Delta coal	Doc Owner: **Environment and Community Coordinator** Doc No:

CHAIN VALLEY COLLIERY

Benthic Communities Management Plan

ENVIRONMENTAL MANAGEMENT PLAN

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Contents

1 Introduction

1.1 Purpose and Scope

The purpose of this Benthic Communities Management Plan (BCMP) is to:

- outline details of the benthic communities monitoring data collected;
- outline existing and predicted subsidence levels;
- outline the methodology to be used to identify depth changes at monitoring locations;
- identify benthic community monitoring locations;
- identify reporting requirements;
- detail benthic community management measures;
- identify the requirements for incident or exceedances reporting and reviews of the document; and
- identify persons responsible for implementation of requirements.

The overall aim of this management plan is to promote a high level of environmental performance through the minimisation of impacts.

A formal Environmental Management System (EMS) has been developed as a systematic and structured approach to managing environmental issues at the operation. This has been developed in general accordance with the requirements of the international standard ISO 14001.

This BCMP is an element of the Chain Valley Colliery (CVC) Environmental Management System (EMS).

1.2 Background

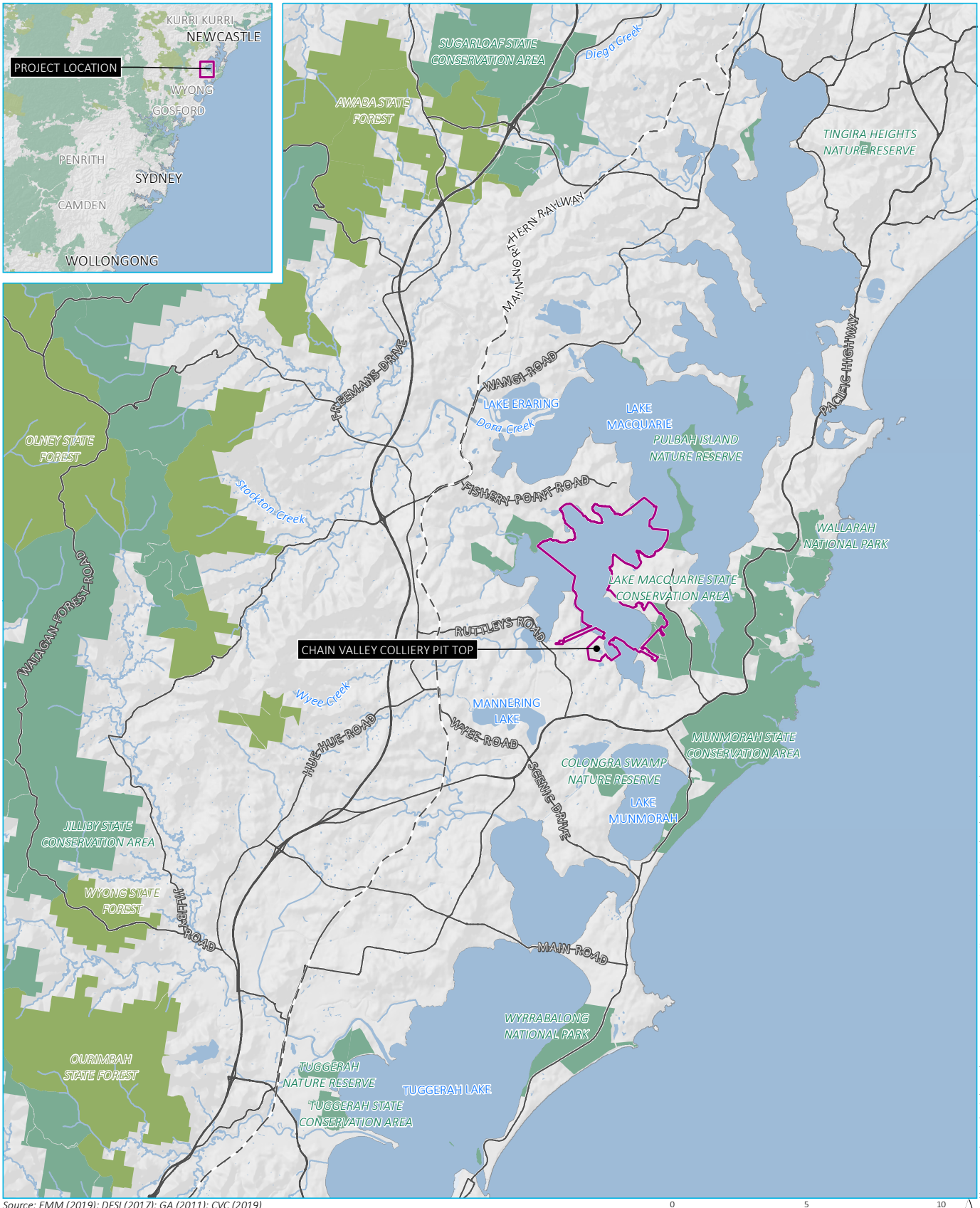
Chain Valley Colliery (CVC) is an underground coal mine located on the southern side of Lake Macquarie approximately 60 km south of Newcastle and 80 km north of Sydney (**Figure 1**). The pit-top is located approximately 1 km south-east of the township of Mannering Park at the southern extent of Lake Macquarie.

In August 1960, J&A Brown and Abermain Seaham Collieries Ltd commenced clearing the present site with drift and shaft sinking starting a few months later. Production of coal from the Wallarah Seam, commenced with the first delivery to the adjacent Delta Electricity's Vales Point Power Station (VPPS) in April 1963.

LakeCoal was formed in 2001 to acquire BHP Billiton's 80% share in the Wallarah Coal Joint Venture (WCJV), the remaining 20% share was owned by Sojitz. In October 2006, Peabody Energy, a US listed company acquired LakeCoal Pty Limited.

In November 2009 LDO Coal Pty Limited purchased LakeCoal Pty Limited. LDO Coal is a consortium consisting of LD Operations, AMCI and private investors. In March 2011 the 20% share in the WCJV which Sojitz held was acquired by LDO Coal shareholders through the entity Fassi Coal Pty Ltd. The WCJV had operated the Wallarah, Moonee and Chain Valley underground coal mines and the Catherine Hill Bay Coal Preparation Plant, all located at the southern end of Lake Macquarie. At the time of LakeCoal's acquisition by LDO Coal, both the Wallarah and Moonee mines were closed.

In 2013 the owners of Mannering Colliery (MC) and CVC entered into an agreement which enabled LakeCoal to operate the MC until 2022. LakeCoal became the operator of MC effective 17 October 2013, with the underground link between CVC and MC completed in October 2017.



Source: EMM (2019); DFSI (2017); GA (2011); CVC (2019)

0 5 10 km

GDA 1994 MGA Zone 56

N

KEY

- Chain Valley Colliery development consent boundary
- Rail line
- Main road
- Watercourse/drainage line
- Waterbody
- NPWS reserve
- State forest

CVC regional context

Chain Valley Colliery
Figure 1

EMM
creating opportunities

\\emmsvr1\EMMJobs\2019\H190358 - Mannering Colliery Mgt Plan Updates\GIS\02_Maps\MCMP001_RegionalLocation_20191021_02.mxd 21/10/2019

1.3 Consultation

The original BCMP was developed in consultation with the OEH, DPI Fisheries and LMCC. These agencies were contacted on the 28 March 2012, and at this time a face-to-face meeting was offered to discuss the development of the methodologies and management plan. However, all stakeholders requested information be provided for comment due to resource constraints. As a result, each stakeholder was provided a summary of the survey methods for comment on the 11 April 2012. A response was received from LMCC on the 23 May 2012 regarding mitigation measures and these comments were addressed in the BCMP. No comments were received from OEH or DPI Fisheries.

Copies of the draft BCMP (Revision 1) were distributed to the OEH, LMCC and DPI Fisheries on the 13th March 2014 with comments requested back by the 1st April 2014. As of 7th April 2014 only one response from the OEH had been received, dated the 21st March 2014. The OEH noted that while they encourage the development of such plans, they do not approve or endorse these documents and accordingly no comments were provided.

