the landscape once mining has ceased. This aspect is discussed further in Section 2.6 of this report.

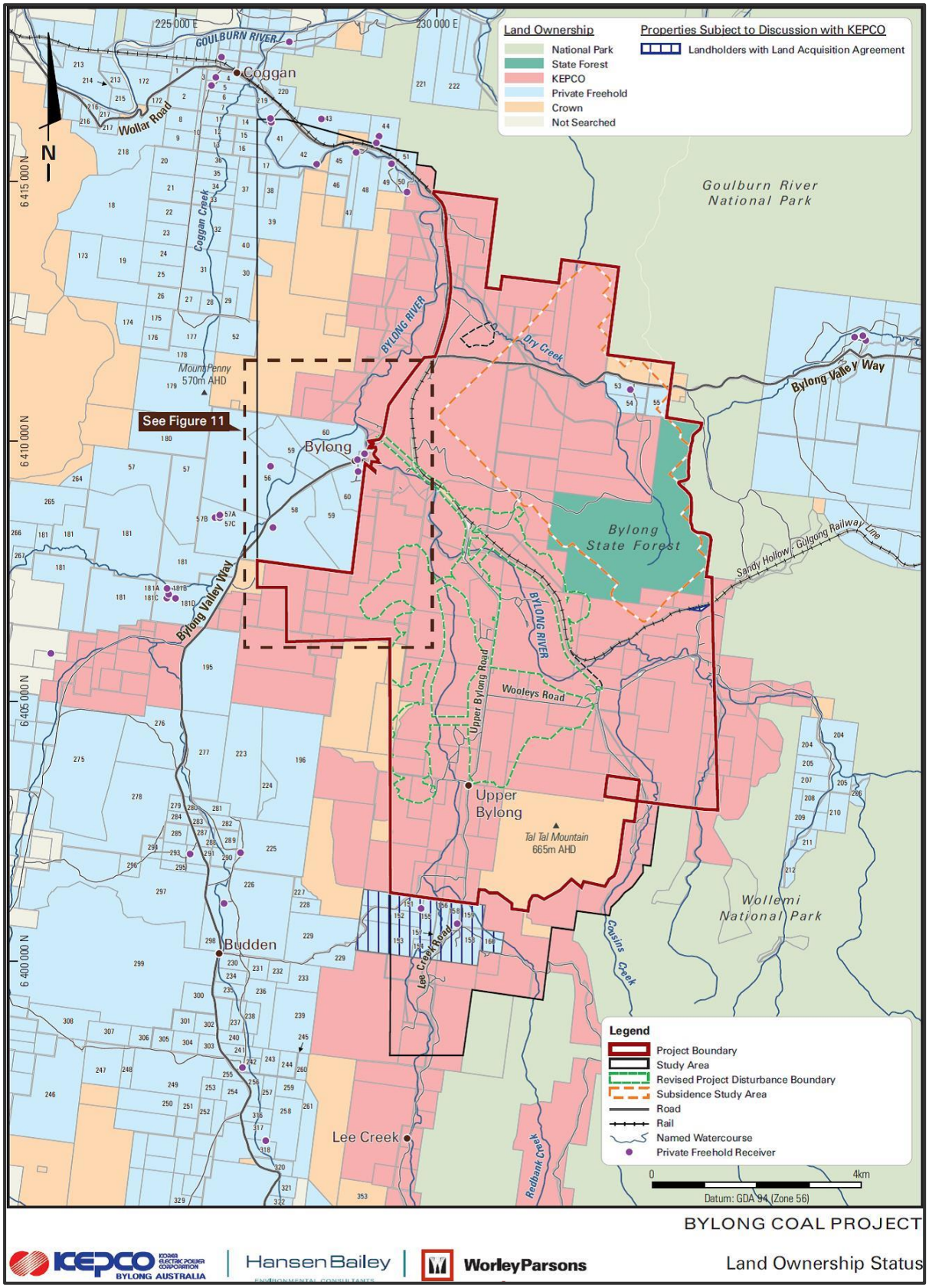



**Figure 3** | Landownership

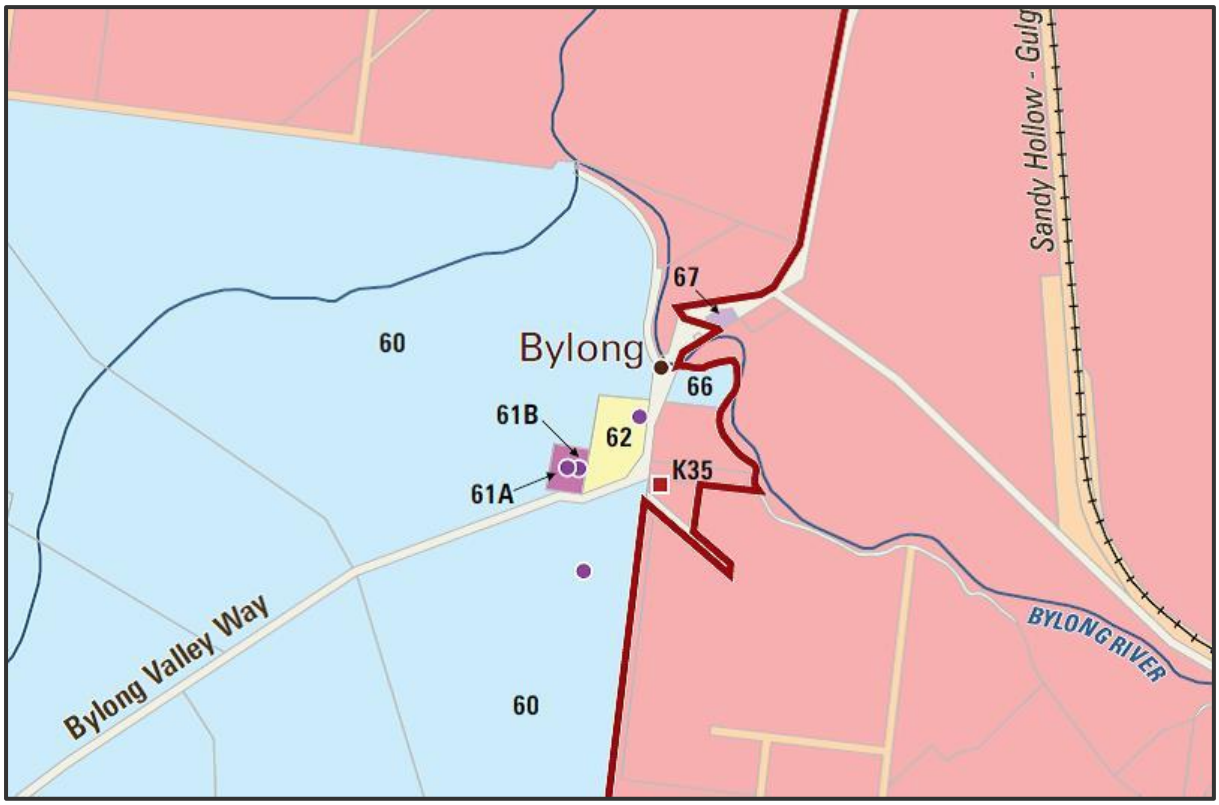



**Figure 4** | Landownership around Bylong Village Area (see Figure 3 for map legend details)

KEPCO has now acquired the Bylong Village store and associated residence (ID K35) and has continued its operation through a commercial lease and is committed to operating the store and services, through the project life. There is one remaining residence on the property Eagle Hill in private ownership that is located in the Bylong Village precinct (ID60).

Noise levels at the residence are reduced by 1 dB(A) due to the Revised Mine Plan, reducing the noise impact from significant (affording acquisition rights under the VLAMP) to moderate (affording mitigation rights under the VLAMP). The Bylong Hall (ID 62) remains a key focal point of the Village, with recreational and public amenities, and remains in the ownership of the Bylong Hall Committee Incorporated.

The upgrade to the unsealed Wollar to Bylong Road is also now well advanced with the works, including sealing of the road, estimated to be completed by November 2018.

## 1.6 Statutory Considerations

In Section 4 and Appendix J of the PAR the Department provided a summary of how the statutory requirements of Section the then 79C(1) of the EP&A Act were considered in the assessment of the project.

The EP&A Act was amended on 1 March 2018 with Section 4.15 outlining the matters a consent authority must take into consideration when determining development applications. The objects of the EP&A Act have also been amended.

The Department has updated its consideration of the relevant provisions of the objects of the Act and relevant provisions of environmental planning instruments in Appendix F.

## 1.7 Bilateral Assessment

The Department included a detailed consideration of Matters of National Environmental Significance (MNES) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) in Appendix L of the PAR. OEH also provided advice on Commonwealth matters as detailed in Appendix K of the PAR. The Department has addressed residual concerns on the assessment of Commonwealth matters in Appendix G, including further consideration of offsets for derived native grassland, consideration of the recently released bioregional assessment package for the Northern Sydney Basin - Hunter Subregion and revised conditions to address Commonwealth matters.

# 2. Consideration of Commission's Review

## 2.1 Overview of the Commission's Review

The overall conclusion of the Commission was that substantial doubt persisted about the potential benefits and impacts on the project, and that further careful weighing up and balancing will be required prior to any decision on the project.

The Commission provided a range of findings covering a number of aspects of the project that in the Commission's view needed further consideration.

The Commission's key findings relate to the aspects referred to in the Minister's terms of reference for the review, namely impacts on water and agricultural resources, social impacts on Bylong village and surrounds, heritage impacts associated with the Tarwyn Park property and justification for the open cut stage of the project.

While the Department provided draft conditions as part of the PAR, the Commission did not consider these in detail its merit review advising that while the recommendations were a useful input, consideration of these recommendations were not central in its review.

## 2.2 Key Issues Raised by the Commission

The Department has focused its Final Assessment Report on key findings of the Commission on the project. The Commission also made many observations and comments which KEPCO has responded to in detail (see Appendix A of the RtPR Report).

A summary of the Commission's key issues requiring further consideration is provided in Table 5 below, while a more detailed discussion is provided in subsequent sections.

**Table 5** | Issues Requiring Further Consideration

| *Issues requiring further consideration* | *Consideration* |
|---|---|
| ***Mine Plan Justification and Economic Evaluation*** | |
| • Integrated mine plan and need for the open cut stage<br>• Open cut product coal quality<br>• Support of the Korean government<br>• Economic evaluation – benefit cost analysis<br>• Computable general equilibrium (CGE) modelling<br>• Risk of project failure | See Section 2.3 |
| ***Water Resources*** | |
| • Groundwater development<br>• Groundwater model uncertainty<br>• Water supply and entitlements<br>• Water inflow and entitlements<br>• Water balance and management of excess water<br>• Water resources – other matters | See Section 2.4 |
| ***Agriculture*** | |
| • Competing land uses and loss of agricultural production<br>• Commitment to managing agricultural activities<br>• Biophysical Strategic Agricultural Land (BSAL) and rehabilitation | See Section 2.5 |

| *Issues requiring further consideration* | *Consideration* |
|---|---|
| ***Heritage and Landscape Values*** | |
| • Heritage significance and impacts on Tarwyn Park<br>• Landscape heritage values and impacts<br>• Aboriginal heritage | See Section 2.6 |
| ***Social Impacts*** | |
| • Adequacy of the social impact assessment and mitigation measures<br>• Voluntary planning agreement<br>• Workforce accommodation facility | See Section 2.7 |
| ***Subsidence*** | |
| • Cliff lines<br>• Bylong Valley Way | See Section 2.8 |
| ***Lighting – Dark Sky Region*** | |
| • Siding Spring Observatory | See Section 2.9 |
| ***Biodiversity*** | |
| • Security for offset area 5<br>• Other biodiversity matters requiring careful consideration | See Section 2.10 |
| ***Transport and Traffic*** | |
| • Traffic funding – Mid-Western Regional Council<br>• Traffic from the Hunter Valley<br>• School bus routes | See Section 2.11 |
| ***Air, Noise and Blasting*** | |
| • Application of the Voluntary Land Acquisition and Mitigation Policy<br>• Diesel emissions<br>• Background air quality<br>• Low frequency noise<br>• Blast impacts – Tarwyn Park and sensitive sites | Section 2.12 |

To address residual issues raised by the Commission, the Department has consulted with the Environment Protection Authority (EPA), Office and Environment and Heritage (OEH), Department of Industry – Lands and Water (DoI - L&W), Division of Resources and Geoscience (DRG) Mid-Western Regional Council (MWRC) and the Heritage Council. The responses from these agencies (see **Appendix D**) are discussed as part of the Department's consideration of the Commission's findings.

## 2.3 Mine Plan Justification and Economic Evaluation

### Integrated Mine Plan and Need for the Open Cut

***Commission Findings***

- As it stands, there is insufficient evidence to conclude that the open cut is vital to the project, or that an alternative development without the open cut would not be in the public interest.
- There was no separate detailed assessment of a standalone open cut or underground mine.
- The Commission is not yet persuaded by "all-or-none" arguments for the open cut and underground asserted by the applicant because they are at this stage, largely unsupported by probative evidence.

In response to the Commission's findings, KEPCO commissioned John T Boyd Company Pty Ltd (JT Boyd - see Appendix T of the RtPR Report) to undertake a peer review of the justification for the integrated mine plan, including further assessment of a potential "hypothetical" standalone underground mine option.

This further review is in addition to the reports prepared by KEPCO for the assessment including:

- Environmental Assessment Appendix E – Mine Plan Justification Report (Mine Advice Pty Ltd);
- Response to Submissions Appendix G – Supplementary Mine Plan Justification Report (Mine Advice Pty Ltd);
- Supplementary Response to Submissions Appendix A – Mine Plan Justification Report – Additional Supporting Information (Hansen Bailey); and
- Planning Assessment Commission Hearing – Public Hearing Response, Appendix C – Independent Mine Plan Peer Review (John T Boyd).

In addition to this information, further supporting information considered in JT Boyd's review includes:

- an updated analysis of the demand for coal supply for Korean power generation markets;
- an analysis of thermal coal product quality for proposed Korean and other international markets;
- recent 2017 forecasts from the International Energy Agency (IEA) and Australian Department of Industry Innovation and Science on global coal demand to 2040; and
- a high-level review of the financial viability of a standalone underground only mine compared to the proposed project.

Similarly, to the previous mine plan justification reports, this review emphasises the importance of the open cut stage of the integrated mine plan and concludes that that the open cut mine footprint has been significantly reduced to minimise impacts on the environment, but allows for a financially viable project.

The peer review found that the "hypothetical" underground only operation would not be financially viable and there would be a decrease of 93% in net present value compared to the integrated mine plan. Boyd concludes that *"the hypothetical underground mine scenario is not feasible or viable."*

The financial viability of the proposed project is not a determinative issue for a consent authority with investment risk ultimately a decision for the applicant. Notwithstanding, KEPCO, supported by its expert reviewers, argues that the integrated mine project as proposed is financially viable and that from an economic efficiency perspective, the project would provide a significant net benefit to NSW.

Conversely, KEPCO has advised that it would not proceed with the project without an open cut stage.

As discussed above, at the request of the Department, KEPCO has provided a Revised Mine Plan that reduces the open cut mine resource by around 14% but retains the key project elements required by KEPCO including an open cut void for reject emplacement and for use as a water storage during underground mining operations.

The Department also notes that Lock the Gate Alliance provided a further submission on the project (see Appendix E1) with a report prepared by the Institute for Energy Economic and Financial Analysis (IEEFA) on the economic evaluation and justification for the project. In particular, concerns are raised about the support by KEPCO and the Korean government through its energy policy, coal price forecasts and royalties, and impacts on net benefits to NSW.

KEPCO has responded to the IEFFA submission in Appendix M of the Revised Mine Plan Supplementary Report. This submission and KEPCO's response are considered further by the Department below.

### Open Cut Product Coal Quality

***Commission Finding***

- The open cut is a marginal operation due to quality (high ash) and it is not demonstrated that it is vital to the project.

The Commission queried whether the open cut stage was justified as the higher ash content of the open cut coal may not be suitable for its targeted power generation market.

In response to the Commission's findings, KEPCO provided further advice on proposed markets for its product coal. During open cut mining operations both the Ulan and Coggan coal seams are the main targets, with target product coal ash (air dried %) specifications being, Coggan (16%) and Ulan (22%). The underground mine targets the lower ash Coggan seam only.

Based on the EIS Mine Plan, over the first 8 years of open cut mining, with 4 years being concurrent with underground mining, it is estimated that 9.6 Mt of high ash coal would be produced out of a total of 30.9 Mt of product coal. That is, approximately 31% of the coal during open cut mining operations would be the higher ash coal from the Ulan seam. The Revised Mine Plan reduces the open cut mine period by one year with a reduction of around 2.5 Mt of product coal from both the Ulan and Coggan seams.

JT Boyd provided an analysis on the markets available for the higher ash coal contained in the target Ulan seam during open cut mining operations. The report identifies that the existing KEPCO power generation companies typically require a maximum of 17% ash, with some specifications increasing to 20% and in some minor cases 30% ash.

The review highlights that blending of different coal products to meet thermal coal specifications for power stations is common practice and that an 80:20 blend of the two Bylong Coal seams during open cut and combined open cut/ underground stages would provide a suitable specification for the target markets, with additional markets also available for the remaining higher ash coal.

The Department and DRG accept that there are available markets for the higher ash coal from the open cut coal seams and that blending of coal of different ash quality, along with other product specifications, is common practice to achieve the target coal quality for individual power stations.

### Support of the Korean Government

***Commission Finding***

- The Korean government announcements on reducing reliance on coal power raise questions on the risks and overall merit of the open cut operation.

KEPCO in its RtPR Report has reiterated the importance of the project to KEPCO Korea (51% owned by the South Korean government) and its subsidiary power generation companies.

KEPCO Korea provided a letter of support (see Appendix C of the RtPR Report) confirming that, while it is committed to increased investment in renewable energy, over the 25-year life of the project coal power generation would continue to be dominant source of energy in South Korea. Through its five South Korean power generating subsidiaries, KEPCO Korea provides more than 80% of Korea's electricity generation, with coal providing 40% of total electricity generation.

KEPCO Korea confirmed that the supply of up to 5 Mtpa of product coal from the project is an important component of KEPCO Korea's electricity generation requirements over the project's life.

The IEEFA submission argues that recent changes in energy policy from 2017 to 2031 in South Korea[2] (which proposes a significant increase in energy from renewables), demonstrate that the project is not necessary to meet demand for coal in Korea. This is because the policy proposing to increase the percentage share of renewables

[2] The 8th Basic Plan for Long-term Electricity Supply and Demand 2017-2031, Dec 2017.

from 6.7% to 20% and a reduction in coal from 45% down to 36%, and proposed conversion of some coal plants to LNG.

KEPCO in its response to the IEEFA submission highlights that even under the new policy that coal power generation would continue to make an important contribution to South Korea's energy mix, with the energy plan identifying that, while the percentage contribution reduces, the total capacity of coal-fired plants would increase from 36.8 GW to 39.9 GW (see the Revised Mine Plan Supplementary Report - Appendix M). Further, the coal from Bylong has low sulphur content which meets new South Korean regulations.

The Department requested DRG to provide an updated resource significance assessment based on the Revised Mine Plan and changes to coal price forecasts (see Appendix D5). DRG concluded that the reduction in total tonnage from the project area would not have any significant impact on either total export revenue or total royalty from the project, and that DRG takes a conservative view of coal price forecasting. DRG advised that its previous advice *"stands with regard to the size, quality and availability of the resource (including market segment), resource recovery, and royalty."*

That is, both the Department and DRG accept that there is a broader demand for the coal resource from the project and that there would be an ongoing demand for thermal coal for the South Korean electricity generation over the life of the project.

The Department is assessing the merits of the proposed project on the land identified in the development application. If the project was approved, the development consent would be tied to the land and like any development, the proponent could change over the life of the consent. Ultimately, the energy policy of the Korean government is not directly relevant to the merit assessment of the project under the EP&A Act, and presumably the project would not be developed if there are no customers for the product coal.

### Economic Evaluation - Benefit Cost Analysis (BCA)

***Commission Finding***

- Assumptions under-pinning the cost benefit analysis were not fully transparent and in some cases problematic including:
  - sensitivity of coal price and exchange rates;
  - treatment of externalities including greenhouse, transport accidents costs and heritage values;
  - inclusion of government funding (Bylong-Wollar Road upgrade).

To address the Commission's findings, Gillespie Economics (Gillespie) (see Appendix W of the RtPR Report) provided a summary of the assumptions prepared for the BCA for the project. The key points from this response include:

- a concise summary of key assumptions used in the BCA;
- the BCA was peer reviewed by Centre for International Economics (CIE) for the Department including a request that the sensitivity analysis for key parameters be increased from +/- 20% to +/- 30% to assess an increased range in changes to coal prices and in the USD: AUD exchange rate;
- a reduction in 30% in the coal price would reduce the net social benefit accrued to NSW from $315 million to $207 million, but would still provide a significant net social benefit;
- coal price estimates used in the BCA were supported by CIE, noting that the coal prices were also consistent with estimates of future coal prices from NSW Trade and Investment;
- allocation of costs associated with greenhouse gas emissions was undertaken in accordance with NSW guidelines, in that it proportionally allocated costs to NSW households;
- inclusion of transport accident costs would not significantly affect the BCA as from a NSW perspective, there would be a spatial redistribution of employment, traffic and potential accidents, that is it is unlikely that there would be a significant net change in accidents that would materially affect the BCA;
- given the substantial net social benefit of $302 Million (net present value) for the Revised Mine Plan, even with the sensitivity analysis, inclusion of additional heritage values would not substantially affect the outcomes of the BCA, noting that the BCA valued the impact on historic heritage items at $1 Million (net present value), noting that there has been a reduction in impacts on heritage with the Revised Mine Plan; and

- the Bylong-Wollar road upgrade is already underway and would be completed regardless of the project, therefore, consistent with NSW Government guidelines, it is not a consideration in the economic evaluation of the project.

Gillespie also undertook a review of the economic evaluation of the Revised Mine Plan (see Revised Mine Plan Supplementary Report – Appendix L). Overall, there would be a reduction in net benefits to NSW from $315 million to $302 million.

Gillespie also recalculated the net benefits for both the EIS Mine Plan and Revised Mine Plan based on changed assumptions to company tax accruing to NSW. The EIS assumed a 28.5% company tax with 7% accruing to NSW. *The NSW Guidelines for the economic assessment of mining and coal seam gas proposals*, identifies that 32% (based on the proportion of the NSW population to Australia) should accrue to NSW. Gillespie used a 30% company tax rate in line with current rates. Using these changed assumptions increases the net benefits for the Revised Mine Plan to NSW from $302 to $380 million.

Lock the Gate/ IEEFA in its submission argue that the coal prices used in the BCA are not reasonable nor reliable and that therefore the benefits from royalties as stated would not be realised. This view is based on the KPMG March/ April consensus price long term average forecast for Newcastle benchmark thermal coal of US$65.3/ tonne (equivalent to around AUD$87 using a long- term exchange rate forecast of 0.75).

Further, IEEFA argues that due to potential debt associated with equity funding, estimates of company tax benefits to NSW would also be lower than stated. The submission also states that the lower quality of coal would further reduce royalties and tax benefits accruing to the project and question therefore whether the benefits of the project would outweigh the impacts.

Gillespie responded to the IEEFA submission with the following key points:

- the coal price forecasts used in the EIS accounted for the quality of the coal;
- the assumed base-case coal price was based on an exchange rate of 0.84, noting that the exchange rate is now more favourable for export coal;
- the current coal price is well in excess of the base case forecast price used for the BCA, noting that the current benchmark price is around USD 105.4/ tonne, compared to the KPMG 2018 forecast price of USD $90.2/ tonne, highlighting the difficulty in forecasts in coal prices;
- while the calorific value of the Bylong Coal is below the benchmark, it is a low sulphur coal which meets Korean regulatory requirements; and
- acknowledges that long term forecasts would vary in response to unexpected changes in supply and demand and that this uncertainty is best addressed through sensitivity analysis.

The additional analysis by IEEFA and Gillespie highlights the differing views on coal price forecasts and its likely effect on royalty streams and net benefits. DRG in its estimates of royalties generated for mining projects, including for Bylong, highlights that *"coal price forecasting is inherently difficult over the long-term time frame of the project there will be many variations in coal price."*

For Bylong, DRG recognised the variation in quality between the coal seams in its estimate of royalties generated of around $266 million (net present value), based on a coal price of between AUD $75-110 AUD. DRG in more recent assessments of coal resources has estimated long term coal prices for thermal export coal[3] of varying quality between AUD $80-$110. As outlined above, DRG provided updated advice on the Revised Mine Plan confirming that there would be no significant impact on its previous estimate of royalties or total export revenue and that DRG takes a conservative view of coal price forecasting.

The Department notes the following:

- the EIS uses a coal price in the range $90-100 AUD;
- there is always uncertainty in predicting resource commodity prices, including coal, further complicated by considering the influence of exchange rates – this uncertainty is dealt with in the Bylong assessment through sensitivity testing;

[3] Bloomfield Extension Project, March 2018, Mt Pleasant Mod 3 Extension, Aug 2017.

- as recommended by CIE, sensitivity testing of +/- 30% was applied to coal prices, with the range accounting for the long- term forecast KPMG consensus coal price of $AUD 87 and coal quality;
- based on this sensitivity testing and a 7% discount rate, the net social benefits of the EIS Project to NSW ranges from $207 million to $425 million; and
- that is, based on the BCA, there would still be substantial net benefit to NSW through royalties and company tax at the low forecast range of coal prices.

The Department considers that the BCA provides a robust and reliable assessment of the likely range in the net benefits of the project to NSW and that it was undertaken generally in accordance with NSW Government policy and guidelines.

Ultimately, the precise financial viability of the project is a matter for the Applicant and is not a relevant matter for assessment of the merits of the project under the EP&A Act. If the project is unlikely to be profitable it will not proceed.

### Computable General Equilibrium (CGE) Modelling

***Commission Finding***

- An assessment based on alternative measures derived from Computable General Equilibrium (CGE) modelling would help calibrate the expected welfare gain to the community

Cadence Economics was commissioned by KEPCO to undertake CGE modelling of the economic impacts of the project on the MWRC area and NSW. This work is in addition to the cost benefit assessment and input-output (I/O) modelling completed by Gillespie for the project. Gillespie provides further analysis of the differences between the two methodologies (see Appendix W of the RtPR Report).

The results of the modelling are consistent with the I/O analysis completed for the EIS in demonstrating there would be significant flow on benefits for the regional economy as measured by gross regional income (GRI), gross regional product (GRP) and increase in employment. The results are summarised in Table 6.

**Table 6** | Summary of Regional Benefits – I/O and CGE modelling

| *Economic Modelling* | *Annual GRP ($M)* | *Annual GRI ($M)* | *Annual Employment* |
|---|---|---|---|
| I/O Modelling | 380(1) | not measured | 830 (part time and full time) |
| CGE Modelling scenarios(2) | | | |
| full employment | 234 - 700 | 254 – 848 | - |
| moderate labour supply | 248 - 739 | 268 – 860 | 153 - 365 FTE |
| higher labour supply | 258 - 769 | 278 - 870 | 272 - 648 FTE |

(1) Average annual contribution to GRP over the project life.
(2) CGE Modelling included sensitivity analysis on availability of labour supply from full employment (zero elasticity in the labour market), moderate labour availability at 0.15 elasticity and a higher labour availability at 0.30 elasticity.

The I/O modelling brackets the predicted range for GRP from the CGE modelling. The lower estimates for the increase in regional employment is due to different assumptions about full vs. part time employment and workforce availability in the regional labour market – with I/O analysis assuming infinite labour elasticity (i.e there would be new employees added to the workforce rather than existing employees moving to new employment).

The CGE modelling supports the conclusion that the project would provide a significant increase in regional employment opportunities during mining operations, with the lower bounds of the CGE modelling still showing significant benefits.

Cadence Economics revised the CGE modelling for the Revised Mine Plan resulting in a 4-7% reduction in the regional benefits compared to the EIS Mine Plan. However, the modelling shows that significant regional economic benefits to the regional economy would be realised.

The potential regional economic benefits of the project are emphasised by MWRC in its letter of support of the project (see Appendix B of the RtPR Report) which outlines the importance of the project to the regional economy,

particularly due to recent closures of large regional employer including Kandos cement and Charbon coal mine, and increased unemployment due to these closures.

This additional CGE modelling should provide further confidence to the Commission that the project as proposed would provide significant benefits to the regional and the NSW economies.

### Risk of Project Failure

***Commission Finding***

- The Commission notes that the project will lead to substantial and irreversible social and environmental impacts – while there is a risk that is stated benefits may only be partially realised or not at all. The risk of project failure is likely to be a continued concern of the community, as represented in submissions

KEPCO also provided a response to the Commission's concerns about the risk of project failure and that impacts could occur without benefits being realised. KEPCO noted that:

- significant benefits through royalties would accrue early in the mine life, by year 3 of the project and would average around $33 million per year over the life of the project;
- local and regional benefits, as identified in the local effects analysis (I/O and CGE analysis) also accrue early in the project life, through construction;
- it is highly unlikely that KEPCO would invest significant capital of $1.3 billion, to then abandon the project, given the ongoing demand for coal as an energy source in Korea and other markets, over the life of the project; and
- KEPCO would be required to hold security deposit arrangements with the NSW Government against rehabilitation liabilities throughout the life of the project.

The Department also notes that there are commitments through the Planning Agreement between KEPCO and MWRC for payment of $2.75 million towards community enhancement projects prior to the commencement of the project and that the Biodiversity Stewardship Agreements for offsetting biodiversity impacts are required to be secured within 2 years of commencement of the project.

There is inherent risk that any project may fail or not proceed even if approved, based on the financial decisions and the investment risk profile of an Applicant. This is not a reason for refusal of a project. KEPCO has made clear its commitment to develop the project and has invested $702 million in developing the project to date.

### Conclusions – Mine Plan Justification and Economic Evaluation

Following consideration of the Commission's findings, the response from KEPCO and submissions from Lock the Gate/ IEEFA, the Department accepts that an integrated mine plan incorporating an open cut is reasonable and that the project's benefits to NSW would outweigh its costs, including externalities. This is because:

- *Scale of the open cut:* the scale of the open cut resource has been substantially reduced over the last 7 years to two relatively small open cut pits and designed to minimise environmental impacts including:
  - avoiding alluvial floodplain areas and associated agricultural and water resources;
  - minimising impacts on Biophysical Strategic Agricultural Land (BSAL) and higher soil and land capability land outside of the floodplain, including commitments to rehabilitate the land to restore a high capability agricultural land use;
  - reducing the extent of air quality and noise amenity impacts, such that there are no significant impacts at residential receivers;
  - substantially reducing the visibility of the open cut mining operations from public vantage points along Bylong Valley Way, Bylong Village and from private receivers; and
  - the Revised Mine Plan further reduces the extent of the open cut mine and avoids direct impacts from mining operations on the Tarwyn Park landholding and the former Upper Bylong Catholic Church.
- *Economic benefits of the integrated mining project*: if both the open cut and underground components of the project are allowed to proceed, there are significant net benefits in the order of $302 million to NSW and to the regional economy through employment opportunities and significant increase in economic activity, as shown through Input/ Output (I/O) and the Computable General Equilibrium (CGE) economic modelling.

- *Viability of an underground only mine:* further peer review commissioned by KEPCO supported its previous conclusions that an underground only operation would not be financially viable, largely due to the cash flow generated by the open cut mining in the early stage of the project, and there would be a decrease of 93% in net present value compared to the integrated mine plan. KEPCO has advised that it would not proceed with an underground only mine, and therefore the economic and public benefit of the project would not accrue.

- *Resource sterilisation:* the project extracts only 8% of the in-situ open cut coal reserves in the coal authorisation area, while the removal of open cut completely would reduce the coal resource proposed to be mined by 26% which is worth more than $2 billion and $159 million in royalties, based on Division of Resources and Energy (DRG) value of the export value of the total coal resource of $8.7 billion and $610 million in royalties.

- *Operational requirements:* an integrated open cut/ underground mine is required to effectively manage coal rejects and excess water over the life of the mine in the open cut void. An underground only mine would still require substantial surface disturbance for emplacement of tailings, rejects and mine water storages - estimated at 400 ha. That is, the Upper Bylong Valley landscape would still be modified with an underground mine or with an integrated mine plan.

- *Development application:* finally, the Department is required to assess the integrated mine plan as proposed by KEPCO in its development application. While the Department has recommended mine plan revisions to further minimise impacts on Tarwyn Park, a determination on the integrated mine plan is required by the consent authority.

## 2.4 Water Resources

### Groundwater Development

***Commission Finding***

- The Commission sees that a summary outlining the course of particular issues would be beneficial, as they received increasingly detailed attention – to ensure transparency.

In response to the Commission's findings, KEPCO has compiled a comprehensive summary of the groundwater modelling and peer review completed for the project over a 7-year period (refer Table 1 and Appendix K of the RtPR Report).

The chronology shows the progressive development of the groundwater model in response to additional information and expert advice, such as the alluvial pump tests completed at the request of DoI-Water and key recommendations from agency expert peer reviewers, including the Department's expert Dr Frans Kalf and KEPCO's peer reviewer Dr Noel Merrick.

These recommendations led to the development of the groundwater model used for the Supplementary RTS which includes improvements to:

- estimates of the permeability and sustainable yield of the alluvial aquifer through the additional pump testing;

- modelling the connectivity between the sub-cropping coal seams and alluvial aquifers through using MODFLOW USG model code; and

- modelling of alluvial recharge through the unsaturated zone.

The additional pump testing completed for the RTS modelling in particular provided refinements on the predictions of yield from the alluvial aquifer, providing increased confidence in the ability of the aquifer to provide the project's water supply during the open cut mining stage. This model has been used to refine the predictions for the Revised Mine Plan.

