CULLEN VALLEY MINE

EROSION AND SEDIMENT CONTROL PLAN

for Shoalhaven Coal Pty Ltd

20 April 2022

DOCUMENT CONTROL

Document Status

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Client	Shoalhaven Coal Pty Ltd
Client Address	Castlereagh Highway, Cullen Bullen NSW 2709
Author	James Bailey & Associates Pty Ltd
Author Address	6/127-129 John Street, Singleton NSW 2330
Our Reference	*220420 Erosion and Sediment Control Plan_Final*

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1. INTRODUCTION

1.1 BACKGROUND

Cullen Valley Mine (CVM) is located near Cullen Bullen in the Western Coalfields of NSW, approximately 30 km north-west of Lithgow (see **Figure 1**). Underground mining commenced at CVM (formerly Tyldesley Colliery) around 1904 and continued up until the 1960s when the workings were abandoned. Early open cut operations were conducted on the site between 1948 and 1953.

The current development consent for CVM (DA 200-5-2003) was granted by the Department of Infrastructure and Planning (now the Department of Planning and Environment (DPE)) in August 2004 for a period of 21 years. The conditions of DA 200-5-2003 were subsequently modified in December 2004 to allow for the transportation of product coal from CVM to domestic destinations other than Mount Piper Power Station. The conceptual layout of the site as approved under DA 200-5-2003 is shown on **Figure 2**.

Mining of coal at CVM commenced in May 2000 using open cut methods following a four-month construction phase and continued until the site was placed in Care and Maintenance in early 2013.

Shoalhaven Coal Pty Ltd (trading as Castlereagh Coal Pty Ltd (Castlereagh Coal)) purchased CVM in May 2015 and has operated the mine under Care and Maintenance since that time. Castlereagh Coal intends to recommence open cut coal mining operations at CVM in early 2022 within the existing disturbance area approved under DA 200-5-2003. The operations are planned to recover approximately 450,000 tonnes of coal and to carry out associated rehabilitation activities, which are scheduled to be undertaken over a period of approximately 9 months. Coal produced from these operations will be transported by road to domestic destinations as currently approved.

1.1 DOCUMENT PURPOSE AND SCOPE

This Erosion and Sediment Control Plan (ESCP) document has been prepared to describe the operational management of erosion and sediment control impacts and performance at CVM. This revision of the ESCP has been prepared in accordance with the requirements of DA 200-5-2003 for use by Castlereagh Coal during the recommencement of mining operations on site.

Other management documents that should be read in conjunction with this ESCP include:

- CVM Environmental Management Strategy (EMS);
- CVM Site Water Management Plan (SWMP); and
- CVM Environmental Monitoring Program (EMP).

1.2 DOCUMENT OBJECTIVES

The objectives of this document are to:

- Describe soil resources and topsoil management at CVM;
- Identify activities that have potential to cause soil erosion, or generate pollution or sediment ladened water off-site;
- Provide an overview of erosion and sediment control measures to minimise soil erosion at CVM; and

- Ensure that erosion and sediment control structures are appropriately designed and maintained.

Statutory requirements from DA 200-5-2003 that relate to this ESCP and where they are addressed in this document are provided in **Table 1**.