The previous version of the BCMP was sent to OEH, DPI Fisheries and LMCC on 4 November 2016 for review and comment. All three agencies provided comments on the revised Plan. LMCC and DPI Fisheries confirmed that the document was acceptable in its revised form. OEH noted that while they encourage the development of such plans, they do not approve or endorse these documents and accordingly no comments were provided on the content of the plan.

A further review to the BCMP was conducted in March 2019 in consultation with DPIE, OEH, LMCC and DPI Fisheries. DPIE requested the inclusion of the most recent bathymetric survey (January 2019) and an update of the latest mine plan in the monitoring. DPI Fisheries gave confirmation that this plan was adequate (dated 5 June 2019). OEH gave advice on 5 June 2019 that they were not able to provide comment on plans. LMCC were requested on several occasions for comment on this management plan without comment received.

A copy of the updated BCMP for the miniwall S4,July 2019 Bathymetry survey and September 2019 Benthic Survey was provided to the stakeholders listed in the below table on 14 November 2019.

A summary of the comments received during this round of review, and amendments subsequently made to the document prior to finalisation are detailed in **Table 1**. Evidence of consultation is provided in **Appendix 1**.

Table 1: Consultation Summary

Stakeholder	Comments	Response/Action
NSW DPIE-Compliance	• Reviewed with comments received on 5/5/2020	• See Appendix 1
NSW DPIE-Resource Assessments	• No comments received	• Nil required
NSW DPIE-BCD	• Reviewed S4 EP with no comments to make	• Nil required
Lake Macquarie City Council (LMCC)	• Reviewed by G.Keech with no comments on BCMP	• Nil required
Central Coast Council	• No comments received	• Nil required
DPI Fisheries	• No comments received	• Nil required
Combined CVC and MC Community Consultative Committee	• No comments received	• Nil required

2 Statutory Requirements

2.1 Key Legislation, Policy and Guidelines

Both State and Commonwealth environmental legislation applies to DC's operation and activities. A number of legislative requirements, government policies and guidelines are applicable. Key items relevant to this management plan are:

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);
- *Protection of the Environment Operations Act 1997* (POEO Act);
- *Environmental Planning and Assessment Act 1979* (EP&A Act);
- *Mining Act 1992*;
- *National Parks and Wildlife Act 1974*;
- *Biodiversity Conservation Act 2016*;
- Department of Primary Industries (2013), *Policy and guidelines for fish habitat conservation and management*; and
- ANZECC 2000, Australian *and New Zealand Guidelines for Fresh and Marine Water Quality*.

Delta lands are within the LMCC and Central Coast Council local government areas (LGAs).

2.2 Development Consent SSD-5465 Requirements

This BCMP has also been completed to satisfy the requirement of Condition 7(h), Schedule 4 of Development Consent SSD-5465 (Modification 2), which states:

"The Applicant shall prepare an Extraction Plan for all second workings on site, to the satisfaction of the Secretary. Each Extraction Plan must:

(h) include a Benthic Communities Management Plan, which has been prepared in consultation with DPIE, OEH, LMCC, and DPI Fisheries, which provides for the management of the potential impacts and/or environmental consequences of the proposed second workings on benthic communities, and which includes:

- surveys of the lake bed to enable contours to be produced and changes in depth following subsidence to be accurately measured;
- benthic species surveys within the area subject to second workings, as well as control sites outside the area subject to second workings (at similar depths) to establish baseline data on species number and composition within the communities;
- a program of ongoing seasonal monitoring of benthic species in both control and impact sites;
- development of a model to predict likely impact of increased depth and associated subsidence impacts and effects, including but not limited to light reduction and sediment disturbance, on benthic species number and benthic communities' composition, incorporating the monitoring and survey data collected; and
- updating the model every 2 years using the most recent monitoring and survey data.

The relevant requirements from Table 8 within Condition 2, Schedule 4 of SSD-5465 (Modification 2), including the relevant notes, are recreated in **Table 2**.

Table 2: Subsidence Impact Performance Measures

Biodiversity	
Benthic Communities	Minor environmental consequences, including minor changes to species composition and/or distribution

Notes:

- *The Applicant will be required to define more detailed performance indicators (including impact assessment criteria) for each of these performance measures in the various management plans that are required under this consent (see Condition 7 below).*
- *Measurement and/or monitoring of compliance with performance measures and performance indicators is to be undertaken using generally accepted methods that are appropriate to the environment and circumstances in which the feature or characteristic is located. These methods are to be fully described in the relevant management plans. In the event of a dispute over the appropriateness of proposed methods, the Secretary will be the final arbiter.*
- *The requirements of this condition only apply to the impacts and consequences of mining operations, construction or demolition undertaken following the date of approval of this consent.*

Benthic related requirements of SSD-5465, including specific requirements that are to be addressed in this plan, and where they are addressed, are detailed in **Appendix 2**.

3 Benthic Communities Management

3.1 Baseline Data

Both species diversity and abundance are recorded as part of the six-monthly seasonal (autumn and spring) benthic communities monitoring, which commenced in 2012.

The mud basin off Summerland Point, in Chain Valley Bay and Bardens Bay, was found to be inhabited by 21 species of organisms greater than 1mm in size. Polychaete worms and bivalve molluscs were the most frequently encountered animals.

Bottom sediment in the study area was composed of a small fraction of black sand and shell fragments of various sizes. Most of the sediment was fine black or grey mud.

The sampling results of the benthos undertaken at six-monthly intervals between February 2012 and September 2019 revealed the following:

- the similar suite of organisms dominated each of the 22 sample stations. These were polychaete worms and bivalves;
- stations were distinguished by the relative abundance of the dominant species.
- water depth was not the key parameter in determining the species composition at a station; and
- physical variables such as salinity (conductivity), dissolved oxygen concentration and turbidity of the bottom water, measured only on the day the benthos was sampled, had little influence on the species composition of the benthos over the period sampled.

The results collated to date appear to support the notion that increasing the water depth by the predicted levels of subsidence has, to date, had no discernible effect on the composition and abundance of organisms making up the benthos of the mud basin.

3.2 Bathymetric Surveys

Bathymetric data from the NSW Office of Environment and Heritage (OEH) was obtained in draft format during 2012. DC was granted a license to use this OEH data for the purposes of monitoring changes in the bed of Lake Macquarie, and acknowledges the OEH's data which has enabled the subsidence comparison to be undertaken based on this 2010 data and data subsequently obtained in 2012 by Delta Coal. OEH notes that the data was obtained via use of differential GPS and a 200 kHz echosounder, which is noted to provide a general data accuracy of 0.1 m.

DC commissioned Astute Surveying in March 2012 to undertake a bathymetric survey over the areas of current and proposed workings. The primary purpose of this survey was to obtain accurate baseline data for future subsidence assessments and to enable comparison with the draft OEH data from 2010. Importantly, the 2012 survey provided accurate details of the lake depth within the proposed mining areas, which would enable future surveys to use as baseline data to monitor the future subsidence levels as a result of mining activities. Prior to 2018, bathymetric surveys were conducted annually.

Following an exceedance of the subsidence predictions over CVC's MW7-12 mining area in 2017, DC has committed to undertaking future bathymetric surveys at six monthly intervals to further understand the behavior of subsidence over the active mining areas. The latest bathymetric survey was undertaken in March 2020 (**Figure 2**).

The surveys have shown that subsidence from the miniwall mining can be monitored with a useful level of accuracy and the surveys will be continued bi-annually to cover future mining areas and areas where mining has been completed.

3.3 Subsidence Predictions and Modelling

Subsidence predictions and modelling is undertaken by specialist geotechnical engineers for each extraction plan. The subsidence predictions and modelling assist the site technical services personnel in the mine design and planning process. The mine design and planning process is fundamental to controlling mine subsidence to consented limits.

