ASSESSMENT REPORT

CHAIN VALLEY COLLIERY
Modification to Mining Extension 1 (SSD 5465 MOD 2)

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1. BACKGROUND

Chain Valley Colliery (Chain Valley) is an underground coal mine located on the southern shore of Lake Macquarie, approximately 60 kilometres (km) south of Newcastle, in the Lake Macquarie and Wyong local government areas (see **Figure 1**). The Mannering Colliery (Mannering) underground coal mine is located directly west of Chain Valley.

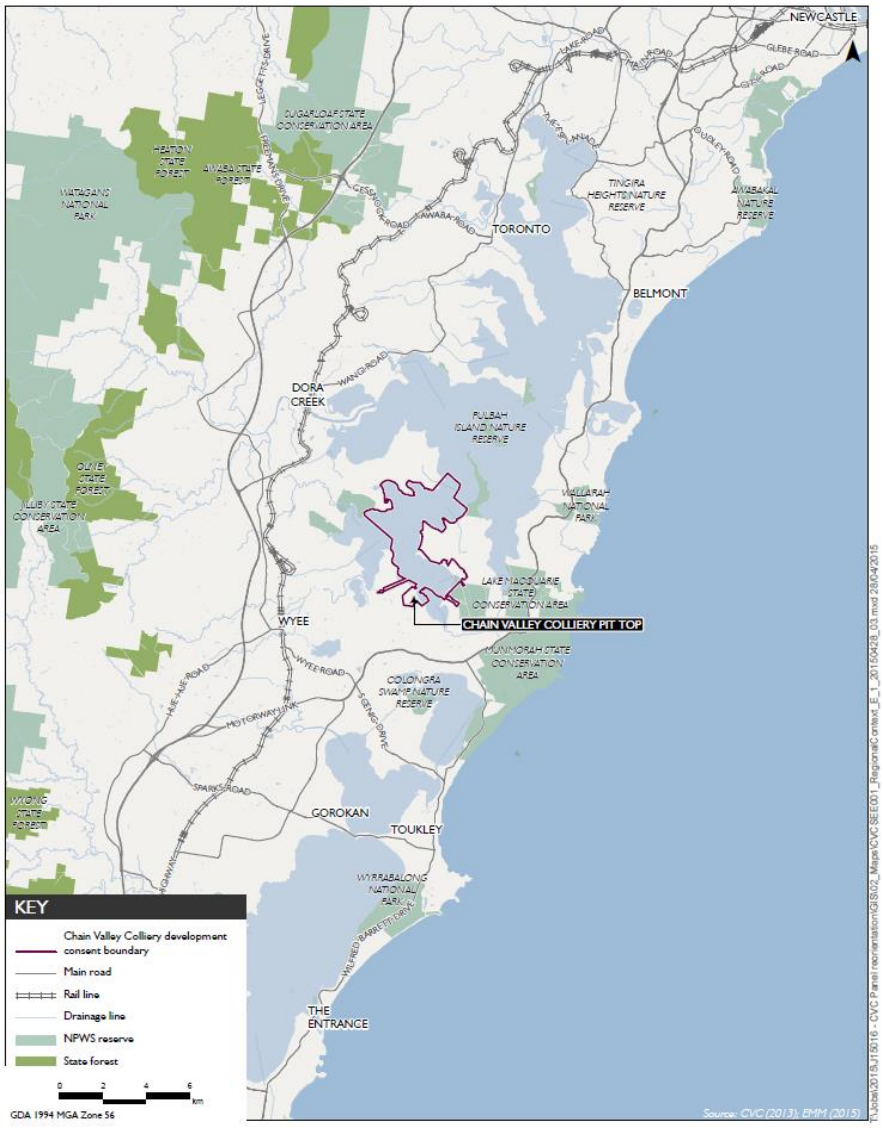

Figure 1: *Location of Chain Valley Colliery*

Chain Valley is owned and operated by LakeCoal Pty Limited (LakeCoal), a wholly-owned subsidiary of LDO Coal Pty Limited. Mannering is owned by Centennial Mannering Pty Limited, a wholly-owned subsidiary of Centennial Coal Company Limited (Centennial).

On 27 November 2012, Mannering ceased production and was placed on care and maintenance due to a combination of high production costs, low coal prices, difficult mining conditions and poor coal quality. The owners of Mannering and Chain Valley have since entered into an agreement, which enabled LakeCoal to become the operater of Mannering from 17 October 2013 until 30 June 2022.

The collieries' pit tops are located approximately 1.1 km from one another on the southern shore of Lake Macquarie, near Chain Valley Bay. The majority of land surrounding the pit tops consists of industrial facilities, such as Delta Electricity's Vales Point Power Station (VPPS) and fragmented areas of vegetation including parts of Lake Macquarie State Conservation Area (SCA). Seagrass beds are also present in the shallow near-shore waters (<2 metres (m) depth) of Lake Macquarie.

Surrounding residential areas include the Macquarie Shores mobile home village, Chain Valley Bay, Mannering Park, Summerland Point and Gwandalan. The closest residential area to the pit tops is Kingfisher Shores, located around 350 m southeast of the Chain Valley pit top.

1.1 Current operations

Chain Valley currently operates under development consent SSD 5465, granted on 23 December 2013, which allows for continued mining within the Fassifern Seam. Chain Valley's consent allows:

- extraction of up to 1.5 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal until 31 December 2027;
- first and second workings using continuous miner and miniwall methods;
- secondary extraction under Lake Macquarie, outside of the High Water Mark Subsidence Barrier (HWMSB) and Seagrass Protection Barrier (SPB);
- sizing and crushing of coal at the Chain Valley Preparation Plant;
- transport of coal via public roads to Port Waratah Coal Services (PWCS);
- transport of coal via private roads to VPPS and by public roads to other customers;
- employment of 120 full-time personnel and 40 full-time contractors; and
- operation 24 hours per day, 7 days a week.

Chain Valley has approval to transport up to 660,000 tonnes per annum (tpa) of ROM coal to PWCS for export, and 180,000 tpa to domestic customers other than VPPS. However, most coal produced is delivered to VPPS via private, sealed roads (Chain Valley access road and Construction Road).

Mannering's and Chain Valley's integrated operations

LakeCoal, as the operator of Mannering, is also responsible for the requirements of Mannering's project approval MP 06_0311 and environment protection licence (EPL) 191, which were transferred from Centennial to LakeCoal on 17 October 2013. LakeCoal has since modified MP 06_0311 and consent SSD 5465 to facilitate the operation of both collieries in a co-ordinated manner, including a modification for an underground linkage between Chain Valley and Mannering granted on 27 November 2014. Once constructed, the linkage will enable coal from Chain Valley to be transferred to VPPS via Mannering's conveyors, and would be used to the current transport via private haul road.

1.2 Proposed Modification

LakeCoal is seeking approval under section 96(2) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for a modification to the Chain Valley development consent to allow:

- an increase in the rate of coal extraction from 1.5 to 2.1 Mtpa with the additional coal produced to be sent via Mannering to VPPS;
- mine design changes;
- an increase in full time personnel from approximately 160 to approximately 220; and
- minor vegetation clearing to protect infrastructure from bushfires.

Mine design changes

The mine design changes are primarily a reorientation of miniwall panels in Chain Valley's northern mining area (see **Figure 2**). The changes would require minor amendments of Chain Valley's consent boundary and minor changes to the spatial extent of mining activities. The consent boundary is also being amended to align with Chain Valley's current mining lease boundaries.