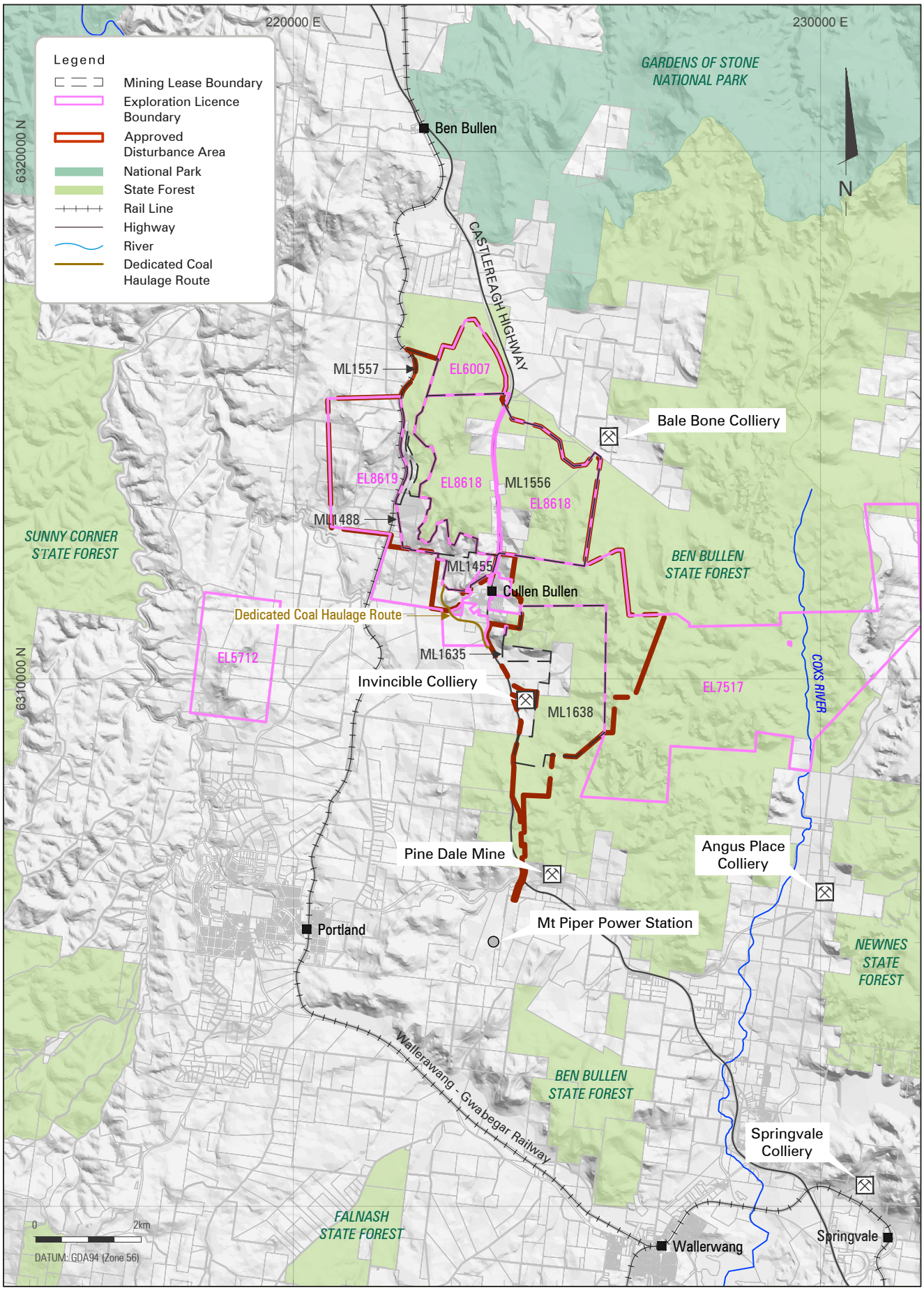
Table 1 ESCP Requirements

DA 200-5-2003 Condition	Requirement	Where Addressed
Schedule 4, Condition 43	Within 6 months of the date of this consent, the Applicant shall prepare (and then implement) a Site Water Management Plan for the development, in consultation with DEC and DPI, and to the satisfaction of the Director-General. This plan must Include; (c) an Erosion and Sediment Control Plan.	**Section 2**, CVM SWMP
Schedule, Condition 45	(a) comply with the requirements of the Department of Housing's Managing Urban Stormwater: Soils and Construction manual [Landcom, 2004];	**Section 2.4** - **Section 2.5**
	(b) identify activities that could cause soil erosion or discharge sediment or water pollutants from the site;	**Section 2.3**
	(c) describe the location, function and capacity of all erosion and sediment control structures, and nominate which, if any, of these structures would be used as water sources for the development; and	**Section 2.4**
	(d) describe the measures to minimise soil erosion and the potential migration of sediments to downstream waters.	**Section 2.4** – **Section 2.6**