4 Benthic Communities Monitoring Program

Based on contour mapping of Lake Macquarie and Delta Coal hydrographic surveys, it was identified that the mining operations are largely proposed to occur beneath areas of the Lake at water depths between 4-6 m which represent the general lake depths where subsidence is proposed and under which mining activities have been, will be or are proposed to occur. Accordingly, the monitoring program was designed to sample benthic invertebrate communities from these depths and to provide ongoing monitoring of the potential effects of subsidence. The methodology and monitoring details are presented in the following sections.

4.1 Sampling Locations

In order to analyse the community assemblages and determine potential impacts of subsidence over time, sampling was, and will continue to be undertaken across two depth intervals from numerous site locations within three site types. The site types consist of:

- Impacted (site prefix "IM"): Sites which are currently, or were historically impacted upon by subsidence;
- Reference (site prefix "R"): Sites which are not currently impacted by subsidence but fall within the proposed future mining footprint. Following undermining, Reference sites are designated as Impacted sites; and
- Control (site prefix "C"): Sites which will not be impacted upon by subsidence.

The sampling locations are identified in **Table 3** and **Figure 3**.

Elevations Table		
Minimum Elevation	Maximum Elevation	Color
	-1.200	
-1.200	-1.000	
-1.000	-0.900	
-0.900	-0.850	
-0.850	-0.800	
-0.800	-0.750	
-0.750	-0.700	
-0.700	-0.650	
-0.650	-0.600	
-0.600	-0.550	
-0.550	-0.500	
-0.500	-0.450	
-0.450	-0.400	
-0.400	-0.350	
-0.350	-0.300	
-0.300	-0.250	
-0.250	-0.200	
-0.200	-0.150	
-0.150	-0.100	
-0.100	-0.050	
-0.050	0.000	
0.000	0.050	
0.050	0.100	
0.100	0.200	
0.200	1.000	

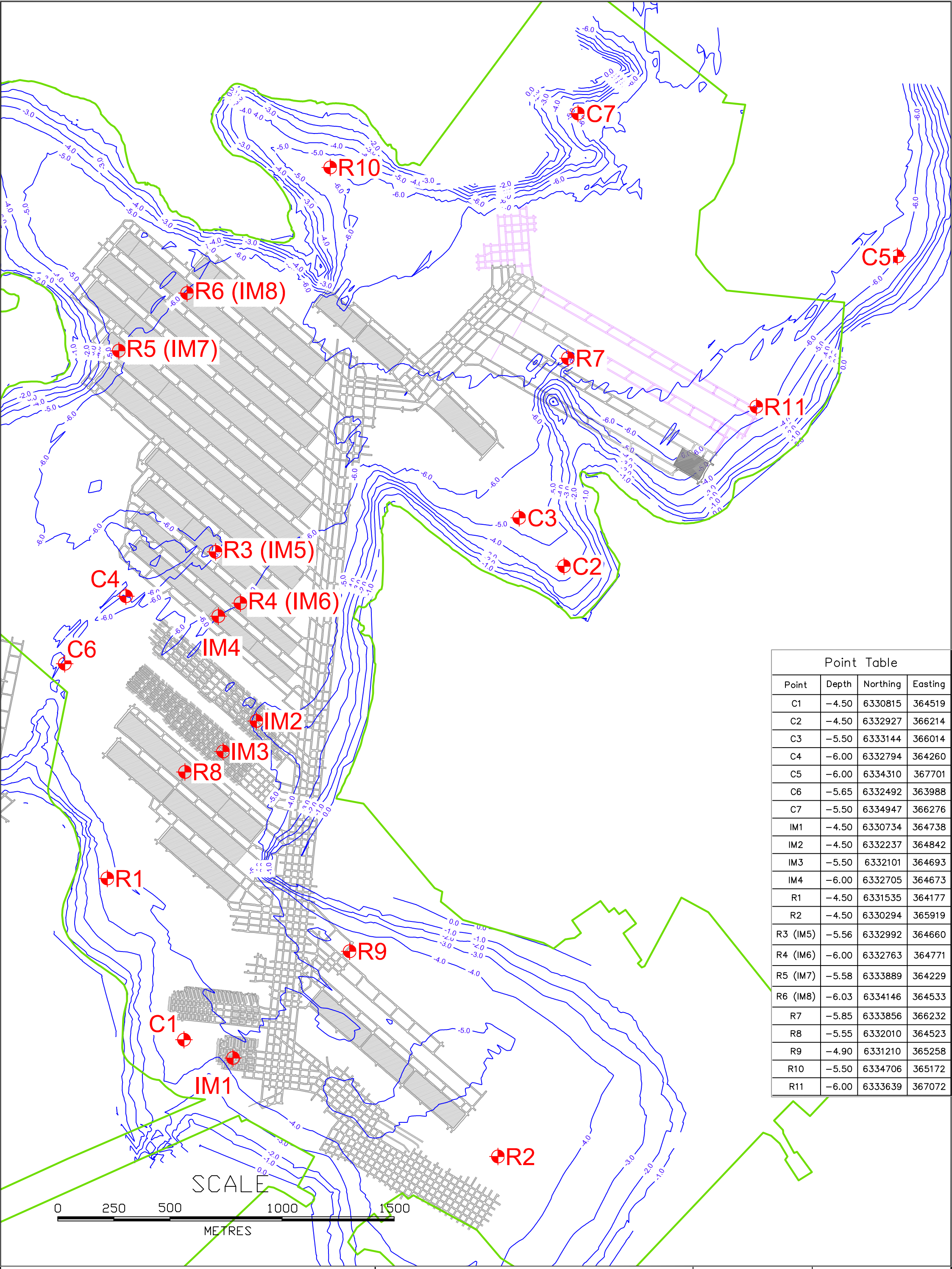
Note: Baseline Survey Carried out Mid-2012
Nominal survey accuracy ±0.100m

DELTA COAL
CHAIN VALLEY COLLIERY

BATHYMETRIC LAKE SCANNING JUL 2019
SUBSIDENCE LEVELS - MW7-12, N1 & S1

SCALE:	1:10 000	DATE:	17 July 2019
DRAWN:	T Chisholm	DRG NO:	C1S0127_1
CHECKED:	C Armit	REV NO:	11
Figure 2		SIZE:	A3

Delta coal



Point Table

Point	Depth	Northing	Easting
C1	−4.50	6330815	364519
C2	−4.50	6332927	366214
C3	−5.50	6333144	366014
C4	−6.00	6332794	364260
C5	−6.00	6334310	367701
C6	−5.65	6332492	363988
C7	−5.50	6334947	366276
IM1	−4.50	6330734	364738
IM2	−4.50	6332237	364842
IM3	−5.50	6332101	364693
IM4	−6.00	6332705	364673
R1	−4.50	6331535	364177
R2	−4.50	6330294	365919
R3 (IM5)	−5.56	6332992	364660
R4 (IM6)	−6.00	6332763	364771
R5 (IM7)	−5.58	6333889	364229
R6 (IM8)	−6.03	6334146	364533
R7	−5.85	6333856	366232
R8	−5.55	6332010	364523
R9	−4.90	6331210	365258
R10	−5.50	6334706	365172
R11	−6.00	6333639	367072

Legend

- Fassifern Seam CVC Workings (December 2015)
- Proposed Fassifern Seam Workings
- Other Existing Workings (Fassifern Seam)
- Project Boundary - Chain Valley Mining Extension 1

DELTA COAL
CHAIN VALLEY COLLIERY

BENTHIC MONITORING POINTS
LAKE MACQUARIE

Figure 3

SCALE:	1:15000	DATE:	21 October 2019
DRAWN:	T Chisholm	DRG NO:	C1S0120_1
CHECKED:	C Armit	REV NO:	14
		SIZE:	A3

Delta coal

Table 3: Benthic Community Sampling Locations

Site Name	Sample Depth (m)	Easting	Northing
C1	-4.5	364519	6330815
C2	-4.5	366214	6332927
C3	-5.5	366014	6333144
C4	-6.0	364260	6332794
C5	-6.0	367701	6334310
C6	-5.5	363988	6332492
C7	-5.5	366276	6334947
R1	-4.5	364177	6331535
R7	-6.0	366232	6333856
R9	-4.5	365258	6331210
R10	-5.5	365172	6334706
R11	-6.0	367072	6333639
IM1	-4.5	364738	6330734
IM2	-4.5	364842	6332237
IM3	-5.5	364693	6332101
IM4	-6.0	364673	6332705
IM5 (previously R3)	-6.0	364771	6332763
IM6 (previously R4)	-5.5	364660	6332992
IM7 (previously R5)	-5.5	364229	6333889
IM8 (previously R6)	-6.0	364533	6334146
IM9 (Previously R8)	-5.5	364523	6332010
IM10 (Previously R2)	-4.5	365919	6330294

4.2 Sampling Methods

Each of the sites will be surveyed for biotic (benthic invertebrates) and environmental (water quality, benthic sediment) variables. The surveys will be undertaken during spring and autumn.