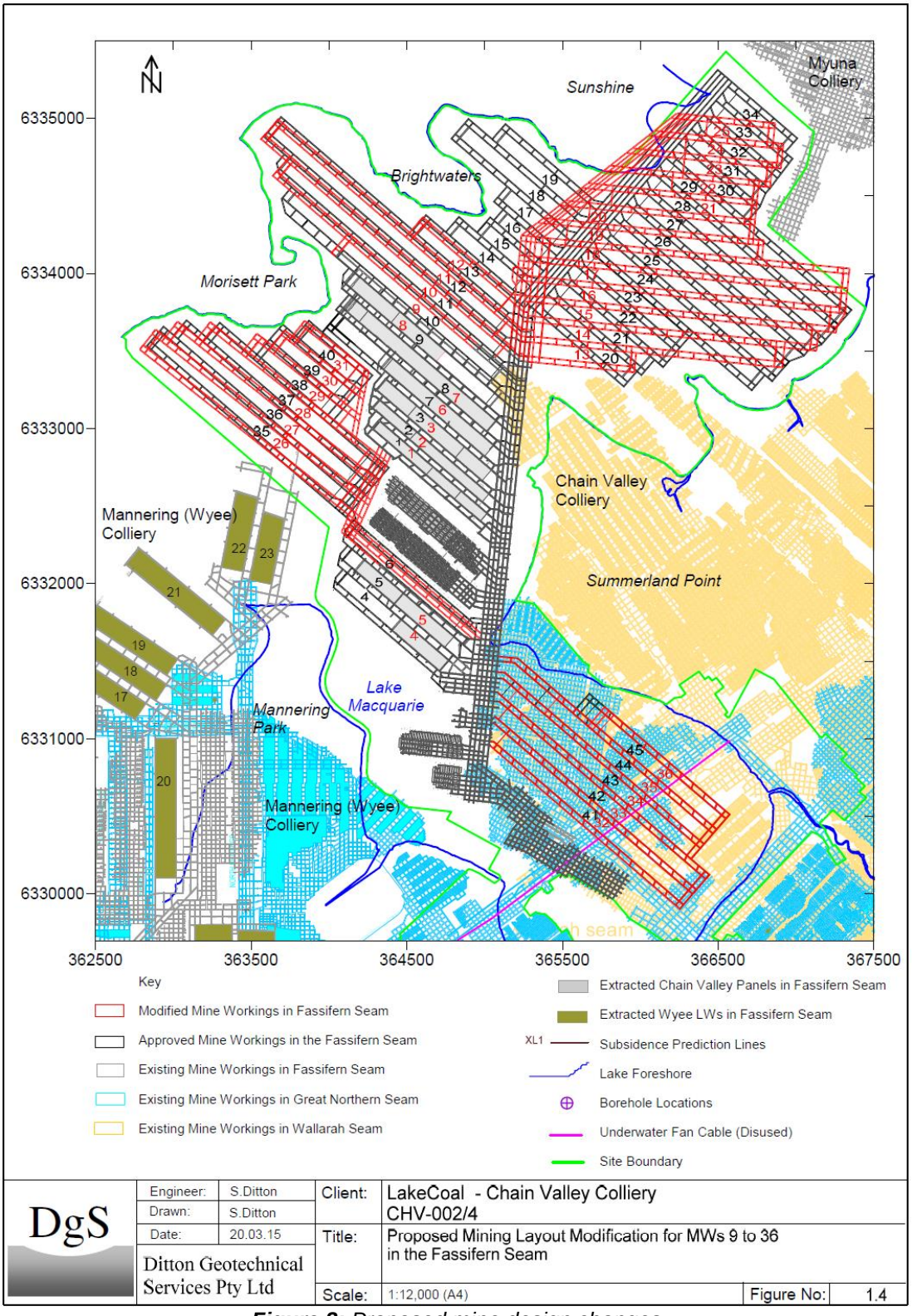

Figure 2: *Proposed mine design changes*

A number of lots are proposed to be included/excluded as a result of the minor amendments to the development consent boundary. All secondary extraction would remain limited to areas beneath Lake Macquarie with existing protection barriers for the foreshore (HWMSB) and seagrasses (SPB) continuing to apply.

The proposed mine design changes are being undertaken primarily for geotechnical and operational reasons as numerous faults have been mapped as running parallel to the current mining alignment. LakeCoal has identified that these geotechnical constraints slow the mining rate and result in a

potentially more hazardous working environment due to the poorer strata conditions. These strata conditions can be improved by a realignment of the mine workings to intersect the faults at an angle closer to the perpendicular.

Increase in ROM extraction and product coal transport
LakeCoal has entered into long-term agreements to supply increased coal volumes to Delta Electricity's VPPS for use in domestic electricity generation which will require increased ROM coal production at Chain Valley. The primary practical limitation on ROM coal production relates to the capacity of the existing coal clearance system. This problem can be overcome by using the higher capacity Mannering coal clearance system, which includes a direct conveyor connection to VPPS.

The additional 600,000 tpa would be mined at Chain Valley but transferred to Mannering via the approved underground linkage for subsequent delivery to VPPS via Mannering's existing infrastructure. The modification to the Mannering approval would allow for the maximum rate of coal transported from Chain Valley to Mannering to increase from 1.1 to 1.3 Mtpa. LakeCoal has stated that, in the event that any of the additional 600,000 tpa of coal is unable to be delivered to, and dispatched from Mannering, the maximum rate of extraction at Chain Valley would return to the current limit of 1.5 Mtpa.

Increase in personnel
The additional 600,000 tpa to be extracted would provide employment for approximately 60 full time persons increasing the current workforce to 220 employees at the maximum production rate.

Asset protection zones
The proposed modification seeks approval for minor vegetation clearing/disturbance in order to extend/establish asset protection zones (APZ) around major assets in the vicinity of Chain Valley's pit top and its ventilation fan site at Summerland Point for the purposes of increased bushfire protection. This proposal is an outcome of a bushfire management risk assessment and subsequent bushfire hazard assessment completed after major bushfires in the immediate vicinity of Chain Valley's pit top and ventilation fan site at Summerland Point on 17 October 2013, which damaged minor assets at Mannering.

2. STATUTORY CONTEXT

2.1 Section 96(2)
Chain Valley's consent for State significant development (SSD) was granted under Division 4.1 of Part 4 of the EP&A Act. LakeCoal is therefore seeking to modify the existing development consent under section 96(2) of the EP&A Act.

2.2 Modification
The Department is satisfied that the proposal is within the scope of section 96(2) and can be characterised as a modification to the original Chain Valley consent.

The proposed modification constitutes a relatively small change to the operation of an approved underground mine that has been operating for over 50 years. The key change is a 40% increase in the approved annual rate of production, to be made possible by the use of the existing infrastructure of an adjacent mine. However, the approved mining area would not be substantially varied in its extent. The re-orientation of approved miniwall panels in Chain Valley's northern mining area was for operational reasons and would result in a reduction in the mining area by 3.8% compared to the approved layout. There would be no change to Chain Valley's existing surface infrastructure, maximum road coal haulage or development consent period. The development, as proposed to be modified, is therefore considered to be substantially the same as the approved development.

2.3 Environmental Planning Instruments (EPIs)
The Statement of Environmental Effects (SEE) supporting the proposed Chain Valley modification included an assessment of the application against relevant EPIs, including the *Lake Macquarie Local Environmental Plan 2004*, the *Wyong Local Environmental Plan 2013*, the *Lake Macquarie Environmental Plan 2014* and a number of State Environmental Planning Policies. The Department concurs with this assessment.

2.4 Consent authority

The Minister for Planning is the consent authority for the Chain Valley modification application. However, under the Minister's delegation of 16 February 2015, the Executive Director, Resource Assessments and Compliance may determine the application as:

- the relevant local councils (Wyong and Lake Macquarie) did not make any objection;
- a political disclosure statement was not made; and
- there were no public submissions in the nature of objections.

3. CONSULTATION

3.1 Description of consultation process

The Department exhibited the SEE supporting the proposed modification from 15 July to 6 August 2015. Copies of the SEE (**Appendix A**) were placed on display at:

- the Department's Sydney Information Centre and on the Department's website;
- Lake Macquarie City Council;
- Wyong Shire Council; and
- the Nature Conservation Council.

In response to this exhibition, the Department received 8 submissions from Government agencies, a single submission from the Darkinjung Local Aboriginal Land Council and 3 public submissions in support (**Appendix B**). No public submissions in objection were received. LakeCoal provided a formal Response to Submissions (RTS) on 18 September 2015 (**Appendix C**). The Department forwarded the RTS to all public authorities that had previously lodged submissions for their review and further comment, as necessary. The key concerns, comments and recommendations from agencies, interest groups and the community are summarised below.