The chronology of the model development over the last 7 years is summarised in Figure 5 below. It shows the substantial effort in groundwater model development that has been undertaken for the groundwater impact assessment of the project.

Independent peer review advice from the Gateway Panel, DoI - L&W, the Department's expert Dr Frans Kalf and the *Commonwealth Independent Expert Scientific Committee* (IESC) has led to refinements in the model which has reduced the uncertainty in the model.

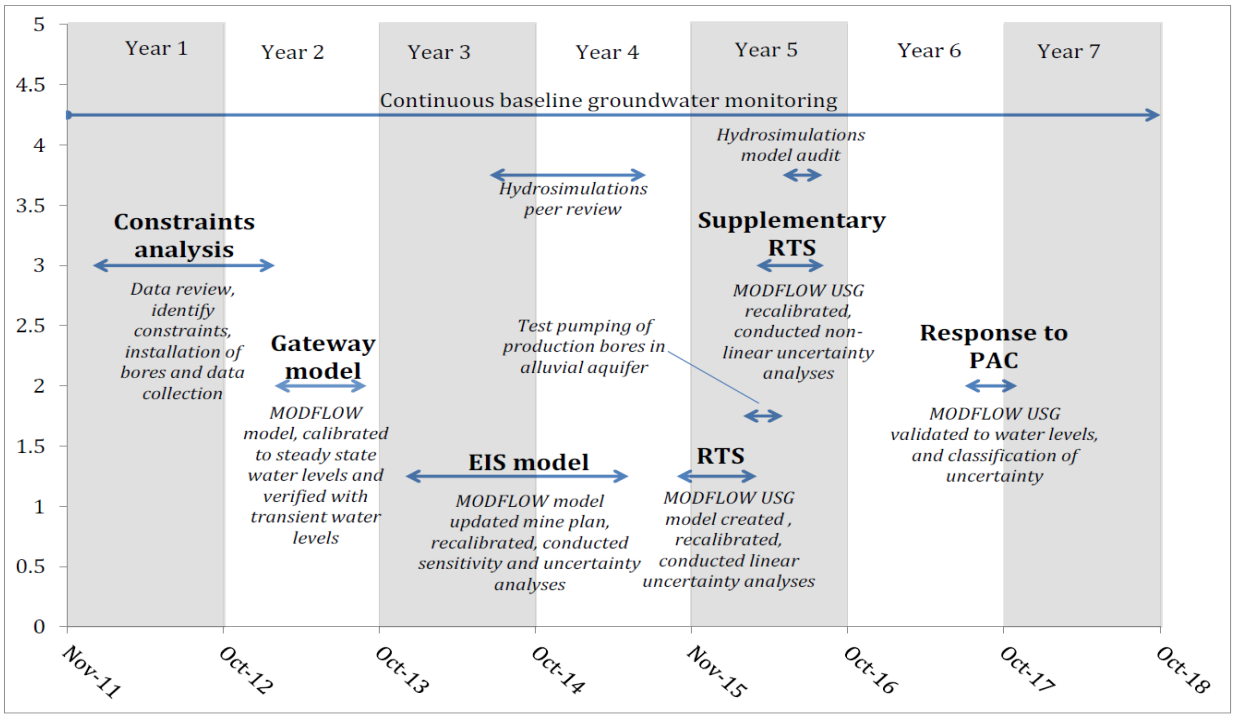



**Figure 5** | Groundwater Model Development

## Groundwater Model Uncertainty

### *Commission Findings*

- Doubt is still present amongst evidence and arguments on groundwater impacts and management strategies.
- There is uncertainty regarding the performance of and impacts on the alluvium and proposed management strategies.
- There is uncertainty on predicted offsite impacts, therefore details on "Make Good" arrangements for agricultural operations should be identified up front.
- The Commission notes persistent uncertainty around the potential for offsite water impacts.
- There is additional pressure and commercial risk on landowners through potential loss of water supply in a short time period.

In response to the Commission's concern on model uncertainty, AGE has provided further clarification on the uncertainty analysis completed for the Supplementary RTS modelling (see Appendix K of the RtPR Report).

While there is a level of uncertainty in any modelling, the groundwater impact assessment is supported by a statistical analysis of the predicted impacts based on the uncertainty analysis completed by AGE. The uncertainty analysis was informed by 140 calibrated model runs where key hydrological parameters, such as the vertical hydraulic conductivity, were varied.

The additional review by AGE provides further context to the predicted impacts using a likelihood scale of drawdown exceeding 2m, based on a composite of statistics from the model runs. This information is presented in Figure 6 below and includes results for the 0-1%ile range (categorised by AGE as almost certain to occur) and 99-100%ile range (categorised by AGE as exceptionally unlikely to occur).

The results indicate that it is exceptionally unlikely that drawdown impacts exceeding the 2m minimal impact drawdown target of the *Aquifer Interference Policy (AIP)* would occur at any privately-owned properties.

To provide further context, only one model run of the 140 model runs of the uncertainty analysis predicted an impact that exceeded the NSW Government's AIP minimal impact requirements on the alluvial aquifer outside of land owned by KEPCO. Under all other uncertainty analysis model runs, the 2m drawdown is confined to land owned by KEPCO within the Upper Bylong River valley catchment.

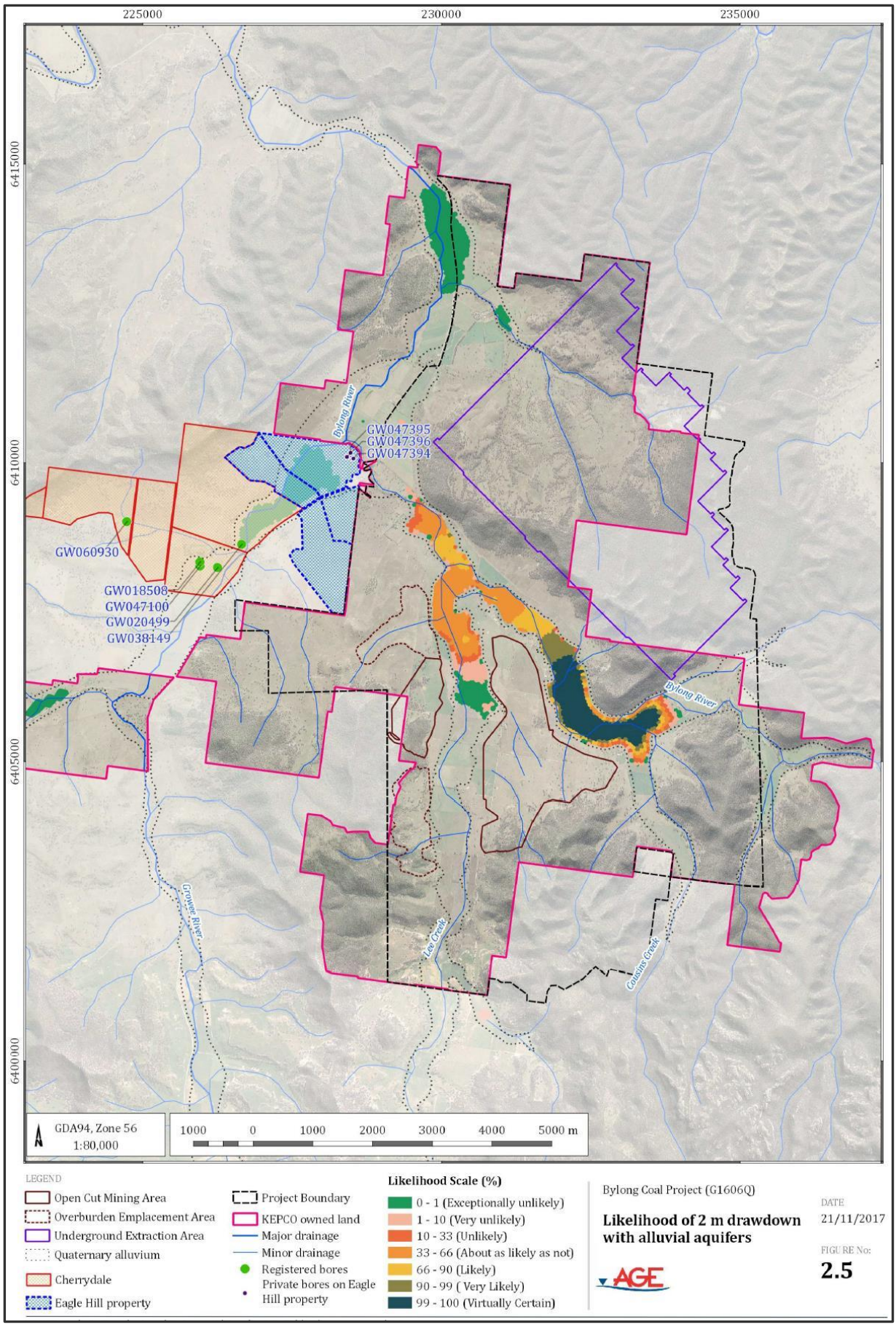



**Figure 6** | Likelihood of drawdown exceeding 2m in the alluvial aquifer

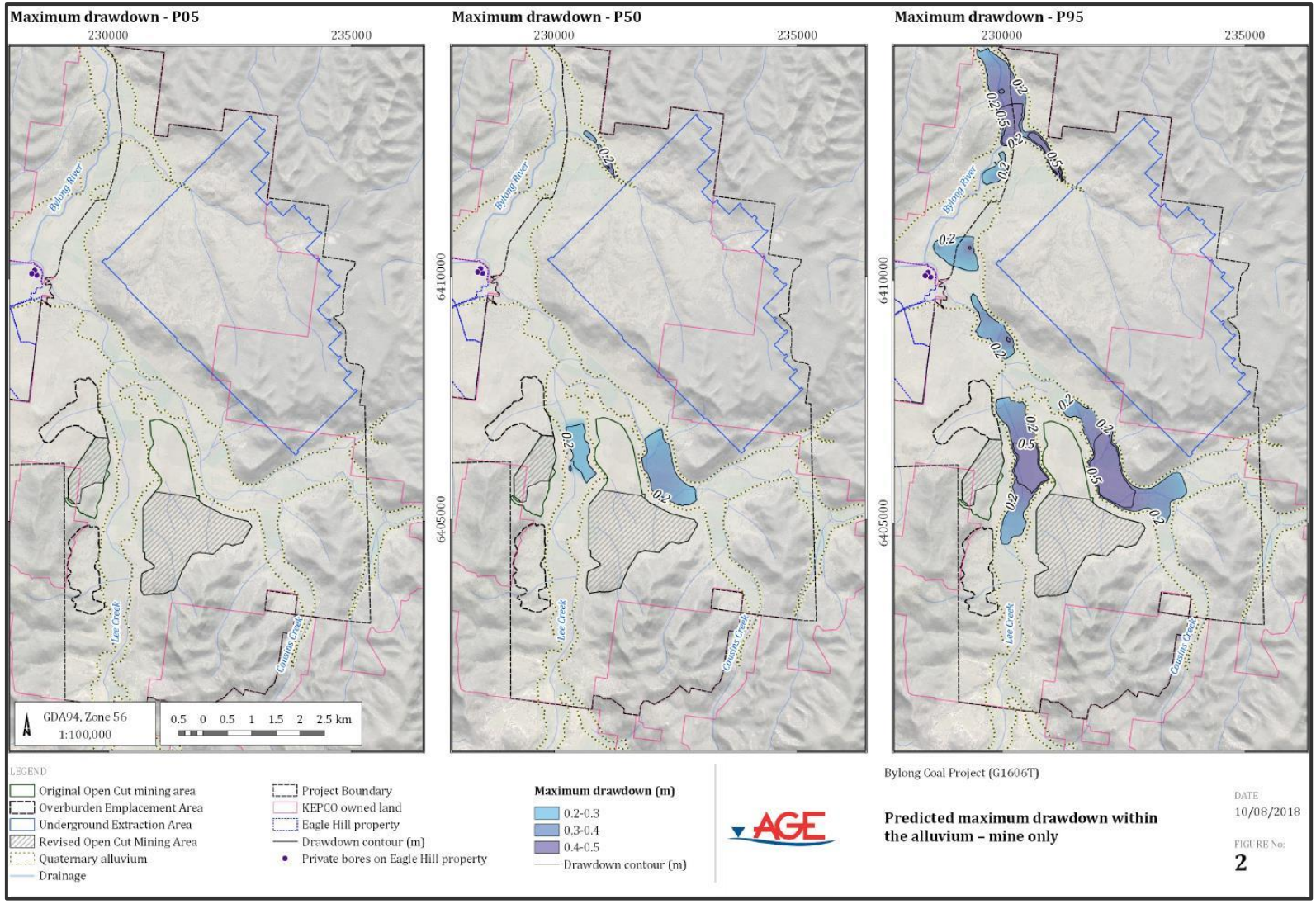



**Figure 7** | Drawdown in alluvial aquifer due to induced take from mining the Permian coal seam

The modelled drawdown shown in Figure 6 is due to the cumulative impacts of 3 activities by KEPCO:

- borefield pumping for mine water supply;
- borefield pumping for agricultural operations on KEPCO land; and
- from depressurisation of the coal seam in the Permian aquifer underlying the alluvial aquifer due to open cut and underground mining operations.

The largest contribution to drawdown in the alluvial aquifer is from borefield pumping for mine water supply during the shorter open cut mining period. This consumptive take of water would be regulated in accordance with the *Water Management Act 2000* (WM Act) and *Hunter Unregulated and Alluvial Water Sharing Plan* (Hunter WSP) which set rules to limit the take of water to protect all users in the relevant water source, in particular to protect stock and domestic users, and ensure sustainable take of water in the long term.

To show the predicted drawdown due to the depressurisation of the coal seam from mining operations only, AGE provided additional advice to the Department (see Appendix E3). Figure 7 above shows that the drawdown under the 95%ile uncertainty analysis is 0.5m and 0.2 m for the median modelling scenario. This predicted drawdown is well below the minimal impact criteria of 2m under the AIP.

While consumptive take from borefield pumping can be readily controlled in accordance with the regulatory requirements of the WM Act and rules of Water Sharing Plans to protect all water users, the induced take from depressurisation of the underlying coal seam from open cut and underground mining cannot be turned off and relies on groundwater recovery once mining ceases. The drawdown from this induced take of water is predicted to be minor compared to the effects of the borefield pumping.

AGE also provided updated information that the main target seam, the Coggan coal seam is hydraulically disconnected from the alluvial aquifers in the Growee River catchment due to the coal seams either being cut and removed by erosion or lying above the water table.

To address the concerns of the Commission on how impacts would be managed and monitored, KEPCO has submitted a draft Water Management Plan. The draft plan includes the following key management elements for monitoring and managing impacts on private water users:

- extensive existing groundwater monitoring program including 97 open standpipes and 14 vibrating wire piezometers, with 56 of these monitors within the alluvium[4];
- proposal to install an additional 17 bores in the alluvium, including targeting aquifers adjacent to private landowners;
- ongoing groundwater model validation and calibration over the life of the mine;
- trigger action response plans based on monitored groundwater levels and quality; and
- proposed compensatory water supply agreements with private landowners, including baseline bore and bore impact assessments.

As described in the Department's PAR, the recommended conditions included a requirement to provide compensatory water supply to the owner of any privately-owned land whose water supply is adversely affected because of the development. Even though the modelling predicts that impacts are extremely unlikely, to address the Commission's concerns, KEPCO has prepared compensatory water agreements that would be triggered, subject to landowner agreement, if the water supply of landowners were to be affected by the mine.

To demonstrate its commitment to consult with landowners, at the time of this report, KEPCO has provided copies of the draft agreement to 13 landowners and has met with 10 of these landowners about entering compensatory water supply agreements. Regardless of whether agreements are entered in to with landholders, the Department's recommended condition requires KEPCO to provide a compensatory water supply if the loss of supply (other than a negligible impact) is due to the mine.

DoI - L&W in its response to the RtPR Report (see Appendix D1) advised it was satisfied with the Department's recommended conditions, and commitments by KEPCO to ensure adequate compensatory measures for impacts

[4] There are also a further 7 DoI -L&W monitoring bores in the Bylong River catchment installed for the management of the Water Sharing Plan.

on private users. KEPCO would be required to consult further with DoI - L&W in finalising the draft Water Management Plan, if the project were approved.

The Department has also received further correspondence about the compensatory water agreements from the owner of the "Budden" property (see Appendix E2). The Budden property is located in the Growee river catchment, approximately 4 km upstream of the Growee River's confluence with the Bylong River. The property is outside the area of predicted drawdown impact under all uncertainty assessment model runs completed for the groundwater modelling.

The key concern of the landowner is to ensure the supply of stock water for cattle within a 2-day period if its water source were to be affected by the mine and that KEPCO should be required to cease pumping if Budden's water supply is affected.

While impacts on private bores is exceptionally unlikely to occur based on the modelling, KEPCO has committed in its compensatory water agreement that it would provide an interim water supply to landowners for domestic and livestock use within 24 hours. However, the Department notes that this is subject to both parties agreeing that the water supply is impacted as a result of the project, including potentially lengthy dispute resolution processes.

The Department has revised the compensatory water condition to make it clear that the burden of proof is on KEPCO to demonstrate that its operations has not affected a private water supply. That is, it would be expected that unless there is clear evidence provided through KEPCO's monitoring and modelling program and investigation and action trigger process, that KEPCO would be required to provide compensatory water supply – particularly in the case for stock and domestic supply.

The recommended project conditions require KEPCO to identify groundwater investigation triggers, including triggers for impacts on groundwater levels and water supply. To ensure that delays are limited to ensure that compensatory water is delivered quickly for stock and domestic purposes, the proposed groundwater monitoring program by KEPCO would need to include clear investigation triggers on groundwater drawdown. KEPCO has provided preliminary investigation triggers in its draft Water Management Plan which would be finalised in consultation with DoI - L&W, if the project is approved.

In relation to requests to cease to pump, DoI - L&W has advised the Department that the *Water Sharing Plan for the Hunter Unregulated and Alluvial Water Sources 2009* makes provision for introduction of cease to take rules by year 10 of the plan (that is from 2019), based on studies to determine appropriate groundwater levels and trigger points. The WM Act also includes provisions for temporary water restrictions to apply to maintain or protect water levels in an aquifer. That is, as outlined above, consumptive take of water (excluding stock and domestic) from this water source would be managed under the provisions of the Water Sharing Plan and all users, including KEPCO, would need to restrict its take in accordance with these rules.

### Water Supply and Entitlements

***Commission Findings***

- The Commission finds it difficult to accept the applicant's and the Department's assertions that there is a low probability of dry periods over the life of the mine, which would lead to impacts that only need to be identified and managed post approval.
- The Commission's view is that the available evidence of existing variability in the alluvial aquifers, as well as potential as well as potential effects of climatic variability, suggest there is uncertainty about potential consequences. This necessitates that the risk of impacts requires very careful consideration before a decision is made on the project.
- The Department of Primary Industries suggested that the applicant should identify a non-alluvial make up water source to serve as a contingency against any shortfalls in water availability.
- Department of Primary Industries advised that surface water losses may not be correctly accounted.

In response to the Commission's findings, KEPCO provided further analysis on the available water supply and entitlement from the alluvium/ surface waters and the Permian aquifers.

AGE also provided further analysis of groundwater availability from the proposed borefield. A concern of the Commission was that the modelling may not have fully considered climate variability. AGE referred to the information from the Supplementary RTS that the groundwater recharge used in the modelling covered the period 2000-2013, a period which includes a large part of the "Millennium drought".

AGE argues that drought periods are already built into the model predictions and that the uncertainty analysis, with recharge reduced by up to 14 times below the base-case model run, also has the effect of modelling drought conditions, with substantially reduced recharge into the model domain.

Based on the Revised Mine Plan, predicted peak project water demand from the borefield in a very dry year (1%ile dry year) is 1,345 ML/year, consistent with the predictions based on the EIS Mine Plan. As described in the

Supplementary RTS report and the PAR (with further clarification provided in the RtPR Report), the proposed 8 bore water supply borefield would be able to provide make-up water supply in 90% of the model runs from the uncertainty analysis. Figure 8 below shows the annual bore water requirements under a range of climatic conditions for the Revised Mine Plan.

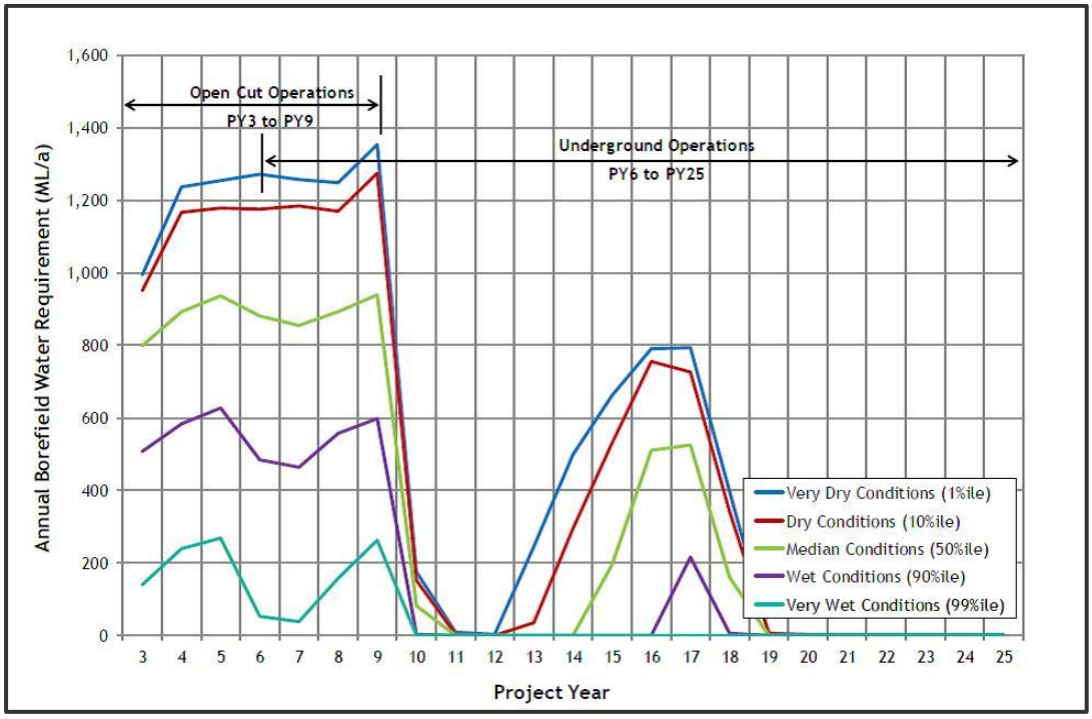



**Figure 8** | Annual Borefield Water Use for Mining Operations - Revised Mine Plan

Further, KEPCO argues that, while very unlikely to occur, this deficiency could be readily augmented from installing two additional bores in the alluvium during open cut mining operations.

The Department also notes that the recommended conditions require that KEPCO must ensure it has sufficient water for all stages of the development, and if necessary, adjust the scale of its mining operations to match its available water supply. That is, like any other water user if KEPCO's water licence allocation under the Water Sharing Plan is reduced, it would need to alter its operations accordingly.

This is a standard requirement for all mining projects and is consistent with the requirements of NSW Government policy in managing water entitlements to ensure sustainable take of water from water sources and represents a commercial risk for KEPCO.

KEPCO now holds 3,045[5] shares across 11 Water Access Licences (WALs) in the Bylong Water Source of the *Hunter Unregulated and Alluvial Water Sharing Plan*. The water balance modelling completed for the Supplementary RTS predicted a peak annual base-case model take of 1,835 ML from the Bylong Water Source, which includes ongoing water use for KEPCO's agricultural operations and induced water take in the alluvium, because of inflow from the Permian aquifer into the open cut and underground mine. The Revised Mine Plan has slightly reduced the peak base-case water take down to 1,815 ML.

A concern raised by the Commission was that this water take did not include loss of surface base-flow to the alluvium due to pumping from the borefield, an issue raised by DoI - L&W in its response to the Supplementary RTS. KEPCO argues that as the surface water / alluvium is highly interconnected and from the same water source in the Water Sharing Plan this would be double counting of the same water take.

DoI - L&W has reviewed the additional information provided by KEPCO (see Appendix M of the RtPR Report) and advised that it considers that the maximum predicted loss of base flow in the Bylong River Water Source has been appropriately accounted for and can be licensed through the existing entitlement. This would be subject to the requirements of the Water Sharing Plan, including cease to pump rules that may be implemented by year 10 of the plan.

[5] This is an increase from 2,644 shares held at the time the PAR was finalised.

## Water Inflow and Entitlements

### *Commission Findings*

- The Commission is hesitant to accept that an assessment of the matters required to obtain shares in the Permian resource can be deferred until after a decision is made about the project.
- The Commission notes that the Triassic basalt aquifers above the underground mine are unlikely to be high yielding aquifers owing to their hard-rock geology, any mine inflow from them will nevertheless need to be accounted for by the applicant, as indicated by the Department of Primary Industries.

The Commission was concerned that allocations in the Permian aquifer should be finalised prior to a decision on the project. KEPCO currently has 411 shares in the Sydney Basin – North Coast Groundwater Source under the *North Coast Fractured and Porous Rock Groundwater Sources Water Sharing Plan 2016* (North Coast WSP) with a valid application under the *Water Act 1912* for a further 2,093 units. This compares to a peak take predicted to be 4,099 ML in year 23 of the project.

DoI - L&W has advised KEPCO that it would be able to issue the 2,093 units subject to approval of the project (see Appendix D). Based on conservative modelling, this means that KEPCO would still need to acquire up to an additional 1,596 units in the Sydney Basin - North Coast Groundwater Source. Figure 9 below shows the take of water from the North Coast Groundwater Source and that water take would only exceed the current/ confirmed allocation from Year 19 of the project, when long wall mining commences in the Series 200 panels (201-206).

As outlined in the PAR, the Department notes that there is substantial depth in the Sydney Basin-North Coast Water Source for KEPCO to acquire the additional shares it requires for the project prior to underground mining commencing. Based on NSW Water Register in August 2018, there are 67,794.5 of the 90,000 aquifer shares currently allocated in the North Coast WSP across 187 Water Access Licences. That is, KEPCO would be required to acquire around 2% of available shares currently available in the water trading market.

The Commission also noted in its report that while the Triassic basalt aquifers are unlikely to be high yielding, but that any mine inflow from this aquifer into the underground workings would need to be accounted in water entitlement in the Sydney Basin – North Coast Groundwater Source. KEPCO has confirmed that water from the basalt aquifer is included in the groundwater modelling inflows to the underground mine. KEPCO has also committed to installing a further 5 monitoring bores within the basalt to monitor saturation and impacts for further inform ongoing model validation and calibration (see Appendix F of the RtPR Report).

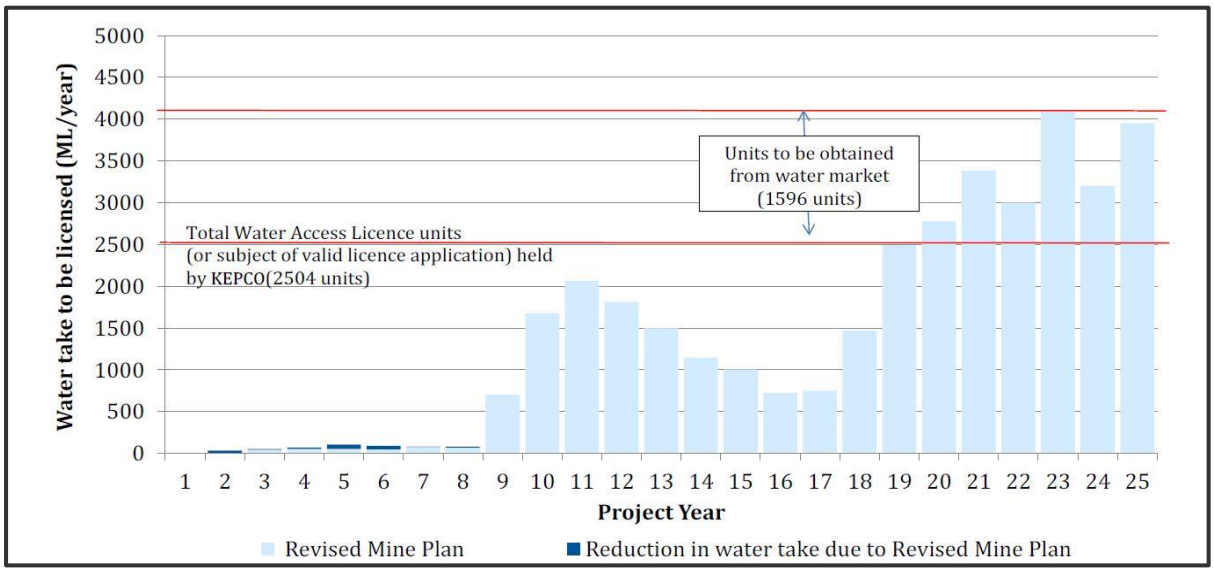



**Figure 9** | Water Take - North Coast Groundwater Source

## Water Balance and Management of Excess Water

### *Commission Findings*

- Uncertainty remains around proposed nil-discharge mine design – doubts raised regarding the evidence supporting applicant's proposed approaches to mine water management (e.g. not providing detailed evidence regarding how any overflow would be managed).
- While it is proposed as a nil-discharge mine, further assessment of contingency for management of excess water should be made prior to determination, eg. discharge to waters, including discharge impacts and discharge limits.
- While there has been extensive review of the numerical groundwater model and physical conditions affecting water resource behaviour, there has been little critical review of the water balance.
- What are the consequences to operations from storing excess water in the open cut pits, including providing depiction of void water storage in mine plans.
- Further clarification is required on how operations would be adapted to manage water accumulation.

In response to the Commission's findings, KEPCO provided further analysis and sensitivity review of the site water balance including:

- a revised water balance completed by WRM (see Appendix M of the RtPR Report); and
- expert peer review of the water balance completed by Mr Lindsay Gilbert – Hydro Engineering and Consulting (see Appendix N of the RtPR Report).

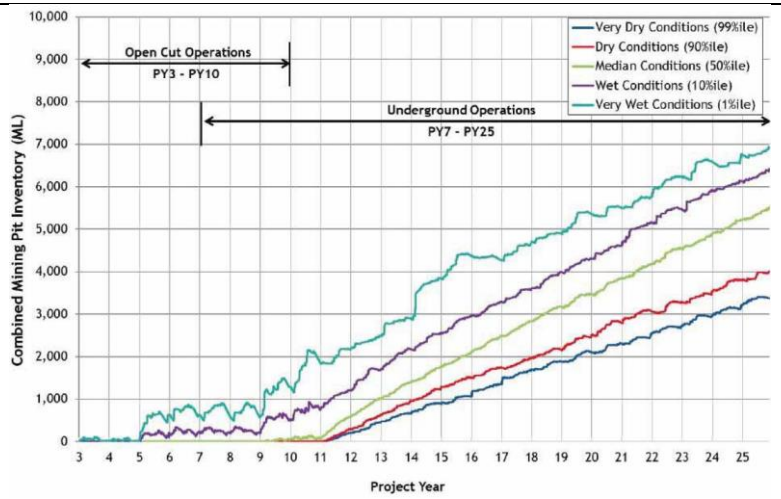
Additional sensitivity analysis included:

- using annual predicted groundwater inflow data, rather than averaged data over the open cut and underground mine stages;
- changes to surface water runoff assumptions, based on verified data from the nearby Wilpinjong mine;
- varying mine inflow rates, including a high and low groundwater inflow scenario based on ranges from the uncertainty assessment completed for the groundwater modelling; and
- utilising the underground mine "goaf"[6] in the 100 series longwall panels (LW101-109) for storage of water.

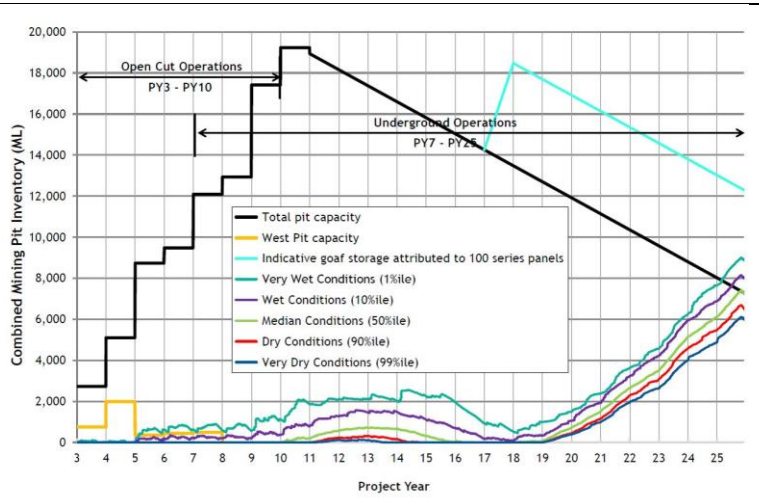
Figures 10A to 10D below compare the available storage capacity on site against the predicted water inflows for the EIS Mine Plan. The water storage capacity is made up of available in-pit storage during open cut operations, which at the end of the open cut stage would provide capacity of around 19,000 ML. The available storage capacity would be reduced through emplacement of around 11,700 ML of reject material into the residual open cut void during the underground mining stage. That is, at the end of mining there would be capacity to store around 7,000 ML of water from the underground workings and surface runoff from the water management system.

In addition, KEPCO has estimated that there would conservatively be 5,000 ML of storage available in the goaf of the 100 series underground mine workings from around Year 17 of the project, towards the end of mining the 100 series panels. Figure 11 shows the indicative area for goaf storage. Mine water would be stored down dip, with the deepest point being RL 145 in long wall panel 101 up to elevation of RL 220. Bulkheads would be installed in the gate-roads between the 100 and 200 series panels. Underground storage in the goaf is standard practice at many underground mines with groundwater of similar water quality being transferred. That is, it would be unlikely to result in any contamination of the aquifer.

