



Doc Owner: **Environment and Community Coordinator**

Doc No:

CHAIN VALLEY COLLIERY
Seagrass Management Plan
ENVIRONMENTAL MANAGEMENT PLAN

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1 Introduction

1.1 Purpose

The purpose of this Seagrass Management Plan is to:

- outline details of the seagrass monitoring data collected;
- outline subsidence prediction methodology;
- outline the methodology to be used to identify depth changes at monitoring locations;
- identify seagrass monitoring locations;
- identify reporting requirements;
- detail seagrass 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 Seagrass Management Plan is an element of the Chain Valley Colliery (CVC) Environmental Management System (EMS).

1.2 Background

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 (see 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, as shown on Figure 1.

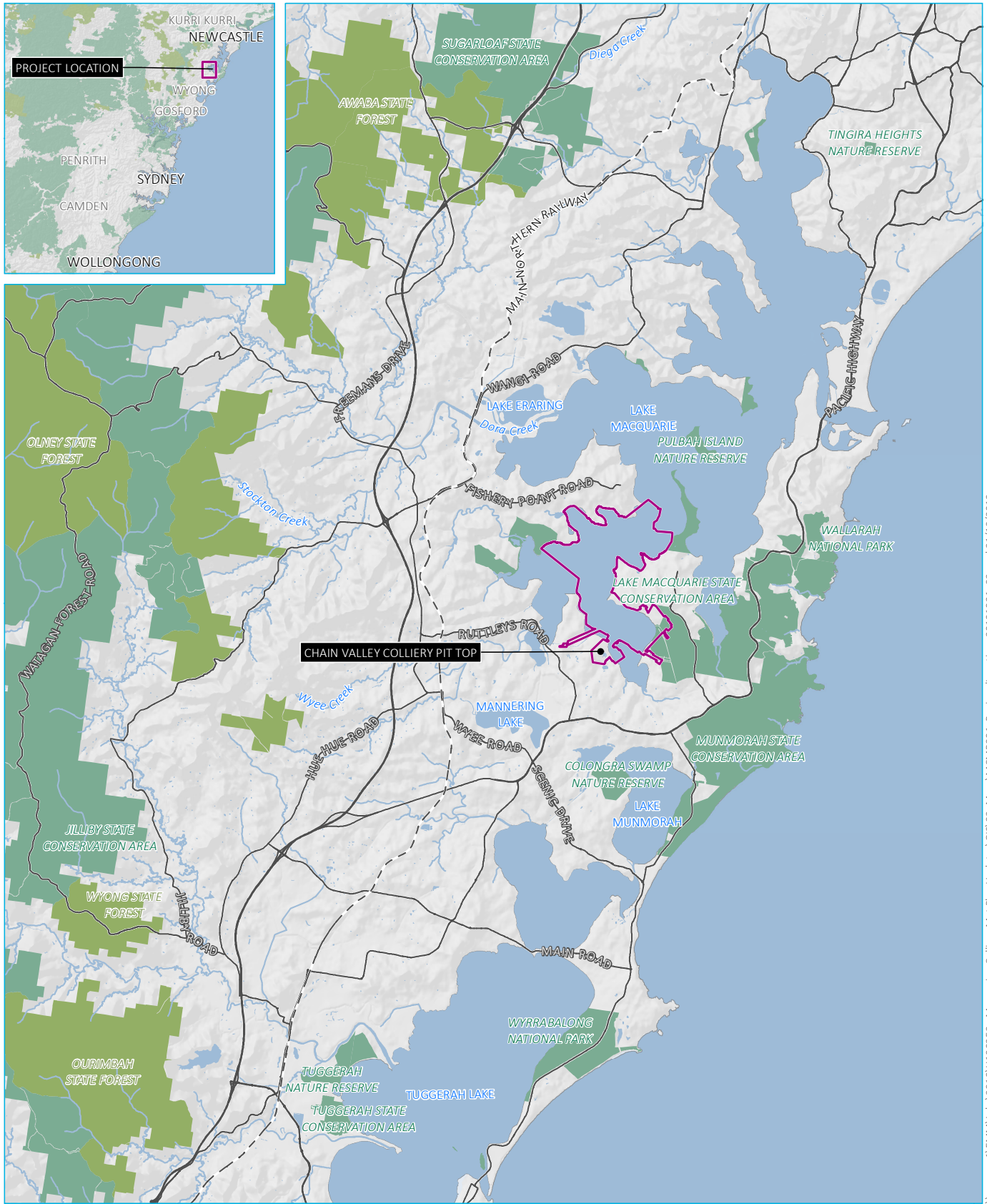
Mining is currently undertaken at CVC, with the coal being transported underground to Mannering Colliery (MC) where the coal is crushed and screened and sent directly to Vales Point Power Station (VPPS).

CVC has been operating since the early 1960s. However, with changes to the Mining Act 1992 and amendments to the Environmental Planning and Assessment Regulation 2000, LakeCoal was required to obtain approval under the Environmental Planning and Assessment Act 1979 (EP&A Act) to permit continued operation of the mine.

Approval of the mine was granted on 23 January 2012 (MP10_0161) following submission of an environmental assessment (EA) (AECOM, 2011). Development consent (SSD-5465) was subsequently approved on 23 December 2013 granting an approval for underground mining over an additional area of Lake Macquarie and a consolidation of approved activities granted by virtue of MP10_0161.

LakeCoal was placed into Voluntary Administration on 3 October 2018. The receivers continued operation of the mines (CVC & MC) in the period 3 October 2018 to 1 April 2019. As of 1 April 2019, Great Southern Energy Pty Ltd (trading as Delta Coal (DC)) own and operate the two underground coal mines, CVC and MC.

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



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

1.3 Consultation

The original version of this Seagrass Management Plan was provided to OEH, LMCC and DPI Fisheries for comment. Both LMCC and DPI Fisheries reviewed the Seagrass Management Plan, with comments from DPI Fisheries provided on the 28th June 2013. At that time DPI Fisheries had no objection to the plan being implemented as written. Comments from Lake Macquarie City Council were received on the 19th July 2013, which were addressed and incorporated into the document, this final version was then sent back to Council who confirmed on the 19th August 2013 that the changes had addressed their comments. The changes made previously to address Council's comments remain in the current version.

Revision 2 of the draft Seagrass Management Plan was provided to OEH, DPI Fisheries and LMCC on the 12th March 2014, with comments on the draft plan requested back by the 1st April 2014. The only response received was from OEH, 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.

Revision 3 of the Seagrass Management Plan 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 while 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.

Revision 4 of the Seagrass Management Plan was provided to OEH, DPI Fisheries and LMCC on 26 February 2018 with the Extraction Plan application for Chain Valley Colliery's Northern Mining Area (NMA).

Revision 5 of the Seagrass Management Plan was sent to OEH, DPI Fisheries and LMCC in May 2019. On the 5 June 2019 DPI Fisheries responded that the Seagrass Management Plan was adequate. On 5 June 2019 OEH noted that they do not approve or endorse these documents and accordingly no comments were provided on the content of the Plan.