3.2 Discussion of key issues raised by agencies and LakeCoal's responses

The **Department of Primary Industries – Water** (DPI Water) requested that a revised Groundwater Management Plan (GMP) is submitted for assessment. The request also sought the provision of the following updated information in the GMP:

- all water related activities carried out at Chain Valley;
- the level of compliance with the previous GMP;
- an assessment the groundwater take to demonstrate compliance with the *NSW Aquifer Interference Policy* (AIP);
- a groundwater monitoring strategy;
- the details of all water licences and approvals held by LakeCoal; and
- a demonstration that sufficient licenced entitlement is held for all proposed take of surface water and groundwater.

The RTS stated that the GMP would be reviewed, and if necessary revised, in accordance with the requirements of condition 5 of Schedule 6 of the consent, following approval of the modification. LakeCoal also noted that it was unlikely that the GMP would need to be revised given the negligible changes to groundwater flows and groundwater impacts predicted under the proposed modification.

DPI Water reviewed the RTS and noted that it had provided comments on the Water Management Plan (WMP), of which the GMP is a component, to LakeCoal in December 2014, but that DPI Water had not since been provided with an updated plan. DPI Water asked that the WMP, GMP and Extraction Plan are updated in consultation with it following approval of the modification. DPI Water also restated its request for a demonstration of sufficient water entitlements as well as an assessment against the minimal impact considerations of the AIP.

The Department met with LakeCoal and DPI Water on 12 October 2015 to discuss these matters. LakeCoal presented additional information on the continued applicability of groundwater assessments submitted as part of the original development application. LakeCoal asserted that its Mining Extension 1 Groundwater Assessment (GeoTerra, March 2013) satisfied the AIP's requirements and that panel re-orientation would not change impacts in respect of depressurisation or altered model parameters.

DPI Water reviewed the information in GeoTerra (2013) and identified that did not provide an assessment against the AIP's minimal impact considerations. DPI Water again sought a report that demonstrates the mine's impacts under the AIP. LakeCoal submitted this assessment on 3 November

2015. DPI Water reviewed the information concluding the assessment was adequate and demonstrated sufficient entitlement. Groundwater impacts are considered further in Section 4.1.3.

The **Division of Resources and Energy** (DRE) of the **NSW Department of Industry** noted that rehabilitation strategies and objectives had not been identified in the SEE and the application did not describe specific rehabilitation performance objectives and standards for each functional domain. These issues could be addressed through amendments to the Mining Operations Plan (MOP) required under the mine's mining lease. However, DRE also recommended conditions of consent relating to rehabilitation objectives, progressive rehabilitation and Rehabilitation Management Plan (RMP).

LakeCoal has no objection to conditions relating to rehabilitation objectives but noted that progressive rehabilitation conditions are usually associated with open cut mines and that the conditions should be commensurate with APZ clearing. DRE maintained the recommended conditions as consistent with its standard conditions for all new approvals and modifications for mining activities and that these conditions would align with its contemporary regulatory requirements.

The **Environment Protection Authority** (EPA) identified that a variation to EPL 1770 would be required in relation to limits on extraction of ROM coal. The RTS stated that an application to vary the EPL would be submitted following approval of the modification.

EPA noted that the proposal does not involve increased dewatering or increased discharges of groundwater or surface water. However, EPA raised concerns about current water management on site including sewage management and mine-water discharges which have resulted in Pollution Reduction Programs (PRPs) to upgrade sewage management and water management being included in the site's EPL. In addition, EPA is in the process of reviewing water quality and volumes discharged from site and will be addressing this issue through a strategic review of all mine-water discharges into Lake Macquarie. EPA recommended a condition relating to sewage management. The RTS provided information relating to implementation of the PRPs and improvements to the sewage management system. In its response to the RTS, EPA advised it had no further comments.

Lake Macquarie City Council (LMCC) raised a number of matters relating to air quality, marine ecology, bushfire management and terrestrial ecology.

LMCC requested an Air Quality Impact Assessment (AQIA) due to the proposed increase in coal production and a 2013 study that showed that cumulative concentrations of key air pollutants were approaching impact assessment criteria. The RTS highlighted that the proposed modification does not result in an increase in dust emissions as there is no proposed increase in coal handling at Chain Valley nor changes to any surface infrastructure. The previous AQIA and Greenhouse Gas Impact Assessment (GHGIA) for the Mining Extension 1 Project found that emissions were below relevant impact assessment criteria at all sensitive receivers. As such, LakeCoal's position in the RTS was that an AQIA was not warranted. In its response to the RTS, LMCC did not further comment on air quality.

LMCC noted a number of inconsistencies between the SEE's Main Report and the summary of mitigation measures set out in the SEE's Marine Ecology Report (MER) and requested the Main Report be updated to reflect the MER's proposed mitigation measures. LMCC also requested further information regarding the sampling period for seagrass and benthic fauna. The RTS identified that the commitments in the SEE Main Report are part of the mine's approved Seagrass Management Plan (SMP) which was prepared in consultation with OEH, LMCC and DPI Fisheries. LMCC's review of the RTS maintained the position that the Main Report and/or the SMP should be updated to reflect the proposed modification and further information on monitoring frequency. These issues are discussed in sections 4.1.4 and 4.1.5.

LMCC recommended clearing for the proposed bushfire APZs be conducted in a manner that prevents erosion and sediment impacts. The RTS noted this concern and committed that clearing would be limited to trails and would be managed in accordance with Chain Valley's erosion and sediment control measures as outlined in the mine's WMP.

LMCC requested an assessment under SEPP 44 to determine if the sites to be cleared/disturbed for APZs constitute core Koala habitat. LMCC also considered that the assessment of significance for Koalas was inadequate. The RTS presented information to demonstrate that the sites to be cleared are unlikely to represent core Koala habitat. Assessments of significance were also undertaken in the RTS in accordance with section 5A of the EP&A Act and also the *Environment Protection and*

Biodiversity Act 1999 (EPBC Act). Both assessments determined that the proposal would not result in significant impacts on Koalas. In its response to the RTS, LMCC did not comment further on Koalas.

LMCC made several recommendations relating to selection of trees for removal and hollow-bearing tree management. The RTS responded that the mine's Biodiversity Management Plan (BMP) would be updated to include measures to manage biodiversity during APZ establishment/extension and maintenance and that additional detail would be included in the BMP to ensure LMCC's recommendations are met.

LMCC stated that it does not support clearing or disturbance of EECs for the establishment of bushfire APZs. However, LMCC recognised that the assets are already built and relocating the assets is not possible. LMCC consequently recommended compensatory replanting and weeding to be implemented via a Vegetation Management Plan. The RTS provided a commitment that funding would be provided equivalent to the biodiversity lost.

LMCC requested that LakeCoal's Statement of Commitments be varied to reflect the peak flowering time for the required pre-disturbance surveys for Black-eyed Susan (ie mid-September to mid-October). The RTS acknowledged that this species' peak flowering season is from mid-September to mid-October, however referred to the National Parks and Wildlife Service NSW (NPWS 2000) 'Environmental Impact Assessment Guidelines *Tetratheca juncea*' survey methodology which states the flowering season is sporadic and therefore 2 – 3 surveys should be completed between late August and the end of November (in dry years) and between August and January (in wet years). LMCC reviewed the RTS and maintained a position that the surveys should be undertaken mid-September to mid-October. Biodiversity impacts are considered further in section 4.2.

The **Office of Environment and Heritage** (OEH) raised concerns with the SEE and assessment of threatened species, in particular survey effort and lack of a compensatory habitat package and/or biodiversity offsets. OEH stated that specific fauna surveying had not been undertaken for threatened species in accordance with required guidelines and that the threatened flora survey work was similarly limited. OEH questioned the SEE's assumption that the survey area does not contain threatened species, populations or important habitat.

The RTS expanded on the previous survey work undertaken and also provided detail as to additional targeted flora and fauna surveys undertaken following receipt of OEH's comments. OEH concluded that it adequately addressed it's concerns and that the proposal is unlikely to have significant impacts on threatened species. OEH acknowledged that no threatened bird species (eg Glossy Black Cockatoo, Little Lorikeet, Scarlet Robin and the Varied Sittella) or plant species (eg Newcastle Doubletail and Black-eyed Susan) were detected and that impacts to biodiversity are likely to be small.