1.3 DOCUMENT STRUCTURE

This document is structured as follows:

- **Section 1** introduces CVM and outlines the purpose, scope and objectives of this ESCP;
- **Section 2** outlines erosion and sediment control risks and constraints for CVM and the control measures to be implemented on site;
- **Section 3** outlines stakeholder engagement completed in the preparation of this ESCP and procedures for the response to incidents and complaints;
- **Section 4** provides an overview of the roles and responsibilities of CVM personnel in relation to air quality management;
- **Section 5** outlines the reporting requirements for this ESCP; and
- **Sections 6** and **7** provide a list of refence documents and abbreviations used in this ESCP.

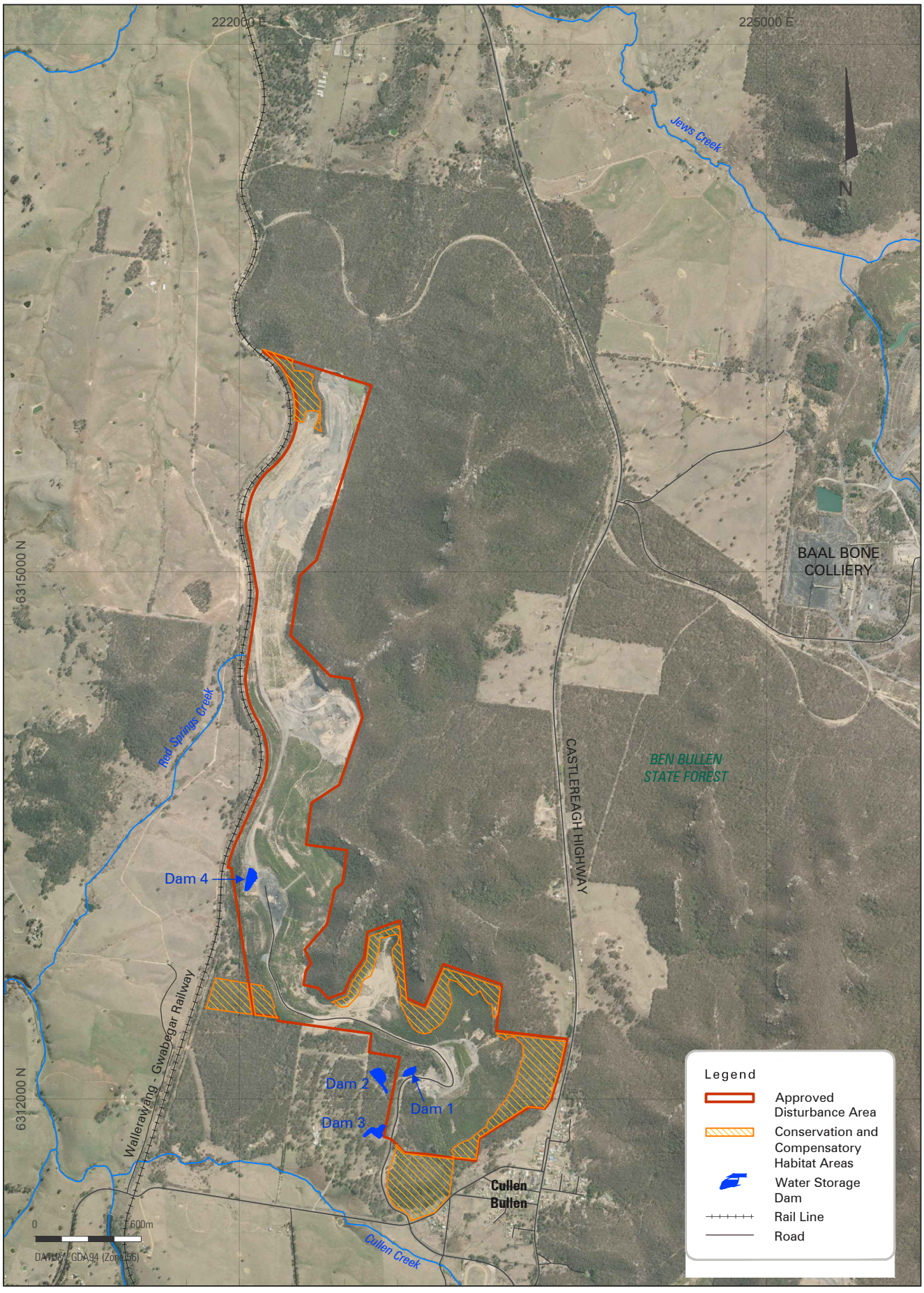


JBA 2187 CVM - F 01 REGIONAL LOCALITY (12/04/2022)

CULLEN VALLEY MINE

Regional Locality

FIGURE 1



JBA 2187 CVM - F 00 CONCEPTUAL PROJECT LAYOUT (9/02/2022)

CULLEN VALLEY MINE

Conceptual Project Layout

FIGURE 2

2. EROSION AND SEDIMENT CONTROL PLAN

2.1 SOIL CHARACTERISTICS

Soils within the CVM site have been developed on the Illawarra Coal Measures and are naturally low in fertility, slightly acidic and moderately erosive. Soil resources present at CVM include:

- Structured loams and Gleyed Podzolic Soils. Confined to narrow open drainage depressions with slope gradients > 5%. These soils occur on the open valleys and may be stripped to an average depth of 15 cm;
- Yellow Podzolic Soils. Located on convex crests and adjacent side slopes with gradients < 10%. Only small sections of this soil type occur, usually on steeper sections above and around the valleys. These soils may be stripped to an average depth of 10 cm; and
- Skeletal Sandy Soils. Located on the undisturbed main ridge and steep side slopes. This area will not yield high volumes of soil, but where available will be stripped to a depth of 10 cm.

