

RUSSELL VALE COLLIERY

BELLAMBI GULLY CREEK DIVERSION - CONSTRUCTION MANAGEMENT PLAN

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1. INTRODUCTION

This Construction Management Plan (CMP) has been prepared by Wollongong Coal Pty Limited (Wollongong Coal) for the Russell Vale Colliery (the Colliery) Bellambi Gully Creek Diversion Works in accordance with condition 2(d) of the Development Control Order (the Order) issued by the Department of Planning, Industry and Environment (DPIE) on 23 July 2020 and conditions of development consent MP09_0013.

A copy of the Order is provided in Appendix A.

1.1 Background

The Colliery is an underground coal mine located at Russell Vale, approximately 8 kilometres (km) north of Wollongong and 70 km south of Sydney, within the Wollongong and Wollondilly local government areas (LGAs), as shown in Figure 1.1. The Colliery is owned and operated by Wollongong Coal. Wollongong Coal is majority owned by Jindal Steel and Power Limited (JSPL).

The Colliery has operated under a development consent (project approval 10_0046) for the Preliminary Works Project (PWP) granted by the Planning Assessment Commission (PAC) on 13 October 2011, and subsequently modified three times. The third modification was approved on 10 October 2014, with the second modification granted by the PAC on 19 November 2014 to allow an extension to the duration of mining. The Colliery has been in 'care and maintenance' since 2015.

Approval from the Commonwealth Department of the Environment and Energy (DoEE) was granted on 12 August 2012 (EPBC 2011-5891) and includes the Bellambi Gully Creek realignment works and associated impacts that were proposed at the time to Dam 6.

In February 2013, Wollongong Coal lodged a separate development application (MP09_0013) for its Underground Expansion Project (UEP) to facilitate further mining operations at the Colliery (ERM 2013). This development application was subsequently amended, as Wollongong Coal proposed a substantial revision to the UEP (Umwelt 2019).

The original environmental assessment (EA) prepared for the project, NRE No. 1 Colliery Project Application (09_0013) Environmental Assessment (the Original EA) (ERM 2013), was preceded by the latest environmental assessment report Russell Vale Revised Underground Expansion Project: Revised preferred project report and response to second PAC review (the Revised Project Report) (Umwelt 2019a).

The Revised Project Report was on public exhibition from 1 August 2019 to 29 August 2019. During public exhibition, submissions were received from government agencies, community and interest groups in response to the project. In response to the submissions received during the exhibition period, Wollongong Coal commissioned Umwelt to prepare the Russell Vale Colliery Revised Underground Expansion Project Submissions Report, which was published in two parts - Submission Report Part A (Umwelt 2019b) and Submission Report Part B (Umwelt 2019c) and is collectively referred to as the Submission Report from here on.

After a formal review process by the Planning Assessment Commission (PAC), the Independent Planning Commission of NSW (IPC) granted a development consent (MP09_0013) on 8 December 2020 for the Revised UEP. The Revised UEP, which is also referred to as the Revised Preferred Project in assessment reports, is referred to as 'the project' from here on.

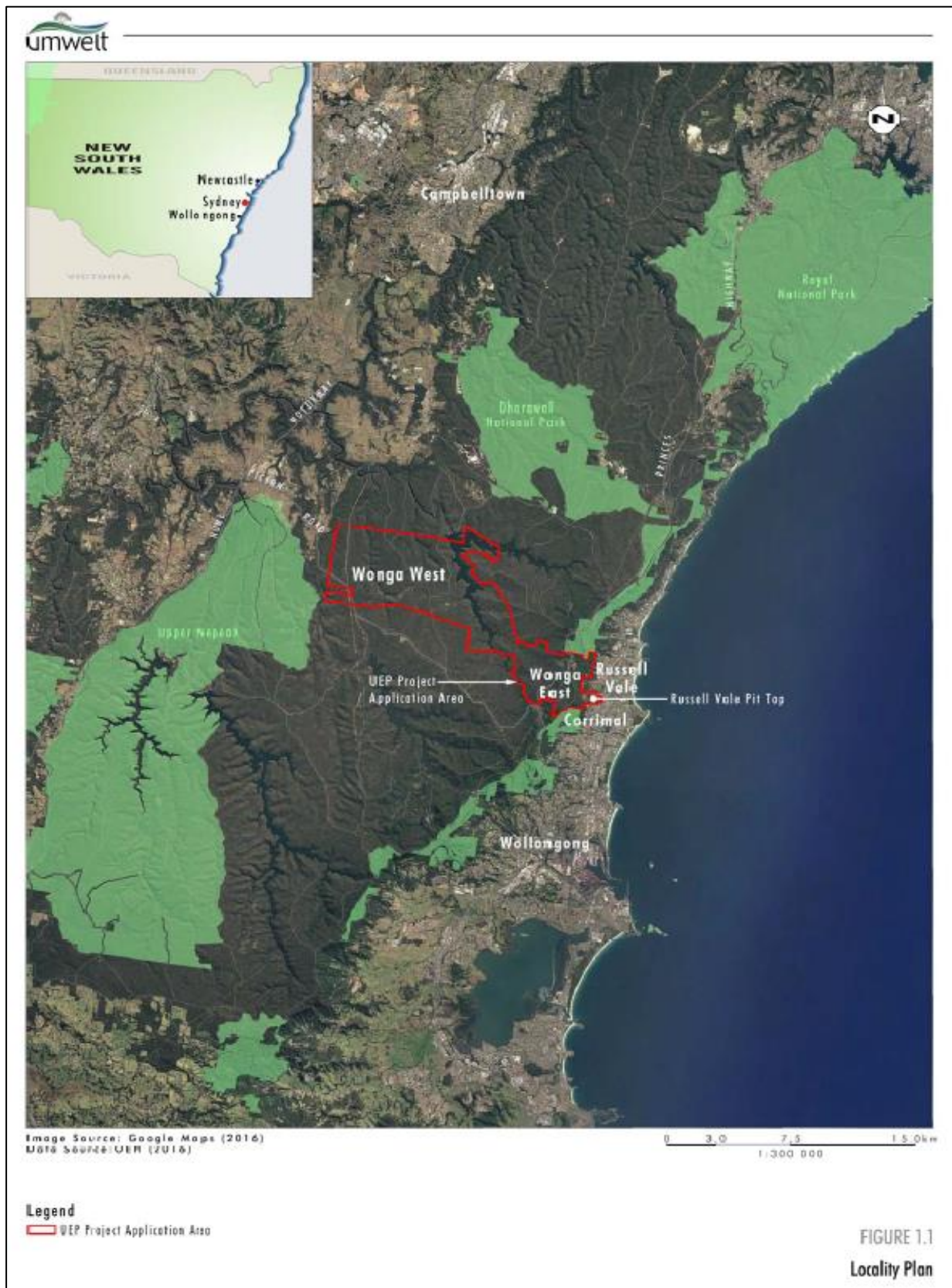


Figure 1.1 Locality plan

1.2 Environmental management system overview

Wollongong Coal has a formalised environmental management system (EMS), which is implemented, managed and updated, as required.

The strategic framework for environmental management at the Colliery is outlined in the EMS for the site, which has been updated as part of the project (Wollongong Coal 2021). This CMP forms part of Wollongong Coal's EMS (as shown in Figure 1.2), as do a number of other key operational environmental management plans (EMPs) and monitoring programs.

Relevant sections of the EMPs and monitoring programs will also be adhered to during the construction of Bellambi Gully Creek diversion works.

1.3 Purpose of this CMP

1.3.1 Overview

The purpose of this CMP is to provide a structured approach and best practice measures for the management of potential environmental issues that could arise during the construction of Bellambi Gully Creek diversion works.

In accordance with Term 2d of the Order, this CMP has been prepared to address any relevant commitments or recommendations identified in:

- the conditions of consent (MP09_0013);
- all written directions of the Planning Secretary; and
- the Revised Project Report; and
- the approved engineering design drawings (refer Appendix C).

Wollongong Coal's general environmental duty of care will ensure all reasonable and feasible measures to prevent, and if prevention is not reasonable and feasible, minimise, any material harm to the environment that may result from the Bellambi Gully Creek diversion works.

The development consent defines construction as:

The demolition of buildings or works, carrying out of works and erection of buildings covered by this approval.

This CMP is a part of a larger suite of operational environmental management documents for the Colliery, which are described in greater detail in Section 3. The overarching document in the environmental management system is Wollongong Coal's Russell Vale Colliery Environmental Management Strategy (EMS), which provides the overall strategic context for the implementation and maintenance of environmental management of the project.

The EMS has been updated with the latest conditions of consent issued in the development consent MP09_0013 (Wollongong Coal 2021).



Figure 1.2 EMS framework, including the Bellambi Gully Creek CMP

1.3.2 Document structure

This CMP is divided into chapters to address specific requirements and objectives as detailed in Table 1.1.

Table 1.1 – CMP Document Structure

Chapter	Content
Chapter 1 – Introduction	Provides the background, purpose and structure of this CMP, outlines the conditions of consent, document scope, as well as consultation requirements and outcomes.
Chapter 2 – Project description	Provides a description of the project including construction activities to be undertaken.
Chapter 3 - Planning	Outlines compliance with legislative framework, and approvals, permits and licences required for the construction of the project.
Chapter 4 – Environmental risk management	Provides the outcomes of the risk assessment undertaken as part of the preparation of this CMP.
Chapter 5 – Background conditions and criteria	Provides specific background conditions and criteria for key environmental aspects requiring management during the construction of the diversion works (i.e. noise, air quality, traffic, soil and water, heritage and waste).
Chapter 6 – Mitigation and management strategies, triggers and responses	Provides specific mitigation and management strategies for key environmental aspects requiring management during the construction of the diversion works (i.e. noise, air quality, traffic, soil and water, heritage and waste). Also provides references to TARPs for the environmental aspects identified.
Chapter 7 – Monitoring	Refers to inspections and environmental monitoring.
Chapter 8 – Reporting	Monitoring, incident and non-compliance reporting.
Chapter 9 – Communication	Refers to internal/external communications, protocols, incident and emergency response.
Chapter 10 – Roles, responsibility and accountability	For Wollongong Coal personnel, contractors and all other employees and sub-contractors.
Chapter 11 – Competency, training and awareness	Includes information to be covered during inductions, toolbox talks and pre-start meetings.
Chapter 12 – Audit and review	Includes information on audit and review processes.
Chapter 13 – Records and document control	Includes information on records and document control.
Chapter 14 – References	Outlines document references used in the CMP.
Chapter 15 – Glossary of abbreviations and terms	Provides a glossary of abbreviations and terms used in the CMP.

1.4 Document scope

The scope of this CMP is to describe how Wollongong Coal propose to manage potential environmental issues that could arise during construction for the Bellambi Gully Creek Diversion Works.

Key environmental issues identified in the CMP and considered in Chapter 5 and Chapter 6 include noise, air quality, traffic, soil and water. The management of these potential environmental issues is considered in relation to construction across the Colliery site, comprising:

- noise mitigation works associated with the underground expansion;
- diversion of Bellambi Gully Creek; and
- new on-site haulage road.

Further details about construction activities and staging are provided in Chapter 2.

1.5 Consultation

1.5.1 Consultation during the environmental assessment process

Extensive community and government consultation has been carried out prior to and during the preparation of the original EA, the Revised Project Report, the Submissions Report and other project-related assessment documentation. The primary objective of consultation was to keep the community, government agencies and other stakeholders informed and involved during project development process.

Surface water impacts associated with the Colliery and Bellambi Gully Creek Diversion Works have been a key concern to the local community. Community engagement has been carried out over a number of years and is summarised in Section 4.1.2 and Section 4.1.3 of the Revised Project Report.

A complete summary of previous and ongoing government agency and stakeholder consultation is provided in Table 4.5 of the Revised Project Report. Consulted parties included the following State and local government agencies, and roads and utilities authorities:

- Department of Planning, Industry and Environment (DPIE);
- Department of Resources and Geosciences (DRG);
- Department of Environment and Energy (DoEE);
- NSW Environment Protection Authority (EPA);
- Wollongong City Council (WCC);
- WaterNSW;
- The former Office of Environment and Heritage (OEH) now DPIE Biodiversity Conservation Department BCD;
- Transport for New South Wales (TfNSW);
- TransGrid;
- Endeavour Energy; and
- the Independent Expert Panel for Mining in the Catchment.

In accordance with condition D5 of development consent, Wollongong Coal have undertaken consultation in relation to MOD4 and with the Community Consultative Committee (CCC) in preparing the Bellambi Gully Creek Diversion Works engineering design with no comments received.

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Doc Title	Russell Vale Colliery – Bellambi Gully CMP		

1.6 CMP preparation and approval

This document has been prepared by EMM Consulting Pty Limited (EMM) in conjunction with Wollongong Coal.

This CMP will be submitted for approval to DPIE's Secretary (the Secretary), or nominee, under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act); and in compliance with Term 2d of the Order.

Construction of the project will not commence prior to approval of the CMP by the Secretary.

2. PROJECT DESCRIPTION

2.1 Overview

This chapter provides a summary of key project components, outlines the key Colliery construction activities.

2.2 Underground Expansion of the Colliery

Table 2.1 provides an overview of key project components for the underground expansion of the Russell Vale Colliery.

Table 2.1 – Key project components

Project component	Project (as revised, 2019)
Project life	5 years
Project Application Area (PAA)	As per the historical Colliery Holdings/lease boundary, including Consolidated Coal Lease (CCL) 745, Mining Purpose Lease (MPL) 271 and Mining Lease (ML) 1575
Mine design and method	No-caving first workings within the Wonga East area. No longwall mining proposed. Longwall equipment will be recovered from underground and sold.
Target seam	Wongawilli seam
Total reserves recovered	Approximately 3.7 Mt of ROM coal
Extraction rate	Up to 1.2 Mtpa ROM coal
Production rate	Up to 1 Mtpa of product coal
Hours of operation	Underground operations and delivery of ROM coal to the surface: 24 hours, 7 days a week Surface facilities and product transport: 7:00am – 6:00pm, Monday to Friday; 8:00am – 6:00pm, Saturday; - no Sundays or Public Holidays. Provision for occasional operation until 10:00pm Monday to Friday to cater for unexpected Port closures or interruptions. Operation until 10:00pm Monday to Friday has been considered in this assessment.
Pit Top facilities	Refer to Section 2.3 (Construction activities)
Management of mining waste	Coarse rejects from the processing plant will be trucked off site as fill if it meets requirements for Virgin Excavated Natural Material (VENM), stockpiled for emplacement underground or used in the rehabilitation of the site.
Coal transport	Transport by road to the Port Kembla Coal Terminal (PKCT) for export.

Project component	Project (as revised, 2019)
Transport hours and rates	- An average rate of 17 laden outbound trucks per hour leaving the site between 7:00am – 6:00pm Monday to Friday and 8:00am – 6:00pm Saturday. - No coal transport Sundays or Public Holidays. - If coal transport is required during the evening to cater for unexpected Port closures or interruptions, these movements would be limited to an average of 12 trucks per hour leaving the site between 6:00pm – 10:00pm Mondays to Fridays only. - Trucks arriving at the site between 6:00am – 7:00am Monday to Friday or between 7:00am – 8:00am Saturday will be required to proceed to the truck parking area on site and turn off engine until loading commences at 7:00am Monday to Friday or 8:00am Saturday.
Employment	- Operational workforce of approximately 205 employees and contractors. - Short-term construction workforce of approximately 22 employees over a 12 - 24-month period.
Ongoing activities within mining tenements	- Exploration activities, environmental monitoring and maintenance of access to the existing underground workings and surface infrastructure within exploration and mining tenements in the Wonga West domain. - Ongoing maintenance and refurbishment of ventilation shafts, water and electrical facilities.
Rehabilitation	Progressive rehabilitation over project life, with rehabilitation of all surface facilities following the completion of mining.
Capital investment value (CIV)	\$35.3 million

2.3 Bellambi Gully Creek Diversion Works

Clean water upslope of the Colliery Pit Top facilities historically flowed through the natural Bellambi Gully Creek water course and connected with a stormwater diversion pipe.

Clean water management system blockages have in the past allowed runoff from upslope catchments to enter the Pit Top water management system resulting in flooding of the stockpile area and washout of coal into residential areas and Bellambi Gully Creek.

Currently a 1,800 millimetre (mm) concrete pipe is buried under the main above ground storage area of the Colliery that takes the flow from Bellambi Gully Creek. This pipe:

- does not have sufficient capacity to carry upstream flows from a 1 in 100 year rainfall event;
- is often blocked by debris from the natural stream at the entrance to the pipe, thereby reducing the capacity of the pipe; and
- is in poor condition and at risk of pipe failure.

As the underground pipe section of Bellambi Gully Creek has not been replaced with a suitably designed and engineered open channel in the required timeframe, an Order was issued to Wollongong Coal by DPIE on 23 July 2020 requiring that the existing pipe be replaced with an open channel capable of safely passing the upstream 'clean' water through the site without being contaminated by the works on site.

The Order for the Bellambi Gully Creek works broadly stipulates that:

- a suitably qualified engineer is to be engaged and endorsed by the Secretary;
- The endorsed engineer is to develop and certify a detailed engineering design plan for the replacement of the underground pipe section of Bellambi Gully Creek;
- The plans are to be submitted to the Secretary for approval;
- The endorsed engineer is to supervise the construction and replacement works;
- Replacement works to be in accordance with approved detailed design (Appendix C);
- The endorsed engineer will prepare and submit written reports to the Secretary during and post construction; and
- Works and milestone timeframes are set by the Order.

Wollongong Coal engaged ROC Engineering Design, approved by DPIE in accordance Term 2a in August 2020, to provide a detailed design of a diversion channel for a tributary of Bellambi Gully Creek that traverses the Colliery. This is outlined in the Bellambi Creek Diversion Design Report (January 2021) and illustrated on Figures 2.1 and 2.2.

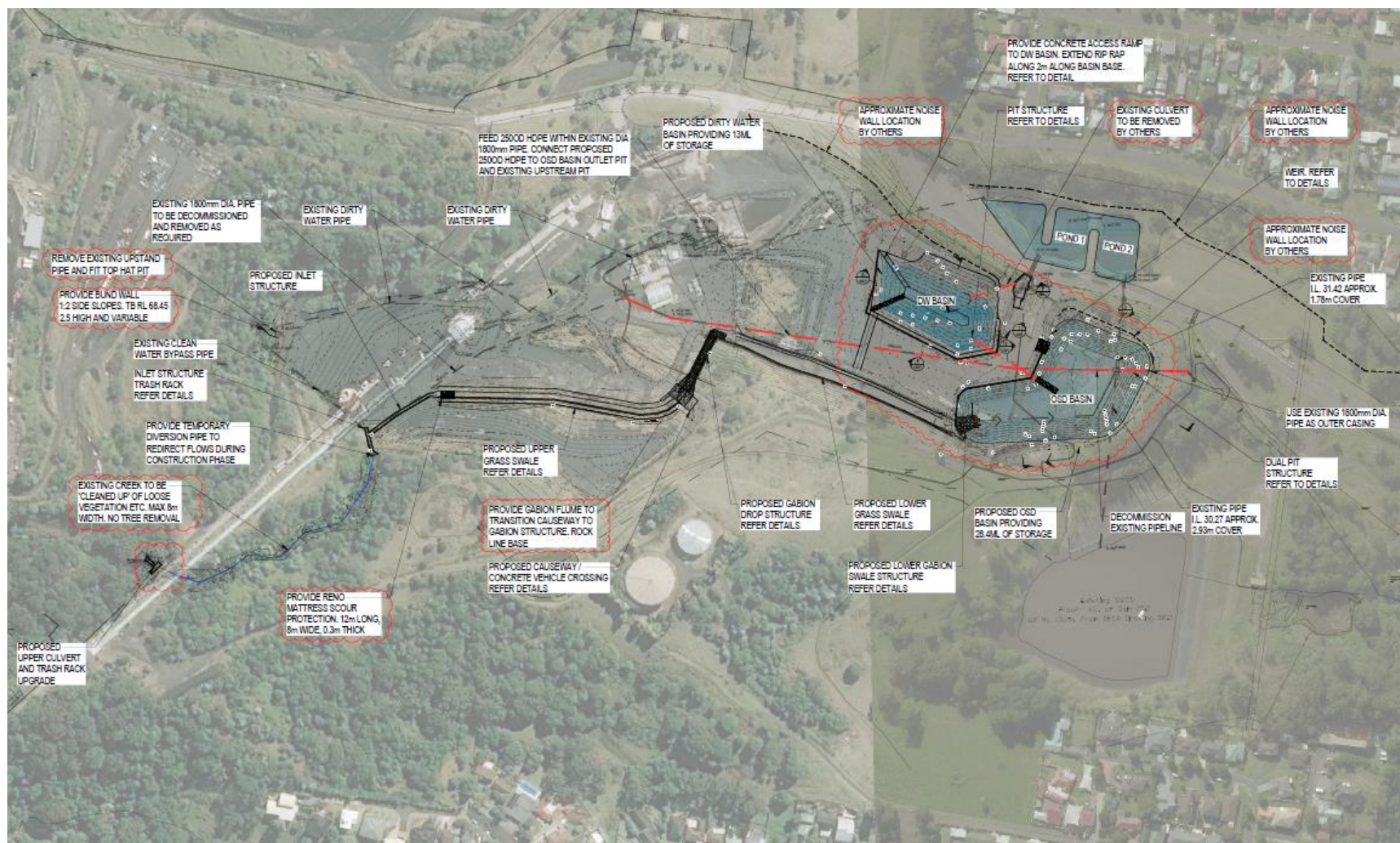
Specifically, works will involve detailed design and construction of a diversion channel and blockage protection to replace the existing structure. The construction phase of the Bellambi Gully works will occur concurrently with the noise mitigation construction works associated with the underground expansion of the Russell Vale Colliery, which are being managed under a separate Construction Environmental Management Plan (CEMP) as required under condition D5 of development consent MP09_0013.

DPIE advised Wollongong Coal of their approval of ROC's Engineering Design and associated Design Report in accordance with the requirements of Term 2b(i), 2b(ii) and Term 2(c) of the Order on 25 February 2021 (Appendix B).

2.4 Haulage Road

In addition to the above diversion, a haulage road will be constructed to the north of the Bellambi Creek diversion. The haulage road will run from the existing access at the western end of Bellambi Lane through the site and tie into the existing wheel wash between dirty water basin and the overflow sediment dam basin.

Figure 2.1 Engineering design of Bellambi Gully Creek Diversion Works



Source: ROC Engineering Design 2020

Figure 2.2 Existing and proposed Colliery plant and infrastructure

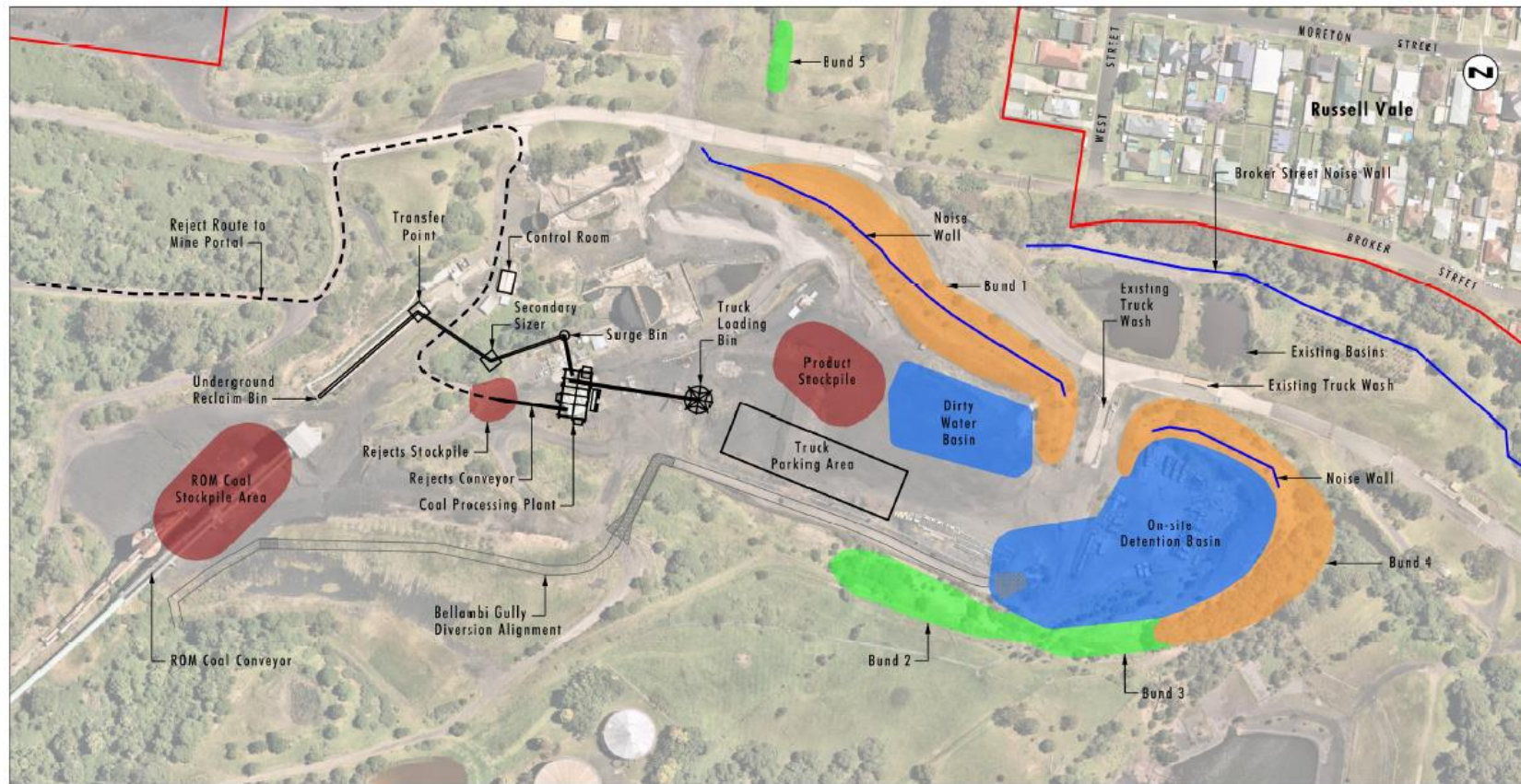


Image Source: Nearmap (Dec 2020)
Data Source: Wollongong Coal (2021)

- Legend**
- UEP Project Application Area
 - Coal Processing Plant and infrastructure
 - Bellambi Gully Diversion alignment
 - Bund to be raised
 - Existing bund
 - Water basins
 - Coal stockpiles

FIGURE 1
Russell Vale Colliery Pit Top

2.5 Construction activities

2.5.1 Bellambi Gully creek diversion

Construction of the diversion will involve the following:

- Install a temporary diversion pipe to redirect flows during construction;
- Install upper culvert, flume and trash rack;
- Install concrete channel;
- Construct upper and lower grass swales;
- Construct causeway/concrete vehicle crossing;
- Install gabion drop structure;
- Construct dirty water (DW) basin with storage of 13 mega litres (ML);
- Construct on-site stormwater detention (OSD) basin with storage of 28.4 ML, including a clay capping layer, overflow weir and scour protection and headwall;
- Construct flow delineation bund; and
- Decommission existing pipeline.

Construction will be undertaken using 25 tonne excavator, dump trucks and concrete agitator trucks.

2.6 Construction activities and staging

The key construction activities are broken down into different components, based on different stages of construction.

Construction of the project is planned to start in at the beginning of April 2021, with a completion date of July 2021 in accordance with the Order. The total period of construction works is expected to be around 15 weeks.

An indicative program is provided in Table 2.2, which outlines the order of priority of construction activities.

Table 2.2 – Overview of construction activities and stages

Component and indicative timeframe	Typical activities
Stage 1: Site establishment and enabling works 1 to 2 weeks	- Contractor risk assessment workshop to confirm staging and environmental site management; - Installation of safety and environmental controls including sediment and erosion controls; - Installation of temporary site fencing; - Implementation of temporary and/or new on-site traffic management measures; - Install site compound; - Survey and setting out; - Establish temporary diversion measures; - Remove and mulch trees in vicinity of works as required; and - Stockpile topsoil for duration of works.
Stage 2: Bulk earthworks and main construction Up to 15 weeks, with completion by 23 July 2021 (12 months from date of Order)	- Cut and fill as per design plans for creek diversion and haulage road, with no material removed from site; - Construct and install structures (swales, gabions, basins etc) as per design plans; and - Coordinate works with noise wall construction and haulage road construction. - Progress reporting every 3 months until completion of the construction works; and - Verification report upon completion of the construction works.
Stage 3: Rehabilitation 1 week	- On completion of main construction works, topsoil and seed disturbed areas outside immediate works; and - Verification survey.
Stage 3: Maintenance phase ongoing	Maintain works in accordance with detailed maintenance plan and as required by the Order.

2.7 Construction hours

In accordance with Term 2f(i) of the Order for the project, construction activities for the replacement of the underground pipe section of Bellambi Gully Creek will be undertaken during the following daytime hours:

- 7:00 am – 6:00pm, Monday to Friday; and
- 8:00am – 1:00pm, Saturday.

No construction activities are proposed on Sundays or public holidays.

2.8 Construction workforce

With a number of different construction projects at the Colliery is intended to be completed by the one contracting company. It is anticipated that a total construction workforce of up to 22 full-time equivalent (FTE) staff will be required for the duration of the construction period associated with the Bellambi Gully Creek Diversion Works and noise mitigation construction works associated with the underground expansion of the Colliery.

3. PLANNING

3.1 Overview

A number of approvals, licences and consents apply to the Colliery, with associated conditions and requirements. The following sections summarise those that are relevant in relation to the CMP.

Wollongong Coal will conduct all approved construction activities consistent with development consent MP10_0046 for the preliminary works project and MP09_0013 for the UEP and any other legislation that is applicable.

A list of legislation applicable (including but not limited to) to construction of Bellambi Gully diversion works are listed below:

- *Work Health and Safety (Mines and Petroleum Sites) Act 2013;*
- *Environmental Planning and Assessment Act 1979;*
- *Environment Protection and Biodiversity Conservation Act 1999;*
- *Contaminated Land Management Act 1997;*
- *Occupational Health and Safety Amendment (Dangerous Goods) Act 2003;*
- *Roads Act 1993;*
- *Protection of the Environment Operations Act 1997;*
- *Biodiversity Conservation Act 2016;*
- *Crown Lands Act 1989;*
- *Energy and Utilities Administration Act 1987;*
- *Water NSW Act 2014;*
- *Water Act 1912;*
- *Water Management Act 2000; and*
- *Local Land Services Amendment Act 2016.*

3.2 Regulatory requirements

A summary of the legal requirements applicable to the Colliery will be maintained in Wollongong Coal's Compliance Register, which will be updated to consider relevant legislation, conditions of consent and licence requirements. The Compliance Register will include both Federal and State legislation, as well as State Environmental Planning Policies (SEPPs) and any Codes of Practice to which the Wollongong Colliery is required to comply.

A copy of the Compliance Register is maintained on the Wollongong Coal Server.

3.3 Notification of commencement

Wollongong Coal will notify DPIE in writing at least two weeks prior to the commencement of development and construction for the Bellambi Gully Creek Diversion Works in accordance with Condition A5.

3.4 Terms of the Order

The key terms of the Order issued to Wollongong Coal on 23 July 2020 as relevant to this CMP are listed in Table 3.1. A cross reference is also provided to indicate where the term is addressed in this CMP or other documents.

Table 3.1 – CMP terms of order requirements

Terms of the Order	Plan section
Development Control Order issued 23 July 2020	
Term 2d Prepare a detailed construction management plan (CMP), including an implementation plan with specific actions and timeframes, for the replacement of the underground pipe section of Bellambi Gully Creek, in accordance with the detailed engineering design plans, and submit the CMP for the Secretary's approval.	Section 1.3 Purpose of this CMP Chapter 6 Mitigation and management strategies
Term 2e Construct and install the replacement of the underground pipe section of Bellambi Gully Creek in accordance with the approved detailed engineering design plans and CMP. All works must be supervised by the engineer approved by the Secretary.	Section 1.3 Purpose of this CMP (Chapter 1 Introduction) Chapter 6 Mitigation and management strategies
Term 2f Undertake replacement of the underground pipe section of Bellambi Gully Creek: (i) only between 7:00am and 6:00pm Monday to Friday, and between 8:00am and 1:00pm on Saturdays. No works are to be undertaken on Sundays or public holidays; (ii) whilst keeping the public roads free of dirt, mud and any other material; (iii) whilst no exceeding: 1. the 50kmph speed limit for Bellambi Lane in the Consent; and 2. the noise and air quality impact assessment criteria in the Consent; and (iv) whilst implementing: 1. best practice noise management, including all reasonable and feasible noise mitigation measures, as defined in the Consent, to minimise the construction and road traffic noise and monitoring to ensure compliance with the noise impact assessment criteria in the Consent; 2. best practice air quality management, including all reasonable and feasible measures, as defined in the Consent, to minimise the off-site dust emission and monitoring to ensure compliance with the air quality impact assessment criteria in the Consent; and	Section 1.3 Purpose of this CMP (Chapter 1 Introduction) Chapter 6 Mitigation and management strategies

Terms of the Order	Plan section
3. erosion and sediment controls, in accordance with the Managing Urban Stormwater – Soils and Construction, Volume 2E Mines and Quarries (DECC 2008), or its latest version.	
Term 2g Prepare and submit a written report detailing the implementation status with the actions and timeframes specified in the CMP referred to in Term 2 d above to the Secretary.	Section 1.3 Purpose of this CMP (Chapter 1 Introduction) Chapter 6 Mitigation and management strategies
Period for compliance with the Order Term 2d - four weeks from the date the Secretary approves detailed engineering design plans, referred to in Term 2a. Term 2e to 2f - within timeframes outlined in the detailed CMP, referred to in Term 2d above and approved by the Secretary but no later than 12 months from the date the Order is given. Term 2g - every three months from the date of the commencement until the date of the completion of the replacement of the underground pipe section of Bellambi Gully Creek. Note: Physical commencement is not permitted until Secretary's approval of detailed engineering design plans and the CMP is granted.	Section 2.6 Construction activities and staging (Chapter 2)

3.5 Conditions of consent

The key conditions of consent (MP09_0013) relevant to this CMP are listed in Table 3.2. A cross reference is also provided to indicate where the condition is addressed in this CMP or other documents.

Table 3.2 – CMP conditions of consent requirements from MP09_0013 UEP

Conditions of consent	Plan section
OBLIGATION TO MINIMISE HARM TO THE ENVIRONMENT <i>Condition A1/ Schedule 2, Part A</i> In addition to meeting the specific performance measures and criteria established under this consent, the Applicant must implement all reasonable and feasible measures to prevent, and if prevention is not reasonable and feasible, minimise, any material harm to the environment that may result from the construction and operation of the development, and any rehabilitation required under this consent.	Section 1.3 Purpose of this CMP Chapter 6 Mitigation and management strategies

Conditions of consent	Plan section
NOTIFICATION OF COMMENCEMENT <i>Condition A5/ Schedule 2, Part A</i> The Applicant must notify the Department in writing at least two weeks prior to: (a) commencing the development under this consent (b) commencing construction under this consent;	Section 3.3 (Notification of Commencement)
NOISE OPERATING CONDITIONS <i>Condition B2/Schedule 2, Part B</i> The Applicant must: a) take all reasonable steps to minimise the construction, operational and road noise of the development, including low frequency noise and other audible characteristics; b) implement reasonable and feasible noise attenuation measures on all plant and equipment that operation in noise sensitive areas, and monitor and report on these measures; c) monitor and record all major equipment use and make this data readily available at the request of the Department or the EPA; (f) carry out attended noise monitoring (quarterly or otherwise agreed with the Secretary) to determine whether the development is complying with the relevant conditions of consent.	Section 5.1.1 Noise (Chapter 5 Background conditions and criteria) Chapter 6 Mitigation and management strategies
WATER MANAGEMENT PERFORMANCE MEASURES <i>Condition B16/Schedule 2, Part B</i> The Applicant must ensure that the development does not cause any exceedance of the performance measures in Table 4, to the satisfaction of the Planning Secretary (i.e. water management – general, erosion and sediment control works, clean water diversion and storage infrastructure, flood protection works, chemical and hydrocarbon storage, aquatic and riparian ecosystems, including affected sections of Bellambi Creek).	Section 6.5 Soil and Water
CONSTRUCTION Construction Hours <i>Condition D1/ Schedule 2, Part D</i> Construction activities at the surface facilities site must only be undertaken between the hours of 7 am to 6 pm Monday to Friday, and 8 am to 1 pm Saturday, with no construction activities on Sundays or public holidays, unless the Planning Secretary agrees otherwise.	Section 2.5 Construction hours (Chapter 2 Project description) Chapter 6 Mitigation and management strategies

Conditions of consent	Plan section
Construction Noise <i>Condition D2/ Schedule 2, Part D</i> The Applicant must ensure that the noise generated by construction complies with the requirements of the ICNG.	Section 5.2.1 Noise (Chapter 5 Background conditions and criteria)
Incident Notification <i>Condition F9/ Schedule 2, Part F</i> The Applicant must immediately notify the Department and any other relevant agencies immediately after it becomes aware of an incident. The notification must identify the development (including the development application number and name) and set out the location and nature of the incident.	Section 8.3.1 Incident and non-compliance reporting
Non-Compliance Notification <i>Condition F9/ Schedule 2, Part F</i> Within seven days of becoming aware of a non-compliance, the Applicant must notify the Department of the non-compliance. The notification must set out the condition of this consent that the development is non-compliant with, why it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.	Section 8.3.2 Non-compliance

3.6 Statement of commitments

The key statement of commitments relevant to this CMP are listed in Table 3.3.

Table 3.3 – CMP statement of commitments

Commitment	Timing
Surrender of Preliminary Works Approval Subject to suitable transitional arrangements being provided for, WCL will within 12 months of the date of approval of the UEP, unless otherwise agreed by the Secretary, surrender all existing development consents for the Russell Vale Colliery Preliminary Works Project Approval 10_0046 in accordance with clause 97 of the EP&A Regulation.	Within 12 months of approval
Environmental Management Plans WCL will prepare a Construction Environmental Management Plan, prior to the commencement of construction, that identifies the environmental and social management controls to be implemented during the construction phase.	Prior to the commencement of construction

Commitment	Timing
All existing operational environmental management plans and monitoring networks will be reviewed and revised (where necessary) to reflect the Revised Preferred Project approval requirements, should the project be approved. Each environmental management plan will include (where relevant): • detailed baseline data • a description of: - the relevant statutory requirements (including any relevant approval, licence or lease conditions) - any relevant limits or performance measures/criteria - the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures • a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria • a program to monitor and report on the: - impacts and environmental performance of the project - effectiveness of any management measures • a contingency plan to manage any unpredicted impacts and their consequences • a program to investigate and implement ways to improve the environmental performance of the project over time • a protocol for managing and reporting any: - incidents - complaints - non-compliances with statutory requirements - exceedances of the impact assessment criteria and/or performance criteria • a protocol for periodic review of the plan.	Within 3 months of approval
Social and Economic WCL will conduct regular community liaison meetings and provide regular updates to the community both during construction and operation of the project, including quarterly website updates and annual community information sessions. WCL will continue to operate the Russell Vale Community Consultative Committee following relevant DPIE guidelines. WCL will continue to implement the existing community complaints response and management program.	Ongoing

Commitment	Timing
Soil and Water WCL will implement pre-treatment of dirty water using flocculant block at the inlet to Dam 1 to aid settling of solids prior to overflowing into Dam 2.	Ongoing as required
Ongoing real time turbidity monitoring of LDP 2 discharge, Bellambi Gully Creek upstream and Bellambi Gully Creek downstream to allow rapid response to deviations above water quality trigger values.	Ongoing
WCL will implement the upgrades to the existing Water Management System as proposed in the Bellambi Gully Flood Assessment (Engeny, 2018), Response to Submissions for Modification 4 (Umwelt, 2018), Further Response to Submissions for Modification 4 (Umwelt, 2019) and additional information provided to DPIE on 14 November 2019, in accordance with the timing requirements established under MOD4.	In accordance with timing requirements established under MOD 4
Detailed plans of the revised Water Management System will be prepared by a suitably qualified civil engineer in consultation with Wollongong City Council and provided to the consent authority for approval prior to commencement of works.	Prior to the commencement of construction
WCL will maintain the existing Bellambi Gully Diversion Pipeline as the method to divert upslope runoff from the Bellambi Gully catchment through the site to the downstream creek.	Ongoing
WCL will undertake a Pipeline Condition Assessment and develop a Pipeline Integrity Management Strategy, as detailed in Appendix 5 of the Further Response to Submissions for Modification 4 (Umwelt, 2019).	Within 6 months of approval of the Mod 4
WCL will manage the proposed ROM stockpile height to not exceed 7m above the Bellambi Gully Diversion Pipeline.	Ongoing
WCL will implement dedicated crossings for heavy vehicles driving over the Bellambi Gully Diversion Pipeline with offset areas of 5 m from the centreline of the pipe either side.	Prior to the commencement of construction
A maintenance schedule will be prepared and implemented for the new on-site stormwater system.	Within 3 months of approval and ongoing
New and existing flood structures and controls will be included on regular maintenance schedules.	Ongoing
WCL will implement the management, monitoring and contingency measures described in Section 7.0 of the Response to Submissions for Modification 4 (Umwelt, 2018) and Section 4.2 of the Further Response to Submissions for Modification 4 (Umwelt, 2019).	Following the approval of MOD 4 and ongoing

Commitment	Timing
WCL will update the Surface Facilities Water Management Plan, including and / or taking account of: • Conditions and commitments set out in the Modification 4 approval • Water Balance • Erosion and Sedimentation Control Plan • Baseline data on water quality • Monitoring program details Trigger levels for the investigation of any potentially adverse impacts.	Within 3 months of approval
The Water Management Plan will include a Monitoring, Management and Maintenance Plan for the proposed flood levee and existing SWCD. This will include an effective monitoring, management and maintenance program designed to ensure the ongoing and safe operation of the flood levee and SWCD in the event of a significant flood.	Within 3 months of approval
<i>WCL will continue to consult with WaterNSW to put in place a mutually agreeable Master Agreement to cover the conditions of the Mining Leases related to mining within the water catchment.</i>	Within 2 years of approval
Hazardous materials, including diesel fuel, water treatment chemicals and hydraulic fluid emulsions will be stored in appropriately sized bunds. All hydrocarbon storage and handling will be undertaken in accordance with AS1940-2017: <i>The storage and handling of flammable and combustible liquids</i>.	Ongoing
Once the mine moves into production, subject to approval, the reject material will be further tested for Acid Base Account parameters on a 6-monthly basis.	Ongoing on a 6 monthly basis
WCL will implement the management, monitoring and contingency measures described in Section 7.0 of the Response to Submissions for Modification 4 (Umwelt, 2018) and Section 4.2 of the Further Response to Submissions for Modification 4 (Umwelt, 2019).	Following the approval of MOD 4 and ongoing
Noise WCL will review and update the existing Noise Management Plan for the Russell Vale Colliery and implement the updated plan for the Revised Preferred Project.	Within 3 months of approval and ongoing
WCL will implement the following feasible and reasonable construction noise management measures during construction of bunds around the Pit Top, in accordance with the ICNG.	Ongoing during construction

Commitment	Timing
Air Quality WCL will review and update the existing Russell Vale Colliery Air Quality and Greenhouse Gas Management Plan and implement the updated plan for the Revised Preferred Project. The Air Quality and Greenhouse Gas Management Plan will detail the monitoring and management controls to be implemented to manage air quality impacts associated with the Revised Preferred Project including implementation of proactive and reactive management protocols in response to air quality trigger levels defined in the plan.	Within 3 months of approval and ongoing
Traffic WCL will review and update the existing Russell Vale Colliery Traffic Management Plan and Drivers Code of Conduct and implement the updated plan for the Revised Preferred Project.	Within 3 months of approval and ongoing

3.7 Other approvals, permits and licences

All licences, permits and approvals that have and/or will be obtained and maintained as required prior to or throughout the construction of the project are outlined in Table 3.4. For a more comprehensive list of all licences previously obtained and required for the project refer to the site EMS.