4.2.1 Water Quality

General physico-chemical water quality variables will be measured at the sites during sampling. The water quality parameters will be measured at 0.5m below the surface and 0.5 m above the lakebed. The variables measured will include temperature (oC), pH, turbidity (NTU), conductivity (µS/cm), dissolved oxygen (mg/L and % saturation) and oxygen reduction potential (ORP) or photosynthetically active radiation (PAR).

4.2.2 Benthic Sediment

Sediment samples will be collected to a depth of 20 cm at each of the sites using 250 mL jars. The jars will be labelled and transported to the laboratory for analysis via settlement method.

4.2.3 Benthic Invertebrates

At each site, five replicate samples of benthic sediment will be collected by a diver using 200x200x100 mm sieve boxes with 1 mm mesh.

The samples will be sieved to remove sediment particles less than 1 mm in diameter. The residual material will then be transferred to a labelled 250 mL plastic jar and preserved with formaldehyde. Large fragments

of shell will be removed from the sample at this time to ensure that the sample volume did not exceed 250 mL and the samples are retained for later inspection at the laboratory.

4.3 Laboratory Analysis

4.3.1 Benthic Sediment

The 250 mL sample of the entire sediment from each site will be transferred into a 500 mL clear glass measuring cylinder and the volume made up to 500 mL with seawater. The cylinder is then to be stoppered and shaken vigorously to suspend the sediment in the seawater. The sample will then be allowed to settle and the volumes of each fraction (shell and coarse sand, fine sand, mud and fine silt) calculated and recorded. Results are then determined relative to the initial volume of sediment collected in the 250 mL jar.

4.3.2 Benthic Invertebrate Identification

The contents of each jar are run through a 1mm mesh sieve and washed free of formalin and any remaining mud.

The washed material is then placed into two enamel dishes and portions of each sample placed in a 100 mm diameter petri dish for examination under a stereoscopic binocular microscope to detect and recover small organisms. Organisms and parts of organisms are removed, counted, identified and the results entered a spreadsheet. The benthic invertebrates are identified to genera and species where possible. This process is repeated until the debris of the entire sample had been examined. The results for each site are then entered an excel spreadsheet for summary and analysis. All shell remaining in the sample is kept for later examination.

4.4 Data Analysis

The biotic and environmental data will be analysed using a variety of univariate and multivariate analysis (**Table 4**). The statistical methods used to analyse the data were determined based on earlier monitoring data to provide the most statistically robust assessment of comparison between impacted and reference and control sites and environmental data. It must be noted that control and reference sites are the same until undermined.

Table 4: Data Analysis

Variable Type	Analysis	Description
Environmental: Water quality	ANZECC/ARMCANZ Guidelines (ANZECC Guidelines)	Trigger values for slightly – moderately disturbed ecosystems: Estuaries.
Biotic and Environmental	Univariate	Descriptive graphical statistics. Analysis of Variance and Similarity (2 way nested)
Biotic and Environmental	Multivariate	A square-foot transformation was performed on the data and Bray-Curtis Similarity matrices created. Cluster analysis was then performed for each site and dendrogram plots produced.

	Multidimensional Scaling Ordination	The analysis represents the sites as points in space so the relative distances between samples show similarities in community structure. Samples that are placed closer together are more similar than samples further apart.
	BIOENV	The analysis matches environmental variables against biotic data which have been measured at the same sites. This analysis enables analysis of the extent to which the physio-chemical data is related to the observed biological patterns. Correlations were performed for each site between the biotic and environmental factors using the BIOENV function in PRIMER5.

4.5 Monitoring Frequency

The baseline sampling program methods outlined in **Section 3** will form the basis for a seasonal monitoring program that will be undertaken during spring and autumn each year to survey biotic (benthic invertebrates) and environmental variables (water quality and sediment). The program has been designed to enable analysis and reporting of the data to monitor the impacts of subsidence and effects, including but not limited to light reduction and sediment disturbance, on benthic species number and benthic communities' composition and distribution.

In addition to the above, annual lakebed bathymetric surveys will be undertaken prior to each autumn survey. The annual bathymetric surveys will enable any change to the lake floor to be identified and addressed during the data analysis process.

4.6 Program Refinements

The survey methods will be reviewed every two years of seasonal sampling to refine the sampling program if required. Prior to each seasonal sampling event the sites will be reviewed against the mine plans to ensure that any reference sites that have become impacted upon by mining are reclassified as impact sites, and replacement reference sites are identified and sampled. This will result in additional reference sites being added to the program during the monitoring period.

5 Modelling to Monitor Potential Impacts

5.1 Model Background

Maximum subsidence for the proposed future mining activities is predicted to be 1230 mm, or 780 mm where no overlying workings exist. The analysis undertaken on the baseline data provides an initial assessment of biotic and environmental variables associated with the study area and forms the basis of the formation of the predictive modelling (JSA 2012). The results will be reported in biannual monitoring reports and the Annual Review.

The aim of the predictive modelling is to compare the condition of the baseline benthic community assemblages prior to mining to the benthic community assemblages after mining has occurred, to ensure that only minor environmental consequences occur due to mining activities. The effects of subsidence are required to result in only minor changes to species composition and/or distribution. As the environmental variables which affect benthic communities are complex, in order to determine whether community dynamics at reference sites are related to subsidence, seasonal biotic survey data will be analysed against environmental data and between impacted types. The analysis and modelling will be undertaken to determine whether:

- Overall community dynamics are related to seasonal and environmental variables and/or subsidence impacts;
- Abundance and diversity changes to community composition at reference sites that have been undermined are related to seasonal and environmental variables or subsidence impacts; and
- Changes identified in reference sites that have been undermined are considered minor.

5.2 Analysis

For the model to identify whether the environmental consequences of subsidence are considered minor (and therefore whether mitigation measures will be required) a series of statistical analysis will be undertaken and reported seasonally and annually. Based on the expected timing of subsidence impacts, the analysis will model scenarios to determine:

- Changes in undermined reference sites with the baseline conditions at the same sites; and
- Similarity of impacted sites to control and reference sites at similar depths.

The modelling will be based on Multi-dimensional Scaling (MDS) Ordination, two-way ANOVAs (analysis of variation) and ANOSIM (analysis of similarity) techniques to identify any links in community structure between sites at the same depth profiles. The modelling will be based on the existing benthic community structure, actual subsidence levels (determined from annual bathymetric surveys), predicted levels of increased subsidence and collection of seasonal data.

Figure 2 identifies the reference sites applicable to the project. The communities at the reference sites will be compared against control and reference sites at a similar depth profile. The determination of the level of impact of subsidence, once other environmental variables have been discounted by the model will be based on ANOVA/ANOSIM techniques.