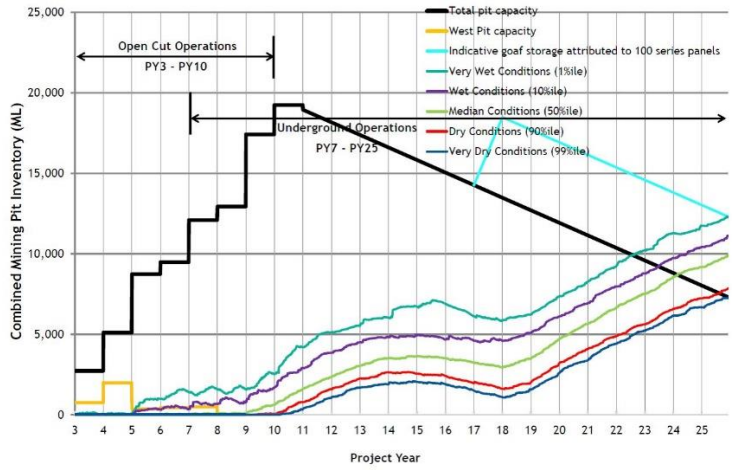
[6] The goaf is the area where overlying rock collapses into the void created when coal has been extracted through longwall mining.



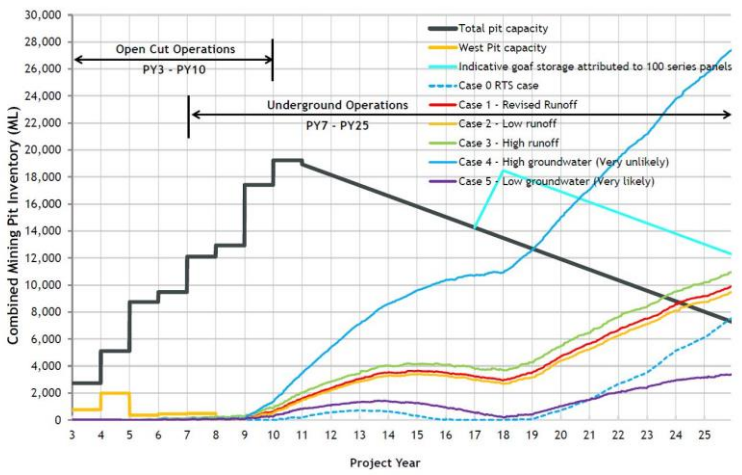

A. RTS (averaged groundwater inflow by mine stage)




B. RtPR (variable annual groundwater inflow)




C. RtPR (sensitivity runs - surface runoff)




D. RtPR (sensitivity runs - groundwater inflows)

**Figure 10 - A-D** | Water Storage Modelling

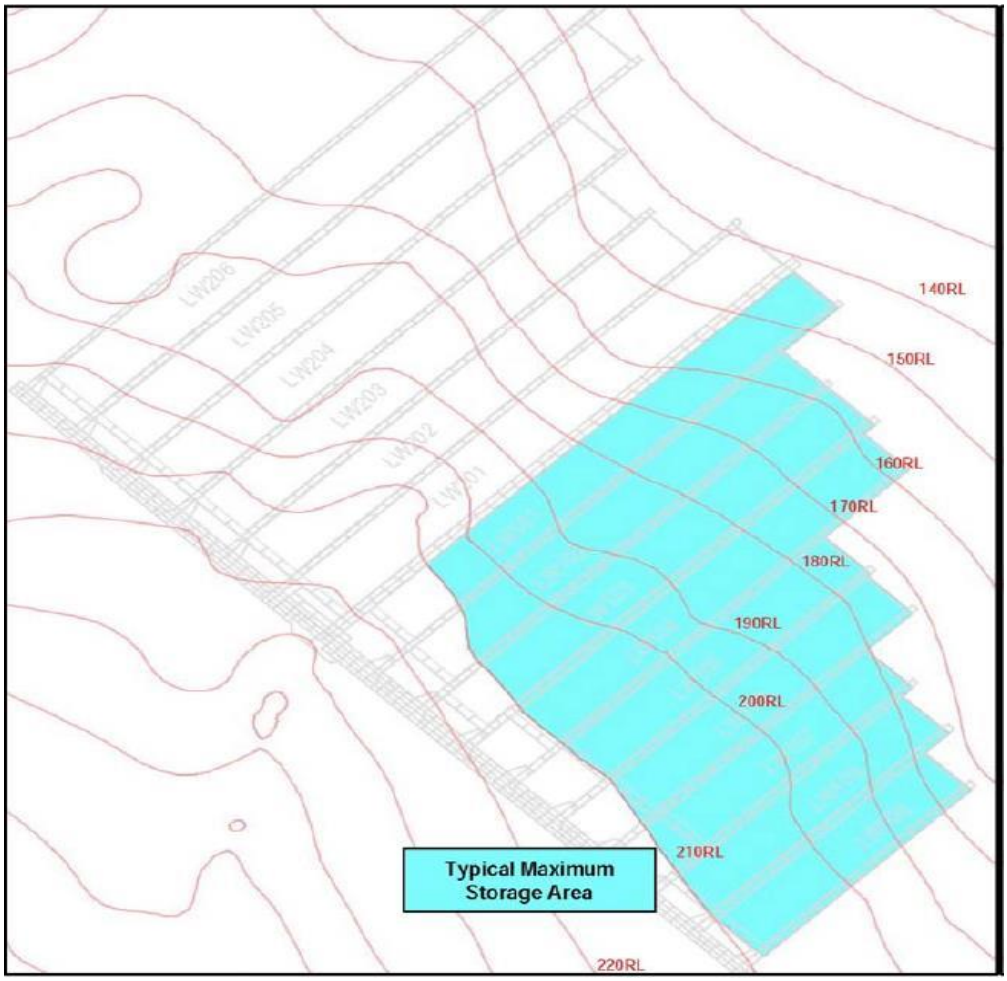



**Figure 11** | Series 100 panel goaf water storage area

The results of the water balance modelling show that under all model runs, except the high groundwater inflow scenario (Figure 10D), the combination of in-pit surface storage and goaf storage is sufficient to manage groundwater and surface runoff inflows. Based on the groundwater modelling sensitivity analysis, the high groundwater inflow prediction used in the water balance sensitivity is very unlikely to occur. KEPCO also argues that:

- management of excess water becomes more of an issue following commencement of the series 200 longwall panels after project Year 18 due to mining the deeper coal seams;
- this allows many years of ongoing validation and calibration of both the groundwater and water balance modelling;
- if the high groundwater inflow scenario during mining of the 200 series panels is realised additional contingencies would be available, including:
    - providing additional surface water storage by temporarily mounding rejects on the eastern overburden emplacement area;
    - modifications to the sequencing and timing of mining the series 200 panels to reduce groundwater inflows, and
    - sealing of mined series 200 panels for additional goaf water storage.

An updated assessment has also been completed for the Revised Mine Plan (Revised Mine Plan Supplementary Report – Appendix H), which would also retain an open cut final void of 18,800 ML for reject emplacement. Given that underground inflows remain the same for the Revised Mine Plan, the supplementary assessment provides similar results to the EIS Mine Plan modelling.

This review also showed that when compared to the EIS Mine Plan:

- the peak groundwater inflow into the open cut pits reduced from 106 ML down to 76 ML; and

- the cumulative volume of groundwater into the open cut pits reduced by 163 ML, due to the reduced mining footprint and one year less of open cut mining.

Based on this additional information and the contingencies proposed, the Department considers that mine water could be effectively managed in surface storages and the mined underground workings without the need to discharge to receiving waters. The Department recommends that this be explicit in the recommended conditions. That is, any discharge of treated mine water would require further environmental assessment and a modification to any development consent required, if approved by the Commission.

The Department also considers that water storage in the series 100 goaf should be prioritised over surface storage. This would allow rehabilitation of the final void area to be progressed earlier if there was less volume required for water storage by the end of the mine life. The Department has recommended an additional requirement to be included in the Rehabilitation Management Plan for a Final Void Management Strategy to optimise the size of the final void based on annual review and validation of reject volumes, mine water storage requirements and prioritising the use of goaf water storage.

During open cut mining operations there is substantial storage volume available within the open cut voids without affecting mining operations or requiring discharge to the environment. The open cut would target multiple coal seams in different sections of the eastern and western open cut areas, allowing sufficient flexibility to manage excess mine water within the pit complex if the capacity of the mine water dams is exceeded.

The Department also recommends that detailed validation and peer review of the site water balance be undertaken every 3 years following commencement of mining operations, consistent with the timeframe for review and validation of the groundwater model. This would also allow any of the proposed contingencies to manage excess water to be identified and implemented well ahead of it causing operational constraints.

### Water Resources – Other Matters

***Commission Findings***

- The Commission notes that the Department's conclusions on several other water resource matters will require detailed evaluation before any decision about the project, including:
  - Catchment hydrology
  - Dry Creek surface flows
  - Residual salt loads
  - Overflows from sediment dams
  - Infrastructure outside flood affected areas
  - Flood impacts from watercourse crossings
  - Groundwater dependent ecosystems and stygofauna

The Commission identified a further 7 statements made by the Department on water resources in the PAR that it considered required further evaluation. The concerns raised by the Commission were comprehensively considered by KEPCO in the EIS and RTS and assessed by the Department in its PAR.

KEPCO in its response identified the sections of the EA and RTS that addressed the matters identified by the Commission as requiring further detailed evaluation. The table below summarises the Department's further consideration of these residual issues for the Revised Mine Plan.

**Table 7** | Residual Water Issues

| *Statement in the PAR* | *Consideration* |
|---|---|
| The project area is a relatively small portion of the Lee, Bylong, and Growee catchments and it is not expected to have significant impacts on catchment hydrology. | • The Revised Mine Plan has slightly reduced the maximum catchment area captured by mining operations and a reduction by one year in the open cut mining operations.<br>• The maximum catchment area captured due to mining operations is <1.1% of the Bylong River downstream of the project boundary, 4.2% of Lee Creek catchment and < 0.1% of the Growee River catchment.<br>• The recommended conditions require progressive rehabilitation as soon as reasonably practicable following disturbance and that there be no final void and the final landform is free-draining to the natural drainage system.<br>• The Department considers that there would be no significant impacts on catchment hydrology, particularly within the wider Bylong and Goulburn River systems. |
| Loss of surface flows in Dry Creek resulting from subsidence deformations and cracking is not | • The subsidence report indicates that fracturing, buckling and dilation are likely to occur in the uppermost bedrock beneath the soil |

| Statement in the PAR | Consideration |
|---|---|
| expected to be significant, and many physical impacts would be remediated. | beds of the drainage lines, which may result in additional infiltration of surface water flows.<br>• The rate of inflow to groundwater via cracks is estimated to be up to about 0.15ML/day,but is only expected after moderate-sized flow events, noting that Dry Creek is a highly ephemeral creek.<br>• It is predicted there would be negligible (<0.1% of total runoff) loss of surface water to groundwater from surface cracking in the underground mining areas.<br>• Some areas would experience increased ponding within a 2.3 ha of the Dry Creek catchment. However, the volume of water captured in ponded areas would be mitigated by drainage works to limit the net reduction in runoff volume in the Dry Creek catchment to a few percent.<br>• The Department has recommended conditions requiring KEPCO to undertake remedial measures for impacts and performance measures that subsidence impacts or environmental consequences are no greater than that predicted in the EIS. |
| Based on nil-discharge mine design, the residual salt loads that are exported from the site are not expected to result in significant impacts on catchment quality. | • The mine water management system is designed for nil-discharge of mine water, with uncontrolled release of water from the sediment dams occurring only after rainfall that exceeds the design standard.<br>• The geochemical assessment indicates that the runoff draining to sediment dams would have salinity consistent with receiving waterways.<br>• During mining operations downstream salt loads would be slightly reduced by the project due to the capture and reuse of water from sediment dams.<br>• Post mining it is predicted there would be <1% increase in total salt load in the Bylong catchment from the mine due to increased salinity from seepage from the backfilled overburden/ reject emplacement.<br>• The predicted changes would not affect the beneficial use category of the alluvial aquifer and would not have any significant effect on environmental values or river condition and therefore would comply with the AIP. |
| Overflow of water from sediment dams during wet periods that exceed the relevant design standard of the sediment control system would be governed by the Environment Protection Licence for the project. | • KEPCO has agreed to increase the sediment dam design capacity to a 95$^{th}$ percentile 5-day rainfall event based on the recommendation of the EPA.<br>• Overflows from sediment dams are likely to have minimal impact on pollutant concentrations in receiving waters due to discharges occurring during higher flow events, where there are elevated sediment concentrations and high dilution in receiving waters.<br>• The recommended conditions require that any water discharged from sediment dams complies with section 120 (no pollution of waters) of the *Protection of the Environment Operations Act 1997* or discharges in accordance with an Environment Protection Licence (EPL). |
| The open cut pits and surface facilities are largely outside flood affected areas. | • The project design has minimised flood impacts, with key project infrastructure designed considering the flood extent for the 100-year average recurrence interval (ARI) – being designed around this constraint.<br>• The flood impacts would be confined to KEPCO-owned land.<br>• The open cut mine and overburden emplacements associated with the eastern open cut have been removed from the Tarwyn Park landholding and further from the alluvium and floodplain areas on Tarwyn Park. |
| Potential impacts to flooding behaviour from two haul-road watercourse crossings would be confined to the project area. | • The flood impacts would be confined to KEPCO-owned land.<br>• This infrastructure and associated service road (to be built at ground level) on the floodplain also results in an isolated change in velocity for all modelled design events – due to the concentration of flood flows occurring at the culvert outlets.<br>• The length of the overland conveyor embankment was adjusted from its original design to avoid adverse impacts to the Bylong River floodplain.<br>• Haul road crossings would be removed and rehabilitated upon completion of operations to ensure long-term floodplain conditions would be similar to existing. |

| Statement in the PAR | Consideration |
|---|---|
| There are no high priority groundwater dependent ecosystems while those present are unlikely to be highly reliant on groundwater, nor significantly affected by the project. | • High priority GDE's are listed in the relevant Water Sharing Plans, there are no higher priority GDE's listed near the project.<br>• Some riparian vegetation (e.g. River Red Gum and River Oak) have a moderate reliance on groundwater, others (particularly shrubs and grasses) are shallower-rooted and are therefore not likely to be dependent upon groundwater<br>• The borefield placement has been revised during the assessment to reduce drawdown impacts from pumping with a 200 m buffer to riparian vegetation identified as GDE. |
| Stygofauna species that are present are not endemic and impacts to local populations are unlikely to be significant to those species. | • There is a wide distribution of stygofauna communities.<br>• Large areas of suitable habitat remain in the immediate vicinity of the project.<br>• Approximately 80% of the species recorded are endemic to the region however many species typically occurring in more than one alluvial aquifer.<br>• Species appear to be spread throughout the Bylong River and Lee Creek alluvial aquifers and have distributions beyond the predicted groundwater draw down area – therefore there is no significant risk to the existing stygofauna community as a consequence of the project. |

### Conclusion – Water Resources

Following consideration of the Commission's findings and the response from KEPCO, the Department concludes that:

- KEPCO has designed the project to avoid significant impacts, including open cut mining undertaken outside a 150 m buffer from the alluvium, and locating bores to minimise impacts on GDEs;
- the predicted impacts on water users and GDEs would comply with the minimal impact criteria as set out in the NSW Government's *Aquifer Interference Policy*;
- KEPCO holds sufficient water licences to account for its predicted water take in the alluvium; and
- while KEPCO has not acquired all its entitlement in the Permian aquifer, there is sufficient depth in the water market to acquire its additional entitlement, noting that the take from the Permian aquifer would not exceed its allocated entitlement until Year 19 of the project;

The groundwater impact assessment has been extensive and carried out over a 7-year period with review and input by a range of independent experts, which has led to refinement of the groundwater model to increase certainty in predictions.

This has included extensive uncertainty analysis to inform the assessment and the likely range of impacts. This indicates that the risk of impact to private bores and GDE is extremely low and well within the NSW Government's minimal impact criteria as defined in the AIP.

Despite these low risks, there are contingencies available under the strict regulatory regime in NSW for managing and regulating water in the *Water Management Act 2000* and requirements of Water Sharing Plans.

The Revised Mine Plan further reduces the impacts on water resources through slightly reduced drawdown impacts in the alluvial aquifer, reduced groundwater inflow during open cut operations and a greater buffer distance of the open cut from the alluvium located on Tarwyn Park.

KEPCO has also prepared a draft Water Management Plan providing details on its management and monitoring of its impacts. This includes commitments around compensatory water agreements in the unlikely case that the project causes loss of water supply at private bores, particularly stock and domestic supply.

### Recommended Conditions – Water Resources

In the PAR, the Department recommended a range of performance, management and monitoring conditions for minimising/ managing impacts on water resources. These included conditions requiring KEPCO to:

- ensure that it has sufficient water for all stages of the project, and if necessary, adjust the scale of mining operations on site to match its available water supply;

- ensure that it has adequate water access licences to account for all water used by the project, prior to the commencement of mining in the open cut and underground mining areas;
- not discharge any mine water (ie. 'dirty' or saline water) from the site, unless otherwise approved under an environment protection licence;
- ensure that all surface water discharges of non-mine water from the site comply with the limits set in any environment protection licence;
- provide compensatory water supplies to any private landowner whose supply is found to be adversely affected by the project, in the unlikely event that this occurs;
- comply with a range of water management performance measures and rehabilitation objectives;
- prepare and implement a comprehensive Water Management Plan for the project, including a:
    - water balance;
    - salt balance;
    - surface water management plan and monitoring program;
    - groundwater management plan and monitoring program;
    - borefield management plan; and
    - program to regularly (every 3 years) validate the groundwater model.

Following consideration of the Commission's findings and KEPCO's response, the Department has recommended the following revisions to the PAR conditions in relation to water impacts:

- **Schedule 4 Condition 25 - Compensatory Water Supply:** Revisions to compensatory water conditions to make it clear that the burden of proof about loss of water supply rests with the Applicant. That is KEPCO must ensure that its water monitoring network and investigation/ action triggers provides sufficient evidence that the mine operations have not caused a loss of water supply.
- **Schedule 4 Condition 27 - Water Management Performance Measures:** Performance measures for mine water storages to make it clear that the consent does not permit discharge of mine water from the site.
- **Schedule 4 Condition 28 - Water Management Plan:** Additional requirements for a detailed validation and peer review of the site water balance every 3 years, including a review of the life of mine water balance and (if necessary) identify and implement measures to ensure mine water storage capacity is retained to ensure commitment to no discharge of mine water off-site.
- **Schedule 4 Condition 64 - Rehabilitation Management Plan:** Additional requirement for a detailed final void management strategy to optimise the size of the final void required for reject emplacement and water storage, with an annual review based on verified data.

## 2.5 Agriculture

### Competing Land Uses and Loss of Agricultural Production

***Commission Findings***

- The Commission notes the release of the *Central West and Orana Regional Plan 2036 (2017)*. The regional plan re-affirms the identified importance of agriculture to the regional economy as set out in the *Upper Hunter Strategic Land Use Plan.*
- Any approval of the project would represent a fundamental shift in the valley in favour of mining as opposed to agricultural pastoral pursuits, and that the water security on which agricultural activities depend, may be jeopardised, particularly during an extended dry period.

The Commission was concerned about the impacts of the project on the agricultural resources of the Bylong Valley and that there would be a fundamental shift in favour of mining over agriculture. As discussed above, the Commission was also concerned about risks to water security and associated agricultural productivity during extended dry periods.

The Commission referenced the *Upper Hunter Strategic Regional Land Use Plan* and the recently approved *Central West and Orana Regional Plan 2036* (CW&O Regional Plan) which emphasise the importance of agricultural enterprises. The Commission identified the Biophysical Strategic Agricultural Land (BSAL) within the Bylong Valley as an important agricultural precinct within the region.

In its RtPR report KEPCO responded to the concerns of the Commission through:

- an analysis of the goals and objectives of the CW&O Regional Plan;
- an updated analysis of loss of agricultural productivity by Scott Barnett & Associates (see RtPR Report – Appendix Q);
- providing examples of co-existence of mining and agricultural activities; and
- reinforcing its commitments to continuing farming activities through the preparation of a Farm Management Plan (see Appendix H of the RtPR Report).

The Department carefully considered the aims and objectives of the *Upper Hunter Strategic Regional Land Use Plan* (SRLUP) in its PAR, along with the key statutory instruments relevant to the project, the *Mid-Western Regional Local Environmental Plan 2012* and the *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries 2007*, which identify that the project is a permissible land use in the Bylong Valley.

The CW&O Regional Plan was finalised in June 2017 and includes goals and directions that promote both agriculture and mining in the region and actions to manage land use conflicts. The relevant goals and directions include:

*Goal 1: The most diverse regional economy in NSW*

Direction 1: Protect the region's diverse and productive agricultural land

Direction 8: Sustainably manage mineral resources

Direction 11: Sustainably manage water resources for economic opportunities

Direction 12: Plan for greater land use compatibility

These directions recognise the importance of both agriculture and mining along with the efficient use of water resources as key drivers to a strong regional economy. Consistent with the goals of the regional plan, MWRC has provided a letter of support (see Appendix B of the RtPR Report) for the project, emphasising the need to balance key industry sectors – mining, agriculture and tourism – to maintain a strong and diverse economy in the region.

KEPCO in its response highlights that mining is an "interim" land use change and that it does not sterilise future agricultural opportunities following rehabilitation. The Department notes that the Commission has concerns over being able to adequately rehabilitate the land back to its pre-mining potential. This is discussed further below. The CW&O Regional Plan also acknowledges that extraction projects are temporary and there is opportunity for interim activities for productive use of land while extraction projects are occurring.

Further analysis on the loss of agricultural productivity was completed by Scott Barnett & Associates. The analysis updated the information presented in the Agricultural Impact Assessment for the EIS by providing:

- an updated comparison of the gross value of agricultural production for different areas;
- updated review of changes to the value of agricultural production foregone because of the project, accounting for:
    - progressive removal of agricultural land with mine progression;
    - progressive re-introduction of rehabilitated land into agricultural production;
    - agricultural land identified on offset properties to be retained for agriculture, with biodiversity conservation areas lost to agriculture in perpetuity; and
    - loss of water for agriculture, based on the borefield requirements

The results are summarised in Table 8 below which compares the annual average gross value of agricultural production for the disturbance and offset areas with and without the project ($0.2 M vs. $2.1 M).

**Table 8** | Annual Average Gross Value of Agricultural Production

| *Area* | *Annual Gross Value of Agricultural Production* *$M* | *% of foregone production* |
|---|---|---|
| Disturbance area and offset areas | | |
| Gross value without the project | 2.1 | |
| Gross value with the project | 0.2 | |
| **Annual Average Foregone Value** | **1.9** | 89 |
| Project area | 7.2 | 26 |
| Mid-Western Region Council LGA | 82.5 | 2.3 |
| Central West Orana Region | 2,719.3 | 0.1 |
| Upper Hunter Region | 255.8 | 0.73 |
| NSW | 11,714 | 0.02 |

The foregone value of agricultural production of $1.9 M is mainly due to change of land use from agriculture to biodiversity offsets, with an average annual gross value loss to agriculture of $1.6 M due to permanently ceasing agricultural production in these areas. However, the reduction in gross value of agricultural production is a small percentage of the broader MWRC LGA area (2.3% reduction) and Central West and Orana Regional area (0.1% reduction).

The Department notes that this assessment is based on the EIS Mine Plan and that with the reduction in direct disturbance to Tarwyn Park, that this area would be retained for agricultural production, whereas the values in Table 8 takes this area temporarily out of agricultural production.

The agricultural production in the disturbance and offset areas is mainly from beef cattle grazing ($1.9 M of the estimated $2.1 M), with limited cultivation undertaken within these areas. KEPCO would continue to undertake mixed grazing and cultivation on its landholdings as discussed below.

### Commitment to Managing Agricultural Activities

***Commission Finding***

- A binding commitment should be required for management of agricultural production with further details on systems and commitments.

As identified in the PAR, KEPCO committed to maintaining the agricultural productivity of land outside of the disturbance and offset areas. The Commission was concerned that there was no binding commitment on KEPCO in the Department's recommended conditions to effectively require KEPCO to meet its commitments, rather that KEPCO must use its "best endeavours."

To address some of the uncertainty about how its properties would be managed, KEPCO has prepared a draft Farm Management Plan (FMP) (see Appendix H of the RtPR Report). The FMP identifies:

- the land available for agricultural enterprises;
- the proposed agricultural management practices;
- improvement strategies to increase production capacity;
- strategies for progressive agricultural production on areas that are unavailable due to mining operations and mine buffer land, and following rehabilitation;
- strategies for limited agricultural activity (such as crash grazing for weed or fire management) within biodiversity offset areas, consistent with the requirements of an approved Biodiversity Management Plan;

- monitoring of pasture and beef production; and
- lines of responsibility, including a dedicated farm manager

The Department notes that KEPCO has committed to preparing and implementing the Farm Management Plan.

As a result of the reduced open cut mining footprint, KEPCO in its Revised Mine Plan Supplementary Report has provided updated information on KEPCO landholdings within and outside the project area available for ongoing agricultural activity, as summarised in Table 9 below and shown in Figure 12.

**Table 9** | KEPCO-owned Land Available for Agriculture (as at June 2018)

| *Type* | *EIS Mine Plan Area (ha)* | *Revised Mine Plan Area (ha)* |
|---|---|---|
| Land continued to be available during the project | 3,166 | 3,237 |
| Temporary removal from agriculture during mining operations | 974 | 882 |
| Biodiversity offset areas – retained for agriculture | 295 | 295 |
| **TOTAL available for agriculture** | **4,435** | **4,414** |
| Biodiversity offset areas – progressive removal from agriculture to biodiversity conservation | 2,104 | 2,125[1] |

(1) Figures were slightly revised from the information in the Revised Mine Plan Supplementary Report with an additional 21 ha of land suitable for agriculture in the Fuzzy Box Offset Area also identified as being progressively removed – refer Appendix E4.

There is around 3,237 ha of land available for agricultural activities on land that would not be constrained due to mining operations or due to being incorporated into biodiversity offset lands. There is a further 882 ha of land that is at some point during the mine life, mainly during open cut operations, which would be progressively removed from agricultural production, with agriculture resuming following rehabilitation. There is a further 295 ha of land that is located on offset properties that would be retained for agricultural production, giving a total of 4,414 ha of land that KEPCO is committing to continue to maintain as agricultural enterprises (see Figure 12).

To address the Commission's concern over the Departments recommended condition (Schedule 4 Condition 67) the Department has revised the recommended condition in the PAR to require the Applicant to take all reasonable and feasible measures to ensure that the agricultural productivity and production on its landholdings is maintained or enhanced, consistent with its commitments in the EIS.

This condition would provide a binding requirement on KEPCO to manage its landholdings consistent with its commitment in the EIS, as progressively updated in the RtPR Report, draft Farm Management Plan and the Revised Mine Plan Supplementary Report. The Department notes that "reasonable" and "feasible" is defined in the recommended conditions, with KEPCO identifying in the draft Farm Management Plan what can be reasonably undertaken, given climatic and operational constraints, to maintain or enhance agricultural productivity on its landholdings.

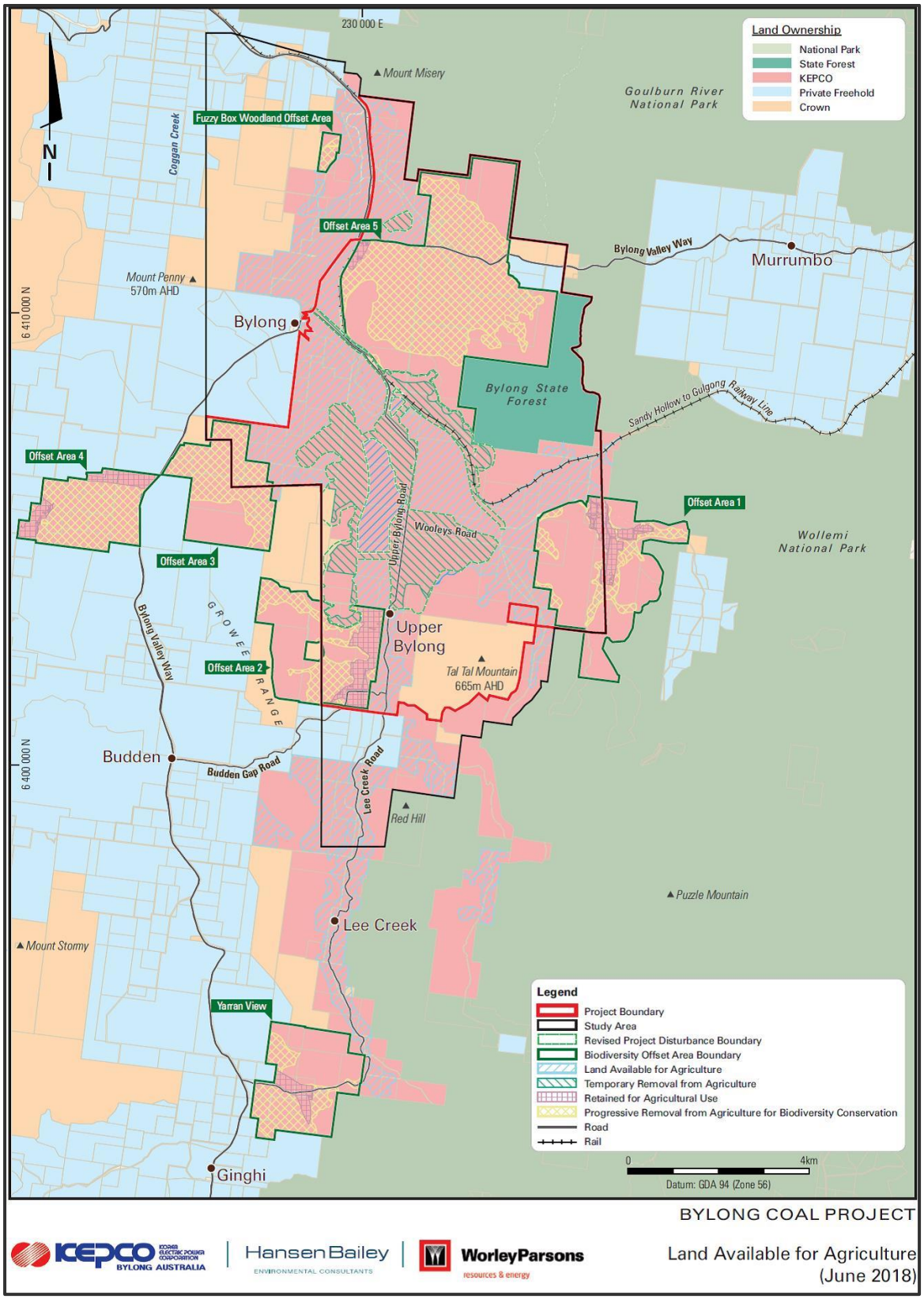



**Figure 12** | Land Available for Agricultural Production

### Biophysical Strategic Agricultural Land (BSAL) and Rehabilitation

***Commission Findings***

- The Commission is reluctant to accept the importance of verified lands is reduced based upon their location and land soil capability and questions downplaying the value of mapped agricultural land.
- Sufficient evidence has not been provided to the Commission to satisfy that sustainable rehabilitation to the BSAL-equivalent land will be achieved – "a more clearly defined picture of how success will be measured at a local level, particularly how success in restoring soil functionality will be defined and measured would be useful."
- Commission observes uncertainty in the proposed rehabilitation – additional info necessary to provide appropriate degree of confidence that objectives would be achieved.
- Key strategic and physical components would remain if the landscape was not mined – retained capability of identified areas of equine CIC to contribute to future expansion of thoroughbred industry.

In response to the Commission's findings, KEPCO provided further information to address the concerns of the Commission on the impacts on BSAL and rehabilitation of the mine to achieve a sustainable agricultural land use. This additional information includes a draft Rehabilitation Management Plan (see Appendix G of the RtPR Report) and expert advice provided by SLR Consulting Australia (SLR) (see Appendix P of the RtPR Report).

This information was also updated in the Revised Mine Plan Supplementary Report to incorporate:

- the reduced impact on:
    - BSAL of 22.7 ha;
    - Class 3 (high land and soil capability) land of 2.43 ha; and
    - Class 4 (moderate land and soil capability) land of 52.74 ha
- the revised conceptual landform and reinstatement of BSAL-equivalent soils; and
- additional information on studies to show the ability to rehabilitate mined areas back to agricultural production.

**BSAL and Land Capability**

There are two agricultural assessment methodologies published by the NSW Government to evaluate the impacts of the project on soil resources and agricultural capability, the *Interim Protocol for Site Verification and Mapping of Biophysical Strategic Agricultural Land* (BSAL Protocol) and the *Land and Soil Capability Assessment Scheme, Second approximation* (LSC Guideline).

Both methods have been used in the assessment of the project to identify land that has a higher capability for agricultural production, the impacts of the project on this land and the avoidance and mitigation measures proposed for the project.

The conclusion reached in the assessment that some of the BSAL land is of varying agricultural land capability based on the LSC Guideline methodology is an outcome of using different criteria to assess the capability of the land. It is a matter of presenting factual information to assist in the assessment and determination of the project, rather than downplaying the importance of identified BSAL.

As noted in the SLR report, across NSW, there are areas of LSC Class 1-3 land (the highest capability for cultivation with few constraints) that are not mapped as BSAL and conversely there are areas mapped as BSAL in Class 3-5 land, of lower agricultural capability due to land and soil constraints. That is, using both methodologies provide more rigour in the assessment of the impacts of the project and the Department considers that the approach used by KEPCO is sound.

In its response, KEPCO has provided further comparison of the extent of BSAL directly impacted by mine infrastructure or mining operations (400 ha – reduced from 423 ha in the EIS Mine Plan) or proposed to be permanently used for a biodiversity conservation outcome in offset areas (288 ha) against BSAL in other regions across NSW. Table 10 below provides a summary of this information, against the temporary impact area and also following rehabilitation back to BSAL of disturbed areas, noting that biodiversity offset areas would not be available for agricultural activities, apart from the specified areas on these properties retained for agriculture as identified above.