Table 3.4 – Environmental approvals, permits and licences required for the construction of the Bellambi Gully Creek Diversion Works

Approval/ permit/ licence	Regulatory authority	Timing	Status of the approval/ permit/ licence
Development consent for UEP granted under the EP&A Act	DPIE/ IPC	-	MP 09_0013 approved 8 December 2020
Development Control Order	DPIE	-	Issued 23 July 2020
Environment Protection Licence (EPL) will be required for activities listed in Schedule 1 of the <i>Protection of the Environment Operations Act 1997</i> (POEO Act)	EPA	Prior to scheduled activities or works that enable a scheduled activity	EPL 12040 issued 6 May 2019
CCL 745	Resource Regulator	-	Obtained and valid until 30 December 2023
MPL 271	Resource Regulator	-	Obtained and valid until 9 May 2033
ML 1575	Resource Regulator	-	Obtained and valid until 22 March 2029

3.8 Guidelines and management plans

The CMP has been prepared to be consistent with the following standards and guidelines:

- Noise Policy for Industry (NPfI) (EPA 2017);
- Interim Construction Noise Guideline (ICNG) (DECC 2009);
- NSW Road Noise Policy (DECCW 2011);
- AS 1055:2018 Acoustics – Description and measurement of environmental noise;
- Australian and New Zealand guidelines for fresh and marine water quality (ANZECC 2000);
- Managing Urban Stormwater – Soils and Construction Volumes 1 (the Blue Book) (Landcom 2004);
- Managing Urban Stormwater – Soils and Construction Volumes 2E Mines and Quarries (DECC 2008); and
- Site environmental management plans (MP 09_0013).

4. ENVIRONMENTAL RISK MANAGEMENT

4.1 Introduction

Wollongong Coal undertook a broad-brush risk assessment (BBRA) on 27 August 2020, with the main objectives being:

- to define all activities to be carried out at the Colliery; and
- identify those activities that represent environmental significant risks.

Consideration was given to risks in the form of people (safety), environment and financial. In addition, the Section 7 of the Mining Operations Plan (MOP) for care and maintenance (September 2020) has considered the Bellambi Creek Diversion construction works. The results of both risk assessments are provided in Appendix D.

The primary risks in relation to construction can be summarised as:

Medium risk:

- Construction noise at start-up.
- Air quality.
- Water management.
- Erosion and entrainment of carbonaceous material during high rainfall events and breach of barriers.

Low risk:

- Construction noise during operational period.
- Access to information.
- Notification of non-compliance.
- There is not a suitable meteorological station operating in the vicinity of the site that complies with the requirements.
- Spills of waste or hazardous materials on site and during transportation and lack of containment.
- Lack of weed management and disturbance of habitat resulting in impact to native flora and fauna.
- Aboriginal heritage.

A contractor risk assessment workshop will be held with the preferred contractor and relevant Wollongong Coal personnel to identify any additional environmental risks and mitigation measures that may need to be implemented during construction works. The CMP will be updated where required following this workshop.

5. BACKGROUND CONDITIONS AND CRITERIA

5.1 Background conditions

5.1.1 Noise

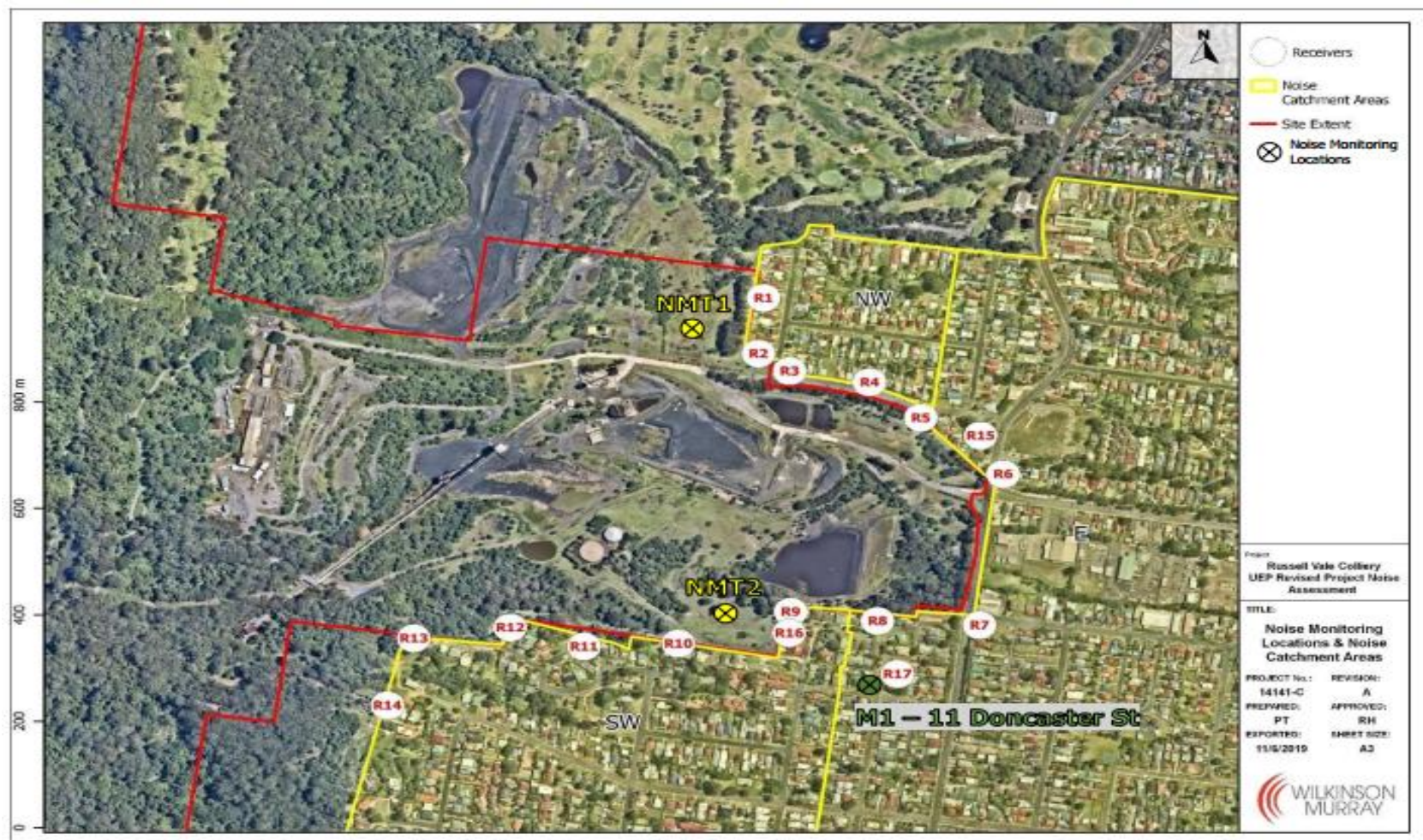
Table 5.1 summarises the rating background level (RBL) in each of the three noise catchment areas surrounding the site (WM 2019). Figure 5.1 shows the background monitoring locations.

Table 5.1 – Summary of RBLs

ID	Representative receiver	Measured RBLs (dBA)			
		Day	Evening	Night	Morning shoulder
M1	R1, R2, R3, R4	43	40	37	39
NMT1	R5, R6, R7, R8	39	38	37	39
NMT2	R9, R10, R11, R12, R13, R14	39	38	34	36

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Figure 5.1 Background noise monitoring locations



5.1.2 Air quality

Two TEOM monitors are maintained at the WCL northern and southern boundaries (see Figure 5.4) that continuously monitor PM₁₀ and PM_{2.5} concentrations. One of the most recent years of data (2016), which corresponds to the modelling year, is shown in Figure 5.2 for PM₁₀ and Figure 5.3 for PM_{2.5} (sourced from Appendix 6 of RPPR – Air Quality Assessment by ERM 2019)).

There were no exceedances of 24-hour PM₁₀ criteria during 2016. On two occasions the 24-hour average concentrations for PM_{2.5} exceeded the assessment criteria (two exceedances at each TEOM on the same days). These exceedances both occurred during May when there was a significant hazard reduction burn within the region.

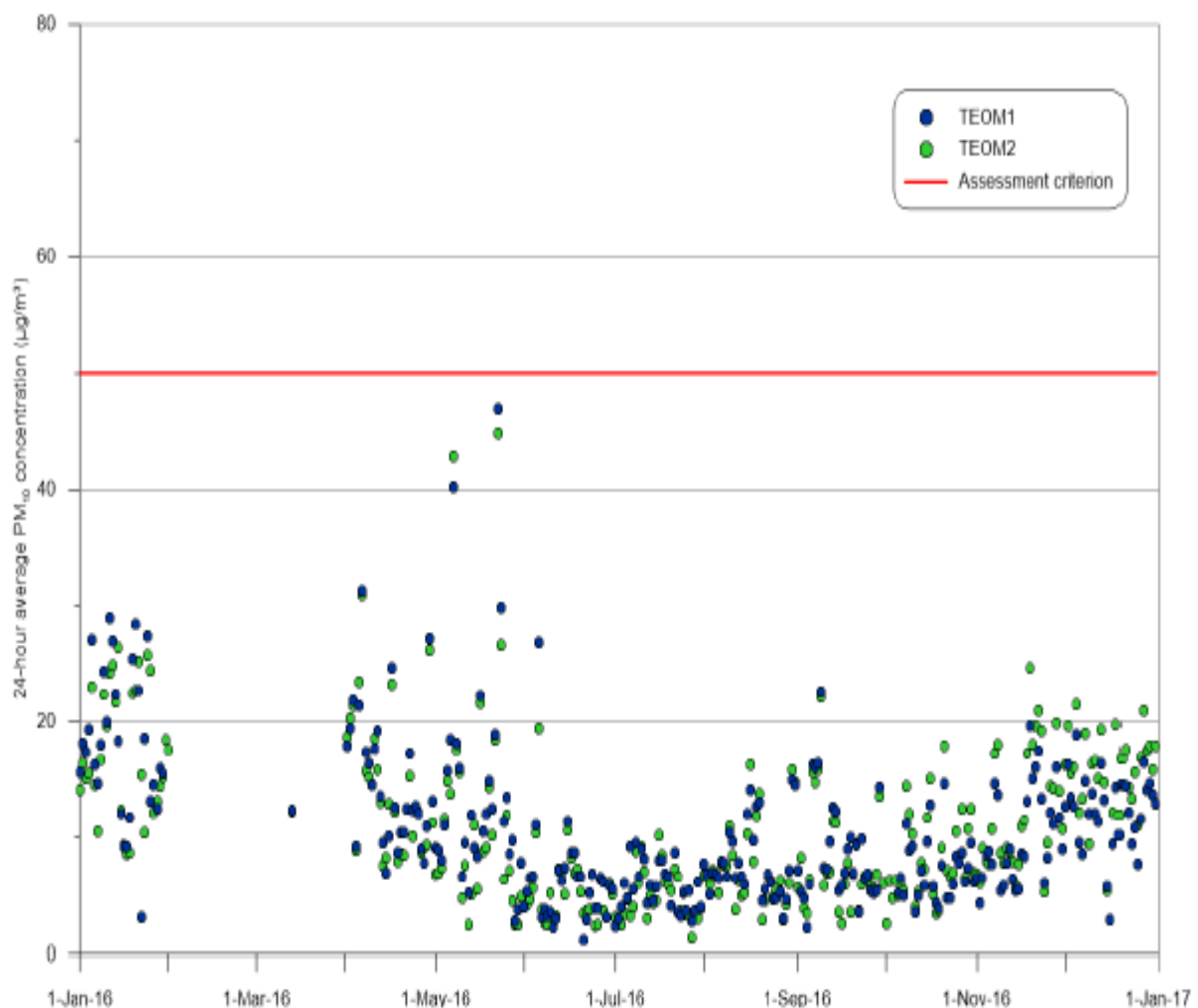


Figure 5.2 24-hour average PM10 concentrations at TEOM1 and TEOM2

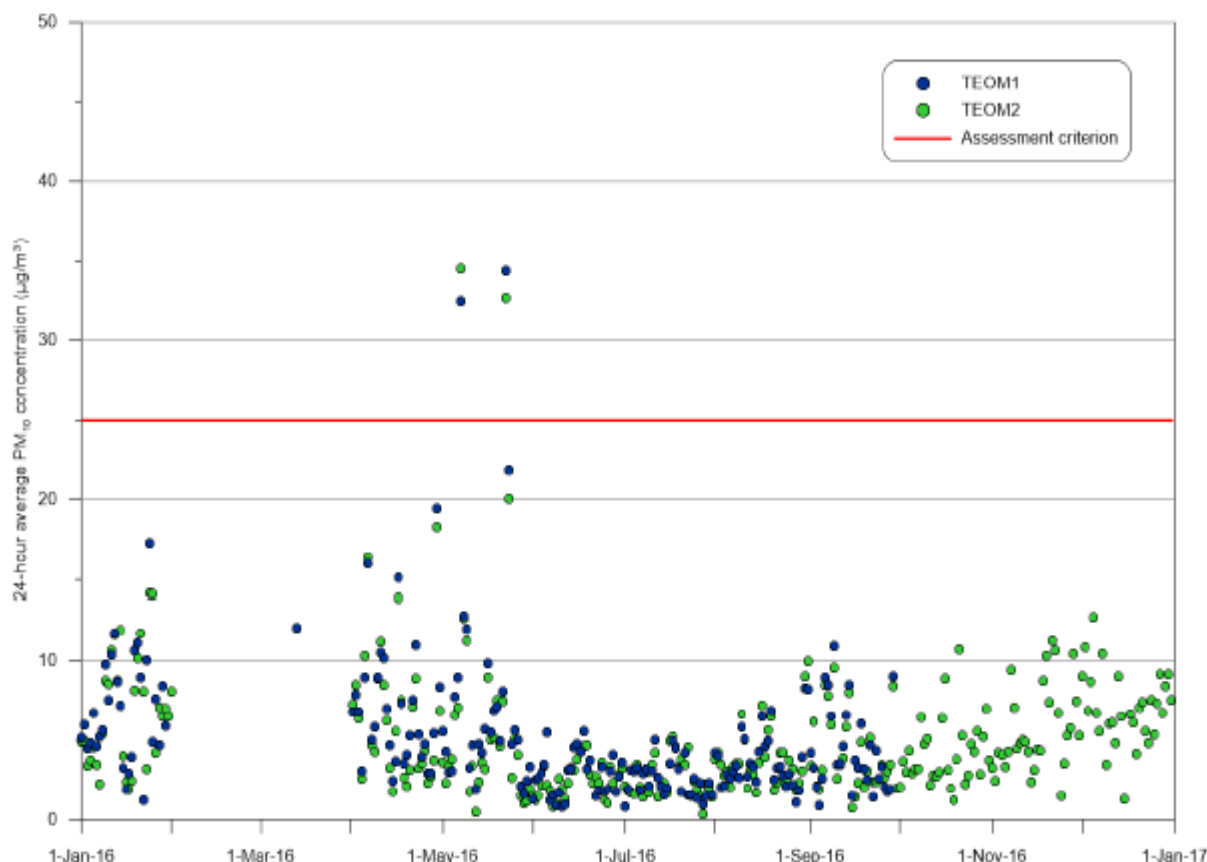


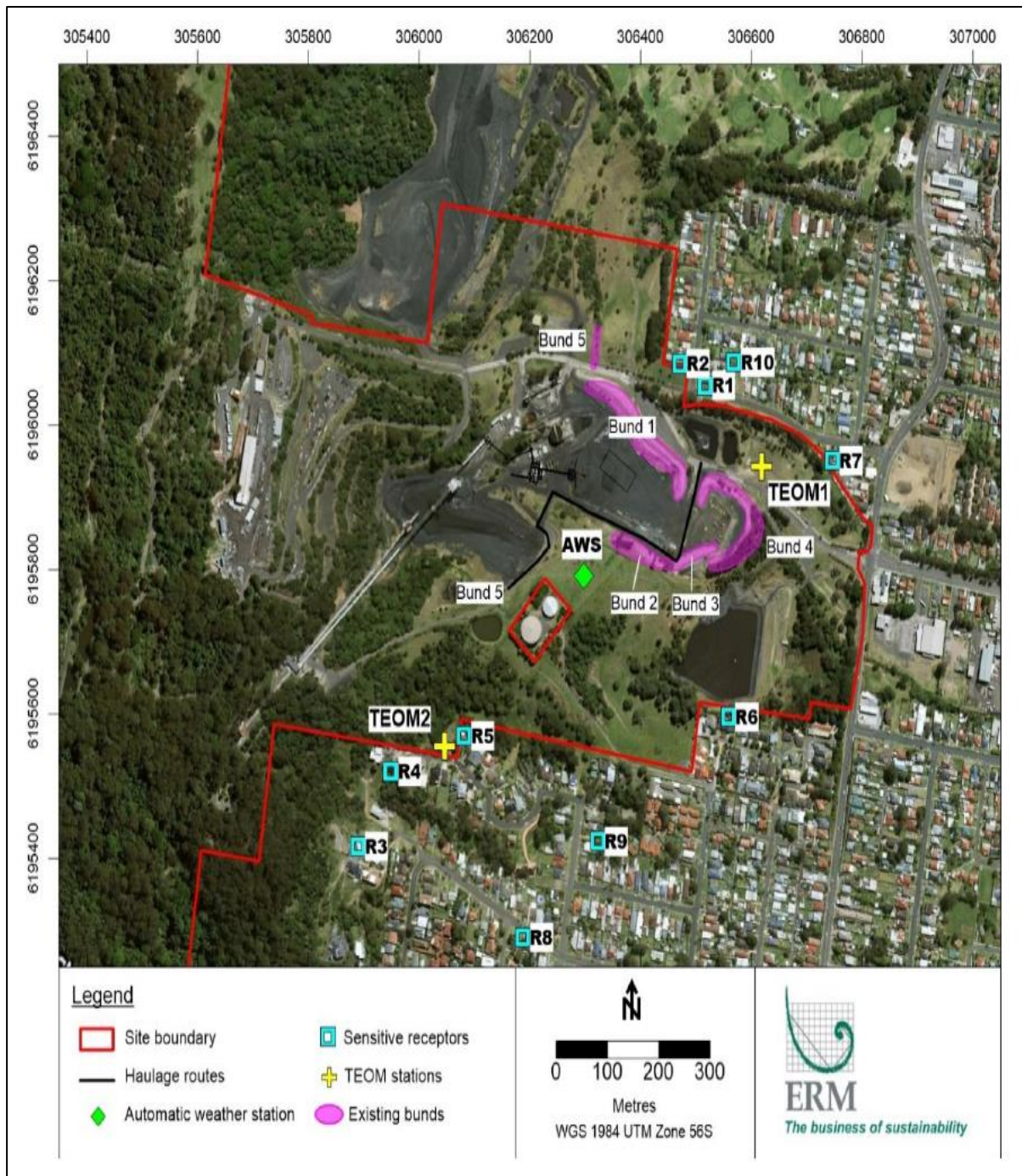
Figure 5.3 24-hour average PM_{2.5} concentrations at TEOM1 and TEOM2

The PM₁₀ and PM_{2.5} data collected by Wollongong Coal at TEOM2 has been used to provide a conservative evaluation of background concentration for the cumulative assessment. The 24-hour background levels for PM₁₀ and PM_{2.5} are also conservative as they have adopted the 95th percentile measured values. The vast majority of measured levels fall well below the adopted background levels (see Figure 5.2 and Figure 5.3). Background concentrations were based on data from TEOM2, for predominate wind directions, this monitor is located upwind of the major particulate matter sources at the mine, in close proximity to sensitive residential receptors.

The following has been assumed, for the purpose of estimating background concentrations of PM₁₀ and PM_{2.5}:

- 24-hour average PM₁₀ concentrations are equivalent to the 95th percentile 24-hour average values collected at TEOM2 during 2016 (22.6 µg/m³);
- Annual average PM₁₀ concentration at TEOM2 during 2016 (10.7 µg/m³);
- 24-hour average PM_{2.5} concentration equivalent to the 95th percentile 24-hour average values collect at TEOM2 during 2016 (11.2 µg/m³); and
- Annual average PM_{2.5} concentration at TEOM2 during 2016 (5.0 µg/m³).

Figure 5.4 Air quality monitoring locations (TEOM1 and TEOM2) and automatic weather station (AWS)



5.1.3 Traffic

The Colliery's principal service road networks for operation and transport of ROM coal include the Colliery Access Road, Bellambi Lane, Memorial Drive, M1 Princes Motorway, Masters Road, Springhill Road and Port Kembla Rad.

The overall management of traffic and transport is outlined in Wollongong Coal's Traffic Management Plan.

The construction workforce trips of an average of 22 people per day arriving and departing the Colliery will occur before and after the weekday AM and PM peak, the adjoining principal intersections currently have adequate capacity. Parking for these workers will be onsite.

The total traffic generation of the construction phase will be less than the operational phase (refer Section 5.2.3).

5.1.4 Soils and water

The Colliery's existing Water Management System (WMS) is approximately 45 ha in area and consist of the following sub catchments:

- Rehabilitated and undisturbed natural catchments.
- Disturbed catchments including the pit top area and coal handling infrastructure.

Hardstand areas including the maintenance workshop area, administration offices, access roads and car parking. The existing WMS allows for two categories of water:

- Clean water, which comprises runoff from undisturbed and fully rehabilitated areas; and
- Dirty water, which comprises runoff from any area disturbed by mining operations, runoff from areas where coal is stockpiled and handled and groundwater extracted from the underground workings.

Works are currently underway to construct noise bunds and noise walls. These works are separate to those addressed in this CMP.

5.1.5 Flora and fauna

As detailed in the Biodiversity Management Plan, assessments undertaken by ERM (2010) identified that native vegetation and fauna habitat at the Colliery is limited in extent, in poor condition and is restricted to the perimeter of the site. All vegetation communities were found to be significantly impacted by weed invasion and no threatened ecological communities were identified.

Bellambi Gully Creek provides marginal fauna habitat, with piped sections forming a barrier to fish movement. There were some pools suitable for frogs (e.g. Green and Golden Bell Frog *Litoria aurea*), however, none have been recorded.

5.1.6 Aboriginal heritage

As detailed in the Heritage Management Plan (HMP 2019), the potential for Aboriginal archaeological relics in the Russell Vale Pit Top area was assessed as extremely low.

5.1.7 Non-Aboriginal heritage

The Bellambi Gully Creek diversion and construction of the haulage road have been designed such that items of historic heritage will not be impacted by the works.

5.1.8 Visual

The Colliery is situated at the base of the Illawarra Escarpment. During the construction phase of the Bellambi Gully Creek diversion works, temporary views of earthworks and associated mobile equipment will be visible to residents surrounding the site. However, concurrent with these works, the existing noise bunds surrounding the Pit Top will be raised in order to improve operational noise mitigation and visual impact.

Lighting during the night-time is required on site meet maintenance and safety requirements. Lighting will be kept to a minimum and directed away from surrounding residences (refer Section 5.2.5). A Visual Impact Management Plan (VIMP) will be prepared as part of the Colliery's operational phase.

5.1.9 Waste

The excavated material generated and vegetation removed during the earthworks phase will be re-used onsite.

The construction activities are not expected to generate a significant amount of general waste material, but may include office, domestic and a small amount of concrete material waste.

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Figure 5.5 EPL discharge monitoring locations



5.2 Compliance criteria

5.2.1 Noise

Table 5.2 provides ICNG noise management levels (NML) which apply to residential assessment locations.

Table 5.2 – ICNG construction noise management levels for residences

Time of day	NML LAeq,15min	How to apply
Recommended standard hours: Monday to Friday 7 am to 6 pm, Saturday 8 am to 1 pm, No work on Sundays or public holidays	Noise-affected RBL + 10 dB	The noise-affected level represents the point above which there may be some community reaction to noise. - Where the predicted or measured $Leq(15\text{-min})$ is greater than the noise-affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. - The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75 dBA	The highly noise-affected level represents the point above which there may be strong community reaction to noise. - Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: - times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences); - if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours	Noise-affected RBL + 5 dB	- A strong justification would typically be required for works outside the recommended standard hours (refer CEMP - OOHW Protocol). - The proponent should apply all feasible and reasonable work practices to meet the noise affected level. - Where all feasible and reasonable practices have been applied and noise is more than 5 dBA above the noise-affected level, the proponent should negotiate with the community. - For guidance on negotiating agreements see Section 7.2.2 of the ICNG.

Source: ICNG (EPA, 2009)

5.2.2 Air quality

Table 5.3 details the air quality criteria for concentrations of particulate matter.

Table 5.3 – NSW EPA impact assessment criteria for particulate matter concentrations and deposited dust

PM metric	Averaging period	Assessment criteria
PM ₁₀	24 hour	50 µg/m ³
	Annual	25 µg/m ³
PM _{2.5}	24 hour	25 µg/m ³
	Annual	8 µg/m ³
Dust deposition	Annual	2 g/m ² /month (project increment only)
		4 g/m ² /month (cumulative)

Notes: µg/m³: micrograms per cubic meter; g/m²/month: gram per square meter per month

5.2.3 Traffic

The traffic impacts of the Bellambi Gully Creek works on the adjacent road network will be relatively minor and less than that assessed for the operational phase.

In order to assess the construction phase traffic, the cumulative construction workforce and associated traffic required during the proposed construction activities (i.e. and Bellambi Gully Creek Diversion Works and noise mitigation construction works associated with the underground expansion) as follows:

- 22 workers (i.e. light vehicle trips) arrive between 6.00am – 7.00am and departing between 6.00pm – 7.00 pm; and
- Up to 8 heavy vehicles per day (i.e. 8 in/ 8 out) including 2 oversize vehicles per week.

The project is not expected to have any adverse impacts on road safety on the road network, or on other road users.

Traffic conditions at the principal adjacent intersections to the Colliery in Bellambi Lane, are expected to remain satisfactory over the life of the project.

5.2.4 Soil and water

Wollongong Coal undertakes a range of water quality and volume monitoring in accordance with the site EPL (12040). EPL monitoring locations and limits (where appropriate) are detailed in Table 5.4.

Table 5.4 – EPL monitoring locations and limits

Point	Description	Monitoring Requirements	Frequency	Limit Conditions
2	Licensed Discharge: Treated water outlet from the 1.2 ML thickener discharging from a 200 mm steel pipe into the 1,800 mm Bellambi Gully Creek diversion pipe.	pH Total Suspended Solids Turbidity Electrical Conductivity Volume	Monthly during discharge Continuous for turbidity	6.5 – 9.2 50 mg/L - - 2,500 kL/day ^{1,2,3}
3	Licensed Discharge: Seepage through the SWCD wall into Bellambi Gully Creek.	-	-	-
9	Licensed Discharge: The SWCD gabion spillway discharging to Bellambi Gully Creek.	-	-	-

Point	Description	Monitoring Requirements	Frequency	Limit Conditions
11	Monitoring: Bellambi Gully ambient water quality west of Princes Highway.	Turbidity Electrical Conductivity	Continuous	
12	Monitoring: Bellambi Gully upstream ambient water quality.	Turbidity Electrical Conductivity	Continuous	

Note:

- ¹ The volume of wastes discharged from Point 2 on any day must not exceed 2,500 kL under dry weather conditions, but may exceed this volume under wet weather conditions provided all practical measures are taken to minimise additional pollution caused by the wet weather.
- ² Dry Weather Conditions is defined as less than 10 mm of rain falling within a 24 hour period measured at a point on the premises. Wet Weather Conditions means anything other than Dry Weather Conditions (i.e. equal or greater than 10 mm of rain falling within a 24 hour period measured at a point on the premises).
- ³ Dry Weather Conditions discharge limit. Volume limit may be exceeded during Wet Weather Conditions for up to 72 hours following these conditions provided all practical measures are taken to minimise additional pollution.
- ⁴ Special Frequency 1 means daily during discharge for 3 consecutive days commencing within 12 hours of "wet weather conditions" occurring. "Wet weather conditions" are defined in condition L3.2 of this licence.

Wollongong Coal will ensure that trucks entering and exiting the site are free of dirt, mud and any other material to prevent residual or accumulated material from falling off onto public roads.

Details on specific requirements for erosion and sediment control are provided in Chapter 6.

5.2.5 Flora and fauna

Details on specific management strategies are provided in Chapter 6.

5.2.6 Aboriginal heritage

No impacts are predicted to Aboriginal sites or objects. Details on specific management strategies are provided in Chapter 6 and is provided in the Aboriginal Heritage Management Plan (2021).

5.2.7 Non-Aboriginal heritage

No impacts are predicted to non-Aboriginal heritage.

5.2.8 Visual

All lighting required during construction will be directed away from surrounding residences and will be maintained in accordance the relevant Australian Standard (*Australian Standard AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting*).

Site restoration works post construction will be undertaken in accordance with the landscaping strategy which forms part Wollongong Coal's Visual Impact Management Plan (VIMP).

5.2.9 Waste

All general waste from construction works will be collected, segregated for reuse / recycling and removed regularly from site by a licensed waste management contractor to an appropriate landfill facility where required. Further information is provided in the Waste Management Plan (2021).

5.2.10 Engineering

Wollongong Coal will comply with the following engineering conditions during construction in accordance with the Order for the Bellambi Gully Creek:

- The endorsed engineer is to supervise the construction works (Term 2a of the Order); and
- The endorsed engineer will prepare and submit written reports to the Secretary during and post construction (Term 2b and 2c of the Order).

A copy of the DPIE approval of ROC's Engineering Design and associated Design Report to satisfy the requirements of Term 2b(i), 2b(ii) and Term 2(c) of the Order was granted on 25 February 2021 (Appendix B).

6. MITIGATION AND MANAGEMENT STRATEGIES

6.1 Introduction

This section describes the management and mitigation measures to be implemented during construction to ensure compliance with the criteria, legal and other requirements that apply to the project. These measures have been sourced from:

- Conditions associated with the DPIE Development Control Order;
- Conditions associated with development consent MP09_0013 and EPL 12040;
- The risk assessment outcomes and controls detailed in Appendix D; and
- Industry best practice.

Measures to monitor the effectiveness of the mitigation and management strategies are detailed in Chapter 7.

6.1.1 Overall Approach

The primary objective of the following mitigation and management measures is to minimise impacts on the surrounding community potentially arising from the Bellambi Gully Creek diversion works.

The following hierarchical approach will be used to ensure that works achieve compliance with the relevant conditions of the development consent;

- Construction will be managed to meet all relevant compliance criteria, through best operational practices and the implementation of reasonable and feasible best practice environmental controls and monitoring;
- Where impacts are above the compliance criteria (i.e. exceedance or non-compliance), notify DPIE and relevant agencies within 7 days and implement additional best practice environmental controls to minimise impacts and/or exposure duration at affected receivers;
- Where the use of recommended environmental control mitigation measures do not adequately address the impact, the activity will be recorded as an incident with investigation to determine and adopt alternative measures to minimise recurrence of impacts on the community; and
- Liaise with the local community regarding scheduled works.

6.2 Noise

Table 6.1 details management and mitigation measures required to ameliorate potential noise impacts during the construction phase of the project.

Table 6.1 – Management and mitigation measures - noise

Management/mitigation measure	Timing	Source	Responsibility	Evidence for compliance
Outcome: Construction activities are managed to minimise potential adverse impacts on the environment, residences and the community	-	Statement of commitments – MP09_0013 Noise Management Plan	-	-
Implement best practice noise management, including all reasonable and feasible noise mitigation measures to minimise the construction noise generated by the works during all meteorological conditions in accordance with the ICNG	During construction	Statement of commitments – MP09_0013 Noise Management Plan	Contract Project Manager Environment Manager	Equipment specifications Monitoring records Maintenance records Real time noise data/recordings
All construction work will be undertaken during standard working hours as defined in the ICNG (2009), being: 7.00am – 6.00pm Monday to Friday; 8.00am – 1.00pm Saturday; and No construction works on Sundays or Public Holidays.	During construction	Statement of commitments – MP09_0013 Development Control Order Noise Management Plan, CEMP	Contract Project Manager	Personnel records Site access records Real time noise data/recordings

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Management/mitigation measure	Timing	Source	Responsibility	Evidence for compliance
All residents adjacent to the site will be notified of the start of works.	Prior to construction	Statement of commitments – MP09_0013	Contract Project Manager Environment Manager	Project newsletters/ communication records WCL website
Where feasible, silenced site equipment will be used to minimise environmental noise emissions.	During construction	Statement of commitments – MP09_0013 Noise Management Plan	Contract Project Manager	Equipment specifications Monitoring records Maintenance records Real time noise data/recordings
Monitor and record all major equipment use and make this data readily available at the request of DPIE or the EPA.	During construction	Statement of commitments – MP09_0013 Noise Management Plan	Contract Project Manager Environment Manager	Equipment specifications Monitoring records Maintenance records
Any complaints regarding environmental noise emissions will be investigated and responded to in an appropriate manner.	During construction	Statement of commitments – MP09_0013 Noise Management Plan	Contract Project Manager Environment Manager	Complaints/ communications records Monitoring records Real time noise data/recordings
All works will be undertaken in accordance with the DECCW's Interim Construction Noise Guideline (2009).	During construction	Statement of commitments – MP09_0013 Noise Management Plan	Contract Project Manager	Personnel records Site access records Real time noise data/recordings

Management/mitigation measure	Timing	Source	Responsibility	Evidence for compliance
Meteorological monitoring is to happen prior to commencing construction. The met station should be capable of continuous real-time measurement of WS, WD sigma theta and temperature, and met conditions in accordance with NPfl.	Prior to construction	CoA B11, MP09_0013 Noise Management Plan	Contract Project Manager	Initial calibration certificate Meteorological records Photographic record
Wollongong Coal will implement the following feasible and reasonable construction noise management measures during construction works around the Pit Top, in accordance with the ICNG and identified in the CEMP:	-	Statement of commitments - MP09_0013 Noise Management Plan	-	-
- Use quieter equipment and methods: - Dump truck access to be provided on the side further away from the closest receivers to maximise distance to receivers and shielding from works; - Use mobile equipment with less annoying alternatives to the typical 'beeper' alarms; and - Regularly inspect and maintain equipment in good working order.	Ongoing during construction	Statement of commitments - MP09_0013 Noise Management Plan	Contract Project Manager	Equipment specifications Monitoring records Maintenance records
Notification before and during construction	Ongoing during construction	Statement of commitments - MP09_0013	Contract Project Manager Environment Manager	Project newsletters/ communication records

Management/mitigation measure	Timing	Source	Responsibility	Evidence for compliance
- Provide information regarding construction activities to potentially affected neighbours, including the nature and expected duration of construction activities; - Provide signage at the front of the site providing contact information, construction hours and any updates on construction activities.		Noise Management Plan		Photographic record WCL website
Continually monitor meteorological conditions to guide day-to-day planning (e.g. modify or stop works) and ensure compliance with construction noise criteria	Ongoing during construction	Statement of commitments - MP09_0013 Noise Management Plan	Contract Project Manager	Meteorological forecasts Daily pre-starts Monitoring records
Implement a complaints handling procedure, maintain a complaints register and implement all feasible and reasonable measures to address the source of complaints.	Ongoing during construction	Statement of commitments - MP09_0013 Noise Management Plan	Contract Project Manager Environment Manager	Complaints and communications records
40 km/hr speed limit onsite	Ongoing	Statement of commitments - MP09_0013 Traffic Management Plan	Contract Project Manager	Complaints/ communications records Drivers code of conduct Vehicle data and dashcam videos

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Management/mitigation measure	Timing	Source	Responsibility	Evidence for compliance
Wollongong Coal to ensure a comprehensive noise management system is implemented and maintained, including predictive noise modelling and real-time to guide day-to-day planning and ensure compliance with construction noise criteria	Ongoing during construction	Statement of commitments - MP09_0013 Noise Management Plan	Environment Manager	Predictive modelling Ongoing monitoring records Calibration records
Attended construction noise monitoring will be conducted quarterly at the nearest and potentially most impacted residence(s) when construction works are occurring within 200 m of noise-sensitive receivers	During construction	Statement of commitments - MP09_0013 Noise Management Plan	Environment Manager	Ongoing monitoring records
Review noise monitoring data (quarterly) to ensure compliance with construction noise criteria	During construction	Statement of commitments - MP09_0013 Noise Management Plan	Environment Manager	Ongoing monitoring records

6.3 Air quality

Table 6.2 details management and mitigation measures required to ameliorate potential air quality impacts during the construction phase of the project.

Table 6.2 – Management and mitigation measures – air quality

Management/mitigation measure	Timing	Source	Responsibility	Evidence for compliance
Outcome: Operations are managed to minimise potential adverse impacts to the environment, residences and the community.		Statement of commitments – MP09_0013 Air Quality and Green House Gas Management Plan		
Trucks will be covered before leaving the site.	Continuous and as required	Statement of commitments – MP09_0013 Air Quality and Green House Gas Management Plan	Contract Project Manager	Inspection records CCTV footage Complaints/ communications records Audit results
Trucks will be cleaned before leaving the site.	Continuous and as required	Statement of commitments – MP09_0013 Air Quality and Green House Gas Management Plan	Contract Project Manager	Inspection records CCTV footage Complaints/ communications records Audit results
NRE will continue to enforce the Driver's Code of Conduct, through continuing driver education (tool box talks) and regular audits.	Continuous and as required	Statement of commitments – MP09_0013 Air Quality and Green House Gas Management Plan	Contract Project Manager	Training /toolbox talk records Driver's Code of Conduct requirements

Management/mitigation measure	Timing	Source	Responsibility	Evidence for compliance
WCL will implement a range of air quality mitigation measures and controls:	-	Statement of commitments – MP09_0013 Air Quality and Green House Gas Management Plan	-	-
- Water sprays on the work areas during construction - Trucks will be covered before leaving the site Trucks will be washed and checked before leaving the site to ensure they are free of dirt, mud and any other material to prevent residual or accumulated material from falling off onto public roads	Ongoing during construction	Statement of commitments – MP09_0013 Development Control Order Air Quality and Green House Gas Management Plan	Contract Project Manager	Inspection records CCTV footage Complaints/communications records Audit results
40 km/hr speed limit onsite	Ongoing	Statement of commitments - MP09_0013 Air Quality and Green House Gas Management Plan Traffic Management Plan	Contract Project Manager	Complaints/communications records Drivers code of conduct Vehicle data and dashcam videos

6.4 Traffic

Table 6.3 details management and mitigation measures required to ameliorate potential traffic impacts during the construction phase of the project.

Table 6.3 – Management and mitigation measures – traffic

Management/mitigation measure	Timing	Source	Responsibility	Evidence for compliance
Trucks arriving between: 6.00am and 7.00am (Mondays to Fridays) or 7.00am and 8.00am (Saturdays) will park in the dedicated truck parking provided on site and switch off engines.	Ongoing during construction	Statement of commitments – MP09_0013 Traffic Management Plan	Contract Project Manager	CCTV footage Vehicle data Site access records Complaints/communications records
Wollongong Coal will maintain, monitor and enforce the voluntary speed limit along Bellambi Lane of 50 km/hr for all trucks accessing the Colliery, with the continued aim of achieving 95% compliance with the voluntary speed restriction and 100% compliance with the signposted 60 km/h speed limit.	Ongoing during construction	Statement of commitments – MP09_0013 Development Control Order Traffic Management Plan	Contract Project Manager	Audit results Complaints/communications record GPS monitoring of trucks
Drivers must maintain truck separation on Bellambi Lane	Ongoing	Traffic Management Plan and Drivers Code of Conduct Traffic Management Plan	Contract Project Manager	Audit results Complaints/communications record

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Management/mitigation measure	Timing	Source	Responsibility	Evidence for compliance
Drivers will minimise compression braking	Ongoing	Traffic Management Plan and Drivers Code of Conduct Traffic Management Plan	Contract Project Manager	Audit results Complaints/communications record Noise monitoring records

6.5 Soil and water

Table 6.4 outlines key performance measures specified in Condition B16 (Table 4) relevant to this CMP are outlined in Table 6.4.

Table 6.4 – Management and mitigation measures – soil and water

Management/mitigation measure	Timing	Source	Responsibility	Evidence for compliance
Construction and operations are managed such that adverse impacts to water quality and flows Bellambi Gully Creek and surrounding residents are prevented or minimised.	During construction	Statement of commitments – MP09_0013 Development Control Order	Contract Project Manager	Inspection records Photographic records Monitoring records
Dirty stormwater and mine water will be treated on site prior to discharge.	Continuous and as required	Statement of commitments – MP09_0013 Development Control Order	Contract Project Manager	Inspection records Monitoring records
Dirty stormwater from hard surfaces will be diverted into the SWCD. Water will be held in the SWCD to reduce solids prior to treatment then discharging via LDP2.	Continuous and as required	Statement of commitments – MP09_0013 Development Control Order	Contract Project Manager	Inspection records Monitoring records Surface Water Management Plan (2019) requirement
The stormwater control dam (SWCD) will be kept at a level that allows 30ML of stormwater to be captured on site, reducing the flow and flood potential downstream.	Continuous and as required	Statement of commitments – MP09_0013 Development Control Order	Contract Project Manager	Inspection records Surface Water Management Plan (2019) requirement

Management/mitigation measure	Timing	Source	Responsibility	Evidence for compliance
The underground pipe section of Bellambi Gully Creek will be replaced with a suitably designed and engineered open bypass channel constructed on the southern side of the coal stockpile area. This will include: - A dissipation pond will be constructed at the end of the bypass channel to reduce the energy of flows back into Bellambi Gully Creek; - Upgrades to the existing channel including Reno mattresses and Gabion drop structures to reduce the velocity of water flowing down the gully; and - Regular maintenance to minimise scouring during major flow events.	By 23 July 2021	Statement of commitments – MP09_0013 Development Control Order	Wollongong Coal Environment Manager	Engineering design plans Development Control Order Inspection records Audit records
Preparation of a Construction Management Plan that includes the following: - A dry and wet basin arrangement to minimise sediment transportation to the stormwater dam; - Works will not take place during heavy rainfall that is likely to contribute to erosion; - Undertake stripping of topsoil, if required, immediately before starting bulk earthworks to be used for rehabilitation or revegetation works on site;	Prior to construction	Statement of commitments – MP09_0013 Development Control Order	Wollongong Coal Environment Manager	Engineering design plans Water Management Plan (2021) Surface Water Management Plan (2019) requirements Inspection records

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Management/mitigation measure	Timing	Source	Responsibility	Evidence for compliance
- Suitable areas for any temporary stockpiling of excavated soil (on flat ground) will be clearly identified and delineated before the commencement of works; - Ensure stockpiles are: - Constructed on the contour at least 2 (preferable 5) metres from hazard areas, particularly likely areas of concentrated water flows or slopes steeper than 10 percent; - Stabilised if they are going to be in place for more than 10 days. The stockpile of VENM excavated from the construction of the bypass channel will be grassed; - Protected from run-on water by installing water diversions upslope; and - Installed with sediment filters immediately downslope to protect other lands and waterways from pollution.				
Construction of Bellambi Gully Creek will be undertaken in accordance with engineering plans prepared in general to meet the design parameters outlined in Coffey (2010).	Prior to and during construction	Statement of commitments – MP09_0013	Contract Project Manager	Engineering design plans Survey records Inspection records Surface Facilities Water Management Plan (2019) requirements

Management/mitigation measure	Timing	Source	Responsibility	Evidence for compliance
All erosion, sediment control and runoff diversion measures will be established before any excavation begins. These will be left in place throughout work execution and beyond works completion until all surfaces have been fully restored and stabilised.	Prior to and during construction	Statement of commitments – MP09_0013 Development Control Order	Contract Project Manager Environment Manager	Surface Facilities Water Management Plan (2019) requirements Inspection records
Regular water quality monitoring	Ongoing	EPL 12040	Contract Project Manager	Surface Facilities Water Management Plan (2019) requirements Monitoring records Annual report
The existing SWCD will be maintained with enough spare capacity to minimise the chance of a major storm surcharging to Bellambi Gully Creek.	Ongoing	Surface Facilities Water Management Plan (2019)	Contract Project Manager	Monitoring records Inspection records
Stockpiles will be protected from run-on water by installing water diversion structures upslope.	Prior to and during construction	Surface Facilities Water Management Plan (2019)	Contract Project Manager	Engineering design plans Inspection records
Construction will not take place during heavy rainfall.	During construction	Surface Facilities Water Management Plan (2019)	Contract Project Manager	Inspection records Monitoring records Site access records Contractor updates

6.6 Aboriginal Heritage

Table 6.2 details management and mitigation measures required to ameliorate potential Aboriginal heritage impacts during the construction phase of the project.