The remaining soils are generally shallow and stony and not conducive for rehabilitation purposes. Heavy clay subsoils will be used as required to line dams and any additional tank bunding but will otherwise be buried within the rehabilitated landform. Lighter clay subsoils are generally used to dress finished landforms prior to topsoiling. There are no acid sulphate soils on site.

2.2 DRAINAGE CHARACTERISTICS

On a local scale, CVM is located within the catchments of Red Springs Creek, Cullen Creek and Jews Creek (refer **Figure 2**). Red Springs Creek, Cullen Creek and their tributaries are ephemeral watercourses that drain the southern extent of the site. Red Springs Creek flows in a south-westerly direction before joining Dulhuntys Creek which in turn joins Williwa Creek which then flows into Jews Creek before joining the Turon River. Cullen Creek flows in a westerly direction before joining Dulhuntys Creek.

Ephemeral tributaries of Jews Creek drain the northern portion of the site. The Jews Creek confluence with the Turon River is approximately 17 km north-west of CVM.

2.3 EROSION AND SEDIMENT IMPACTS

Potential risks and causes of soil erosion and sediment impacts from CVM are listed in **Table 2**.

Table 2 Potential Sources of Soil and Erosion Impacts

Risk Factor / Operational Activities	Potential Impacts
High rainfall events	Elevated surface water and sediment flows greater than erosion and sediment control structure designs.
Vehicle movement over exposed areas	Disturbance of the surface during mining, overburden emplacement activities, leading to increased runoff potential.
Runoff from exposed areas, hardstands	Potential for control structure overflow in high rainfall events.
Exposed soils in stripping and rehabilitation areas in early development	Limited cohesion in topsoils leading to increased sediment and erosion potential.

Risk Factor / Operational Activities	Potential Impacts
Eroded / poorly maintained drainage channels	Potential for uncontrolled runoff if not appropriately maintained; may result in off-site water quality impacts.
Water storage dams / sediment basins	Potential for uncontrolled runoff if not appropriately maintained; may result in off-site water quality impacts.