Revision 6 of the Seagrass Management Plan was sent to DPI-Fisheries, OEH, DPIE and LMCC on 17 November 2019.

A summary of the comments received, 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
DPI- Fisheries	<ul style="list-style-type: none"> No comments received 	<ul style="list-style-type: none"> Nil required
NSW DPIE-BCD	<ul style="list-style-type: none"> Reviewed S4 EP with no comments to make 	<ul style="list-style-type: none"> Nil required
NSW DPIE –Resource Regulator Subsidence Engineer	<ul style="list-style-type: none"> No comments received 	<ul style="list-style-type: none"> Nil required
DPIE-Resource Assessments	<ul style="list-style-type: none"> Comments received on 5 May 2020. Appendix 1 	<ul style="list-style-type: none"> Updated Section 3.4
LMCC	<ul style="list-style-type: none"> Seagrass Management Plan (SMP) missing information to include. Appendix 1. 	<ul style="list-style-type: none"> See updated Table 5 for unfinished statement to include additional stakeholders to send the Seagrass report to.

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Stakeholder	Comments	Response/Action
Combined CVC and MC Community Consultative Committee	<ul style="list-style-type: none"> No comments received 	<ul style="list-style-type: none"> 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;* and
- Department of Primary Industries (2013), *Policy and guidelines for fish habitat conservation and management.*

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

2.2 Development Consent SSD-5465 (as modified)

This management plan has also been completed to satisfy the requirements of Development Consent SSD-5465 (Modification 2), Schedule 4, Condition 7(i) and Schedule 4, Table 8, which states:

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

(i) include a Seagrass 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 seagrass beds, and which includes:

- a program of ongoing monitoring of seagrasses in both control and impact sites; and
- a program to predict and manage subsidence impacts and environmental consequences to seagrass beds to ensure the performance measures in Table 8 are met."

In addition to the above, Condition 2 within Schedule 4 of SSD-5465 (Modification 2) also requires that:

"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."

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The relevant seagrass requirements from Table 8 within Schedule 4 of the Development Consent, including the relevant notes, are recreated in **Table 2**.

Table 2: Subsidence Impact Performance Measures - Natural and Heritage Features

Biodiversity	
Seagrass beds	<p>Negligible environmental consequences including:</p> <ul style="list-style-type: none"> • <i>negligible</i> change in the size and distribution of seagrass beds; • <i>negligible</i> change in the functioning of seagrass beds; and • <i>negligible</i> change to the composition or distribution of seagrass species within seagrass beds.

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.*

Seagrass 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**.

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3 Background

3.1 Operations

CVC is an underground coal mine with current coal mining methods including development of roadways in the coal seam known as first workings and secondary extraction (miniwall). These first workings develop panels to support the installation of a miniwall, a modern secondary coal extraction method.

Lake Macquarie is the largest saline lake in New South Wales. It lies on the central coast between Sydney and Newcastle within the local government areas of Wyong and Lake Macquarie. Lake Macquarie has a catchment of 700 km² and a water surface area of 125 km² (Bell & Edwards, 1980). The lake has a permanent entrance to coastal waters at Swansea and has an average depth of around 6 m (Laxton, 2005).

The catchment of Lake Macquarie is largely rural with large areas of bush land and grazing land. The shoreline of Lake Macquarie is heavily urbanised, especially the eastern, western and northern shorelines. The region has a relatively long history of coal mining and power generation, with mining occurring since the late 1800s and the first power station at Lake Macquarie commencing operations in 1958.

CVC is situated on the southern shores of Lake Macquarie near Mannering Park, NSW. The mine has been operating since 1962. Mining is currently undertaken using miniwall methods with first workings to support the development in advance of each miniwall panel. All secondary extraction is currently occurring in the Fassifern Seam, in line with Development Consent SSD-5465. The general layout of the CVC Extension Project in respect to Lake Macquarie is shown on **Figure 2**.

3.2 Seagrass Communities

Lake Macquarie contains approximately 10% of the total area of seagrass beds in NSW (DPI 2007). The following four species of seagrass occur in Lake Macquarie:

- eelgrass (*Zostera capricorni*);
- paddle weed (*Halophila ovalis*);
- *Ruppia sp.*; and
- strapweed (*Posidonia Australia*), which is listed as an endangered species under the *Fisheries Management Act, 1994*.

Seagrass distribution within estuaries is naturally influenced by light penetration, depth, salinity, nutrient status, bed stability, wave energy, estuary type, and the evolutionary stage of the estuary. Light is a major limiting factor for the growth of seagrasses and the effects of shading either by artificial structures or increased turbidity associated with sediment re-suspension are common light reducing factors in estuaries (BioAnalysis, 2008).

Seagrass communities in Lake Macquarie appear to have declined since 1953, though there was a general increase in the cover of seagrass in Lake Macquarie between 2000 and 2004 due to a change in light penetration following a period of lower freshwater inputs (King and Barclay 1986; Wellington 2000; Gray and Wellington 2004).

Annual surveys of seagrass communities at Summerland Point, Chain Valley and Crangan Bay (i.e. within and adjacent to the current mining areas) have been undertaken by J.H. & E.S. Laxton - Environmental Consultants Pty Ltd (Laxton Environmental Consultants) on behalf of Delta Coal (and previously LakeCoal) since 2008. Additional survey locations in Bardens Bay were added to the survey program in 2014. Two species of seagrass are present in these areas, namely, eelgrass and paddle weed.