Essentially, if ANOVA/ANOSIM results indicate that undermined reference site communities are changing at a rate of ANOVA/ANOSIM test of significance <5% then the impacts will be moderate or major mitigation measures to manage impacts will be required. The use of 5% (the p significance level of 0.05) is a standard statistical method of determining level of significance, another is p= 0.01. Because the data set used in the initial analysis represents a single sampling event the use of the conservative 5% significance rule has been applied to determine minor impacts(other methods such as ranking and scaling were applied to the data but

did not provide adequate measurable results). The 5% significance will be applied to seasonal data and revisited regarding suitability based on data outcomes.

The options for mitigation measures to manage subsidence on the lake floor are largely limited to changes to mine design. If impacts are determined to be moderate or major, mine planning will be required to modify mine plans.

The benthic community results of surveys and annual monitoring undertaken have identified that while communities at some sites were defined by dominant species, the abundance and diversity of the communities did not identify clear links to location or impact type. Rather the analysis identified that natural environmental fluctuations in water quality, benthic substrate composition and natural depth intervals were influencing the communities (JSA 2013).

The results of sampling between February 2012 and September 2017 appear to support the notion that increasing the water depth by the predicted subsidence will have no discernible effect on the composition and abundance of organisms making up the benthos of the mud basin (Laxton & Laxton, 2017). This is supported by the statistical modelling of results which is undertaken every 3 years.

In January 2018 Delta Coal engaged JSA environmental to undertake the 3 yearly statistical modelling of the sites Benthos data set. Detailed ANOSIM analysis of the benthic community data between un-impacted and impacted sites between 2012 and 2017 identified a significance p value of 24.1%. This value indicates that there had been no significant differences between the un-impacted and impacted sites over the last 5 years.

EMM Consulting undertook statistical modelling of the Benthic communities monitoring data between January 2020 and April 2020 and presented the following conclusions, the results of statistical analysis of CVC's benthic monitoring data indicate that no exceedance of the BCMP subsidence impact performance measure of "minor environmental consequences, including minor changes to species composition and/or distribution" has occurred. Consequently, CVC is not required to implement any additional investigations of benthic communities within the project study area at this time and should continue the routine monitoring of benthic assemblages.

If the assessment of results from future analysis indicate that impacts are outside the defined trigger level Delta Coal will investigate the cause of incident and implement corrective actions where required as outlined in **Section 8**.

6 Reporting

6.1 Regular Reporting

In accordance with Schedule 6, Condition 8, the Applicant shall provide regular reporting on the environmental performance of the development on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of the development consent.

The benthic community monitoring results will be reviewed on a biannual basis as survey reports are received to confirm compliance with the conditions specified in the *Subsidence Impact Performance Measures*.

6.2 Annual Review

In accordance with Schedule 6, Condition 4, the Applicant shall review the environmental performance of the development to the satisfaction of the Secretary, by the end of March each year, or other timing as may be agreed by the Secretary.

The Annual Review will also include a summary of monitoring results during the past year, discussion with reference to the impact assessment criteria, and any relevant details related to comparisons between actual results and predictions in the Environmental Impact Statement. The Annual Review will be forwarded to the relevant authorities including DPIE, and EPA. The Annual Review will also be forwarded to members of the Community Consultative Committee and local Councils (Central Coast and Lake Macquarie). It will also be placed on the company's website along with a summary of environmental monitoring results.

6.3 Incident or Non-Compliance Reporting

If monitoring reveals that, as a result of mining activities, greater than minor impacts have occurred, then DC will investigate the cause of the non-compliance. As detailed in Schedule 6, Condition 7 of the DA, relevant agencies will be notified by phone or email at the earliest opportunity of an incident that causes or threatens to cause material harm to the environment. For all other incidents, relevant agencies will be notified by phone or email as soon as practicable.

The investigation into the incident will consider any activities, plant operations or other factors that may have caused or contributed substantially to the non-compliance. The written report will be provided to any affected landowner and/or existing tenants, including tenants of mine owned properties, to the DPIE, EPA and any other relevant stakeholders within 7 days of the date of the incident or being made aware of the incident (such as receiving monitoring data). The investigation will consider any activities or other factors that may have generated the non-compliance. The report will be provided to DPIE, OEH, and LMCC.

The report will:

- describe the date, time and nature of the observation;
- identify the cause (or likely cause) of the damage;
- describe what action has been taken to date; and
- describe the proposed measures to address the damage and prevent further such occurrences.

DC will implement any recommendations in order to prevent future occurrences. Any incident or complaint will be recorded and fully investigated to find root causes and corrective actions implemented where necessary.

7 Stakeholder Management, Response and Training

7.1 Complaint Protocol

DC has a 24-hour telephone hotline (1800 115 277) through which members of the public can lodge complaints, concerns, or to raise issues associated with the operation. This service aims to promptly and effectively address community concerns and environmental matters.

All complaints are recorded and responded to and if, for some reason, no action is taken then the reason why is recorded. The information recorded in the complaint register includes:

- date and time the complaint was lodged;
- personal details provided by the complainant;
- nature of the complaint;
- action taken or, if no action was taken, the reason why; and
- follow up contact with the complainant.

1.1 Independent Review

As detailed in Condition 2, Schedule 5 of SSD-5465, an Independent Review can be requested by a landowner who "*considers the development to be exceeding the relevant criteria in Schedule 3".*

If the Secretary is satisfied that an independent review is warranted, then within 2 months of the Secretary's decision the Applicant shall:

(a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Secretary, to:
- *consult with the landowner to determine his/her concerns;*
- *conduct monitoring to determine whether the development is complying with the relevant criteria in Schedule 3; and*
- *if the development is not complying with these criteria then identify the measures that could be implemented to ensure compliance with the relevant criteria; and*

(b) give the Secretary and landowner a copy of the independent review.

1.2 Dispute Resolution

If any disputes are not adequately addressed by the complaints handling process then they will be handled by the Environment and Community Coordinator. If the response of CVC is not considered to satisfactorily address the concern of the complainant, a meeting may be convened with the complainant, Mine Manager together with the Environment and Community Coordinator to determine any further options to reduce potential impacts.

Any actions agreed from the meeting will be implemented by CVC. After implementation of the proposed actions the complainant will be contacted and advice sought as to the satisfaction or otherwise with the measures taken.

If no agreed outcome is determined or the complainant is still not satisfied by the action taken, then an Independent Review may be requested by the complainant. If determined to be warranted by the Secretary, an independent review will be undertaken in accordance with the process identified in Schedule 5 of SSD-5465.

7.2 Training, Awareness and Competence

Training is an essential component of the implementation phase of this BCMP. The Environment and Community Coordinator will ensure that training and awareness processes are implemented to manage, identify and minimise potential impacts of CVC and to ensure personnel are aware of their roles and responsibilities in terms of benthic management.

Generally training at CVC consists of induction training for new starters and contractors along with environmental awareness training at two-year intervals and ongoing “toolbox” training for all permanent employees as required.

As the document owner, the Environment and Community Coordinator is the contact point for any person that does not understand this document or their specific requirements, and will provide guidance and training to any person that requires additional training regarding this BCMP.

8 Audit and Review

8.1 Review and Improvement

This document shall be reviewed, and if necessary revised, within 3 months of the following:

- the submission of an Annual Review;
- the submission of an incident report;
- the submission of an independent environmental audit; and
- following any modification to the development consent.

As outlined in **Section 6.2**, the Annual Review will include a review of the seasonal monitoring program and mine plans to ensure that any reference sites that have been impacted by mining reclassified as impacted impact sites, and replacement reference sites identified and sampled. Survey methods will be reviewed every two years to refine the sampling program if required. Improvements identified during reviews or audits will be incorporated into the BCMP.

8.2 Auditing

The objectives of an audit are to maintain compliance with the BCMP. Audits shall be carried out by personnel who have the necessary qualifications and experience to make an objective assessment of the issues. The extent of the audit, although pre-determined, may be extended if a potentially serious deviation from this document is detected.