However, it also noted that there is no lower limit with respect to scale of the development for the provision of offsets/compensatory habitat and that the SEE did not address this. OEH estimated that the proposed impact area would likely generate in the order of 5-10 'ecosystem credits' when assessed under the BioBanking Assessment Methodology (OEH, 2014). A number of recommendations were made by OEH to address the provision of biodiversity offsets and/or compensatory measures. LakeCoal committed in the RTS to provide funding to a conservation project or the purchase of credits that benefit the community and species impacted. LakeCoal stated that options would be considered in consultation with OEH and that the option that achieves the greatest benefit to impacted biodiversity would be selected. OEH supported the options presented by LakeCoal and indicated that it would negotiate the most appropriate option with LakeCoal. OEH informed the Department that the offset is able to be finalised post APZ disturbance activities in consideration of the minor area to be offset.

OEH also made a number of recommendations relating to potential subsidence impacts to benthic and seagrass ecosystems including conditions requiring offsets or mitigation measures should subsidence adversely affect the benthos and that the SMP must be updated to include greater detail on any remedial actions taken in the event of adverse impacts to these ecosystems. The RTS stated that the BCMP and SMP already manage monitoring of benthic and seagrass communities and detail responses to identified impacts and as such did not support the inclusion of additional consent conditions. OEH reviewed the RTS and stated its view that the SMP should be amended to include consideration of threatened marine species, such as turtles. Benthic communities and seagrass management and monitoring are discussed in sections 4.1.4 and 4.1.5.

OEH also raised concerns relating to subsidence impacts, flooding and floodplain management. OEH reviewed and commented on the floodplain management components of the proposed modification noting that there have been historical subsidence impacts greater than the subsidence predictions in the SEE and thus there is potential for a greater impact on terrestrial and aquatic ecosystems than what is stated in the SEE. OEH requested that subsidence monitoring reports and raw survey data be supplied to OEH within three months of their completion. LakeCoal committed to providing these reports as requested in the RTS and noted that the subsidence monitoring reports have been made publically available on the internet since 2011. LakeCoal also highlighted previously submitted information regarding performance measures and remediation works. OEH reviewed the RTS and had no further comment on the matters raised concluding that all issues raised by OEH were addressed in the RTS document. Subsidence impacts are considered further in section 4.1.

Wyong Shire Council (WSC) raised a number of issues relating to the management of biodiversity impacts including provision of a hollow-bearing tree register, threatened flora species survey methodology and offsets to compensate for *Swamp Sclerophyll Forest on Coastal Plains* Endangered Ecological Community (EEC) and threatened species. WSC also recommended that animal welfare/pest management protocols are included in the BMP and conditions included in the consent regarding hollow-bearing tree management procedures and removal of vegetation in the APZs. The RTS provided commitments with respect to updating the BMP to include details of hollow-bearing tree management prior to vegetation thinning, a requirement for an ecologist to be present during clearing operations to determine trees to be retained, animal welfare and pest management procedures. These matters were addressed in the response to OEH.

WSC also noted the increase in staff from 160 to 220 and that staff parking was not addressed in the Chain Valley consent. LakeCoal responded in the RTS that Chain Valley has on-site car parking capacity to accommodate the increase in staff proposed.

WSC recommended that LakeCoal consult with the **Rural Fire Service** (RFS) with respect to bush fire requirements in relation to the protection of infrastructure. LakeCoal's RTS committed to consulting with the RFS during the development of the Bushfire Management Plan.

In its response to the RTS, WSC advised it had no further submissions.

The **Mine Subsidence Board** had no objection to the modification.

Fisheries NSW and **Crown Lands** advised that they did not identify any issues with the proposed modification.

3.3 Special Interest Group Submissions

Darkinjung Local Aboriginal Land Council was satisfied with the recommendations in the aplication and requested:

- involvement in assessment of vegetation clearing;
- continued protection of any Aboriginal sites within or near the project area; and
- to be kept informed of any further information as it relates to Aboriginal heritage.

3.4 General Public Submissions

Three public submissions supported the proposed modification, raising issues relating to:

- local employment benefits;
- local social benefits;
- security of supply for local domestic electricity generation;
- future employment opportunities;
- continued viability of Chain Valley which has been operating for over 50 years; and
- workforce protection through improved productivity and bushfire protection.

4. ASSESSMENT

In assessing the merits of the proposal, the Department has considered the SEE, submissions on the proposal and LakeCoal's RTS. The Department considers the key assessment issues to be:

- subsidence impacts resulting from the changes to mine design layout; and
- biodiversity impacts resulting from vegetation clearing and disturbance associated with establishment of APZs.

4.1 Subsidence

The SEE includes a detailed subsidence impact assessment (SIA) undertaken by Ditton Geological Services. The SIA predicted subsidence effects, subsidence impacts and environmental consequences for the proposed mine design changes and compared these effects, impacts and consequences with those already approved for the project.

The proposed mine design changes primarily involve re-orientation of miniwall panels in the mine's northern mining area. All secondary extraction would remain limited to areas beneath Lake Macquarie with protection barriers for the foreshore (HWMSB) and seagrass (SPB) continuing to apply. The proposed modification includes a reduction in the number of previously proposed miniwalls from 45 to 36 and mine design changes to Miniwalls 9 to 36, although the principal changes relate to the reorientation of miniwall panels in the northern mining area (proposed Miniwalls 13 to 25). The modified Miniwalls 9 – 36 would remain outside the HWMSB and SPB. The proposed mine design results in a reduction in the mining area by 3.8% when compared to the approved layout. The proposed miniwalls are located in areas where the depth of cover ranges from 148 m to 230 m.

In accordance with the Department's standard practice for managing mine subsidence, LakeCoal is already subject to consent conditions which stipulate key subsidence performance measures and require the implementation of a detailed Extraction Plan to govern the extraction of the miniwalls. An application to vary the Extraction Plan is required to be approved by the Secretary of the Department before the carrying out of any second workings.

4.1.1 Subsidence Predictions and Effects

Figure 3 shows the predicted worst-case predicted maximum vertical subsidence, which is quite limited over the proposed mining layout. Miniwalls 9 to 31 would experience single panel subsidence only, as there are no historic workings in the overlying seams and lesser subsidence is therefore predicted. The greatest subsidence is predicted above Miniwalls 32 – 36 located in Chain Valley Bay, which would experience multi-seam subsidence due to previous workings in the overlying Great Northern and Wallarah Seams.

A summary of the key changes in the mine design parameters and a comparison between the maximum vertical subsidence, tilt and strain predictions (including multi-seam effects) for the approved and proposed mining layouts and the incremental changes between them are provided in **Table 1**.

Table 1: *Comparison of total subsidence parameters based on the approved and proposed layouts*

Element	Approved mining layout	Modified mining layout	Incremental change
Maximum miniwall width	97 m	97 m	Nil
Minimum chain pillar width	30.6 m	29.3 m	-1.3 m
Maximum extraction height	3.5 m	3.5 m	Nil
Average vertical subsidence (single-seam mining area)	0.43 m	0.66 m	0.15 m
Maximum vertical subsidence (single-seam mining area)	0.62 m	0.78 m	0.16 m
Maximum vertical subsidence (beneath existing workings)	0.89 m	1.23 m	0.34 m
Tilt (single-seam mining area)	2 to 17 mm/m	2 to 15 mm/m	- 2 mm/m
Tilt (beneath existing workings)	5 to 9 mm/m	4 to 15 mm/m	6 mm/m
Strain (single-seam mining area)	1 to 6 mm/m	1 to 6 mm/m	Nil
Strain (beneath existing workings)	2 to 4 mm/m	1 to 6 mm/m	2 mm/m

Table 1 shows that the average maximum predicted subsidence for single-seam mining areas are generally consistent with those under the approved project. The predicted worst-case vertical subsidence contours for planned panels without multi-seam mining effects ranges from 0.21 m to 0.78 m. The predicted worst-case vertical subsidence contours for Miniwalls 32 to 36, those predicted to exhibit multi-seam mining effects, ranges between 0.6 m to 1.23 m. These predictions represent an incremental increase in the worst-case vertical subsidence of 0.16 m (single-seam) and 0.34 m (multi-seam) as a result of the proposed modification.