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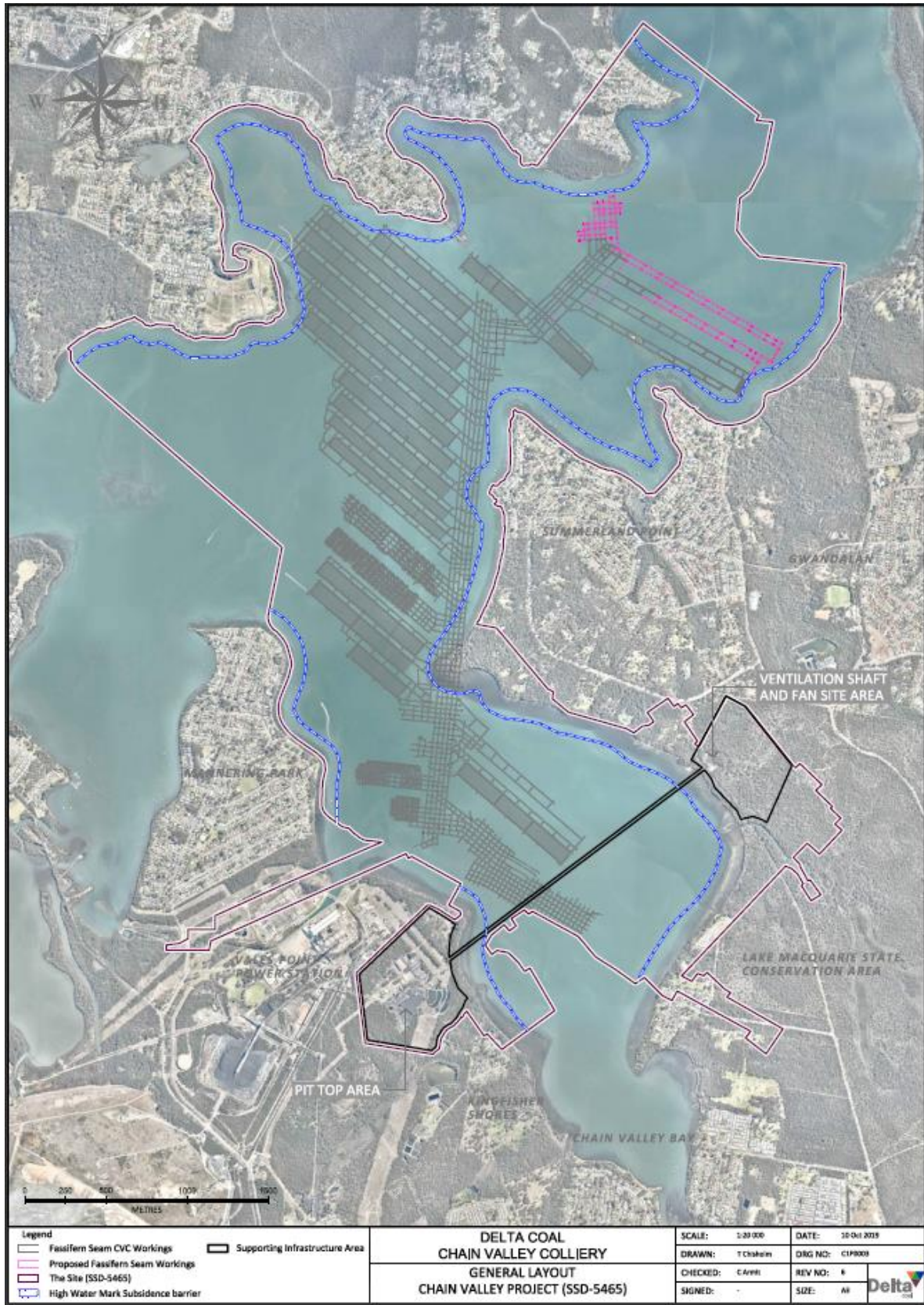


Figure 2: General Layout of the Chain Valley Northern Mining Domain

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The 2019 survey report *Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay, Lake Macquarie, NSW (Results for 2008 to 2017)* (Laxton Environmental Consultants, June 2019) reported seagrass cover along the transects ranged from 24% to 100% of the substratum in 2019. Since 2011 seagrass cover has generally increased progressively. This annual increase in seagrass cover is most likely attributable to the cessation of commercial fishing in Lake Macquarie which was known to impact on the seagrass beds through land-based netting practices.

In 2019 there were no changes in seabed height across transects greater than 0.15 m (0.15 m trigger level) compared with the datum from previous years.

Several studies have been conducted on the seagrass beds in Chain Valley Bay and Summerland Point that are relevant to this Seagrass Management Plan.

In 2007, LakeCoal engaged Laxton Environmental Consultants to identify environmental factors including seagrasses, benthic fauna and bathymetry. The study area was the area east of Mannering Park where it was found that the seagrass beds were composed of *Zostera capricorni* (eelgrass) only.

It was concluded that seagrasses in Chain Valley Bay commenced along the lake edge and appeared to have a depth limit of less than 2 m. Any mining beneath the beds could lead to subsidence which would cause a decline of seagrasses along the outer edge of the seagrass beds. It was also concluded that the distribution and density of seagrass beds in Chain Valley Bay could change due to events unrelated to underground coal mining.

In July 2008, the seagrass survey was conducted to the west of Summerland Point (see **Figure 1**), from Frying Pan Point to Sandy Beach Reserve, Summerland Point, Lake Macquarie. The 2008 seagrass survey provided the baseline data for seagrass distribution, density and condition to which annual surveys are compared. It was determined that seagrass densities in Chain Valley Bay and Crangan Bay ranged from 17.74 to 99.32% of the substratum in the -0.19 to -2.34 A.H.D zone around the shore.

Two forms of the seagrass *Zostera capricorni* were present; short leaved and long leaved forms. In Lake Macquarie, the distinction between these two forms of *Zostera capricorni* appeared to be arbitrary. In 2010 a second species of seagrass, *Halophila ovalis* (paddle weed), was discovered for the first time at transect E6 in Chain Valley Bay.

Subsequent annual seagrass surveys discovered large and unexplained changes in seagrass cover which were unrelated to underground coal mining, as no mining had impacted seagrass beds since commencement of monitoring. The precise reasons for these longer term changes in seagrass distribution are not always obvious but may be related to changes in water transparency, salinity, nutrient concentrations and the proliferation of epiphytic algae. Migration of sediment may also change the distribution of seagrasses over time. It is also thought that the cessation of commercial fishing in Lake Macquarie has positively contributed to the regrowth of seagrass beds.

Seagrass is a vital component of Lake Macquarie's marine ecosystem. It captures the sun's energy and converts it into organic matter that may be utilised by the whole food chain. Destruction of seagrass beds could lead to a reduction in available organic matter for marine flora and faunal species. Seagrass also improves water quality as it decreases sediment within the water column and takes in many nutrients and heavy metals entering the waterway. Hence, a reduction in seagrass population may also result in decreased water quality.

3.3 Seagrass Mapping

Surveys have shown that the short leaved and long leaved forms of *Zostera capricorni* present adjacent to the proposed mining operations commence along the lake edge and terminate when water depths approached 2 m.

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Further mapping undertaken as part of the Chain Valley Mining Extension 1 Project in 2011/2012, enabled the maximum depths and locations of seagrass to be considered in the mine design. This resulted in the generation of a broader seagrass protection barrier, extending to the proposed mining areas, which was then used to refine the mine design and ensure subsidence impacts to seagrass communities could be avoided. This study found that the communities were dominated by *Zostera capricorni* and that in general, the areas were characterised by patchy individuals of *Zostera*. The seagrass beds were found to exist to a maximum depth of 1.9 m.

Further visual assessments and remapping of seagrass beds within the areas of Sugar Bay, Frying Pan Bay and Point Wolstoncroft was undertaken by LakeCoal, Laxton Environmental Consultants, and Daly Smith Surveyors in February 2018.

Details from these studies have been combined to produce the mapping of seagrass over the entirety of the historic, current and future mining areas, and enabled the seagrass protection barrier to be further defined. The current seagrass mapping is shown on **Figure 3: Mapped Seagrass and Protection Barrier**

3.4 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.