**Table 10** | BSAL Areas Comparison

| Area | Area (ha) BSAL | % removed from agriculture during mining[1] | % removed from agriculture post rehabilitation |
|---|---|---|---|
| BSAL areas impacted or offset | 688 | 100 | 41.8 |
| Bylong Valley Catchment | 5,345 | 12.9 | 5.4 |
| Mid-Western Region Council LGA | 29,780 | 2.3 | 1.0 |
| Central West Orana Region | 520,900 | 0.13 | 0.06 |
| Upper Hunter Region | 211,060 | 0.33 | 0.14 |
| NSW | 2,800,000 | 0.02 | 0.01 |

(1) This is a maximum area as BSAL areas would be progressively taken out of production over the life of the project and progressive rehabilitation would occur to reinstate agricultural land back to productive use during the project life.

The percentage of BSAL permanently removed from agriculture across the broader areas of the MWRC local government area and Central West Orana Region, within which the project is located is relatively small both prior to and after rehabilitation of the mine disturbance areas.

As discussed in the PAR, the Department and OEH considered that the permanent removal from agriculture of 288 ha of BSAL for biodiversity offset areas is the highest and best use of this land given the areas are mainly intact woodland, with some areas of grazing rather than cultivation. However, around 120 ha of BSAL on the offset properties, which have been historically cropped and located on higher agricultural and soil capability class land would be retained for agriculture.

Under NSW Government policy, the identification of land as BSAL does not preclude development for mining. However, for land impacted by mining projects it provides a rigorous and comprehensive process to assess the impacts on the soil resources and agricultural productivity. This process included a Gateway Panel review and gateway certificate to be issued early in the planning process to ensure that all key concerns were considered in the assessment of the project.

KEPCO provided comprehensive responses to the Gateway Panel's and Department of Industry – Agriculture's (DPI-Agriculture) concerns throughout the assessment process. DPI-Agriculture did not object to the loss of BSAL within the project disturbance area, provided that the BSAL (or BSAL-equivalent) is reinstated within the rehabilitation area to ensure no net loss of BSAL in the locality.

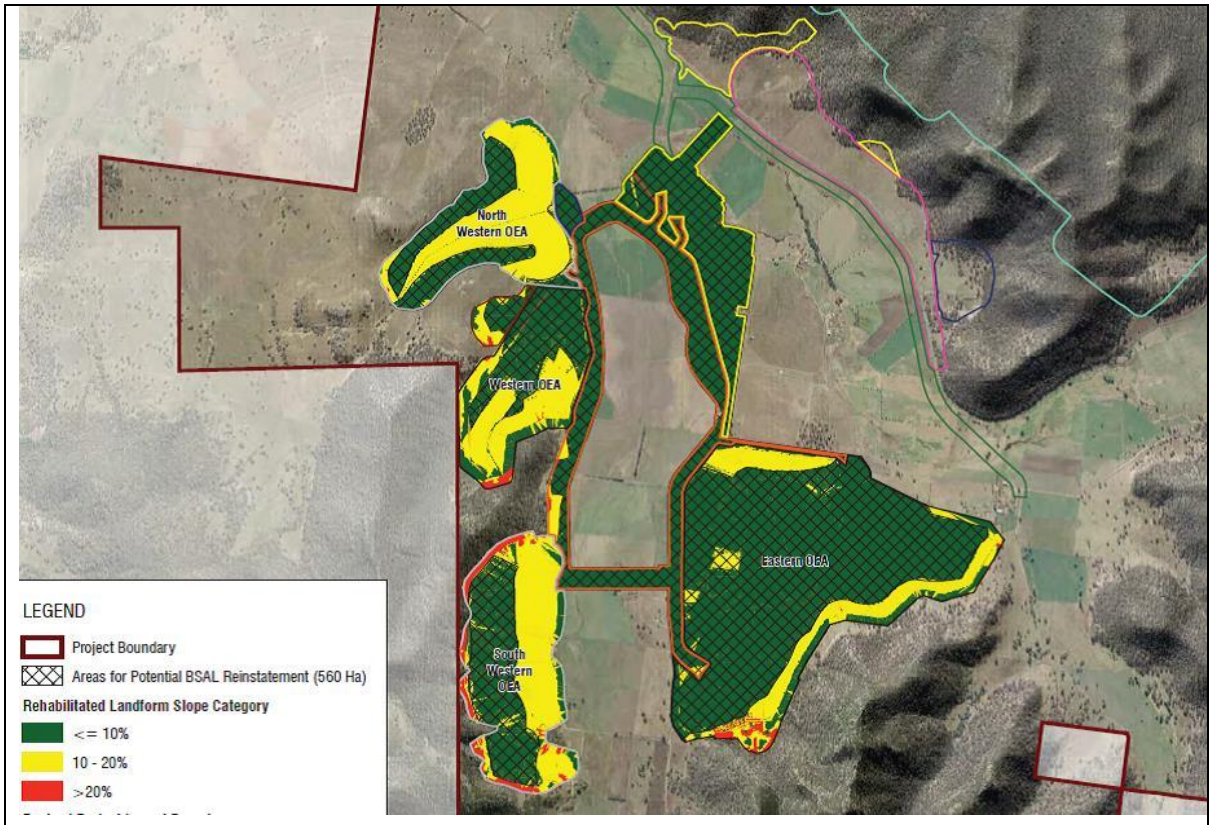
As detailed in the PAR, the Department considers that KEPCO has designed the project to avoid direct and permanent impacts to both BSAL, high capability Class 3 land and Equine CIC as far as practicable. The Revised Mine Plan further reduces the impact on BSAL.

**Rehabilitation to Productive Agricultural Land**

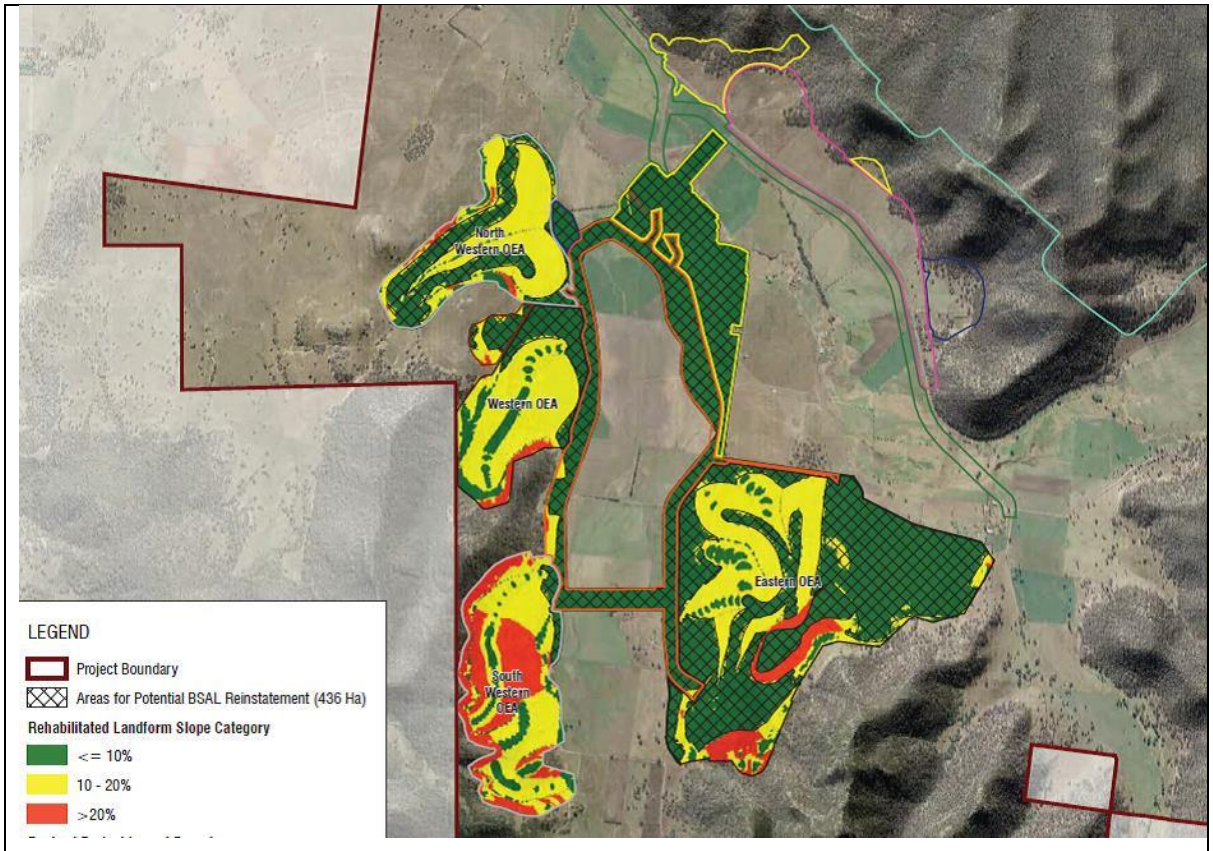
The Commission was concerned about the ability to rehabilitate the land back to productive agricultural uses and that additional criteria, based on land and soil functionality, should be considered for re-establishment of BSAL.

In its advice for the PAR, the Department recommended that the site be rehabilitated back to achieve higher end productive agricultural use based on achieving both BSAL and LSC Class 3 capability. The rehabilitation objectives recommended include the restoration of at least 319.5 ha of LSC Class 3 land, and 423.1 ha of BSAL-equivalent land.

The Revised Mine Plan Supplementary Report (Appendix I) provides an updated conceptual final landform including areas suitable for the reinstatement of 400 ha of BSAL-equivalent land. Two key physical landform requirements to meet BSAL criteria is for the landform slopes to be < =10% and that there is a minimum contiguous area of 20 ha. LSC Class 3 similarly is required to have a slope of 3-10%, with Class 4 land including sloping lands of 10-20% slope. Figure 13 below shows the Revised Mine Plan final landform incorporating a base-case option that optimises slopes and landform to meet BSAL criteria landform targets, against a landform incorporating improved macro-relief (ridges and valleys).




**BSAL reinstatement without macro-relief design**




**BSAL reinstatement with macro-relief design**

**Figure 13** | BSAL Reinstatement Final Landform Options

The macro-relief landform is designed to better integrate the final landform with the existing landscape, as recommended by the Commission and the Heritage Council to minimise impacts on landscape values on Tarwyn Park and the broader Bylong Landscape Conservation Area (BLCA) (see Section 2.6 below).

Both landform designs can meet the physical BSAL criteria based on slope and contiguous area. For the landform option incorporating macro-relief, there would be 436 ha available, with up to 560 ha available under the more uniform landform option. The Department considers there is opportunity through the preparation of the final detailed mine closure plan, as part of the recommended rehabilitation management plan to optimise the design to achieve the required BSAL-equivalent target and a design to incorporate macro-relief to achieve better integration with the existing landform, and to also meet the rehabilitation objective of a stable final landform.

It should also be noted that at a minimum (based on the landform with macro-relief option) the proposed rehabilitation would provide 437 ha of land that is proposed to meet LSC Class 3 criteria. This compares to the Revised Mine Plan disturbance impacting 176 ha of Class 3 land.

In addition to the information provided in the EIS, RTS and Supplementary RTS, SLR has provided further advice, to address the Commission's concerns about rehabilitation completion criteria to meet both BSAL-equivalent and LSC land capability classes in the final landform. The proposed completion criteria are also provided in the draft Rehabilitation Management Plan, which has been prepared based on the Department's draft recommendations in the PAR. The Department notes that further consultation with agencies, MWRC and the CCC would be required if the project were approved and commenced.

As outlined in its EIS and supporting information and now also documented in its draft Rehabilitation Management Plan, KEPCO has proposed a comprehensive range of completion criteria for returning the land back to agricultural productivity. These are documented in Table 15 (General Completion Criteria) and Table 16 (BSAL and LSC Class 3 completion criteria) of the draft Rehabilitation Plan, based on the commitments made through the assessment of the project. The proposed completion criteria for the rehabilitation of the land and soil profile includes a combination of physically based landform and soil criteria, soil function, soil resilience and agricultural productivity, as summarised in the Table 11 below. These criteria are based on the BSAL Protocol and LSC Guideline.

**Table 11** | Summary of Proposed Completion Criteria for Land and Soil Profile – Agricultural Land Use

| *Indicators* | *Summary of Criteria* |
|---|---|
| Biophysical Strategic Agricultural Land | Based directly from 10 BSAL criteria from the BSAL interim protocol including slope, rock outcrops, surface rockiness, Gilgai, relative soil fertility class, physical barriers, soil drainage, pH, soil salinity and chemical barriers.<br><br>Fertility criteria cannot directly apply to Anthroposols (man-made soils) as it applies to the inherent values of in-situ soils, therefore a modified criterion using tracking of the parent soil material and monitoring of Cation Exchange Capacity (CEC) is proposed. This has been developed in consultation with DPI- Agriculture. |
| Land and Soil Capability | Based directly from 8 LSC criteria from the LSC Guideline including water erosion, wind erosion, soil structure decline, soil acidification, salinity, water-logging, shallow soils and rock and mass movement.<br><br>Also includes criteria for vegetation yield similar or exceeding known yield of local Class 3 agricultural enterprises and representative of a range of soil fauna species relative to nearby reference sites of the same class. |
| Soil Function<br><br>• Physical stability and support<br>• Habitat for soil organisms<br>• Nutrient cycling<br>• Hydraulic buffer<br>• Filtering and chemical buffer | Criteria includes vegetation stability, infiltration and water drainage, erosion, soil biota, vegetation health, soil and pasture nutrients, resilience to dry periods and droughts, profile moisture content, vegetation survival and growth, subsurface water and chemicals. |
| Soil Resilience<br><br>• Drought<br>• Agricultural practices<br>• Fire | Vegetation health indicators during and post dry periods<br><br>Comparison of analogue reference sites<br><br>Vegetation growth and maturity |
| Agricultural Productivity | Comparison to analogue sites for a range of parameters including pasture and livestock growth rates. |

In response to the Commission's comment that the BSAL-equivalent soil completion criteria should include landscape function, not just physical attributes, KEPCO argues that the validation of achieving BSAL-equivalent land should be only based on the relevant interim BSAL criteria used to identify the impacted land, in accordance with NSW Government policy.

As identified in Table 11, LSC Class 3 completion criteria also include soil and land function attributes including vegetation yield and soil fauna and the general completion criteria include soil function, resilience and productivity which would also apply to any rehabilitated BSAL land. The Department considers that the BSAL-equivalent completion criteria should be based only on the criteria as defined in the BSAL interim protocol, noting the variance for soil fertility and that both the general criteria and LSC criteria, which would also apply to the BSAL land, include criteria for land and soil function.

SLR in its advice has also provided additional information on rehabilitation trials and monitoring completed for mines to rehabilitate back to BSAL, different LSC class land and comparative studies on agricultural productivity compared to reference sites. The details of these studies are provided in Appendix P of the RtPR Report and Appendix I of the Revised Mine Plan Supplementary Report. These examples are summarised in the Table below.

**Table 12** | Examples of Agricultural Rehabilitation Trials

*Coal and Allied – Alluvial Lands Project*

- Requirement to rehabilitate 63 ha to Class 1 and 2 cropping land
- Completion criteria to achieve district average production yields of Lucerne for three consecutive years
- DPI- Agriculture undertook monitoring to verify performance
- Production yields have met completion criteria

*Bengalla BSAL Reinstatement*

- Class 3 LSC and BSAL verification program on mine rehabilitation the Bengalla mine in the Hunter Valley has been completed by SLR Consulting
- The results have confirmed that BSAL criteria have been met
- The results are available in the Bengalla Annual Review

*Upper Hunter Mine Rehabilitation Grazing Study*

- Four-year project managed by NSW DPI-Agriculture to assess the success of grazing land rehabilitation
- Based on comparative statistical analysis of cattle growth rates
- The results indicated that cattle grazing on rehabilitated land were 100kg heavier than the reference farm sites

*Liddell Grazing Trial – Glencore*

- Cattle grazing trial comparing cattle growth rates on rehabilitated land against adjoining un-mined unimproved pasture land, over an area of around 70ha
- 18-month trial from December 2012 to June 2014
- Slightly higher weight gain (10% higher) on rehabilitated pastures
- Further stocking trials proposed to confirm results

*Bengalla Class III Land and BSAL verification*

- Bengalla Mine was required to rehabilitate 5.7 ha to Class III capability land
- Rehabilitation has been completed and completion criteria met for key physical parameters
- Although the area was not required to meet BSAL criteria, the area was also assessed against BSAL criteria with the results confirming that the rehabilitation could be classified as BSAL quality land, as 3 of 4 test sites met the criteria. One site had elevated soil salinity in the sub-soil
- All sites met the soil fertility based on replacement of original soil types and cation exchange capacity being high to very high.

While the studies are limited, the results indicate that rehabilitated mining land, if monitored and managed correctly, has reasonable prospects of being returned to productive agricultural land use for cultivation and grazing.

The completion criteria as proposed by KEPCO are comprehensive with further refinement needed following consultation and input by agencies and the community on a final Rehabilitation Management Plan. DPI-Agriculture reviewed the draft Rehabilitation Management Plan and is generally satisfied with the criteria for agricultural rehabilitation but recommended that in addition, monitoring and criteria is included for water holding capacity of the soils.

The Revised Mine Plan Supplementary Report (Appendix I) also provides an updated soil inventory showing that there is sufficient soil resource available for rehabilitation to meet the proposed BSAL/ LSC Class rehabilitation objectives. The Department notes that this soil inventory is based on achieving the landform with macro-relief

option, with the rehabilitation of 437 ha of land to BSAL/ Class 3 – with deeper target soil depths (0.3m topsoil and 0.6 m subsoil).

**Rehabilitation to Equine CIC**

The Commission raised concerns about the ability to return rehabilitated land back to Equine CIC. As discussed by SLR Consulting in Appendix P of the RtPR Report, the *Upper Hunter Strategic Regional Land Use Plan* (Upper Hunter SRLUP) provides guidance on the definition of Equine CIC land within Mid-Western Regional Council LGA.

Of relevance to the project, this includes land having a slope equal to or less than 18 degrees and located within 5km of the Bylong Valley Way. Given that slope class is the main constraint in identifying BSAL land, the majority of rehabilitation of the mine site would be less than 10 degrees, with some areas integrated with the existing woodland on higher slopes adjoining ridgelines, which would be rehabilitated back to woodland.

The proposed rehabilitated landform would therefore not impose any significant constraints for future post mining use for equine facilities, based on the criteria identified in the Upper Hunter SRLUP. Given the shorter open cut mining stage of 7 years, the progressive rehabilitation proposed by KEPCO, with few constraints to rehabilitate mine land to meet CIC criteria, the Department does not consider there would be any fundamental impediment to re-establishing an equine industry in the Bylong Valley in the longer term.

The Revised Mine Plan substantially reduces the direct impacts on Equine CIC within the disturbance area from 700 ha to around 587 ha, around a 16% reduction in area impacted by mining. Importantly, mining is removed from Tarwyn Park and impacts avoided on the horse burial site associated with the former Melbourne Cup winner Rain Lover.

As discussed in the PAR, the temporary impact of up to 587 ha should also be put in context, in that:

- it is a small percentage (0.3%) of the total mapped area of CIC identified in the *Upper Hunter Strategic Regional Land Use Plan* (SRLUP);
- prior to KEPCO acquiring land in the area for the project, there was only one stud (Bylong Park Stud) operating in the area, which has since been acquired by KEPCO and subsequently relocated to the Denman area;
- the Equine CIC is located at the extremity of the mapped CIC area and while mapped as CIC, there is no significant interrelationship between the site and the more productive equine industries around Scone and Denman; and
- NSW Government policy does not prohibit mining on CIC land, but applies a rigorous merits assessment, including a Gateway Panel review, as discussed above.

### Conclusion – Agricultural Resources

While the Department acknowledges that there would be an impact on agricultural resources as a result of the project, the Department considers that these impacts would not cause a fundamental or irreversible shift from agriculture to mining in the Bylong Valley.

The Department considers that the project as proposed, with stringent conditions, would represent a good example of co-existence of these important industries, consistent with the strategic objectives of the CW&O Regional Plan. This is because:

- as outlined in section 2.4 above, there would be no significant impact on water resources used for agricultural production, with water diverted to mining operations considered in the overall economic impacts of the project;
- the reduction in the value of agricultural production as mining progresses is a small percentage of the production in the region, that is only a relatively small area is temporarily impacted by mining;
- agricultural production would continue within the proposed disturbance areas prior to mining and following progressive rehabilitation over the relatively shorter 7 year open cut mining stage, that is, it represents a temporary loss of production;
- while there is a permanent loss of agriculture in offset areas, these are in areas that retain significant biodiversity values and are used for grazing, not higher value production such as for cultivation;

- the economic assessment undertaken for the project indicates that the gross economic benefits of the project outweighs the economic benefits associated with the continued use of the project lands (including the offset areas) for agriculture;
- the Revised Mine Plan further avoids direct impacts on BSAL, high-moderate LSC land and Equine CIC;
- agricultural production associated with natural sequence farming on Tarwyn Park is further protected with the Revised Mine Plan design;
- MWRC supports the development, recognising that the development would provide further resilience to the regional economy with co-existence between mining, agriculture and tourism industries; and
- KEPCO is committed to ongoing management of agriculture on its landholdings, and has prepared a draft Farm Management Plan outlining its approach to maintaining agricultural production.

The Department considers that KEPCO has sought to avoid impacts on the most important agricultural land and water resources that support agricultural production and is committed to continuing to maintain and enhance agricultural enterprises on its landholdings. It should also be acknowledged that there has been mining interest with the release of Exploration Leases in the Bylong Valley since the early 1980's with the opening of the railway line from Sandy Hollow up to Wollar/ Ulan area in 1982.

### Recommended Conditions – Agricultural Resources

In the PAR, the Department recommended a range of conditions for minimising/ managing impacts on agricultural resources. These included conditions requiring KEPCO to:

- achieve a number of rehabilitation objectives, including reinstatement of at least 423.1 hectares of BSAL-equivalent land within the rehabilitation area; and
- prepare and implement a comprehensive Rehabilitation Management Plan in consultation with DPI - Agriculture and other authorities, including requirements on KEPCO to (amongst other things):
    - achieve detailed performance and completion criteria for agricultural land and BSAL;
    - maintain and periodically review a detailed soil balance;
    - prepare and implement a comprehensive plan for reinstating BSAL and the proposed LSC Class agricultural land;
    - a protocol for periodic trials (commencing as early as possible) to demonstrate that the stated land capability is being achieved; and
    - a protocol for verification of the BSAL rehabilitation.

Following consideration of the Commission's findings and KEPCO's response, the Department has recommended the following revisions to the PAR conditions:

- **Schedule 4 Condition 63 - Rehabilitation Objectives**: To reflect the Revised Mine Plan reduction in impacts to BSAL, the rehabilitation objectives have been revised to restore at least 400 ha of BSAL-equivalent land/ Class 3 land.
- **Schedule 4 Condition 65 - Rehabilitation Management Plan**: In preparing the Rehabilitation Management Plan, an additional requirement is recommended to further optimise the final landform design towards meeting objectives of integration with the existing landscape (macro-relief) and restoration of higher capability agricultural land (BSAL/ LSC Class 3).
- **Schedule 4 Condition 67 - Agricultural Productivity**: Maintaining or enhancing agricultural production - the condition has been revised to clearly identify the land available for agricultural production and require that reasonable and feasible steps are undertaken to maintain or enhance production, in line with the commitments made during the assessment of the project, including the draft Farm Management Plan.

## 2.6 Heritage and Landscape Values

### Heritage Significance and Impacts on Tarwyn Park

***Commission Findings***

- The Commission is persuaded that the properties have greater heritage significance than has been previously documented by the applicant or considered by the Department or Heritage Council. As such, it is clear to the Commission that the documented impacts and mitigation measures to the properties need to be re-evaluated taking account of the potential for greater heritage significance.
- Although the GML report has been made publicly available, the Commission recognises that the timing of its publication (and the peer review that the applicant subsequently elected to submit) has meant that both public and agency responses to the findings and recommendations of the report have not been possible during the review period. The Commission considers that formal opportunity for public and agency review is essential prior to any determination.
- The Commission also notes that assessment of the values of, impacts to and mitigation measures for the setting of the properties, which is currently part of the proposed disturbance area, is largely absent. The importance of the landscape setting is moreover elevated by the value placed on it by the community, and the designation of a Bylong Landscape Conservation Area by the National Trust. As the natural beauty of the area is widely recognised, the extent of its interruption by the project requires evaluation.

The impacts on the heritage values of the project on the Tarwyn Park property is a key concern of the Commission and was a specific term of reference requested by the Minister for Planning. To assist its review, the Commission engaged GML Heritage to provide it advice on the heritage values of Tarwyn Park and the project's impacts on these heritage values. KEPCO subsequently provided a peer review of the GML report to the Commission, prepared by MUSEcape.

The Commission considered further evaluation and agency review was required prior to determination.

In response to the Commission's review, KEPCO prepared a detailed *draft Historic Heritage Management Plan*, including updated significance assessments and a *Horse Burials Management Plan*, and a *Draft Conservation Management Plan* for the Tarwyn Park landholding. This additional information also included 3D visualisation and video animations, and photo montages (see Appendix A) to provide further analysis of the visual/ landscape impacts on Tarwyn Park, the Bylong Valley Historic Cultural Landscape, and the broader Bylong Landscape Conservation Area (BLCA).

To address the Commission's concerns, the Department requested the Heritage Council of NSW to undertake a review of the heritage values of the Tarwyn Park landholding. The Heritage Council subsequently engaged Hector Abrahams Architects (HAA) to provide it with advice (see Appendix B).

Table 13 below provides a summary of the advice of the various heritage expert's assessment of the Tarwyn Park heritage values, against the NSW Heritage Office's criteria[7] for assessing the significance of heritage items.

Overall, there are a range of expert views on the heritage values associated with Tarwyn Park and the criteria that would satisfy a State heritage significance classification.

**Table 13** | Expert Advice on the Heritage Significance of Tarwyn Park Heritage Items

| *Advice* | *Key Significance Assessment Conclusions* |
|---|---|
| AECOM, EIS | • Concluded there was local historical significance only. |
| GML Heritage, Commission expert review | • Concluded that there was State level significance against 4 criteria:<br>o Criterion A - Historic Value, due to agriculture, thoroughbred breeding and natural sequence farming (NSF).<br>o Criterion B - Associated with a NSW identity, due to farming, horse-breeding history and NSF (Peter Andrews).<br>o Criterion C - Aesthetics/ Technical Achievement, due to landscape setting and technical achievement associated with NSF.<br>o Criterion E – Contributory Value, due to overall historic values such as agricultural practices and NSF. |
| MUSEcape, KEPCO, peer review of the GML Heritage report | • Considered the GML report was limited in its assessment by not identifying the inclusions/ exclusions applied to determine significance, no statement of significance was provided, and the comparative analysis was limited. |

[7] Specified in the guideline *Assessing Heritage Significance*, part of the NSW Heritage Manual which establishes seven evaluation criteria

| Advice | Key Significance Assessment Conclusions |
|---|---|
| | • Concluded that there is insufficient evidence to justify the levels of significance assessed.<br>• Inadequate consideration of the impacts on heritage values and mitigation measures proposed in the EIS. |
| AECOM, Draft Bylong Historical Heritage Plan and Draft Conservation Management Plan | • Concluded there was State level significance against 1 criterion:<br>o Criterion B – Associated with a NSW identity, due to NSF (Peter Andrews). |
| Betteridge Consulting, peer review of the AECOM, Draft Historic heritage and Conservation Management Plans. | • Concluded that the revised assessments of heritage significance completed by AECOM provide a sound basis for draft State Heritage inventory database. |
| Hector Abrahams Architects (HAA), expert review for the Heritage Council of NSW. | • Concluded that there was local significance against 3 criteria:<br>o Criterion A - Historic Value, related to the pastoral industry of Tarwyn Park;<br>o Criterion B - Associated with a NSW identity, due to colonial figures related to the Lee family and associations with the thoroughbred industry;<br>o Criterion C - Aesthetics – for architectural and garden significance;<br>o Criterion E – Contributory Value, due to the archaeological significance of the complex structures;<br>• Concluded that there was State level significance against 5 criteria:<br>o Criterion A - Historic Value, due to NSF.<br>o Criterion C - Aesthetics/ Technical Achievement, aesthetically due to Tarwyn Park setting in a scenic landscape and technologically due to NSF.<br>o Criterion E - Contributory Value, due to technological significance of NSF and for ongoing information/ research potential.<br>o Criterion F - Rarity, due to uniqueness as the original site of NSF.<br>o Criterion G - Representativeness, due to Tarwyn Park being a substantial component of the Bylong Landscape Conservation Area (BLCA). |
| **Heritage Council of NSW** | • Supported HAA's finding that the Tarwyn Park Homestead Complex has **local** heritage significance.<br>• Supported HAA's finding that the Tarwyn Park association with the NSW horse racing industry has **local** heritage significance.<br>• Noted HAA's finding that natural sequence farming is of potential State heritage significance but considers further comparative evaluation is required.<br>• Noted HAA's findings that the BCLA is of potential State Significance but considers further comparative evaluation is required. |

In considering the various independent evaluations, the Heritage Council concluded that further comparative evaluation would be required to determine a nomination for State heritage listing for Tarwyn Park, and that further work is required by the NSW Government to ensure there is a robust and systematic process for evaluating the heritage significance of scenic landscapes, such as the BLCA.

The heritage significance and impacts on the broader BLCA is discussed in more detail below.

The Heritage Council made a number of recommendations for the Department to consider for avoiding or further minimising impacts on the heritage values of Tarwyn Park including:

- measures to be introduced to mitigate the loss of the research potential associated with natural sequence farming; and

- further evaluation of the proposed post-mining landscape form to better reproduce the current character of the terrain.

In relation to natural sequence farming and research potential, the Heritage Council noted that the concept of NSF was applied to management of the entire landholding and landform, and not just specific features placed within the floodplain. As a result, the Council considered "that the project could potentially impact the ability to understand the technology, the theory and its application at this site." That is, protection of the entire property may be warranted to retain research potential and historical context.

In relation to the landscape context, the Heritage Council, was particularly concerned about the change in the valley landform and views from the Tarwyn Park complex (homestead and stables) across the Upper Bylong Valley towards Lee Creek and the Growee Range. The Council considered that further measures could be put in place

to reflect the existing landscape, including the natural and built heritage, such as reinstatement of roads and built structures.

Following careful consideration of the Heritage Council's advice and the Commission's concerns on the impacts of the mine on Tarwyn Park's heritage values and the landscape setting within the Upper Bylong Valley, the Department considered that a precautionary approach should be adopted.

KEPCO were advised that the Department would be recommending a condition to the Commission to prohibit mining on Tarwyn Park. The Department requested KEPCO to revise the mine plan to:

- exclude open cut mining and overburden emplacement on the Tarwyn Park landholding; and
- re-design emplacement areas to minimise visual impacts and maximise the integration of the final landform with the surrounding topography.

KEPCO's Revised Mine Plan proposes to address the concerns of the Commission and Heritage Council and the recommendation of the Department, through the following changes summarised in the table below.

**Table 14** | Revisions to the Mine Plan to Reduce Impacts on Tarwyn Park

| *Area* | *Changes to the Mine Plan* |
|---|---|
| Eastern Open Cut | • Removal of open cut mining and overburden emplacement from the Tarwyn Park landholding, extending the distance of<br>  o mine haul roads from within 40m of the Tarwyn Park complex to about 1 km;<br>  o open cut mining/ blasting from within 107 m of the Tarwyn Park complex to more than 1.4 km;<br>• Retention of the former Upper Bylong Catholic Church and cemetery, retaining visual links in the historic landscape setting.<br>• Subject to consultation and agreement with MWRC, re-establishment of the connection between the Upper Bylong Road and Lee Creek Road at mine closure. |
| Western Open Cut | • Reduction in the footprint of the western open cut to maintain a wooded ridgeline (northern spur), retaining existing views from the Tarwyn Park homestead. |
| Overburden Emplacements | • Modification of the north-western overburden emplacement area to retain an existing valley, to minimise the visual impacts of views from Tarwyn Park.<br>• Reduction in the height and slope of the south western overburden emplacement area to be more sympathetic with the existing landform.<br>• Incorporation of macro relief into the conceptual final landform, consistent with existing landscape elements in the Upper Bylong Valley, including branching ridgelines with slopes and widths emulating the existing terrain. |

The reduction in area of the eastern and western open cut is shown in Figure 14 below.

AECOM prepared an updated Historic Heritage and Visual Impact Assessment along with updated photomontages (see Appendix J-K – Revised Mine Plan Supplementary Report).

Figure 15 below shows the change in view from near the Tarwyn Park homestead and Stables, comparing the existing view across the Upper Bylong Valley to the EIS Mine Plan and the Revised Mine Plan. This is a key vantage point of concern to the Heritage Council, where the eastern overburden emplacement area located impacted on the landscape views across the valley, towards the Growee Range and Bald Hill further up Lee Creek valley. Appendix J-K of the Revised Mine Plan Supplementary Report shows additional views.