Any audit non-conformances and/or improvement opportunities will have corrective and preventative actions implemented to avoid recurrence, these actions will be loaded into the site Incident Database to ensure the actions are assigned to the relevant people and completed.

External audits will be conducted utilising external specialists and will consider this document and related documents. External auditors shall be determined based on skills and experience and upon what is to be accomplished.

9 Records and Document Control

9.1 Records

Generally, the Environment and Community Coordinator will maintain all Environmental Management System records which are not of a confidential nature. Records that will be maintained include:

- monitoring data;
- environmental inspections and auditing results;
- environmental incident reports;
- the complaints register; and
- licences and permits.

All records will be stored so that they are legible, readily retrievable and protected against damage, deterioration and loss. Records will be maintained for a minimum of 4 years or as otherwise required under any legislation, licence, lease, permit or approval.

9.2 Document Control

This document and all others associated with the Environmental Management System shall be maintained in a document control system which is in compliance with the site Document Control Standard which is available to all site personnel. Any proposed change to this document will be via the Environment and Community Coordinator.

A copy of this document is available on the DC website. Document revision details are provided in **Table 5**.

Table 5: Document Revision Details

Version	Date	Details of Revision	Company	Reviewed by/ Authorised by
1	May 2012	Version 1 Final	LakeCoal	Unknown
2	07/04/2014	Version 2 Final	LakeCoal	Chris Ellis
3	10/02/2017	Version 3 Final	LakeCoal	Wade Covey
4	14/05/2018	LakeCoal updated document to reflect the development consent requirements and to include monitoring locations for proposed mining areas that are referred to in Extraction Plan	LakeCoal	Wade Covey Adrian Moodie
5	17/06/2019	Updated for Miniwalls S2/S3	Delta Coal	Chris Armit
6	10/03/2020	Updated document to reflect current S4 workings and consultation with stakeholders	EMM Consulting / Delta Coal	Katie Weekes Chris Armit
7	12/05/2020	Updated document to reflect consultation with DPIE and 2020	Delta Coal	Chris Armit

Version	Date	Details of Revision	Company	Reviewed by/ Authorised by
		statistics report		

10 Roles and Responsibilities

All employees and contractors at CVC are responsible for environmental management. However, various positions in the organisation have roles, responsibilities and authorities for managing environmental aspects, action plans, programs and controls.

Roles and responsibilities specific to completing the requirements of this plan are identified in **Table 6**.

Table 6: Benthic Communities Management Plan Roles and Responsibilities

Role	Responsibilities
Manager of Mining Engineering (Mine Manager)	• Ensure that adequate financial and personnel resources are made available for the implementation of the BCMP. • Maintain overall responsibility for environmental compliance with Mining Lease, EPL, development consent and other mining approvals as they pertain to the management of benthic communities. • Ensure that adequate training is provided to staff to minimise impacts to benthic communities.
Environmental Compliance Officer	• Co-ordinate benthic community monitoring. • Review benthic community monitoring results on a seasonal and annual basis. • Develop management actions in consultation with regulatory agencies as/if required from the monitoring results. • Compile the Annual Review (including a summary of the benthic community monitoring). • Respond to any potential or actual non-compliance and report these as required to regulatory bodies and other stakeholders. • Undertake reviews of this document • Undertake or coordinate the required audits of this document • Notify relevant agencies if there are any exceedances in impact thresholds • Ensure complaint handling and response is undertaken, including determination of sources and potential remedial action to avoid recurrence.
All employees and contractors	• Comply with the requirements of this BCMP. • Immediately notify Environment and Community Coordinator of possible incident.

11 References

Documents referenced in the preparation of the BCMP are detailed in **Table 7**.

Table 7: References

Reference	Title
Australian Standards	AS/NZS ISO 14001:2004, *Environmental management systems – Requirements with guidance for use* AS/NZS ISO 14004:2004, *Environmental management systems – General guidelines on principles, systems and support techniques* ANZECC 2000, *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*
Government Department	Department of Primary Industries (2013), *Policy and guidelines for fish habitat conservation and management* SSD-5465 Development Consent SSD-5465 (Modification 2), 16 December 2015 NSW EPA Environment Protection Licence: EPL 1770, 2 April 2019
Delta Coal documents	EMS Environmental Management Strategy.
External documents	JSA Environmental 2013, *Chain Valley Colliery Mining Extension 1 Project Marine Ecology Assessment,* Lake Coal JSA Environmental 2015*, Chain Valley Colliery Modification 2 Marine Ecology Assessment,* Lake Coal JSA Environmental 2018*, Chain Valley Colliery Benthos Statistical Analysis,* Lake Coal EMM Consulting 2020, Chain Valley Colliery Benthic Community Monitoring - Statistical Analysis Laxton & Laxton, 2013, *Lake Macquarie Benthos Survey Results of Sampling No. 4.* September 2013. Laxton and Laxton 2015, *Benthic Communities Survey of Chain Valley Bay, Summerland Point and Crangan Bay, Lake Macquarie*, NSW Laxton and Laxton 2016*, Lake Macquarie Benthos Survey Results No.10 September 2016.* J.H. & E.S. Laxton - Environmental Consultants P/L. Report for Lake Coal Pty Ltd Chain Valley CollieryO'Connor S et al 2007, Stone Construction on Rankin Island, Kimberley, Western Australia, Australian Archaeology, Number 64, PP: 15-22

12 Definitions

CVC Delta Coal - Chain Valley Colliery

DA Development approval

DC Delta Coal

DP&E Department of Planning & Environment (former)