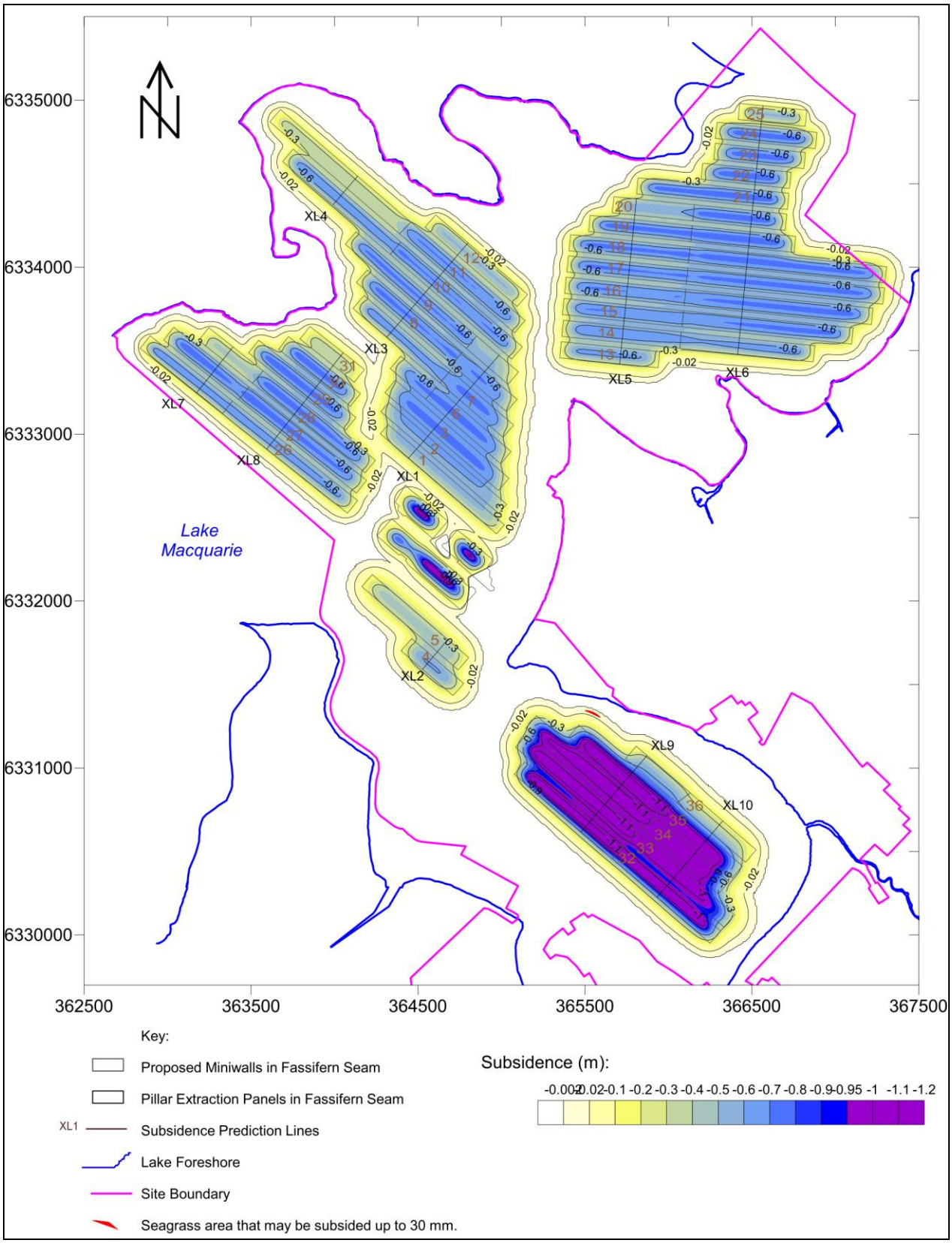

Figure 3: *Predicted worst-case vertical subsidence contours*

In accordance with condition 6 of Schedule 4 of the development consent, prior to the submission of an Extraction Plan for Miniwalls 32 – 36, a detailed Multi-Seam Mining Investigation Feasibility Investigation must be prepared to the satisfaction of the Secretary. Whilst vertical subsidence effects are predicted to increase under the modified layout, the incremental change is minor and it is unlikely that the modified layout would cause a significant increase to the previously assessed impacts and therefore is unlikely to exceed the performance measure defined in the development consent.

The maximum predicted total tilt for the planned single-seam panels ranges from 2 millimetres/metre (mm/m) to 15 mm/m (average of 12 mm/m). The predicted worst-case cumulative tilt contours for the planned multi-seam panels, range from 4 mm/m to 15 mm/m. For both single-seam and multi-seam panels, maximum tilt is predicted to be up to 15mm/m, an increase of up to 6 mm/m in the multi-seam area but a reduction of 2 mm/m in the single-seam mining area. Overall, the maximum tilt is lower under the proposed mine design when compared to the approved mine design.

The predicted strain contours for both single-seam and multi-seam panels range from 1 to 6 mm/m (average of 3.5 mm/m). This represents an increase of 2 mm/m in the multi-seam mining area and no change in the single-seam mining area. The maximum predicted strain of 6 mm/m remains unchanged from the approved mine design.

The Department considers that the predicted subsidence values for the modified layout are low and that the resulting impacts on the lakebed itself are also very likely to be low. They do not represent any increase to the risk of cracking of the rock strata between the mine workings and the lakebed, or to instabilities in the lakebed's sediments (ie erosion from increased tilts). DRE also raised no concerns regarding the level of subsidence impacts on the lakebed.

4.1.2 Surface Features and Potential Impacts

There are no significant overlying surface features in the area affected by the modified mining layout, given that the entire mining area is within Lake Macquarie, and the foreshore areas are protected by the HWMSB. Infrastructure above the areas of secondary extraction is limited to a disused electrical power cable which runs across the lake bed from the pit top area to the Summerland Point ventilation fan site and a Telstra fibre optic cable, which is subject to an approved management plan developed between LakeCoal and Telstra.

Part of the proposed Trinity Point Marina development would traverse Miniwalls 9 and 10. Subsidence effects for these panels are not predicted to change under the modified layout. LakeCoal has committed to consulting with the the marina's proponent to develop a specific Built Features Management Plan (BFMP) should the marina's development commence prior to extraction of either Miniwalls 9 or 10. The consent conditions also require a BFMP as part of the Extraction Plan. This plan must address all items of public infrastructure and other built features, and be prepared in consultation with the owners of those features. The BFMP would require recommendations for appropriate remedial measures and include commitments to mitigate, repair, replace or compensate all predicted impacts on potentially affected built features in a timely manner. The consent also includes performance measures for all built features to ensure serviceability is maintained and that any damage is fully repaired or compensated. The Department considers these conditions (coupled with the low predicted subsidence effects) would ensure that all impacts on built features would be minimal and appropriately managed.

The reorientation of miniwall panels in the northern mining area would necessitate small changes to the development consent boundary and the inclusion of seven additional residential lots in the residential area of Sunshine on the northern shore of the Lake. Mining in this area would be limited to first workings only, where subsidence is predicted to be less than 20 mm. The Department considers there would be no perceptible subsidence impacts on these residential lots as a result of the proposed modification and proposes that the changes are reflected in a new project layout plan and Schedule of Land in the consent.

4.1.3 Groundwater Resources

The SEE includes a Groundwater Assessment undertaken by GeoTerra that considered the proposed mine design changes, the groundwater assessment for the original development application and recent monitoring data. The proposed 3.8% reduction in the underground mining area is within the error margin of the MODFLOW Surfact groundwater model used for the original groundwater assessment. As such, there would be negligible change to previously predicted effects regarding:

- hydraulic connection to Lake Macquarie;
- aquifer / aquitard interconnection;
- regional groundwater depressurisation;
- private bore yields and serviceability;
- groundwater dependent ecosystems;
- groundwater quality; and

- groundwater seepage to or from terrestrial streams.