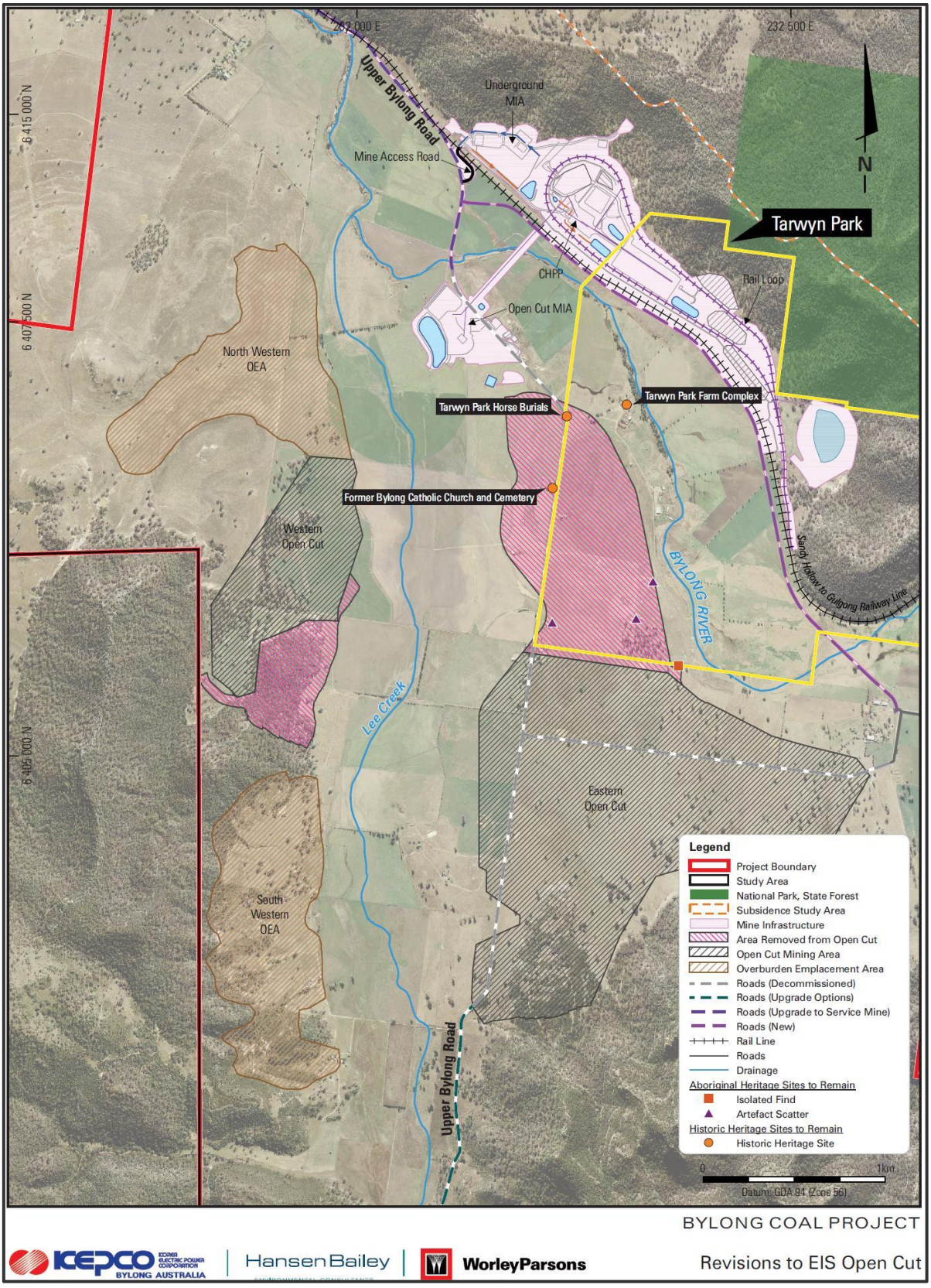



**Figure 14** | Open Cut Area Reduction


**Figure 15** | Change in view to the South West from Tarwyn Park homestead

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In particular, the photomontage series shows that with the removal of the eastern overburden emplacement area from Tarwyn Park the landscape character across the Upper Bylong Valley is largely retained, including the distant views of Bald Hill and the Growee Range. The viewshed also retains views of built infrastructure (the former Church and cemetery), which was an important consideration of the Heritage Council. The ridgeline in the western open cut, that was to be removed under the EIS Mine Plan is also retained.

To assist in gaining an understanding of the effectiveness of these changes, KEPCO has also prepared a video animation showing the key landscape features through the Upper Bylong Valley. The video can be viewed on the Department's website at:

http//majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=6367

Figure 16 below shows the cross-sectional change in landform from Tarwyn Park homestead up Lee Creek Valley towards Bald Hill, showing the existing landform, the EIS Mine Plan and the Revised Mine Plan. Of note is the removal of the high overburden emplacement on the Tarwyn Park property and the retention of the wooded ridgeline in the western rehabilitation area.

The incorporation of macro-relief into the conceptual final landform is shown in Figure 17 below. Comparing this landform design to the EIS Mine Plan landform shows:

- enhanced integration and retention of existing landform features, with the reconfigured valley drainage line incorporated into the north-western overburden emplacement area,
- the retention of the wooded ridge line in the western open cut; and
- re-designed south-western emplacement area to incorporate a forested spur/ ridgeline into the rehabilitated landform.

KEPCO also proposes a landscape design for the final landform incorporating an open woodland including paddock trees of endemic tree species, including from Fuzzy Box and Coastal Grey Box Woodland communities. This landscape element in the final landform is shown the final photomontage in the sequence in Figure 15 above.

The option for retention of a road link between Upper Bylong Road and Lee Creek Road is also identified in the final conceptual landform.

KEPCO owns all landholdings within the Upper Bylong Valley, and has an acquisition agreement with the remaining landowner in Lee Creek (residences ID 151/158 in Figure 3), that have direct views from residences to the open cut mining area. KEPCO does not own landholding ID 204-212 to the east of the mine, however there are no residences on this landholding with this property located behind ridgelines with no direct views of the open cut mining area.

The Department considers that the Revised Mine Plan provides a significant improvement to the EIS Mine Plan by retaining key landscape features of the Upper Bylong Valley and a similar landscape view from the Tarwyn Park homestead of Bald Hill, the Growee Range, Tal Tal Mountain and the Upper Lee Creek catchment.

The Heritage Council of NSW has reviewed the Revised Mine Supplementary Report (see Appendix D) and advised the Department that it:

> *"welcomes the responses by KEPCO to revise the proposed Mine Plan to avoid and minimise potential impacts to the heritage values of Tarwyn Park and the surrounding landscape, and to specifically hear and respond to the key issues raised in the Heritage Council's submission to the Department (Feb 2018). The RMP makes a substantive improvement to the exhibited EIS proposal and genuinely responds to several key impacts identified by the Heritage Council in its submission;.."*

In addition to the mine plan revisions made in the Revised Mine Plan that significantly reduces direct and landscape impacts on the heritage values of Tarwyn Park and the former Upper Bylong Catholic Church, KEPCO has committed to a range of mitigation measures, as detailed progressively through the assessment of the project, as summarised in Table 15 below.

KEPCO proposes that, subject to the determination of the project, the draft Historic Heritage Management Plan prepared for the RtPR Report, would be updated in accordance with the changes to the mine plan and additional mitigation measures.

**Table 15** | Summary of Avoidance and Mitigation Measures – Tarwyn Park

| *Heritage Aspect* | *Mitigation Measures* |
|---|---|
| Tarwyn Park Complex (House and Stables Area) | • Indirect impacts (blast/ vibration/ visual) substantially reduced compared to the EIS Mine Plan.<br>• Avoid direct impacts to the driveway entry into Tarwyn Park and access retained through existing access tracks.<br>• Proposed ongoing use of the homestead as a collaborative research and education centre (subject to suitable arrangements with institutions).<br>• Blast design to meet blast limits to avoid impacts, with commitment to repair any damage.<br>• Priority conservation works identified to preserve heritage features.<br>• Update the draft Tarwyn Park Conservation Management Plan and Historic Heritage Management Plan to reflect changes. |
| Tarwyn Park Horse Burials | • Direct impacts now avoided.<br>• Update the Horse Burial Management Plan to reflect avoidance of the site.<br>• Update the draft Tarwyn Park Conservation Management Plan to reflect changes. |
| Natural Sequence Farming | • Direct disturbance from open cut mining and emplacement areas now avoided.<br>• Maintaining or enhancing soil hydrology techniques (natural sequence farming) with commitments identified in a draft Farm Management Plan prepared for the RtPR Report.<br>• Maintaining reasonable access for external study of these techniques.<br>• Potential to establish a research and education centre, subject to suitable arrangements with institutions.<br>• Maintain agricultural production on the Tarwyn Park landholding. |
| Former Upper Bylong Catholic Church and Cemetery | • Direct impacts now avoided.<br>• Prepare a conservation management strategy for the church and cemetery.<br>• Incorporate measures to ensure blast and vibration limits are met, noting that blasting would be more than 1 km from the church site. |

While the Heritage Council requires more evaluation before it makes a determination on the heritage significance of Tarwyn Park under the *Heritage Act 1977*, this is a separate matter to the planning decision before the Commission. The Commission in its review report noted that the eligibility for listing is a matter for the Heritage Council and the Minister for Heritage.

Separate to the assessment of the development application for the Bylong Coal Project, there is also opportunity for further public input into the Heritage Council's decision on the listing of Tarwyn Park on the State Heritage Register. Once the Heritage Council forms a view that an item may have State significance it invites public submissions on its "notice of intention to consider listing", in accordance with Section 33 of the *Heritage Act 1977*. That is, there would be opportunity for further public input into the decision about the heritage significance of Tarwyn Park and the additional heritage studies considered by the Heritage Council.

The Department has considered the impacts on Tarwyn Park cognisant of its potential heritage significance and is satisfied that, regardless of the decision on the listing by the Heritage Council, the impacts on the heritage values Tarwyn Park have been largely avoided or minimised as far as practicable, in accordance with the recommendations of the Heritage Council.

In relation to heritage impacts on Tarwyn Park, the Revised Mine Plan provides an appropriate balance, allowing the significant economic benefits from the project to be realised and the heritage values associated with Tarwyn Park to be retained. Further, KEPCO has committed to ongoing scientific research of natural sequence farming and provision of substantial funds towards conservation management of the Tarwyn Park complex, with $100,000 spent on high priority conservation measures and an additional $650,000 in further maintenance and repairs identified in the Draft Conservation Management Plan for the property.

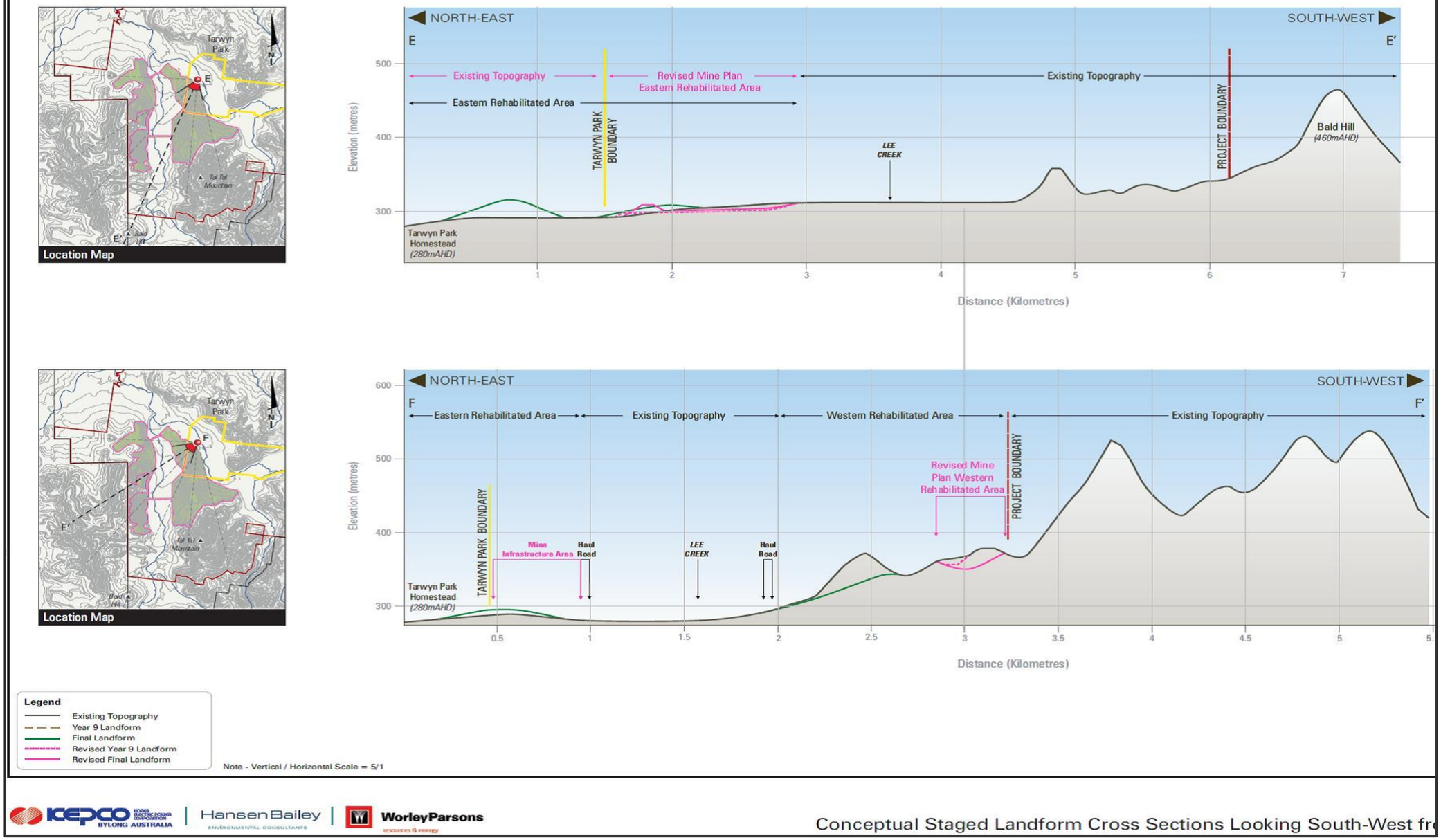


**Figure 16** | Landform Cross Sections to the South West quadrant from Tarwyn Park homestead

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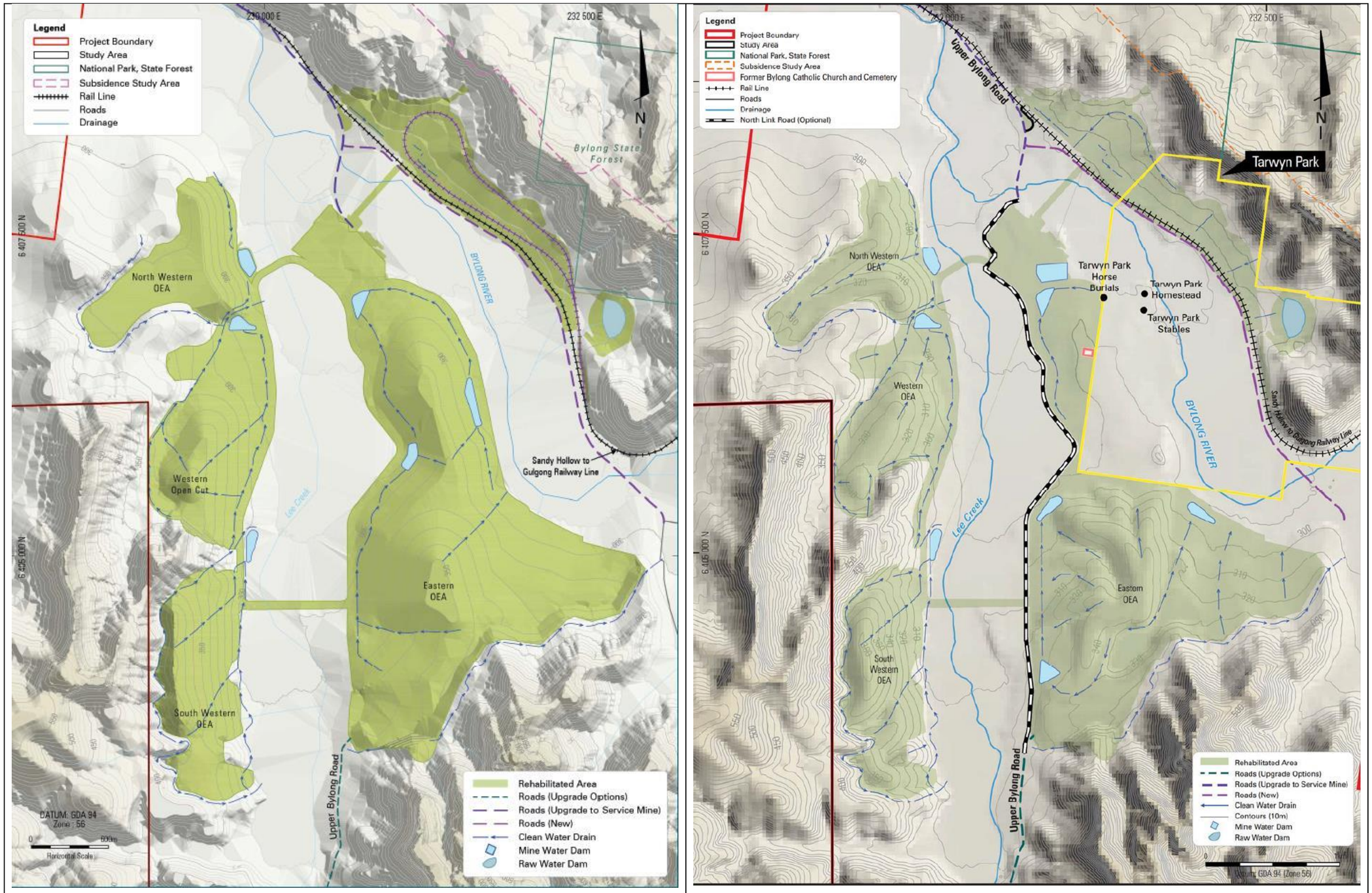


EIS Mine Plan

Revised Mine Plan

**Figure 17** | Conceptual Final Landform Comparison

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## Landscape Heritage Values and Impacts

### *Commission Finding*

- Consider impacts on landscape values are more significant with transformation from agricultural landscape considered to be exceptional (by the National Trust) to industrial – even with treatments, it is unlikely that values would be returned.

As outlined above, both the Commission and the Heritage Council raised concerns about the impact of the mine on the broader landscape heritage values of the Bylong Valley. In particular, the impacts on the BLCA in which the mine and Tarwyn Park property is located within, as shown in Figure 18 below.

The BLCA covers an area of some 486 km$^2$ and is listed on the non-statutory National Trust of Australia NSW Register. The area extends primarily along the Bylong Valley Way and adjoining valleys and is one of 111 landscape conservation areas listed by the National Trust in NSW.

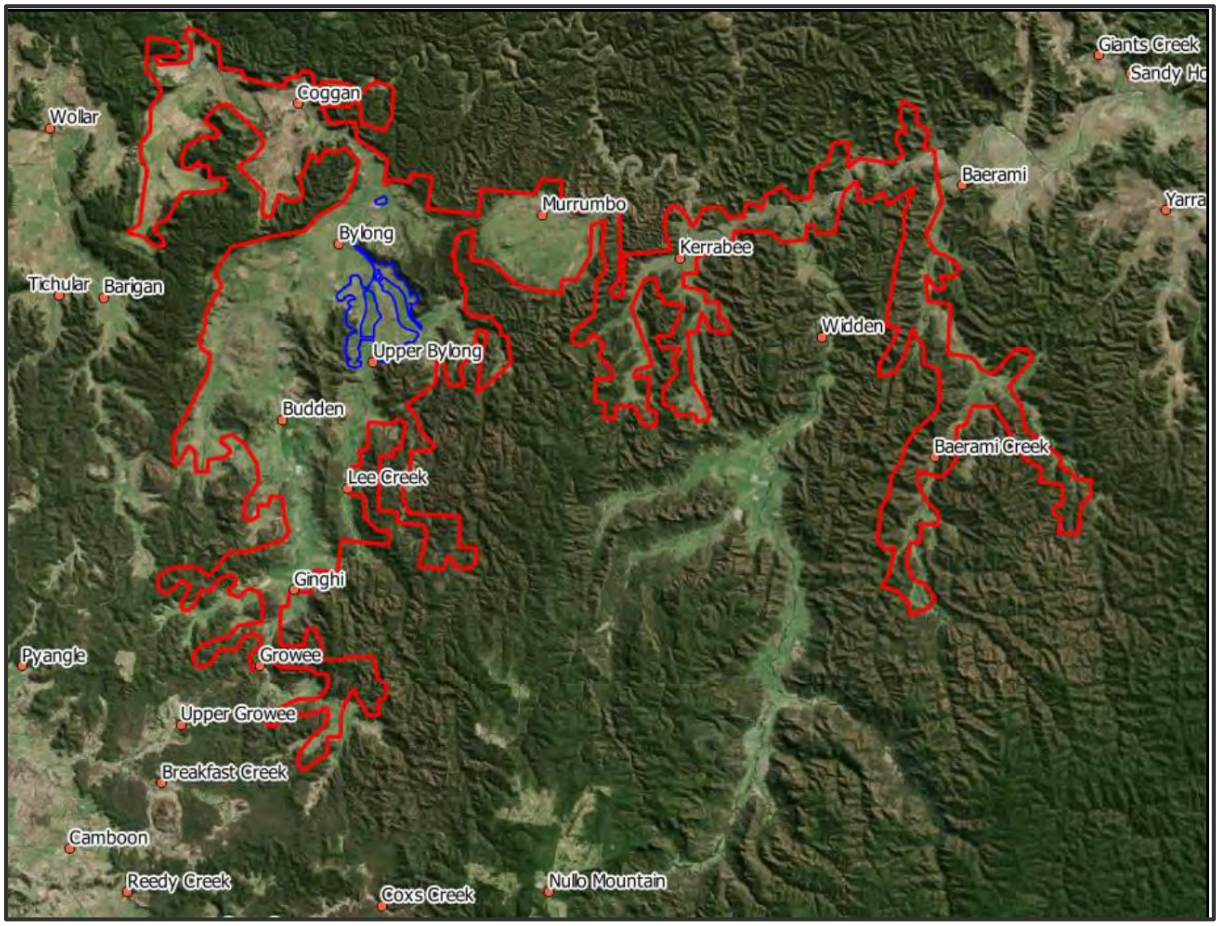


**Figure 18** | Bylong Landscape Conservation Area and EIS Mine Plan

Both AECOM and HAA undertook a significance assessment of the BLCA using the Heritage Council's guidelines and evaluation criteria as described above. AECOM concluded that the BLCA was of State historical significance based on historical, aesthetic, research and representative significance criteria.

HAA focused its assessment of the BLCA on Tarwyn Park and the Upper Bylong Valley, as a substantial component of the broader BLCA, and concluded that the area was of State heritage significance, based on aesthetic significance and representativeness criteria.

In response, the Heritage Council carefully considered these findings and agreed that the BLCA scenic landscape has heritage significance but concluded that further work was required by the NSW Government to develop a rigorous framework for assessing the significance of heritage landscapes. In particular, advising that

> *"As a result of the examination of the impact of the Project on the BSL, the Council realises that the potential State significant heritage assessment of natural and cultural landscapes is an area in which work is required to develop a more substantive and holistic assessment of landscapes across the State. As a result of the lack of current rigour in the assessment of such landscapes and an understanding of their*

*values as scenic elements, and complex cultural landscapes evolved from initially Indigenous and then European human interactions, the Council cannot at this time confirm the likely State significance attributes of the BSL (including the much smaller Tarwyn Park element).*[8]

While the Heritage Council considers that there is merit in improving how landscape significance assessment is undertaken in NSW, it should not delay the decision on the Bylong Coal Project. The landscape heritage values are acknowledged by the proponent, with avoidance and mitigation measures incorporated into the mine design to minimise impacts on the BLCA.

In regard to impacts on the broader BLCA, KEPCO in the RtPR Report argues that the project would only be visible to around 0.6% of publicly accessible locations within the BLCA, with minimal direct views along the main Bylong Valley Way tourist drive and from the Bylong Village precinct, due to the woodland vegetation and intervening ridgelines associated with the Growee range. With the Revised Mine Plan, there would be direct impacts from mining to around only 2% of the total BLCA area.

The key impact on the BLCA is on the intrinsic landscape values within the Upper Bylong Valley and associated with the heritage values of Tarwyn Park as discussed above. The association of Tarwyn Park and natural sequence farming as a specific heritage component of the BLCA is referenced in the National Trust's report.

The Heritage Council and HAA considered that the permanent introduction of artificial landforms would alter the shape of the broader Lee Creek and Bylong River Valley. The Revised Mine Plan materially reduces impacts on the views from the Tarwyn Park complex, following rehabilitation of the open cut disturbance area, including the retention of existing landscape elements including the former Catholic church and reconnection of the Upper Bylong Road to Lee Creek Road post mining, subject to MWRC agreement.

To provide further context on the change in the valley landscape looking to the south through the Upper Bylong Valley, KEPCO has prepared a photomontage of the existing view against the view of the Revised Mine Plan final rehabilitation, as shown in Figure 19 below. The incorporation / retention of some landscape features compared to the EIS Mine Plan, including the retained ridgeline in the foreground of the Growee Range, valley drainage design in the north should be noted.

The Department and the Heritage Council consider that the Revised Mine Plan provides a significant reduction in the impacts on the landscape values of the Upper Bylong Valley and the BLCA in that:

- the valley form is largely retained across the broader Bylong River and Lee Creek catchments;
- views from across the Upper Bylong Valley from Tarwyn Park and from vantage points along Upper Bylong Road to the south/ south east would retain key landform features;
- there is improved integration with existing landform, with retention of forested ridgelines and incorporation of macro and micro relief in the rehabilitated final landform; and
- while the EIS Mine Plan was designed to have limited views from the main Bylong Valley Way tourist drive, the proposed changes would retain key landform aspects post mining and allow opportunity for future reinstatement of the road connecting to Upper Lee Creek catchment and significant cultural heritage infrastructure in the landscape, such as the former Upper Bylong Catholic Church.

[8] The BLCA is referenced as the Bylong Scenic Landscape (BSL) in the Hector Abrahams Architect report


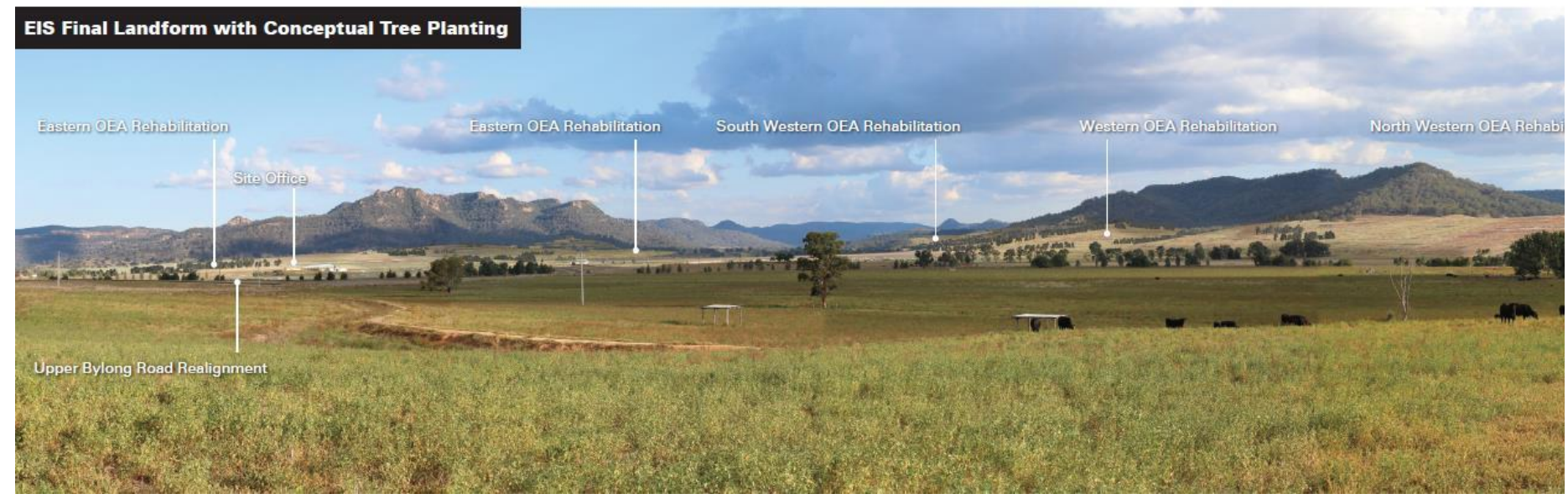



**Figure 19** | Change in landscape view looking south down the Upper Bylong Valley

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### Aboriginal Heritage

***Commission Finding – Aboriginal heritage***

- An up-front agreement with OEH is required on the method and scope of work required for the recommended ochre study and Aboriginal cultural heritage assessment within biodiversity offset areas.

KEPCO has consulted further with OEH and the Department on the scope of the ochre study and Aboriginal cultural heritage assessment of the biodiversity offset areas. The requirement to undertake these studies was recommended by the Department in the PAR draft development consent conditions as a component of the Aboriginal Heritage Management Plan (Schedule 4 Condition 44(d)).

OEH's advice (see Appendix D) and KEPCO's response is provided in Appendix U of the RtPR Report. OEH provided a detailed scope for these studies with KEPCO committing to undertaking these studies in accordance with OEH's advice. The Department has revised Condition 44 to reference the scope of work recommended by OEH.

The Department also notes that further consultation with OEH and Registered Aboriginal Parties (RAPs) would be required when preparing the Aboriginal Heritage Management Plan.

The Revised Mine Plan avoids direct impacts on a further 4 Aboriginal heritage items including 3 artefact scatters and one isolated find located on the Tarwyn Park landholding. All of these sites were ranked low archaeological significance, however site AS076 is a larger scatter site approximately 40x30m with 25 artefacts recorded.

### Conclusion – Heritage

The Department considers that the Revised Mine Plan provides a significant reduction on the impacts of the project on the heritage values of Tarwyn Park and other heritage features associated with the Upper Bylong Valley including:

- avoiding direct impacts of the open cut mine on Tarwyn Park, including retaining the use of the entire property holistically for natural sequence farming;
- retaining the research potential of soil hydrological principles on Tarwyn Park;
- avoiding direct impacts on 2 heritage items – the former Catholic church and cemetery, and the Tarwyn Park horse burials;
- significantly increased distance from blasting to the Tarwyn Park complex;
- significantly improved landscape view from the Tarwyn Park complex across the Upper Bylong Valley;
- additional mitigation of the impacts on the BLCA through incorporating key natural and built landscape elements into the mine design and rehabilitation; and
- avoiding direct impacts on 4 Aboriginal heritage sites.

### Recommended Conditions – Heritage

In the PAR, the Department recommended a range of conditions for minimising/ managing impacts on heritage. These included conditions requiring KEPCO to prepare and implement a comprehensive Heritage Management Plan.

For Historic heritage the plan would require:

- archival recording, test excavation, archaeological salvage and, where possible relocation, of the 6 sites that would be directly affected;
- blast mitigation and monitoring for sites potentially affected by project-related blasting;
- landscape treatments to mitigate visual impacts;
- exhumation and reinternment of human burials in accordance with a detailed Burials Management Plan and applicable statutory approvals under the *Public Health Regulation 2012*;
- installation of a memorial in the local area in the event that reburials occur outside the locality;

- Conservation Management Plans for all identified built heritage items outside the project disturbance area, including assisting Council with any proposal to list the sites on applicable heritage registers;
- an Interpretation Plan for the broader Bylong precinct, including a detailed oral history prepared in consultation with existing and former residents of the Valley; and
- continuation of natural sequence farming techniques on the Tarwyn Park property and making the property available for external study by applicable scientific organisations.

For Aboriginal heritage, the plan would require:

- ongoing consultation with the local Aboriginal community and OEH;
- a description of measures to be implemented for:
    - salvage, excavation and archival recording of sites within the project disturbance area;
    - protection, monitoring and management of sites outside the project disturbance area, including archival recording of sites subject to potential indirect impacts, and test excavation of significant rock-shelter sites;
    - further investigation and research into the ochre site and rock art in the region;
    - further assessment of the Aboriginal cultural heritage values of the biodiversity offset areas;
    - ensuring continued access to cultural heritage sites for Aboriginal stakeholders;
    - managing the discovery of human remains or previously unidentified Aboriginal artefacts;
    - adequate training and induction of personnel; and
    - storage and management of salvaged items.

Following consideration of the Commission's findings and KEPCO's response, the Department has recommended the following revisions to the PAR conditions in relation to heritage:

- **Schedule 2 Condition 2 - Terms of Consent:** Revised condition to require that KEPCO can only develop the open cut stage of the mine generally in accordance with the Revised Mine Plan.
- **Schedule 4 Condition 14 - Blast Management Plan:** Revision to the Blast Management Plan requirements to manage blasting to meet blast criteria for heritage items on Tarwyn Park and the former Upper Bylong Catholic Church and cemetery.
- **Schedule 4 Condition 42 - Aboriginal Heritage Management Plan:** Requiring the minimum scope of the Aboriginal heritage ochre study and assessment of values of Aboriginal heritage items in offset areas to be consistent with advice from OEH, as identified in Appendix U of the RtPR Report.
- **Schedule 4 Condition 44 - Historic Heritage Management Plan:** Removal of the requirement for a Burials Management Plan and a Horse Burials Management Plan.
- **Schedule 4 Condition 62 - Rehabilitation Objectives:** Rehabilitation objectives to include macro-relief principles, reference to the revised conceptual final landform for the Revised Mine Plan and potential for reinstatement of the road connection between Upper Bylong Road and Upper Lee Creek Road, subject to Council agreement as part of consultation on post closure land use.
- **Schedule 4 Condition 64 – Rehabilitation Management Plan:** Revisions to the Rehabilitation Management Plan to optimise the design of the final landform to incorporate macro and micro-relief features to improve visual integration with the existing landscape and rehabilitation to meet agricultural objectives to reinstate BSAL-equivalent land and Class 3 and 4 agricultural land.