DPIE Department of Planning, Industry and Environment

DPI Fisheries Department of Primary Industries – Fisheries NSW

DTIRIS Department of Trade, Investment, Regional Infrastructure and Services

EMS Environment Management System

EPA NSW Environment Protection Authority

EPL Environmental Protection License

EP&A Act *Environmental Planning and Assessment Act 1979*

LMCC Lake Macquarie City Council

POEO Act *Protection of the Environment Operations Act 1997*

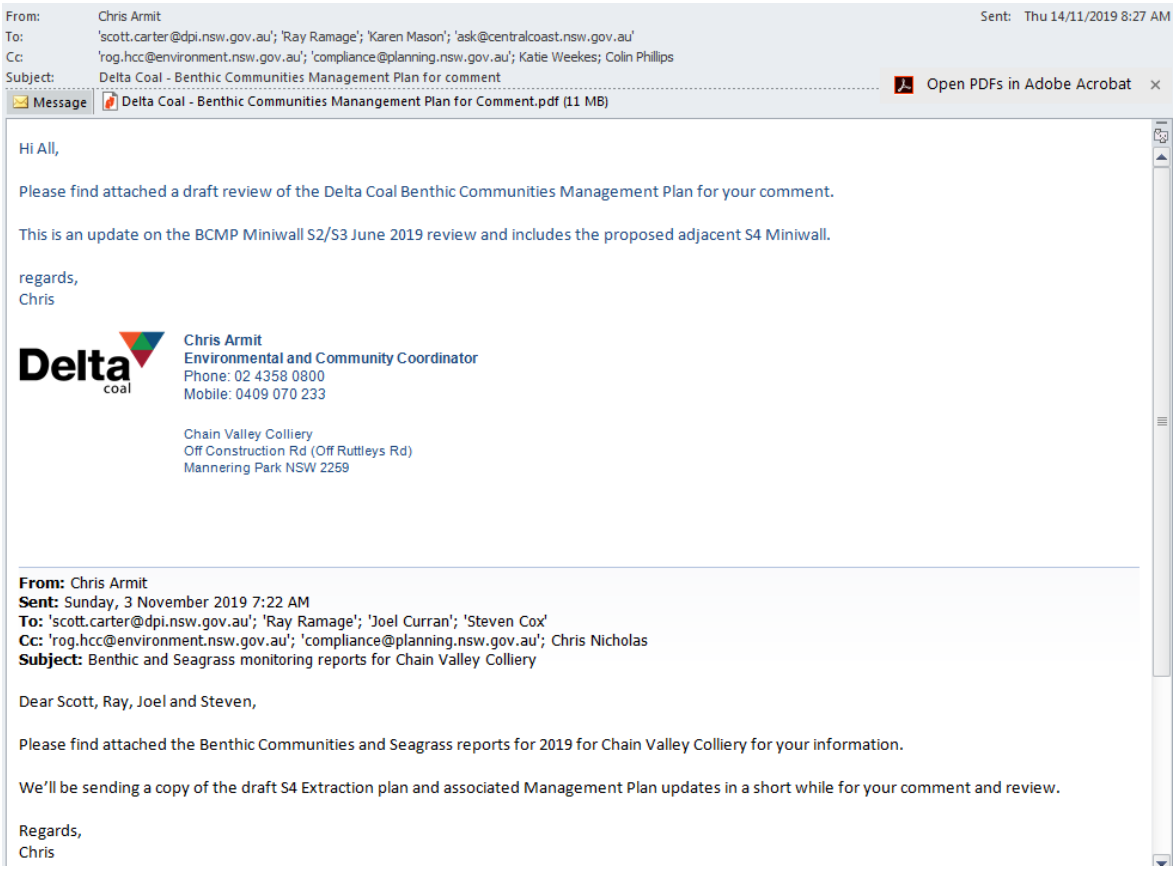
OEH Office of Environment and Heritage

ROM Run-of-mine

Secretary
Secretary of the Department of Planning and Environment, or nominee

SSD-5465
Development Consent SSD-5465 (for the Chain Valley Colliery Mining Extension 1 Project)

Appendix 1: Consultation



From: Chris Armit
To: 'scott.carter@dpi.nsw.gov.au'; 'Ray Ramage'; 'Karen Mason'; 'ask@centralcoast.nsw.gov.au'
Cc: 'rog.hcc@environment.nsw.gov.au'; 'compliance@planning.nsw.gov.au'; Katie Weekes; Colin Phillips
Subject: Delta Coal - Benthic Communities Management Plan for comment
Sent: Thu 14/11/2019 8:27 AM

Message | Delta Coal - Benthic Communities Manangement Plan for Comment.pdf (11 MB) | Open PDFs in Adobe Acrobat

Hi All,

Please find attached a draft review of the Delta Coal Benthic Communities Management Plan for your comment.

This is an update on the BCMP Miniwall S2/S3 June 2019 review and includes the proposed adjacent S4 Miniwall.

regards,
Chris

Delta coal

Chris Armit
Environmental and Community Coordinator
Phone: 02 4358 0800
Mobile: 0409 070 233

Chain Valley Colliery
Off Construction Rd (Off Ruttleys Rd)
Mannering Park NSW 2259

From: Chris Armit
Sent: Sunday, 3 November 2019 7:22 AM
To: 'scott.carter@dpi.nsw.gov.au'; 'Ray Ramage'; 'Joel Curran'; 'Steven Cox'
Cc: 'rog.hcc@environment.nsw.gov.au'; 'compliance@planning.nsw.gov.au'; Chris Nicholas
Subject: Benthic and Seagrass monitoring reports for Chain Valley Colliery

Dear Scott, Ray, Joel and Steven,

Please find attached the Benthic Communities and Seagrass reports for 2019 for Chain Valley Colliery for your information.

We'll be sending a copy of the draft S4 Extraction plan and associated Management Plan updates in a short while for your comment and review.

Regards,
Chris

From: Chris Armit
To: 'rog.hcc@environment.nsw.gov.au'; 'Resources Regulator'; 'Margaret MacDonald-Hill'; 'scott.carter@dpi.nsw.gov.au'; 'Geoffrey Keech'; Melissa Sawatske; 'dpi.cabinet@dpi.nsw.gov.au'; 'cassandra.mcnamara@dpi.nsw.gov.au'; 'Matthew.Montgomery@finance.nsw.gov.au'; 'Ray Ramage'; 'dan.adams@planning.nsw.gov.au'; 'Robert Gibson'; 'Joanna Pajkowska'; 'landuse.enquiries@industry.nsw.gov.au'; 'water.referrals@dpi.nsw.gov.au'; 'Mitchell Isaacs'; 'Danielle.Allen@centralcoast.nsw.gov.au'; 'EPA RSD Hunter Region Mailbox'; 'Steve Clair'
Cc: Tim Chisholm; 'David Richards'; Chris Nicholas; 'David Hill'; Dave McLean; 'Flood, Justin'; Everett, Greg; Colin Phillips; 'Gurney, Steve'; 'Joel Curran'; Katie Weekes
Subject: Miniwall S4 Extraction Plan draft for comment and associated MP status
Sent: Fri 20/12/2019 4:57 AM

Dear All,

The draft Miniwall S4 Extraction Plan document has been uploaded onto the Delta Coal website (https://www.deltacoal.com.au/environment/chain-valley-colliery/ch) for your comment.
After 28 days and the inclusion/consideration of your comments the S4 Extraction Plan document will be uploaded onto the DPIE planning portal.

The associated management plans were submitted on the below dates to the relevant stakeholders and comments have been received, thank you for your comments on these.
The management plan review for comment process nominally ends December 31 and the management plans will being updated with comments and added to the planning portal for assessment/approval.

Associated Management Plan	Date submitted to stakeholders
CVC Public Safety MP	25/11/19
CVC Built Features MP	20/11/19
CVC Water MP	1/12/19
CVC Rehabilitation MP	19/11/19
CVC Benthic Communities MP	17/11/19
CVC Seagrass MP	14/11/19
CVC Heritage MP	1/12/19
CVC EMS	1/12/19
CVC Biodiversity MP	1/12/19

As always, happy to go through any comments you have in person or over the phone.

Thanks for your collective assistance over 2019 and look forward to working with you all again in 2020. Happy Holidays !

Regards,
Chris

From: Robert Gibson <Robert.Gibson@environment.nsw.gov.au> Sent: Fri 10/01/2020 4:40 PM
To: Chris Armit
Cc: Nicole Davis
Subject: RE: Miniwall S4 Extraction Plan draft for comment and associated MP status

Dear Chris,
Thank you for your e-mail of 20 December 2019 with a copy of the draft Miniwall S4 Extraction Plan for the Chain Valley Colliery for comment. Biodiversity and Conservation Division (BCD) notes that this document has been prepared to meet the requirements of Condition 7, Schedule 4 of the consent for SSD-5465, and is to be prepared in consultation with several Government agencies, including BCD. BCD has reviewed the draft Extraction Plan and has no comment to make on it.

If you have any questions about this advice then please call me on 4927 3154 to discuss.

Kind regards,

Robert

Robert Gibson
Regional Biodiversity Conservation Officer, Hunter Central Coast Branch

Biodiversity and Conservation Division | Department of Planning, Industry and Environment
T 02 4927 3154 | **E** robert.gibson@environment.nsw.gov.au
Level 4, 26 Honeysuckle Drive, Newcastle, NSW 2300
www.dpie.nsw.gov.au

From: Geoffrey Keech [mailto:gkeech@lakemac.nsw.gov.au]
Sent: Thursday, 12 December 2019 3:41 PM
To: Chris Armit
Cc: Melissa Sawatske
Subject: LMCC response to Delta Coal Mannering Colliery and Chain Valley Colliery management plans consultation

Hi Chris,

Thankyou for providing Council the opportunity to comment on your management plans. I provide the following feedback:

Plan	LMCC Comments
CVC Rehabilitation Management Plan	Any infrastructure (slabs, pits, pipes, etc.) that is to be abandoned and covered over should be mapped and this map made available to any future user or purchaser of the site. Spelling mistake "mircobat"
CVC Benthic Communities Management Plan	No comments
CVC Seagrass Management Plan	*Page 25, Table 5 – Environment and Community Coordinator 'Send annual Seagrass Monitoring Reports to DPI Fisheries and……' there is information missing here with respect to who the reports would be sent to.*
CVC Built Features Management Plan	No comments – no identified built features fall within the LMCC boundary or jurisdiction. Central Coast Council should provide comment for the dwellings at Summerland Point.