The median annual groundwater inflow to the Fassifern Seam workings at Chain Valley is currently estimated at 2,440 megalites (ML) and under the approved mine plan is predicted to increase to 3,832 ML. The volume licenced (4,443 ML/yr) exceeds this predicted maximum inflow and therefore the predicted groundwater inflows are able to be managed under Chain Valley's existing licences under the *Water Act 1912*. Groundwater quality monitoring (2013) identifies that groundwater seepage into the underground workings is not generally suitable for use but is suitable for discharge under the EPA licence to Lake Macquarie.

DPI Water's initial concerns regarding licence entitlements and AIP considerations were addressed by LakeCoal and DPI Water raised no further concerns about potential impacts to groundwater. The Department is satisfied that no additional management or monitoring measures are required and that the existing conditions of the consent and the WMP are sufficient to manage groundwater impacts.

4.1.4 Benthic Invertebrate Communities

The SEE identified that subsidence may affect benthic communities by increasing the depth of the lakebed and, consequently, decreasing the light penetration of the water column and affecting light dependent biota (eg algae and biofilms) on which benthic organisms feed.

The current consent requires LakeCoal to develop and implement a BCMP, which includes:

- annual bathymetric covering active and previously-mined areas;
- a program of ongoing six monthly/seasonal monitoring of benthic species in both control and impact sites to establish baseline data on species numbers and community composition;
- development of a model to predict likely impacts of increased water depth (including light reduction and sediment disturbance) on benthic species numbers and benthic community compositions, incorporating the survey data collected; and
- updating the model every 2 years using the most recent monitoring and survey data.

The current consent also contains performance measures that require subsidence impacts not exceed 'minor' environmental consequences for benthic communities. Monitoring data (ongoing every 6 months since early 2012) indicates that there has been no exceedance of the 'minor environmental consequences' performance measure for benthic communities. The benthic community surveys and annual monitoring have not identified any clear link between abundance/diversity of communities and location or impact type. Monitoring of benthic fauna on the lakebed, both prior to and subsequent to mine subsidence, has also confirmed no significant impacts to either diversity or abundance. Subsidence of up to 0.57 m has previously been recorded within the single-seam mining areas near benthic monitoring sites, where surveys did not identify any association between subsidence and benthic species abundance and diversity. As such, increments of 0.16 m (single-seam) and 0.34 m (multi-seam) subsidence associated with the modified mine layout are not expected to adversely impact benthic communities. If impacts to benthic community abundance or distribution should occur above a minor level, then this impact must be remediated or offset in accordance with condition 3 of Schedule 4 of the consent.

The Department is satisfied that the predicted impacts to benthic communities are very low and that current consent conditions ensure that LakeCoal undertakes effective measures to identify any adverse impacts to benthic communities and, where required, implements corrective action.

4.1.5 Seagrass Communities

LakeCoal has implemented a HWMSB and SPB to protect foreshore environments and seagrass communities. The intent of the SPB is to limit subsidence to less than 20 mm and ensure compliance with condition 1, Schedule 4 of the consent. The proposed mine design continues to setback second workings from the SPB to ensure that less than 20 mm subsidence occurs within the seagrass communities. The extent of secondary extraction which would result in subsidence would continue to be limited by an angle of 26.5 degrees from the vertical, projected downwards to the coal seam being mined. In some additional areas (particularly the northeast mining area) LakeCoal would further amend the mine design to ensure there are negligible environmental consequences to seagrass beds.

Annual seagrass surveys have been undertaken since 2010 to monitor for potential impacts from mining activities. Survey reports have identified that all seagrass beds have expanded since 2011, most likely as a result of the cessation of commercial fishing in Lake Macquarie. Seagrass

communities will continue to be surveyed annually to monitor community assemblage and extent. Monitoring would be undertaken in accordance with the SMP which also details management actions to take place in the event that an impact is detected.

LMCC raised concerns that the SMP has not been updated to reflect the proposed modification. Under condition 5, Schedule 6 of the consent LakeCoal is required to review, and if necessary revise, the plans required under the consent following approval of any modification, to the satisfaction of the Secretary. LakeCoal would be required to review the SMP and BCMP within 3 months of the modification. In this way the SMP would be updated to take into account any recommendations resulting from the current application.

The Department considers the current consent conditions sufficient to ensure that LakeCoal mitigates any potential impacts to seagrass communities as a result of the proposal. Further, LakeCoal has provided a commitment to update its Extraction Plan, and therefore the SMP, to reflect the proposed modification, as also required by the conditions of consent.

4.1.6 Wave Action and Foreshore Erosion

The SEE identified that changes to the depth of Lake Macquarie have the potential to cause changes to wave behaviour on the foreshore. The waters of the lake are almost enclosed from the sea and waves are primarily generated by surface winds rather than seaswell. The SEE included an assessment of the effects of predicted subsidence on the wave climate and associated foreshore erosion and recession. Under worst case conditions, northwest wind waves are predicted to increase in velocity by up to 2.7%, an increase of 0.3% from the worst-case predictions for the current approved mine design. These worst case conditions prevail less than once a year and velocities return to pre-subsidence values in shallower water closer to shore. In addition predicted mine subsidence would not alter the tidal prism within the lake with such factors such as increasing tidal range due to projected sea level rise and continuation of inlet scour presently occurring in response to the entrance training outweighing any impacts that result from the proposal. The Department considers that the report satisfactorily addresses potential wave erosion and shoreline impacts, demonstrating that the risk is negligible and the current consent conditions are sufficient to mitigate any residual risk.

4.1.7 Conclusion

The Department recognises that the proposed mine layout would result in increased subsidence effects, however considers these effects to be very small and very unlikely to have an impact on Lake Macquarie's marine ecosystem. Under the existing consent, LakeCoal is required to undertake ongoing seagrass, benthic communities, surface water and groundwater monitoring and implement actions in response to any identified impact. Subsidence would continue to be measured using annual bathymetric surveys of the lake bed. Land-based survey monitoring would also be used to confirm no subsidence impacts on the foreshore and other built features. Implementation of these surveys would allow measured subsidence to be reviewed against predictions. Any significant exceedances in measured subsidence would be assessed and LakeCoal has committed to reviewing panel designs to limit future impacts to acceptable levels, where required. These requirements are also reflected in LakeCoal's Statement of Commitments and in relevant management plans.

4.2 Biodiversity

In October 2013, Chain Valley's ventilation site and nearby Mannering pit top were threatened by a bushfire that resulted in minor damage to some Mannering assets. LakeCoal engaged EMM to assess bushfire risks so that protection measures, such as APZs, could be determined and implemented at Chain Valley. Bushfire risks were assessed in accordance with the RFS guideline *Planning for Bushfire Protection* (PBP) which was also used to derive the following APZ distances:

- 25 m for the pit top infrastructure (a 15 m inner protection area (IPA) and a 10 m outer protection area (OPA); and
- 20 m for the ventilation fan site, with no requirement for an OPA.

Establishment and maintenance of an IPA involves the removal of shrubs located under trees and within 10 m of exposed windows and doors, and keeping canopy cover to less than 15% of total surface areas. Establishment and maintentance of an OPA involves slashing the understorey annually before the fire season to remove shrubs and long grasses, and keeping canopy cover to less than 30% of total surface area.