## 2.7 Social Impacts

### Adequacy of the Social Impact Assessment and Mitigation Measures

***Commission Findings***

- Consider there is inadequacies in the SIA such that the severity of the impacts cannot be determine and that social impacts have not been fully recognised including social impacts due to land acquisitions and whether mitigation measures are sufficient.
- The Commission is also concerned that there does not appear to be any evaluation of the sufficiency of the mitigation measures proposed by the applicant and recommended by the Department with some of the peer reviewer's recommendations weakened in the Department's conditions, which require only that the applicant *"make every effort"* to contribute to local community projects, and maintain agriculture, but only *"where possible"*.
- These terms seem to reinforce the Department's acceptance of the inevitability of local social impacts and reliance of open market conditions to protect the interests of impacted people without recognising the full significance of community impacts.
- The Commission considers, as a result, that there are several inadequacies in the social impact assessment of the project, and as a consequence, the severity of the social impact cannot be adequately determined. In the absence of this information, any future evaluative judgement on the social benefits and social costs of the project will be impaired.

To address the Commission's concerns and provide further information on social impacts and proposed mitigation measures Hansen Bailey has prepared a Preliminary Social Impact Management Plan (SIMP) in consultation with MWRC and the local Bylong Valley community (see Appendix D of the RtPR Report). The Preliminary SIMP was peer reviewed by Dee Elliot (Elliot Whiteing).

The preparation of the Preliminary SIMP also considered the Department's *Social Impact Assessment Guidelines*, noting this guideline does not require a SIMP to be prepared and implemented for mining projects. The SIA Guideline provides approaches to management of social impacts and monitoring and management frameworks.

The Preliminary SIMP provides further consideration and information about key concerns raised by the Commission including:

- social impacts that have already occurred due to project property acquisitions;
- adequacy of engagement with Bylong Valley residents;
- the significance of social impacts and measures to mitigate these impacts;
- community health impacts and linkages to assessments on air/ noise; and
- mine closure impacts.

The RtPR Report and Preliminary SIMP provides an update on the population change in Bylong Valley, estimating that the number of residents in the Valley at the time of the preparation of the preliminary SIMP at 66 persons across 35 property holdings, a net reduction of 30 people over the period 2011 - 2017. This includes 59 persons who left the area and 29 incoming persons during this period, including 14 employees residing in the area for KEPCO farming operations.

The Bylong Valley extends south along the Growee River with private landholdings located up to 25 km by road from Bylong Village to the Ginghi locality, before the Bylong Valley rises through the escarpment towards Rylstone. While there are no private residences remaining in Bylong Village, there is one residence on the Eagle Hill landholding within the Village precinct and a further 4 residences on 2 landholdings within 3 km of the mine.

Further analysis of population change in Bylong Valley shows that there has been historic peaks and troughs with a steady trend of population decline in the valley since the 1980's, particularly following the completion of the railway line construction and significant landholding amalgamations in the early 2000's. The Department acknowledges that the recent acquisitions by KEPCO have accelerated this decline with consequent impacts on social cohesion and services in the Bylong Valley.

The Department accepts that if the mine were to proceed and appropriate actions and incentives in place to promote workers residing in the valley, there could be a positive social impact compared with the existing situation. For example, KEPCO in its Preliminary SIMP, identifies potential for 30-50 persons to move to the Bylong Valley during the operational stages of the project.

Similarly, in the townships of Rylstone and Kandos there has been a downward trend in population, particularly with the Kandos cement work closure in 2011 and Charbon mine closure in 2015. These population declines have

been offset within the MWRC area due to population growth in the larger town of Mudgee, largely due to the resilience of a diverse economy supported by agriculture, mining and tourism.

There is broad support for the project in the Kandos and Rylstone communities due to the potential positive social impacts/ opportunities for employment and businesses. In particular, MWRC supports the project and provided a letter of support (see Appendix B of the RtPR Report), highlighting the history of mining in the local government area, the need to maintain a diverse economy, and highlighting the importance of the project to the local communities of Bylong, Rylstone and Kandos.

MWRC also provided the Department a copy of a petition of support from 459 Kandos, Rylstone and surrounding community residents, provided to the local State Member for Bathurst, the Hon. Paul Toole MP.

In addition to the social impact assessment completed for the EIS and the RTS, to further inform social impacts in the preparation of the SIMP, KEPCO:

- used updated socio-economic baseline data from recently available 2016 census data;
- conducted face to face and telephone interviews with 26 Bylong Valley residents (not including KEPCO farm managers or workers);
- undertook a community health and wellbeing survey of the local community;
- consulted with MWRC;
- consulted further with service providers including accommodation surveys and social housing, education and health; and
- held focus group sessions with Kandos / Rylstone residents and businesses.

The SIMP includes a detailed risk assessment and opportunities analysis focusing on the Bylong Valley and the broader regional community including Mudgee, Kandos and Rylstone Appendices D1-D4 of the Preliminary SIMP provides a detailed analysis identifying risk management measures to mitigate social impacts and actions to enhance social opportunities.

The SIMP also identifies preliminary key performance indicators to track against these commitments. For example, indicators include the number of percentage of local people employed and number of KEPCO employees residing in Bylong Valley.

This approach is consistent with the SIA Guideline which recommends that relevant measurable performance criteria and management objectives be developed, and be preferably incorporated into a plan.

Examples of this analysis is shown in Table 16 below for social impacts and opportunities associated with labour supply, support for the Bylong Rural Fire Service and population decline and social cohesion in the valley.

**Table 16** | Social Impacts – proposed enhancement/ mitigation measures

| *Social Impact* | *Proposed Enhancement / Mitigation Measures* |
|---|---|
| Labour Supply | • Undertake a labour supply study to inform the Local Content and Economic Development Plan, for the provision of local employment and training opportunities, local procurement and Indigenous participation, including opportunities at the mine and agricultural enterprises.<br>• Provision of employment opportunities for existing residents who are unemployed or underemployed.<br>• Maintain a project employment portal.<br>• Monitor local labour supply over the project life.<br>• Provide part time/ flexible employment opportunities, including job sharing.<br>• Investigate provision of suitable and affordable child care for Bylong Valley residents. |
| Rural Fire Service | • Provide part time/ flexible employment opportunities to allow participation in community / volunteering.<br>• Support the Bylong RFS to be adequately resourced.<br>• Investigate programs to reduce the barriers to residents participating in the Bylong RFS.<br>• Establish employee policies for volunteer actions.<br>• Contributions to the Westpac Rescue Helicopter Service. |

| Social Impact | Proposed Enhancement / Mitigation Measures |
|---|---|
| Population decline and social cohesion in Bylong Valley | • Offer operations phase workers and families incentives to support residence in the Bylong Valley.<br>• Assist new residents and families to integrate into the community.<br>• Encouraging new residents to participate in local volunteer roles and community groups/ organisations.<br>• Commitments to enhance Bylong Village, including Bylong Hall and recreation area;<br>• Commitment to operate the Bylong Valley store to retain as a community focal point and tourist feature.<br>• Continue the existing refurbishment program for KEPCO owned residences to ensure they are suitable for and attractive to employees and their families.<br>• Lobby Telstra for the construction of an additional mobile phone tower.<br>• Investigate the provision of suitable and affordable child care in the Bylong Valley.<br>• Advocate ongoing access to safe, efficient and reliable school bus transport between the Bylong Valley and schools in Rylstone and Kandos. |

This updated assessment has been used to develop 7 preliminary action plans[9] that KEPCO is committed to implementing, including:

- Bylong Valley Preliminary Action Plan
- Regional Housing and Accommodation Preliminary Action Plan
- Community Liveability, Health and Wellbeing Preliminary Action Plan
- Workforce Management Preliminary Action Plan
- Local Content and Economic Development Preliminary Action Plan
- Mine Closure Preliminary Action Plan
- Social Investment Preliminary Action Plan – including the development of a Community Investment Strategy.

KEPCO also commits to further engagement if the project were to proceed and has prepared a stakeholder engagement strategy for the preparation of a final SIMP. The recommended conditions require the establishment of a project CCC which would be required to be consulted during the preparation of a final SIMP.

The Preliminary SIMP is based on the EIS Mine Plan and some of the commitments would need to be revised to reflect the Revised Mine Plan, particularly social impact aspects associated with the avoidance of impacts on Tarwyn Park and the former Upper Bylong Catholic Church.

### Voluntary Planning Agreement

***Commission Finding***

- There is limited requirement in the recommended conditions for funding contributions to go towards local community projects, with the applicant only required to "make every effort" to contribute to local community projects.

As identified in the PAR, KEPCO executed a Planning Agreement with MWRC to fund community enhancement projects in December 2016. This Planning Agreement was publicly exhibited by MWRC in accordance with the requirements of the EP&A Act before it was finalised.

Over the life of the project, based on the Revised Mine Plan, approximately $7.12 million dollars (2017 dollars) in funds would be disbursed including $2.75 million if the project commenced and a $0.05 per tonne of product coal indexed to CPI from July 2017. There is a small 3% reduction in total VPA funding compared the EIS Mine Plan due to the reduction in product coal over the mine life.

In accordance with the terms of this agreement, the expenditure of the funds would be consistent with the MWRC's Community Plan, which is a publicly exhibited document. The *Towards 2030 Community Plan* was

[9] For details of identified commitments refer to Tables 31 to 37 of the Response to PAC Review Report – Appendix D.

adopted by MWRC in 2013 and reviewed in 2017 and includes key objectives relevant for Bylong Village including promoting vibrant towns and villages within the region, maintaining and promoting the aesthetic appeal of villages and managing the impacts of mining operations.

MWRC has also written to the Department (see Appendix E5) confirming that it would fund projects in accordance with its Community Plan and that any submissions from residents of the Bylong Valley or from the Bylong Valley Progress Association would be given priority in expenditure of these funds over the life of the agreement.

As discussed above, KEPCO has prepared a Preliminary SIMP (see Appendix D of the RtPR Report), that includes a proposed Bylong Valley Preliminary Action Plan that would formalise commitments made through the environmental assessment. In the action plan, KEPCO identifies a range of commitments that would be additional to funding directed by MWRC to the Bylong Valley area through the VPA and the Community Plan. In addition, draft key performance indicators (KPIs) are proposed to track performance against these commitments – for example success in attracting KEPCO employees to reside in the Bylong Valley.

In the PAR, the Department recommended that a SIMP be prepared and implemented to the satisfaction of the Secretary. If the project is approved, further consultation would be required in accordance with the recommended conditions, the approved SIMP would be implemented with monitoring against the commitments in the SIMP.

The Department considers that with the executed VPA and the proposed commitments in the preliminary SIMP, there would be financial and practical support for the Bylong Valley community to minimise and manage the social impacts of the project, noting the broader positive social impacts for the regional community.

### Workforce Accommodation Facility

***Commission Findings***

- An on-site accommodation facility has not historically been necessary for mining projects in the region – its provision is likely to have associated impacts to the local community and the wellbeing of workers as has been documented in prior remote mining projects.
- These impacts can be significant and therefore may be inappropriate to defer their assessment to the post-decision domain.
- Some of the socio-economic benefits of the project would be eroded by the provision of on-site workers' accommodation.

Following further consultation with MWRC, KEPCO has removed the WAF from the project. The Department has included in its recommended condition, a clear requirement that no WAF is permitted.

The Department notes that the No-WAF accommodation scenario was assessed in the SIA for the project and further considered in the Preliminary SIMP, through the preparation of a Housing and Accommodation Preliminary Action Plan, including consultation with accommodation service providers, MWRC and Mudgee Regional Tourism.

The action plan includes the preparation of a detailed Project Workforce Accommodation Strategy prior to commencement of construction. MWRC have also committed to working with KEPCO and accommodation service providers to ensure that accommodation impacts are adequately managed.

With the removal of the WAF, the Department has formally included the requirement to prepare an updated Workforce Accommodation Strategy as a requirement of the SIMP.

### Conclusion – Social Impacts

To address the concerns of the Commission, KEPCO has undertaken additional consultation with the local community, MWRC and service providers and prepared a detailed preliminary SIMP for the project. The preliminary SIMP identifies KEPCO's commitments to manage social impacts including mitigation actions and monitoring programs over the life of the project. If the project were to be approved, a final SIMP would be prepared and implemented with further consultation with the Bylong Valley community, CCC and MWRC.

KEPCO has also removed the WAF from the project to reduce social impacts in the local Bylong Valley community during the construction period. This would also increase economic activity in the regional area through use of services and facilities, particularly in Mudgee, Rylstone and Kandos.

The Department acknowledges that social impacts have already occurred due to the acquisition of land by KEPCO in the Bylong Valley with loss of social cohesion and loss of connections in the local farming community. This has followed a slow decline in the population in the Valley, particularly since construction peaks during the construction of the Sandy Hollow to Gulgong railway in the area in the 1980's, with consolidation of landholdings occurring in the area over the last 20 years.

However, there is community support in the broader region for the proposed mine, particularly in the larger regional towns of Mudgee, Rylstone and Kandos where the positive social impacts of the project are predicted to occur through additional employment and economic stimulus, as shown through the assessment of net benefits and local effects analysis, including a petition from 459 Kandos, Rylstone and surrounding community residents in support of the project.

To ensure that the broader regional benefits of the mine are distributed to the Bylong Valley area to address the social impacts, both KEPCO and MWRC propose a range of mitigation measures to mitigate the social impacts at the Village and Bylong Valley during the mine life and at closure. This includes:

- clear commitment by MWRC to prioritise VPA funding to projects in the Bylong Valley;
- implementing a Bylong Valley Action Plan as a component of the SIMP to monitor and mitigate social impacts including actions to:
    - attract and retain Bylong Valley residents, including promoting opportunities for employees to reside in the Bylong Valley;
    - enhance Bylong Village, including funding for enhancement works in the Village including the Bylong Hall and sporting grounds, and maintaining the Bylong General Store;
    - improve social cohesion, through hosting community events, promote opportunities for new residents to participate in volunteer roles (for example with the RFS) and local community groups; and
    - maintain and/or enhance agricultural productivity on KEPCO landholdings, promoting the co-existence in the Valley for mining and agriculture.

### Recommended Conditions – Social Impacts

In the PAR, the Department recommended a range of conditions for minimising/ managing residual social impacts including:

- affording acquisition and/or mitigation rights to the remaining noise affected residents in the vicinity of the proposed mining operations (although the Department considers KEPCO should seek to acquire or reach agreement with these landowners prior to any determination);
- requiring a CCC to ensure that the views and concerns of the community through its representatives are considered during the life of the project, including input into management plans;
- retaining agricultural productivity where possible on KEPCO acquired landholdings during mining and to return disturbed areas to an agricultural land use following mining;
- undertaking an oral history of the area, preparing archival documentation, relocating where possible important local historical items of importance to the local community and managing impacts on heritage items, including on Tarwyn Park;
- preparing a Burial Management Plan for exhumations from the former Upper Bylong Catholic Church grounds;
- providing assistance for the RFS and ensuring the site is equipped for fire-fighting;
- support for allocation of VPA funding to be directed to local community projects;
- requiring monitoring, management and reporting of impacts under management plans and the environmental management system for the project;
- requiring KEPCO to implement measures, in consultation with Council and the CCC, for post mining land use and managing socio-economic impacts associated with mine closure; and
- prepare and implement a comprehensive and adaptive Social Impact Management Plan.

Following consideration of the Commission's findings and KEPCO's response, the Department has recommended the following revisions to the PAR conditions in relation to social impacts:

- **Schedule 2 Condition 8 - WAF:** Confirming that the consent does not permit the construction of a WAF.
- **Schedule 4 Condition 66 - Maintaining or enhancing agricultural production:** The condition has been revised to clearly identify the land available for agricultural production and require that reasonable steps are undertaken to maintain or enhance production, in line with the commitments made during the assessment of the project, including the draft Farm Management Plan.
- **Schedule 4 Condition 68 – Social Impact Management Plan:** A specific requirement to prepare a construction workforce accommodation strategy to manage the social impacts associated with construction stage(s) of the project has been included and that the SIMP must consider both negative and positive social impacts.

## 2.8 Subsidence

### Cliffs

***Commission Finding***

- The Commission support in principle the refinement of the subsidence model based upon real data, however the Commission notes the potential for greater than anticipated change to result in irreversible damage to the cliff lines.

As outlined in the PAR and in KEPCO's RtPR Report, impacts on the most prominent cliffs in the project area (Cliffs C1-C4) have been avoided through shortening the long wall panels. The Department and OEH also recommended that longwall panel LW106 be shortened to protect a further large cliff line C5, which would be managed through subsidence monitoring and adaptive management.

LW106 is proposed to be mined around 6 years after long wall mining commences. KEPCO is required to prepare progressive Extraction Plans including subsidence monitoring and validation of subsidence effects. This would allow adequate time to collect subsidence monitoring data to inform the set-back distance required to protect the cliff line located at the end of LW106, noting that longwall mining would be progressing from the north towards the cliff. Monitoring of LW105 which would be mined first would need to be undertaken due to the proximity of the end of this longwall to Cliff C5.

The Department's recommended conditions include performance measures for Cliff C5 and nearby Cliff 24312 that there must be negligible environmental consequences, that is impacts of less than 0.5% of the total cliff face due to longwall mining.

The Department is satisfied that the required monitoring and subsidence validation modelling would adequately inform setback distances to ensure that the performance measures required to be achieved are met. However, to provide more certainty, the Department considers that the burden of proof remains with KEPCO to demonstrate based on the validated subsidence modelling and monitoring that the performance objective would be met for Cliff 5 and Cliff 24312.

The Department has therefore recommended an additional condition that no longwall mining be undertaken within a 150 m offset distance horizontally from Cliff C5 and Cliff 24312, unless approved by the Secretary following independent expert review of the validated subsidence modelling. The 150 m distance is based on the angle of draw line estimated by MSEC in its subsidence assessment using the depth of cover near the end of LW105 and 106 ranges from 280-300 m, which would require a horizontal offset of 140-150m, which is a conservative estimate based on NSW Government guidelines.[10]

The Department is satisfied that the proposed monitoring and adaptive management approach would protect the significant cliff lines located at the end of longwall panel LW106. The recommended conditions include strict performance measures requiring negligible impact on the significant cliffs located at the end of LW106 and progressive validation of subsidence effect and impact predictions.

[10] Based on an angle of draw of 26.5 degrees as defined in Section 6.2 in the NSW Government's *Guideline for Applications for Subsidence Management Approvals*, Dec 2003.

### Bylong Valley Way

***Commission Findings***

- The Commission is concerned about the ongoing management of subsidence impacts to Bylong Valley Way from a public safety perspective. The Commission notes that the Bylong Valley Way is likely to experience an overall increase in traffic, including mine related traffic, and that the predicted levels of subsidence and surface cracking could have an impact on safe operation of Bylong Valley Way.
- The Commission notes subsidence impact; have been successfully managed in other road networks, including the Charlton Road, Hume Highway and Appin Road as referenced by the applicant. However, the Commission considers that for this to be successfully achieved, binding and comprehensive commitments need to be established and implemented relating to timely monitoring of impacts on the road surface attributable to subsidence and prompt remediation action to ensure road safety.

As discussed in the PAR, the assessment and management of subsidence impacts on Bylong Valley Way was comprehensively detailed in the EIS, with further information provided in the RTS report.

To further address the Commission's concerns, KEPCO met with MWRC, the appropriate roads authority for the section of Bylong Valley Way impacted, to outline its approach to managing subsidence impacts. Mine Subsidence Engineering Consultants (MSEC) provided a summary (see Appendix V of the RtPR Report) of the subsidence impacts, likely length of time subsidence would occur and how road safety and serviceability would be managed during subsidence events.

The briefing material also shows the subsidence case studies previously documented by MSEC in the EIS and RTS report, in particular the monitoring and management of subsidence impacts on Charlton Road associated with the Beltana Mine, which has similar traffic volumes, pavement type, and also has shallow depth of cover. That is, there is evidence that repair of roads due to subsidence and road safety management can be effectively managed.

MWRC (as the relevant roads authority) provided a letter of response (see Appendix E7) advising it is satisfied that subsidence impacts could be effectively managed.

Table 17 provides a summary of impacts, proposed management measures and the Department's recommended conditions to clearly show that there are binding and comprehensive commitments on KEPCO to manage road safety and serviceability. That is, the recommended conditions place binding obligations on KEPCO to repair subsidence damage and implement measures to ensure there is negligible additional risk to public safety.

There are 2 separate periods when subsidence impacts would occur along Bylong Valley Way, with impacts during mining of the Stage 1 longwall panels with one panel LW101 below Bylong Valley Way, and Stage 2 longwall with 6 panels (LW 201-206) in years 16-25 of the mine life. Approximately 3.5 km of the road is located above the subsidence area of the longwall mining panels, with active subsidence requiring management occurring for around 4-8 weeks as each long wall panel undermines the road.

Ongoing subsidence monitoring and validation of subsidence modelling undertaken during the development of the Stage 1 (LW101-LW109) would further inform the subsidence predictions and guide management actions, by the time the main section of Bylong Valley Way is impacted during Stage 2 mining.

KEPCO and MWRC have also agreed to establish a steering committee, including relevant experts on subsidence, geotechnical and pavement design.

***Table 17*** | Subsidence Management – Bylong Valley Way

| *Stage* | *Impacts* | *Proposed Management Measures* | *Recommended Conditions* |
|---|---|---|---|
| Stage 1<br>LW 101<br>Year 9 project | • At corner / end of panel, minor subsidence (<450mm)<br>• Minor cracking<br>• Approximate 250m length undermined | • Weekly surveying and monitoring<br>• Regular visual monitoring during active subsidence<br>• Repair crew available | Schedule 2 Condition 13<br>• Protection of public infrastructure – requirement to repair, or pay the full costs associated with repairing public infrastructure<br>Schedule 3 Condition 5<br>• Performance measures for Bylong Valley Way to be always safe and serviceable, damage does not affect safety or serviceability must |
| Stage 2<br>LW 201-206<br>Years 16-25 | • Subsidence up to 3,000 mm<br>• Strains causing cracking (50-100mm), heaving (up to 25mm) and stepping of road surface<br>• Ponding and drainage through culverts affected. | • Pre-mining inspections<br>• Notifications to MWRC, public and emergency services<br>• 24 hr monitoring during active subsidence<br>• Repair crew on standby | |

| Stage | Impacts | Proposed Management Measures | Recommended Conditions |
|---|---|---|---|
| | • Approximate 400m-800m length of road pavement affected as each panel is mined.<br>• Duration of each panel subsidence event around 4 - 8 weeks | • Actively carry out repairs<br>• Post mining inspection<br>• Permanent repairs | be fully repairable and must be fully repaired.<br>• Performance measure for public safety for negligible additional risk<br><br>Schedule 3 Condition 8<br><br>• Extraction Plan to be prepared in consultation with DRG, OEH, Forests NSW, MWRC and the Subsidence Authority including a subsidence monitoring program, Built Features Management plan, Bylong Valley Way Management Plan and a Public Safety Management Plan. |

### Conclusion – Subsidence

As outlined in the PAR, the Department accepts that the subsidence associated with the project is able to be minimised, managed, or at least compensated for to an acceptable standard. There are no residences located within the subsidence area and the subsidence assessment predicted there would be no impacts on adjoining National Parks, with subsidence largely confined to woodland, including associated cliff-lines, and agricultural areas. The key infrastructure asset that would be impacted is Bylong Valley Way.

To reduce any uncertainty about protection of the larger Cliff C5 and the adjoining Cliff 24312, currently located within the subsidence area, the Department has revised the recommended conditions to ensure that no longwall mining can occur within 150 m of these cliffs, unless updated subsidence effects modelling and impact assessment is undertaken based on validated data. Any longwall mining undertaken closer than this would require approval by the Department through the Extraction Plan process.

KEPCO has undertaken further consultation with MWRC demonstrating how the subsidence would be effectively monitored and managed, in accordance with standard practice and procedures. MWRC has confirmed that it is satisfied with the proposed measures to ensure the road remains safe and serviceable.

### Recommended Conditions – Subsidence

In the PAR, the Department recommended conditions that reflected the standard framework for managing subsidence in NSW. These conditions require KEPCO to:

- meet a number of performance measures to protect or manage impacts on natural and built features within the subsidence affectation area;
- remediate or repair subsidence impacts;
- provide additional offsets in the event that impacts, or consequences are greater than the performance measures; and
- prepare and implement comprehensive Extraction Plan(s), which include a (amongst other things):
    - Property Subsidence Management Plan(s), in consultation with landholders;
    - Built Features Management Plan(s) and Bylong Valley Way Management Plan, in consultation with affected public infrastructure providers;
    - Water Management Plan, in consultation with EPA and DPI-Water;
    - Biodiversity Management Plan, in consultation with OEH;
    - Heritage Management Plan, in consultation with OEH;
    - Public Safety Management Plan, in consultation with DRE;
    - subsidence monitoring program; and
    - contingency plan that provides for adaptive management.

Following consideration of the Commission's findings and KEPCO's response, the Department has recommended the following revisions to the PAR conditions in relation to subsidence impacts:

- **Schedule 3 Conditions 2-3 - Cliffs:** New conditions restricting longwall mining from within 150m horizontally of cliffs C5 and 24312 unless a revised subsidence impact assessment report is submitted demonstrating that the performance measures can be met. Any mining closer than 150 m would require approval through the Extraction Plan approval process.

## 2.9 Lighting – Dark Sky Region

### Siding Spring Observatory

***Commission Finding***

- The Commission notes that the stated level of lighting impact and proposed management strategy for both direct and diffuse light impacts may not have been considered against the NSW Government's Dark Sky Planning Guideline, particularly in relation to cumulative impacts with mines between the project site and the Siding Spring Observatory.

The *NSW Dark Sky Planning Guideline* (Dark Sky Guideline) was published in June 2016 after the development application and EIS was lodged for the project. The Dark Sky Guideline identifies the Dark Sky Region as land within 200 km distance of the Siding Spring Observatory, located near Coonabarabran.

Under Clause 92 of the EP&A Regulation 2000, the consent authority must consider the Dark Sky Guideline for State significant development where the project is located less than 200 km from the observatory. The Bylong Coal Project is located around 170 km from the observatory so therefore the Dark Sky Guideline must be considered by the consent authority.

The Dark Sky Guideline identifies direct artificial upward light spill, reflection of light and illumination of light from dust emissions as contributing to increasing artificial sky glow that can affect observing conditions. The guideline also identifies good lighting design principles to eliminate or reduce the upward spill of light.

In the PAR, the Department recommended a condition to ensure that all external lighting complies with *Australian Standard AS 4282 (INT) 1997 – Control of Obtrusive Effects of Outdoor Lighting*. This requires lighting to be designed and installed to minimise direct and diffuse lighting impacts, consistent with the design principles of the Dark Sky Guideline.

The recommended conditions also require KEPCO to implement all reasonable and feasible measures to minimise the visual and off-site lighting impacts.

To reinforce the importance of minimising upward spill of light in the Dark Sky Region, the Department has referenced the good lighting design principles outlined in the Dark Sky Guidelines in the operating conditions for visual and light impacts and recommended that a Dark Sky Lighting Management Strategy be prepared in consultation with the Observatory Director of the Siding Springs Observatory.

The Department also requires that the applicant implements all reasonable and feasible measures to minimise off-site dust emissions and to minimise any visible air pollution generated by the development.

### Recommended Conditions – Lighting

In the PAR, the Department recommended a range of conditions for minimising/ managing visual and lighting impacts. These included conditions requiring KEPCO to:

- implement additional visual mitigation measures to reduce the visibility of the mine operations on privately-owned receivers that have direct views of the mining operations, at the request of the landowner;
- notify relevant land owners of their entitlement to additional site-specific visual assessment and landscaping treatments;
- undertake screening along affected roadsides as soon as possible;
- ensure that all external lighting associated with the development complies with *Australian Standard AS4282 (INT) 1997 – Control of Obtrusive Effects of Outdoor Lighting*, or its latest version; and
- implement all reasonable and feasible measures to reduce the visual and offsite lighting impacts of the development.

Following consideration of the Commission's findings and KEPCO's response, the Department has recommended the following revisions to the PAR recommended conditions:

- **Schedule 4 Condition 55 - Visual and Lighting Impacts:** Additional requirement to implement all reasonable and feasible measures to minimise off-site lighting impacts with consideration of the good lighting design principles identified in the *NSW Dark Sky Planning Guideline*.
- **Schedule 4 Condition 56 - Dark Sky Lighting Management Strategy:** Additional requirement to prepare a strategy prepared in consultation with the Siding Spring Observatory Director by a suitably qualified and experienced person to identify and implement measures to minimise the upward spill of light.

With the additional acquisitions by KEPCO within the Upper Bylong Valley and Lee Creek, there are no residences with significant direct views. The Department has removed the recommended conditions from the PAR for additional off-site mitigation measures and notification requirements.

## 2.10 Biodiversity

### Security for Offset Area 5

***Commission Finding***

- The Commission notes that the finalisation of a significant area of biodiversity offsets (i.e. the areas in Offset 5 impacted by subsidence) would occur after the commencement of the project. The appropriateness of this approach should be considered in any future decision about the project.

As described in the PAR, Offset Area 5 (OA5) provides residual ecosystem credits for one plant community type, *Grey Box – White Box grassy open woodland on basalt hills in the Merriwa region, Upper Hunter Valley* (PCT HU690) and residual species credits for the Regent Honeyeater.

The other 6 land-based offsets provide sufficient ecosystem and species credits for all other communities/ species impacted by the project, with substantive excess credits available as shown in Table 18 below.

**Table 18** | Land Based Offsets Excluding Offset Area 5

| *Vegetation Community or Species (PCT)* | *Credits Required* | *Credits Available* | *% Credit liability met by offset credits* |
|---|---|---|---|
| Yellow Box grassy woodland on lower hillslopes and valley flats in the southern NSW Brigalow Belt South Bioregion (HU732) | 593 | 2,031 | 342% |
| Grey Box – White Box grassy open woodland on basalt hills in the Merriwa region, upper Hunter Valley (HU690) | 11,143 | 9,704 | 87% |
| Rough-barked Apple-Red Gum-Yellow Box woodland on alluvial clay to loam soils on valley flats in northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion (HU714) | 295 | 1,946 | 660% |
| Fuzzy Box Woodland on alluvial brown loam soils mainly in NSW South Western Slopes Bioregion (HU547) | 152 | 233 | 153% |
| White Box-Black Cypress Pine shrubby woodland of the Western Slopes (HU824) | 6,431 | 9,503 | 148% |

| Vegetation Community or Species (PCT) | Credits Required | Credits Available | % Credit liability met by offset credits |
|---|---|---|---|
| Grey Box-Slaty Box shrub-grass woodland on sandstone slopes of the upper Hunter and Sydney Basin (HU869) | 1,480 | 6,699 | 453% |
| Regent Honeyeater | 13,892 | 8,786 | 63% |
| Brush-tailed Rock-wallaby | 688 | 5,005 | 727% |
| Large-eared Pied Bat | 728 | 5,136 | 705% |
| Eastern Bentwing-bat | 728 | 5,136 | 705% |
| Eastern Cave Bat | 728 | 5,136 | 705% |

As shown in the table below, to meet the remaining credit liability, only 19% of the available credits in OA5 for PCT HU690 and 76% for Regent Honeyeater are required to be retired.

That is, there is sufficient offset credits available in OA5 even accounting for diminution of biodiversity values due to subsidence, estimated by Cumberland Ecology to be a reduction of 1.5% of species credits associated with the Regent Honeyeater and 1.2% of ecosystem credits for HU690.

The credits generated within the subsidence area were conservatively reduced by 10%. Further, 30% of OA5 is located outside the subsidence impact area.

**Table 19** | Offset Area 5 Ecosystem and Species Credits

| Vegetation Community or Species (PCT) | Residual Credits Required in OA5 | Estimated Credits available in OA5 | % required of available credits |
|---|---|---|---|
| Grey Box – White Box grassy open woodland on basalt hills in the Merriwa region, upper Hunter Valley (HU 690) | 1,439 | 7,514 | 19% |
| Regent Honeyeater | 5,106 | 6,721 | 76% |

OEH concluded in its assessment that it is satisfied that the proposed offset package, inclusive of OA5, contains sufficient species credits for the Regent Honeyeater. However, the mechanism for securing the offsets would not be finalised until after underground mining is completed. OEH advised that a Biobanking Agreement (now a Stewardship Agreement under the *Biodiversity Conservation Act 2017*) would be a suitable mechanism for securing the offset, but only following completion of underground mining.

This is due to statutory considerations about the eligibility of land subject to active underground mining to be used as a biobanking site which was a consideration under the now repealed *Threatened Species Conservation Regulation 2008*, and has been transferred into the *Biodiversity Conservation Regulation 2017*.

In the interim, the Department has recommended that OA5 be secured through an alternative mechanism, such as positive and restrictive covenants under the *Conveyancing Act 1919*, and offsets managed through the Extraction Plan and Biodiversity Management Plan required for the project and that a conservation bond be provided for OA5.This is a valid approach for securing offsets used for mining projects used elsewhere in NSW, including in the nearby Western Coalfield mines.

The recommended conditions provide certainty around the proposed offset package for the project in that:

- the majority of the offset liability is available in the land-based offsets already acquired by KEPCO, excluding OA5 and would be secured through a Stewardship Agreement;

- 87% of the Grey Box and 63% of the Regent Honeyeater credit liability is available in the land- based offsets excluding OA5;
- for the residual credits, there are significant excess credits available in OA5, even conservatively accounting for some diminution of biodiversity values due to subsidence;
- OA5 will be monitored and managed through the Extraction Plan and Biodiversity Management Plan, with offsets within OA5 secured in the interim through covenants under the *Conveyancing Act 1919*; and
- in the very unlikely event there is a shortfall in credits from the land-based offsets (given the excess credits available), consistent with current NSW Government policy, the applicant can pay residual credit liability into the NSW Biodiversity Conservation Fund or undertake biodiversity conservation actions/ supplementary measures.