Table 6.5 – Management and mitigation measures – Aboriginal heritage

Management/mitigation measure	Timing	Source	Responsibility	Reference	Evidence for compliance
Outcomes: Surface works at the Russell Vale site are managed such that adverse impacts to archaeology are minimised.	-	-	-		-
- A Protocol for the discovery of suspected Aboriginal objects (chance finds) will be implemented. The protocol includes: - Contact the registered stakeholder groups who participated in fieldwork, Illawarra Local Aboriginal Land Council and the D'harawal Knowledge Holders and have a representative identify if the suspected item is in fact an Aboriginal site or object; - If the identification is positive, contact a qualified archaeologist to determine record of the	Ongoing during construction	Statement of commitments – MP09_0013	Contract Project Manager Environment Manager	Heritage Management Plan (2019), Discovery of Unanticipated Aboriginal Cultural Material and Discovery of Unanticipated Human Remains	Inspection records Heritage Management Plan (2019) Discovery of Unanticipated Aboriginal Cultural Material and Discovery of Unanticipated Human Remains

Management/mitigation measure	Timing	Source	Responsibility	Reference	Evidence for compliance
site or object. The archaeologist in consultation with the registered stakeholder groups should provide management and mitigation measures as necessary, and provide a short report of the investigation to NRE and a copy to DECCW; • If human skeletal remains are found the following actions should be immediately undertaken: • Stop works in the immediate area of the remains; • The local police contacted, a physical anthropologist or archaeologist contacted; • If the remains are determined to be of antiquity and of Indigenous origin contact the registered stakeholder groups; and					

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Management/mitigation measure	Timing	Source	Responsibility	Reference	Evidence for compliance
Management and mitigation measures to be drawn up in consultation with the registered stakeholder groups and the archaeologist.					

6.7 Visual

Table 6.6 details management and mitigation measures required to ameliorate potential visual impacts during the construction phase of the project.

Table 6.6 – Management and mitigation measures – visual

Management/mitigation measure	Timing	Source	Responsibility	Evidence for compliance
Outcome: Construction and design is managed to ensure minimal visual impacts on local residents.	-	Statement of commitments – MP09_0013	-	-
The area of disturbance will be restricted to the minimum practicable.	During design and construction	Statement of commitments – MP09_0013	Contract Project Manager Environment Manager	Inspection records Survey records
Outcome: Operations are managed to ensure minimal visual impacts on local residents.	-	-	-	-
Progressive rehabilitation will be undertaken as required.	Continuous and as required	Statement of commitments – MP09_0013	Contract Project Manager Environment Manager	Inspection records Monitoring records Audit results
Appropriate use of lighting equipment to limit impacts on sensitive locations. This will be managed through inductions of all construction and operations employees.	Continuous	Statement of commitments – MP09_0013	Contract Project Manager Environment Manager	Training records Complaints/ communications record
Outcome: Wollongong Coal will implement the following measures to improve the visual amenity of the site and minimise the visual impact of the Project:	-	-	-	-

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Management/mitigation measure	Timing	Source	Responsibility	Evidence for compliance
Areas of disturbance will be kept to the minimum practicable and rehabilitated as soon as practical.	Ongoing during construction	Statement of commitments – MP09_0013	Contract Project Manager Environment Manager	Inspection records Audit results Survey records

6.8 Waste

Table 6.6 details management and mitigation measures required to ameliorate potential waste impacts during the construction phase of the project.

Table 6.7 – Management and mitigation measures – waste

Management/mitigation measure	Timing	Source	Responsibility	Evidence for compliance
Outcome: Avoidance of unnecessary resource consumption, reuse, reprocessing, recycling and energy recovery wherever possible and, where this is not possible, disposal of wastes in an environmentally responsible manner.	-	Statement of commitments – MP09_0013	-	-
All construction materials will be purchased with the aim of reducing waste products.	Prior to construction	Statement of commitments – MP09_0013	Contract Project Manager Environment Manager	Quotes and purchasing records
Onsite storage and disposal of different categories of waste will be defined prior to construction. A sufficient number of storage bins will be provided for waste disposal on site, with separate bins for recyclable and non-recyclable waste	Prior to construction and ongoing	Statement of commitments – MP09_0013	Contract Project Manager Environment Manager	Inspection records Monitoring records / waste tracking

6.9 Social

Table 6.8 details management and mitigation measures required to ameliorate potential social impacts during the construction phase of the project.

Table 6.8 – Management and mitigation measures – social and economic

Management/mitigation measure	Timing	Source	Responsibility	Evidence for compliance
Effective communication/consultation is undertaken throughout construction and operation of the project.	Prior to construction and at regular intervals of not less than 2 times a year	Statement of commitments – MP09_0013	Contract Project Manager Environment Manager	CCC meeting minutes Complaints/ communications records
Wollongong Coal will conduct regular community liaison meetings and provide regular updates to the community during construction. It will include quarterly website updates and annual community information sessions.	Ongoing during construction	Statement of commitments – MP09_0013	Contract Project Manager Environment Manager	Complaints/ communications records CCC meeting minutes WCL website updated
Wollongong Coal will continue to operation the Russell Vale CCC following relevant DPIE guidelines	Ongoing	Statement of commitments – MP09_0013	Contract Project Manager Environment Manager	CCC meeting minutes WCL website updated
Wollongong Coal will continue to implement the existing community complaints response and management program	Ongoing	Statement of commitments – MP09_0013	Contract Project Manager Environment Manager	Complaints and communications records CCC meeting minutes WCL website updated

7. MONITORING

7.1 Daily Pre-Starts

The Contractor will use daily pre-starts to continually monitor meteorological and site conditions to guide day-to-day planning.

These measures will include:

- reviewing meteorological forecasts, warnings and site conditions to prepare for and manage the construction activities; and
- modifying, rescheduling and or stopping construction due to adverse weather forecasts (e.g. high winds, rain) that has the potential to increase the impacts associated with the activity, if required.

7.2 Weekly and post rainfall site inspections

The Environment Manager (EM), Site Environmental Representative (SER) or delegate will undertake inspections of the work sites weekly and after significant rainfall events (more than 20 mm) to evaluate the effectiveness of environmental controls.

The results of the inspections will be recorded in the site Environmental Inspection Checklist.

If any maintenance or deficiencies in environmental controls or in the standard of environmental performance are observed, they will be recorded on the checklist form.

Records will also include details of any maintenance required, the nature of the deficiency, any actions required and an implementation priority. The completion of the actions will be monitored to ensure they are implemented within the agreed timeframes.

7.3 Environmental monitoring

The monitoring required under the CMP during construction is described in detail in the relevant environmental management sections of this CMP (Chapter 6) with monitoring locations outlined in Appendix F.

The Environment Manager /SER will be advised of any exceedances or non-compliances identified through monitoring activities. Details will be reported by the EM/SER in the monthly report.

Where an exceedance or non-compliance is detected or monitoring results are outside the expected range and are directly attributable to the project (i.e. are influenced by factors under the direct control of the project e.g. noise from construction equipment), an adaptive/contingency management process will be implemented and actions outlined in the Trigger Action Response Plan (TARP) will be applied, as it relates to the construction exceedance or non-compliance (Section 7.4 – Adaptive management).

All reasonable and feasible steps will be taken to ensure the exceedance or non-compliance ceases and does not reoccur, in accordance with Condition F4 of the Consent.

All environmental monitoring equipment will be maintained and calibrated (e.g. two continuous noise monitoring stations) according to the manufacturer's specifications and appropriate records kept.

7.4 Adaptive management

In accordance with Condition F4, where exceedances of criteria or performance measures has occurred, commensurate with construction activities Wollongong Coal will:

- review to ensure all reasonable and feasible mitigation measures and corrective / preventative actions (i.e. TARPs) were implemented to ensure that the construction, performance measure or criteria exceedance does not re-occur (Section 7.4.1 and Appendix E);
- consider all options for remediation;
- within 14 days of an exceedance occurring, submit a report to the Secretary describing the remediation options and preferred remediation measure or other course of action; and
- implement the remediation measure(s) as directed by the Planning Secretary.

7.4.1 Triggers and responses

Condition F5(f) of MP09_0013 requires Wollongong Coal to establish a contingency plan to manage any unpredicted impacts and their consequences, and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible.

This takes the form of a TARP, as presented in Appendix E. The TARP provides a simple, transparent and useable reference for the short-term management of aspects or issues at Russell Vale Colliery, and ensure the implementation of appropriate construction management measures.

TARPs are designed to summarise for each aspect or issue:

- monitoring requirements (may include different locations);
- trigger levels (performance measures or criteria) that flag implementation of contingency measures (e.g. modify or stop works);
- management and contingency actions or reporting requirements;
- responsibilities; and
- timing.

7.5 Maintenance and implementation

Wollongong Coal will prepare a maintenance and implementation plan within one month of the date of completion of the Bellambi Gully Creek diversion works in accordance with Term 2i and 2j of the Order.

Maintenance of Bellambi Gully Creek Diversion Works will be undertaken in accordance with the maintenance and implementation plan which would form a part of the Russell Vale Colliery surface water management plan.

8. REPORTING

8.1 Monitoring reports

On receipt of monitoring results, these will be reviewed fortnightly during construction to confirm compliance with relevant criteria specified in Chapter 5. This will ensure corrective action is taken where results might indicate a non-compliance or risk of future non-compliance.

Results of monitoring data will be made available on the Wollongong Coal website in accordance with the requirements of Condition 10, Schedule 5 of MP10_0046 and Condition F17(a) of MP09_0013.

8.2 Incident and non-compliance reporting

Incidents and non-compliance will be managed through established WCL procedures as detailed in the EMS (Wollongong Coal 2021).

MP09_0013 defines:

- an 'incident' to be "an occurrence or a set of circumstances that causes or threatens to cause material harm and which may or nor cause a non-compliance". Examples may include a breach of water quality criteria or EPL licence condition breach.
- 'Exceedance or non-compliance as "an occurrence, set of circumstances or development that is a breach of this consent".

The following order of priority actions will be implemented:

- Ensure incident notification requirements are undertaken in accordance with the Development Consent, EPL and other approval conditions to the appropriate agencies, including DPIE;
- Record the incident on the incident report form, which is to be forwarded to the Environment and Community (E&C) Department for action;
- Complete the incident form for any corrective actions that are identified as being required as a result of the incident, and follow up with a specific work order for rectification or corrective action/s as required;
- Review the effectiveness of the corrective or preventative action; and
- Update the relevant work procedures and / or training requirements as required.

In accordance with Conditions E1, F4, F9 and F10 of the Consent, Wollongong Coal will notify DPIE and other relevant agencies of any incidents that has caused or has the potential to cause significant risk of material harm to the environment.

A detailed report of the incident shall be provided to the Secretary of DPIE within 7 days of the incident occurring consistent with Condition F10 of the Consent.

8.2.1 Incidents

As required by Condition 6, Schedule 5 of MP10_0046 and Condition F9 of MP09_0013, after Wollongong Coal becomes aware of an incident it will notify:

- DPIE immediately; and
- any other relevant agencies.

The notification will identify the project (including the development application number and name) and set out the location and nature of the incident.

8.2.2 Exceedance or Non-Compliance

As required by Condition F10 of MP09_0013, WCL will notify DPIE and relevant agencies of any exceedance or non-compliance (being occurrence, set of circumstances or development that is a breach of this consent) within seven days of becoming aware of it.

The notification will set out the condition of the consent that the project has exceeded or is non-compliant with, why it does not comply, the reasons for the exceedance or non-compliance (if known), and what actions have been, or will be, undertaken to address the exceedance or non-compliance and whether affected land owner(s) have been notified.

In the event of an exceedance or non-compliance, the EM is to undertake the actions outlined in the TARP, as it relates to the exceedance or non-compliance. All reasonable and feasible steps will be taken to ensure the exceedance or non-compliance ceases and does not reoccur, in accordance with Condition F4 of the Consent.

Corrective or preventative actions are required to be undertaken in accordance with the Wollongong Coal Incident Investigation, Reporting and Non-Conformance Procedure.

8.3 Construction progress and compliance reports

The following specific reports that are required to be prepared during the course of the construction works:

- Reporting on construction compliance will be undertaken on a weekly basis as supported by an inspection routine;
- Outcomes will be reported to the Senior Leadership Team (SLT);
- Three monthly progress reporting to DPIE in accordance with Term 2g of the Order with information to made readily available at the request of Department, if required;
- Regular meetings will be held with the SLT, construction contractor and independent engineer;
- Construction Compliance Reports (at the completion of the contract);
- Non - Conformance Reports (when an NCR occurs);
- Corrective Action Plan (when an NCR occurs); and
- Complaint Management Report (when a complaint is received).

Copies of each report will be made available by any interested party on request.

The Construction Compliance Report must include the following information:

- Verification from the independent engineer confirming the replacement of the underground pipe section of Bellambi Gully Creek has been constructed and completed in accordance with the approved detailed engineering design plans;
- Compliance with the CMP and Conditions of Approval;
- Compliance with any other relevant approvals or licenses;

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- The implementation and effectiveness of environmental controls. The assessment of effectiveness should be based on a comparison of actual impacts against performance criteria identified in the CMP;
- The number and details of any complaints, including a summary of the main areas of complaint, action taken response given and intended strategies to reduce recurring complaints; and
- Details of any review and amendments to the CMP resulting from construction during the reporting period.

9. COMMUNICATION

9.1 Internal communications

Clear communication throughout all levels and functions (e.g., management, staff members and subcontracted service providers), is key to minimising environmental impacts and achieving continual improvements in environmental performance during construction.

The environmental team will meet fortnightly or as required subject to site activities to discuss on-site construction environmental management, amendments to plans, changes to construction activities, environmental monitoring results and other relevant aspects of the project.

Regular meetings may also be scheduled with the CPM or delegate to communicate ongoing environmental performance and to discuss issues to be addressed.

The EM/SER or delegate will participate regularly in toolbox talks to communicate to the wider project personnel on environmental performance including sensitive environmental matters for future work areas, and to receive feedback from on-site personnel.

9.2 Communication with relevant agencies and authorities

The EM/SER will be the main point of contact regarding specific environmental issues.

The EM/SER has the responsibility to report on the ongoing environmental performance of the project to DPIE, EPA and WCC and the Project Director.

The EM/SER, or delegate, will prepare three monthly progress reporting to DPIE in accordance with Term 2g of the Order with information to made readily available at the request of Department, if required .

9.3 Communication with the community

Wollongong Coal is committed to regular liaison with the local community and strives to maintain positive relationship with stakeholders.

Dissemination of information to the local community and relevant agencies regarding the Colliery, its construction schedule, progress and environmental management will be achieved via:

- The community consultative committee (CCC);
- Project newsletters, letterbox drops or notifications; and
- The Wollongong Coal website or the local press.

9.4 Complaint protocol

Wollongong Coal will maintain public signage advertising the telephone number on which environmental complaints can be made. The Environment and Community Department is responsible for ensuring that the currency and effectiveness of the service is maintained. Notifications of complaints received are to be provided as quickly as practicable to the CPM and EM/SER.

As required by Condition F5(h) of MP09_0013, complaints and enquiries will be handled in accordance with the Wollongong Coal Community Complaints and Enquiries Procedure and Section 4.7 of the EMS.

In accordance with Condition F17(a)(x) of MP09_0013, the complaints register will be updated monthly and be made available on the Wollongong Coal website.

9.5 Incident and emergency response

All environmental incidents and emergencies will be managed in accordance with the Wollongong Coal's Incident Management Procedure and Emergency Response Procedure/Emergency Management Plan. Once notified of an incident, the Control Room Operator (CRO) is to mobilise internal and external expertise and resources. Where an incident represents an immediate threat to human health or property, the first point of contact should be the Emergency response hotline on 000.

If the incident does not require an initial combat agency, or once 000 has been called, in accordance with the EPA notification protocol, the relevant individual responsible for activating the Pollution Incident Response Management Plan (PIRMP) needs to be notified.

Upon consultation with the EM/SER, CPM and SLT, each relevant authority will be notified immediately via the appropriate telephone number should a pollution incident occur that causes or threatens material harm to the environment, as required by Condition F9 immediately after Wollongong Coal becomes aware of an incident. Section 8.3 of this CEMP provides further details.

The relevant authorities to be notified are detailed in the PIRMP. A copy is held in the Control Room.

A report will be submitted to Wollongong Coal on each occasion when the site is visited by the EPA or any other Authority. The report will detail the purpose, outcome and actions pertaining to the visit and is submitted to the ER within one working day of the EPA or any other Authority visit.

9.5.1 Pollution incident response management plan

The purpose of Wollongong Coal's PIRMP is to meet the requirements of the Protection of the Environment Legislation Amendment Act 2011 (POELA Act).

The plan provides a reference for the Colliery's pollution incident response procedures and responsibilities, as well as the day-to-day management for the prevention and mitigation of any such incident/s, including (but not limited to):

- The implementation of pre-emptive management actions;
- The location of hazardous materials;
- Emergency response actions;
- Communication procedure;
- Safety equipment requirements; and
- Personnel responsibilities.

The notification of environmental incidents under the PIRMP is only required for those incidents causing or threatening to result in material environmental harm as defined in the POEO Act.

10. ROLE, RESPONSIBILITY, AND ACCOUNTABILITY

The key environmental management roles and responsibilities for the construction of the project are described below and have been divided into two main groups including Wollongong Coal personnel and Contractor personnel.

10.1 Wollongong Coal personnel

Wollongong Coal will have the primary responsibility of preparing, administering and updating the CMP. The environmental responsibilities of the positions as detailed below include:

- Contract Project Manager (CPM)
 - Ensure all works comply with relevant regulatory and project requirements;
 - Ensure the requirements of this CMP are fully implemented, and in particular, that environmental requirements are not secondary to other construction requirements;
 - Endorse and support the project environmental policy;
 - Participate and provide guidance in the regular review of this CMP and supporting documentation;
 - Provide adequate resources (personnel, financial and technological) to ensure effective development, implementation and maintenance of this CMP;
 - Ensure that all personnel receive appropriate induction training, including details of the environmental and community requirements;
 - Ensure that complaints are investigated, issues raised resolved; and
 - Direct that works be stopped immediately where there is an actual or potential risk of harm to the environment.
- Environment Manager (EM)
 - Overall responsibility for the management of environmental aspects of the project;
 - Development, implementation, monitoring and updating of the CMP and sub plans;
 - Report to SLT on the performance and implementation of the CMP;
 - Liaise with DPIE, EPA and other government authorities as required;
 - Ensure management reviews of the CMP are undertaken annually, documented and actions implemented;
 - Ensure environmental risks of the project are identified and appropriate mitigation measures are implemented;
 - Identify where environmental measures are not meeting the set targets and where improvement can be achieved;
 - Ensure environmental protocols are in place and managed;
 - Ensure environmental compliance;

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- Obtain and update all construction environmental licences, approvals and permits as required;
- Manage environmental document control, reporting, inductions and training;
- Manage environmental reporting;
- Prepare reports on a monthly basis outlining the construction works undertaken, achievements and areas where improvements were made;
- Oversee site construction environmental monitoring, inspections and internal audits;
- Manage all subcontractors and consultants with regards to environmental matters, including assessing their environmental capabilities and environmental documents;
- Prepare and/or distribute environment awareness notes;
- Develop and facilitate inductions, Toolbox Talks and other training programs regarding environmental requirements for all site personnel;
- Notify relevant authorities in the event of an environmental incident and manage the close-out of these;
- Stop activities where there is actual or potential risk of harm to the environment or to prevent an environmental non-conformance and advise the SLT, Construction Manager;
- Recommend reasonable steps to be taken to avoid or minimise unintended or adverse environmental impacts;
- Resolve environment-related complaints;
- Ensure that all community consultation activities are carried out in accordance with the conditions of approval;
- Report any environmental issues raised by stakeholders or members of the community to the SLT;
- Communicate environment-related project progress, performance, mitigation measures and issues to stakeholders and the community; and
- Maintain the 24-hour complaints hotline.
- Site Environmental Representative (SER)
 - Environmental monitoring, compliance and reporting back to EM;
 - Development, implementation, monitoring and updating of the CMP and sub plans;
 - Liaise with DPIE, EPA and other government authorities as required;
 - Ensure management reviews of the CMP are undertaken annually, documented and actions implemented;
 - Ensure environmental risks of the project are identified and appropriate mitigation measures are implemented;

- Identify where environmental measures are not meeting the set targets and where improvement can be achieved;
- Ensure environmental protocols are in place and managed;
- Ensure environmental compliance;
- Undertake site construction environmental monitoring, inspections and internal audits;
- Manage all subcontractors and consultants with regards to environmental matters, including assessing their environmental capabilities and environmental documents;
- Prepare and/or distribute environment awareness notes;
- Develop and facilitate inductions, Toolbox Talks and other training programs regarding environmental requirements for all site personnel; and
- Stop activities where there is actual or potential risk of harm to the environment or to prevent an environmental non-conformance and advise the SLT, Construction Manager.

10.2 Contractor personnel

The Contractor(s) appointed for the construction of the project will have the primary responsibility for implementing the CMP. All actions, except where specifically attributable to others, will be the responsibility of the Contractor.

Contractors' environmental requirements and responsibilities will be addressed in the contract documentation. As part of the selection process, consideration will also to be given to their past environmental performance. The EMR, or delegate, will participate in the tender assessment and selection process where it is deemed necessary due to associated environmental risks.

Prior to undertaking construction works, all contractors will be inducted into, and will operate under the framework provided in this CMP. All contractors will be required to implement the same procedures, monitoring and reporting systems that have been designed for construction of the project and contained in this CMP.

A standard monitoring form will be developed that will be used to assess the:

- Contractor's general work practices;
- Effectiveness of the contractor's environmental protection measures;
- Contractor's compliance with the requirements of this CMP; and
- Maintenance of environmental measures.

10.3 All other employees and sub-contractors

Will be responsible for following directions and instructions from site management and supervisors. All other employees and sub-contractors will be inducted into and will operate under the framework provided in this CMP.

11. COMPETENCE, TRAINING, AND AWARENESS

The Environment Manager has overall responsibility for ensuring the requirements of this CEMP are fully implemented.

The EM/SER will coordinate environmental training in conjunction with other training and development activities.

11.1 Environmental induction

All personnel, including contractors, sub-contractors and staff, are required to attend a compulsory site induction that includes an environmental component prior to commencement on site. The EM/SER, or delegate, will conduct the environmental component of the site induction.

The environmental component will include an overview of:

- Relevant details of the CMP including purpose and objectives;
- Key environmental issues (i.e. protection of sensitive areas, heritage, erosion control, dust and noise management);
- Conditions of environmental licences, permits and approvals;
- Specific environmental management requirements and responsibilities;
- Mitigation measures for the control of environmental issues;
- Incident response and reporting requirements; and
- Information relating to the location of environmental constraints.

A record of all environment inductions will be maintained and kept on site. The ER may authorise amendments to the induction where required to address project modifications, legislative changes or amendments to this CMP or related documentation.

The EM/SER will review and endorse the induction program and monitor its implementation.

11.2 Toolbox talks

Toolbox talks will be used to raise awareness and educate personnel on construction related environmental issues. The Toolbox talks will be used to ensure environmental awareness continues during construction.

Toolbox talks will be tailored to specific environmental constraints as relevant to the package of works, including:

- Erosion and sediment control;
- Hours of work;
- Emergency and spill response;
- Threatened species (including GGBF), endangered ecological communities, clearing controls and vegetation protection;
- Project and clearing limits;
- Aboriginal heritage;
- Non-Aboriginal heritage;

- Weed management;
- Noise;
- Housekeeping and waste;
- Concrete washout;
- Dewatering;
- Works in waterways;
- Dust control; and
- Traffic management.

Toolbox Talk attendance is mandatory, with attendees required to sign an attendance form. Records of Toolbox Talk attendance will be maintained.

Targeted environmental awareness training will be provided to individuals or groups of workers with a specific authority or responsibility for construction environmental management or those undertaking an activity with a high risk of environmental impact.

The EM/SER and Mine Training Manager will review the training program and monitor its implementation.

11.3 Daily pre-start meeting

The pre-start meeting is a tool for informing the workforce of the day's/ shift's activities, safe work practices, site weather condition, environmental protection practices, safe work method statement (SWMS) for a particular area of work, work area restrictions, activities that may affect the works, coordination issues with other trades, hazards and other information that may be relevant to the day's work.

The Construction Manager, or other appropriate site staff member, will conduct a daily pre-start meeting for the site workforce before the commencement of work each day (or shift) or where changes occur during a shift. Pre-start meetings may be project-wide and/or held for specific work areas.

The environmental component of pre-starts will include any environmental issues and weather conditions (e.g. rain, high winds) that could potentially be impacted by, or impact on, the day's construction activities. All attendees will be required to sign on to the pre-start and acknowledge their understanding of the issues explained.

Pre-start topics, dates delivered, and a register of attendees will be recorded and the records maintained.

12. AUDIT AND REVIEW

12.1 Progress reporting

In accordance with the requirements of Development Control Order, Wollongong Coal will provide DPIE with 3 monthly reports on the progress of construction works and include a review of this CMP in accordance with Term 2g of the Order with information to made readily available at the request of Department, if required.

Wollongong Coal will revise the CMP where required. Where revisions to any document are required, then within 6 weeks of the review, the revised document will be submitted to the Secretary for approval, unless agreed otherwise.

Any revisions or changes to the CMP will be made in consultation with the relevant authorities and groups.

12.2 Annual Review

In accordance with Condition F11 of the Consent, an Annual Review of the environmental performance of the Colliery is prepared and submit to DPIE by the end of March each year, following the commencement of activities approved under the Consent. Or at a timeframe agreed with the Secretary of DPIE.

The Annual Review will:

- 1) Describe the development (including any rehabilitation) that was carried out in the previous calendar year and the development that is proposed to be carried out over the current calendar year.
- 2) Include a comprehensive review of the monitoring results and complaints records of the development over the previous calendar year, including a comparison of these results against the:
 - i) relevant statutory requirements, limits or performance measures/criteria;
 - ii) requirements of any plan or program required under this consent;
 - iii) monitoring results of previous years; and
 - iv) relevant predictions in the document/s listed in condition A2(c);
- 3) Identify any non-compliance or incident which occurred in the previous calendar year, and describe what actions were (or are being) taken to rectify the non-compliance and avoid recurrence.
- 4) Evaluate and report on:
 - i) the effectiveness of the noise and air quality management systems; and
 - ii) compliance with the performance measures, criteria and operating conditions of this consent;
- 5) Identify any trends in the monitoring data over the life of the development.
- 6) Identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies.

7) Describe what measures will be implemented over the next calendar year to improve the environmental performance of the development.

Copies of the Annual Review will be submitted to DPIE, WCC and made available to the CCC and any interested person upon request.

12.3 Auditing

Condition F13 of the Consent requires an Independent Environmental Audit (IEA) of the Russell Vale development, following one-year post commencement of mining activities and every 3 years thereafter (unless the Secretary advises otherwise).

12.4 Management reviews

Management reviews will be undertaken quarterly as part of the continual improvement process. The reviews will be initiated by the EM and includes relevant project team members and the mine SLT members as required.

The Wollongong Coal Environment and Community Department will meet at least quarterly, to review environmental management issues for the Colliery. The meeting can be run in conjunction with a wider project team meeting if the EM/SER deems it appropriate.

The reviews will include:

- Consideration of the general progress of work and the level of overall construction environmental risk;
- Consideration of monitoring, inspection and audit results;
- Consideration of recent and relevant incidents and any lessons learnt;
- Consideration of any new regulatory obligations;
- Consideration of any recorded pollution complaints;
- A review of the effectiveness of environmental controls, including. Erosion and sediment controls;
- Consideration of changes in operational needs such as resourcing; and
- Feedback from Wollongong Coal and other relevant stakeholders.

The outcomes of the environmental reviews may trigger amendments to this CMP and related documentation, revision to the project's environmental management system, review of the risk assessment, re-evaluation of the project objectives and targets as well as input into other project documents.

13. RECORDS AND DOCUMENT CONTROL

13.1 Environmental records

The EM/SER is responsible for maintaining all environmental management documents so that they are always current at the point of use.

Types of records include:

- Monitoring, inspection and compliance reports/records;
- Correspondence with public authorities;
- Induction and training records;
- Reports on environmental incidents, other environmental non-conformances, complaints and follow-up action;
- Community engagement information; and
- Minutes of environmental management system review meetings and evidence of any action taken.

All construction environmental management documents are subject to ongoing review and continual improvement. This includes times of change to scheduled activities or to legislative or licensing requirements.

Only the EM/SER, or delegate, has the authority to change any of the construction environmental management documentation.

13.2 Document control

The CPM will coordinate the preparation, review and distribution, as appropriate, of the environmental documents. During construction, the environmental documents will be stored at the main site compound.

The CMP will be developed, approved, implemented and maintained in accordance with the Document Control Procedure (WCL SYS PRO 001).

14. REFERENCES

Biosis 2013, NRE No. 1 Colliery, Russell Vale: Conservation Management Plan, report for Gujarat NRE Coking Coal Ltd.

ERM 2013, NRE No. 1 Colliery Project Application (09_0013) Environmental Assessment, prepared for Gujarat NRE Coking Coal Pty Ltd, Environmental Resources Management Australia.

PAC 2015, *Russell Vale Colliery – Underground Expansion Project: Review Report*, Planning Assessment Commission.

PAC 2016, *Russell Vale Colliery – Underground Expansion Project: Second Review Report*, Planning Assessment Commission.

Umwelt 2019a, *Russell Vale Revised Underground Expansion Project: Revised preferred project report and response to second PAC review*, Umwelt Environmental and Social Consultants.

Umwelt 2019b, *Russell Vale Colliery Revised Underground Expansion Project Submissions Report – Part A*, Umwelt Environmental and Social Consultants.

Umwelt 2019c, *Russell Vale Colliery Revised Underground Expansion Project Submissions Report – Part B*, Umwelt Environmental and Social Consultants.

Wollongong Coal 2019, *Russell Vale Colliery Surface Facilities Water Management Plan*, Wollongong Coal Pty Limited.

Wollongong Coal 2019, *Russell Vale Colliery Biodiversity Management Plan*, Wollongong Coal Pty Limited.

Wollongong Coal 2019, *Russell Vale Colliery Heritage Management Plan*, Wollongong Coal Pty Limited.

Wollongong Coal 2020, *Russell Vale Colliery Mining Operations Plan, September 2020 to September 2022*, Wollongong Coal Pty Limited.

Wollongong Coal 2021, *Russell Vale Colliery Environmental Management Strategy*, Wollongong Coal Pty Limited.

15. GLOSSARY OF ABBREVIATIONS AND TERMS

Abbreviations	
CCC	Community Consultative Committee
CCL	Consolidated Coal Lease
CPM	Contract Project Manager
CMP	Construction Management Plan
DECC	Department of Environment and Climate Change NSW
DPIE	NSW Department of Planning, Industry and Environment
EA	Environmental assessment
EMM	EMM Consulting Pty Limited
EMP	Environmental Management Plan
EM	Environment Manager
EMS	Environmental Management System
EPA	NSW Environment Protection Authority
EPL	Environment Protection Licence
ICNG	Interim construction noise guideline
IPC	Independent Planning Commission of NSW
JSPL	Jindal Steel and Power Limited
LGA	Local Government Area
ML	Mining Lease
MPL	Mining Purpose Lease
Npfi	Noise Policy for Industry
NSW	New South Wales
PAA	Project application area
PAC	Planning Assessment Commission

Abbreviations	
PKCT	Port Kembla Coal Terminal
ROM	Run-of-mine
SEPP	State Environmental Planning Policy
SER	Site Environment Representative
UEP	Underground Expansion Project
VENM	Virgin Excavated Natural Material

Terms	
exceedance or non-compliance	- Any inspection/test result that does not meet the acceptance criteria specified in the development consent, EPL and /or other conditions of approval identified in the EMS; - Any notice of non-compliance issued by the EPA; or - Any other regulatory authority with environmental jurisdiction.
incident	an occurrence or set of circumstances that causes or threatens to cause material harm and which may or may not be or cause a non-compliance
material harm	harm to the environment is material if: It involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or It results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000.
the Colliery	Russell Vale Colliery
the Planning Secretary	The Planning Secretary of the Department of Planning, Industry and Environment (DPIE)
The Project	the Revised Preferred Project
Wollongong Coal Pty Limited	Wollongong Coal



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APPENDIX A – DEVELOPMENT CONTROL ORDER



Proper Officer
Wollongong Coal Limited
7 Princes Highway
CORRIMAL NSW 2518

Contact: Georgia Dragicevic
Phone: (02) 4247 1852
Email: Georgia.Dragicevic@planning.nsw.gov.au

Attention: Mr Rob Faddy, Environmental Co-ordinator
Mr Devendra Vyas, Technical Service Manager

Email: rfaddy@wcl.net.au, dvyas2@wcl.net.au

23 July 2020

**DEVELOPMENT CONTROL ORDER UNDER ITEM 14, PART 1, SCHEDULE 5
SECTION 9.34 OF THE *ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979***

I, Ben Harrison, as delegate of the Minister for Planning and Public Spaces (**Minister**), pursuant to the powers conferred by Section 9.35 of the *Environmental Planning & Assessment Act 1979* (**EP&A Act**) serves Wollongong Coal Limited, ABN 28 111 244 896, (**Wollongong Coal**) with this Development Control Order (**Order**). The order is given to Wollongong Coal, in accordance with Item 14 Part 1 of Schedule 5 of the EP&A Act to remedy a breach of a consent for State significant development.

The order is served to Wollongong Coal as the person who caused the breach and who is entitled to act on the Consent (as defined below).

Premises

The land known as Russell Vale Colliery on Princes Highway, Russell Vale NSW, in the Local Government Area of Wollongong, as described in the Consent (**Premises**).

Planning Approval

Project Approval 10_0046 for the continued operations and extraction up to 1 million tonnes of run-of-mine coal a year was approved by the Planning Assessment Commission as delegate of the Minister, subject to conditions, on 13 October 2011 and was subsequently modified on 24 December 2012, 10 October 2014 and 19 November 2014 (**Consent**). On 1 June 2018, Consent was declared a transitional State Significant Development under clause 6 of Schedule 2 of the *Environmental Planning & Assessment (Savings, Transitional and Other Provisions) Regulation 2017*.

The applicant for the Consent (and subsequent modifications) was Wollongong Coal (formerly Gujarat NRE Coking Coal Ltd). The Premises are owned by Wollongong Coal. Wollongong Coal is entitled to act on the Consent.

Terms of the Order issued to Wollongong Coal

1. I revoke the Order dated 15 July 2019 (as modified) issued by Kirsty Ruddock, Director – Compliance and Investigations on 16 December 2016, as delegate of the Minister for Planning.

2. You must comply with the terms of this Order as follows:
 - a. Engage a suitably qualified independent licensed engineer and submit to the Secretary for endorsement.
 - b. The endorsed engineer is to:
 - i. develop detailed engineering design plans for the replacement of the underground pipe section of Bellambi Gully Creek with a suitably designed and engineered open channel, generally in accordance with the design parameters outlined in Cardno 2020 Phase 1 and 2 Bellambi Gully Flood Assessment Proposed Stormwater Diversion Drain;
 - ii. certify the detailed engineering design plans as being fit for purpose,
 - iii. supervise the replacement of the underground pipe section of Bellambi Gully Creek, in accordance with the approved detailed engineering design plans;
 - iv. develop a written report confirming the replacement of the underground pipe section of Bellambi Gully Creek has been constructed and completed in accordance with the approved detailed engineering design plans.
 - c. Submit the detailed engineering design plans referred to in Term 2 a. above to the Secretary for approval.
 - d. Prepare a detailed construction management plan (CMP), including an implementation plan with specific actions and timeframes, for the replacement of the underground pipe section of Bellambi Gully Creek, in accordance with the detailed engineering design plans, and submit the CMP for the Secretary's approval.
 - e. Construct and install the replacement of the underground pipe section of Bellambi Gully Creek in accordance with the approved detailed engineering design plans and CMP. All works must be supervised by the engineer approved by the Secretary.
 - f. Undertake replacement of the underground pipe section of Bellambi Gully Creek;
 - i. only between 7:00am and 6:00pm Monday to Friday, and between 8:00am and 1:00pm on Saturdays. No works are to be undertaken on Sundays or public holidays;
 - ii. whilst keeping the public roads free of dirt, mud and any other material;
 - iii. whilst not exceeding:
 1. the 50kmph speed limit for Bellambi Lane in the Consent; and
 2. the noise and air quality impact assessment criteria in the Consent; and
 - iv. whilst implementing:
 1. best practice noise management, including all reasonable and feasible noise mitigation measures, as defined in the Consent, to minimise the construction and road traffic noise and monitoring to ensure compliance with the noise impact assessment criteria in the Consent;
 2. best practice air quality management, including all reasonable and feasible measures, as defined in the Consent, to minimise the off-site dust emissions and monitoring to ensure compliance with the air quality impact assessment criteria in the Consent; and
 3. erosion and sediment controls, in accordance with the Managing Urban Stormwater – Soils and Construction, Volume 2E Mines and Quarries (DECC 2008), or its latest version.
 - g. Prepare and submit a written report detailing the implementation status with the actions and timeframes specified in the CMP referred to in Term 2 d above to the Secretary.

- h. Submit the written report referred to in Term 2 b iv above to the Secretary.
- i. Prepare a detailed maintenance plan, including an implementation plan with specific actions and timeframes, Bellambi Gully Creek, in accordance with the detailed engineering design plans, and submit for the Secretary's approval.
- j. Undertake maintenance of the Bellambi Gully Creek, in accordance with the detailed maintenance plan, approved by the Secretary.

Period for compliance with the Order

Term 2a	– six weeks from the date the Order is given.
Term 2 b i and 2 b ii	– eighteen weeks from the date the Secretary endorses engineer.
Term 2 c	– eighteen weeks from the date the Secretary endorses engineer.
Term 2 d	– four weeks from the date the Secretary approves detailed engineering design plans, referred to in Term 2 a
Term 2 e to 2 f	– within timeframes outlined in the detailed CMP, referred to in Term 2 d above and approved by the Secretary but no later than 12 months from the date the Order is given.
Term 2 g	– every three months from the date of the commencement until the date of the completion of the replacement of the underground pipe section of Bellambi Gully Creek.
Term 2 h	– one month from the date of the completion of the replacement of the underground pipe section of Bellambi Gully Creek.
Term 2 i	– one month from the date of the completion of the replacement of the underground pipe section of Bellambi Gully Creek.
Terms 2 j	– within timeframes outlined in the detailed maintenance plan, referred to in Term 2 i.

Note: Physical commencement is not permitted until Secretary's approval of detailed engineering design plans and the CMP is granted.

Reason for issuing the Order

1. The Secretary considers the Order is required to remedy a breach of Schedule 2, Condition 2 of the Consent. It is an offence under Section 4.2 (1) (b) of the Act to carry out the development not in accordance with the consent.
2. Schedule 2, Condition 2 of the Consent states:

The Proponent shall carry out the project generally in accordance with the:

- (a) EA;

- (a1) *EA – Mod 1 with the exception that approval is not given for development of Maingates 7 and 8;*
 - (a2) *EA – Mod 2;*
 - (b) *Statement of Commitments (see Appendix 3); and*
 - (c) *conditions of this approval.*
3. Underground pipe section of Bellambi Gully Creek has not been replaced with a suitably designed and engineered open channel, constructed on the southern side of the coal stockpile area, in accordance with engineering plans prepared generally in accordance with the design parameters outlined in Coffey 2010, by 31 December 2013, as required under Schedule 2, Condition 2, of the Consent, specifically the EA Section 3.5 and Figure 3.3 and Statement of Commitments.
4. Since 21 December 2019, Wollongong Coal has not complied with the terms of the Order dated 15 July 2019 (as modified) issued by Kirsty Ruddock, Director – Compliance and Investigations on 16 December 2016, as delegate of the Minister for Planning to replace the underground pipe section of Bellambi Gully Creek with a suitably designed and engineered open channel, as required under Schedule 2, Condition 2 of the Consent.

Non-Compliance with the Order

It is an offence pursuant to section 9.37 of the EP&A Act to fail to comply with this Order. The maximum penalty for breaching or failing to comply with an Order issued under section 9.34 of the EP&A Act is \$5 million and a further penalty of \$50,000 for each day that the offence is continuing.

Appeal

You are advised that you may appeal to the Land and Environment Court of NSW against the terms of this Order or as specified part of this Order under the provisions of section 8.18 of the EP&A Act. Such appeal must be made within 28 days after the service of this Order on you and does not affect the requirement for you to comply with the terms of this Order.

Departmental Contact

The contact for this matter is Georgia Dragicevic who may be contacted on (02) 4247 1852 or at Georgia.Dragicevic@planning.nsw.gov.au.



Ben Harrison
Director Compliance
as delegate of the Minister for Planning and Public Spaces

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APPENDIX B – DPIE APPROVAL OF DETAILED DESIGN FOR BELLAMBI CREEK DIVERSION WORKS

Mr Robert Faddy-Vrouwe
Environment Coordinator
Wollongong Coal Limited
PO Box 281
FAIRY MEADOW NSW 2519

25/02/2021

Dear Mr Faddy-Vrouwe

**Russell Vale Revised Underground Expansion Project
Detailed Designs for Bellambi Creek Diversion**

The Department has reviewed the *Detailed Engineering Designs* (dated 18 December 2020) and the associated *Design Report* (dated January 2021) prepared by ROC Engineering Design for the Bellambi Creek Diversion.

It is noted that these documents were prepared in response to the Development Control Order (the Order) issued by the Department on 23 July 2020.