The seagrass communities within the entirety of the proposed mining areas have been mapped and the majority of the seagrass beds appear to extend to depths around 2 – 2.5 m. As a result, if mining takes place beneath the seagrass beds, and subsidence takes place, it could be expected that the lower areas of the seagrass beds will potentially retreat with increased depth as a result of reduced light available for photosynthesis.

In light of Condition 7 (i) Schedule 4 and to ensure the performance measures in are met, an essential component of this Seagrass Management Plan is the seagrass protection barrier to ensure that any impacts associated with mining operations are negligible. This barrier is further described in **Section 4.2**.

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4 Seagrass Management

4.1 Management Practices

No secondary extraction is being undertaken, nor is it planned to be undertaken beneath seagrass beds.

In addition, to achieve negligible impact on seagrass beds due to subsidence effects, a seagrass protection barrier has been established. This barrier is based on the seagrass mapping and the application of an “angle of draw” of 26.5° from the seagrass area to the coal seam being mined, as depicted in **Figure 3: Mapped Seagrass and Protection Barrier**

Only first workings are to be undertaken within the seagrass protection barrier. In these areas, subsidence will be limited to less than 20 mm which is considered to be negligible.

The personnel responsible for the above management measures are detailed in **Section 8**.

4.2 Seagrass Protection Limits

As part of the protection of the lake foreshore, the Colliery holding mining leases require a protection barrier around the foreshore. This is known as the High-Water Mark (HWM) subsidence barrier and is shown on **Figure 4**. The barrier is approximately 130 m wide, but varies based on the depth of cover, and no secondary extraction occurs within this zone.

Although similar in some locations, the HWM subsidence barrier and the seagrass protection barrier are separate barriers, with the mine layout limited (among other factors) by either barrier at any specific location. The application of the HWM subsidence barrier and seagrass protection barrier is depicted on **Figure 3**.

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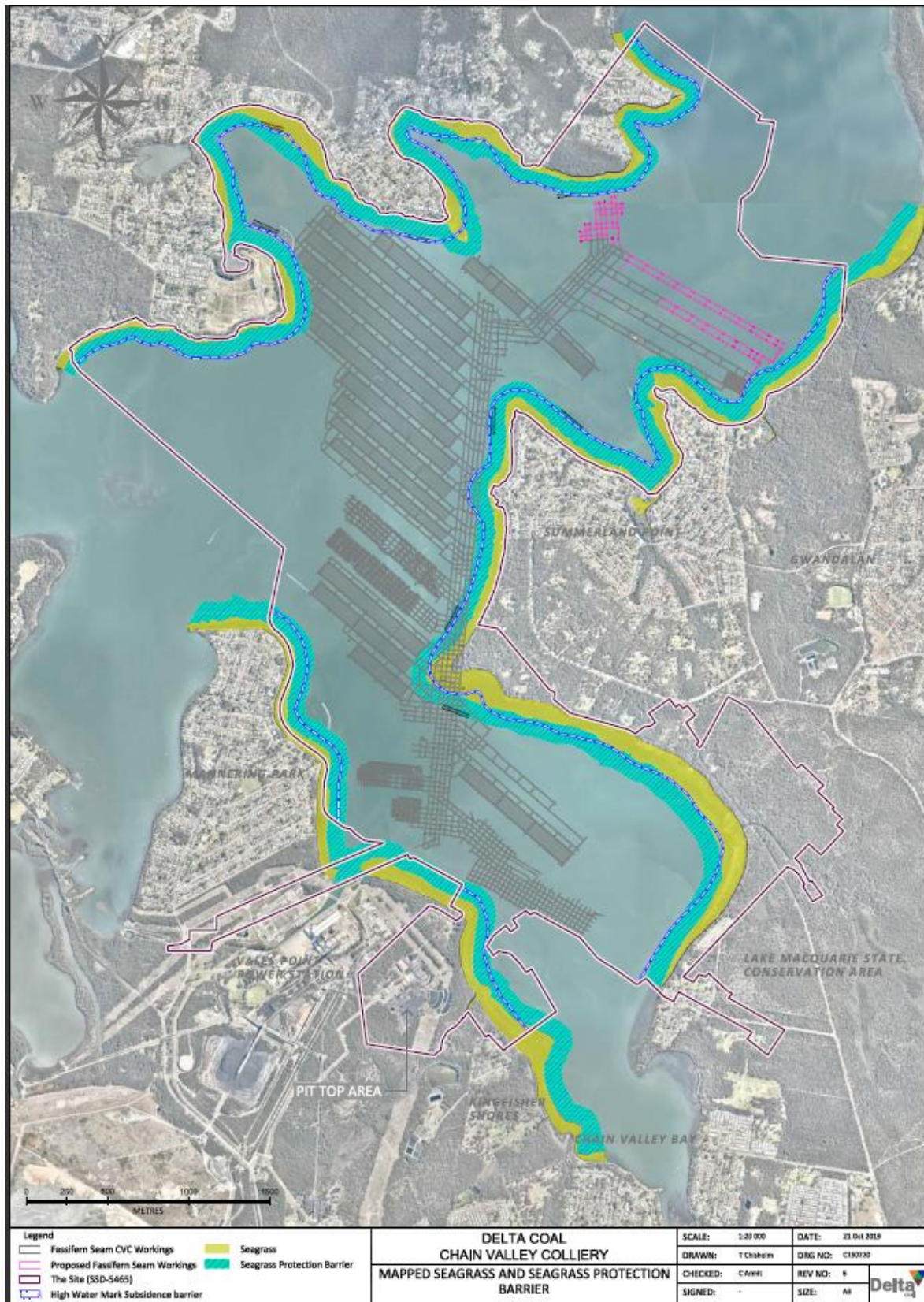


Figure 3: Mapped Seagrass and Protection Barrier

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4.3 Seagrass Impact Mitigation

If, through the monitoring program, subsidence is found to occur in areas known to contain seagrass beds (as identified in **Figure**) and loss of seagrass habitat has been determined to have occurred as a direct result of subsidence, DC would commit to undertaking remediation strategies to replace an equal area of any loss of seagrass habitat that has occurred.

DC's approach to managing seagrass is aimed at protection. However, if an investigation were to identify that an exceedance or incident has occurred that was a direct result of the mining activities and associated subsidence, then DC would develop a remediation plan which would be submitted to DPI Fisheries, identifying the proposed remediation strategy. The strategy would identify proposed remediation measures which could include:

- Transplanting existing communities with additional fast growing locally occurring seagrass plants;
- Regrading, topographical restoration; and/or
- Fertilising, to stimulate lateral ingrowth of seagrass communities.

The exact method of remediation would be determined based on the existing integrity of the seagrass beds, existing species and specific impacts that have occurred. The remediation strategy would be developed in consultation with DPI Fisheries and be "site specific" to ensure the most appropriate remediation methodology is implemented.