### Other Biodiversity Matters Requiring Consideration

***Commission Finding***

- A number of matters require careful consideration prior to a decision including – impacts associated with subsidence deformation; potentially observable impacts to identified groundwater dependent ecosystems which must be carefully monitored and managed; verifying vegetation offsets in suitable locations, quantities and qualities to maintain landscape connectivity; and being satisfied that disturbed areas are expected to be rehabilitated.

The concerns raised by the Commission were comprehensively considered by KEPCO in the EIS and RTS and assessed by the Department in its PAR. The table below further summarises the Department's consideration of these residual issues.

**Table 20** | Residual Biodiversity Issues Identified by the Commission

| *Issue* | *Consideration* |
|---|---|
| Impacts associated with subsidence deformation in relation to the structure and form of native vegetation, which might need to be managed alongside subsidence remediation | • The EIS, RTS, Supplementary RTS and the PAR considered subsidence impacts on biodiversity values from surface cracking, hydrological changes and cliff falls.<br>• KEPCO conservatively reduced the biodiversity values in the subsidence area by 10% due to subsidence or subsidence remediation works and undertook additional biometric analysis through a modified Framework for Biodiversity Assessment (FBA) with estimated reduction in biometric values of up to 1.5%.[11]<br>• The Extraction Plan recommended by the Department requires KEPCO to:<br>o manage and monitor the condition of vegetation in the subsidence impact area as longwall mining progresses;<br>o prepare and implement a Biodiversity Management Plan for the subsidence area;<br>o ensure the development does not cause exceedance of strict performance measures, including that there is no greater subsidence impacts or environmental consequences than predicted in the EIS; and<br>o if performance measures are exceeded, undertake remediation to the satisfaction of the Secretary or provide suitable offset to compensate the impact. |
| Potentially observable impacts to identified groundwater dependent ecosystems GDEs even though they are unlikely as they occur in the riparian corridors of the creeks that are largely ephemeral and already subject to natural variations in flow. Such impacts may nevertheless need to be very carefully monitored and managed | • There are no high priority GDE's identified in the relevant Water Sharing Plan in the area surrounding the project site.<br>• Three vegetation communities were identified as having some reliance on groundwater along Lee Creek, Bylong River and Dry Creek.<br>• The proposed borefield has been designed with a minimum buffer of 200m from these GDEs to minimise drawdown impacts from pumping.<br>• The recommended conditions include preparation and implementation of an Extraction Plan and Water Management Plan including requirements for monitoring and reporting on GDE's and implementing trigger/action/ response plans (TARPs) to mitigate and/or offset any adverse groundwater impacts on GDE's. |

[11] The FBA has now been replaced by the Biodiversity Assessment Method (BAM) under the *Biodiversity Conservation Act 2016*, however under transitional arrangements the Bylong Project biodiversity assessment continues to be assessed under the FBA and the *NSW Offsets Policy* that was in effect.

| Issue | Consideration |
|---|---|
| Verifying that areas of vegetation consistent with the total areas proposed to be cleared are present as offsets in suitable locations, quantities and qualities to maintain landscape connectivity | • The proposed offsets have appropriately targeted vegetation communities consistent with the communities being cleared, as required in applying the NSW Offsets Policy and FBA rules, and as confirmed by OEH.<br>• The project mainly clears native vegetation adjoining existing woodland, rather than cut through any substantive vegetation corridors.<br>• Only one regionally significant biodiversity link was identified within the project disturbance area along the Bylong River, with only around 0.7 ha of native vegetation impacted due to widening of Upper Bylong Road. OEH was satisfied that the small encroachment on this riparian buffer is sufficiently dealt with through the proposed biodiversity offsets.<br>• Most of the offsets are located adjoining National Park estate or forested areas adding to and providing connectivity to existing remnant woodland.<br>• The Department's recommended conditions require the biodiversity offsets to be secured within 2 years of the commencement of the project to meet the credit liability. |
| Being satisfied that disturbed areas are expected to be rehabilitated and result in the successful establishment of suitable vegetation communities | • KEPCO has provided a draft Rehabilitation Management Plan (RMP), based on the draft conditions recommended by the Department.<br>• The PAR recommended conditions require the re-establishment of at least 33.6 ha of native vegetation on the rehabilitated landform, on land and soil capability land class 6 or 7.<br>• The draft Rehabilitation MP identifies the establishment of 57 ha of White Box Grassy Woodland and 8 ha of Yellow Box Grassy Woodland in the rehabilitated landform.<br>• KEPCO has confirmed its commitment to rehabilitate 65 ha of native woodland community for the Revised Mine Plan (see Appendix E6).<br>• Completion criteria for ecosystem establishment and development have been developed as a component of the draft RMP with requirements for ongoing monitoring and auditing of the success of the rehabilitation.<br>• Rehabilitation bonds are required to be paid to fund rehabilitation liability over the life of the project.<br>• The recommended conditions establish the framework for the successful establishment of suitable vegetation communities. |

### Revised Mine Plan – Reduction in Direct Impacts

The Revised Mine Plan reduces the direct impacts on native vegetation by around 62 ha (from 753 ha to 691 ha), including 25 ha of native woodland. This also includes a reduction of 4.4 ha on threatened Box Gum Woodland. KEPCO has committed to offset the project's impacts based on the EIS Mine Plan offset requirements.

OEH have reviewed the Revised Mine Plan (see Appendix D) and commitments made by KEPCO and welcomed the reduction of impact to biodiversity and Aboriginal heritage, noting that the offset package already proposed by KEPCO would be retained.

### Conclusion – Biodiversity

Following consideration of the Commission's findings and the response from KEPCO, the Department confirms its and OEH's view that OA5 is a suitable offset area and that, with the recommended conditions there is sufficient certainty that the offset area would be appropriately managed and secured for biodiversity conservation.

As concluded in the PAR, KEPCO has sought to avoid, mitigate, manage and/or offset the residual impacts of the project in accordance with NSW and Commonwealth requirements, so that biodiversity values would be enhanced or maintained over the medium to long term.

### Recommended Conditions – Biodiversity

In the PAR, the Department recommended a range of conditions for minimising/ managing biodiversity impacts. These included conditions requiring KEPCO to:

- prepare and implement a Biodiversity Management Plan to ensure the commitments of the EIS to avoid, mitigate, offset and monitor impacts on biodiversity are undertaken;

- provide a substantial land based offset package comprising around 3,800 ha of native vegetation, to compensate for the direct clearing of 754 ha of native vegetation, with further avoidance with the implementation of the Revised Mine Plan;
- secure the majority of these offset areas through Biobanking Agreements, which would provide upfront funding in perpetuity for management of the offset areas; and
- monitor and manage subsidence impacts and offset management measures for OA5 with long term security provided through a Biobanking Agreement, once underground mining is completed.

Following consideration of the Commission's findings and KEPCO's response, the Department has recommended the following revisions to the PAR conditions:

- **Schedule 4 Condition 62 – Rehabilitation Objectives:** The area of rehabilitation to woodland increased to 65 ha as identified in the draft Rehabilitation Management Plan.

The biodiversity conditions have also been updated to reference the *Biodiversity Conservation Act 2016,* which commenced in August 2017, for example securing offsets through Biodiversity Stewardship Agreements, rather than Biobanking Agreements.

## 2.11 Transport and Traffic

### Road Funding – Mid-Western Regional Council

***Commission Finding***

- The Commission notes that funding arrangements for road upgrades and maintenance would be agreed between the applicant and Council in time for those agreements to be scrutinised as part of any future decision about the project. Similarly, the details and timing for realignment works to maintain access continuity in the local road network should also be available to inform any future decision on the project

At the time of the PAR, MWRC and KEPCO had reached an agreement on ongoing maintenance contributions and road upgrades that were committed as a component of the project but had not agreed on funding for safety upgrades to the Wollar Road (Munghorn Gap), and pavement and intersection upgrades for the Bylong Valley between Wollar Road and the Upper Bylong Road.

MWRC and KEPCO have now reached an agreement on these upgrades with KEPCO contributing an additional $3.64 million towards these road upgrades (see Appendix E9). Table 21 below provides a summary of the commitments by KEPCO to upgrade road infrastructure either as direct works as part of the construction stage of the project, or funding contributions to MWRC to undertake the works as part of the Council road works program.

The Department has included these funding and maintenance commitments in the recommended consent conditions.

The NSW Government has also agreed to contribute $3 million towards upgrades along the Wollar Road through Munghorn Gap through the Resources for Regions Program, which directs funds from mining royalties to infrastructure projects. This is in addition to the $14 million funding MWRC has received for the sealing and upgrading 17 km of road between Wollar and Bylong Valley Way to support regional development and improve access to the Mudgee area.

In addition to these works, the key road infrastructure upgrade is the sealing and realignment of the road between Wollar and Bylong. This road upgrade is well underway and advice from MWRC in September 2018, is that this work will be completed by November 2018. That is, this key road upgrade would be completed prior to the project commencing, if approved by the Commission.

**Table 21** | Road and Ancillary Infrastructure Upgrades and Maintenance Contributions Agreed with MWRC

| *Measures* | *Timing* | *Funding* |
|---|---|---|
| Construction of the realigned Upper Bylong Road (East Link).<br><br>Unsealed with the pavement standard to the satisfaction of Council with the crossing of the Bylong River constructed to an equivalent flood | Constructed prior to closure of the Upper Bylong Road. | Component of the development. |

| Measures | Timing | Funding |
|---|---|---|
| design as the existing Upper Bylong Road crossing. | | |
| Wollar Road (Munghorn Gap) upgrade. | Timing as approved under the Traffic Management Plan. | $2,254,113 (ex GST) funding to MWRC to undertake the upgrades in its roadworks development plan. |
| Upper Bylong Road Upgrade – including intersection with Bylong Valley Way.<br>Sealed and upgraded to the satisfaction of Council. | Timing as approved under the Traffic Management Plan. | Component of the development. |
| Administration facility intersection.<br>Constructed to the satisfaction of Council. | Prior to use of the facility. | Component of the development. |
| Bylong Valley Way Upgrade between Upper Bylong and Wollar Road intersections. | Timing as approved under the Traffic Management Plan. | $784,950 (ex GST)<br>funding to MWRC to undertake the upgrades in its roadworks development plan. |
| Realignment of Wollar Road to proposed intersection location. | Timing as approved under the Traffic Management Plan. | $177,751 (ex GST) funding to MWRC to undertake the upgrades in its roadworks development plan. |
| Intersection upgrade Bylong Valley Way and Wollar Road (incl. asphalt pavement). | Timing as approved under the Traffic Management Plan. | $418,988 (ex GST) funding to MWRC to undertake the upgrades in its roadworks development plan. |
| Construction of the North Link Road, if required by Council.<br>Constructed to the satisfaction of Council. | Mine closure – rehabilitation, subject to consultation and agreement of Council. | Component of the development. |
| Road Maintenance Contributions. | Annual payments with the first payment within 3 months of the date of commencement of development and then every 12 months until mining operations have ceased following approval of a closure plan for the mine.<br>*Note: 50 percent of the annual payment must continue to be made if the mine were to be placed in care and maintenance.* | $177,000 (plus GST)<br>CPI indexed annually from the 2017/2018 financial year. |

KEPCO has now acquired or has an acquisition agreement with all landholders in Upper Lee Creek and therefore the proposed North Link Road, to link Upper Bylong Road to Upper Lee Creek Road, is not required to be constructed to maintain access to these properties over the life of the mine. However, there would still be access to these landholdings from the south.

As discussed in Section 2.6 above, the potential re-establishment of the North Link Road at mine closure is included as a rehabilitation objective, subject to the agreement of Council as the appropriate roads authority.

There is one landowner remaining which would require access via the proposed East Link access (see Figure 3 ID 204 – 212), along with NPWS personnel to access Wollemi National Park. The Department recommended a condition in the PAR that prior to the closure of Upper Bylong Road, KEPCO must provide a formal right of way over the proposed East Link Road to maintain access to this property and Wollemi National Park.

### Traffic from the Hunter Valley

***Commission Finding***

- The Commission notes that the applicant's commitments around commuter safety and haul road usage remain uncertain. Muswellbrook Shire Council highlighted concerns in relation to the likelihood of mine traffic originating within Muswellbrook Shire, which is geographically closer to the project than Mudgee and was argued to have a higher capability to provide the materials and labour likely to be required by the project.

Muswellbrook Shire Council (MSC) has raised concerns about the traffic impact assessment completed for the project and considers that there would be higher project related traffic from the Upper Hunter than assumed in KEPCO's assessment.

KEPCO in the RtPR Report reiterates that its revised traffic assessment presented in the Appendix F of the Supplementary RTS report provided a detailed response to MSC concerns about workforce assumptions and traffic flows. For workforce safety reasons, KEPCO is targeting its workforce to reside within a 1 hr drive from the project, identified as the local area. The assessment concludes that only 5-7% of the workforce would reside and commute from the local area from Bylong Valley Way to the east, in Denman/ Sandy Hollow within the MSC local government area. KEPCO advise that the key assumptions to support this include:

- that for safety reasons, KEPCO require that its employees should reside within a local area, defined as a 1 hour drive from the project site, which includes the towns of Mudgee, Rylstone, Kandos within MWRC, Merriwa within the Upper Hunter LGA and Sandy Hollow and Denman from MSC LGA;
- the project is located entirely within the MWRC local council boundary and KEPCO is working actively and effectively with MWRC to maximise use of a local workforce;
- the Wollar Road sealing and upgrade would materially decrease commuter time to Mudgee, compared to Bylong Valley Way to the east which is constrained by curves/ steep grades;
- Mudgee is the closest significant service centre, with Muswellbrook well over a 1 hour commute;
- Rylstone and Kandos communities have recent economic downturn with closure of mines and cement works with substantial support for the mine; and
- there are existing mine support services around Mudgee in MWRC LGA due to the coal mining operations around Wolllar-Ulan.

KEPCO has increased its offer to Muswellbrook Shire Council (MSC) on safety upgrades along a 40 km length of Bylong Valley Way from a one-off contribution of $40,000 up to $267,700 (CPI indexed) to fund replacement of safety barriers along Bylong Valley Way within MSC (see Appendices E9-1 and E9-3). These costs are based on a road safety audit completed by MSC in 2015. KEPCO had previously based its funding contribution as a percentage of the total safety upgrade cost based on its share of traffic using the road.

KEPCO has also offered MSC a road maintenance contribution to account for any damage that may occur during the peak 2 year construction period. This would be based on dilapidation inspections prior to and after the construction period.

These road safety upgrade contributions are included as recommended conditions for the project.

MSC has not accepted the proposed road safety contributions from KEPCO (see Appendix E9-2) and continues to argue that the majority of the workforce would likely be sourced from the Hunter Valley and that social and other impact assessment undertaken for the project would therefore fundamentally change. MSC also argues that it would be difficult to enforce and monitor compliance with any conditions restricting heavy vehicle movements along Bylong Valley Way from the east.

MSC's position is that the project should therefore be rejected as it would place a risk to the workforce and road safety.

However, KEPCO has completed a comprehensive traffic assessment which was updated to consider the no-WAF option and additional sensitivity analysis assuming higher traffic from the east along Bylong Valley Way. The assessment was informed by extensive consultation with MWRC and social assessment/ demographic data on potential operational and construction workforce locations.

MSC has provided no evidence that the traffic impact assessment for the project cannot be relied upon. It is also clear that KEPCO and MWRC are committed to utilising existing accommodation, mining services, the existing employment pool from MWRC, and initiatives to encourage employees to relocate to the area.

The Department considers that KEPCO's proposed funding of road upgrades and maintenance contributions mainly targeting the Mid-Western Regional Council local government area is reasonable and commensurate with the likely impacts of the project as:

- KEPCO has a clear strategy negotiated with MWRC in targeting employment and accommodation in the MWRC area, including the Bylong Valley, Mudgee, Rylstone and Kandos;
- there is already a well-established mining service industry located in the MWRC area;
- the sealing and upgrade of the Wollar Road between Wollar and Bylong and proposed road upgrades along Wollar Road would reduce travel times to Mudgee;
- the recommended conditions restrict larger heavy vehicle traffic (more than gross vehicle mass of 10 tonnes), which cause more road dilapidation and safety concerns along Bylong Valley Way to the east of the project, and also require monitoring of traffic flows to validate the EIS predictions;
- KEPCO would also manage heavy vehicle restrictions through contractual arrangements with supplier and contractors and by requiring Journey Management Plans for heavy vehicles travelling to and from the site;
- KEPCO's offer for pre and post construction dilapidation surveys is a standard approach for monitoring and managing construction impacts on roads;
- defining heavy vehicle routes, including monitoring and reporting requirements incorporated into a Traffic Management Plan is a standard approach that is regulated by the Department's compliance unit; and
- KEPCO's offer to fund the high-risk safety barrier upgrades along Bylong Valley Way within the MSC local government area is well in excess of what would be required, based on its predicted traffic contribution.

Roads and Maritime Services (RMS) has also advised the Department that it is satisfied with the recommended conditions for the project but would want to continue to be consulted on road safety as part of the preparation of the recommended Traffic Management Plan.

To provide further certainty on KEPCO's commitments around road contributions, the Department has also recommended a condition to undertake pre and post dilapidation surveys during each construction stage and decommissioning stages where there is potential for additional heavy vehicle use, noting that there are heavy vehicle restrictions for larger (>10 GVM tonnage) vehicles that would make a greater contribute to pavement damage due to the higher axle load.

### School bus routes

***Commission Finding***

- The Commission also notes that the impacts of increased traffic movements in relation to school bus services was not considered in respect of heavy vehicles other than B-doubles. The applicant identified a significant change in the volume of heavy vehicle traffic, particularly between Mudgee and the project site, which has the potential to coincide with the operation of school bus services.

In its RtPR Report, KEPCO maintains its commitment to consult with local bus companies and adjust mine associated travel with the school bus timetable. KEPCO has advised that currently there are two school buses operating along the Wollar Road between Wollar and the Ulan Road, with one bus from Wollar and one from Totnes, which turns off the Wollar Road. There are no school bus services that currently run between Wollar and Bylong.

In the PAR, the Department recommended conditions to address the Commission's concerns about school bus services including requiring KEPCO to schedule production shift changes on site to occur outside of school bus hours and prepare a Traffic Management Plan to include measures that would be implemented to minimise traffic impacts on school bus routes.

The Department has strengthened these recommended conditions by requiring KEPCO to schedule construction shift changes to avoid school bus hours and that relevant school bus service providers be consulted when preparing the Traffic Management Plan for the project.

An additional requirement has been included in the Traffic Management Plan that requires measures to be implemented to minimise and manage heavy vehicle interaction during school bus hours, for example, school bus routes and hours to be documented in the proposed heavy vehicle Journey Management Plans.

### Conclusion – Traffic and Transport

The Department considers that the Commission's concerns on the traffic and transport impacts of the project have been addressed through:

- agreement between KEPCO and MWRC on funding arrangements for road upgrades;
- commitments by KEPCO for provision of substantial additional funding to MSC for safety upgrades; and
- commitments by KEPCO for pre and post road dilapidation surveys during construction on Bylong Valley Way within the MSC's area.

### Recommended Conditions – Traffic and Transport

In the PAR, the Department recommended a range of conditions for minimising/ managing traffic and transport impacts. These included conditions requiring KEPCO to:

- maintain access through road upgrades/ realignments to properties to the south and east of the project site;
- contribute funding towards road safety upgrade works and road maintenance along the main transport routes to the applicable local roads authorities;
- not commence construction until the Wollar Road is sealed;
- restrict larger heavy vehicles from accessing the site along Bylong Valley Way from the Castlereagh Highway to the south, Golden Highway to the east and Ulan-Wollar road;
- prepare and implement a Traffic Management Plan, including requirements for managing worker fatigue and utilising bussing and car-pooling of workers to the site; and
- ensure shift changeover traffic does not interact with school bus schedules.

Following consideration of the Commission's findings and KEPCO's response, the Department has recommended the following revisions to the PAR recommended conditions:

- **Schedule 4 Condition 47 - Shift Changes and School Bus Routes:** In addition to production shifts, the applicant must schedule construction shift changes to occur outside of school bus hours.
- **Schedule 4 Condition 49 - Roadwork Upgrades:** Inclusion of all agreed road funding upgrades between MWRC and KEPCO and the proposed increase in funding from $40,000 to $267,700 to MSC for road safety measures along Bylong Valley Way within MSC local government area
- **Schedule 4 Condition 52 - Road Maintenance:** Additional requirement for pre and post dilapidation surveys and make good requirements around construction and decommissioning stages for Bylong Valley Way within the MSC area.
- **Schedule 4 Condition 53 - Traffic Management Plan:** Additional requirement to consult with school bus service providers in preparation of the Traffic Management Plan, including measures to minimise and manage heavy vehicle interaction during school bus hours, and for monitoring of traffic to provide adequate data to determine the contribution of the development to road dilapidation rehabilitation or make good requirements.

## 2.12 Air, Noise and Blasting

### Voluntary Land Acquisition and Mitigation Policy (VLAMP) and Low Frequency Noise

***Commission Findings***

- It appears that residual uncertainties could be remedied before decision – or in relation to air and noise impacts could be subject of a more cautious approach in the application of the VLAMP.
- There is residual uncertainty around the incomplete analysis of the low frequency (LF) noise spectrum and third octave bands under the modified UK Department of Environment, Food and Rural Affairs (DEFRA) method of assessment.

**Predicted Noise Impacts**

At the time the PAR was prepared, a total of 9 privately-owned receivers (owned by 6 landowners) were predicted to experience noise levels above the Project Specific Noise Level (PSNL) criteria of 35dB(A) during the open cut stage of the project.

As outlined above, KEPCO has acquired additional landholdings and has entered an acquisition agreement with the owner of the property "Arabanoo" (residences ID 151/ 158), subject to the approval of the project.

The Revised Mine Plan has also reduced the predicted noise impact at the Eagle Hill residence as summarised in the table below. Additional noise modelling of the peak Year 5 impacts, containing open cut operations in the eastern and western open cut areas was undertaken, with a reduction of 1dB(A) at residence ID60.

Excluding Arabanoo, 5 privately-owned receivers (owned by 3 landowners) are now predicted to exceed the PSNL.

**Table 22** | Predicted Noise – Revised Mine Plan

| Property | Receiver ID | $LA_{eq,15\ min}$ dB(A) (reduction) | | | Change in impact based on the *VLAMP* |
|---|---|---|---|---|---|
| | | Day | Evening | Night | |
| **During Open Cut Stage** | | | | | |
| Eagle Hill | 60 | 39 (-1) | 40 (-1) | 40 (-1) | Change from a significant (acquisition rights afforded) to moderate impact, mitigation rights afforded. |
| Meadsville | 58 | 37 | 38 | 38 | No change - remains moderate impact, mitigation rights afforded. |
| Cherrydale Park | 56 | 35 | 37 | 37 | No change - remains negligible impact. |
| | 57A, 57C | <35 | 36 | 36 | No change - remains negligible impact. |
| All other receivers | | <35 | <35 | <35 | No change – meets PSNL |
| **During Underground Only Mine Stage** | | | | | |
| Eagle Hill | 60 | 35 | 36 | 36 | No change - remains negligible impact. |
| All other receivers | | <35 | <35 | <35 | No change – meets PSNL |

Eagle Hill (residence ID 60) and Meadsville (residence ID 58) are characterised as having moderate impacts and afforded mitigation rights under the *Voluntary Land Acquisition and Mitigation Policy (VLAMP)*, as the noise levels are 3-5dB(A) above the PSNL. For Eagle Hill, the noise levels would reduce to a negligible impact with 36 dB(A) predicted during underground mining only operations, that is during most of the mine life.

In accordance with the VLAMP, the Department now recommends that mitigation rights rather than acquisition rights be afforded to Eagle Hill and that the predicted noise limits in Table 22 apply at the property.

In this regard, it is important to note that the noise levels would remain below the EPA's recommended 'acceptable' night-time noise amenity criterion of 40 dBA $_{Laeq\ night\ period}$ for a rural area, as defined under the *Industrial Noise Policy* (INP) which continues to apply to the project. This also applies to the current *Noise Policy for Industry*.

Cherrydale Park (residences ID 56, 57A, 57C) exceeds the PSNL by 1-2 dB(A) which is characterised as a negligible impact under the VLAMP. The exceedances at Cherrydale Park are only predicted during the open cut period, which under the Revised Mine Plan is reduced by one year (from 7 to 8 years).

The noise levels would be reduced to below the PSNL once underground only mining commences. The Department considers that, in accordance with the VLAMP, no mitigation rights should be afforded.

The recommended noise conditions (see below) provide safeguards for monitoring and managing noise to ensure that that the noise limits are met.

**Low Frequency Noise (LF)**

The Commission was concerned that if a LF noise penalty were to apply then this may change the noise impact such that mitigation or acquisition rights would need to be afforded.

KEPCO in its RtPR Report noted that since the Commission's review was completed, the NSW Government has released the *Noise Policy for Industry* (NPfI) which adopts the modified DEFRA LF assessment method used by KEPCO.

Under transitional arrangements, the *Industrial Noise Policy* (INP) applies to the Bylong Coal Project, except for the treatment of LF noise, where the NPfI methodology can be adopted.

The EPA in its advice on the RtPR Report (see Appendix D4) noted that it was satisfied with the proponent's assessment of LF noise using the modified DEFRA approach. The assessment showed that no LF noise penalty would apply at private receivers.

However, while the EPA was satisfied with the LF assessment, it noted that as no LF modifying factor was predicted to apply to the noise levels that if a LF noise penalty subsequently did apply during operations, that KEPCO should make adequate contingency arrangements.

The recommended conditions require KEPCO to strictly comply with strict noise criteria, inclusive of any noise penalties. This includes requirements to incorporate real time noise monitoring, including investigation and action triggers to modify or cease operations as necessary to ensure compliance. This is a standard proactive management approach used effectively at mining operations in NSW.

In the unlikely event that during attended noise monitoring a noise penalty applied that caused an exceedance of noise criteria at a private receiver, then KEPCO would be required to undertake actions to ensure compliance. That is, there is no uncertainty about KEPCO's obligation to comply with the noise limits.

In its review of the Revised Mine Plan, the EPA has provided advice (see Appendix D9) confirming that the Department's recommended condition for monitoring and treatment of LF noise is consistent with the NPfI. The Department recommends revising Appendix 5 of the recommended PAR condition to directly reference the NPfI and the transitional arrangements that apply for the assessment of LF noise.

### Diesel Emissions

***Commission Finding***

- There is residual uncertainty around the mitigation measures that could be reasonably deployed to minimise diesel emissions.

The EPA has provided further advice (see Appendix D) on its preferred approach to ensuring best practice is implemented to reduce diesel emissions from the project. The EPA has been consulting with the mining industry on proposals to reduce fine particulate loads generated from non-road diesel emissions.

In particular, the EPA is concerned that coal mines are a dominant contributor to $PM_{2.5}$ emissions from non-road equipment. The EPA also notes that lower particulate levels from Tier 4 equipment was mandated in North America from January 1, 2018 and similar Euro Stage V Regulation comes into force in 2019.

KEPCO argues that its modelling demonstrates that the predicted particulate levels would easily comply with the ambient air quality targets required to be met in NSW and that further reductions would impose further cost with little incremental benefit to receivers.

The Revised Mine Plan has significantly reduced peak particulate emissions with an estimated reduction in $PM_{2.5}$ of 48%, compared to the EIS Mine Plan, as shown in Table 23 below. The largest contribution is due to reduced haulage lengths, providing 34% of the reduction in total emissions.

***Table 23*** | Reduction in $PM_{2.5}$ particulate Emissions - Revised Mine Plan

| Activity | $PM_{2.5}$ kg/year | |
|---|---|---|
| | EIS | Revised |
| Top soil | 254 | 799 |
| Blast/drill | 678 | 535 |

| Activity | $PM_{2.5}$ kg/year | |
|---|---|---|
| | EIS | Revised |
| Overburden handling | 16,370 | 9,009 |
| Coal handling | 9,788 | 8,179 |
| Haulage | 83,022 | 27,583 |
| Wind erosion | 27,476 | 20,600 |
| Grading | 989 | 989 |
| Diesel emissions | 19,384 | 13,698 |
| TOTAL | 157,961 | 81,391 |
| Reduction | | -48% |

The Department also notes that the overall $PM_{2.5}$ emission reduction of around 76,000 kg/year due to the Revised Mine Plan is significantly higher than moving from USEPA Tier 2 to Tier 4 diesel emissions, noting that the total peak diesel emission contribution is only around 13,700 kg/year.

The Department considers that it is reasonable that KEPCO is required to minimise its diesel emissions in line with the industry-wide approach proposed by the EPA. A decision on the timing to require newly commissioned fleet to meet Tier 4 emission standards has not yet been finalised by the EPA, with further consultation to be undertaken by the EPA with industry. However, the EPA has nominated a cut-off date of 30 June 2020 for requiring Tier 4 standards to apply for equipment commissioned into service and has recommended the following condition.

*"The applicant must ensure that any item of non-road diesel equipment commissioned into service and operating at the premises after 30 June 2020,*

*(i) complies with the US EPA Tier 4 final or equivalent exhaust emission standard; or*
*(ii) is otherwise approved, in writing, by the NSW EPA for use on premises.*

The requirement to comply with USEPA Tier 4 emission standards would only apply to the project for new equipment being commissioned in Australia after 30 June 2020.

In the case of the Bylong Coal Project, given the short duration of the open cut mining operations, KEPCO would be using a contractor operated fleet. KEPCO has advised that this may include existing fleet operating in Australia but accepts that any new equipment used for the project would be commissioned to comply with Tier 4 standards, which would result in a further decrease in particulate emissions from the project.

The Department supports EPA's recommended condition and notes that the EPA, as the lead NSW government agency for regulating air pollution, would implement these requirements, through conditions on its environment protection licence for the project, if the project was approved.

### Background Air Quality

***Commission Finding***

- There is residual uncertainty around the suitability of background data used in the air quality model

As discussed in the PAR, the EPA in its advice to the Department on the EIS noted the background air quality data and limitations in the dataset. However, the EPA concluded that the background data used is likely to represent prevailing or usual conditions in the area.

The Department requested the EPA to provide advice on the Commission's findings on the air quality impact assessment. The EPA did not raise any further residual concerns about the air quality assessment apart from measures to minimise diesel emissions and recommended conditions, as discussed above.

The Department also notes that since the EIS was completed, KEPCO has acquired additional properties around the mine and with the Revised Mine Plan there is a significant decrease in peak dust emissions from the open cut stage along with a one year reduction in open cut mining operations.

### Blast Impacts - Tarwyn Park and Sensitive Sites

***Commission Findings***

- The Commission is concerned about the Department's recommended approach to blast impacts on heritage features and sensitive sites, incl. Tarwyn Park – in accepting either blast specifications that won't cause impacts or blast specifications that are likely to cause impacts providing damage is remediated.
- These approaches require careful consideration prior to a decision, especially as Tarwyn Park may have greater heritage significance that previously thought.
- If damage is permitted to occur through a management plan, the specifics of likely damage and proposed remediation measures should be available to determining authority and not just deferred to post approval arrangements.

In its RtPR Report, KEPCO submitted a detailed *Tarwyn Park and Iron Tank Draft Conservation Management Plan*, inclusive of a specific Blast Management Strategy prepared by Terrock Consulting Engineers, to minimise the impacts on Tarwyn Park homestead and stables. This included mitigation actions at the heritage items, such as installation of boards and bracing, and specifications for smaller, shallower blasts as the blasting approached within approximately 500m of these heritage items.

As discussed above, the Revised Mine Plan now substantially increases the distance of blasting to the Tarwyn Park homestead and stables such that the blast criteria for overpressure and ground vibration are comfortably met at the highest blast charge proposed (maximum instantaneous charge MIC of 3,500 kg), without requiring significant changes to blast design near these heritage items. That is, blasting impacts are unlikely to occur based on the predicted overpressure and ground vibration levels. The table below summarises these changes.

**Table 24** | Predicted blast impacts on historic heritage items – Revised Mine Plan

| Site | Blast Distance (m) | | Ground vibration (mm/s) | Overpressure dB(L) |
|---|---|---|---|---|
| | EIS Mine Plan | Revised Mine Plan | MIC 3,500 kg (Criterion of 15)[1] | MIC 3,500 kg (Criterion of 133)[1] |
| Tarwyn Park Homestead | 190 | >1,400 | 6.51 | 117 |
| Tarwyn Park Stables | 107 | >1,400 | 7.50 | 117 |
| Tarwyn Park Horse Burials | Direct Disturbance, Salvaged | >1,400 | 7.01 | 117 |
| Former Upper Bylong Catholic Church | Direct Disturbance, Salvaged | >1,000 | 11.92 | 120 |

1. Overpressure value recommended in Australian Standard AS 2187: Part 2-2006 "Explosives – Storage and Use" - Appendix J for building damage, Ground Vibration based on AS 2187 and British Standard BS 7385-2 Evaluation and measurement for vibration in buildings.

Nonetheless, careful blast design and management would be required, in accordance with the recommended Blast Management Plan, to monitor blast levels and impacts. KEPCO has committed to updating the detailed Blast Management Strategy prepared by Terrock, as part of the Blast Management Plan required for the project.

As the former Upper Bylong Catholic Church and cemetery and the horse burial on Tarwyn Park would not be directly impacted and remain in-situ, the recommended blast criteria would also apply to these heritage items.

### Revised Mine Plan – EPA advice

The Department requested advice from EPA on the Revised Mine Plan (see Appendix D). The EPA noted that the impacts would be equal or less that those assessed previously and that it considered that its recommended conditions remain relevant and appropriate.

The EPA noted that the predicted noise levels had changed, and the Department should take this into consideration. As discussed above, the Department has recommended that noise limits apply based on the predicted noise levels at receiver ID60 and that mitigation rights be afforded.