For future iterations of these plans, could you please send the plans to Council@lakemac.nsw.gov.au addressed to "Development Assessment and Certification officer." The plans will be allocated to a DAC officer to coordinate comments from the relevant sections of Council.
It would help us if you can include a note about the purpose of the consultation (as per the "Audit and Review" section of the management plans), and ideally send a copy that has been marked up with the changes that have occurred, as this allows us to focus quickly on the relevant changes.

Geoffrey Keech
Development Planner
LAKE MACQUARIE CITY
T 02 4921 0025 **M** 0429 124 904
E gkeech@lakemac.nsw.gov.au
lakemac.com.au

Date: 05/05/2020
From Colin Phillips
To: Chris Armit

The Department's review of the Extraction Plan for Chain Valley Colliery Miniwall S4 has identified several areas requiring clarification or correction. I would be grateful if you would attend tot he identified matters, revise the Extraction Plan and re-submit it to the Department via the Planning Portal. The attachement conatins the Department's review.
The most important matter is reproduced below:
Appendix 13 Subsidence Report. Section 6.3 states that the High Water Mark is defined by the 2.44 m AHD land contour. This is incorrect. The High Water Mark is on the Lake shore, not 9 feet higher. This misinterpretation flows through to Figure 21 where it is shown with the lakeside boundary of the HWMSB as expressed in the seam being the intersection of a line drawn at 35 degrees from the 2.44 m AHD contour to the Fassifern seam. This line needs to be drawn from the lake shore to the seam. This then brings into play the question of whether the calculation of the lake side HWMSB edge has been correctly calculated. On the methodologoly presented in th Appendix 13, the calculations are most likely incorrect and will have implications as the the boundary of second workings in the vicinity of the proposed starting position of Miniwall S4.
Please investigate this matter and revise these aspects of the Miniwall S4 Extraction Plan before resubmitting to the Department for consideration

DPIE Resource Assessments - Benthic Communities Management plan related comments	**Response**
6. Appendices 6, 8 and 9. In Section 1.2 of the Benthic Communities MP, Public Safety MP and Built Features MP the first line of text is almost completely repeated in the second line of text.	Section 1.2 removed
7. Appendices 6 and 7 - Benthic Communities MP and Seagrass MP (Section 3.4) contains several references of subsidence of up to 1230 mm (or 1.23 m) in areas of the mine where former mine workings exist in seams overlying the Fassifern Seam. These references must be removed.	References removed

Appendix 2: Development Consent Summary

Chain Valley Colliery Development Consent SSD-5465 Summary

This BCMP has been prepared in accordance to Schedule 3, Condition 21 of SSD-5465, which states the requirements of the BCMP and what it must address. **Table A2** outlines the requirements of the BCMP and where this document addresses these requirements.

Table A2: Requirements from Chain Valley Colliery Development consent SSD-5465

<table>
<tr><th>Condition No.</th><th>Requirement</th><th>Relevant section of this document</th></tr>
<tr><td></td><td>Schedule 2 Administrative Conditions</td><td></td></tr>
<tr><td>18</td><td>Updating and Staging Strategies, Plans or Programs

The Applicant must regularly review the strategies, plans and programs required under this consent and ensure that these documents are updated to incorporate measures to improve the environmental performance of the development and reflect current best practice in the mining industry. To facilitate these updates, the Applicant may at any time submit revised strategies, plans or programs for the approval of the Secretary.

With the agreement of the Secretary, the Applicant may also submit any strategy, plan or program required by this consent on a staged basis. With the agreement of the Secretary, the Applicant may prepare a revision or stage of any strategy, plan or program required under this consent without undertaking consultation with all parties nominated under the applicable condition in this consent.

Notes:
• While any strategy, plan or program may be submitted on a staged basis, the Applicant must ensure that the existing operations on site are covered by suitable strategies, plans or programs at all times.
• If the submission of any strategy, plan or program is to be staged, then the relevant strategy, plan or program must clearly describe the specific stage to which the strategy, plan or program applies, the relationship of this stage to any future stages, and the trigger for updating the strategy, plan or program.</td><td>Section 8</td></tr>
<tr><td></td><td>Schedule 3 Specific Environmental Conditions</td><td></td></tr>
<tr><td>2</td><td>Performance Measures- Natural Environment

The Applicant shall ensure that the development does not cause any exceedance of the performance measures in Table 8 to the satisfaction of the Secretary.

Table 8: Subsidence Impact Performance Measures
<table>
<tr><td colspan="2">Biodiversity</td></tr>
<tr><td>Threatened species or endangered populations</td><td>Negligible environmental consequences</td></tr>
<tr><td>Seagrass beds</td><td>Negligible environmental consequences including:
• Negligible change in the size and distribution of seagrass beds;
• Negligible change in the functioning of seagrass beds; and
• Negligible change to the composition or</td></tr>
</table></td><td>This document</td></tr>
</table>

		distribution of seagrass species within seagrass beds.
	Benthic communities	*Minor environmental consequences, including minor changes to species composition and/or distribution*
	Mine workings	
	First workings under an approved Extraction Plan beneath any feature where performance measures in this table require negligible environmental consequences	*To remain long-term stable and non-subsiding.*
	Second workings	*To be carried out only in accordance with an approved Extraction Plan.*

Notes:

- *The Applicant will be required to define more detailed performance indicators (including impact assessment criteria) for each of these performance measures in the various management plans that are required under this consent (see Condition 7 below).*
- *Measurement and/or monitoring of compliance with performance measures and performance indicators is to be undertaken using generally accepted methods that are appropriate to the environment and circumstances in which the feature or characteristic is located. These methods are to be fully described in the relevant management plans. In the event of a dispute over the appropriateness of proposed methods, the Secretary will be the final arbiter.*

The requirements of this condition only apply to the impacts and consequences of mining operations, construction or demolition undertaken following the date of approval of this consent

3	***Offsets*** *If the Applicant exceeds the performance measures in Table 8 and the Secretary determines that: (a) it is not reasonable or feasible to remediate the impact or environmental consequence; or (b) the remediation measures implemented by the Applicant have failed to satisfactorily remediate the impact or environmental consequence; then the Applicant shall provide a suitable offset to compensate for the impact or environmental consequence to the satisfaction of the Secretary. Note: Any offset required under this condition must be proportionate with the significance of the impact or environmental consequence*.	**Section 4**
7	***Extraction Plan*** ***(h)*** *include a Benthic Communities Management Plan, which has been prepared in consultation with OEH, LMCC, and DPI Fisheries, which provides for the management of the potential impacts and/or environmental consequences of the proposed second workings on benthic communities, and which includes:* • *surveys of the lakebed to enable contours to be produced and changes in depth following subsidence to be accurately measured;* • *benthic species surveys within the area subject to second workings, as well as control sites outside the area subject to second workings (at similar depths) to establish baseline data on species number and composition within the communities;* • *a program of ongoing seasonal monitoring of benthic species in both control and impact sites;* • *development of a model to predict likely impact of increased depth and associated subsidence impacts and effects, including but not limited to light reduction and sediment disturbance, on benthic species number and benthic communities' composition, incorporating the monitoring and survey data collected; and* • *updating the model every 2 years using the most recent monitoring and survey data.* *The Applicant shall implement the approved management plan as approved from time to time by the*	**This document**

	Secretary. *Notes:* • *To identify the underground mining areas approved under this consent referred to in this condition, see Appendix 3.* • *This condition does not limit secondary extraction under a Subsidence Management Plan approved as at the date of this consent.*	
8	*The Applicant shall ensure that the management plans required under conditions 7(g)-(j) above include: (a) an assessment of the potential environmental consequences of the Extraction Plan, incorporating any relevant information that has been obtained since this consent; and (b) a detailed description of the measures that would be implemented to remediate predicted impacts*	**Section 4 and 6**