Should remediation on-site not be viable, mitigation could be undertaken at other sites within Lake Macquarie in consultation with DPI Fisheries and LMCC. Work would be completed to offset the impact arising as a result of mining activities.

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5 Seagrass Monitoring

The purpose of this plan is to monitor and report on any changes in seagrass communities over time. The monitoring program also includes physical surveys to detect if there is any vertical movement that could be attributable to mine subsidence and if identified, determine if subsidence has caused anything other than a negligible impact. To achieve this, the following will be undertaken:

- an annual survey of the study area with 50 seagrass transects using differential GPS survey methods. These differential GPS survey methods will establish the precise location and height of the lake bed at inner and outer ends of each transect and compare these values against those of previous years and the baseline survey;
- a survey to determine the maximum seaward extent of the seagrass beds and the maximum depth at which they occurred;
- photographic survey of seagrass distribution, density and condition along each transect to be recorded using a video camera enclosed within a waterproof housing and mounted on a floating platform;
- conduct annual seagrass surveys while mining operations have the potential to impact seagrass communities. Reports of annual surveys will be sent to the Department of Primary Industries – Fisheries and Lake Macquarie City Council.
- a summary of the annual seagrass survey will be included in the Annual Review;
- responding to any potential or actual non-compliances and reporting as required to regulatory bodies and other stakeholders; and
- all complaints will be recorded in the complaints register with actions taken also noted.

The detailed methods used to conduct the surveys to determine subsidence of the lake bed and the photographic surveys of seagrass distribution, density and conditions are described below. The same or similar methods should be used in future seagrass surveys to ensure consistency of results.

5.1.1 Seagrass Photography

A video camera fitted with a wide conversion lens and enclosed in an underwater housing is used to capture the video footage.

The camera in the underwater housing is mounted vertically in the centre of a 1 m long surfboard. This rig is towed alongside a workboat. Experimentation revealed that the best photographic results are obtained when the boat and photographic rig were poled very slowly along the transect line on windless days. Good quality photographs were obtained both in boat shadow and full sunlight although half shadow sequences could still be evaluated satisfactorily.

The water depth along most of the transect lines ranges from around 0.5 to 2 m (depending on the lake level). At the end of the transect line the water depth could be around 2 m. Transect lines are photographed from the outer end to the inner end. The beginning of each transect is marked by photographing a plate with the transect number printed in large type.

At the end of the each day's photography, the hard drive of the video camera is downloaded, the film is paused at around 1m intervals along the transect line. Each still frame is examined and the following information is recorded on a data sheet:

1. The file name and number of the video segment being examined;
2. The transect number and date the video was taken;
3. The percentage areas occupied by the following organisms in each still or quadrat was determined:

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- (a) % area occupied by long leaved seagrass (*Zostera capricorni*);
- (b) % area occupied by short leaved seagrass (*Zostera capricorni*);
- (c) % area occupied by the small seagrass (*Halophila ovalis*);
- (d) degree of fouling of the seagrass leaves by algae 1=no fouling, 2=light fouling, 3=heavy fouling;
- (e) % area occupied by the large brown alga (*Sargassum* sp., *Hormosira banksii* or *Cystoseira trinodis*);
- (f) % area occupied by filamentous and thallose algae (green or brown algae);
- (g) Number of the large bivalve *Pinna bicolor*;
- (h) % area of uncolonised (by macroscopic epibenthos) ground (bare ground).

At the end of the analysis of the photographs, the results are entered into a work sheet and mean values for each category of organism are calculated.

5.1.2 Surveying Methods

Surveyors have established base stations with their differential GPS equipment along the shore of Chain Valley Bay. A carbon fibre staff fitted with a 110mm diameter aluminium base plate (to prevent penetration into the sediment) is used to take the readings. Survey data (x, y & z coordinates) are recorded on a separate hand piece. Communication between the GPS receiver, the base stations and the hand piece is by coded radio signals.

The boat is maneuvered into position at the inshore end of each transect. The staff is placed on the lakebed and held vertically until the observation is made and recorded. The boat is then moved outwards from the shore where intermediate points along the transect were established and recorded. When the outer end of the transect is reached, the staff is placed alongside the concrete marker and the position and height of the lake bed was recorded.

The gps is downloaded and the following plots made:

- a map of the position of transects in Chain Valley Bay, Summerland Point and Bardens Bay;
- a table of the coordinates of inner and outer ends of each transect and the coordinates of the base stations are made; and
- elevations of the seabed at the inner and outer ends of each transect, relative to AHD, are established and tabulated.

The results from the seagrass monitoring, including determination of compliance with seagrass impact thresholds, is undertaken and reported back to DC in a formal report to be provided following the completion of each annual seagrass survey.

5.2 Monitoring Locations

Monitoring locations have been chosen based on the proposed mining activities that will be covered by the Seagrass Management Plan, over time, as this management plan is updated to reflect future mining locations, it is anticipated that additional monitoring transects will be incorporated and others removed from the monitoring regime as time progresses. More specifically, the monitoring locations proposed to be monitored are those that are adjacent to past, current and proposed mining activities that are within the review period of this management plan.

The monitoring locations are substantially derived from the original experimental and control transects selected by Laxton Environmental Consultants and JSA Environmental Pty Ltd who completed the Marine Ecology assessment that supported the Environmental Assessment for the Mining Extension 1 Project. An additional