2.4 EROSION AND SEDIMENT MANAGEMENT

The primary objective of the erosion and sediment control system is to safeguard against soil loss and in turn, minimise the risk of potential water quality impacts. As noted in the SWMP, the CVM water management system has been implemented to separate clean water and mine water catchments on site. Runoff from disturbed areas will continue to be managed within the existing site water management system (refer to the CVM SWMP), with additional erosion and sediment controls to be implemented and maintained in accordance with the principles and management measures described in the Blue Book (Landcom, 2004).

A description of erosion and sediment controls that will be used during CVM mining operations are outlined in **Section 2.4.1** to **Section 2.4.4**.

2.4.1 Sediment Fences

Sediment fences will be constructed around the site at locations where the potential for erosion exists, in advance of normal pollution control facilities such as during the construction of the advancing drainage system and clearing of vegetation. The purpose of sediment fencing is to provide a temporary control for runoff from disturbed areas, trapping the sediment and allowing filtered water to pass through. The reason for using a filter fabric instead of a straw bale filter is the ease of removing trapped material to be returned to the topsoil stockpile.

The filter fabric will have a sufficient permeability to allow sheet flow during minor rain events without creating water build-up. Each fence will have a silt retention efficiency of at least 75%. By using the fences in parallel, the overall retention efficiency can be increased.

Sediment fences are not to be used in concentrated water flow paths.

2.4.2 Sediment Basins

If required, sediment control basins would be constructed within the dirty water system to complement the main pollution control structures already in place on site (Dam 1 to Dam 4 on **Figure 2**). These basins may include temporary structures to control runoff from new disturbance areas such as access tracks, as well as permanent structures to control runoff from mining and infrastructure areas.

Any additional sediment basins required on site will be designed and constructed in accordance with the Blue Book (Landcom, 2004).

2.4.3 Drainage Channels

Drainage channels have previously been constructed on site to convey dirty water within the water management system. Any additional drains to be constructed to direct the flow of water within the mine water management system will be designed and sized in accordance with the Blue Bok (Landcom, 2004) and lined with an appropriate groundcover (to reduce scour potential) and velocity checks (to reduce water flows).

Channels will be inspected on a regular basis to identify and repair damage caused by scour, sediment deposition, channel obstruction and loss of vegetative cover.

2.4.4 Vegetation Clearing

Any vegetation clearance on site will be undertaken in accordance with the CVM Flora and Fauna Management Plan. When clearing is required, the vegetation will be progressively stripped and windrowed away from site activities.

No vegetation clearing will be completed unless a prior assessment has been undertaken to determine whether any additional erosion and sediment controls are required. Where clearing is required to install erosion and sediment control structures, the area of clearing shall be minimised.

2.5 TOPSOIL MANAGEMENT

Topsoil is a valuable natural resource for site rehabilitation which will be handled separately underlying subsoils and overburden. Prior to any disturbance, topsoil will be stripped and stockpiled separately. Several stockpile locations may be required during the course of the operation and will be located close to areas available for rehabilitation, where practicable. Topsoil stockpiles will generally be less than 2 m high, with side slopes of 3:1 (H:V) or less. Stockpile length will vary according to quantity.

An important factor with topsoil management is to minimise compaction and loss of structure. This will be achieved by minimising the amount of rehandling required and by keeping the distance between the stripping areas, stockpiles and eventual end use site to a minimum. It is also important to avoid large topsoil stockpiles and compaction during handling since this can lead to anaerobic conditions within the soil.

Topsoil will be progressively stripped from disturbance areas, no longer than 12 months ahead of scheduled overburden removal. This will reduce the life of each topsoil stockpile as well as minimising the area of total disturbance at any one time. Topsoil will be used progressively on rehabilitated land as mining progresses. Although topsoil will be stockpiled for no longer than 12 months, they are normally sown with sterile pasture seed. This will help minimise loss of the material and infestation by weed species. Silt fences will also be constructed, if no other controls are in place, around the lower toe of each stockpile to control soil loss prior to its use in rehabilitation works.