### Revised Approved Methods

The EPA's *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* was revised in January 2017 to include ambient targets for annual (8 µg/m$^3$) and 24-hour (25 µg/m$^3$) $PM_{2.5}$. Prior to this, advisory targets only were set in the *National Environment Protection (Air Quality) Measure (Air NEPM)*. The Air NEPM was revised in 2015.

KEPCO undertook its air quality assessment against these advisory targets indicating that emissions from the project would comply with these ambient limits.

The revision to the approved methods and the Air NEPM also reduced the $PM_{10}$ annual target down from 30 µg/m$^3$ to 25 µg/m$^3$ with the air quality modelling indicating that the project would easily comply with the annual ambient targets at private receivers.

The Department recommends that these revised air quality criteria be adopted for the project.

### Greenhouse Gas Emissions

The PAR contained an assessment of the project's anticipated greenhouse gas emissions (see Section 6.1 of the PAR).

In November 2016, the NSW Government released its *NSW Climate Change Policy Framework*. The policy sets an "aspirational long-term objective" of achieving net-zero emissions in NSW (ie greenhouse gas emissions within NSW will be balanced by carbon storage) by the year 2050. The policy states that the NSW Government will seek to achieve this objective through particular functions of Government, being:

- *Government policy:* The NSW Government will set policy to achieve emissions savings, consistent with Commonwealth action, and to enable effective adaptation to climate change;
- *Government operations:* The NSW Government is a major purchaser in the NSW economy through delivering government services and managing government assets. The government will lead by example and drive market change; and
- *National and international advocacy:* The NSW Government will advocate for climate policy action at national and international levels.

However, the policy makes no direct reference to coal mining or to the export of coal for consumption in other countries. Nor does it refer to any encouragement or discouragement of particular industries in NSW, or to development consent under the EP&A Act.

The Department considers that the policy is a framework to guide Government in its own operations, rather than a development control policy as such. In this respect, it is important to note that the policy is not an EPI under the EP&A Act, but a policy published by OEH. On this basis, the Department concludes that the policy's content has no direct bearing on either the project or its determination by the Commission.

KEPCO has also provided revised greenhouse gas (GHG) emission estimates based on the Revised Mine Plan, with a comparison against the Commonwealth government's commitments against the Paris Agreement (431 Mt $CO_{2-e}$ by 2030).

The Revised Mine Plan reduces Scope 1 and Scope 2 GHG emissions (direct emissions and electricity consumption) by around 3% over the life of the project to 3.4 Mt $CO_{2-e}$ (annual average contribution reduced from 0.140 Mt to 0.136 Mt), which is 0.03% of Australia's commitment under the Paris Agreement.

There is also a 2% reduction in Scope 3 emissions, largely due to less extraction and transportation of coal over the life of the project.

### Recommended Conditions – Air, Noise and Blasting

In the PAR, the Department recommended a range of conditions for minimising/ managing amenity and health impacts from noise, air emissions and blasting. These included conditions requiring KEPCO to:

For noise:

- acquire the significantly affected property (Receiver 60), if requested by the landowner;

- undertake additional noise mitigation measures (such as double glazing, insulation, and/or air conditioning) at residences which are predicted to be moderately or significantly affected, if requested by the landowner;
- comply with contemporary operational and construction noise limits;
- develop a comprehensive Noise Management Plan in consultation with the EPA and the CCC, including real-time noise monitoring and an active management system which includes an early warning alert system to identify and manage potential exceedances;
- independently investigate noise complaints and undertake applicable management measures;
- communicate mining operations with the community, including publicly reporting all monitoring results, and effectively responding to enquiries and complaints;
- implement all reasonable and feasible measures to minimise construction, operational, rail and traffic noise;
- implement additional noise mitigation measures on Receiver 44 (such as double glazing, insulation, and/or air conditioning) at the landowner's request, if the WAF is not developed as part of the project
- ensure that the project only uses locomotives that comply with the noise limits in ARTC's EPL; and
- use its best endeavours to ensure that rolling stock are selected to minimise noise.

For air:

- comply with contemporary air quality criteria;
- implement best practice dust management measures;
- develop a comprehensive Air Quality Management Plan, including a real-time dust monitoring program and an active management system;
- independently investigate air quality exceedances and undertake applicable management measures;
- respond effectively to enquiries or complaints;
- publicly report on its environmental performance;
- advise tenants of the possible health and amenity impacts of the mine;
- allow tenants to terminate their lease without penalty;
- install air quality mitigation measures (commensurate with the impact of the mine) on the residence, at the tenant's request;
- undertake regular air monitoring to inform tenants of the dust emissions at the residence, and provide this data to the residents
- develop a blast fume management procedure as a component of the Blast Management Plan;
- implement all reasonable and feasible measures to minimise diesel emissions;
- investigate and outline these measures in the Air Quality Management Plan; and
- prepare and implement a detailed Spontaneous Combustion Monitoring and Management Plan

For blasting:

- manage blasting operations to comply with all relevant criteria at private properties and public infrastructure;
- manage blasting operations to comply with relevant criteria at heritage sites and sensitive features, unless measures to minimise and rectify any blast-related damage to these features have been approved as part of a plan for the specific site or feature;

- limit blast frequency and hours;
- keep the public notified and up-to-date regarding blasting operations, and facilitate feedback and complaint management;
- provide for structural property inspections and investigations on request;
- repair any structural damage to buildings or infrastructure caused by the project;
- manage blasting operations to avoid fly-rock related safety risks;
- develop a comprehensive Blast Management Plan including a:
    - detailed blast monitoring program; and
    - fume management protocol;
- develop Conservation Management Plans for heritage items in the vicinity of the project area

Following consideration of the Commission's findings and KEPCO's response, the Department has recommended the following revisions to the PAR recommended conditions:

- **Schedule 4 Conditions 1 - Acquisition Rights:** Property ID 60 (Eagle Hill) now afforded mitigation rights (rather than acquisition) in accordance with the VLAMP, and strict noise limits to apply.
- **Schedule 4 Condition 2 - Noise Criteria during open cut stage:** Property ID 60 included with strict noise criteria to apply; property ID65 and 141 removed as these properties have been acquired by KEPCO, notation included identifying property ID151/ 158 as having an acquisition agreement with KEPCO, subject to the approval of the project.
- **Schedule 4 Condition 3 - Noise Criteria during underground stage:** Land ID65 removed from the table as the property has been acquired by KEPCO.
- **Schedule 4 Condition 14 - Blast Management Plan:** Revision to the Blast Management Plan requirements to manage blasting to meet blast criteria for heritage items on Tarwyn Park and the former Upper Bylong Catholic Church and cemetery, noting this would now not be directly impacted.
- **Schedule 4 Condition 17 - Air Quality Criteria:** Revised to adopt current EPA approved methods air quality criteria for $PM_{10}$ and $PM_{2.5}$.
- **Schedule 4 Condition 19 - Air Operating Conditions:** additional requirement included to address EPA's advice to apply Tier 4 USEPA standards for non-road diesel for equipment commissioned into service after 30 June 2020.
- **Appendix 5 – Noise Compliance Assessment:** Assessment of LF noise revised to refer directly to the Noise Policy for Industry which applies to the project under transitional arrangements.

# 3. Recommended Conditions

While the Department attached a comprehensive suite of conditions to its PAR, it has made changes to address the recommendations of the Commission, commitments made by KEPCO in response to the Commission's review (see **Appendix G**). These changes are summarised in Table 25 below.

The Department considers that they reflect best practice and provide a sound basis for preventing, minimising and/or offsetting the impacts of the project. The Department has consulted with key agencies, who have provided input on conditions, and addressed concerns residual concerns raised by MWRC, including removing the option for a WAF and road upgrade and maintenance contributions.

**Table 25** | Summary of Revised Recommended Conditions

| *Issue* | *Condition* |
|---|---|
| Mine Plan | • Remove open cut mining and overburden emplacements from the Tarwyn Park property, in accordance with the proposed Revised Mine Plan. |
| Water Resources | • KEPCO to bear the burden of proof to demonstrate it has not caused impacts to landholder's water supply where compensatory water is claimed, as supported by a comprehensive monitoring network and validated groundwater modelling.<br>• Ensure there is no treated or untreated mine water discharge from the site and that all water is managed in on-site mine water storages, the open cut voids or in the underground goaf storage area.<br>• Undertake a detailed validation and peer review of the site water balance every 3 years, including a review of the life of mine water balance and (if necessary) identify and implement measures to ensure mine water storage capacity is retained to ensure commitment to no discharge of mine water off-site.<br>• Prepare a detailed final void management strategy to optimise the size of the final void required for reject emplacement and water storage, with an annual review based on verified data. |
| Agricultural resources | • The rehabilitation objectives have been revised to restore at least 400 ha of BSAL-equivalent land/ Class 3 land, to reflect the reduction in impacts to BSAL. .<br>• In preparing the Rehabilitation Management Plan, an additional requirement is recommended to further optimise the final landform design towards meeting objectives of integration with the existing landscape (macro-relief) and restoration of higher capability agricultural land (BSAL/ LSC Class 3).<br>• Maintaining or enhancing agricultural production - the condition has been revised to clearly identify the land available for agricultural production and require that reasonable and feasible steps are undertaken to maintain or enhance production, in line with the commitments made during the assessment of the project, including the draft Farm Management Plan. |
| Heritage | • Revision to the Blast Management Plan requirements to manage blasting to meet blast criteria for heritage items on Tarwyn Park and the former Upper Bylong Catholic Church and cemetery, where direct impacts are now avoided.<br>• Requiring the minimum scope of the Aboriginal heritage ochre study and assessment of values of Aboriginal heritage items in offset areas to be consistent with advice from OEH.<br>• Removal of the requirement for a Burials Management Plan and a Horse Burials Management Plan as the impacts have now been avoided.<br>• Rehabilitation objectives to include macro-relief principles, reference to the revised conceptual final landform for the Revised Mine Plan and potential for reinstatement of the road connection between Upper Bylong Road and Upper Lee Creek Road, subject to Council agreement as part of consultation on post closure land use. |

| Issue | Condition |
|---|---|
| | • Revisions to the Rehabilitation Management Plan to optimise the design of the final landform to incorporate macro and micro-relief features to improve visual integration with the existing landscape and rehabilitation to meet agricultural objectives to reinstate BSAL-equivalent land and Class 3 and 4 agricultural land. |
| Social impacts | • Inclusion of a condition confirming that the consent does not permit the construction of a WAF.<br>• Requirement to prepare an updated workforce accommodation strategy prior to the commencement of the development to manage the social impacts associated with construction stage(s) of the project. |
| Subsidence | • Restricting longwall mining from within 150 m horizontally of cliffs C5 and 24312 unless a revised subsidence impact assessment report is submitted demonstrating that the performance measures can be met. Any mining closer than 150 m would require approval through the Extraction Plan approval process. |
| Lighting – Dark Sky Region | • Implement all reasonable and feasible measures to minimise off-site lighting impacts with consideration of the good lighting design principles identified in the *NSW Dark Sky Planning Guideline*.<br>• To support the identification of appropriate measures, prepare a strategy in consultation with the Siding Spring Observatory Director by a suitably qualified and experienced person to identify and implement measures to minimise the upward spill of light. |
| Biodiversity | • The area of rehabilitation to woodland increased from 33 ha to 65 ha as identified in the draft Rehabilitation Management Plan. |
| Transport and Traffic | • In addition to production shifts, the applicant must schedule construction shift changes to occur outside of school bus hours.<br>• Inclusion of all agreed road funding upgrades between MWRC and KEPCO and the proposed increase in funding from $40,000 to $267,700 to MSC for road safety measures along Bylong Valley Way within MSC local government area.<br>• Additional requirement for pre and post dilapidation surveys and make good requirements around construction and decommissioning stages for Bylong Valley Way within the MSC area.<br>• Additional requirement to consult with school bus service providers in preparation of the Traffic Management Plan, including measures to minimise and manage heavy vehicle interaction during school bus hours, and for monitoring of traffic to provide adequate data to determine the contribution of the development to rehabilitation or make good requirements for road dilapidation surveys. |
| Air, Noise and Blasting | • Due to reduction in noise impacts, property ID 60 (Eagle Hill) now afforded mitigation rights rather than acquisition rights and strict noise limits to apply.<br>• Changes to noise limits to reflect acquisitions by KEPCO and the Revised Mine Plan.<br>• Revision to the Blast Management Plan requirements to manage blasting to meet blast criteria for heritage items on Tarwyn Park and the former Upper Bylong Catholic Church and cemetery, noting this would not now be directly impacted.<br>• Air quality criteria revised to adopt current EPA approved methods air quality criteria for $PM_{10}$ and $PM_{2.5}$.<br>• Additional requirement included to address EPA's advice to apply Tier 4 USEPA standards for non-road diesel for equipment commissioned into service after 30 June 2020.<br>• Assessment of LF noise revised to refer directly to the *Noise Policy for Industry*, which applies to the project under transitional arrangements. |

# 4. Conclusion

In accordance with Section 4.15 of the EP&A Act, the Department has considered the following in its assessment of the project:

- the Commission's Review Report of the Bylong Coal Project;
- the environmental impacts of the project on the natural and built environments, and social and economic impacts in the locality of the project, including the information outlined in KEPCO's EIS, RTS, Supplementary RTS, Response to PAC Review Report and the Supplementary Information Report incorporating the Revised Mine Plan;
- all submissions and additional public representations received throughout the assessment process, including advice from public authorities;
- additional information provided by KEPCO to further address issues raised during the assessment process;
- the gateway certificate for the project;
- applicable environmental planning instruments and draft instruments, including non-discretionary development standards and development control plans;
- other relevant NSW Government policies and guidelines, including the *Upper Hunter Strategic Regional Land Use Plan* (SRLUP), the *Voluntary Land Acquisition and Mitigation Policy*, the *Central West and Orana Regional Plan 2036, Dark Sky Planning Guideline* and the *NSW Climate Change Policy Framework;*
- the planning agreement executed for the project between KEPCO and MWRC;
- the suitability of the site for the project;
- relevant provisions of the EP&A Act and Regulations, including the objects of the Act; and
- the public interest.

The Department and the Commission have undertaken extensive public consultation to inform the assessment including:

- public exhibition for 44 days with 364 submissions received;
- holding a public information session at Bylong community hall during the exhibition period;
- targeted consultation with the local Bylong Valley and surrounding community and a social impact assessment expert engaged by the Department, including one on one meetings and group consultation sessions;
- the review of the project including a public hearing held by the Planning Assessment Commission, with 44 verbal submissions, mainly in support of the project and 1,123 written submissions; and
- ongoing correspondence and submissions on the project from individuals and special interest groups considered by the Department in its assessment of the project.

The Department has carefully considered the Commission's findings from its review of the Bylong Coal Project, KEPCO's response and additional information provided by key agencies and special interest groups, in its assessment of the project. A significant change to the project is the removal of mining from Tarwyn Park. The Department has recommended the open cut mine stage be developed generally in accordance with the Revised Mine Plan.

The Bylong Coal Project would result in a range of social and economic benefits for the Mid-Western Regional Council local government area, the Central West and Orana Region and the State of NSW including:

- direct employment of up to 450 persons at full production, 665 during the peak construction period;

- direct capital investment of around $1.3 billion;
- average annual contribution to the regional economy over a 23 year period of:
    - $602 million in annual business turnover;
    - $386 million in annual regional value added; and
    - 805 direct and indirect jobs
- $301 million in net social benefits to NSW, including $278 million in royalty payments.

The Department believes its revised recommended conditions of consent provide a comprehensive, strict and precautionary approach to ensuring the project can comply with relevant performance measures and standards, and that the predicted residual impacts can be effectively minimised, mitigated and/ or compensated.

Based on its assessment of the project, the Department of Planning and Environment considers that the project is approvable, subject to the stringent conditions of consent outlined in **Appendix H**.

This final assessment report is hereby presented to the *Independent Planning Commission* for determination.

4/10/18

Stephen O'Donoghue

**A/ Director**

**Resource and Energy Assessments**

Michael 4/10/18.

Mike Young

**A/ Executive Director**

**Resource Assessments & Business Systems**

# Appendices

# Appendix A – KEPCO's Response to the PAC Review

Refer to the Department's website:

http//majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=6367

# Appendix B – Advice from the Heritage Council of NSW

Refer to the Department's website:

http//majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=6367

# Appendix C – KEPCO's Supplementary Response - Revised Mine Plan

Refer to the Department's website:

http//majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=6367

# Appendix D – Additional Advice from Agencies

Refer to the Department's website:

http//majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=6367

**Advice on the RtPR Report**

D1: Department of Industry – Lands and Water

D2: Office of Environment and Heritage

D3: Environment Protection Authority (Air Advice)

D4: Environment Protection Authority (Noise Advice)

**Advice on the Revised Mine Plan**

D5: DPE – Division of Resources & Geoscience

D6: Department of Industry – Lands and Water

D7: Heritage Council of NSW

D8: Office of Environment and Heritage

D9: Environment Protection Authority

# Appendix E – Additional Advice / Information

Refer to the Department's website:

http//majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=6367

E1-1: Lock the Gate Submission

E1-2: IEEFA Expert Report

E2-1: Email from Property Owner Budden

E2-2: Letter from Property Owner Budden to KEPCO

E3: Advice from AGE – Drawdown due to Mining only

E4-1: Advice from KEPCO – Land Available for Agriculture

E4-2: Revised Figure – Land Available for Agriculture

E5: Letter from Mid-Western Regional Counci (MWRC) – Disbursement of VPA Funds

E6-1: Advice from KEPCO – Woodland Rehabilitation

E6-2: Woodland Rehabilitation Figure

E7: Letter from MWRC – Management of Subsidence, Bylong Valley Way

E8: MWRC Council Minutes – Agreement on Road Funding

E9-1: KEPCO offer of road funding to Muswellbrook Shire Council (MSC)

E9-2: Letter from MSC – road funding

E9-3: KEPCO letter to MSC in response

# Appendix F -Updated Statutory Consideration

In line with the requirements of Section 4.15 of the EP&A Act the Department's assessment of the project has given detailed consideration to a number of statutory requirements. These include:

- the objects found in Section 1.3 of the EP&A Act; and
- the matters listed under Section 4.15(1) of the EP&A Act, including applicable environmental planning instruments and regulations.

The Department has considered all of these matters in its assessment of the project, including the Department's Preliminary Assessment Report and this Final Assessment Report and has provided a summary of this assessment in Table F1 below.

Reference should also be made to Sections 4 and 9 of the EIS and Section 3 of the RtPR Report where KEPCO has also considered applicable legislation and environmental planning instruments in detail.

**Table F1** | Summary of Statutory Consideration

| *Aspect* | *Summary* |
|---|---|
| Relevant Objects of the EP&A Act<br><br>1.3 (a) to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources.<br><br>1.3 (b) to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment.<br><br>1.3 (c) to promote the orderly and economic use and development of land.<br><br>1.3 (e) to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats.<br><br>1.3 (f) to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage).<br><br>1.3 (j)to provide increased opportunity for community participation in environmental planning and assessment. | The objects of most relevance to the Commission's decision on whether or not to approve the project are found in Section 1.3(a), (b), (c), (e), (f) and (j) of the EP&A Act.<br><br>The Department is satisfied that objects 1.3(a) and (c) are met as:<br><br>o the project is a permissible land use on the subject land;<br>o the project is consistent with the *Central West and Orana Regional Plan 2036,* recognising the importance of both agriculture and mining to diversify the economy, along with the efficient use of water resources;<br>o the Department's Division of Resources and Geoscience confirmed the size and quality of the coal reserve;<br>o the mine would be a mid-sized operation providing substantial royalties of up to $278 million (present value); and<br>o the project would provide considerable economic benefits to the region and to NSW as a whole.<br><br>The Department is satisfied that object 1.3(b) is met as:<br><br>o the principles of ecologically sustainable development have been considered through its assessment of the project;<br>o the proposed modification is able to be carried out in a manner that is consistent with the principles of ESD;<br>o the assessment has sought to integrate all significant environmental, social and economic considerations; and<br>o the Revised Mine Plan has further reduced the environmental and social impacts of the project, while providing a significant net benefit to NSW and the regional economy.<br><br>The Department is satisfied that objects 1.3(e) and (f) are met as:<br><br>o the project has sought to avoid and minimise impacts on biodiversity and heritage and has offset residual biodiversity impacts in accordance with NSW and Commonwealth Government policy;<br>o the Revised Mine Plan has further reduced impacts, particularly on heritage values associated with the Tarwyn Park property, including ensuring key heritage features are appropriately managed and conserved; and<br>o the Revised Mine Plan also is designed to minimise landscape impacts associated with the Bylong Landscape Conservation Area and heritage features within the Upper Bylong Valley.<br><br>The Department is satisfied that object 1.3(j) is met as:<br><br>o the project was exhibited for 44 days with 364 submissions received;<br>o a public information session was held at Bylong community hall during the exhibition period;<br>o targeted consultation held with the local Bylong community and a social impact assessment expert engaged by the |

| Aspect | Summary |
|---|---|
| | Department, including one on one meetings and group consultation sessions;<br>o a review of the project including a public hearing was held by the Planning Assessment Commission, with 44 verbal submissions, mainly in support of the project and 1,123 written submissions; and<br>o ongoing correspondence and submissions on the project from individuals and special interest groups considered by the Department in its assessment of the project. |
| Environmental Planning Instruments (EPIs) | Appendix J of the PAR provides a summary of the Department's consideration of the relevant EPI's. Further consideration is provided below where relevant, due to changes to the Revised Mine Plan or revisions to EPIs.<br><br>*Mid-Western Regional LEP 2012* – see the Department's consideration in the PAR.<br><br>*SEPP No.33 – Hazardous and Offensive Development* – see the Department's consideration in the PAR.<br><br>*SEPP No.44 – Koala Habitat Protection* – see the Department's consideration in the PAR.<br><br>*SEPP No.55 – Remediation of Land* – see the Department's consideration in the PAR.<br><br>*SEPP (State and Regional Development) 2011*<br><br>Under Section 4.38 of the EP&A Act the project is considered a State Significant Development.<br><br>Under clause 8A of the *State Environmental Planning Policy (State and Regional Development) 2011* and Section 4.5(a) of the EP&A Act, the Independent Planning Commission is the consent authority for the development as there were more than 25 public submissions in the nature of objections.<br><br>*SEPP (Infrastructure) 2007* – see the Department's consideration in the PAR.<br><br>*SEPP (Mining, Petroleum Production and Extractive Industries) 2007 (Mining SEPP)*<br><br>*Non-discretionary Development Standards for Mining (Clause 12AB)*<br><br>In the PAR, the Department considered the potential noise, air quality, air blast, ground vibration and aquifer interference impacts of the project. The Department was satisfied that the project could be managed to comply with all relevant development standards. The Revised Mine Plan further reduces these impacts.<br><br>*Compatibility with other land uses (Clause 12)*<br><br>The Department's assessment has considered the potential impacts of the project on other land uses in the area, including the residential land uses associated with Bylong village, agricultural activity in the Bylong Valley and surrounds, forestry within Bylong State Forest, quarrying operations at the Bylong Quarry and National Park estate. This assessment has been undertaken in consideration of the public benefits of the project.<br><br>The Department undertook a detailed assessment of the potential impacts of the project on all nearby land uses (see Section 6 of the PAR and Section 2 of this report) and found that the project could be managed to meet acceptable criteria for dust and blasting impacts established by the EPA. However, under the Revised Mine Plan two landowners have been afforded mitigation rights due to moderate noise impacts at their residences.<br><br>Further, the Department is satisfied that other indirect impacts of the project on surrounding land uses and are able to be minimised, mitigated or managed to achieve acceptable environmental and amenity outcomes.<br><br>*Consideration of Voluntary Land Acquisition and Mitigation Policy (Clause 12A)* |

| Aspect | Summary |
|---|---|
| | The Department's assessment has considered the NSW Government's *Voluntary Land Acquisition and Mitigation Policy* (December 2014). As a result of additional land acquisitions/ acquisition agreements and the reduction in noise impact as a result of the Revised Mine Plan no private receivers are predicted to have a significant impact such that acquisition rights would be afforded.<br><br>*Compatibility with Mining, Petroleum Production or Extractive Industry (Clause 13)*<br><br>The Department is satisfied that the project has been designed in a manner that is compatible with, and would not adversely affect, adjacent current or future mining-related activities.<br><br>*Natural Resource Management and Environmental Management (Clause 14)*<br><br>In the PAR, the Department has recommended a number of conditions aimed at ensuring that the project is undertaken in an environmentally responsible manner, including but not limited to, conditions in relation to soils, water resources, threatened species and biodiversity, and greenhouse gas emissions. The Revised Mine Plan further reduces environmental impacts on natural resources.<br><br>*Resource Recovery (Clause 15)*<br><br>While there is a small reduction in resource recovery with the Revised Mine Plan, the Department and DRG are satisfied that the project can be carried out in an efficient manner that optimises resource recovery within environmental constraints. The Department has also recommended conditions requiring KEPCO to implement reasonable and feasible measures to minimise waste.<br><br>*Transport (Clause 16)*<br><br>The Department notes that the project would transport all product coal off-site via the Gulgong to Sandy Hollow Railway. The Department has consulted with the applicable roads authorities and the ARTC in relation to the project, and taken these submissions into consideration in its assessment of the project.<br><br>The conditions require KEPCO to provide substantial road upgrades and maintenance contributions to MWRC where the majority of traffic impacts would occur during construction and operations. KEPCPO has also committed to provide a substantive up front road safety contribution and payments based on pre and post construction road dilapidation surveys to MSC which the Department considers would appropriately mitigate traffic impacts.<br><br>*Rehabilitation (Clause 17)*<br><br>The Department is satisfied that the proposed final landforms and rehabilitation plans could be achieved to meet contemporary best practice in the NSW mining industry, and has recommended a number of conditions to ensure the appropriate rehabilitation of land that would be affected by the project.<br><br>The recommended conditions require KEPCO to prepare and implement a Rehabilitation Management Plan, to effectively manage waste and to meet a number of rehabilitation objectives, including ensuring public safety, outcomes to rehabilitate land for agricultural land-use and landscape reinstatement of BSAL and Class 2-3 agricultural capability land and improved integration with the existing landscape, and that the mine site as a whole is safe, stable and non-polluting.<br><br>*Summary – Mining SEPP*<br><br>Based on its assessment of the development, the Department is satisfied that the project can be managed in a manner that is generally consistent with the aims, objectives and provisions of the SEPP. |
| Dark Sky Planning Guideline | Clause 92(1)(d) of the EP&A Regulation requires that the consent authority must consider the *Dark Sky Planning Guideline* for any SSD development on land less than 200 kilometres from the Siding Spring Observatory. |

| Aspect | Summary |
|---|---|
| | The Department consideration of the Dark Sky Planning Guidelines and recommended condition to minimise the upward spill of light in accordance with good lighting design principles is provided in Section 2.9 of this report. |
| Commonwealth Approval | In accordance with the EPBC Act, the project (EPBC 2015/7431) was determined to be a 'controlled action' on 12 March 2014 due to likely significant impacts to listed threatened species and communities (sections 18 and 18A) and a water resource (Sections 24D and 24E).<br><br>The Departments assessment of all matters that the Commonwealth Minister must consider under the EPBC Act is provided in Appendix K, Appendix L, Section 6.3 and Section 6.6 of the PAR, and Section 3 of this report. |

# Appendix G – Bilateral Assessment – Residual Issues

The Department included a detailed consideration of Matters of National Environmental Significance (MNES) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) in Appendix L of the PAR. OEH also provided advice on Commonwealth matters as detailed in Appendix K of the PAR.

Following consultation with DoEE, further, clarification is provided on how low condition grassland is dealt with under State vs. Commonwealth requirements.

The Department also notes that the Commonwealth has published the Northern Sydney Basin - Hunter Subregion Bioregional Assessment which has been raised by the community as new information that should be considered in the assessment of the project.

## Offsetting low condition derived native grassland

Under the NSW Government's offsetting rules established under the Framework for Biodiversity Assessment (FBA), offsets are not required where the condition of a plant community type (PCT) in the disturbance area has a biometric score of less than 17. As discussed in the PAR, there was 111 ha of direct disturbance to the Commonwealth listed Box Gum Woodland (BGW) in the form of derived native grassland (DNG) that was not required to be directly offset under the FBA rules, due to its low condition.

The Department notes that the Revised Mine Plan has avoided a further direct impact on BGW of 4.4 ha, including 2.4 ha of woodland and 2 ha of derived native grassland (DNG).

While the low condition BGW is not required to be directly offset under the NSW offsetting framework, there are substantial excess credits for Box Gum Woodland EEC in the offset areas, excluding offset area 5 (OA5), to account for the low condition DNG as indicated in the table below.

**Table 25** | Box Gum Woodland Reconciliation – EPBC

| *Plant Community Type (PCT)* | *Condition* | *Impact Area Credits* | | | *Offset Area Credits (excluding OA5)* | |
|---|---|---|---|---|---|---|
| | | *Area (ha)* | *Credits Required* | *Average Credits / ha* | *Area (ha)* | *Credits Available* |
| Yellow Box grassy woodland on lower hillslopes and valley flats in the southern NSW Brigalow Belt South Bioregion (HU732) | Moderate/ Good Woodland | 8.2 | 464 | 56.6 | | |
| | Moderate/ Good DNG | 6.0 | 126 | 21.0 | | |
| | Low Condition DNG | 8.5 | 0 | 0 | | |
| | Total | 22.7 | 590 | 26 | 335 | 1,903 |
| Grey Box – White Box grassy open woodland on basalt hills in the Merriwa region, upper Hunter Valley (HU690) | Moderate/ Good Woodland | 57.3 | 3,289 | 57.4 | | |
| | Moderate/ Good DNG | 68.1 | 1,380 | 20.3 | | |
| | Low Condition DNG | 102.9 | 0 | 0 | | |
| | Total | 228.3 | 4,669 | 20.5 | 1,353 | 8,394 |
| **TOTAL** | **Moderate/ Good Woodland** | **65.5** | **3,753** | **57.3** | | |
| | **Moderate/ Good DNG** | **74.1** | **1,506** | **20.3** | | |
| | **Low Condition DNG** | **111.4** | **0** | **0** | | |
| | **Total** | **251** | **5,259** | **21** | **1,688** | **10,297** |
| **Excess BGW Credits in Offset Areas (excluding OA5)** | | | | | | **5,038** |
| **Excess Credits/ Ha available for Low Condition DNG** | | | | | | **45.2** |

There is an excess of 5,038 BGW credits available which would equate to 45 credits /ha for the 111 ha of low condition DNG, well in excess of the 20 - 21 credits /ha credit liability for DNG in moderate to good condition calculated using the FBA.

The recommended conditions require KEPCO to retire credits in offset areas 1 – 4, Yarran View Offset Area and the Fuzzy Box Offset Area and secure these areas through a Stewardship Agreement under the *Biodiversity Conservation Act 2016* within 2 years of commencing the development. This time period would allow for the applicant to undertake additional surveys in the offset areas to validate the offset credit calculations and for processing of the Stewardship Agreement application, once the development consent is acted upon.

The Department notes that, if approved by the Commission, the proposal would be referred to the Commonwealth Minister for the Environment for determination under the EPBC Act.

### Northern Sydney Basin Bioregional Assessment – Hunter Subregion

The Commonwealth Government released its bioregional assessment package for the Northern Sydney Basin - Hunter Subregion in May 2018. The Department notes that the bioregional assessment includes predictions of drawdown covering the Bylong Coal Project area. Concerns were raised by the community and special interest groups that the drawdown and the extent of these predictions exceeds that predicted by the modelling completed by AGE.

The bioregional assessments are undertaken at a regional scale and the results are used to inform more detailed local scale assessment, using finer scale modelling and local data. The bioregional assessment itself indicates that the modelling identifies where impacts are unlikely to occur, and that more detailed local data and modelling would be required to inform project specific impact assessment. That is, large-scale bioregional assessments are not a substitute for careful assessment under State or Commonwealth environmental law.

Appendix G of the Revised Mine Plan Supplementary Report considers the bioregional assessment modelling and notes some of the limitations of this coarser regional modelling, in particular that the bioregional assessment used a 500m grid cell size, compared to the finer resolution 10-75 m grids used in the modelling undertaken by AGE.

### Bilateral Assessment – Conditions

The Department notes that there are sufficient like-for-like biodiversity credits in the proposed land-based offsets to offset any residual significant impacts to relevant MNES, subject to final field validation. The recommended conditions require KEPCO to retire credits through its identified land-based offsets and only use supplementary measures or payment into an offset fund if there is a shortfall in credits following the field validation.

The Department has consulted with the Department of the Environment and Energy (DoEE) on acceptable methods for proponents to discharge their offset obligations for MNES. DoEE has advised that it would not allow payments into an offset fund, including to the Biodiversity Conservation Trust, unless it has been endorsed by the Commonwealth Minister responsible for administering the EPBC Act.

Similarly, DoEE requested that if supplementary measures are used instead of land-based offsets for relevant MNES, that it must include conservation actions set out in approved Commonwealth policies or plans, with the contribution determined by converting biodiversity credits to an equivalent dollar value using an offsets calculator approved by the Commonwealth Minister responsible for administering the EPBC Act.

The Department has noted DoEE's requirements in the biodiversity conditions.

The Department has also assessed the impacts of the project on water resources (Sections 24D and 24E of the EPBC Act) and recommended a range of strict conditions to manage and mitigate impacts.

For the reasons set out in Section 6.3 and Appendix L of the PAR, and Section 2.4 of this report, which considers residual issues raised by the Commission, the Department recommends that the impacts of the action on a water resource, in relation to coal seam gas development and large coal mining development would be acceptable.

This is subject to the avoidance, mitigation measures proposed by KEPCO throughout the assessment of the project, and the requirements of the recommended conditions of consent in Appendix H.

The Department is satisfied that the recommended conditions would provide suitable protection for those MNES under the EPBC Act for which there is a residual impact.

# Appendix H – Recommended Conditions

Refer to the Department's website:

http//majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=6367