An assessment of the impacts on terrestrial ecology as a consequence of the vegetation clearing and disturbance was included in the SEE and RTS. Field surveys, focussed on areas proposed to be

cleared or disturbed, were undertaken on 8 April, 26 August 2015 and 17 November 2015 (for the Black-eyed Susan and Leafless Tongue Orchid only). Clearing of the APZs would result in direct impacts to native vegetation communities and potential impacts on fauna species and their habitat. The areas of vegetation to be cleared/disturbed to extend/establish the APZs for bushfire protection purposes are shown in **Table 2**. A plan showing the proposed APZs is shown in **Figure 4.**

Table 2: *Vegetation to be cleared/disturbed.*

Vegetation community	Equivalent EEC	Approximate area to be cleared (ha)	Approximate area to be disturbed (ha)
Swamp Mahogany Swamp Forest (native)	*Swamp Sclerophyll Forest on Coastal Plains EEC*	0.03	0.22
Scribbly Gum Red Bloodwood Heathy Woodland (native)	-	Nil	0.48
Smooth-barked Apple Red Bloodwood Open Forest (native)	-	Nil	0.31
Planted exotic	-	0.06	0.32
Total		**0.09**	**1.33**

4.2.1 Impacts on Flora

The initial field survey identified a total of 50 plant species, comprising 44 native and 6 exotic species. Three native vegetation communities were recorded: *Scribbly Gum – Red Bloodwood heathy woodland on coastal plains of the Central Coast, Sydney Basin*; *Smooth-barked Apple – Red Bloodwood open forest on coastal plains of the Central Coast, Sydney Basin*; and *Swamp Mahogany Swamp Forest on coastal lowlands of the North Coast and northern Sydney Basin*. The *Swamp Mahogany Swamp Forest on coastal lowlands* community meets the description of *Swamp Sclerophyll Forest on Coastal Plains EEC* which is listed under the TSC Act.

Endangered Ecological Communities

The expansion of existing APZs would result in clearing of 0.03 ha of *Swamp Sclerophyll Forest EEC* and disturbance of a further 0.22 ha. Disturbance would be limited to selective felling of trees to reduce canopy cover to 15% of the area within the IPA and 30% within the OPA. LakeCoal has committed to selectively felling trees and retaining important structural components of the community.

These impacts cannot be avoided due to the existing siting of infrastructure to be protected from bushfire. The Department has considered whether this residual impact would constitute a significant effect on the *Swamp Sclerophyll Forest EEC*. Although the clearing of habitat is a key threatening process under the *Threatened Species Conservation Act 1995* (TSC Act), the Department is of the view that the proposal would be unlikely to lead to any significant threat to this EEC, based on the very small area to be impacted and the EEC's abundance in adjacent areas remaining unaffected. The Department considers that LakeCoal's commitments to minimise impacts on this EEC are sound, and do not require to be further amplified.

Threatened flora species

No flora species listed under either the TSC Act or the EPBC Act were recorded during the surveys. However potential habitat was identified for three species listed under either the TSC Act and EPBC Act that are difficult to detect outside of their flowering periods:

- Variable Midge Orchid;
- Black-eyed Susan; and
- Leafless Tongue Orchid.

LMCC and OEH raised a number of concerns about the SEE's assessment of threatened species, including the above cryptic threatened flora species. These concerns were largely addressed by LakeCoal in the RTS, particularly for the Variable Midge Orchid.

LMCC's review of the RTS identified residual concerns with the timing of pre-clearance surveys for the Black-eyed Susan and again requested that pre-clearance surveys are undertaken in the peak flowering season between mid-September to mid-October. The NSW NPWS Environmental Impact Assessment Guidelines *Tetratheca junceae* states that the flowering season is sporadic and therefore surveys should be undertaken 2 – 3 times during the flowering season between late August 2015 and the end of November (in dry years) and between August and January (in wet years). The Department also notes news media reports of flowering Black-eyed Susan in August 2015. The Department

Figure 4: *Asset protection zones*

considers that it highly unlikely that there are any Black-eyed Susan individuals present in the proposed APZ as no individuals were recorded in the targeted surveys undertaken in late-August and late-November, both of which are during the flowering season.

LakeCoal completed a targeted pre-disturbance survey during the flowering season of the Leafless Tongue Orchid on 17 November and did not identify any individuals. The Department is satisfied that the occurrence of Leafless Tongue Orchid in the proposed APZ areas is unlikely.

LakeCoal has committed to delineating any threatened plant populations with fencing to ensure protection during the extension/establishment and maintnenace of APZs. Whilst surveys have not identified any threatened species there is still a possibility that individuals could be identified. As such, the Department has required the Biodiversity Management Plan be updated to include measures to be implemented to protect threatened flora species in APZ areas.

Other native vegetation
Of the total of 1.01 ha of native vegetation to be disturbed by development of the APZs, 0.79 ha is non-EEC vegetation. None of this area would be fully cleared, with over-storey disturbance limited to selective felling of trees to reduce canopy cover to 15% of the area within the IPA and 30% within the OPA. Understorey clearing and slashing would be as for EECs. LakeCoal has committed to selectively felling trees and prioritising retention of the important structural components of the communities. The Department considers that LakeCoal's commitments to minimise impacts on non-EEC native vegetation are sound, and do not require to be further amplified.

4.2.2 Impacts on Fauna
No threatened fauna species were identified in the APZs, but nonetheless these areas may provide potential habitat for threatened fauna species previously recorded within a 10 km radius, including:

- *owls:* Barking Owl, Masked Owl and Powerful Owl;
- *woodland birds:* Glossy Black-cockatoo, Little Lorikeet, Scarlet Robin, Varied Sittella, Regent Honeyeater and Swift Parrot ;
- *flying mammals:* Grey-headed Flying-fox, Eastern Bentwing Bat, Eastern Freetail Bat and Little Bentwing Bat;
- *mammals:* Koala, Spotted-tail Quoll, New Holland Mouse and Squirrel Glider; and
- *migratory birds:* White-bellied Sea Eagle.

The clearing of native vegetation would remove 0.03 ha of potential habitat resources for these species. Disturbance of an additional 1.01 ha of native vegetation may also adversely impact potential habitat resources. Assessments of significance were completed in accordance with Section 5A of the EP&A Act (and EPBC Act where relevant) for threatened fauna species and guilds. The assessments determined that any impacts were not predicted to be significant. The removal and disturbance of habitat would not have a significant impact on these species due to the small areas proposed to be cleared/disturbed as well as their location being adjacent to large patches of contiguous and suitable alternative foraging habitat. As such, the Department considers that the proposal would not be likely to result in significant impacts on threatened fauna species.

4.2.3 Mitigation and Management Measures
LakeCoal proposes a range of mitigation measures, which would be secured as part of an update to the Biodiversity Management Plan (BMP), including:

- the completion of pre-disturbance surveys in the survey area for for Black-eyed Susan, Leafless Tongue Orchid and Variable Midge Orchid during their flowering periods;
- pre-disturbance surveys by an ecologist to determine the important components of vegetation communities and fauna habitats that should be preferentially retained in the APZs;
- installation of delineation fencing around threatened flora populations (if found) to ensure their protection during development and maintenance of the APZs;
- condition monitoring for threatened flora populations (if found);
- retention of hollow-bearing trees in the APZs, where possible;
- installation of nest boxes (or salvaged hollows) within the APZs under the supervision of a suitably qualified ecologist or wildlife carer to replace hollows where hollow-bearing trees cannot be retained;
- measures for APZ maintenance that include weed control;
- clearing of hollow-bearing trees (if required) under the supervision of a suitably qualified ecologist;

- transportation of any injured fauna to the nearest veterinary hospital for treatment before release; and
- relocation of suitable felled trees adjacent to the APZs to create additional fauna habitat.

The Department is satisfied with these mitigation measures, subject to an update to the Biodiversity Management Plan in light of LakeCoal's revised Statement of Commitments.

4.2.4 Biodiversity Offset

The Department is satisfied that the proposal has sought to avoid and minimise impacts on flora and fauna. LakeCoal has proposed to investigate one of the following options for biodiversity offsets:

- provide $10,000 of funding, which is equivalent to the biodiversity being lost (ie 5 credits x $2,000 per credit) to existing environmental programs at the site which benefits the *Swamp Sclerophyll Forest* EEC; or
- identify another suitable conservation program and provide $10,000 funding; or
- purchase and retire 5 credits on the Biobanking register.

LakeCoal has committed to investigating these three options in consultation with OEH and to select the option that achieves the greatest benefit to biodiversity impacted by the proposed modification. OEH supports this approach and has agreed to negotiate the most appropriate option with LakeCoal post APZ clearing and/or disturbance, subject to the cosent requiring provision of an offset. The Department considers that the residual biodiversity impacts would be appropriately offset.