2.5.1 Stripping Methods and Stockpiling

The quality of topsoil can be degraded during the stripping process, therefore particular attention will be given to the following matters:

- Vehicular traffic will be kept to a minimum on those soils which are to be stripped, to reduce soil compaction and structural decline;
- Soil should be stripped when it is in a slightly moist condition. Material should not be stripped in either a dry or wet condition because the possibility of soil structural decline.
- Topsoil will be loaded and transported directly to areas being rehabilitated or to a designated stockpile area.
- Vegetation clearing will avoid contamination of the topsoil with large quantities of green material as this promotes biological degradation (composting) of runners, roots and seeds which would otherwise be a source of regrowth when topsoil is respread;
- Where indicated as available, topsoil will be stripped in accordance with this ESCP and the Flora and Fauna Management Plan. The stripping depths are only indicative as there may be areas with deeper or shallower soils depending on local topographic conditions;
- Equipment operators involved in topsoil stripping will be instructed on topsoil identification to maximise recovery and to avoid contamination of the target soil with subsurface material;

- Since the subsoil clays are dispersive, the topsoil stripping phase will avoid their removal. However, an A2 horizon exists to a depth of up to 30 cm. This material will be stripped where available and stockpiled separately;
- Where possible soil material will be directly used in rehabilitation rather than stockpiled;
- When it is necessary to stockpile topsoil, the pile should not be deeper than 2 m;
- Stockpiles will be revegetated and fertilised as soon as possible;
- Stockpiles will be located in areas protected from runoff and wind erosion; and
- A good vegetative cover crop will be maintained on stockpiles by excluding all stock and controlling weed growth.

2.6 EROSION AND SEDIMENT CONTROL MONITORING

The CVM site water management system and water monitoring network are described in the CVM EMP and SWMP documents.

An indication of the effectiveness of the sediment and erosion control structures is also obtained through regular visual inspections. These inspections will focus on permanent erosion and sediment control structures and areas where the ground has been disturbed and soils are exposed. Recently disturbed sites are most vulnerable to erosion and loss of sediment following periods of heavy rainfall.

In the event that water quality monitoring or visual inspections carried out on indicate elevated levels of erosion or sedimentation, the applicable erosion and sediment control structures will be inspected to determine the cause and the necessary mitigation works required to ensure that the structure(s) are operating effectively.

Erosion and sedimentation controls will be inspected on a monthly basis and:

- Prior to a forecast rain event greater than 25 mm in 24 hours; and
- Following a rain event of greater than 25 mm in 24 hours.

Drains and dams will generally be scheduled for desilting when the capacity of a structure has been reduced by 30%.

3. STAKEHOLDER ENGAGEMENT

3.1 ESCP CONSULTATION

Correspondence with regulatory agencies relating to this revision of the ESCP included as **Appendix A**.

3.2 EXTERNAL COMMUNICATIONS

3.2.1 Community Complaints

All community plaints received by CVM are recorded in the Castlereagh Coal Complaints Register. The register is regularly maintained and published on the Castlereagh Coal website to document a summary of all complaints received and follow-up actions taken by CVM personnel in response.

Further detail on the management of community complaints is provided within Section 6.1.3 of the CVM EMS.

3.2.2 Incidents and Non-Compliances

Schedule 6, Condition 5 of DA 200-5-2003 requires CVM to report any non-compliances against site water impact criteria to regulatory agencies and describe the exceedances in the Annual Review.

- Any reporting of a breach in compliance will outline the following:
- The date, time, and nature of the exceedance/incident;
- The cause (or likely cause) of the exceedance/incident;
- Reference to the development consent condition which is considered to be non-compliant and the reasons for it;
- What action has been taken to date; and
- Describe the proposed measures to address the exceedance/incident and the proposed timeframe for completion.

Any incident will be reported to DPE and other relevant regulatory authorities immediately after becoming aware of the incident. Any non-compliance must be notified to DPE by the operator within seven days of becoming aware of the non-compliance. These notifications for incidents or non-compliances will be submitted in writing via the DPE's Major Projects Website and identify the development (including the development application number and name) and set out the location and nature of the incident, as outlined above.