The Department is satisfied that the documents fulfil the requirements of **Term 2b (i)**, **2b (ii)** and **Term 2c** of the Order, and formally approves the detailed engineering plans.

If you have any questions, please contact Rose-Anne Hawkeswood on 02 9274 6324 or email at rose-anne.hawkeswood@planning.nsw.gov.au.

Yours sincerely



Stephen O'Donoghue
Director
Resource Assessments
As nominee of the Planning Secretary



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APPENDIX C – DPIE APPROVED ENGINEERING DRAWINGS



BELLAMBI CREEK DIVERSION

DRAWING LIST

C000	COVER SHEET AND DRAWING LIST
C001	CIVIL SPECIFICATION
C010	LOCALITY PLAN
C020	SITE PLAN
C021	SEDIMENTATION AND EROSION CONTROL PLAN
C022	SEDIMENTATION AND EROSION CONTROL DETAILS
C023	BULK EARTHWORKS PLAN
C030	SITE STORMWATER PLAN
C031	DIVERSION CHANNEL DETAIL PLAN SHEET 1
C032	DIVERSION CHANNEL DETAIL PLAN SHEET 2
C033	DIVERSION CHANNEL DETAIL PLAN SHEET 3
C034	DIVERSION CHANNEL DETAIL PLAN SHEET 4
C035	DIVERSION CHANNEL DETAIL PLAN SHEET 5
C040	DIVERSION CHANNEL LONGITUDINAL SECTION
C050	DIVERSION CHANNEL SECTIONS SHEET 1
C051	DIVERSION CHANNEL SECTIONS SHEET 2
C052	DIVERSION CHANNEL SECTIONS SHEET 3

DRAWING LIST

C060	INLET STRUCTURE DETAILS SHEET 1
C062	DIVERSION CHANNEL DETAILS SHEET 1
C063	DIVERSION CHANNEL DETAILS SHEET 2
C065	GABION DROP STRUCTURE DETAILS SHEET 1
C069	TRASH RACK INLET DETAILS
C070	OSD PLAN
C071	OSD CROSS SECTIONS
C072	OSD DETAILS SHEET 1
C073	OSD DETAILS SHEET 2
C080	SUMP AND PIPE DETAILS

NOT FOR CONSTRUCTION

3	FOR TENDER	TMC	02.02.2021
2	FOR APPROVAL	TMC	18.12.2020
1	FOR INFORMATION	TMC	14.12.2020
REVISION	DESCRIPTION	ISSUED	DATE

THESE DRAWINGS WERE PREPARED IN ACCORDANCE WITH THE RELEVANT AUSTRALIAN STANDARDS AND STRUCTURAL / CIVIL PROVISIONS OF THE BUILDING CODE OF AUSTRALIA.

CLIENT



THESE DESIGNS, PLANS, SPECIFICATIONS & COPYRIGHT THEREIN ARE THE PROPERTY OF ROC ENGINEERING DESIGN AND MUST NOT BE USED, REPRODUCED, OR COPIED, WHOLLY OR IN PART WITHOUT THE WRITTEN PERMISSION OF ROC ENGINEERING DESIGN.



PROJECT

BELLAMBI CREEK DIVERSION
RUSSELL VALE COLLIERY

DRAWING TITLE

COVER SHEET AND
DRAWING LIST

SCALE (A1)

JOB NUMBER	DATUM	DRAWING NUMBER	REVISION
20240	AHD	C000	3

GENERAL

- All works to be undertaken in accordance with current Australian Standards and Council's specifications.
- All drawings are to be read in conjunction with all other consultants drawings and specifications including but not limited to architectural, structural, hydraulic and landscape.
- Do not scale these drawings for dimensions.
- The contractor shall provide sufficient notice to the principal certifying authority and ensure all works are inspected to enable compliance certificates to be issued.
- Restore all paved, covered, grassed and landscaped areas to their original condition on completion of works
- All survey setout to be by a registered surveyor.
- Verify all dimensions and existing levels and conditions on site prior to commencing work.

SITEWORKS

- All works to be in accordance with relevant local council / regulatory authorities requirements, all specifications and australian standards. Conflicts between said documents shall be referred to the superintendent for direction.
- The contractor is to design, obtain approvals and carry out required temporary traffic control procedures during construction in accordance with all regulatory authorities, inclusive of local council regulations and requirements.
- The contractor is to obtain all authority approvals as required prior to commencement of works.
- Restore all paved, covered, grassed and landscaped areas to their original condition or as directed by the site superintendent on completion of works. Where planting of new grass is necessary refer to landscape architect and / or architect documentation.
- On completion of any trenching works, all disturbed areas shall be restored to their original condition or as directed by the site superintendent, including kerbs, footpaths, concrete areas, gravel, grassed areas and road pavements.
- The contractor shall arrange all survey setout to be carried out by a registered surveyor prior to commencement of works.
- The contractor shall verify all dimensions and existing levels onsite prior to lodgment of tender and onsite works. the price as tendered shall be inclusive of all works shown on the tender project drawings. Additional payments for works shown on the tender project drawings will not be approved.
- Do not obtain dimensions by scaling drawings.
- In case of doubt or discrepancy refer to superintendent for clarification or confirmation prior to the commencement of construction.
- Where new works abut existing the contractor shall ensure that a smooth even profile, free from abrupt changes is obtained. Make smooth transition to existing features and make good where joined.
- Trenches through existing road and concrete pavements shall be sawcut to full depth of concrete and a min 50mm in bituminous paving.
- All civil engineering design has been documented under the assumption that all necessary site contamination remediation works have been satisfactorily completed (if applicable) and that the site is not affected by any soil strata or groundwater table contamination.

SERVICES

- The location of existing services shown on the drawings are approximate only and may be incomplete. The locations have been obtained from data supplied by the relevant authorities.
- It is the contractors responsibility to obtain clearances from the relevant service authorities prior to works commencing.
- It is the contractors responsibility to verify the location of all existing services prior to works commencing.
- Protect and maintain all existing services to be retained in the vicinity of the proposed works.
- No mechanical excavations to be undertaken over communication, gas or electrical services. Hand excavation only in these areas.
- The contractor shall be responsible for all damage caused to existing services as a result of the contractors work.

ACCESS AND SAFETY

- The contractor shall comply with all statutory and industrial requirements for provision of a safe working environment including traffic control.
- The contractor shall provide traffic management plans for the proposed works completed by a suitably qualified person and approved by council / regulatory authority. Work is not to commence on site prior to approval of traffic management scheme.
- Contractor to locate all existing services prior to commenoement of works. Any damage to services to be rectified at the contractors expense.
- Where necessary the contractor shall provide safe passage of vehicles and/or pedestrians through or by the site.
- The contractor shall ensure public access external to the site is in accordance with councils requirements.

EARTHWORKS

- At the commencement of filling operations for bulk earthworks a **geotechnical engineer is to visit the site & confirm the suitability of the methodology of achieving the required compaction requirements.**
- Strip topsoil, vegetable matter and rubble to expose naturally occurring material and stockpile on site as directed by the superintendent.
- Where filling is required to achieve design subgrade, proof roll exposed natural surface with a minimum of ten passes of a vibrating roller (minimum static weight of 10 tonnes) in the presence of the superintendent.
- All soft, wet or unsuitable material is to be removed as directed by the superintendent and replaced with approved material satisfying the requirements below.
- Provide certificates verifying the quality of imported material for the superintendents approval.
- All fill material shall be placed in maximum 200mm thick layers, (loose) and compacted at optimum moisture content (+ or -2%) to achieve a dry density determined in accordance with AS1289 2.1.1, AS1289.5.7.1 and AS1289.5.8.8 of not less than the following standard minimum dry density.

Location	Compaction Requirement
Landscaped Areas	98% SMDD
Roads	100% SMDD (in accordance with council specifications)
Paved Areas	100% SMDD (in accordance with council specifications)

- Z. Testing of the subgrade for buildings shall be carried out by an approved N.A.T.A registered laboratory.
- Allow the following compaction testing by N.A.T.A. registered laboratory for platforms and fill layers in accordance with the latest version of AS3798. (minimum 3 tests per layer) or 1 test per material type per 2500m² or 1 test.
 - Where test results are below the specified compaction, recompact and retest until specified compaction standards are achieved, otherwise subgrade replacement is required if compaction standards are not achieved.
 - Allow for excavation in all materials as found U.N.O. no additional payments will be made for excavation in wet or hard ground.
 - Where there is insufficient excavated material suitable for filling or subgrade replacement, the contractor is to allow to import fill.Imported fill shall comply with the following;
 - 1.1. Be of virgin excavated natural material or
 - 11.2. Contractor to provide evidence import is suitable use
 - 11.3. Plasticity index between 2-15% and CBR > 8
 - 11.4. Free from organic and perishable matter
 - 11.5. Maximum size 50mm, passing 75 micron sieve (<25%)

SEDIMENT CONTROL

- The contractor shall at all times be responsible for the establishment & management of a detailed scheme meeting councils design, other regulatory authority requirements and make good payment of all fees.
- The contractor shall instigate all sediment and erosion control measures in accordance with statutory requirements and in particular the 'blue book' (managing urban stormwater soils and construction), produced by the department of housing and councils policies. These measures are to be inspected and maintained on a daily basis.
- The contractor shall inform all sub contractors of their responsibilities in minimising the potential for soil erosion and pollution to downslope lands and waterways.
- Where practical, the soil erosion hazard on the site shall be kept as low as possible, to this end, works should be undertaken in the following sequence;
 - 1.construct temporary stabilised site access inclusive of shake down / wash pad.
 - 2.install all temporary sediment fences and barrier fences, where fences adjacent each other, the sediment fence can be incorporated into the barrier fence.
 - 3.install sediment control measures as outlined on the approved plans.
- Undertake site development works so that land disturbance is confined to areas of minimum workable size.
- At all times and in particular during windy and dry weather, large unprotected areas will be kept moist (not wet) by sprinkling with water to keep dust under control ensuring conformity to regulatory authority requirements.
- Any sand used in the concrete curing process (spread over the surface) shall be removed as soon as possible and within 10 working days from placement.
- Water shall be prevented from entering the permanent drainage system unless the catchment area has been stabilised and/or any likely sediment been filtered out.
- Temporary soil and water management structures shall be removed only after the lands they are protecting are stabilised / rehabilitated.
- Allow for grass stabilisation of exposed areas, open channels and rock batters during all phases of construction.
- Erosion and sediment control measures shall be inspected to ensure that they operate effectively. Repairs and/or maintenance shall be undertaken regularly and as required, particularly following rain events.
- Receptors for concrete and mortar slurries, paints, acid washings, light-weight waste materials and litter shall be disposed of in accordance with regulatory authority requirements. Contractor to pay all fees and provide evidence of safe disposal.
- If a temporary sediment basin is required, ensure safe batter slopes in accordance with the geotechnical report. Maintain adequate storage volume in accordance with plans. Temporary pump 'clean flocculated' water to councils stormwater system . Ensure whole site run-off is directed to temporary sediment basin.

STORMWATER DRAINAGE

- Stormwater drainage to be generally in accordance with current Australian Standards and Council's specifications.
- Contractor to locate all existing services prior to commencement of works. Any damage to services to be rectified at the contractors expense.
- Pipes of 300mm dia. and under to be UPVC to AS1254
- Pipes of 375mm dia. and larger shall be FRC or concrete class 2 to AS1342, rubber ring jointed UNO.
- Pipes up to 150mm dia. shall be laid at a minimum grade of 1%. Pipes 225mm dia. and over 0.5%.
- Bedding material to AS2032 or AS3725 as appropriate
- All lines to be 100 dia. at 1% min grade (UNO).
- All pits located in trafficable areas (eg driveways) to have medium duty grated covers to AS 3996.
- Minimum pipe cover to be 100mm adjacent to dwellings, 300mm in landscaped areas and 450mm in areas subject to vehicular loading UNO.
- Polymer stormwater pits may be used, to councils standards up to 600x600 in size.
- Pits and downpipe locations and levels may be varied to suit site conditions after consulting ROC.
- Connection to Council's stormwater drainage network is to be carried out in accordance with council specifications.
- Surface drainage shall be installed to avoid collecting against or near the footings and slab.
- The base of service trenches under slab are to slope away from the building and backfilled in accordance with AS2870.
- During construction, water run-off shall be collected and diverted away from building.

CONCRETE

- Concrete specification:

Slump	80 mm
Max. aggregate	20 mm
Cement	Type GP Portland
- Concrete strength and clear cover (including fitments) to be as follows:

Element	f _c (MPa)	cover(mm)
Footings	32	50
Slab	32	50
Kerbs, Drains	32	50
- All concrete including footings and slabs to be compacted with mechanical vibrators.
- If concrete is poured in hot or windy conditions it is recommended aliphatic alcohol be applied immediately following screeding. Aliphatic alcohol to be on site prior to inspection by engineer.
- All above ground concrete surfaces are to be cured by an approved means for 7 days immediately after the concrete is set.
- Pour beams and slabs monolithically.
- Construction joint locations shall be approved by the engineer.
- Cast-in conduits shall have a minimum 25mm concrete cover and shall be placed between, not outside, the layers of reinforcement.
- Notify engineer 72 hours prior to pouring concrete.

REINFORCEMENT

- R - denotes grade 250 plain bar to AS4671 (f_{sy} = 250 MPa)
L - denotes grade 500 deformed bars as mesh to AS4671 (f_{sy} = 500 MPa)
N - denotes grade 500 deformed bars to AS4671 (f_{sy} = 500 MPa)
- All hooks, laps, cogs and bends to be in accordance with AS3600.
- Splice reinforcement in accordance with AS3600. Min. laps for bars: 40 diameters.
- Mesh laps are to be spacing of transverse wires +25mm, min. laps. for fabric: 350m
- All reinforcement shall be adequately and accurately tied and supported on plastic tipped chairs.
- All reinforcement to slab on ground shall be supported by plastic bar chairs at 600 cts. max. to maintain top cover.

INSPECTION AND HOLD POINTS

- Inspection schedule and hold points are to be in accordance with below:
- Prior to placing basecourse present the excavated foundation area for inspection and approval by the Geotechnical Design Representative.
 - Prior to placing any concrete in reinforced elements, present the reinforcing for inspection and approval by the Structural Design Representative.
 - Fill compaction testing to Level 2 in accordance with AS3798 at a rate of 1 test per 1000m

SCOUR PROTECTION

- Pipe outlets must be protected by the placement of scour protection extending 5xpipe dia. downstream, and fanned out to a min. width of 1.5m, consisting of :
 - A min. of 2 layers of angular rock, min. 50% to have a mass greater than 5kg, laid over 75mm layer of 14mm gravel.
or
 - Grouted rock, min. size 150mm, max. size 350mm, minimum 50% to be 250mm in size, grouting to be minimum 50mm deep with 70mm embedment of rocks and rock spacing maximum 300mm.
or
 - Reno mattress, 300mm deep and bedded 50mm into ground laid over non woven geotextile (bidim a14 or similar).

GABION / MATTRESS

- Installation of gabion structures is to be in accordance with RMS R55.
- Gabions and mattresses must be flexible, woven, galvanized wire mesh boxes of dimensions as shown on the Drawings conforming to ASTM A975-97. Where specified on the Drawings, the galvanized wire mesh must be coated with PVC.
- The galvanizing coating must be a 95% Zinc, 5% Aluminium Mischmetal alloy conforming to the requirements of ASTM A975-97. The physical properties of the steel wire and PVC coating must conform to the requirements of ASTM A975-97.
- Gabions and mattresses must have a nominal mesh size of 80 mm x 100 mm.
- Rockfill shall comply with AS 2758.4-2000 (Aggregate for gabion baskets and wire mattresses).
- Rock fill sizing to be u.n.o:
-Gabions - 100mm < Rockfill < 250mm; no more than 5% smaller material is permitted.
-Mattress - 75mm < Rockfill < 2/3 mattress thickness.
- All gabion structures to be placed on BIDIM A29 geotextile or equivalent u.n.o.
- Carry out filling of the gabion boxes only while the gabion boxes are under tension.
- Mechanical filling equipment may be used provided that adequate precautions are taken to protect any PVC coating from abrasion during filling operations.
- Redistribute the filling materials by hand to ensure that all diaphragm compartments are fully filled and to produce a neat and level top surface.
- Gabions**
- The boxes must be divided by diaphragms into cells of length not greater than the width of the gabion plus 100 mm, or as shown on the Drawings.
- The minimum diameter of mesh wire must be 2.7 mm.
- The minimum diameter of galvanized selvedge wire must be 3.4 mm.
- Mattresses**
- The boxes must be divided into cells by diaphragms across the width of the unit and at not more than 1 m centres, or as shown on the Drawings.
- Diaphragms may be formed by folding the base layer of a mattress, provided that the bottom of each of the diaphragm halves is securely tied together so that the transmission of tensile forces in the mesh of the base layer is not impeded.
- For mattresses less than 350 mm thick, the minimum diameter of mesh wire must be 2.0 mm and the minimum diameter of galvanized selvedge wire must be 2.4 mm.
- For mattresses with thickness between 350 mm and 550 mm, the minimum diameter of mesh wire must be 2.4 mm and the minimum diameter of galvanized selvedge wire must be 3.0 mm.
- When the mattress is laid on a slope steeper than 1(V) in 1.5(H), secure the upper edge by galvanized star pickets driven at 1 m centres a minimum of 500 mm into the ground, or as shown on the Drawings.
- Selvedges**
- All edges of the gabions, mattresses, diaphragms and end panels must be selvedged with a continuous wire in accordance with ASTM A975-97.
- The selvedging must be such that the mesh will not unravel and such that the strength of the connection between the selvedge wire and the mesh must be equal to or greater than the breaking strength of the mesh.
- Lacing and connecting wire**
- Lacing and connecting wire must be supplied with the gabions, mattresses and mesh panels to perform all the wiring operations to be carried out in construction of the gabions or mattresses. Materials must conform to ASTM A975-97.
- The minimum diameter of the wire (or wire core in the case of PVC coated wires) must be 2.2 mm.
- Alternative fastener systems such as "C" clips in place of lacing and connecting wire are permitted but must conform to the requirements of ASTM A975-97.
- Hold Point**
- The Principal is to inspect and approve all installed gabion baskets and mattresses prior to rock filling.

NOT FOR CONSTRUCTION

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3	FOR TENDER	TMC	02.02.2021
2	FOR APPROVAL	TMC	18.12.2020
1	FOR INFORMATION	TMC	14.12.2020

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PROJECT

**BELLAMBI CREEK
DIVERSION
RUSSELL VALE COLLIERY**

DRAWING TITLE

CIVIL SPECIFICATION

SCALE (A1)

JOB NUMBER

20240

DATUM

AHD

DRAWING NUMBER

C001

REVISION

3

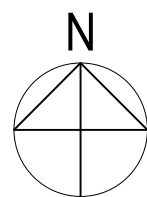


LOCALITY PLAN
SCALE: 1:5000

NOT FOR CONSTRUCTION

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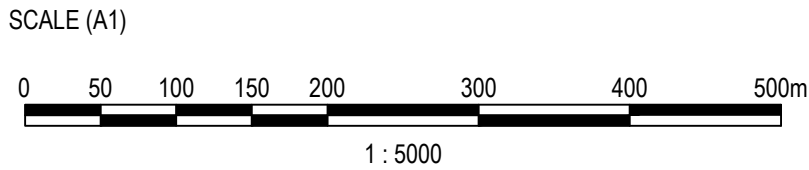
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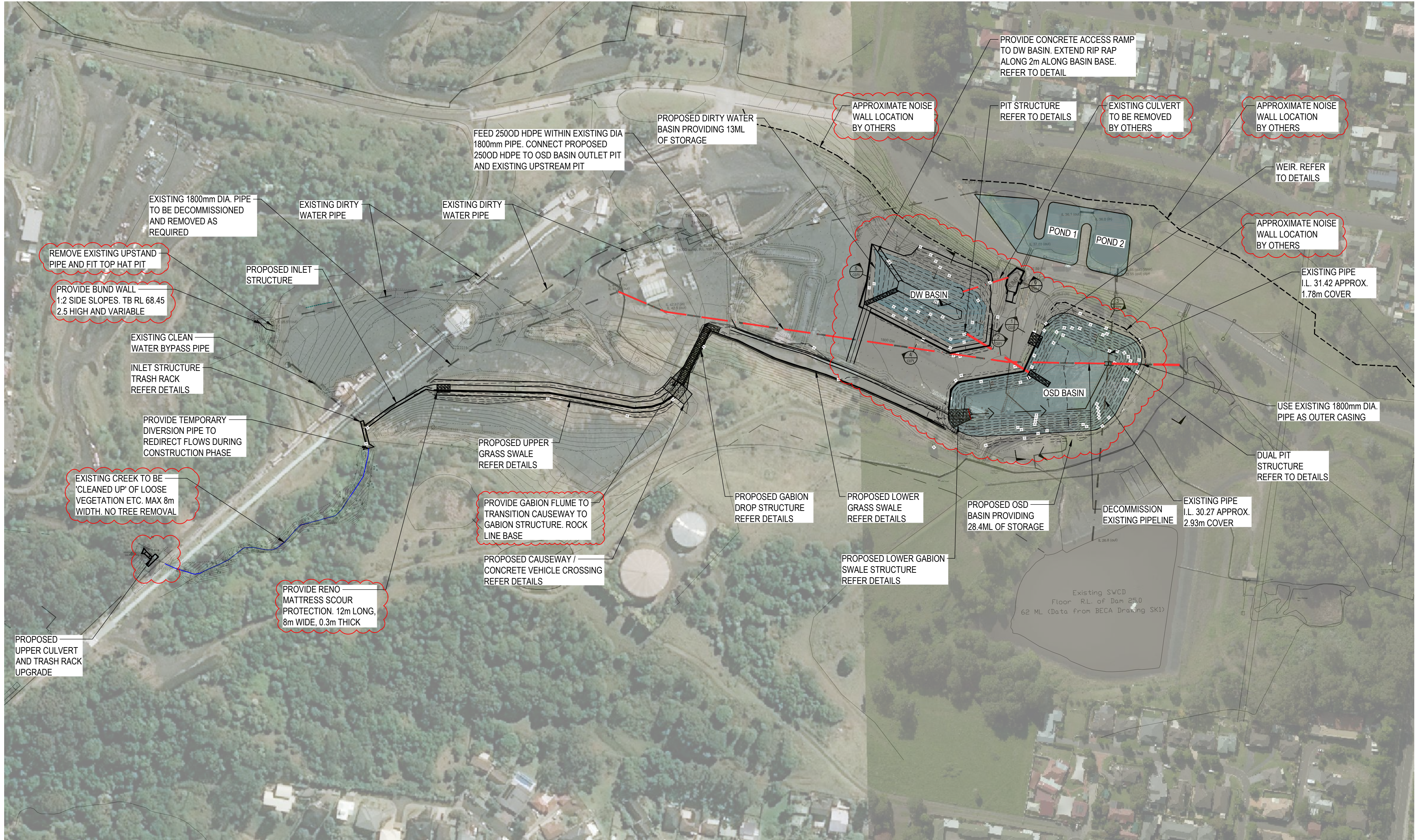
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PROJECT
**BELLAMBI CREEK
DIVERSION
RUSSELL VALE COLLIERY**

DRAWING TITLE
LOCALITY PLAN



JOB NUMBER	DATUM	DRAWING NUMBER	REVISION
20240	AHD	C010	3



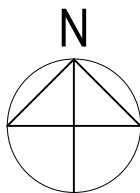
SITE PLAN
SCALE: 1:2000

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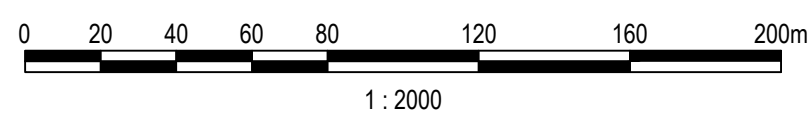
PROJECT

**BELLAMBI CREEK
DIVERSION
RUSSELL VALE COLLIERY**

DRAWING TITLE

SITE PLAN

SCALE (A1)



JOB NUMBER	DATUM	DRAWING NUMBER	REVISION
20240	AHD	C020	3



SEDIMENTATION AND EROSION CONTROL PLAN
SCALE: 1:1000

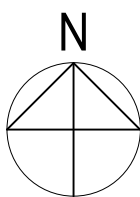
- LEGEND
- BOUNDARY
 - SEDIMENT AND EROSION CONTROL FENCE
 - MOVEABLE HAY BALES (SEDIMENT AND EROSION CONTROL)
 - LOCATION OF MATERIALS STORAGE ON-SITE

NOT FOR CONSTRUCTION

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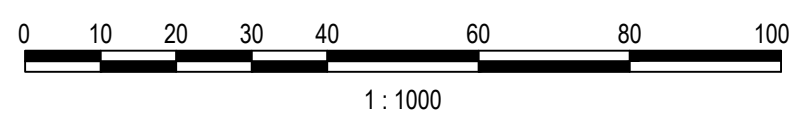
PROJECT

BELLAMBI CREEK
DIVERSION
RUSSELL VALE COLLIERY

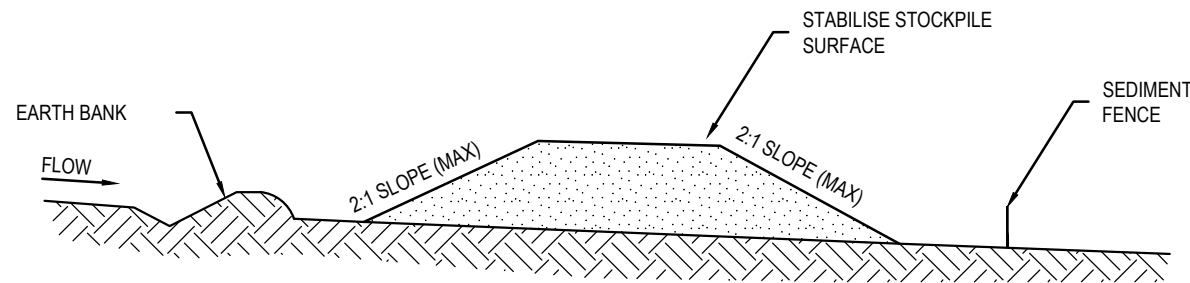
DRAWING TITLE

SEDIMENTATION AND
EROSION CONTROL PLAN

SCALE (A1)



JOB NUMBER	DATUM	DRAWING NUMBER	REVISION
20240	AHD	C021	3

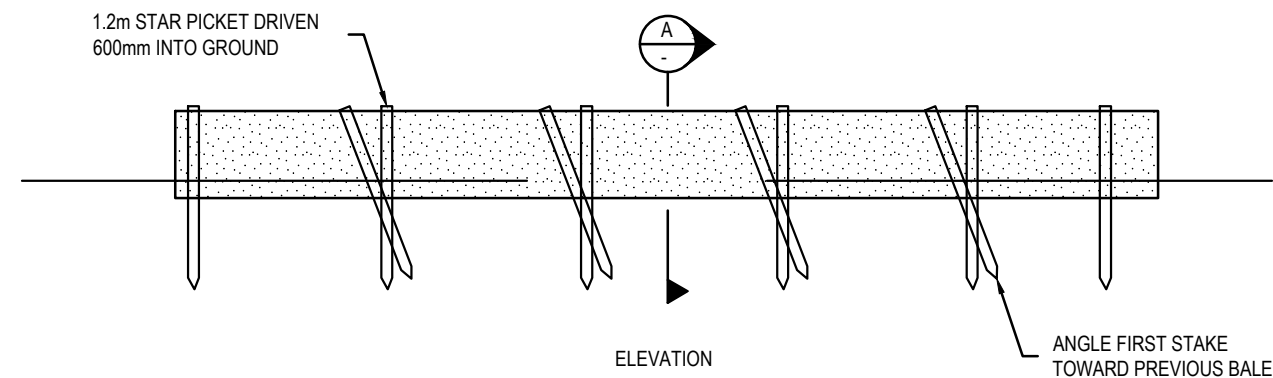


CONSTRUCTION NOTES

1. PLACE STOCKPILES MORE THAN 2 (PREFERABLY 5) METRES FROM EXISTING VEGETATION, CONCENTRATED WATER FLOW, ROADS AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT, ELONGATED MOUNDS
3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2 METERS IN HEIGHT.
4. WHERE THEY ARE TO BE PLACED FOR MORE THAN 10 DAYS, STABILISE FOLLOWING THE APPROVED ESCP OR SWMP TO REDUCE THE C-FACTOR TO LESS THAN 0.10.
5. CONSTRUCT EARTH BANKS (SD 5-5) ON THE UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES AND SEDIMENT FENCES (SD 6-8) 1 TO 2 METERS DOWNSLOPE.

SED SD 1-1: STOCKPILE DETAIL (BB 4-1)

(DIAGRAM NOT TO SCALE)

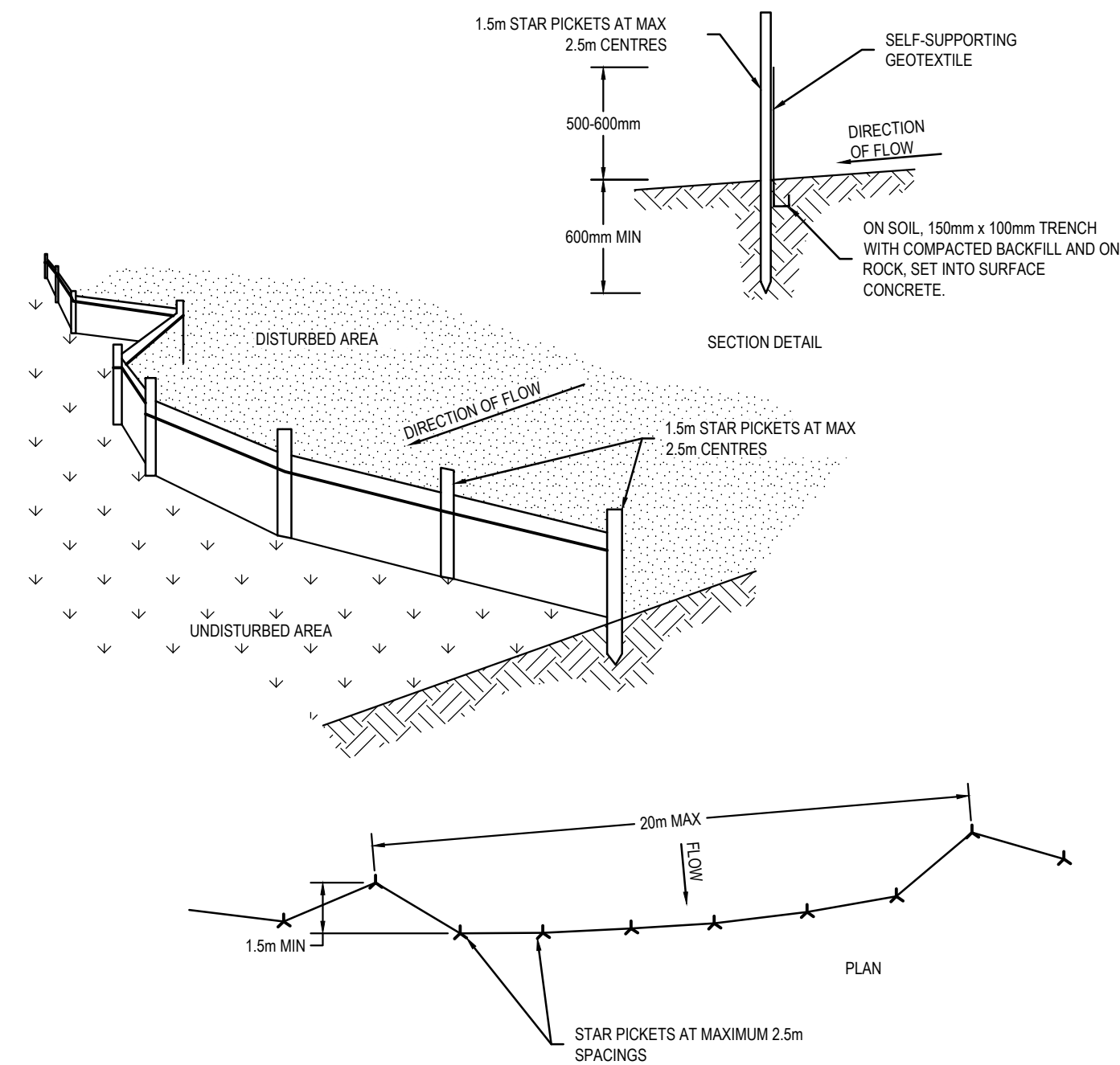


CONSTRUCTION NOTES

1. CONSTRUCT THE STRAW BALE FILTER AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE.
2. PLACE BALES LENGTHWISE IN A ROW WITH ENDS TIGHTLY ABUTTING. USE STRAW TO FILL ANY GAPS BETWEEN.
3. ENSURE THAT THE MAXIMUM HEIGHT OF THE FILTER IS ONE BALE.
4. EMBED EACH BALE IN THE GROUND 75mm TO 100mm AND ANCHOR WITH TWO 1.2m STAR PICKETS OR STAKES. ANGLE THE FIRST STAR PICKET OR STAKE IN EACH BALE TOWARDS THE PREVIOUSLY LAID BALE. DRIVE THEM 600mm INTO THE GROUND AND IF POSSIBLE, FLUSH WITH THE TOP OF THE BALES. WHERE STAR PICKETS ARE USED AND THEY PROTRUDE ABOVE THE BALES, ENSURE THEY ARE FITTED WITH SAFETY CAPS.
5. WHERE A STRAW BALE FILTER IS CONSTRUCTED DOWNSLOPE FROM A DISTURBED BATTER, ENSURE THE BALES ARE PLACED 1m TO 2m DOWNSLOPE FROM THE TOE.
6. ESTABLISH A MAINTENANCE PROGRAM THAT ENSURES THE INTEGRITY OF THE BALES IS RETAINED - THEY COULD REQUIRE REPLACEMENT EACH TWO TO FOUR MONTHS.

SED SD 1-5: STRAW BALE FILTER DETAIL
(BB 6-7)

(DIAGRAM NOT TO SCALE)



CONSTRUCTION NOTES

1. CONSTRUCT SEDIMENT FENCES AS CLSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENT AREA OF ANY ONE SECTION. THE CATCHMENT AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT TO 50 L/s IN THE DESIGN STORM EVENT (USUALLY THE 10% AEP).
2. CUT A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
3. DRIVE 1.5m LONG STAR PICKETS INTO ROUNF AT 2.5m INTERVALS (MAX) AT THE DOWNSLOPE EDGE OF THE TRENCH. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
4. FIX SELF-SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS ENSURING IT GOES TO THE BASE OF THE TRENCH. FIX THE GEOTEXTILE WITH WIRE TIES OR AS RECOMMENDED BY THE MANUFACTURER. ONLY USE GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY.
5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.
6. BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THROUGHLY OVER THE GEOTEXTILE.

SED SD 1-6: SEDIMENT FENCE DETAIL
(BB 6-8)

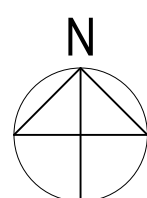
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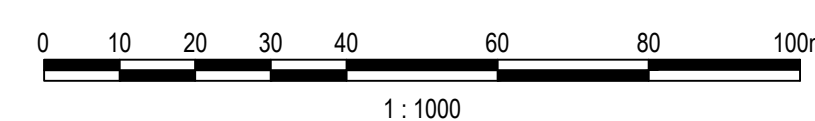
PROJECT

**BELLAMBI CREEK
DIVERSION
RUSSELL VALE COLLIERY**

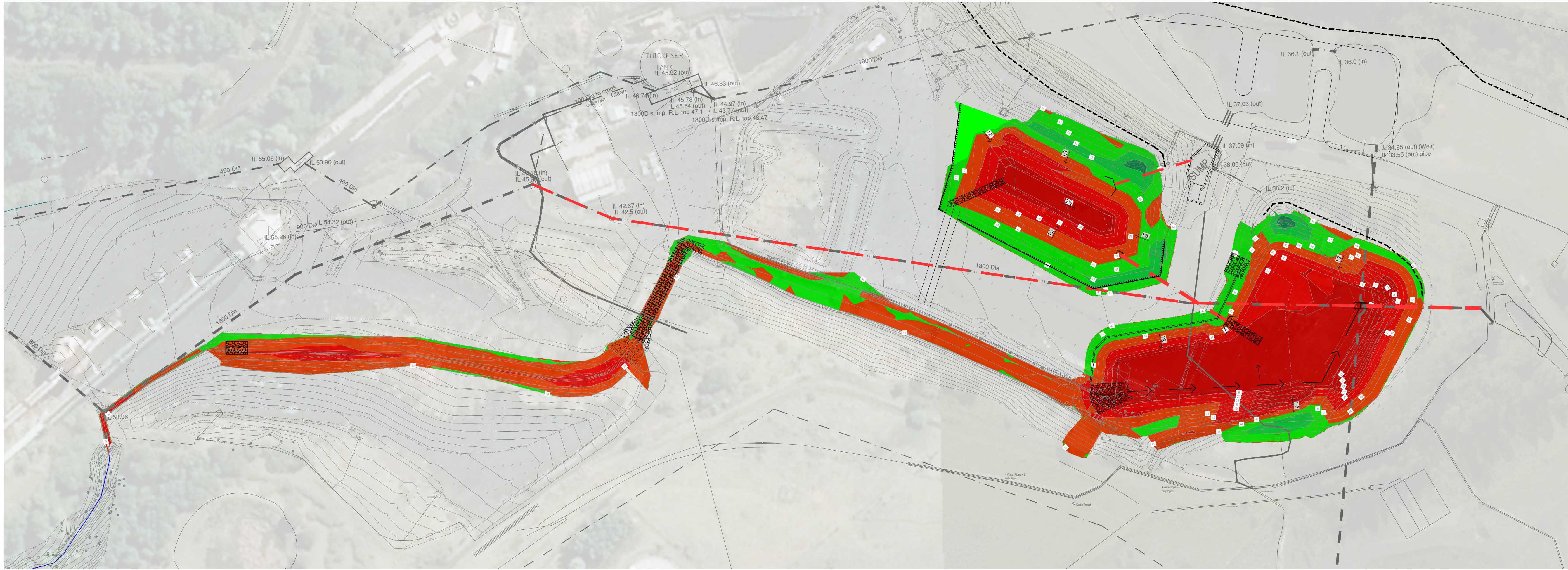
DRAWING TITLE

**SEDIMENTATION AND
EROSION CONTROL
DETAILS**

SCALE (A1)



JOB NUMBER	DATUM	DRAWING NUMBER	REVISION
20240	AHD	C022	3



CUT / FILL DEPTH RANGES	
Elevation	Colour
-10.00 to -8.00	
-8.00 to -6.00	
-6.00 to -4.00	
-4.00 to -2.00	
-2.00 to 0.00	
0.00 to 2.00	
2.00 to 4.00	
4.00 to 6.00	

BULK EARTHWORKS PLAN
SCALE: 1:1000

BULK EARTHWORKS VOLUME - CHANNEL					
Chainage	Cut Area (m ²)	Cut Volume (BCM)	Fill Area (m ²)	Fill Volume (BCM)	Cumulative Total (BCM)
44.07					
60.00	93	241	7	28	220
80.00	3	8	1	3	226
100.00	15	49	10	45	242
120.00	9	296	6	53	485
140.00	19	484	1	10	959
160.00	30	549	-	1	1,507
180.00	25	435	-	-	1,942
200.00	18	139	-	-	2,081
220.00	44	426	-	3	2,503
240.00	13	272	-	6	2,769
260.00	14	254	1	4	3,020
280.00	73	359	-	-	3,384
300.00	144	389	-	-	3,783
320.00	203	289	-	1	4,114
340.00	207	209	1	1	4,322
360.00	186	187	10	17	4,492
380.00	8	75	6	42	4,526
400.00	2	48	-	-	4,574
420.00	2	56	-	43	4,587
440.00	3	55	4	43	4,599
460.00	2	24	-	-	4,623
480.00	11	66	-	-	4,688
500.00	2	40	-	-	4,728
520.00	2	31	-	-	4,760
540.00	7	68	-	-	4,828
560.00	61	66	-	-	4,899
563.16	37	23	-	-	4,952

BULK EARTHWORKS VOLUME - OSD BASIN				
Cut Area (m ²)	Cut Volume (BCM)	Fill Area (m ²)	Fill Volume (BCM)	Cumulative Total (BCM)
8,920	28,600	2,520	2,530	26,070

BULK EARTHWORKS VOLUME - DW BASIN				
Cut Area (m ²)	Cut Volume (BCM)	Fill Area (m ²)	Fill Volume (BCM)	Cumulative Total (BCM)
3,271	8,000	2,920	3,750	4,250

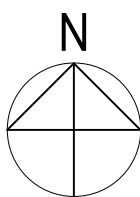
BULK EARTHWORKS VOLUME - TOTAL				
Cut Area (m ²)	Cut Volume (BCM)	Fill Area (m ²)	Fill Volume (BCM)	Cumulative Total (BCM)
13,424	41,738	5,487	6,580	35,158

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	DATE
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2	FOR APPROVAL	TMC	18.12.2020
1	FOR INFORMATION	TMC	14.12.2020

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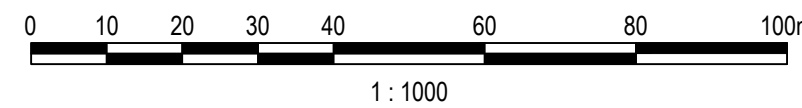
PROJECT

BELLAMBI CREEK
DIVERSION
RUSSELL VALE COLLIERY

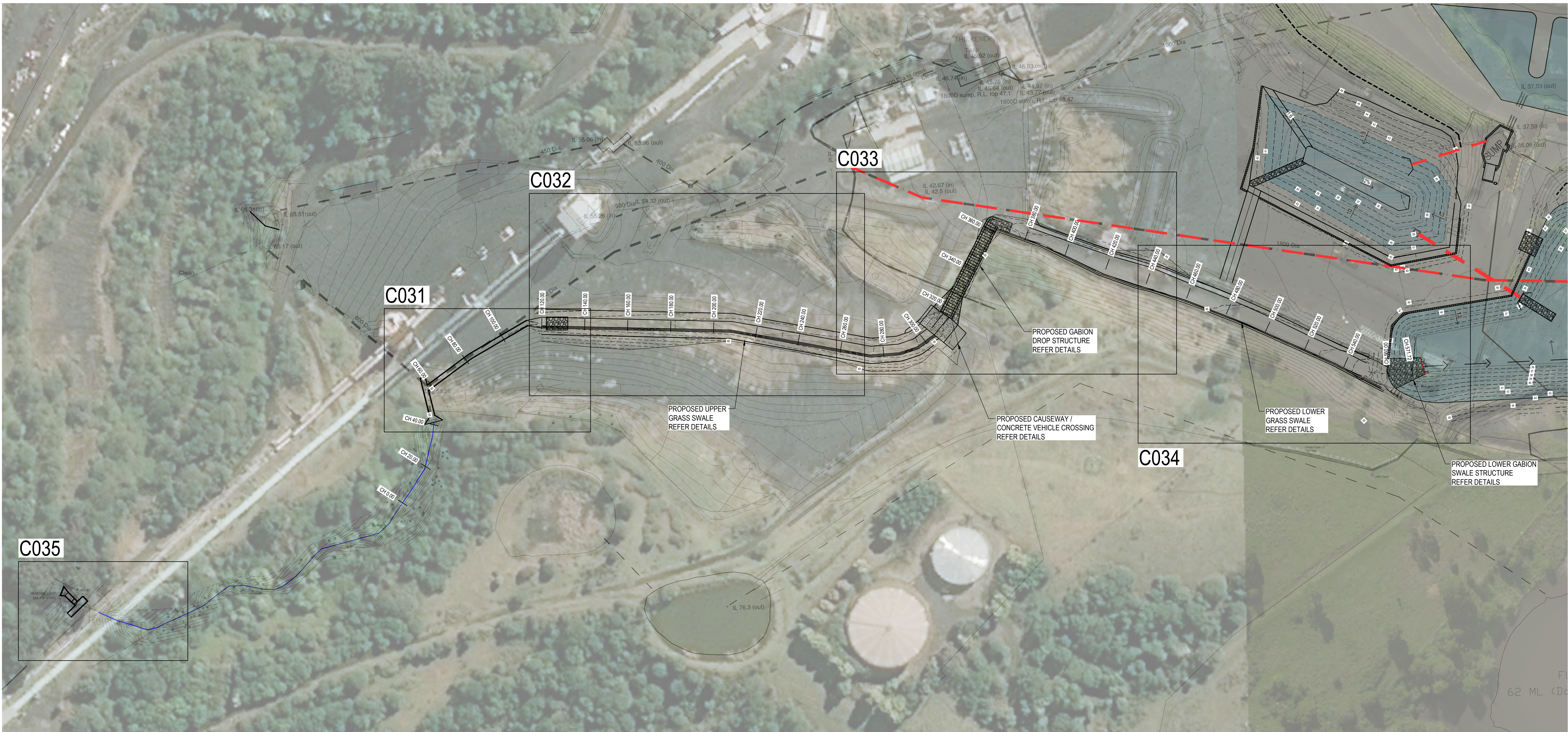
DRAWING TITLE

BULK EARTHWORKS
PLAN

SCALE (A1)