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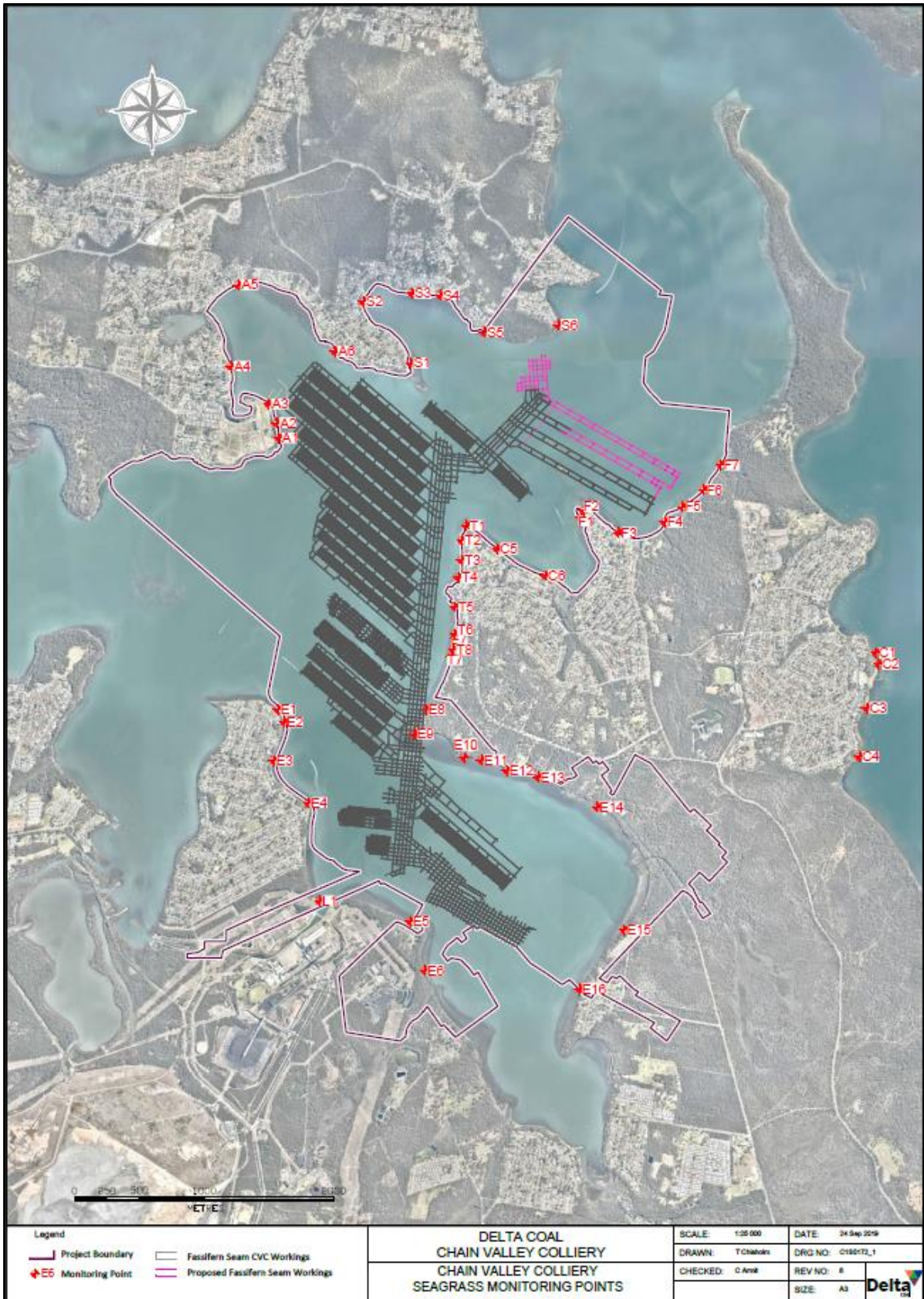
15 transects were added to the seagrass monitoring program as part of the latest revision to this plan to obtain baseline information within the areas of Frying Pan Bay, Sugar Bay and the Northern side of Point Wolstoncroft. Two additional Control Points (C5 and C6) were also added to the monitoring program in 2018.

The current monitoring locations are:

- Transects E1 to E16 Transects primarily in Chain Valley Bay and adjacent Summerland Point;
- Transects T1 to T8 Transects adjacent Summerland Point;
- Transects C1 to C6 Control stations in Crangan Bay and Frying Pan Bay;
- Transects A1 to A6 Transects primarily in Bardens Bay;
- Transect L1 Transect above potential future first workings in Chain Valley Bay;
- Transects S1 to S6 Transect adjacent Sugar Bay;
- Transects F1 to F7 Transects adjacent Frying Pan Bay and along Point Wolstoncroft.

Table 3 shows the GPS locations of the inner ends of the seagrass monitoring transects. Where available, reduced levels of the lakebed measured historically are presented. For sites that have not yet been surveyed by differential GPS, baseline depth levels will be obtained prior to any secondary extraction undertaken in the vicinity of the site. Transects in Crangan Bay were for control purposes only, i.e. no mining or subsidence impact potential, and accordingly no differential GPS depths/locations are required. Relocation of the control stations is done with hand-held GPS.

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Figure 1: Locations of Seagrass Monitoring Transects

Table 3: Seagrass Monitoring Transect Coordinates

Site	Easting	Northing	Reduced Level (m) – inner transect	Reduced Level (m) – outer transect
E1	363986	6331797	-0.68	-1.00
E2	364035	6331701	-0.64	-1.78
E3	363953	6331405	-0.32	-2.34
E4	364220	6331078	-0.46	-1.69
E5	365006	6330164	-0.46	-1.68
E6	365118	6329788	-0.48	-1.21
E7	365351	6332350	-0.24	-1.68
E8	365128	6331796	-0.27	-0.99
E9	365040	6331608	-0.19	-1.07
E10	365423	6331427	-0.41	-1.74
E11	365554	6331410	-0.40	-1.09
E12	365750	6331329	-0.59	-1.50
E13	365991	6331278	-0.59	-1.44
E14	366447	6331047	-0.52	-1.34
E15	366657	6330098	-0.39	-1.22
E16	366310	6329644	-0.55	-1.08
T1	365440	6333217	-0.40	-1.15
T2	365403	6333101	-0.70	-1.31
T3	365400	6332952	-0.29	-1.01
T4	365377	6332817	-0.46	-1.12
T5	365350	6332590	-0.42	-1.38
T6	365348	6332380	-0.47	-1.61
T7	365321	6332207	-0.17	-1.64
T8	365337	6332262	-0.20	-1.14
C1	368596	6332235	N/A	N/A
C2	368619	6332147	N/A	N/A
C3	368524	6331811	N/A	N/A
C4	368467	6331435	N/A	N/A
C5	365676	6333038	N/A	N/A
C6	366045	6332831	N/A	N/A
A1	363991	6333894	-0.51	-1.19
A2	363974	6334009	-0.39	-0.81
A3	363912	6334156	-0.33	-1.44
A4	363621	6334445	-0.16	-0.72
A5	363678	6335072	-0.30	-0.96
A6	364423	6334560	-0.14	-0.68
L1	364306	6330322	-1.12	-1.63
S1	365009	6334470	-0.64	-1.78
S2	364642	6334943	-0.28	-1.59
S3	365017	6335008	-0.11	-1.87
S4	365235	6334992	-0.11	-1.73
S5	365575	6334709	-0.69	-1.39
S6	366144	6334765	-0.1	-0.92
F1	366321	6333281	-0.25	-1.31
F2	366342	6333330	-0.24	-1.98
F3	366611	6333163	-0.11	-1.88
F4	366968	6333242	-0.11	-2.45
F5	367106	6333361	-0.33	-2.46
F6	367271	6333493	-0.3	-2.81

Site	Easting	Northing	Reduced Level (m) – inner transect	Reduced Level (m) – outer transect
F7	367402	6333682	-0.48	-1.4

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6 Reporting

6.1 Regular reporting

In accordance with Schedule 6, Condition 8, DC 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 seagrass monitoring results will be reviewed on an annual basis as survey reports are received to confirm compliance with the conditions specified in the *Subsidence Impact Performance Measures - Natural and Heritage Features* found in Table 2 and the criteria outlined in **Section 4.2**.

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 be forwarded to the relevant authorities including the DPIE, the EPA, members of the Community Consultative Committee and local Councils (Wyong and Lake Macquarie) and will also be placed on the MC website along with a summary of environmental monitoring results.