4. ROLES & RESPONSIBILITIES

Table 3 outlines the key roles and responsibilities for CVM personnel in relation to this ESCP.

Table 3 ESCP Roles and Responsibilities

Ref	Control Measure	Responsibility	Timing
1.	• Review and approve this ESCP and provide adequate resources for its implementation on site.	Operations Manager	Ongoing
2.	• Complete regular inspections site water storage structures and controls to confirm that management measures are being implemented to minimise potential impacts.	Mining Supervisor	Monthly
	• Assist the Environment Officer with investigations into site water related incidents, non-compliances, and complaints.		As required
3.	• Manage the implementation of this ESCP during CVM operations.	Environment Officer	Ongoing
	• Respond to complaints and maintain CVM Complaints Register.		Ongoing
	• Investigate erosion and sediment control incidents and prepare associated reporting for regulatory agencies as required.		As required
	• Facilitate regular training of CVM personnel in the requirements of this ESCP.		Annual
	• Complete review of this ESCP to ensure consistency with current CVM operations and industry standards and procedures.		Five Yearly
4.	• Comply with the requirements of this ESCP.	All CVM personnel	Ongoing
	• Report any activities which are generating excessive erosion and sediment to the equipment operator and/or Mining Supervisor.		Ongoing

5. REVIEW & REPORTING

5.1 ANNUAL REPORTING

In accordance with Schedule 6, Condition 5 of DA 200-5-2003, CVM will continue to submit an Annual Review to DPE and relevant agencies which includes results of monitoring in this ESCP. Information to be provided in the Annual Review will include:

- A summary of the water monitoring results for the development during the year;
- A detailed analysis of these monitoring results against the relevant impact assessment criteria, monitoring results from previous years, and predictions made in the EIS;
- Identification of any trends in the monitoring over the life of the development;
- Identification of any non-compliances during the reporting period and the findings of any TARP investigations; and
- A description of what management actions were or are being taken to ensure compliance with relevant planning criteria.

A copy of each CVM Annual Review is provided to DPE, Department of Regional NSW-RR, EPA, LCC and the representatives of the mine Community Consultative Committee (CCC).

5.2 STAKEHOLDER REPORTING

In accordance with Schedule 6, Condition 8 of DA 200-5-2003 CVM has established a CCC to oversee the environmental performance of the mine. While in operation, the CCC will meet at least twice a year and will review and provide advice on environmental performance including this document, monitoring results, audit reports or complaints.

5.3 AUDITING

In accordance with Schedule 5, Condition 6 of DA 200-5-2003, Castlereagh Coal is required to commission an Independent Environmental Audit within 2 years of the date of consent, and every five years thereafter, for submission to DPE, unless otherwise approved. This audit report is required to consider the effectiveness of the SWMP and will provide environmental management advice to ensure its ongoing effectiveness.

5.4 REVIEW

This ESCP will be reviewed on at least a five yearly basis to ensure that it remains consistent with operations at CVM and in accordance with general industry standards and procedures. Reviews will consider the need to modify the ESCP and associated management measures in place at CVM. The ESCP will also be reviewed (and if necessary, updated) in response to:

- Relevant findings from Independent Environmental Audits;
- Findings from water data investigations, community complaints or monitoring non-compliances relating to water impacts; and
- Directions from regulatory agencies.

Castlereagh Coal is currently conducting a work program to address a regulatory notice from the Department of Regional NSW – RR in relation to landform stability and surface water management. Upon the completion of this work program, Castlereagh Coal will review this ESCP to determine the need for revision to the erosion and sediment control framework described within this plan. If required, this ESCP will be updated to address any required changes.

Approval of any major amendments to this ESCP will be sought from the Secretary of DPE and other stakeholders, as required under DA 200-5-2003.