JOB NUMBER	DATUM	DRAWING NUMBER	REVISION
20240	AHD	C023	3



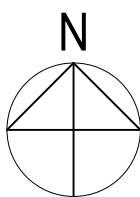
DIVERSION CHANNEL PLAN
CHANNEL CH 0.00 to CH 571.72
SCALE: 1:1000

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	DATE
3	FOR TENDER	TMC	02.02.2021
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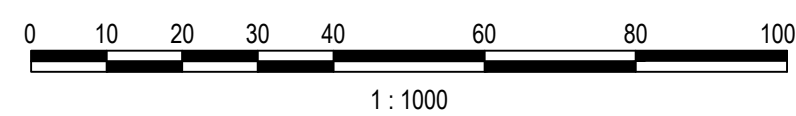
PROJECT

BELLAMBI CREEK
DIVERSION
RUSSELL VALE COLLIERY

DRAWING TITLE

SITE STORMWATER
PLAN

SCALE (A1)



JOB NUMBER	DATUM	DRAWING NUMBER	REVISION
20240	AHD	C030	3



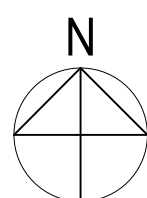
DIVERSION CHANNEL DETAIL PLAN
CH 40.00 to CH 140.00
SCALE: 1:200

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REVISION	DESCRIPTION	ISSUED	DATE
3	FOR TENDER	TMC	02.02.2021
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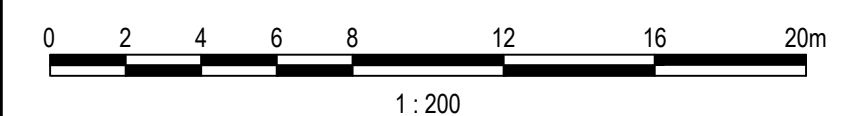
PROJECT

BELLAMBI CREEK
DIVERSION
RUSSELL VALE COLLIERY

DRAWING TITLE

DIVERSION CHANNEL
DETAIL PLAN SHEET 1

SCALE (A1)



JOB NUMBER	DATUM	DRAWING NUMBER	REVISION
20240	AHD	C031	3



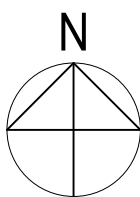
DIVERSION CHANNEL DETAIL PLAN
CH 120.00 to CH 260.00
SCALE: 1:200

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REVISION	DESCRIPTION	ISSUED	DATE
3	FOR TENDER	TMC	02.02.2021
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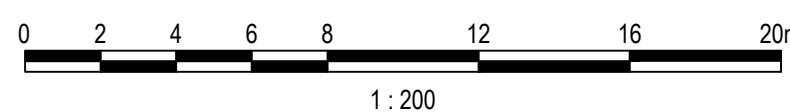
PROJECT

BELLAMBI CREEK
DIVERSION
RUSSELL VALE COLLIERY

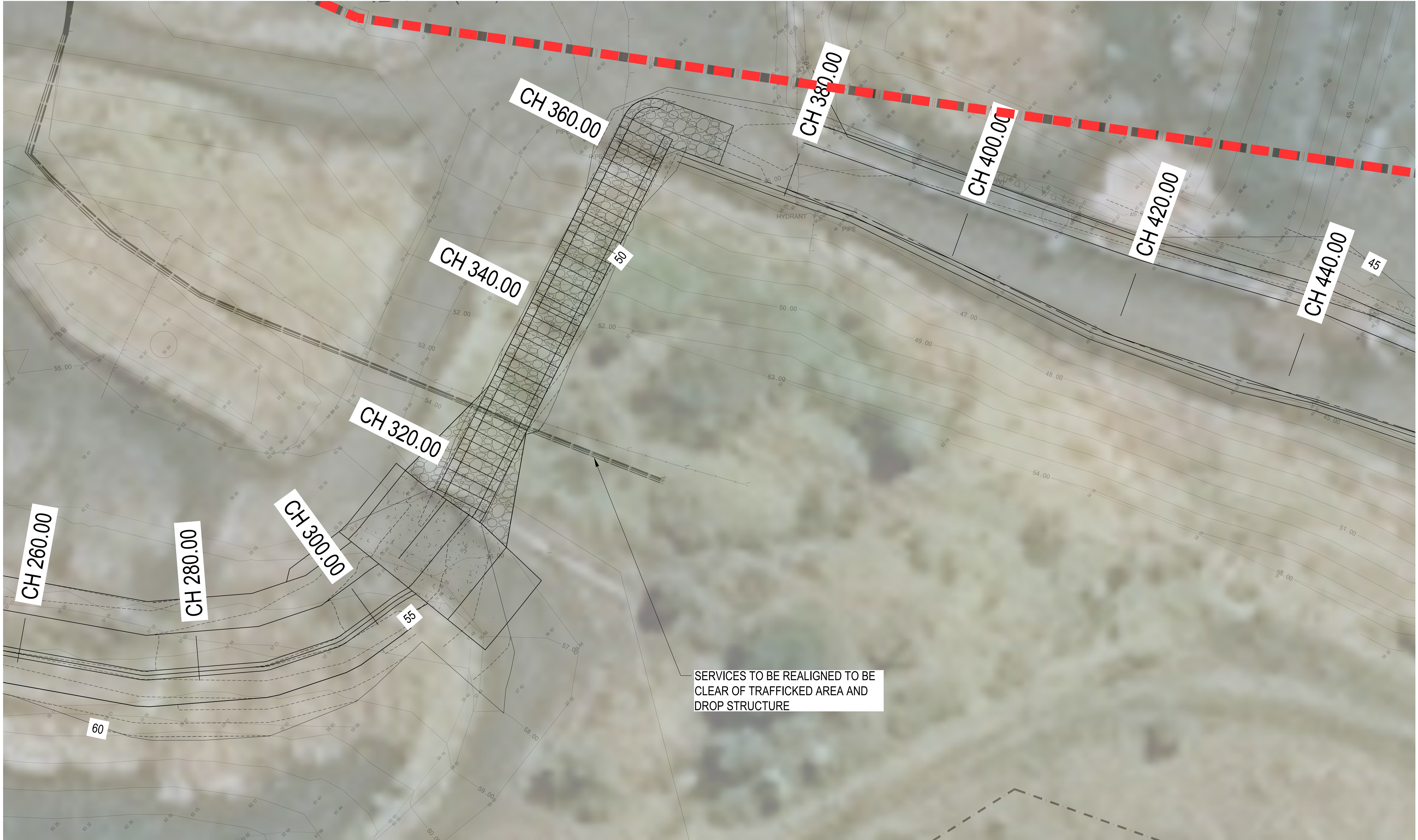
DRAWING TITLE

DIVERSION CHANNEL
DETAIL PLAN SHEET 2

SCALE (A1)



JOB NUMBER	DATUM	DRAWING NUMBER	REVISION
20240	AHD	C032	3



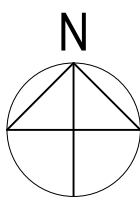
DIVERSION CHANNEL DETAIL PLAN
CH 260.00 to CH 440.00
SCALE: 1:200

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	DATE
3	FOR TENDER	TMC	02.02.2021
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1	FOR INFORMATION	TMC	14.12.2020

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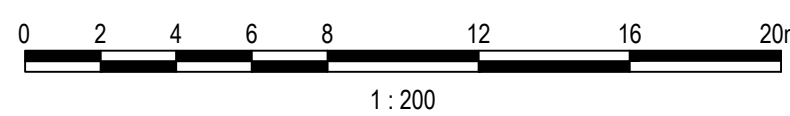
PROJECT

BELLAMBI CREEK
DIVERSION
RUSSELL VALE COLLIERY

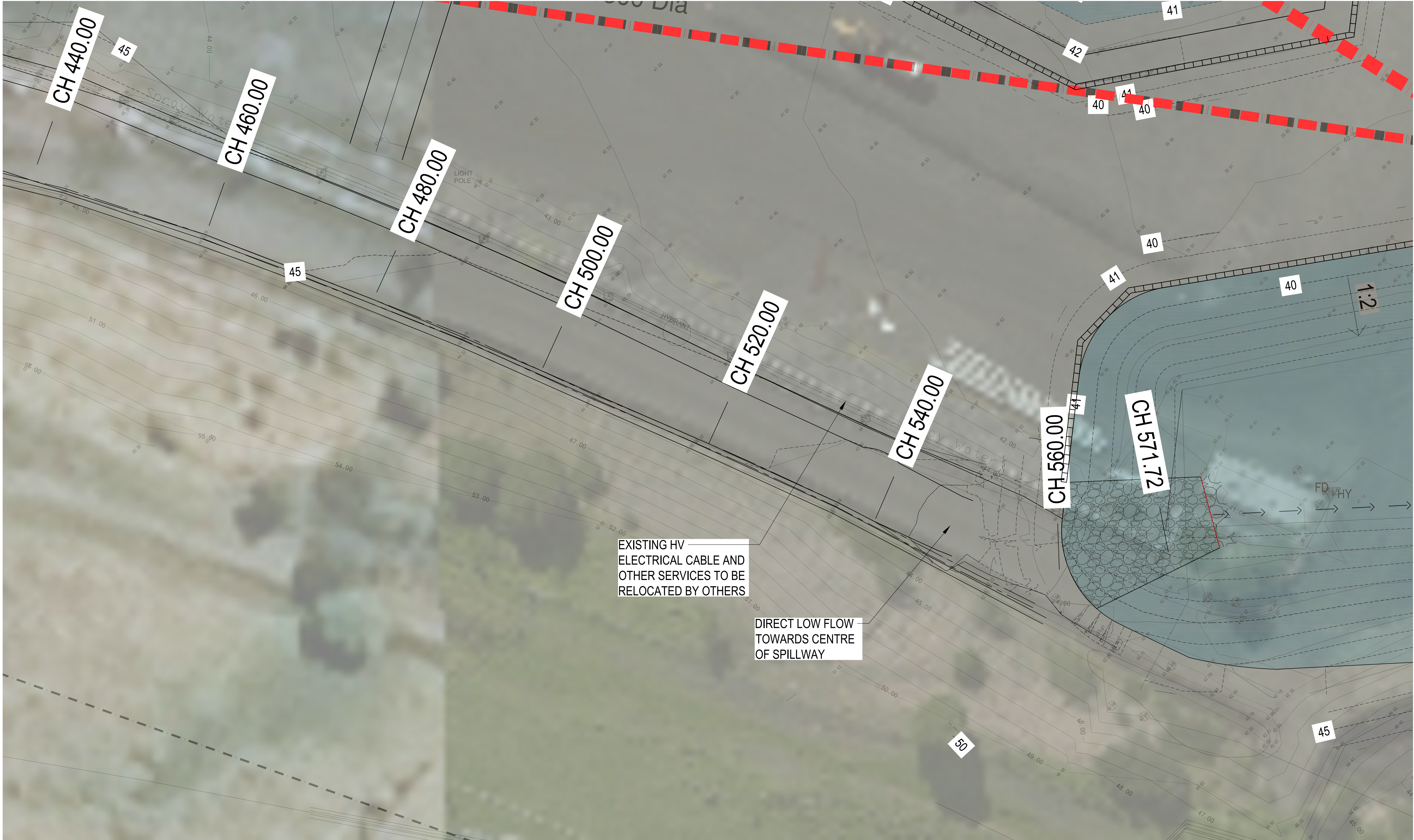
DRAWING TITLE

DIVERSION CHANNEL
DETAIL PLAN SHEET 3

SCALE (A1)



JOB NUMBER	DATUM	DRAWING NUMBER	REVISION
20240	AHD	C033	3



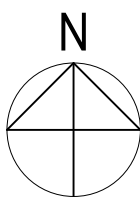
DIVERSION CHANNEL DETAIL PLAN
CH 440.00 to CH 569.80
SCALE: 1:200

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3	FOR TENDER	TMC	02.02.2021
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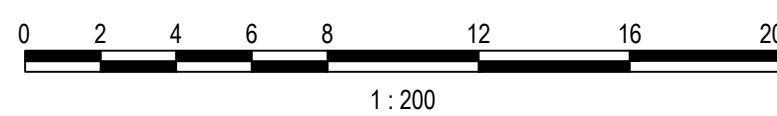
PROJECT

BELLAMBI CREEK
DIVERSION
RUSSELL VALE COLLIERY

DRAWING TITLE

DIVERSION CHANNEL
DETAIL PLAN SHEET 4

SCALE (A1)



JOB NUMBER	DATUM	DRAWING NUMBER	REVISION
20240	AHD	C034	3



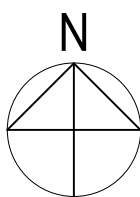
UPPER CONVEYOR CULVERT AND TRASH RACK
SCALE: 1:100

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REVISION	DESCRIPTION	ISSUED	DATE
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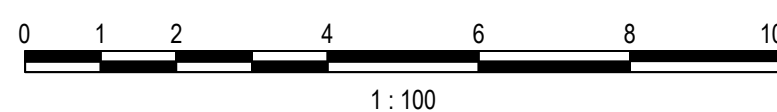
PROJECT

BELLAMBI CREEK
DIVERSION
RUSSELL VALE COLLIERY

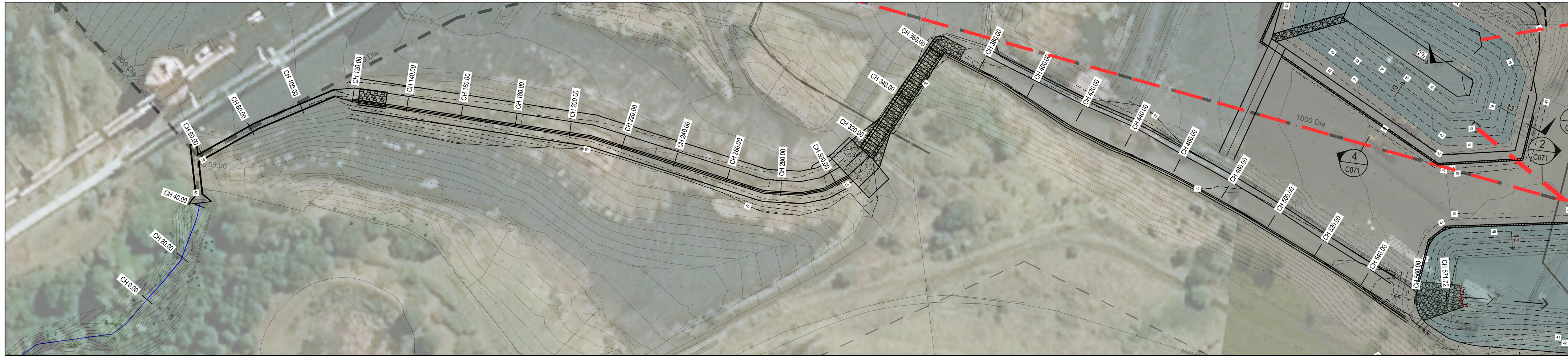
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DIVERSION CHANNEL
DETAIL PLAN SHEET 5

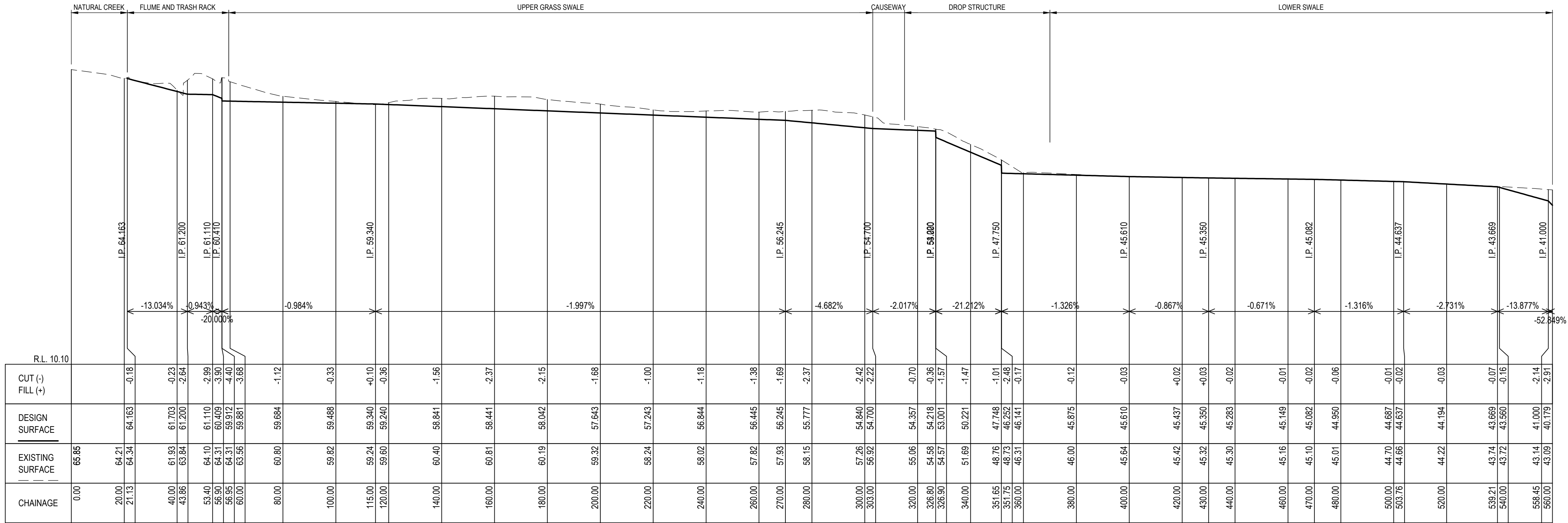
SCALE (A1)



JOB NUMBER	DATUM	DRAWING NUMBER	REVISION
20240	AHD	C035	3



PLAN
CHANNEL CH 0.000 to CH 560.00
SCALE: 1:1000



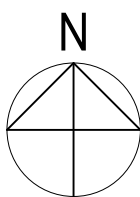
LONGITUDINAL SECTION
CHANNEL CH 0.00 to CH 560.00
SCALES: HORIZONTAL 1:1000 VERTICAL 1:500 CHANNEL

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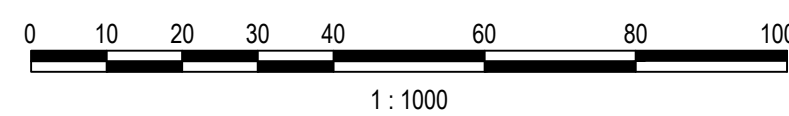
PROJECT

BELLAMBI CREEK
DIVERSION
RUSSELL VALE COLLIERY

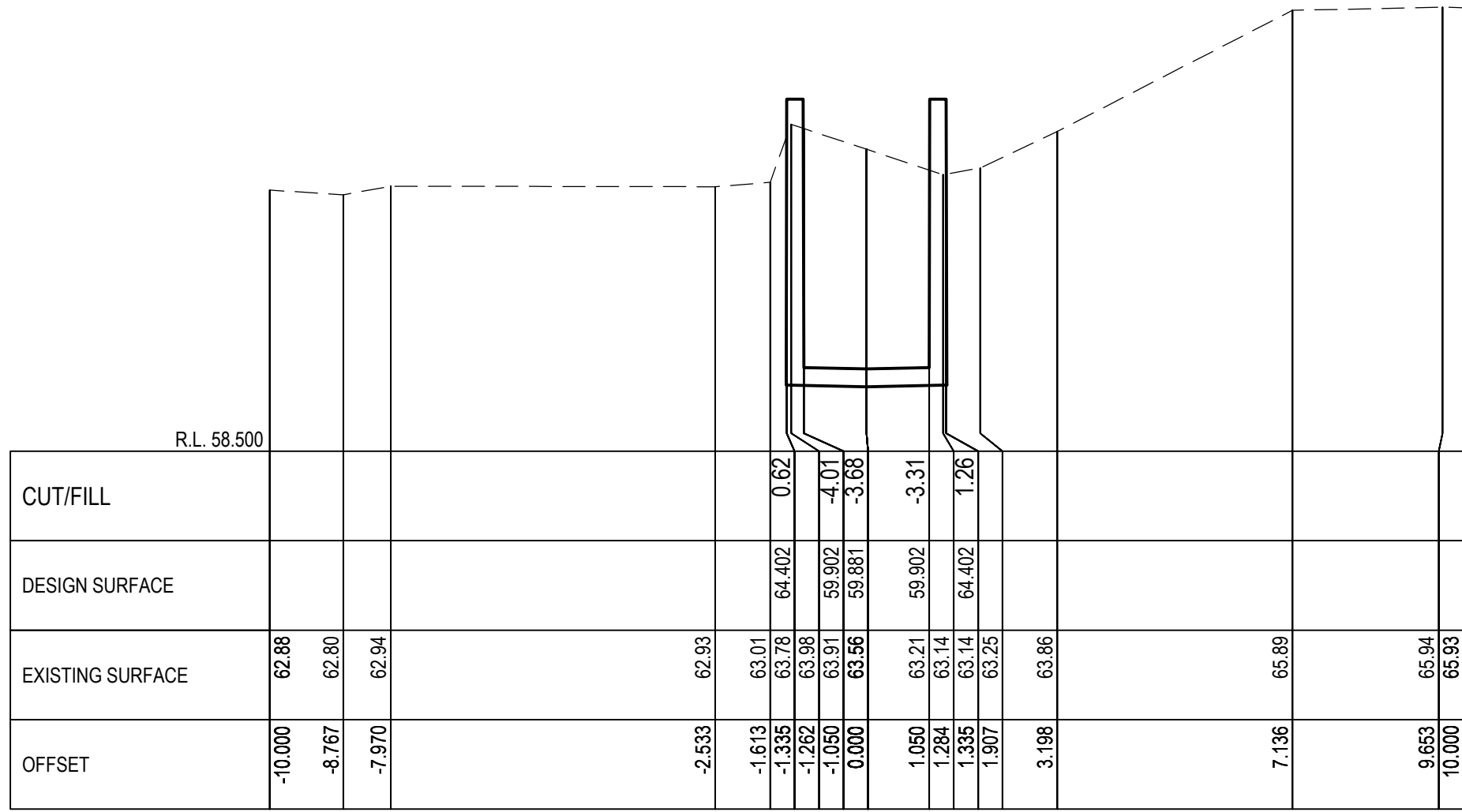
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LONGITUDINAL SECTION
SHEET 1

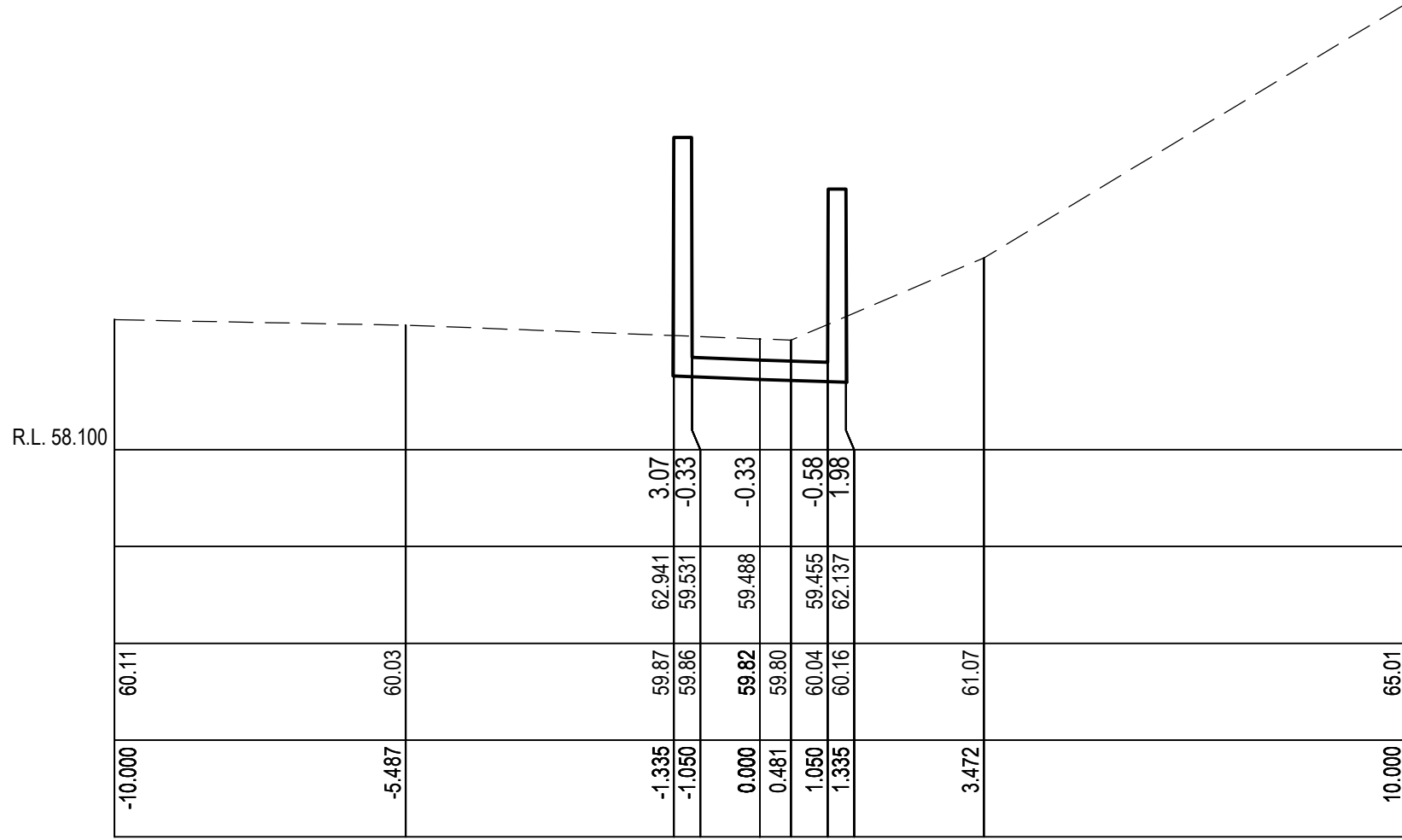
SCALE (A1)



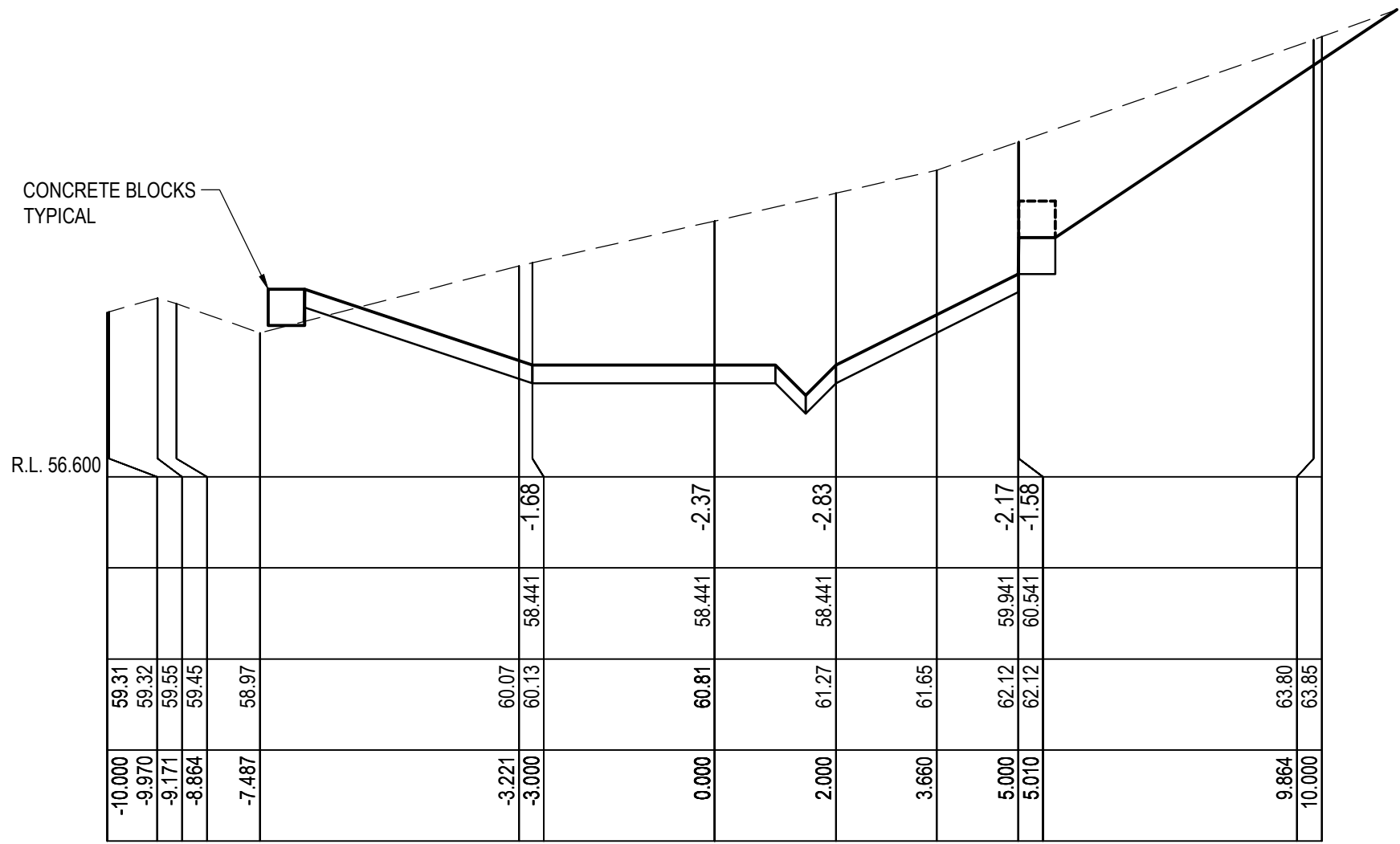
JOB NUMBER	DATUM	DRAWING NUMBER	REVISION
20240	AHD	C040	3



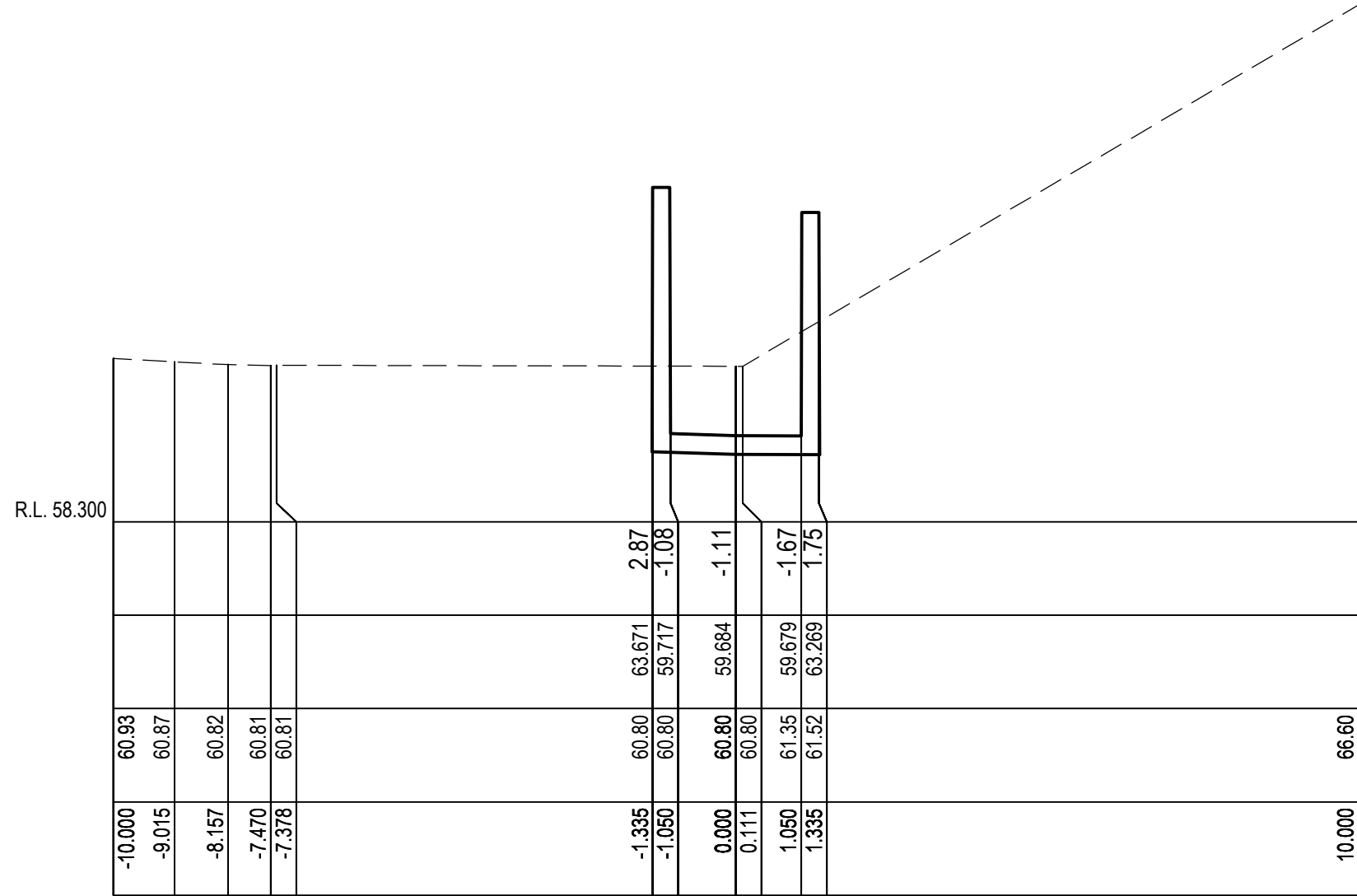
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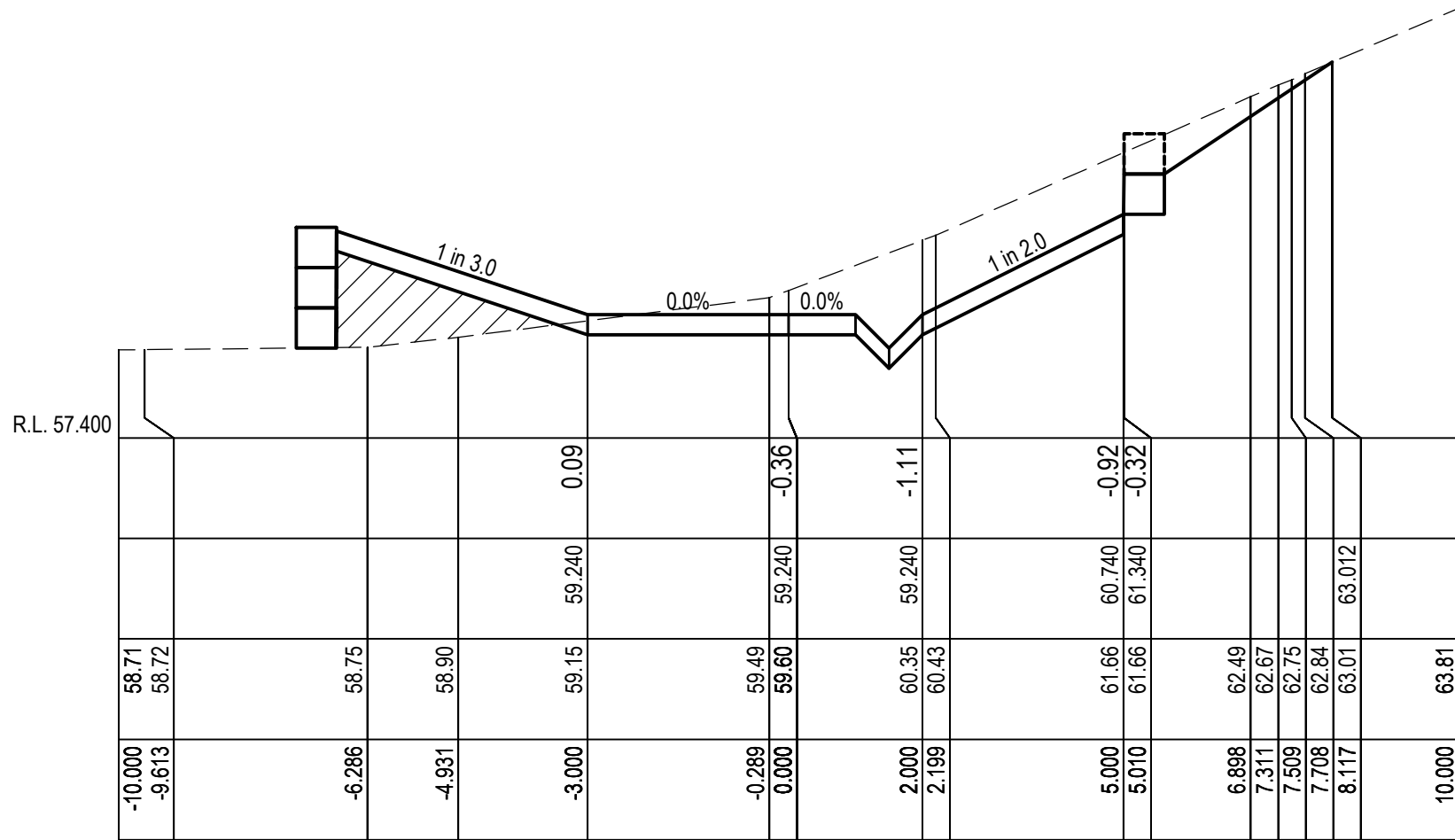
Ch 100.00



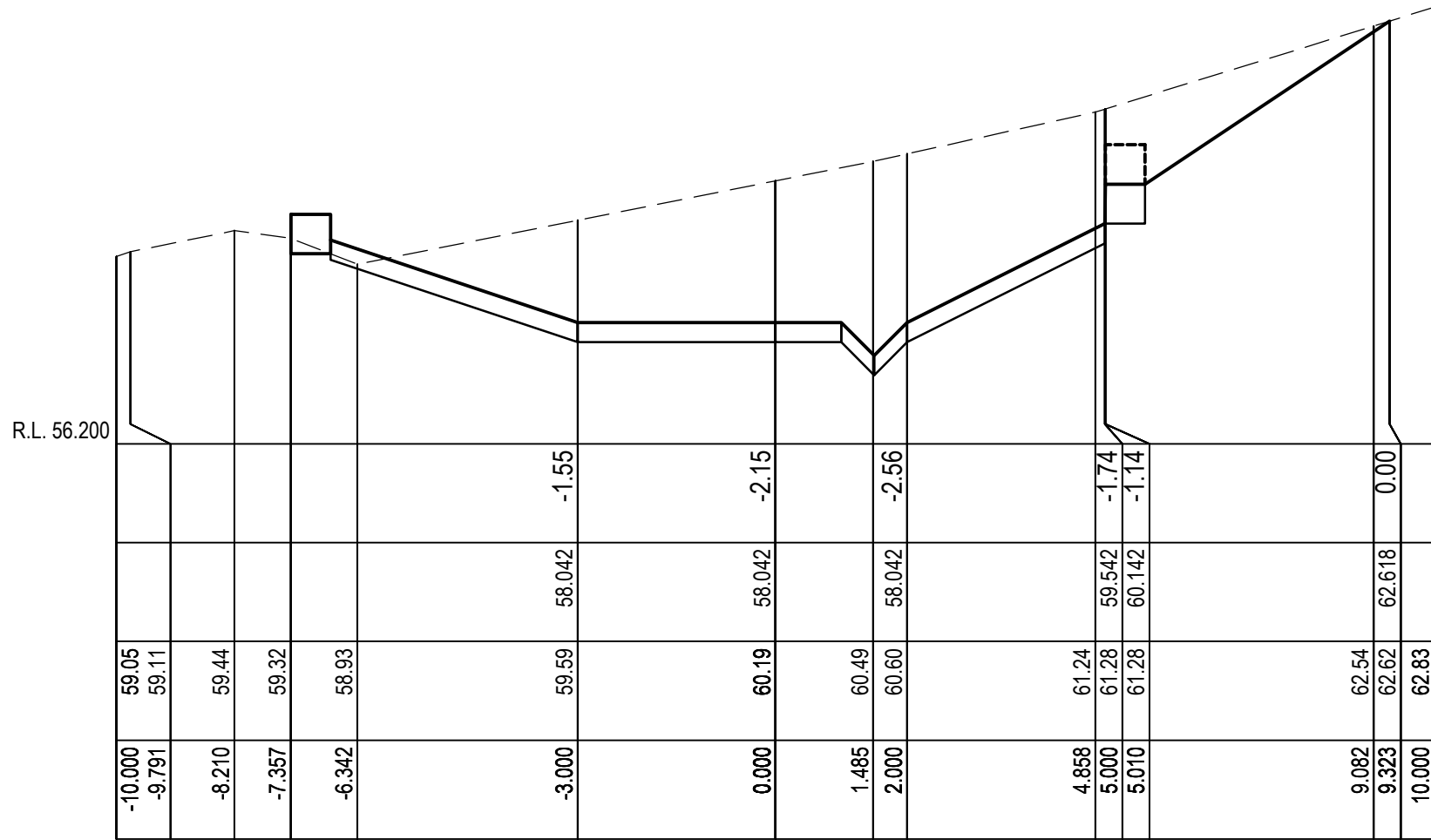
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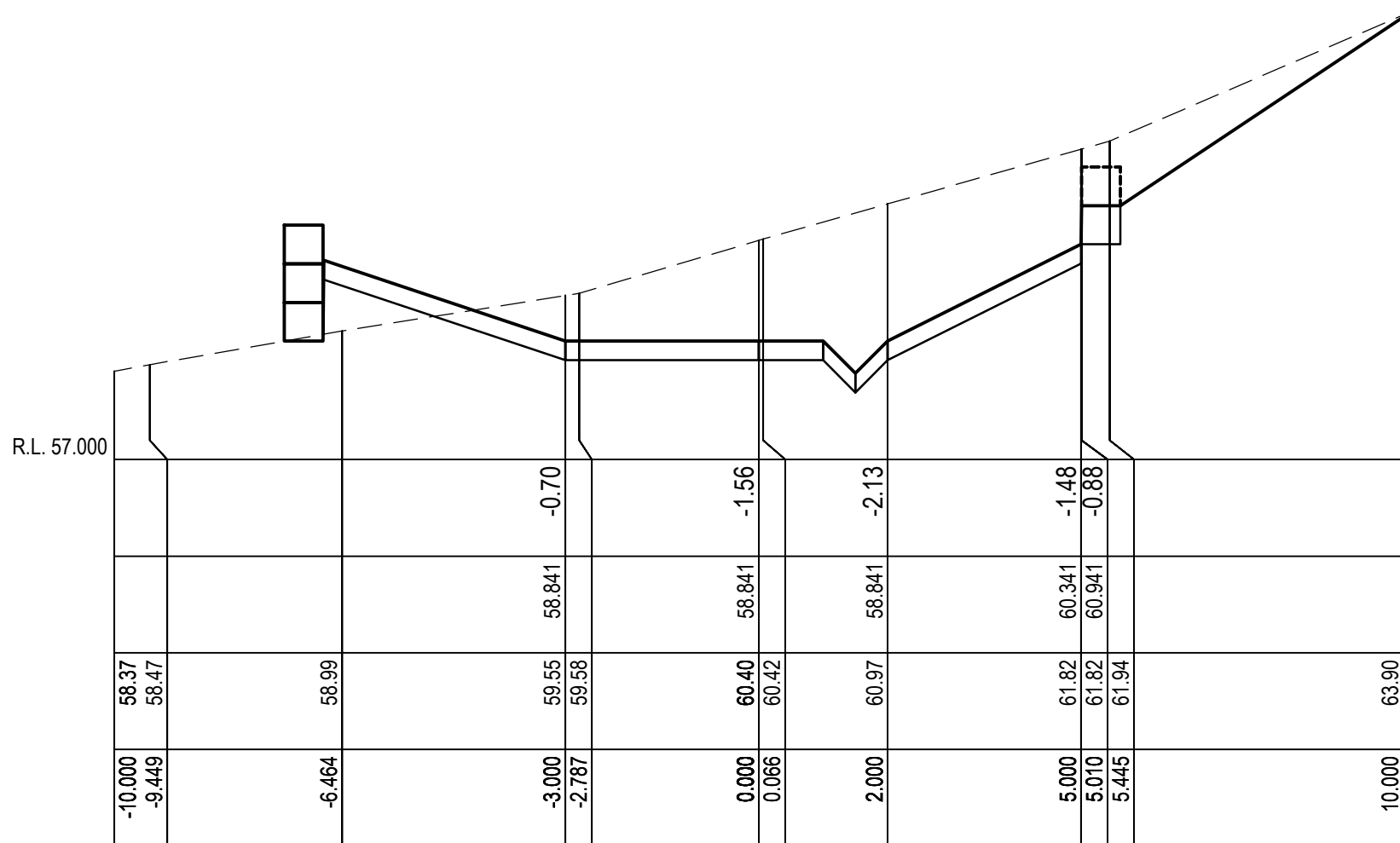
Ch 80.00



Ch 120.00



Ch 180.00



Ch 140.00



Ch 200.00

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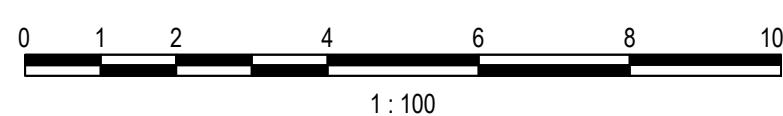
PROJECT

BELLAMBI CREEK
DIVERSION
RUSSELL VALE COLLIERY

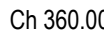
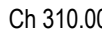
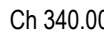
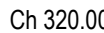
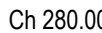
DRAWING TITLE

DIVERSION CHANNEL
SECTIONS SHEET 1

SCALE (A1)



JOB NUMBER	DATUM	DRAWING NUMBER	REVISION
20240	AHD	C050	3



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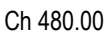
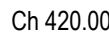
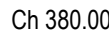
BELLAMBI CREEK DIVERSION RUSSELL VALE COLLIERY

DIVERSION CHANNEL SECTIONS SHEET 2

A scale bar for the map, showing distances from 0 to 10 units. The scale is labeled 1:100.