6.3 Incident or Non Compliance Reporting

If seagrass monitoring reveals that, as a result of mining activities, the criterion outlined in **Section 4.2** have been exceeded, then DC will conduct an investigation into the cause of the non-compliance. As detailed in Schedule 6, Condition 7 of SSD-5465, 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 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 impacts and prevent further such occurrences.

DC will implement the recommendations of the investigation in order to address any potential future incidents. Additional details of the incident reporting process are provided in the Environmental Management Strategy (EMS).

Any incidents or complaints will be recorded and fully investigated to find root causes and corrective actions implemented where necessary

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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. 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.

7.2 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*

7.3 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.

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7.4 Training, Awareness and Competence

Training is an essential component of the implementation phase of this Seagrass Management Plan. Any person or position that has a role or responsibility under this document will be provided with a copy of the document and be advised verbally regarding their requirements by the Environment and Community Coordinator.

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 management plan.

8 Audit and Review

8.1 Review and improvement

In accordance with Schedule 6, Condition 5 of SSD-5465, this management plan 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 project approval.

8.2 Audits

Internal and external audits of this document will be carried out as described below. Internal and external audits shall be objective and if possible be conducted by a person or organisation independent of the document being audited.

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.

An Independent Environmental Audit (IEA) was undertaken during June 2019. In accordance with SSD-5465 Schedule 6, Condition 9, IEA's will be scheduled for every three years thereafter (unless the Secretary directs otherwise) by an audit team whose appointment has been endorsed by the Secretary.

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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 are maintained include:

- monitoring data and equipment calibration;
- environmental inspections and auditing results;
- environmental incident reports;
- complaint register; and
- licenses 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 (EMS) 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. Details on document revisions are provided in **Table 4**.

Table 4: Document Revision Details

Version	Date	Details of Revision	Company	Reviewed by/ Authorised by
1	16/08/2013	Final	LakeCoal	Chris Ellis
2	09/04/2014	Final	LakeCoal	Chris Ellis
3	4/11/2016	Final	LakeCoal	Wade Covey
5	17/06/2019	Update to Delta Coal format and include proposed S2/S3 secondary workings	Delta Coal	Wade Covey Chris Armit Dave McLean
6	10/03/2020	Update to include proposed S4 secondary workings / 2019 Seagrass report	EMM Consulting	Katie Weekes Chris Armit
7	12/5/2020	Update to include DPIE comments	DeltaCoal	Chris Armit

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10 Roles and Responsibilities

Roles and responsibilities specific to completing the requirements of the Seagrass Management Plan are identified in **Table 5**.

Table 5: Seagrass Management Roles and Responsibilities

Role	Responsibilities
Mine Manager	<ul style="list-style-type: none"> • Ensure that adequate financial and personnel resources are made available for the implementation of the Seagrass Management Plan. • Ensure mine layout and workings are as approved, taking into consideration the seagrass barriers
Environment Compliance Officer	<ul style="list-style-type: none"> • Co-ordinate seagrass monitoring, through the use of differential GPS surveying and photographic monitoring of seagrass beds. • Develop management actions in consultation with regulatory agencies as/if required from the monitoring results. • Review seagrass monitoring results on an annual basis. • Send Annual Seagrass Monitoring reports to DPI Fisheries, DPIE-BCD and DPIE-Compliance • Compile the Annual Review (including a summary of the annual seagrass survey). • Respond to any potential or actual non-compliance and report these as required to regulatory bodies and other stakeholders. • Undertake reviews of this document as per Section 9 • Undertake or coordinate the required audits of this document, in accordance with Section 9. • Notify the DPI Fisheries, Department of Industry – Resources and Energy and Department of Planning and Environment if there are any exceedances in impact thresholds outlined in Section 4.2 • Ensure complaint handling and response is undertaken, including determination of sources and potential remedial action to avoid recurrence.
Mine Surveyor	<ul style="list-style-type: none"> • Ensure mine layout and workings are as approved, taking into consideration the seagrass barriers

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11 References & Associated Documents

Documents referenced in the preparation of the Seagrass Management Plan are detailed in **Table 6**.

Table 6: References and Associated Documents

Reference type	Document
Australian Standards	AS/NZS ISO 14001:2004 <i>Environmental management systems – Requirements with guidance for use</i> AS/NZS ISO 14004:2004 <i>Environmental management systems – General guidelines on principles, systems and support techniques</i>
Legislation and regulations	NSW DPI (2007) <i>PrimeFacts 629 - Seagrasses</i> . NSW EPA, EPL 1770 <i>Environment Protection License 1770</i> SSD-5465 Development Consent SSD-5465 (Modification 2) dated 16 December 2015 for the Mining Extension 1 Project POEO Act 1997 Protection of the Environment Operations Act, 1997
Delta Coal documents	EMS Environmental Management Strategy.
External documents	Bell, F.C. and Edwards, A.R. (1980) <i>An Environmental Inventory of Estuaries and Coastal Lagoons in New South Wales</i> . Total Environment Centre. BioAnalysis (2008) <i>Assessment of seagrasses associated with proposal to expand the Lake Macquarie yacht club in Belmont Bay</i> . EMM (June 2015) <i>Chain Valley Colliery Modification 2 Statement of Environmental Effects</i> , prepared by EMGA Mitchell McLennan (EMM) dated 29 June 2015. Laxton, J.H. (2005) <i>Water Quality of Lake Macquarie</i> . J.H. & E.S. Laxton – Environmental Consultants P/L. Unpublished Report. Laxton, E. and Laxton, J.H. (August 2007) <i>Aquatic Biology of Chain Valley Bay Lake Macquarie, NSW</i> . J.H. & E.S. Laxton – Environmental Consultants P/L. Unpublished report prepared for Chain Valley Colliery Laxton, J.H. and Laxton, E. (July 2008) <i>Seagrass Survey of Chain Valley Bay Lake Macquarie, NSW</i> . J.H. & E.S. Laxton – Environmental Consultants P/L. Unpublished report prepared for Chain Valley Colliery. Laxton, J.H. and Laxton, E. (2009). <i>Peabody Energy – Chain Valley Colliery. Aquatic Biology of Domain No. 2 off Summerland Point, Lake Macquarie, NSW</i> . Emma and John H. Laxton. July 2009 Laxton, J.H. and Laxton, E. (2011). <i>Seagrass Survey of Chain Valley Bay, Summerland Point and Crangan Bay, Lake Macquarie, NSW</i> (Results from 2008, 2010 and 2011) J.H. & E.S. Laxton – Environmental Consultants