6. REFERENCES

- Castlereagh Coal (2022) *Cullen Valley Mine Environmental Management Strategy*.
- Castlereagh Coal (2022) *Cullen Valley Mine Environmental Monitoring Program*.
- Landcom (2004) *Managing Urban Stormwater: Soils and construction - Volume 1.*
- Landcom (2004) *Managing Urban Stormwater: Soils and construction - Volume 2.*
- International Environmental Consultants (2003) *Cullen Valley Mine Lease Extension Project.*

7. ABBREVIATIONS

Abbreviation	Meaning
CCC	Community Consultative Committee
CVM	Cullen Valley Mine
DPE	Department of Planning and Environment
RR	Department of Regional NSW - Resource Regulator
EIS	Environmental Impact Statement
EMP	Environmental Monitoring Program
EPA	Environmental Protection Authority
ESCP	Erosion and Sediment Control Plan
LCC	Lithgow City Council
TSS	Total Suspended Solids

APPENDIX A

STAKEHOLDER ENGAGEMENT

RVF22/403#17
MAAG0013530

Mr

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Via: Major Project Portal / Email

Dear

Re. Cullen Valley Coal – CVM Erosion and Sediment Control Management Plan

I refer to your request of 18 February 2022 for advice regarding Cullen Valley Coal – CVM Erosion and Sediment Control Management Plan. The Resources Regulator has reviewed the request.

It should be noted that the Resources Regulator has issued notices to Cullen Valley mine to address risks associated with landform stability and surface water management structures located in the rehabilitated landform. Following the outcomes of this process, which may lead to modifications of the surface water management system, a future amendment to the CVM Erosion and Sediment Control Management Plan may be subsequently required.

Background
The Mining Act Inspectorate within the Resources Regulator undertake risk-based compliance and enforcement activities in relation to obligations under the *Mining Act 1992*. This includes undertaking assessment and compliance activities in relation to mine rehabilitation activities and determination of security deposits.

The Mine Safety Inspectorate within the Resources Regulator is responsible for ensuring the mine operators' compliance with the Work Health and Safety (WHS) legislation, in particular the effective management of risks associated with the principal hazards as specified in the *Work Health and Safety (Mines and Petroleum Sites) Regulation 2014*.

Contact
Should you require any further information or clarification, please contact the Office of the Executive Director (ED.ResourcesRegulator@planning.nsw.gov.au)

Yours sincerely,

Peter Day
Executive Director
Resources Regulator

15 March 2022

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Reviewed: Lincoln de Haas (April 2022)

Site Water Management Plan* - DA 200-5-2003 - *Schedule 4, Condition 45	**Satisfactory (Yes/No/Partial)**	**Comment**	**Action Required**	**Proponent Response**
The Erosion and Sediment Control Plan shall:				
• comply with the requirements of the Department of Housing's *Managing Urban Stormwater: Soils and Construction* manual;	Partial	• Section 2.4 ○ 'Runoff from disturbed areas will continue to be managed within the existing site water management system (refer to the CVM SWMP), with additional erosion and sediment controls to be implemented and **maintained generally in accordance with the principles and management measures described in the Blue Book** (Landcom, 2004).' • Section 2.4.2 ○ 'Any additional sediment basins required on site will be designed and constructed in accordance with the Blue Book (Landcom, 2004).'	Please remove the word 'generally' shown in the underlined text, from the plan.	Removed generally from Section 2.4 first paragraph

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		• Section 2.4.3 ○ 'Any additional drains to be constructed to direct the flow of water within the mine water management system will be designed and sized in accordance with the Blue Bok'		
• identify activities that could cause soil erosion or discharge sediment or water pollutants from the site;	Yes	• Section 2.3 ○ Table 2 – Contains list of activities and their subsequent impacts	No	
• describe the location, function and capacity of all erosion and sediment control structures, and nominate which, if any, of these structures would be used as water sources for the development; and	Yes	• Section 2.4 ○ Describes Sediment Fences, Sediment Basins, and Drainage Channels as erosion and sediment control structures ○ None of the structures have been designated as water sources for the development		

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• describe the measures to minimise soil erosion and the potential migration of sediments to downstream waters.	Yes	• Section 2.4 these measures		
Other Comments				