JOB NUMBER	DATUM	DRAWING NUMBER	REVISION
20240	AHD	C051	3

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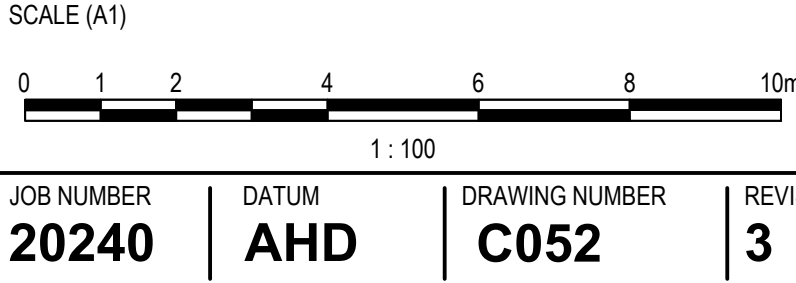


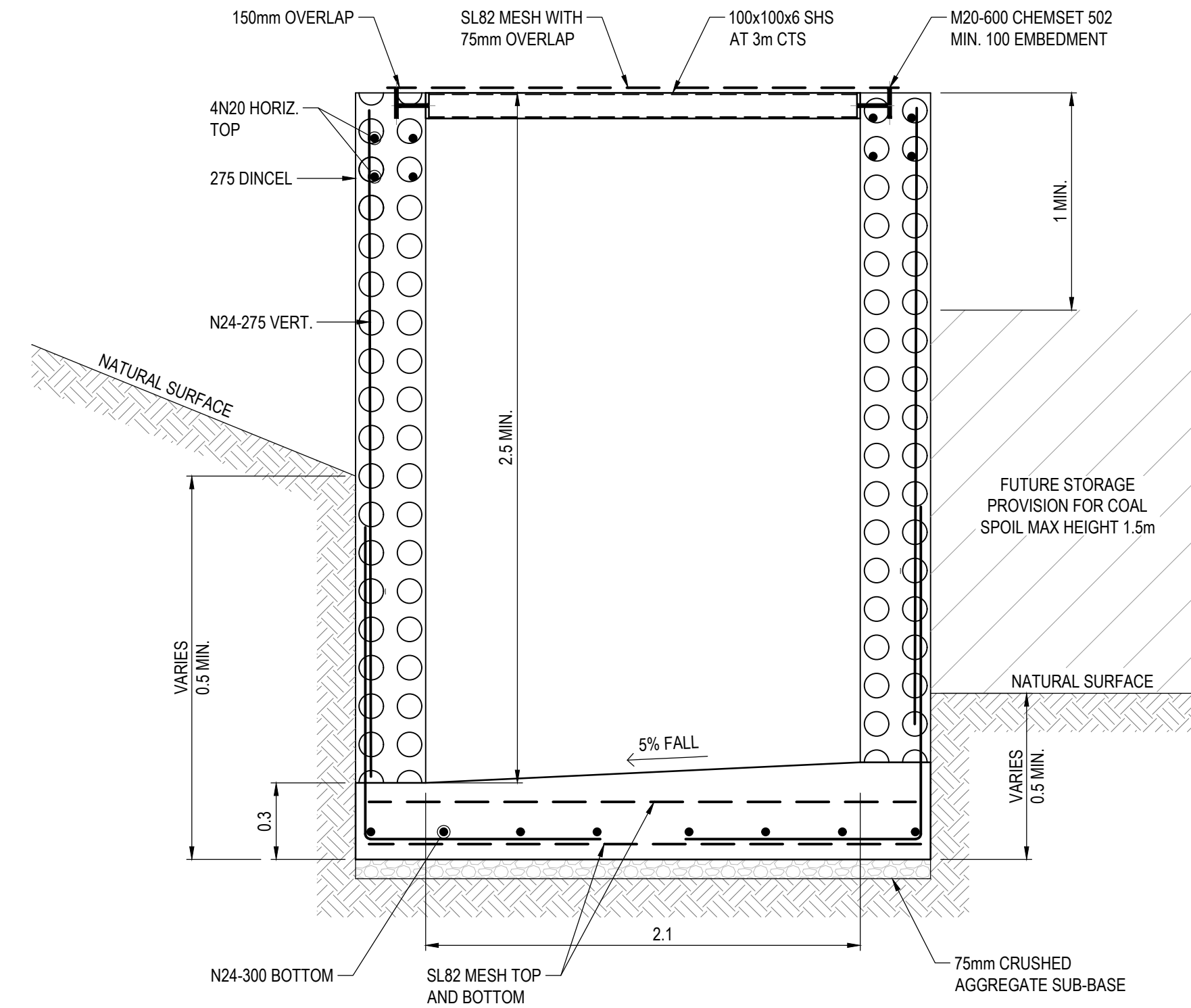
PROJECT

**BELLAMBI CREEK
DIVERSION
RUSSELL VALE COLLIERY**

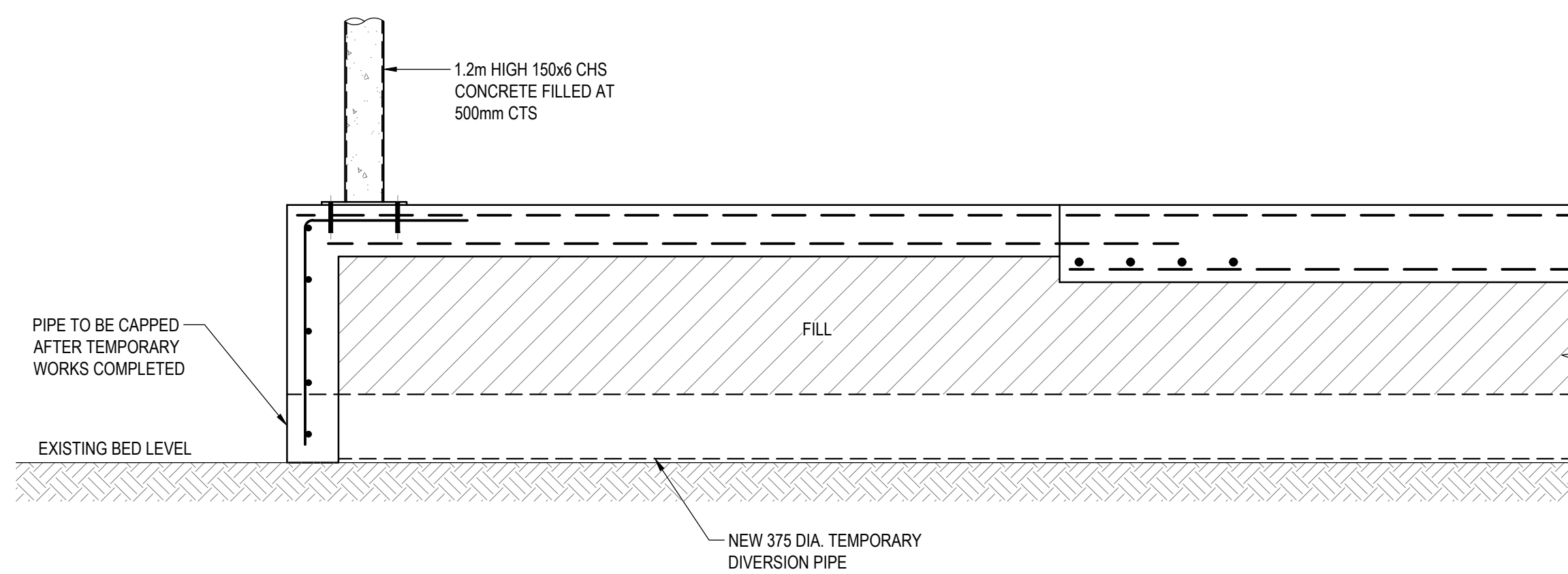
DRAWING TITLE

DIVERSION CHANNEL SECTIONS SHEET 3





DINCEL CONCRETE CHANNEL DETAIL
N.T.S.



INLET STRUCTURE DETAIL
N.T.S.

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	DATE
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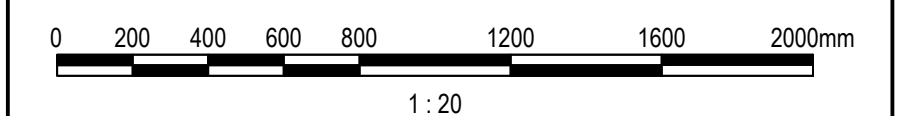
PROJECT

**BELLAMBI CREEK
DIVERSION
RUSSELL VALE COLLIERY**

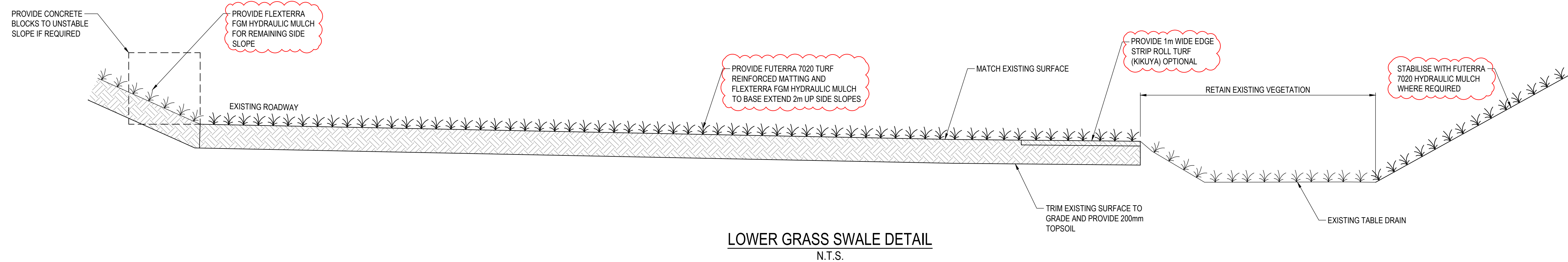
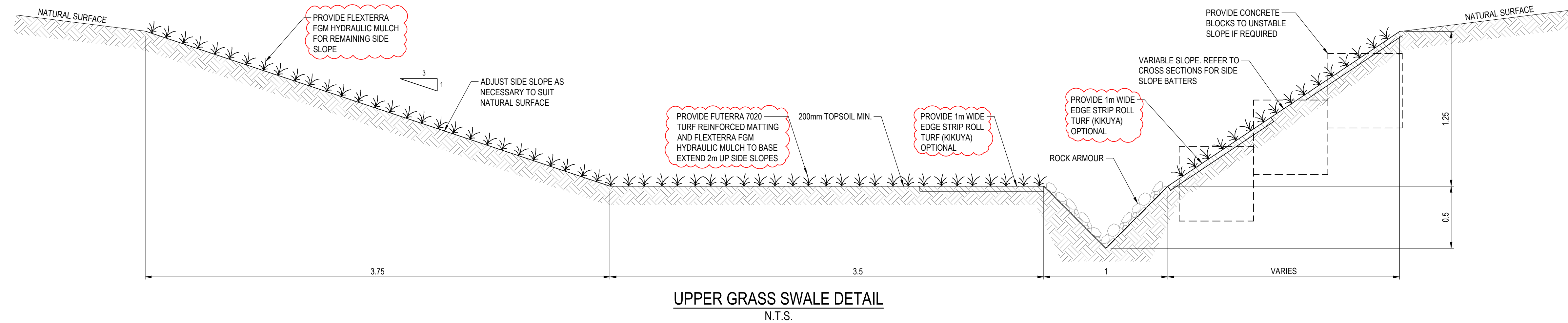
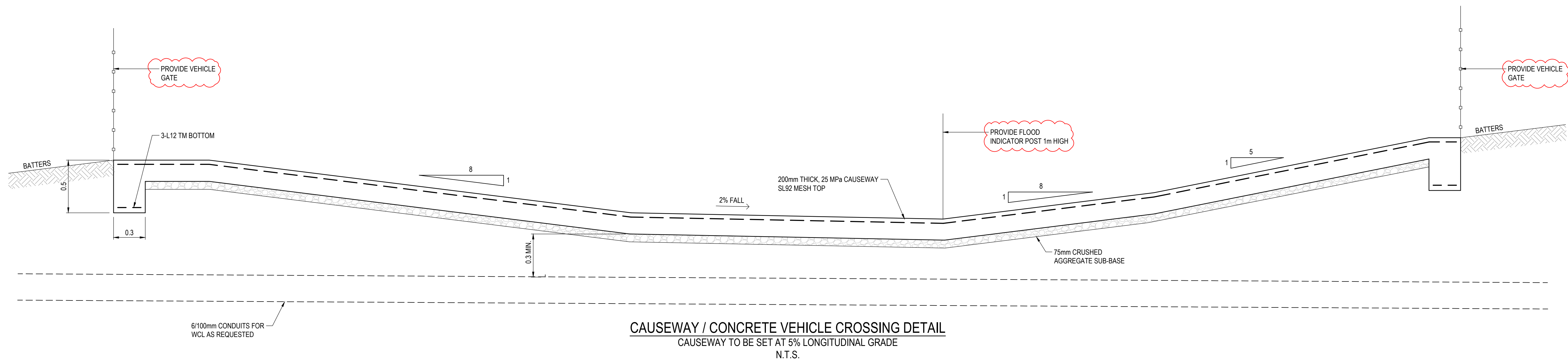
DRAWING TITLE

**INLET STRUCTURE
DETAILS SHEET 1**

SCALE (A1)



JOB NUMBER	DATUM	DRAWING NUMBER	REVISION
20240	AHD	C060	3



NOT FOR CONSTRUCTION

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2	FOR APPROVAL	TMC	18.12.2020
1	FOR INFORMATION	TMC	14.12.2020

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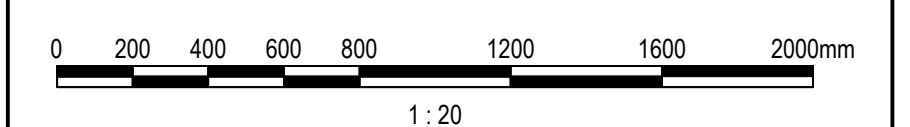
PROJECT

**BELLAMBI CREEK
DIVERSION
RUSSELL VALE COLLIERY**

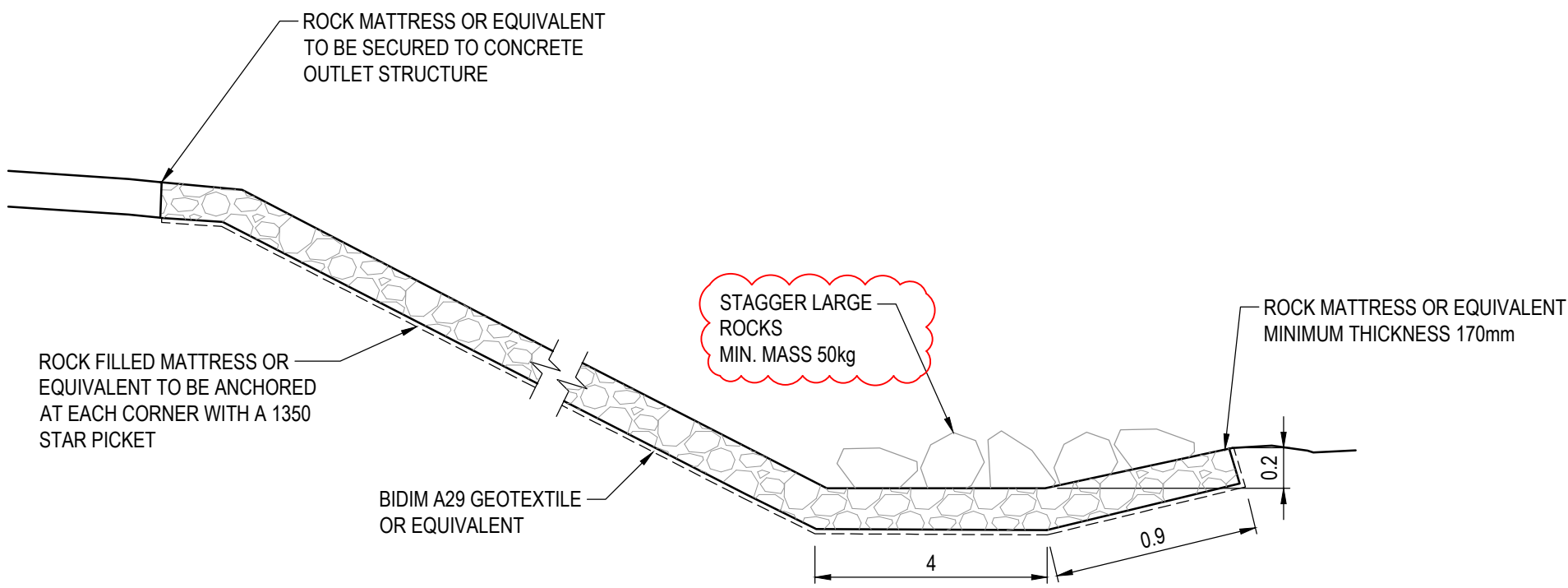
DRAWING TITLE

**DIVERSION CHANNEL
DETAILS SHEET 1**

SCALE (A1)



JOB NUMBER	DATUM	DRAWING NUMBER	REVISION
20240	AHD	C062	3



LOWER GABION SWALE STRUCTURE
N.T.S.

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	DATE
3	FOR TENDER	TMC	02.02.2021
2	FOR APPROVAL	TMC	18.12.2020
1	FOR INFORMATION	TMC	14.12.2020

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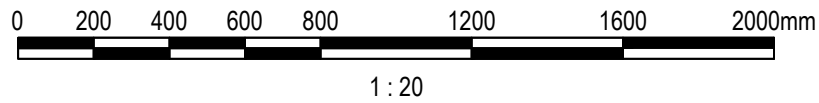
PROJECT

**BELLAMBI CREEK
DIVERSION
RUSSELL VALE COLLIERY**

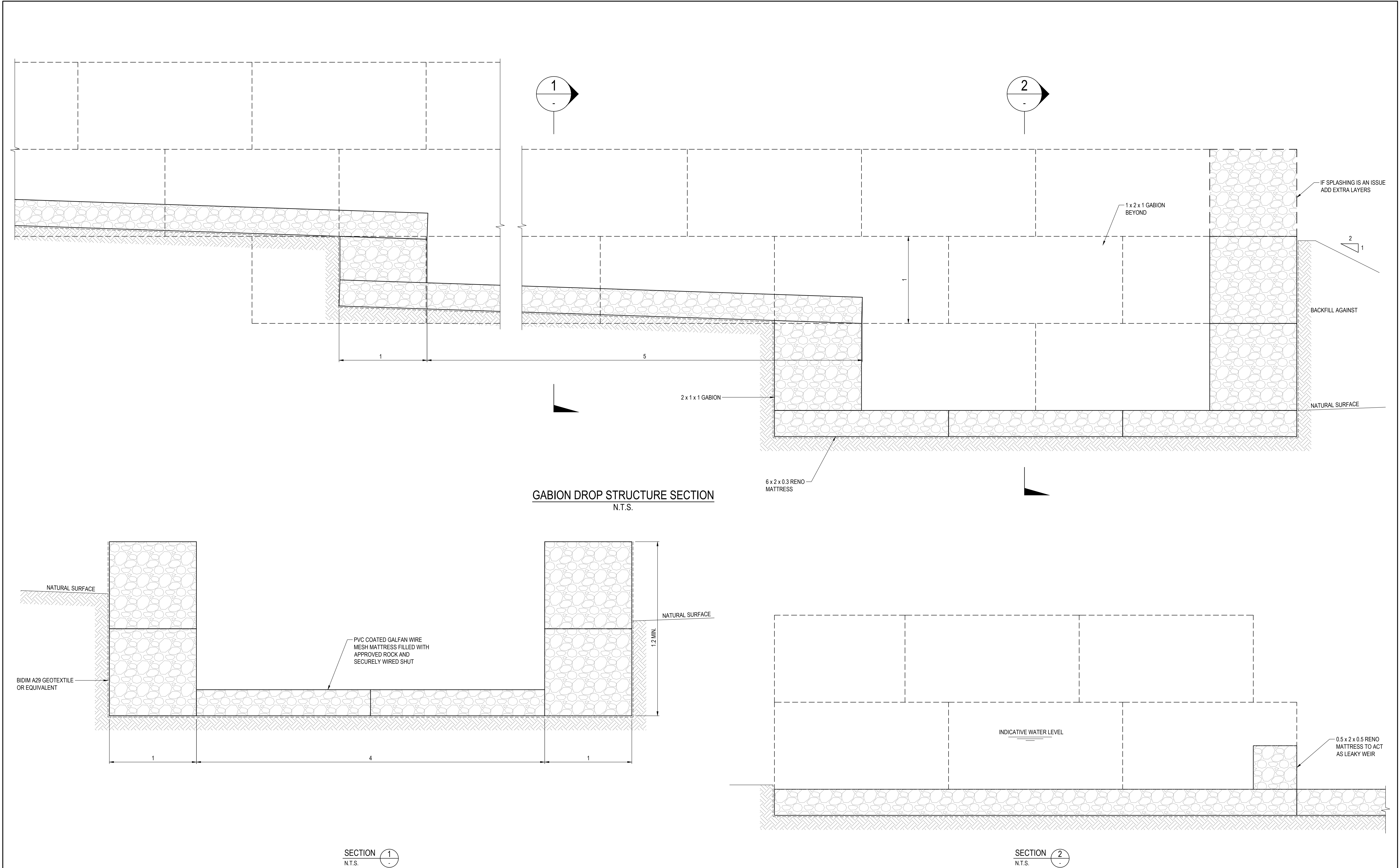
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**DIVERSION CHANNEL
DETAILS SHEET 2**

SCALE (A1)



JOB NUMBER	DATUM	DRAWING NUMBER	REVISION
20240	AHD	C063	3



NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	DATE
3	FOR TENDER	TMC	02.02.2021
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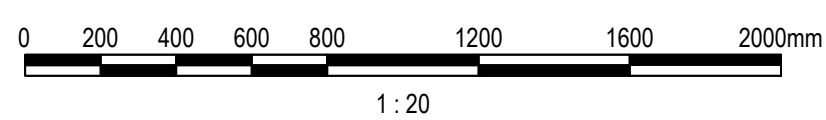
PROJECT

**BELLAMBI CREEK
DIVERSION
RUSSELL VALE COLLIERY**

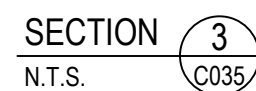
DRAWING TITLE

**GABION DROP STRUCTURE
DETAILS SHEET 1**

SCALE (A1)



JOB NUMBER	DATUM	DRAWING NUMBER	REVISION
20240	AHD	C065	3



3	FOR TENDER	TMC	02.02.2021
2	FOR APPROVAL	TMC	18.12.2020
1	FOR INFORMATION	TMC	14.12.2020
REVISION	DESCRIPTION	ISSUED	DATE



WOLLONGONG COAL

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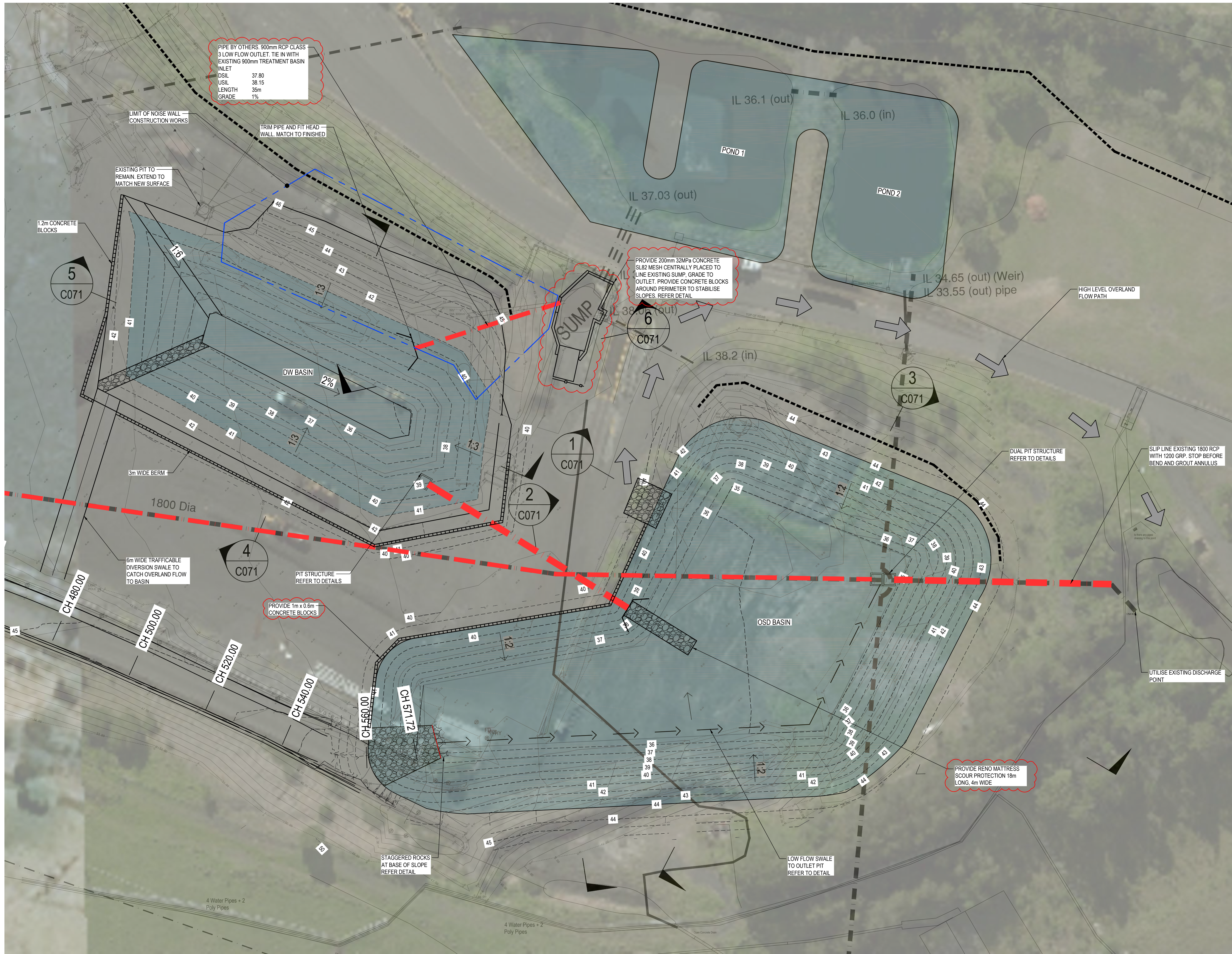
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**BELLAMBI CREEK
DIVERSION
RUSSELL VALE COLLIERY**

TRASH RACK INLET DETAILS

JOB NUMBER 20240	DATUM AHD	DRAWING NUMBER C069	REVISION 3
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NOT FOR CONSTRUCTION



OSD PLAN

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	DATE
3	FOR TENDER	TMC	02.02.2021
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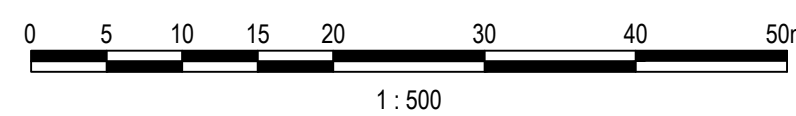
PROJECT

BELLAMBI CREEK
DIVERSION
RUSSELL VALE COLLIERY

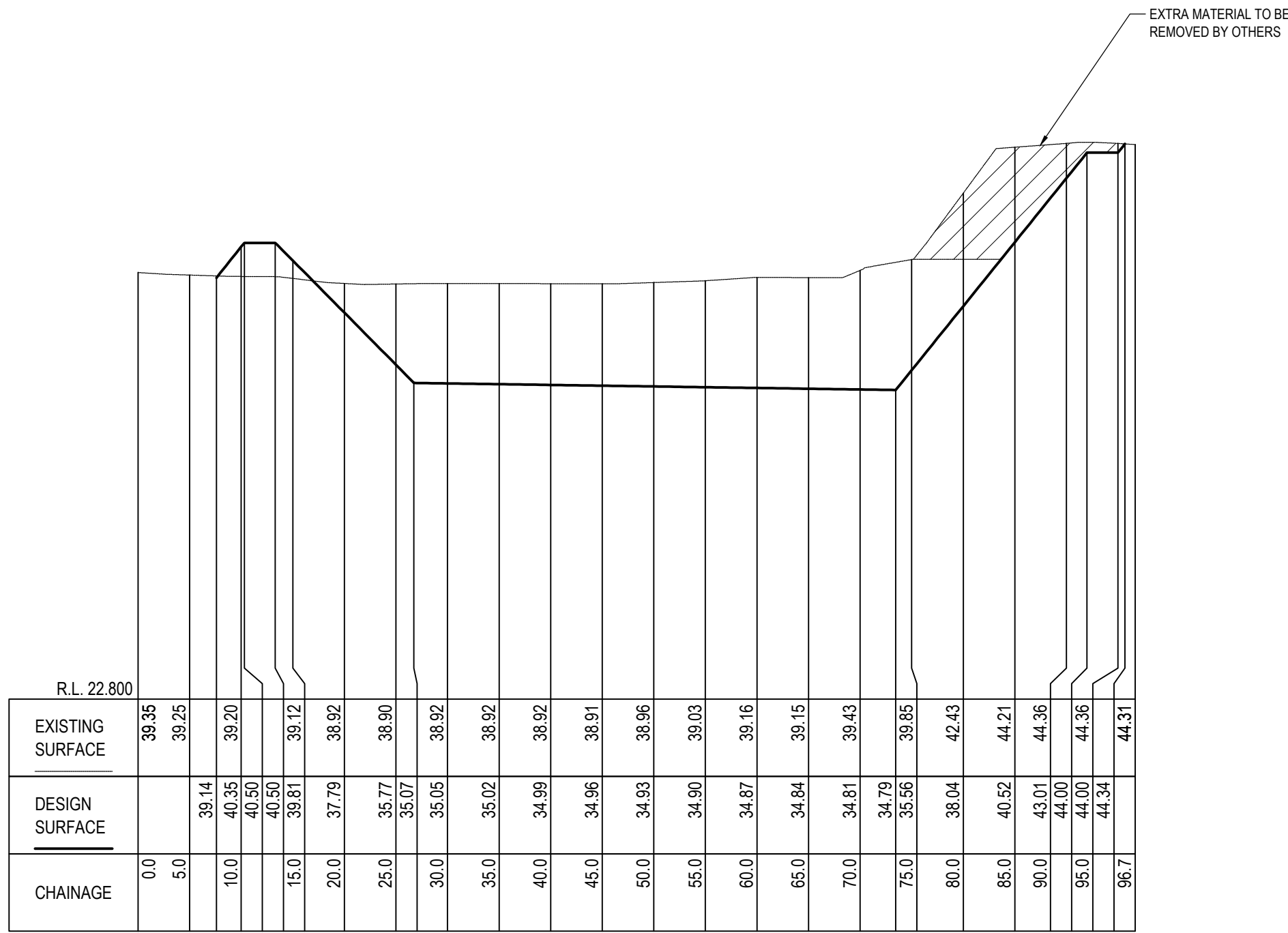
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OSD PLAN

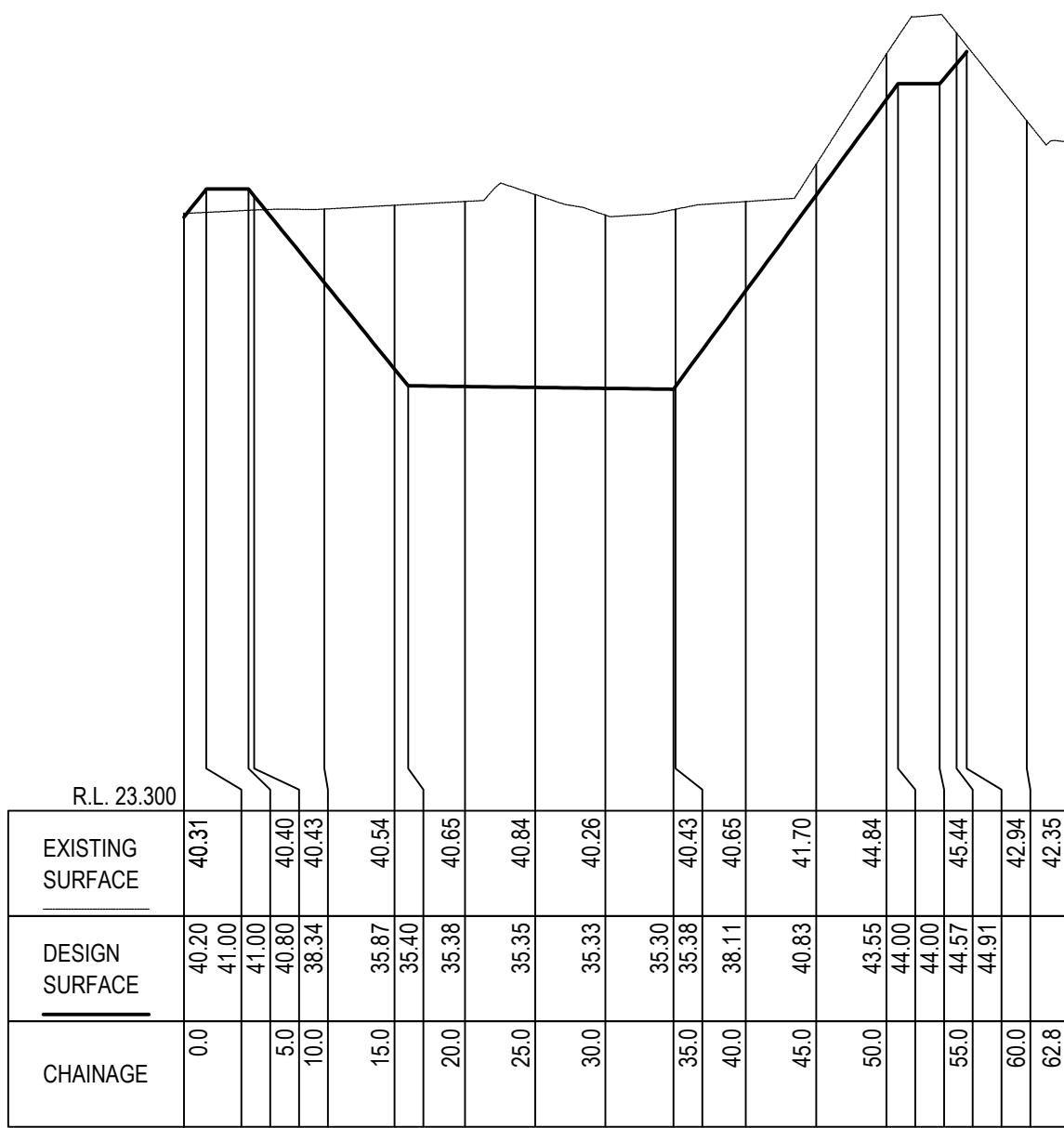
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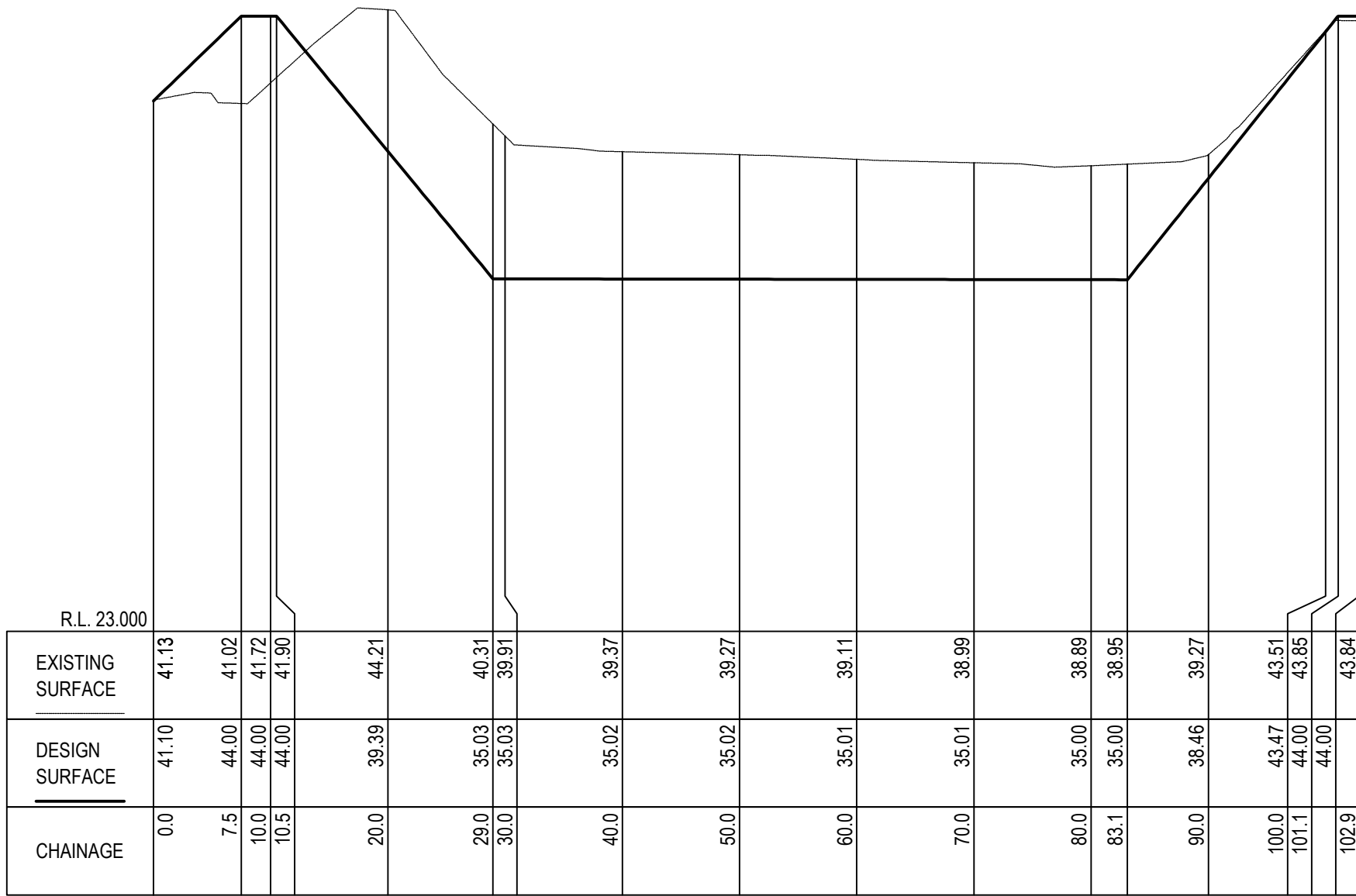
JOB NUMBER	DATUM	DRAWING NUMBER	REVISION
20240	AHD	C070	3