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	<p>P/L. Unpublished report prepared for Chain Valley Colliery.</p> <p>Laxton, J.H. and Laxton, E. (2012). <i>Seagrass Survey of Chain Valley Bay, Summerland Point and Crangan Bay, Lake Macquarie, NSW</i> (Results from 2008, 2010, 2011 and 2012) J.H. & E.S. Laxton – Environmental Consultants P/L. Unpublished report prepared for Chain Valley Colliery.</p> <p>Laxton, J.H. and Laxton, E. (2013). <i>Seagrass Survey of Chain Valley Bay, Summerland Point and Crangan Bay, Lake Macquarie, NSW</i>. (Results for 2008, 2010, 2011, 2012 and 2013). J.H. & E.S. Laxton – Environmental Consultants P/L. Unpublished report prepared for Chain Valley Colliery.</p> <p>Laxton, J.H. and Laxton, E.S. (2014) <i>Seagrass Survey of Chain Valley Bay, Summerland Point and Crangan Bay, Lake Macquarie, NSW</i> (Results for 2008 to 2014). J.H. & E.S. Laxton – Environmental Consultants P/L. Unpublished report prepared for Chain Valley Colliery.</p> <p>Laxton, J.H. and Laxton, E.S. (2015) <i>Seagrass Survey of Chain Valley Bay, Summerland Point and Crangan Bay, Lake Macquarie, NSW</i> (Results for 2008 to 2015). J.H. & E.S. Laxton – Environmental Consultants P/L. Unpublished report prepared for Chain Valley Colliery.</p> <p>Laxton, J.H. and Laxton, E.S. (2016) <i>Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay, Lake Macquarie, NSW</i> (Results for 2008 to 2016). J.H. & E.S. Laxton – Environmental Consultants P/L. Unpublished report prepared for Chain Valley Colliery.</p> <p>Laxton, J.H. and Laxton, E.S. (2017) <i>Seagrass Survey of Chain Valley Bay, Summerland Point, Bardens Bay and Crangan Bay, Lake Macquarie, NSW</i> (Results for 2008 to 2017). J.H. & E.S. Laxton – Environmental Consultants P/L. Unpublished report prepared for Chain Valley Colliery.</p>
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12 Definitions

CVC Delta Coal - Chain Valley Colliery

DC Delta Coal

DP&E Department of Planning & Environment (former)

DPIE Department of Planning, Industry and Environment

DPI Fisheries Department of Primary Industries NSW Department of Primary Industries – Fisheries

EMS Environmental Management System

EPA NSW Environment Protection Authority

EPL Environment Protection License

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

HWM High Water Mark

LMCC Lake Macquarie City Council

POEO Act *Protection of the Environment Operations Act 1997*

OEH Office of Environment and Heritage

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

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

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Appendix 1: Consultation

From: Chris Armit Sent: Fri 20/12/2019 4:57 AM
 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

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 be 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: Chris Armit Sent: Sun 17/11/2019 6:16 AM
 To: 'scott.carter@dpi.nsw.gov.au'; 'Ray Ramage'; 'Karen Mason'; 'rog.hcc@environment.nsw.gov.au'
 Cc: 'compliance@planning.nsw.gov.au'; 'Katie Weekes'; 'Colin Phillips'; 'Chris Nicholas'
 Subject: Chain Valley Colliery - Seagrass Management Plan for comment


Message Draft - CVC Seagrass Management Plan 17.11.2019.pdf (4 MB) Open PDFs in Adobe Acrobat

Hi All,

Please find attached a review of the Chain Valley Colliery - Seagrass Management Plan for your comment.
 This is an update on the Seagrass Management Plan June 2019 review which was for Miniwalls S2 and S3 and includes the proposed adjacent S4 Miniwall.

By way of an update of Chain Valley's operations, secondary extraction mining is currently occurring in the S2 miniwall panel.

regards,
 Chris

 **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.

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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	<i>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.</i>
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



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 to the identified matters, revise the Extraction Plan and re-submit it to the Department via the Planning Portal. The attachment contains 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 methodology presented in the Appendix 13, the calculations are most likely incorrect and will have implications as to 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 - Seagrass Management plan related comments	Response
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

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8. Appendix 7 Seagrass MP - Section 3.4 states that the Seagrass Protection Barrier is further described in Section 3.1. This is not so. Maybe this description is located in Section 4.1 or 4.2???	Reference in section 3.1 updated
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Appendix 2: Development consent summary

Chain Valley Colliery SSD-5465 Summary

Relevant sections of SSD-5465 detail the requirements of the SMP and are reproduced in **Table A2** below along with identification of where the requirements are addressed in this document.

Table A2: Requirements from Chain Valley Colliery Development Consent (SSD-5465)

Condition No.	Requirements	Relevant section of this document												
Schedule 4 Environmental Conditions – Underground Mining														
2	<p>Performance Measures- Natural Environment</p> <p><i>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.</i></p> <p><i>Table 8: Subsidence Impact Performance Measures</i></p> <table border="1"> <tr> <td colspan="2">Biodiversity</td> </tr> <tr> <td><i>Threatened species or endangered populations</i></td> <td><i>Negligible environmental consequences</i></td> </tr> <tr> <td><i>Seagrass beds</i></td> <td> <i>Negligible environmental consequences including:</i> <ul style="list-style-type: none"> <i>Negligible change in the size and distribution of seagrass beds;</i> <i>Negligible change in the functioning of seagrass beds; and</i> <i>Negligible change to the composition or distribution of seagrass species within seagrass beds.</i> </td> </tr> <tr> <td><i>Benthic communities</i></td> <td><i>Minor environmental consequences, including minor changes to species composition and/or distribution</i></td> </tr> <tr> <td colspan="2">Mine workings</td> </tr> <tr> <td><i>First workings under an approved Extraction Plan beneath any feature where performance measures in this table require negligible environmental consequences</i></td> <td><i>To remain long-term stable and non-subsiding.</i></td> </tr> </table>	Biodiversity		<i>Threatened species or endangered populations</i>	<i>Negligible environmental consequences</i>	<i>Seagrass beds</i>	<i>Negligible environmental consequences including:</i> <ul style="list-style-type: none"> <i>Negligible change in the size and distribution of seagrass beds;</i> <i>Negligible change in the functioning of seagrass beds; and</i> <i>Negligible change to the composition or distribution of seagrass species within seagrass beds.</i> 	<i>Benthic communities</i>	<i>Minor environmental consequences, including minor changes to species composition and/or distribution</i>	Mine workings		<i>First workings under an approved Extraction Plan beneath any feature where performance measures in this table require negligible environmental consequences</i>	<i>To remain long-term stable and non-subsiding.</i>	Section 1
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	<p>Second workings</p>	<p>To be carried out only in accordance with an approved Extraction Plan.</p>	
<p>3</p>	<p>Offsets</p> <p>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.</p>	<p>Section 4</p>	
<p>7</p>	<p>Extraction Plan</p> <p>(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:</p> <ul style="list-style-type: none"> • 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. <p>The Applicant shall implement the approved management plan as approved from time to time by the Secretary.</p> <p>Notes:</p> <ul style="list-style-type: none"> • 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. 	<p>This document</p>	

<p>8</p>	<p><i>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</i></p>	<p>Section 4 and 6</p>
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