4.2.5 Conclusion

To ensure any flora and fauna impacts are minimised, managed, monitored, and the long term beneficial biodiversity outcomes are realised, the Department has recommended that LakeCoal:

- prepares and implements an updated Biodiversity Management Plan; and
- offsets the clearing of 0.03 ha and disturbance of 0.22 ha of *Swamp Sclerophyll Forest* EEC and disturbance of 0.79 ha of other native vegetation in consultation with OEH within 12 months of approval of the modification.

Subject to these conditions, the Department considers the impacts on biodiversity to be suitably mitigated.

4.3 Other Issues

Other potential impacts of the proposed modifications are discussed below in **Table 3**.

Table 3: *Assessment of other impacts*

Issue	***Consideration and Assessment***	***Recommendation***
Traffic and Transport	• A traffic and transport assessment was prepared by EMM. The proposal would result in approximately 60 additional employees which would increase light vehicular traffic to Chain Valley. • The proposed increase in coal extraction from 1.5 to 2.1 Mtpa would not otherwise increase traffic movements on public roads, since the additional coal will be sent via Mannering's overland conveyer to VPPS. The current consent limits the number of coal laden trucks dispatched from the site per day and no change would result. • Consequently, the assessment focused on the intersection of Ruttleys Road with Construction Road and included future traffic projections and SIDRA analyses to determine the intersection's suitability to accommodate increased traffic from the extra workers for both the current year and the year 2027 (last year of the current consent). The results showed that there would be negligible changes to intersection delays. The assessment also demonstrated that on-site car parking areas would accommodate the additional vehicles associated with the extra workers.	No additional conditions necessary.
Socio-economic	• The modification would use the existing workforce of 160 employees and contractors to optimise coal recovery from an area already approved for underground mining, with minimal additional impacts. The modification also creates employment for an extra 60 workers. • Approximately 90% of the existing workforce resides in the Wyong and Lake Macquarie LGAs. • LakeCoal would continue to contribute $0.035 per tonne of ROM coal production to improve public infrastructure and provide	No additional conditions necessary.

	community projects in the local area and the contribution would apply to the proposed increase in ROM coal. • The modification would recover a greater amount of ROM coal annually, provide continued employment for Chain Valley's workforce, create additional employment, provide continued State and Commonwealth taxes and royalties, and efficiently recover State-owned mineral resources.	
Aboriginal Heritage	• No items of Aboriginal heritage significance were identified in the APZ survey areas through preliminary investigations, previous assessment and AHIMS searches. • The mine design changes would not result in impacts to Aboriginal sites or objects greater than that previously predicted. The proposed mine design changes results in an AHIMS registered site, 45-7-0154, no longer being above the Chain Valley mining area. Whilst negligible subsidence was previously predicted, the proposed mine design provides certainty that the site will not be impacted. • The Department is satisfied that the modification has a very low potential to adversely impact Aboriginal heritage.	No additional conditions necessary
Surface Water	• No changes to the existing surface water system are proposed. Negligible change to groundwater inflows to the mine are expected and inflows would continue to be managed under the existing water management system. • Increased potable water needs associated with the increased employment/extraction of ROM coal, including measures to minimise use, would be managed in accordance with the WMP. • EPA identified that PRPs have been included on EPL 1770 to upgrade sewage treatment systems and water management on site and recommended conditions relating to sewage management. The Department notes that the consent already conditions sewer management to be undertaken to the satisfaction of EPA.	No additional conditions necessary
Rehabilitation	• The modification involves only minor changes to existing surface disturbance areas through the establishment and extension of APZs. • LakeCoal is required to implement a RMP for the development which must be consistent with the rehabilitation objectives detailed in Table 7 of the consent, to the satisfaction of DRE. • DRE recommended number of varied rehabilitation objectives for inclusion in the modified consent, which the Department carefully considered. The Department considers that DRE's recommended objectives for mine site, water quality, landforms and native flora and fauna habitat corridors are addressed by existing conditions of approval.However, the Department accepts the following proposal: o *rehabilitation materials* – an objective for the recovery, appropriate management and effective use of materials as resources in rehabilitation. • DRE also recommended new conditions for progressive rehabilitation and a Rehabilitation Plan. The Department has carefully considered these proposals and reviewed the existing conditions. A progressive rehabilitation condition is already included in the consent, but does not require progressive rehabilitation to be undertaken to the satisfaction of DRE. This condition has been updated to require progressive rehabilitation to be undertaken to the Secretary's and DRE's satisfaction. • DRE's proposed condition for a Rehabilitation Plan is similar to a current consent condition requiring a Rehabilitation Management Pla and the outcomes are identical. Therefore, the Department has not adopted the new Rehabilitation Plan conditions.	The Department has recommended an additional rehabilitation objective.
Visual	• There would be no new surface infrastructure or intensification of visible activities. Only minor vegetation is to be cleared for the APZs and this would be within or adjacent to existing areas of disturbance which are not generally visible from public areas.	No additional conditions necessary.
Noise	• The proposed modifications would only involve underground operations and would not change surface operations which have the potential to generate noise emissions at sensitive receivers. • The minor increase in traffic movements as a consequence of additional vehicles associated with new employees is unlikely to result in adverse noise impacts at any potentially sensitive receivers. • Noise impacts would continue to be managed in accordance with	No additional conditions necessary.

	Chain Valley's existing monitoring and management plans.	
Air Quality	• The modifications would only involve additional underground operations and would not increase surface plant and equipment types/numbers, coal movements or stockpiling. • Air quality impacts would continue to be managed in accordance with Chain Valley's existing monitoring and management plans.	No additional conditions necessary.
Greenhouse Gases (GHG)	• Average annual scope 1 (ie direct) GHG emissions were estimated to increase as a result of the proposed modification from 0.59 Mt carbon dioxide equivalent (CO2-e) to 0.724 Mt CO2-e. • Average annual scope 2 GHG emissions were estimated to increase as a result of the proposed modification from 0.018 Mt CO2-e to 0.026 Mt CO2-e. • Average annual scope 3 GHG emissions were estimated to increase as a result of the proposed modification from 4.199 Mt CO2-e to 5.027 Mt CO2-e. • LakeCoal would continue to employ mitigation measures and management strategies in accordance with Chain Valley's Air Quality Management Plan, in order to reduce energy use and minimise Scope 1 and 2 GHGEs.	No additional conditions necessary.
Hazards	• The modifications would decrease the risk of bushfire hazard through the establishment/extension of APZs. • Hazards would be managed in accordance with established risk management plans and procedures.	No additional conditions necessary.

5. CONCLUSION

The Department has assessed the modification application in accordance with the relevant requirements of the EP&A Act. The proposed modification would have minimal or negligible environmental impacts beyond those already approved and any potential impacts would be able to be controlled by existing and proposed conditions of consent.

All 3 public submissions received from the local community supported the development. Further, no affected State agencies or Council opposed the modification. Agency and Council concerns have been suitably addressed either in the RTS or the Department's recommended conditions of consent. The proposed modification would enhance the economic viability of Chain Valley, result in increased contributions to support community infrastructure and create employment for 60 additional employees.

The Department is therefore satisfied that the proposed modification is in the public interest and should be approved, subject to conditions.

LakeCoal has reviewed the proposed conditions, and has accepted the proposed modifications to Chain Valley's development consent.

6. RECOMMENDATION

It is RECOMMENDED that the Executive Director, Resource Assessments and Compliance exercise the powers and functions delegated in the Minister for Planning's Instrument of Delegation and:

- **consider** the findings and recommendations of this report;
- **determine** that the proposed modification is within the scope of section 96(2) of the EP&A Act;
- **approve** the modification application, subject to conditions, under section 96(2) of the EP&A Act; and
- **sign** the attached notice of modification (**Appendix D**).

Howard Reed

Howard Reed
Director
Resource Assessments

4.12.15

Oliver Holm
Executive Director
Resource Assessments and Compliance

APPENDIX A: STATEMENT OF ENVIRONMENTAL EFFECTS

Refer to Department's website:

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=7139

APPENDIX B: COPY OF SUBMISSIONS

Refer to Department's website:

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=7139

APPENDIX C: RESPONSE TO SUBMISSIONS

Refer to Department's website:

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=7139

APPENDIX D: NOTICE OF MODIFICATION