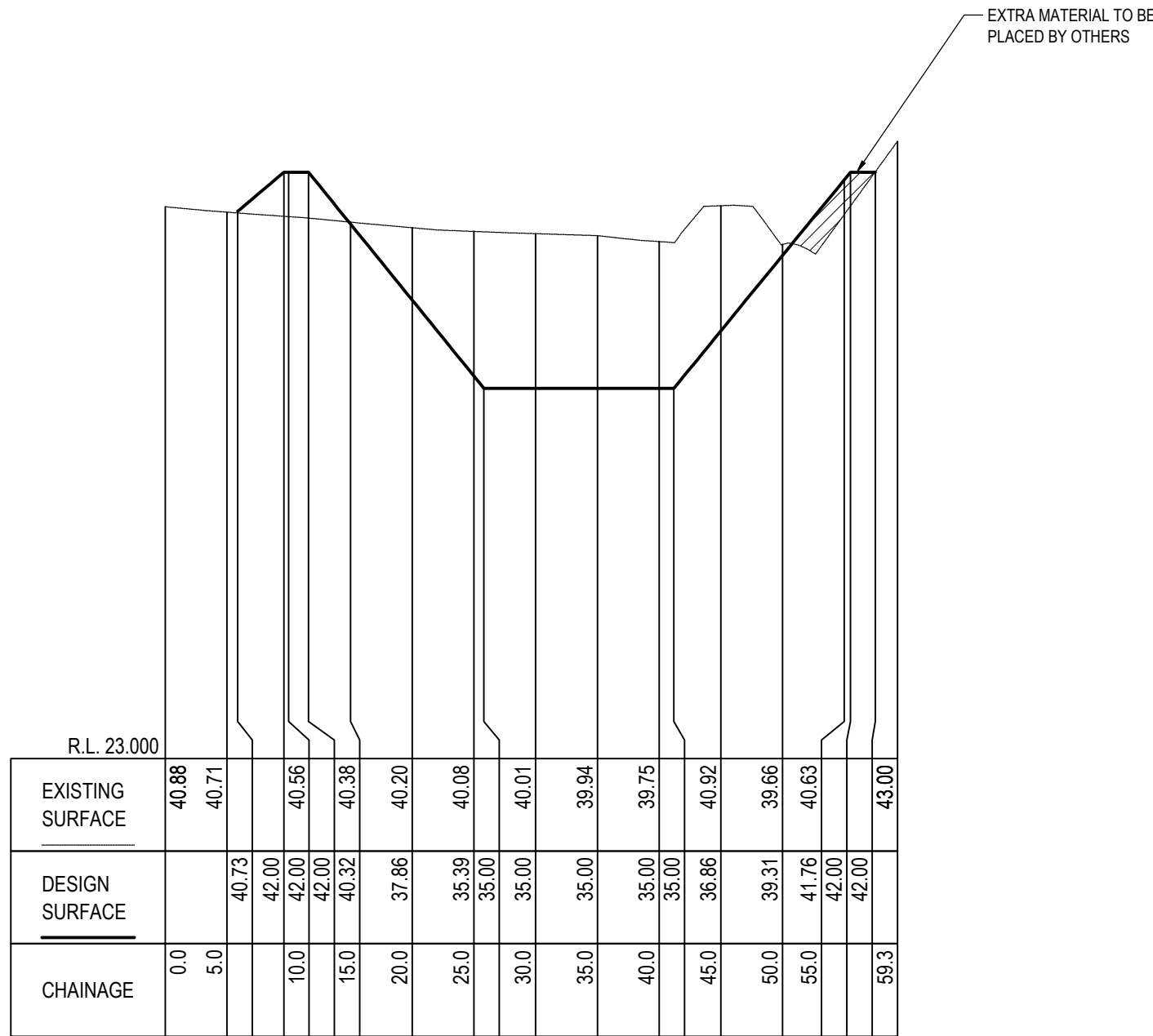
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SCALES: C070
HORIZ 1:500 VERT 1:200



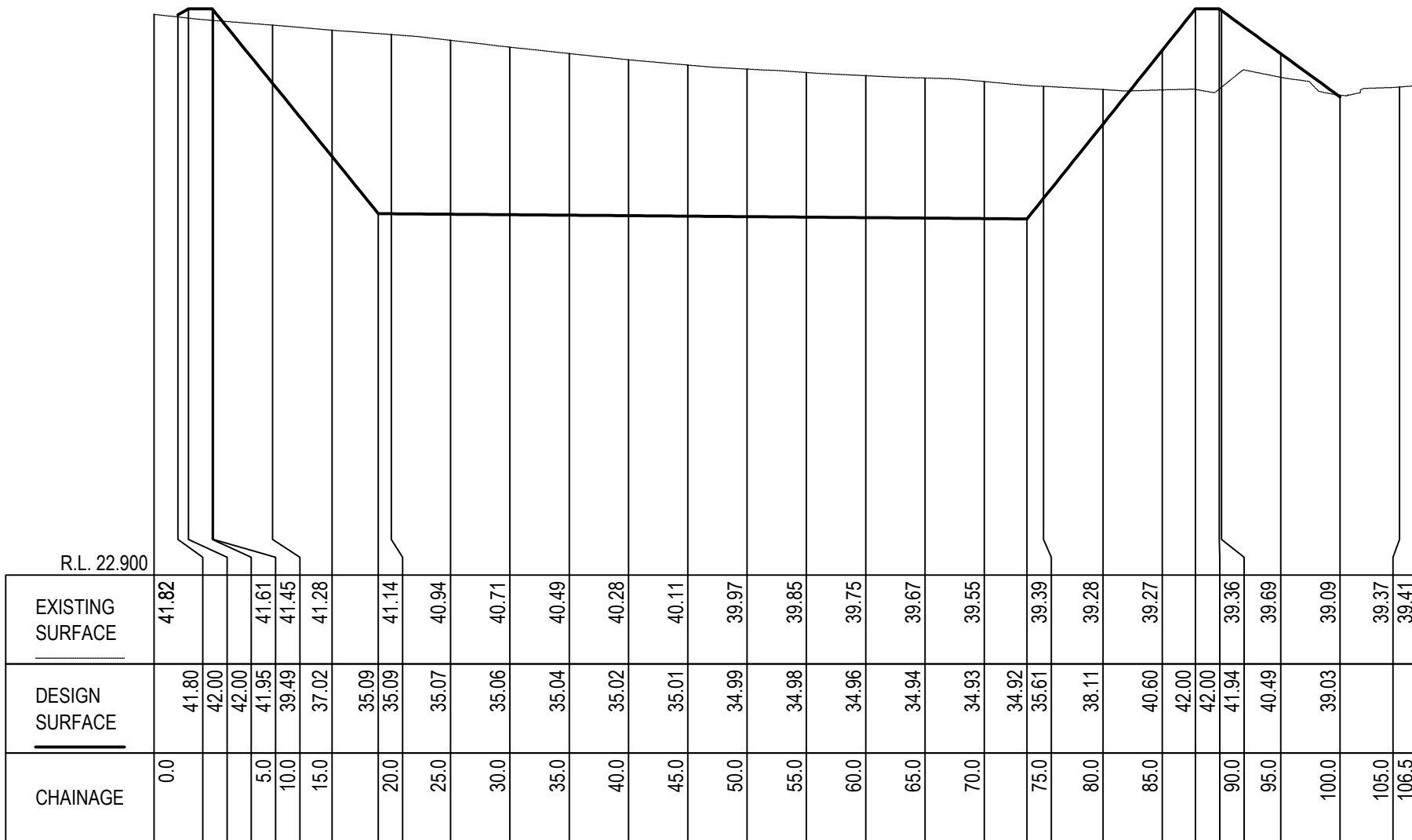
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SCALES: C070
HORIZ 1:500 VERT 1:200



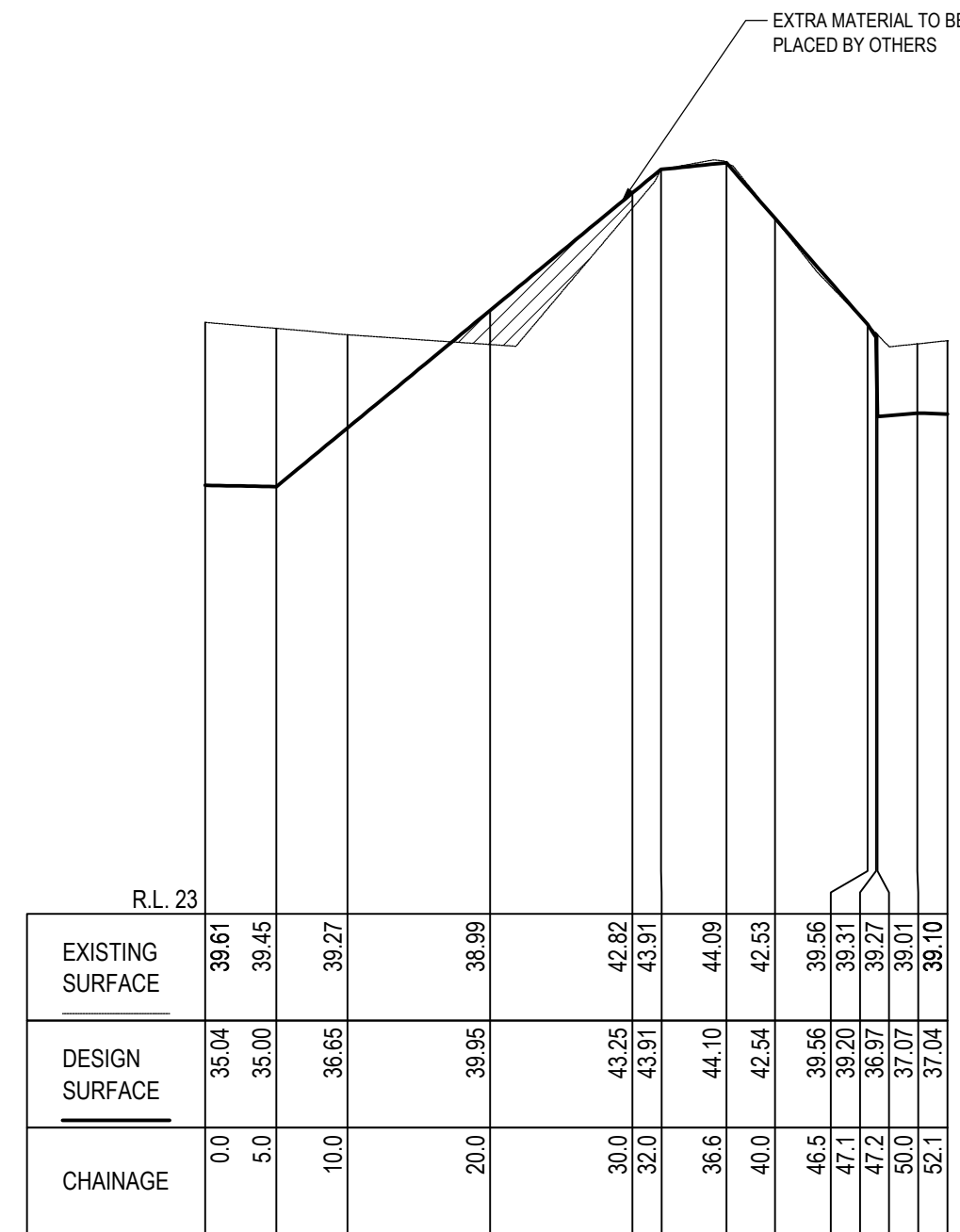
SECTION 3
SCALES: C070
HORIZ 1:500 VERT 1:200



SECTION 4
SCALES: C070
HORIZ 1:500 VERT 1:200



SECTION 5
SCALES: C070
HORIZ 1:500 VERT 1:200



SECTION 6
SCALES: C070
HORIZ 1:500 VERT 1:200

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	DATE
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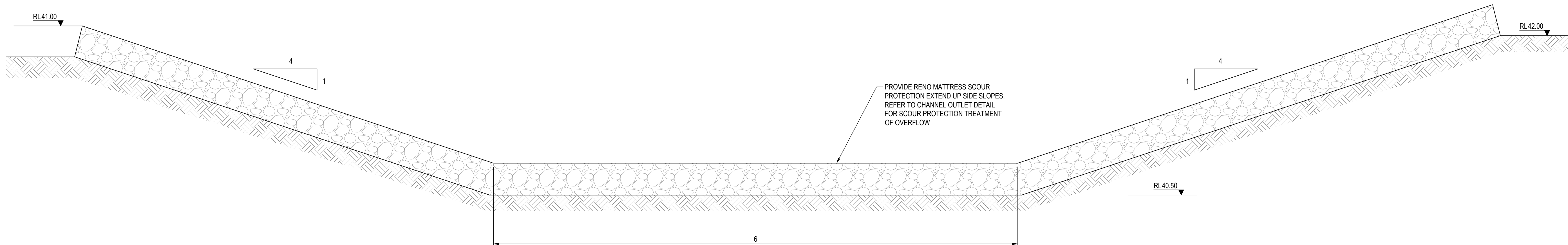
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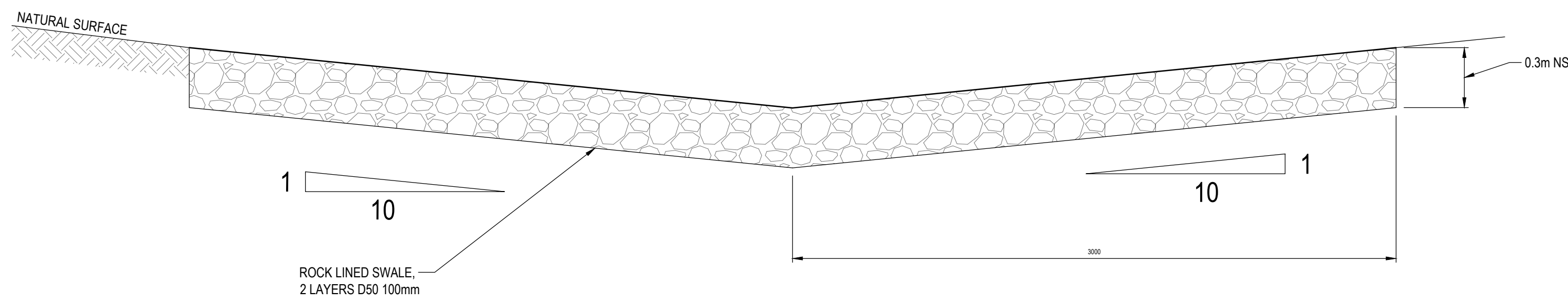
PROJECT
BELLAMBI CREEK
DIVERSION
RUSSELL VALE COLLIERY

DRAWING TITLE
OSD CROSS SECTIONS

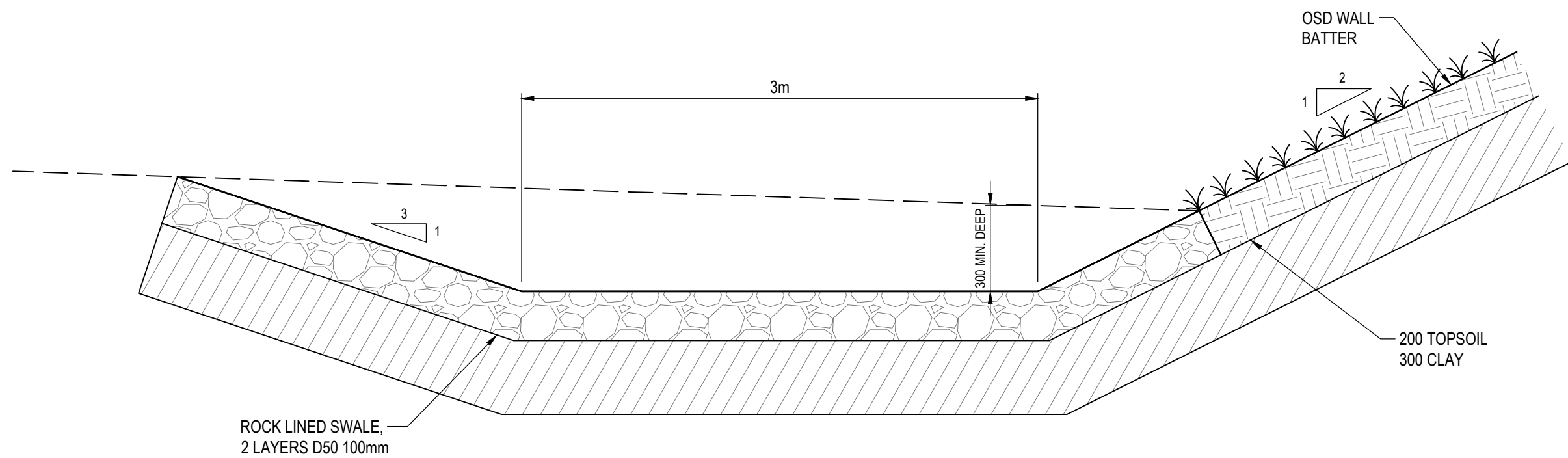
JOB NUMBER	DATUM	DRAWING NUMBER	REVISION
20240	AHD	C071	3



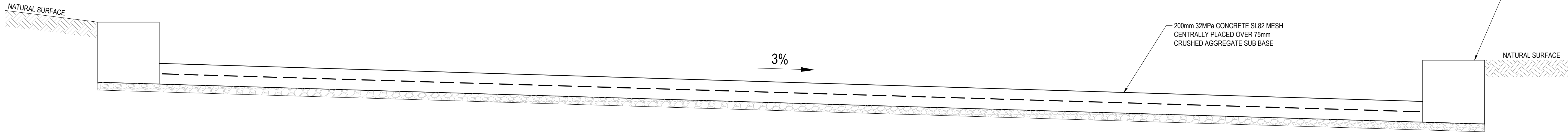
OSD WEIR DETAIL
N.T.S.



TRAFFICABLE LOW FLOW SWALE DETAIL
N.T.S.
MIN. 1% LONGITUDINAL GRADE



OSD LOW FLOW SWALE DETAIL
N.T.S.
0.5% MIN. FALLS TO OSD OUTLET PITS



DIRTY WATER ACCESS DETAIL
N.T.S.

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	DATE
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1	FOR INFORMATION	TMC	14.12.2020

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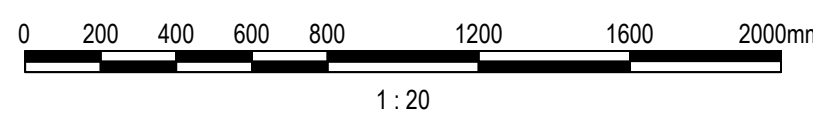
PROJECT

BELLAMBI CREEK
DIVERSION
RUSSELL VALE COLLIERY

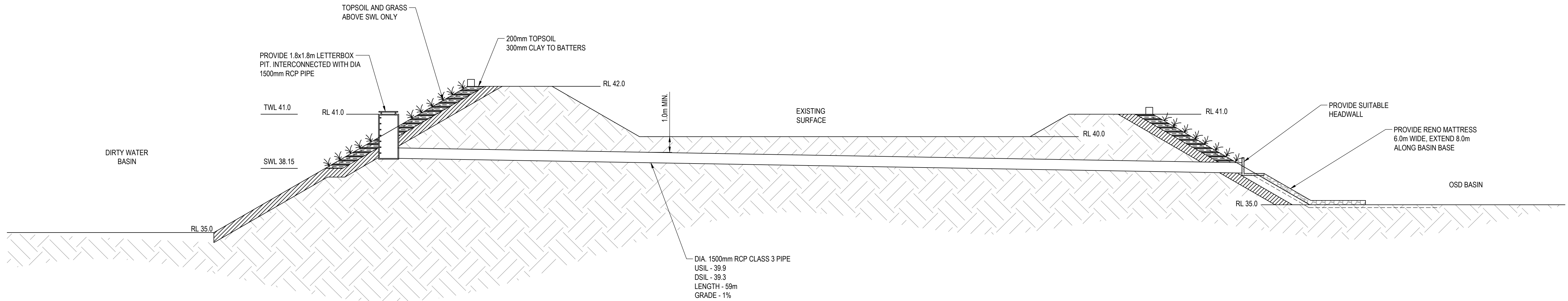
DRAWING TITLE

OSD DETAILS
SHEET 1

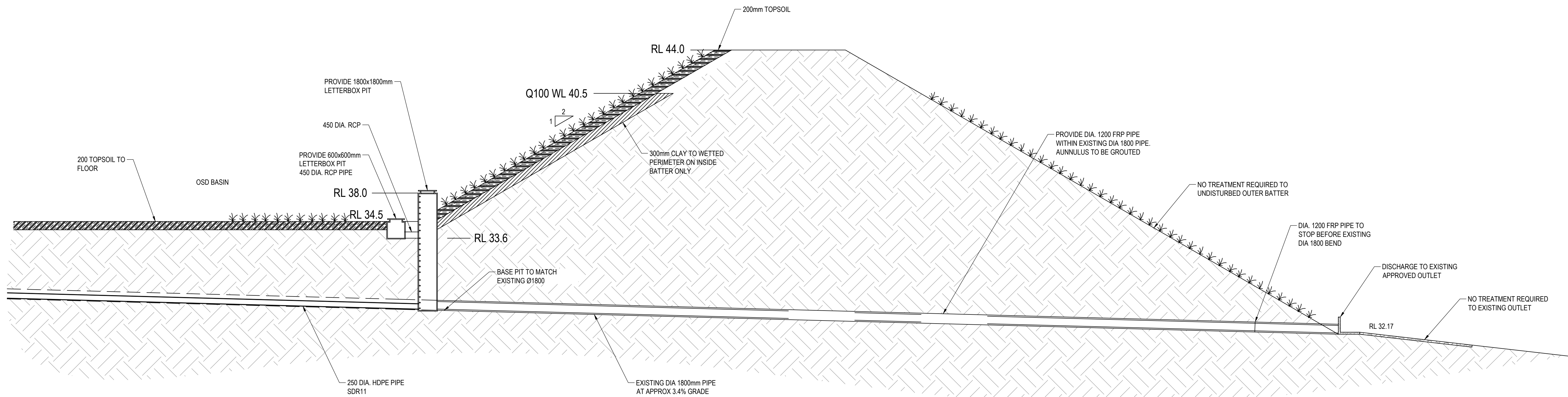
SCALE (A1)



JOB NUMBER	DATUM	DRAWING NUMBER	REVISION
20240	AHD	C072	3



DIRTY WATER BASIN OUTLET DETAIL



OSD BASIN OUTLET DETAIL

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	DATE
3	FOR TENDER	TMC	02.02.2021
2	FOR APPROVAL	TMC	18.12.2020
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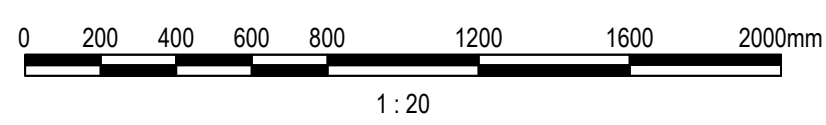
PROJECT

BELLAMBI CREEK
DIVERSION
RUSSELL VALE COLLIERY

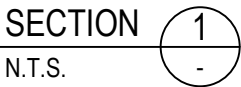
DRAWING TITLE

OSD DETAILS
SHEET 2

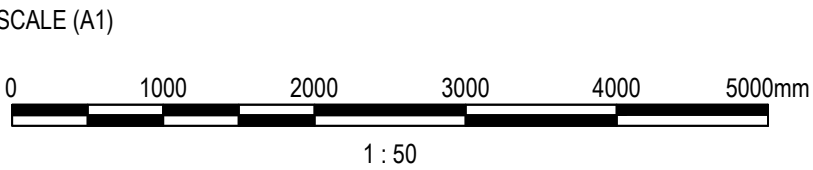
SCALE (A1)



JOB NUMBER	DATUM	DRAWING NUMBER	REVISION
20240	AHD	C073	3



HEADWALL DETAIL



JOB NUMBER	DATUM	DRAWING NUMBER	REVISION
20240	AHD	C080	1

1	FOR TENDER	TMC	02.02.2021
REVISION	DESCRIPTION	ISSUED	DATE

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PROJECT

BELLAMBI CREEK DIVERSION RUSSELL VALE COLLIERY

DRAWING TITLE

SUMP AND PIPE DETAILS

Site	Russell Vale Colliery	DOC ID	
Type	Management Plan	Date Published	31/03/2021
Doc Title	Russell Vale Colliery – Bellambi Gully CMP		

APPENDIX D - RISK ASSESSMENT

7.1 Probability Chart

The probability that the consequence will occur or re occur.

Level	Descriptor	Description
A	Almost Certain	Expected to occur in most circumstances Multiple / 12 months (> 80% probability)
B	Likely	Will probably occur in most circumstances Once / 12 months (61% to 80% probability)
C	Possible	Might occur within 1-2 year time period Once / 12 months – 2 years (41% to 60% probability)
D	Unlikely	Could occur during specified time period Once / 12 months – 5 years (21% to 40% probability)
E	Rare	May only occur in exceptional circumstances Once > 5 years (20% probability)

7.2 Risk Matrix

	CONSEQUENCE				
	Insignificant	Minor	Moderate	High	Major
PROBABILITY	1	2	3	4	5
A Almost Certain	M11	S16	S20	E23	E25
B Likely	M7	M12	S17	E21	E24
C Possible	L4	M8	S13	S18	E22
D Unlikely	L2	L5	M9	S14	S19
E Rare	L1	L3	M6	M10	S15

Risk Ranking Legend

7.3 Safety Standard to be achieved

Selection of controls to reduce risks are made with due regard to their reliability. That is, installing engineering modifications is a superior control to operator training, education or warning signs. Removing the hazard altogether is the most effective control of all.

In every case the effectiveness of the controls in place was considered and assessed by the team for adequacy. In this manner the Risk Control Effectiveness (RCE) was assessed by the team using the risk rank and potential consequences of each hazard to ensure that the controls bring the risk to an acceptable level as low as reasonably practicable (ALARP).

Risk Rating	Risk Level	Guidelines for Risk Rating Matrix
E21 to E25	(E) – Extreme	Eliminate, avoid, implement specific action plans/procedures to manage and monitor – elevate to Senior Management Team for consideration prior to activity – must include improvements to decrease level of risk
S13 to S20	(S) – Significant	Proactively manage with systems and approval of same by Senior Management Team – must include improvements to decrease level of risk
M6 to M12	(M) – Medium	Actively manage
L1 to L5	(L) – Low	Monitor and manage as appropriate

7.31 Table 1:

Risk Identification		Risk Analysis and Evaluation					Management Action Plan							
Risk Event	Causes (Direct & Contributing)	Preventative Controls	Mitigating Controls	Justification of Consequence and Probability ratings	Residual Risk Rating			Tolerable	Action Plan			Residual Risk Rating		
		Elim = Eliminate Sub = Substitute Iso = Isolate Eng = Engineering Adm = Administrative PPE = Personal Protective Equipment				Cons	Prob		Rating	Action	Responsible Person	Due Date	Cons	Prob
Exploration	Environmental damage, poor roads and vehicle incidents, leaks, sediment erosion, impacts to flora and fauna.	WCL EC PLN 003 Traffic Management Plan WCL EC PRO 022 Surface Drilling Within WATER NSW Catchment WCL EC PRO 011 Drill Hole Sealing And Capping Procedure WCL EC PRO 016 Vegetation Clearing In Special Area Land (Managed By WaterNSW) Review of environmental factors document WCL EC TRN 001 Remote Work & Special Area Land (Managed by WaterNSW) Access Induction Assessment WCL EC FRM 003 WaterNSW Access for Works Permit WCL EC PRO 015 Special Area Land (Managed by WaterNSW) Access Procedure WCL EC PRO 017 Catchment Monitoring Biological Hygiene Control Procedure v2	WCL EC PLN 002 Incident Response MP for Surface Drilling (Water NSW) WCL EC PLN 001 Incident Response Management Plan Special Area Managed by WaterNSW RVC EC PLN 022 Pollution Incident Response Management Plan	During the MOP period an exploration program consisting of drilling 11 holes to gather data on coal quality, strata, gas and water is planned to start in August 2018. Initially one drill rig will be operating and the full programme of 11 holes is expected to take approximately 8 months. 3 holes to complete which will be done by March 2021. A second exploration program of a similar size will be undertaken in the period of the MOP.	2	C	M 8	Yes						
Construction	Environmental damage, poor roads and vehicle incidents, leaks, sediment erosion, impacts to flora and fauna. Community impacts such as noise, dust traffic	WCL HS PLN 001 Contractor Management Plan WCL HS FRM 008 Specialised Contractor Pre Works Checklist WCL HS PRO 002 WCL	WCL EC STD 003 Spill Kit Standard WCL EC PRES 004 Spill Response Presentation RVC EC PLN 022 Pollution Incident Response	Construction activities will consist of Bellambi Creek Diversion and Rejects Emplacement Area rehabilitation area.	2	C	S1 3	Yes				2	C	S1 3

Risk Identification		Risk Analysis and Evaluation						Management Action Plan						
Risk Event	Causes (Direct & Contributing)	Preventative Controls	Mitigating Controls	Justification of Consequence and Probability ratings	Residual Risk Rating			Tolerable	Action Plan			Residual Risk Rating		
		Elim = Eliminate Sub = Substitute Iso = Isolate Eng = Engineering Adm = Administrative PPE = Personal Protective Equipment			Cons	Prob	Rating		Action	Responsible Person	Due Date	Cons	Prob	Rating
		Contractor HST Requirements DPIE Order with controls to be implemented. RVC EC PLN 015 Traffic Management Plan	Management Plan											
Mining Operations	Dust, noise, water balance changes, materials handling, waste, water, ecological impacts	RVC EC PLN 010 Extraction Plan RVC EC PLN 011 Coal Resource Recovery Plan WCL HS FRM 005 Change Management Approval		Increase in activity on site. No mining activities during this MOP period until approvals are granted by the Regulator.					Not Rated					
Rock Emplacement				No rock emplacement activities during the period of this MOP					Not Rated					
Processing Residues and Tailings				There are no planned mining operations proposed to be undertaken during this MOP period and thus there will be no processing residues or tailing produced that would require emplacement.					Not Rated					

Risk Identification		Risk Analysis and Evaluation						Management Action Plan							
Risk Event	Causes (Direct & Contributing)	Preventative Controls	Mitigating Controls	Justification of Consequence and Probability ratings	Residual Risk Rating			Tolerable	Action Plan			Residual Risk Rating			
		Elim = Eliminate Sub = Substitute Iso = Isolate Eng = Engineering Adm = Administrative PPE = Personal Protective Equipment				Cons	Prob		Rating	Action	Responsible Person	Due Date	Cons	Prob	Rating
Waste Management	Spills on site and during transportation, truck noise.	WCL HS PLN 001 Contractor Management Plan WCL HS FRM 008 Specialised Contractor Pre Works Checklist WCL HS PRO 002 WCL Contractor HST Requirements RVC MIN STD 006 Transport rules RVC EC PLN 015 Traffic Management Plan	WCL EC STD 003 Spill Kit Standard WCL EC PRES 004 Spill Response Presentation RVC EC PLN 022 Pollution Incident Response Management Plan	All general waste from both the surface and underground operations is collected in large portable skips and removed regularly from site to by licensed waste management contractors to a licensed waste disposal depot. Waste oil and oily water is collected from a waste oil tank and, if necessary, site holding pits or sumps and removed from site by authorised oil recycling/disposal contractors.	2	D	L5	Yes							
Decommissioning and Demolition Activities	Environmental damage, poor roads and vehicle incidents, leaks, sediment erosion, impacts to flora and fauna, trespassers (Public Safety)	RVC MIN STD 006 Transport rules WCL HS PLN 001 Contractor Management Plan WCL HS FRM 008 Specialised Contractor Pre Works Checklist WCL HS PRO 002 WCL Contractor HST Requirements	WCL EC STD 003 Spill Kit Standard WCL EC PRES 004 Spill Response Presentation RVC EC PLN 022 Pollution Incident Response Management Plan	Rehabilitate 1 and 2 shafts.	2	D	L5	Yes							
Temporary Stabilisation	Environmental damage, poor roads and vehicle incidents, leaks, sediment erosion, impacts to flora and fauna, trespassers (Public Safety)	RVC EC PLN 015 Traffic Management Plan WCL HS PLN 001 Contractor Management Plan WCL HS FRM 008 Specialised Contractor Pre Works Checklist WCL HS PRO 002 WCL Contractor HST Requirements RVC MIN PLN 007 Stockpile Slope Stability Coal Handling Control Plan	WCL EC STD 003 Spill Kit Standard WCL EC PRES 004 Spill Response Presentation RVC EC PLN 022 Pollution Incident Response Management Plan	There will be temporary stabilisation work undertaken in the stockpile and processing area over this MOP period. The intention of the work will be to prevent erosion or entrainment of residual carbonaceous materials. The stabilisation methods will involve either: - Coverage of exposed areas with topsoil and planting with grasses; - Regular application of a dust suppressant/binding material to maintain surface cohesion to resist erosion or wind entrainment.	2	D	L5	Yes							

Risk Identification		Risk Analysis and Evaluation						Management Action Plan							
Risk Event	Causes (Direct & Contributing)	Preventative Controls	Mitigating Controls	Justification of Consequence and Probability ratings	Residual Risk Rating			Tolerable	Action Plan			Residual Risk Rating			
		Elim = Eliminate Sub = Substitute Iso = Isolate Eng = Engineering Adm = Administrative PPE = Personal Protective Equipment				Cons	Prob		Rating	Action	Responsible Person	Due Date	Cons	Prob	Rating
		RVC EC PLN 019 Water Management Plan RVC EC PLN 014 Air Quality & GHG Management Plan													
Progressive Rehabilitation and Completion	Environmental damage, poor roads and vehicle incidents, leaks, sediment erosion, impacts to flora and fauna, trespassers (Public Safety)	RVC EC PLN 015 Traffic Management Plan WCL HS PLN 001 Contractor Management Plan WCL HS FRM 008 Specialised Contractor Pre Works Checklist WCL HS PRO 002 WCL Contractor HST Requirements RVC EC PLN 019 Water Management Plan RVC EC PLN 014 Air Quality & GHG Management Plan RVC EC PLN 020 Rehabilitation Management Plan Water carts Community Consultation Committee (CCC)	WCL EC STD 003 Spill Kit Standard WCL EC PRES 004 Spill Response Presentation RVC EC PLN 022 Pollution Incident Response Management Plan WCL EC PRO 002 Community Complaints & Enquiries Procedure	Rejects emplacement will be rehabilitated during the period of this MOP.	2	C	M 8	Yes							
Rehabilitation – Geology and Geochemistry				Russell Vale Colliery is located in the NSW Southern Coalfield. The economic coal seams in the Southern Coalfield are located within the Illawarra Coal Measures, which contain a number of workable coal seams. At Russell Vale Colliery the Bulli, Balgownie and Wongawilli seams have been worked. As no fine rejects are produced at Russell Vale Site, geochemistry of waste rejects is not a					Not Rated						

Risk Identification		Risk Analysis and Evaluation						Management Action Plan							
Risk Event	Causes (Direct & Contributing)	Preventative Controls	Mitigating Controls	Justification of Consequence and Probability ratings	Residual Risk Rating			Tolerable	Action Plan			Residual Risk Rating			
		Elim = Eliminate Sub = Substitute Iso = Isolate Eng = Engineering Adm = Administrative PPE = Personal Protective Equipment			Cons	Prob	Rating		Action	Responsible Person	Due Date	Cons	Prob	Rating	
		Extraction Plan													
Erosion and Sediment Control - Russell Vale Colliery Pit Top	High rainfall events, breach of barriers	RVC EC PLN 018 Surface Facilities Water Management Plan Monthly environmental inspection work order. Erosion sediment controls (sedimentary fence, sand bags)		Permanent erosion and sediment control measures involve the use of a number of settlement structures. These include some smaller sumps that are cleaned out as required with the frequency depending largely on rainfall runoff. There are three larger earthen dams to the north and east of the coal stockpile area. An excavator is used to remove material from these dams as required.	2	C	M 8	Yes							
Erosion and Sediment Control - SMP and Catchment Lease Areas	High rainfall events, subsidence	RVC EC PLN 003 Subsidence Monitoring Plan		As part of Extraction Plan monitoring, Russell Vale Colliery conducts inspections for impacts above longwall extraction areas that may have been affected by mine subsidence. Areas inspected that may experience soil erosion due to mine subsidence are generally restricted to rock outcrops, steep slopes and cliff lines, unpaved roads or tracks, streams and general soil cracking. These areas are checked when undertaking the monitoring program and will continue until regulatory approval is received to cease the monitoring. No new erosion is anticipated due to no mining activities during the period of this MOP.	2	E	L3	Yes							
Soil Types and Suitability	Contamination of soil, dust generated, erosion, sediment	RVC EC PLN 020 Rehabilitation Management Plan		There is no plan to disturb soil at the Russell Vale Pit Top or in the catchment areas during the MOP period. During the rehabilitation of the emplacement area, topsoil will be appropriately sourced and applied as required.	3	D	M 9	Yes	Perform a soil analysis and inspection prior to soil being used during rehabilitation	Robert Faddy-Vrouwe	Prior to rehabilitation work commencing	3	D	M 9	

Risk Identification		Risk Analysis and Evaluation						Management Action Plan						
Risk Event	Causes (Direct & Contributing)	Preventative Controls	Mitigating Controls	Justification of Consequence and Probability ratings	Residual Risk Rating			Tolerable	Action Plan			Residual Risk Rating		
		Elim = Eliminate Sub = Substitute Iso = Isolate Eng = Engineering Adm = Administrative PPE = Personal Protective Equipment			Cons	Prob	Rating		Action	Responsible Person	Due Date	Cons	Prob	Rating
Flora - Russell Vale Colliery Pit Top	Lack of weed management, feral animals	RVC EC PLN 017 Biodiversity Management Plan		Regular inspection of weeds, particularly lantana, by the Illawarra District Noxious Weeds Authority (IDNWA) as well as chemical spraying and general vegetation maintenance will continue to be conducted at during this MOP period. Threatened flora will be managed in accordance with the approved Biodiversity Management Plan. Activities in historically disturbed areas of the pit top site have no potential effects on threatened aquatic or terrestrial vegetation as none have been identified close to these areas.	2	D	L5	Yes						
Flora - SMP and Catchment Lease Areas	Lack of weed management, feral animals, mobility of seeds due to human activities.	RVC EC PLN 017 Biodiversity Management Plan WCL EC PRO 016 Vegetation Clearing In Special Area Land (Managed By WaterNSW) Review of Environmental Factors Inspection of drilling sites prior to drilling APZ environmental management plan		Vegetation clearing around the firebreaks at the shaft and drilling sites involves management of regrowth areas only and doesn't impact on threatened species.	2	D	L3	Yes						
Fauna - Russell Vale Colliery Pit Top	Disturbance of habitat, impact of vehicles	RVC EC PLN 017 Biodiversity Management Plan RVC EC PLN 015 Traffic Management Plan		Threatened fauna will be managed in accordance with the approved Biodiversity Management Plan. Ongoing operations in historically disturbed areas of the site have no potential effects on threatened fauna habitat as none have been identified close to these areas.	2	D	L5	Yes						

Risk Identification		Risk Analysis and Evaluation						Management Action Plan						
Risk Event	Causes (Direct & Contributing)	Preventative Controls	Mitigating Controls	Justification of Consequence and Probability ratings	Residual Risk Rating			Tolerable	Action Plan			Residual Risk Rating		
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Fauna - SMP and Catchment Lease Areas	Disturbance of habitat, impact of vehicles	RVC EC PLN 017 Biodiversity Management Plan WCL EC PRO 017 Catchment Monitoring Biological Hygiene Control Procedure		There is no planned activity that could impact threatened fauna species at the ventilation shaft sites during the MOP period.	2	D	L5	Yes						
Slopes and Slope Management	Erosion, design, high rain events, maintenance of slopes	RVC MIN PHMP 003 Ground or Strata Failure RVC MIN PLN 007 Stockpile Slope Stability Coal Handling Control Plan RVC EC PLN 009_Public Safety Management Plan		There is no planned extraction in the MOP period that could lead to slope instability. However, as access to the previously extracted LW6 (365m) area is subject to WaterNSW access restrictions. With no four wheel drive tracks or fire trails directly beneath identified cliffs or steep slopes, it is unlikely there would be any issues of safety as a result of potential rock falls.	2	D	L5	Yes						
Air Quality - Russell Vale Colliery Pit top	High wind events, poor maintenance of sprays, hot/dry weather conditions	RVC EC PLN 014 Air Quality & GHG Management Plan Water carts Sprays Community Consultation Committee (CCC)	WCL EC PRO 002 Community Complaints & Enquiries Procedure	The air quality will be monitored in accordance with approved Air Quality & Greenhouse Gas Management Plan. Dust control options for surface activities during this MOP period include: - Stabilising the coal stockpile and coal processing area; - Use of the stockpile water sprays system. This facility can be automatically activated according to pre-set wind speed and direction controls; - Use of a water truck to wet down areas such as the coal processing area; and - Covering stockpile area with dust suppressant material.	2	C	M8	Yes	Repair stockpile sprays automation	Peter Karakolevski	31/12/2020	2	D	L5
Air Quality - SMP and Catchment Lease Areas	High wind events, hot/dry weather conditions	RVC EC PLN 014 Air Quality & GHG Management Plan WCL EC PRO 022 Surface Drilling Within WATER NSW Catchment WCL HS PLN 001 Contractor Management		The only activities in the catchment during the MOP period that could create dust are related to EP inspections, maintenance activities, and the exploration program. The impacts from these activities are: Particulate emissions from motor vehicles and other fuel powered machinery.	2	D	L5	Yes						

Risk Identification		Risk Analysis and Evaluation						Management Action Plan						
Risk Event	Causes (Direct & Contributing)	Preventative Controls	Mitigating Controls	Justification of Consequence and Probability ratings	Residual Risk Rating			Tolerable	Action Plan			Residual Risk Rating		
		Elim = Eliminate Sub = Substitute Iso = Isolate Eng = Engineering Adm = Administrative PPE = Personal Protective Equipment			Cons	Prob	Rating		Action	Responsible Person	Due Date	Cons	Prob	Rating
		Plan WCL HS FRM 008 Specialised Contractor Pre Works Checklist WCL HS PRO 002 WCL Contractor HST Requirements												
Surface Water - Russell Vale Colliery Pit top	High rainfall events, poor maintenance of drainage structures, contamination of water	RVC EC PLN 018 Surface Facilities Water Management Plan RVC EC PRO 002 Guide for Operation of RVC Stormwater Control Dam Pumps RVC EC PRO 003 Operational Procedure for RVC Discharge Valve		A system of cut-off drains are established up- slope of the mine site facilities to capture stormwater run-off and divert it away from the operational areas of the mine site and into local watercourses. The clean water drains are generally grassed open channels. The system carries the water from above the mine site to discharge through areas of bushland and via unnamed watercourses into tributaries of Bellambi Gully, Towradgi Creek and Hicks Creek.	2	C	M 8	Yes						
Surface Water - SMP and Catchment Lease Areas	High rainfall events	RVC EC PLN 019 Water Management Plan WaterNSW deny access at 10mm of rain		Surface water quality monitoring is undertaken in the Russell Vale East area at a frequency outlined in the approved EP, or as agreed by regulatory authorities to determine the impacts on surface water quality from previous mining.	2	D	L5	Yes						
Ground Water - Russell Vale Colliery Pit top	High rainfall events, poor maintenance of pumps, inadequate inspections	RVC EC PLN 006 Groundwater Management Plan Work order system for pump maintenance		Groundwater is collected in pits/sumps underground and is recycled/transferred underground where possible. This water is primarily used for dust suppression transport roadways and conveyor systems. Groundwater that is discharged from the mine is pumped to the surface and flows into the Mine Dams for use underground and for stockpile sprays. The overflow discharges to the site's dirty water management system and eventually collects in the SWCD where it is pumped to the clarifier and finally through the LDP2 into Bellambi Gully Creek.	2	C	M 8	Yes						

Risk Identification		Risk Analysis and Evaluation						Management Action Plan						
Risk Event	Causes (Direct & Contributing)	Preventative Controls	Mitigating Controls	Justification of Consequence and Probability ratings	Residual Risk Rating			Tolerable	Action Plan			Residual Risk Rating		
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Ground Water - SMP and Catchment Lease Areas	Subsidence	RVC EC PLN 006 Groundwater Management Plan		Ground Water monitoring is undertaken in catchment lease areas of Russell Vale Colliery on a regular basis and in accordance with EP requirements. No mining activities during this MOP period.	2	D	L5	Yes						
Contaminated Land - Russell Vale Colliery Pit top	Spills, lack of containment	Re-fuelling procedure RVC HS PLN 005 Hazardous Substances Bunding Inspections	WCL EC STD 003 Spill Kit Standard WCL EC PRES 004 Spill Response Presentation RVC EC PLN 022 Pollution Incident Response Management Plan	An assessment of potential site contamination has been undertaken in the past at Russell Vale Colliery. The report recommends further investigations and the development of a Remediation Action Plan prior to rehabilitation work at the end of mine life.	2	D	L5	Yes						
Contaminated Land - SMP and Catchment Lease Areas	Spills, lack of containment	Hazardous materials plan Bunding Inspections WCL EC PRO 022 Surface Drilling Within WATER NSW Catchment WCL EC PRO 011 Drill Hole Sealing And Capping Procedure	WCL EC STD 003 Spill Kit Standard WCL EC PRES 004 Spill Response Presentation RVC EC PLN 022 Pollution Incident Response Management Plan	The only activities involving materials that could potentially contaminate land are: - The transport to the No.4 Shaft site of minor quantities of: - Diesel for the diesel tanks; - Cleaning chemicals for cleaning of ventilation shaft buildings and machinery; and - Herbicide. - Diesel in vehicles accessing the ventilation shaft sites. Herbicide is used to keep vegetation within the compound to a manageable level to reduce fire risk. The only risk in the EP areas involving materials that could potentially contaminate land are diesel fuel in vehicles accessing monitoring sites and drill rig sites.	2	D	L5	Yes						

Risk Identification		Risk Analysis and Evaluation						Management Action Plan							
Risk Event	Causes (Direct & Contributing)	Preventative Controls	Mitigating Controls	Justification of Consequence and Probability ratings	Residual Risk Rating			Tolerable	Action Plan			Residual Risk Rating			
		Elim = Eliminate Sub = Substitute Iso = Isolate Eng = Engineering Adm = Administrative PPE = Personal Protective Equipment			Cons	Prob	Rating		Action	Responsible Person	Due Date	Cons	Prob	Rating	
Hazardous Materials	Spills, lack of containment, transporting	RVC HS PLN 005 Hazardous Substances SDS Register Chemwatch Specialist storage systems RVC MIN STD 006 Transport rules	WCL EC STD 003 Spill Kit Standard WCL EC PRES 004 Spill Response Presentation RVC EC PLN 022 Pollution Incident Response Management Plan	Diesel fuel is brought to site by fuel tankers. The fuel is stored on site in a double skinned 10,000 L tanks. This tank is situated in the workshop area and is bonded, with fire-fighting facilities in close proximity. Fuel is pumped from this main storage tank into smaller transportable containment vessels for use underground. Russell Vale Colliery maintains a register of Safety Data Sheets (SDS) for all chemicals used on site. Other dangerous goods kept at Russell Vale Colliery include compressed gases, flammable and combustible liquids, poisonous substances and corrosive substances, none of which exceed the acceptable holding limits.	2	D	L5		Health control plan risk assessment has actions relating to hazardous substances						
Greenhouse Gases, Methane Drainage / Venting	Poor drilling standards, capping standards, variation in coal seam gas contents	RVC MIN PLN 004 Ventilation Control Plan RVC MIN PHMP 010 Outburst RVC EC PLN 014 Air Quality & GHG Management Plan		A Ventilation Control Plan is in use at Russell Vale Colliery. The Ventilation Control Plan has the prime objectives of ensuring critical safety risks posed by gas emissions and other hazards related to ventilation at Russell Vale Colliery can be effectively controlled. The highest desorbable gas content recorded for the Wongawilli seam, from exploration samples is approximately 8m3/tonne (at 20°C, 101.3kpa). The gas is generally composed of 70% Methane and 30% Carbon Dioxide.	1	D	L2	Yes							
Blasting	Incorrect storage and usage of explosives	RVC MIN PLN 009 Explosives Control Plan WCL HS PLN 001 Contractor Management Plan WCL HS FRM 008 Specialised Contractor Pre Works Checklist WCL HS PRO 002 WCL Contractor HST Requirements		Small scale blasting (known as Shot Firing) occurs underground infrequently or as the need arises. Underground blasting activities will be undertaken during this MOP period as the need arises. Using a licenced contractor to undertake this task as required	2	E	L3	Yes							

Risk Identification		Risk Analysis and Evaluation						Management Action Plan							
Risk Event	Causes (Direct & Contributing)	Preventative Controls	Mitigating Controls	Justification of Consequence and Probability ratings	Residual Risk Rating			Tolerable	Action Plan			Residual Risk Rating			
		Elim = Eliminate Sub = Substitute Iso = Isolate Eng = Engineering Adm = Administrative PPE = Personal Protective Equipment				Cons	Prob		Rating	Action	Responsible Person	Due Date	Cons	Prob	Rating
Noise - Russell Vale Colliery Pit top	Vehicle movements, starting and reversing vehicles, conveyors and fans noise, poor maintenance practices	RVC EC PLN 013 Noise Management Plan RVC MIN STD 006 Transport rules Operating hours Due diligence noise monitoring program Community Consultation Committee (CCC)	High earth bund wall WCL EC PRO 002 Community Complaints & Enquiries Procedure	- Continuous unattended real time noise monitors with audio capture and real time alerts; - A 3 to 4 metre high earth bund surrounds the coal processing area. This bund was constructed to provide noise attenuation for local residents from coal processing area activities; - Truck drivers are directed to drive slowly and have regard for Russell Vale residents' amenity;	2	C	M 8	Yes							
Noise - SMP and Catchment Lease Areas		RVC EC PLN 013 Noise Management Plan		Due to the absence of potentially affected receivers in the EP area and in general catchment areas, noise is not an issue.					Not Rated						
Visual and Lighting - Russell Vale Colliery Pit top	Bright light			Light from Russell Vale Colliery is either directly or indirectly visible to the local community as well as to the regional community within the view shed. The site is visible to a large area of the northern Wollongong Local Government Area due to its location on the escarpment. A lighting audit has been undertaken for the site.	1	E	L1	Yes							
Visual and Lighting - EP and Catchment Lease Areas				The lights at ventilation shafts are only turned on when required. There is no need to manage visual impact or stray light in the catchment areas.					Not Rated						

Risk Identification		Risk Analysis and Evaluation						Management Action Plan								
Risk Event	Causes (Direct & Contributing)	Preventative Controls	Mitigating Controls	Justification of Consequence and Probability ratings	Residual Risk Rating			Tolerable	Action Plan			Residual Risk Rating				
		Elim = Eliminate Sub = Substitute Iso = Isolate Eng = Engineering Adm = Administrative PPE = Personal Protective Equipment				Cons	Prob		Rating	Action	Responsible Person	Due Date	Cons	Prob	Rating	
Aboriginal Heritage - Russell Vale Colliery Pit top		RVC EC PLN 023 Conservation Management Plan		The Russell Vale Colliery Pit Top is listed in the Wollongong LEP 2009 as South Bulli Colliery as having heritage significance.					Not Rated							
Aboriginal Heritage - EP and Catchment Lease Areas	Disturbance of sites, lack of training and awareness	RVC EC PLN 023 Conservation Management Plan RVC EC PLN 005 Heritage Management Plan WCL EC PRO 022 Surface Drilling Within WATER NSW Catchment		Aboriginal Heritage Monitoring is undertaken in mining and catchment lease areas of Russell Vale East, Cultural Heritage Sites	2	D	L5	Yes								
Spontaneous combustion	Oxidation of coal	RVC MIN PHMP 009 Spontaneous Combustion	RVC MIN PLN 014 Emergency Response Control Plan	No instances of spontaneous combustion have been recorded at Russell Vale Colliery or in the 90 years of mining the Wongawilli Seam in the NSW Southern Coalfields.	1	E	L1	Yes								
Bushfire - Russell Vale Colliery Pit top	Dry vegetation, lightning, arson, ignition sources	RVC EC PLN 026 Bush Fire Management Plan (RV) RVC EC PLN 022_Pollution Incident Response Management Plan WCL EC PRO 016 Vegetation Clearing in Special Area Land (Managed by WaterNSW) Procedure APZ Clearance Procedure	RVC MIN PLN 014 Emergency Response Control Plan Emergency services	Ongoing clearing of undergrowth from around the general pit top operational areas will be undertaken during this MOP period to reduce the risk of bushfires affecting the operational areas of the mine surface. A firefighting water main is also provided on the mine site, which is boosted by a pressure pump, to provide the means to manually fight any bushfire that may threaten the site. A firebreak is maintained along the pit top access road to ensure the emergency evacuation route remains safe. The site has personnel trained in firefighting and has a large supply of readily available water and firefighting equipment on site.	4	C	S1 8	Yes								

Risk Identification		Risk Analysis and Evaluation						Management Action Plan							
Risk Event	Causes (Direct & Contributing)	Preventative Controls	Mitigating Controls	Justification of Consequence and Probability ratings	Residual Risk Rating			Tolerable	Action Plan			Residual Risk Rating			
		Elim = Eliminate Sub = Substitute Iso = Isolate Eng = Engineering Adm = Administrative PPE = Personal Protective Equipment				Cons	Prob		Rating	Action	Responsible Person	Due Date	Cons	Prob	Rating
Bushfire - EP and Catchment Lease Areas	Dry vegetation, lightning, arson, ignition sources	RVC EC PLN 026 Bush Fire Management Plan (RV) RVC EC PLN 022_Pollution Incident Response Management Plan WCL EC PLN 001 Incident Response Management Plan Special Area Managed by WaterNSW WCL EC PRO 016 Vegetation Clearing in Special Area Land (Managed by WaterNSW) Procedure APZ Clearance Procedure APZ management Plan	RVC MIN PLN 014 Emergency Response Control Plan Emergency services	Firebreaks are cleared around the site perimeter fence line of the main ventilation shaft site provides an asset protection zone and catchment bushfire protection.	2	C	M 8	Yes							
Post Mining Land Use - Regulatory Requirements	Regulatory requirements do not meet Post Mining Land Use.	RVC EC PLN 025 East 1 DSC Notification Area Closure Plan RVC EC PLN 020 Rehabilitation Management Plan		There are a number of rehabilitation activities identified for the period of the MOP including No.1 and 2 shaft, portal sealing of the eastern Bulli and Balgownie seam portal entries and the RVEA rehabilitation works.	3	D	M 9	Yes							
Post Mining Land Use - Mining Lease Requirements		RVC EC PLN 025 East 1 DSC Notification Area Closure Plan RVC EC PLN 020 Rehabilitation Management Plan			3	D	M 9	Yes							



Site	Russell Vale Colliery	DOC ID	
Type	Management Plan	Date Published	31/03/2021
Doc Title	Russell Vale Colliery – Bellambi Gully CMP		

APPENDIX E - TARPS

Noise

ASPECT	MONITORING				TRIGGER				
	SITES	PARAMETERS	FREQUENCY	PURPOSE	LEVEL	ACTION/ REPORTING	RESPONSIBILITY	TIMING	PURPOSE
Regional Noise Quality	2 real-time monitoring locations M1 and M2 10 short term attended monitoring – R1, R2, R3, R4, C1, C2, C3, C4, C5 and C6 1 automatic weather station (AWS) (W1)	Desktop Analysis: Periodic noise measurement levels in L_{Aeq} , L_{A90} and L_{A1} Field Analysis: 15 minute noise measurement levels in L_{Aeq} , L_{A90} and L_{A1} AWS- meteorological conditions including wind speed at 10m; wind direction at 10m, standard deviation of wind direction (sigma-theta) at 10m, temperature at 2m and 10m, relative humidity at 2m and rainfall (gauge at ground-level) (W1)	Field: - Real-time monitor automatically 15 minutes (M1 and M2) - Quarterly attended monitoring – 15 min monitoring (R1, R2, R3, R4, C1, C2, C3, C4, C5 and C6) - W1 – meteorological conditions automatically every 15 minutes	To identify triggers for implementation of management response measures To assess the effectiveness of noise control measures To quantify changes to noise emissions affecting residences and private properties near the site To ensure the mine contributions for noise emission levels	Unattended Monitoring Real-time Noise Monitor - L_{Aeq} 40 dB(A) at M1 - L_{Aeq} 35 dB(A) at M2 Criteria - L_{Aeq} 41 dB(A) at M1 - L_{Aeq} 36 dB(A) at M2 Attended Monitoring (undertaken on a quarterly basis e.g. January, April, July and October) Criteria Noise levels and locations as identified in Table 4.1 of	Performance Indicators: Review conditions and operations during the period of monitoring to identify potential causes of exceedances and implement mitigation measures as required. Criteria: If criteria trigger value is exceeded for any event: - Review meteorological data recorded at AWS including	Group Environmental Manager	Report exceedances of criteria trigger values immediately once results are received. Investigation initiated within 1 week, with monitoring carried out within 14 days Results of investigation reported to EPA and DPE	Inform stakeholders of monitoring Identify, investigate and report on noise impacts

				remain below relevant noise criteria at the nearest residences To obtain information to provide a basis for assessing the ongoing impact of the WCL Russell Vale Colliery operations on noise emissions; and To provide data suitable to demonstrate compliance with the CoA	the Noise Management Plan	wind speed and temperature inversions to investigate possible influence on the noise monitoring - Review WCL site activities undertaken during the monitoring period and investigate any irregular site activities or non-WCL related activities that might have influenced the monitoring - Undertake short-term operator attended noise monitoring to investigate		within 1 week of completion Commence preparation of mitigation/action plan within 1 week if required Monthly updates of investigation progress, if required by EPA and DPE Monitoring results include in annual review	
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						potential exceedances of noise criteria within 14 days - Inform EPA and DPE of exceedance - Investigation of possible mitigation measures in consultation with EPA and DPE - Prepare and implement a site mitigation/action plan in consultation with EPA and DPE if appropriate			
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Alarm	Management/Control Action	Role & Responsibility
Level 1 Alarm	- Review of the measured audio data to assess whether the noise is related to site operations. - Review of the meteorological data to confirm that the meteorological conditions are applicable to the operational noise criteria. Operational noise criteria are not applicable during the following periods: - rain/hail; - average wind speeds exceeding 5 m/s at 2 m above ground level; - Stability Categories A-D combined with wind speeds exceeding 0.5 m/s at 10 m above ground level; - and/or periods with Stability Categories E-F combined with wind speeds exceeding 2 m/s at 10 m above ground level). - If UEP noise is audible and a significant contributor to total noise levels (Item 1), and meteorological conditions are applicable to the operational noise criteria (Item 2): - Review predicted meteorological conditions to identify if noise enhancing conditions are forecast or likely to occur for the rest of the shift/assessment period of the day. - Review predicted noise impacts for the shift against observations. - Prepare a priority list of operating equipment contributing to resultant noise level, and or site activities and their location/s - Record management strategies. This includes details of investigation, type of response (if any required), real-time monitoring results and actions taken.	- Shift Site Supervisor - Shift Production Manager, - Environment Monitoring Coordinator, - Group Environment Manager
Level 2 Alarm	- Review of the measured audio data to assess whether the noise is related to site operations. - Review of the meteorological data to confirm that the meteorological conditions are applicable to the operational noise criteria. Operational noise criteria are not applicable during the following periods: - rain/hail; - average wind speeds exceeding 5 m/s at 2 m above ground level; - Stability Categories A-D combined with wind speeds exceeding 0.5 m/s at 10 m above ground level; - and/or periods with Stability Categories E-F combined with wind speeds exceeding 2 m/s at 10 m above ground level).	- Shift Site Supervisor - Shift Production Manager, - Environment Monitoring Coordinator,

Alarm	Management/Control Action	Role & Responsibility
	3. If UEP noise is audible and a significant contributor to total noise levels (Item 1), and meteorological conditions are applicable to the operational noise criteria (Item 2): • Prepare a priority list of operating equipment contributing to resultant noise level. • Where possible, progressively relocate or shutdown 'high priority' and then 'lower priority' operating equipment as per the priority list. • Review predicted meteorological conditions to identify if noise enhancing conditions are forecast or likely to occur for the rest of the shift/assessment period of the day. • Review predicted noise impacts for the shift against observations. 4. Monitor changes in noise levels against operational changes. 5. Monitor the changes in noise levels until noise levels drop below the alarm trigger. 6. Monitor changes in meteorological conditions and noise levels and progressively reinstate equipment once noise levels have dropped below the alarm trigger. 7. Record management strategies. This includes details of investigation, type of response (if any required), real-time monitoring results and actions taken.	• Group Environment Manager

Air Quality

ASPECT	MONITORING				TRIGGER				
	SITES	PARAMETERS	FREQUENCY	PURPOSE	LEVEL	ACTION / REPORTING	RESPONSIBILITY	TIMING	PURPOSE
Regional Air Quality	11 dust deposition gauges (DDG) (G1, G2, G3, G4, G5, G6, G7, G9, G10, G11, G12) 2 tapered elemental oscillating microbalance (TEOM) 1 automatic weather station (AWS)	Laboratory analysis: Dust deposition gauges - deposited dust including insoluble solids, soluble solids, ash content Field analysis: TEOM – PM10 (T1, T2) AWS – meteorological conditions including wind speed at 10 metres (m); wind direction at 10 m, standard deviation of wind direction (sigma-theta) at 10 m, temperature at 2 m and 10 m, relative humidity at 2 m and rainfall (gauge at ground-level). (W1)	Laboratory analysis: • DDG (G1 to G12) monthly - every 30 days $\pm$ 2 days Field air quality: • T1, T2 – PM10 automatically every ten minutes • W1 – meteorological conditions automatically every 15 minutes • Odour – detection during site inspections	To identify triggers for implementation of management response measures To assess the effectiveness of air quality control measures To quantify changes to air quality at residences and private properties near the site To ensure the mine contributions for dust concentrations and deposition levels remain below relevant air quality criteria at the nearest residences To obtain information to provide a basis for assessing the ongoing impact of the Russell Vale Colliery operations on air quality; and To provide data suitable to demonstrate compliance with the CoA.	DDGs – Deposited dust (Insoluble Solids) Performance Indicator Monthly insoluble solids exceeds 4/g/m ² /month Criteria Annual average insoluble solids exceeds 4/g/m ² /month	Performance Indicators: Repeat dust deposition gauge sampling of impacted and adjacent DDGs. Review conditions and operations during the period of sampling to identify potential root causes and implement mitigation measures as required. Criteria: If criteria trigger value is exceeded for the rolling 12 month average: • Inform EPA and DP&E of exceedance • Investigation of possible mitigation measures in consultation with EPA and DP&E • Prepare and implement a site mitigation/action plan in consultation with EPA and DP&E if appropriate	Group Environmental Manager	Report exceedances of criteria immediately once results are received. Investigation initiated within 1 week Results of investigation reported to EPA and DP&E within 1 week of completion Commence preparation of mitigation/action plan within 1 week if required Monthly updates of investigation progress, if required by EPA and DP&E Monitoring results included in annual review	Inform stakeholders of monitoring Identify, investigate and report on impacts to air quality

ASPECT	MONITORING				TRIGGER				
	SITES	PARAMETERS	FREQUENCY	PURPOSE	LEVEL	ACTION / REPORTING	RESPONSIBILITY	TIMING	PURPOSE
					<u>PM₁₀</u> Performance Indicator 10 minute sampling PM₁₀ exceeds 150 µg/m³ 24 hour sampling PM₁₀ exceeds 30 µg/m³ Criteria 24 hour sampling PM₁₀ exceeds 50 µg/m³ Annual average PM₁₀ exceeds 30 µg/m³	Performance Indicators Repeat PM₁₀ sampling. Review conditions and operations during the period of sampling to identify potential root causes and implement mitigation measures as required. Criteria If trigger value is exceeded for the rolling 12 month average: • Inform EPA of exceedance • Investigation of possible mitigation measures in consultation with EPA • Prepare and implement a site mitigation/action plan in consultation with EPA if appropriate	Group Environmental Manager	Report exceedances of criteria immediately once results are received and an exceedance has occurred Investigation initiated within 1 week Results of investigation reported to EPA within 1 week of completion Commence preparation of mitigation/action plan within 1 week if required Monthly updates of investigation progress, if required by EPA Monitoring results included in annual review	Inform stakeholders of monitoring Identify, investigate and report on impacts to air quality

ASPECT	MONITORING				TRIGGER				
	SITES	PARAMETERS	FREQUENCY	PURPOSE	LEVEL	ACTION / REPORTING	RESPONSIBILITY	TIMING	PURPOSE
					<u>Odour</u> Performance Indicator Detectable odour at the site boundary during site inspections.	Determine if odour is from site operations Review conditions and operations to identify potential root causes and implement mitigation measures as required	Group Environmental Manager	Investigation initiated immediately on detection of odour. Long term (>week) detections of odour to be reported to DP&E and EPA. - Results of investigation reported to EPA within 1 week of completion - Commence preparation of mitigation/action plan within 1 week if required - Monthly updates of investigation progress, if required by EPA and DP&E - Monitoring results included in annual review	Inform stakeholders of monitoring Identify, investigate and report on impacts to air quality

ASPECT	MONITORING				TRIGGER				
	SITES	PARAMETERS	FREQUENCY	PURPOSE	LEVEL	ACTION / REPORTING	RESPONSIBILITY	TIMING	PURPOSE
					<u>Dust Emission</u> Performance Indicator Dust emissions from Spontaneous Combustion event	WCL to respond to spontaneous combustion event and put out fire as quick as possible in accordance with the spontaneous combustion principal hazard management plan and TARP which describes a rapid and effective sealing of the mine.	Incident Response Manager	As per event.	Inform stakeholders of monitoring Identify, investigate and report on impacts to air quality

Traffic

ASPECT	MONITORING				TRIGGER				
	SITES	PARAMETERS	FREQUENCY	PURPOSE	LEVEL	ACTION / REPORTING	RESPONSIBILITY	TIMING	PURPOSE
Transport	Russell Vale Colliery - Site wide and particularly along loading and transit areas.	<u>Logistics Manager Inspection:</u> Driver compliance with PKCT Driver's Code of Conduct. Truck cleanliness, use of covers and vehicle faults. Noise levels at the load point.		To identify triggers for implementation of management response measures; To assess the effectiveness of air quality control measures; To assess effectiveness of noise control measures;	<u>Traffic Inspection</u> Performance Indicator 1. <u>Drivers to act in accordance with code of conduct</u> Criteria	<u>Traffic Inspection</u> Performance Indicators: Driver required to undertake code of conduct training with periodic review Criteria: If a driver acts contrary to the code twice Performance Indicators: Driver required to undertake training with periodic review Criteria:	Russell Vale Colliery (Logistics Manager)	Report exceedances of criteria immediately once results are received Investigation initiated within 1 week Results of investigation reported to EPA and DP&E within 1 week of completion Commence preparation of mitigation/action plan within 1 week if required Monthly updates of investigation progress, if required by EPA and DP&E Monitoring results included in annual review	Inform stakeholders of monitoring Identify, investigate and report on impacts to traffic, noise and air quality
	Bellambi Lane adjacent to Colliery as identified in Noise and Air Quality Management Plans.	Driver, plant operator communication issues. Loading/discharge delays. <u>Air Quality - Field Analysis:</u> Refer to Air Quality Management Plan TARPs <u>Noise - Field Analysis:</u> Refer to Noise Management Plan TARPs	<u>Truck inspection and driver behavior audit:</u> - Weekly audit - Spot inspections <u>Field air quality:</u> Refer to Air Quality Management Plan TARPs <u>Noise - monitoring:</u> Refer to Noise Management Plan TARPs	To ensure the mine contributions for dust concentrations and deposition levels remain below relevant air quality criteria at the nearest residences; To obtain information to provide a basis for assessing the ongoing impact of the Russell Vale Colliery	Driver acts contrary to code of conduct in the opinion of the Logistics Manager. Performance Indicator 2. <u>Truck wash not operational</u> Criteria No loading from stockpile while truck wash not operating.	Logistics Manager to speak to driver to determine reason for exceedance, with training to follow Performance Indicator Trucks only to be loaded from overhead bins while truck wash not operating Criteria No deposition of coal particulates along haulage route to PKCT			

ASPECT	MONITORING				TRIGGER				
	SITES	PARAMETERS	FREQUENCY	PURPOSE	LEVEL	ACTION / REPORTING	RESPONSIBILITY	TIMING	PURPOSE
				operations on air quality; and To provide data suitable to demonstrate compliance with the CoA.	Performance Indicator 3. <u>Trucks operate in an efficient manner</u> Criteria Trucks inspected to ensure in good working order, well maintained and covers fit for purpose Performance Indicator 4. <u>A traffic related unintended event</u> Criteria The occurrence of a traffic-related unintended event	Performance Indicator Review of truck condition undertaken by Logistics Manager on a weekly basis and identify potential causes of exceedances relating to noise or air quality and identify mitigation required Criteria If inspection reveals that trucks are in poor order the haulage contractor would be contacted immediately to rectify the problem and maintenance regime would be investigated by Logistics Manager Performance Indicator The traffic related unintended event must be reported to the Logistics Manager immediately and a report logged with DP&E where required. Criteria The occurrence of a traffic-related unintended event			

ASPECT	MONITORING				TRIGGER				
	SITES	PARAMETERS	FREQUENCY	PURPOSE	LEVEL	ACTION / REPORTING	RESPONSIBILITY	TIMING	PURPOSE
					Performance Indicator 5. <u>Heavy vehicles (off the main mine access road) or plant/equipment operating</u> Criteria A control zone of 2m plus 10m must be enforced, with no person entering unless provided with permission by the vehicle, plant/equipment operator after considering the persons safety and local operations. <u>Air Quality</u> Performance Indicator 1. <u>Air Quality – refer to Air Quality Management Plan</u> Criteria Air Quality – refer to Air Quality Management Plan <u>Noise</u> Performance Indicator 1. <u>Noise – refer to Noise Management Plan</u> Criteria Noise – refer to Noise Management Plan	Performance Indicator Person enters control zone while heavy vehicle, plant/machinery in energised or de-energised in an unsafe position Criteria Operator to advise person to immediately leave area. <u>Air Quality</u> Performance Indicator Air Quality – refer to Air Quality Management Plan Criteria Air Quality – refer to Air Quality Management Plan <u>Noise</u> Performance Indicator Noise – refer to Noise Management Plan Criteria Noise – refer to Noise Management Plan	Group Environmental Manager		

Water

ASPECT	MONITORING				TRIGGER				
	SITES	PARAMETERS	FREQUENCY	PURPOSE	LEVEL	ACTION / REPORTING	RESPONSIBILITY	TIMING	PURPOSE
Bellambi Gully Creek Discharge	WCL Russell Vale Colliery	Opportunistic visual inspection for signs of suspended solids contamination during active mining. Monitoring LDP2 water quality for the following parameters; - Oil and Grease; - total dissolved solids (TDS); and - pH.	In accordance with the requirements of EPL12040	To identify triggers for implementation of management response measures; To assess the effectiveness of erosion and sediment control measures; To quantify changes to contaminant levels within the Bellambi Gully Creek discharge waters; To ensure that discharge limits within EPL 12040 are complied with; To obtain information to provide a basis for assessing the ongoing impact of the WCL Russell Vale Colliery operations on stream health and stability; and To provide data to demonstrate compliance with the CoA.	Low No exceedance of EPL limits No deterioration in stream health and stability. Medium Exceedance of EPL pollution concentration limits at LDP 2 Oil and Grease: 10 mg/L pH: 6.5-9.2 TSS: 50mg/L Deterioration in stream health and stability is identified. High Unauthorised discharge from a location other than a licenced discharge point as specified in EPL 12040. Immediately cease the discharge.	Low No notification required Continue monitoring Report in regular monthly reporting Medium Notify the WCL Group Environment Manager. Review monitoring results against historical monitoring data. Test water quality at LDP2 and return water to Storm Water Control Dam until within licence. Report any Environmental Incidents in accordance with the Project Approvals, EPL and section 7.1. High Notify the WCL Group Environment Manager. Report any Environmental Incidents in accordance with the Project Approvals, EPL and section 7.1.	WCL Russell Vale Colliery (Group Environmental Manager) WCL Environmental Monitoring Team	Report exceedances of EPL limits immediately once results are received. Investigation initiated within 1 week Results of investigation reported to EPA and DPE within 1 week of completion Commence preparation of mitigation/action plan within 1 week if required Quarterly updates of investigation progress to EPA Monitoring results included in annual review	Inform stakeholders of stream health and stability Identify, investigate and report any exceedances of the EPL limits and potential discharge impacts

ASPECT	MONITORING				TRIGGER				
	SITES	PARAMETERS	FREQUENCY	PURPOSE	LEVEL	ACTION / REPORTING	RESPONSIBILITY	TIMING	PURPOSE
Stormwater Management	WCL Russell Vale Colliery	Routine visual inspection of stormwater diversion assets	Regularly and after significant rainfall events	To confirm that Stormwater management structures are open, clean and in good working order To identify triggers for implementation of management response measures such as build up of sediment in dam levels; To assess the effectiveness of Stormwater diversion assets; To obtain information to provide a basis for assessing the ongoing potential of the WCL Russell Vale Colliery operations to result in erosion and subsequent impacts on water bodies; and To provide data to demonstrate compliance with the CoA.	Low No erosion or sedimentation compared to baseline conditions. All Stormwater structures clear of vegetation, debris and/or sediments. Medium Noticeable erosion or damage to structures. Blockage of structures by vegetation, debris or sediments. High Noticeable bypasses or overflows of Stormwater channels Sediments in coarse sediment control structure and dams above design level.	Low No notification required. Continue monitoring. Report in regular monthly reporting. Medium Notify the WCL Group Environment Manager. Organise rehabilitation of Stormwater structures. High Notify the WCL Group Environmental Manager Organise cleaning of Stormwater structures Review hydraulic capacity of swales and culverts Notify the WCL Group Environment Manager. Organise cleaning of sediment control structures and dams.	WCL Russell Vale Colliery (Group Environmental Manager) WCL Environmental Monitoring Team	Report erosion or damage immediately once identified. Investigation initiated within 1 week Results of investigation reported to EPA and DPE within 1 week of completion Commence preparation of mitigation/action plan within 1 week if required Quarterly updates of investigation progress to EPA	Inform stakeholders of effectiveness of Stormwater assets in managing erosion Identify, any deficiencies in Stormwater assets resulting in erosive processes.

Biodiversity

ASPECT	MONITORING				TRIGGER				
	SITES	PARAMETERS	FREQUENCY	PURPOSE	LEVEL	ACTION / REPORTING	RESPONSIBILITY	TIMING	PURPOSE
Threatened species (Giant Burrowing Frog, Red-crowned Toadlet, Littlejohns Tree Frog), Green and Golden Bell Frog (GGBF)	Potential breeding habitat for Giant Burrowing Frog and Littlejohns Tree Frog along Wallandoola Creek and a tributary of Wallandoola Creek	Collection of data on habitat features, particularly breeding pools, as well as data on the abundance of adult frogs as well as tadpoles and egg masses within breeding pools or suitable habitat.	Two years of baseline monitoring prior to mining. Monitoring during mining.	To determine if subsidence effects resulting from longwall mining result in impacts to the habitat for threatened frog species.	Within prediction (Level 1): Minor reduction in pool depths and/or size. Minor visual impacts to water quality, such as iron staining. Opening of joints and bedding planes within frog habitat that do not impact on significant habitat features (such as breeding pools).	- Continue monitoring. - Report negligible impact in six monthly reports.	Group Environmental Manager	Six monthly reporting in accordance with Extraction Plan approval.	Inform stakeholders of baseline assessment and monitoring identify, investigate and report on impacts to groundwater quality and levels
			A minimum of two years of monitoring post-mining. If Level 2 or 3 triggers are reached, monitoring will continue in consultation with DPE, OEH and DEE. Threatened species monitoring (frogs only) will be undertaken twice in the appropriate season, with four surveys per annum.		Within prediction (Level 2): Reduction in pool size and/or depth affecting multiple pools along creek or within swamp. Short term (one year duration) reduction in species richness and/or abundance measures. Opening of joints and bedding planes within frog habitat resulting in minor impacts to significant habitat features (such as breeding pools).	- Inform WaterNSW, OEH and DPE of potential impact. - Engage ecologist to investigate and report on the cause of trigger exceedences and advise of potential impacts - Inform WaterNSW, OEH and DPE of investigation outcomes - Investigation of possible mitigation measures in consultation with WaterNSW & OEH - Prepare and implement a site mitigation/action plan in consultation with WaterNSW/ OEH if necessary - Implement a site specific monitoring program, where relevant, to determine if impacts is short, medium or long term in duration		- WaterNSW, OEH and DPE informed within one week. - Monitoring plan reviewed within one month of impact. - Six monthly reporting in accordance with Extraction Plan approval.	

ASPECT	MONITORING				TRIGGER				
	SITES	PARAMETERS	FREQUENCY	PURPOSE	LEVEL	ACTION / REPORTING	RESPONSIBILITY	TIMING	PURPOSE
					Exceeding prediction: Significant statistical difference between control and impact sites or between before and after mining at the control sites. Loss of significant habitat features (such as breeding pools) due to subsidence effects (such as fracturing of bedrock or iron staining)	• Inform WaterNSW, OEH and DPE of observed exceedance. • Engage ecologist to investigate and report on the cause of trigger exceedences and advise of potential impacts • Inform WaterNSW, OEH and DPE of investigation outcomes • Investigation of possible mitigation measures in consultation with WaterNSW & OEH • Prepare and implement a site mitigation/action plan in consultation with WaterNSW/ OEH if necessary • Implement a site specific monitoring program, where relevant, to determine if impacts is short, medium or long term in duration • Assess requirements for offset, in consultation with DPE and OEH.	Group Environmental Manager	• WaterNSW, OEH and DPE informed at the earliest opportunity of impact detection. • Investigation initiated within 1 week of impact detection • Results of investigation reported to WaterNSW , OEH AND DPE within 1 week of completion • Commence preparation of mitigation/action plan within 1 week if required	

ASPECT	MONITORING				TRIGGER				
	SITES	PARAMETERS	FREQUENCY	PURPOSE	LEVEL	ACTION / REPORTING	RESPONSIBILITY	TIMING	PURPOSE
Aquatic ecology	Monitoring of water quality and aquatic macroinvertebrates at two impact sites (RV01 and RV02).	A comprehensive visual inspection and photographic record of each monitoring site will be collected each time a site is visited. Condition of aquatic habitats based on AUSRIVAS method. Upper and lower limits of aquatic habitat will be established using OE50TaxaScores and SIGNAL scores.	Two years of baseline monitoring prior to mining. Monitoring during mining. One year post-mining at sites where data shows negligible impacts (as defined by the Trigger values). If Level 2 or Level 3 triggers are reached, or parameters measured as part of the Stream Monitoring program show changes, monitoring will continue in consultation with DPE, OEH and DoE. Photopoint monitoring of creeks determined by proposed monitoring schedule for monitoring sites (see above). Macroinvertebrate monitoring is undertaken in spring and autumn.	To determine if subsidence effects resulting from longwall mining result in impacts to aquatic habitats or threatened species. Inform stakeholders of baseline assessment and monitoring. Identify, investigate and report on impacts to aquatic ecology.	Within prediction (Level 1): Negligible environmental consequences for creeks, as illustrated by no significant changes in water quality or data collected during macroinvertebrate sampling.	- Continue monitoring. - Report negligible impact in six monthly reports.	Group Environmental Manager	Six monthly reporting in accordance with Extraction Plan approval.	

ASPECT	MONITORING				TRIGGER				
	SITES	PARAMETERS	FREQUENCY	PURPOSE	LEVEL	ACTION / REPORTING	RESPONSIBILITY	TIMING	PURPOSE
					Within prediction (Level 2): Reduction in aquatic habitat at impact sites illustrated by a short term (one year) reduction in aquatic habitat, as shown by: • Water quality data exceeding upper or lower limits of baseline monitoring over at least two months; • A statistically significant decline in OES0Taxa Score since mining commenced compared to control sites; or • Change in AUSRIVAS Band since mining commenced compared to control sites.	• Inform DoE, WaterNSW, OEH and DPE of potential impact. • Continue monitoring. • Review frequency and location of monitoring and determine if additional monitoring is required. • Report potential impacts in six monthly reports.	Group Environmental Manager	• DoE, WaterNSW, OEH and DPE informed within one week • Monitoring plan reviewed prior to next season • Six monthly reporting in accordance with Extraction Plan approval.	

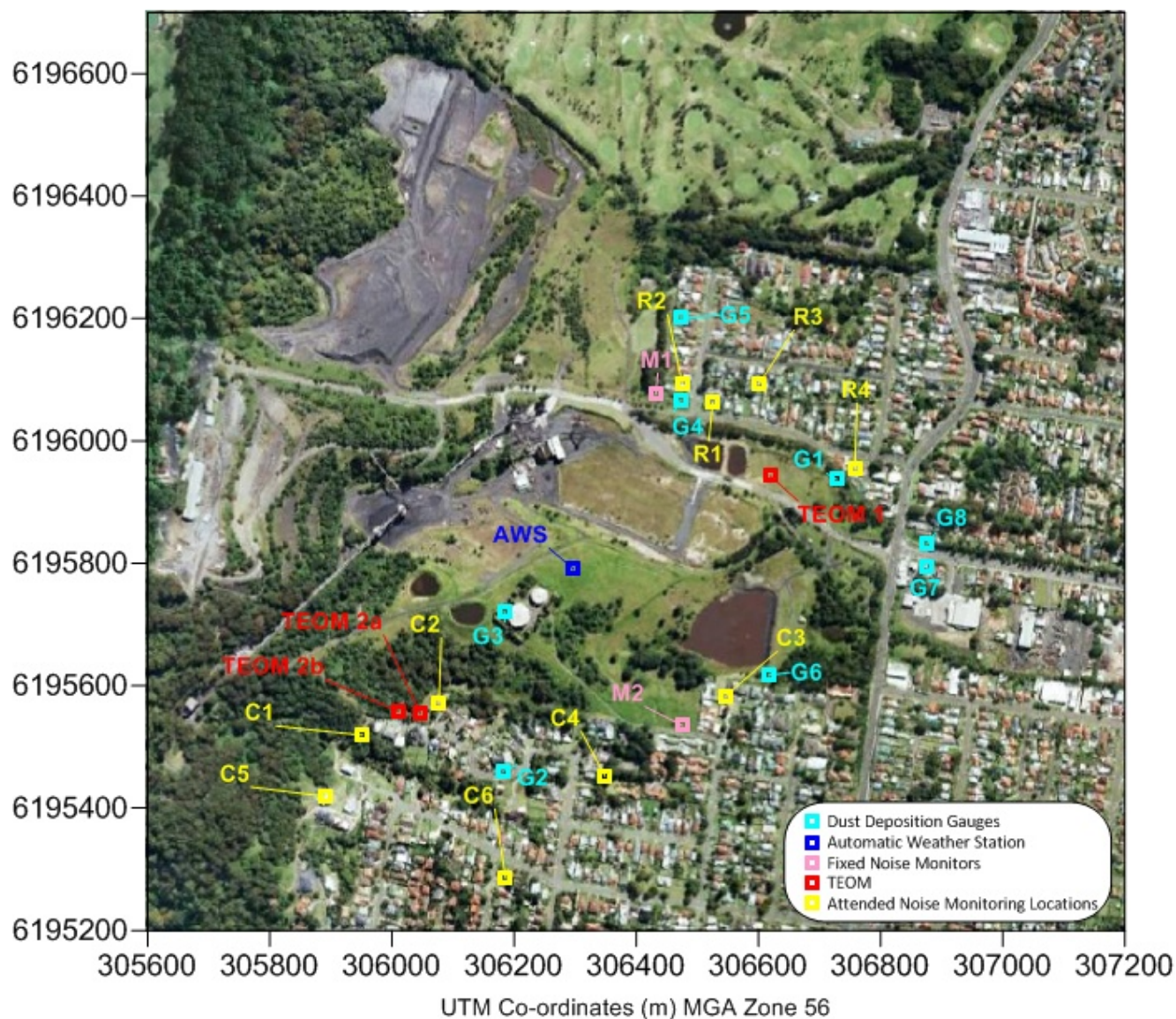
ASPECT	MONITORING				TRIGGER				
	SITES	PARAMETERS	FREQUENCY	PURPOSE	LEVEL	ACTION / REPORTING	RESPONSIBILITY	TIMING	PURPOSE
					Exceeding prediction: Reduction in aquatic habitat at impact sites only for an extended timeframe (>2 years), as shown by: • Water quality data exceeding upper or lower limits of baseline monitoring for at least four months; • A statistically significant decline in OE50Taxa Score since mining commenced compared to control sites; or • Change in AUSRIVAS Band since mining commenced compared to control sites.	• Inform DoE, WaterNSW, OEH and DPE of observed exceedance. • Engage ecologist to investigate and report on the cause of trigger exceedances and advise of potential impacts. • Inform DoE, WaterNSW, OEH and DPE of investigation outcomes. • Review monitoring program, including frequency and location, and modify if necessary. This may include addition of flora monitoring along creeks where stream flow has reduced. • Develop and implement impact mitigation and remediation measures in consultation with DoE, WaterNSW, OEH and DPE. • Develop a monitoring plan to determine the success of mitigation / remediation measures. • If mitigation / remediation measures are unsuccessful determine whether offsets will be required, and develop an offset strategy. • Report in annual reviews and six monthly reports to inform relevant agencies of results of monitoring. • Assess requirements for offset, in consultation with DPE and OEH.	Group Environmental Manager	• DoE, WaterNSW, OEH and DPE informed at the earliest opportunity of impact detection. • Investigation initiated within one week of impact detection. • Results of investigation reported to DoE, WaterNSW, OEH and DPE within one week of completion. • Monitoring plan reviewed within one month of impact detection. • Commence preparation of mitigation/action and monitoring plan within one week (if required). • Monthly updates of investigation progress, if required by WaterNSW / OEH. • Six monthly reporting in accordance with Extraction Plan approval.	

Site	Russell Vale Colliery	DOC ID	
Type	Management Plan	Date Published	31/03/2021
Doc Title	Russell Vale Colliery – Bellambi Gully CMP		

APPENDIX E – MONITORING LOCATIONS

Air & Noise Monitoring Locations

Gujarat NRE Russell Vale Underground Coal Mine Noise and Air Quality Monitoring Network



EPL Monitoring Locations



Legend

- UEP Project Application Area
- + Ambient Monitoring Location
- + Licensed Discharge Point
- + Former Monitoring Location

FIGURE 5.3

Environment Protection Licence Monitoring Locations

Source: Umwelt 2019a, Russell Vale Revised Underground Expansion Project: Revised preferred project report and response to second PAC review